a) **Waterfront Station**
SkyTrain, SeaBus, West Coast Express, and local and express buses all share a common station at Waterfront. This station is also adjacent to frequent seaplane and helicopter services to Victoria, Nanaimo, and other island destinations as well as numerous more remote destinations. The station provides connections to Canada Place and the proposed convention centre expansion. The station might also become the terminus of the Richmond/Airport rapid transit line and the streetcar.

Given the convergence of many transportation modes, Waterfront Station is a major transportation hub for downtown. It is proposed to enhance the role of Waterfront Station as an intermodal interchange. Changes to achieve this include the creation of additional bus stops and bus-only lanes on Cordova Street in front of the station and the creation of a nearby streetcar station. See improvement #50 in Section 5.1 for more details.

b) **Granville Mall**
The Granville Mall is the location of the major downtown transfer points for most bus service in the City of Vancouver. Of the several transfer points along the Mall, the Granville SkyTrain station is of particular importance. The Plan emphasises the role of Granville Street by confirming the Mall as a transit priority corridor, recommending enhancements to it, and by introducing new streetcar stations at Drake Street and at Cordova Street. Ultimately it has been suggested that the streetcar could run the length of Granville Street downtown thereby completing a loop.

c) **Burrard Station**
The intersection of Burrard and Dunsmuir streets, in the centre of the downtown office precinct, is a major terminus for regional bus routes and is the location of one of the busiest SkyTrain stations. Underground pedestrian connections link the SkyTrain station directly to Bentall Centre and Royal Centre. Bus stops line Dunsmuir and Burrard Streets next to the station. Generally this transit hub functions well. Changes proposed for this area include a mid-block crosswalk across Dunsmuir Street between Burrard and Thurlow Streets and bus priority on Burrard Street.

d) **Main Street Station**
Main Street station is a busy SkyTrain station with good connections to a number of local bus routes. Next door is Pacific Central Station, providing inter-city bus and rail service to the rest of the continent. In the future, one, possibly two, streetcar stations at this hub would provide connections to Granville Island, False Creek Flats, Chinatown, Gastown, Yaletown, and many other downtown destinations. Bus priority measures on Main Street could improve access to this transit hub.

Transit Priority Corridors

Transit priority corridors are identified in figure 4.2-K and could include measures such as, bus lanes, HOV lanes, signal priority, and enhanced pedestrian facilities. The following transit priority measures are recommended.

a) **Burrard Street**
Investigate the potential for introducing transit/HOV lanes from Pacific to Pender, in the peak periods/peak directions only, as part of the Vancouver Area Transit Planning process starting in September.

b) **Georgia Street**
Extend the westbound 3:00 to 7:00 PM HOV lane further east from Burrard to Richards Street.

c) **Hastings Street**
Investigate the potential for a transit signal priority system, following an operational review of the new 98 B Line Granville Street transit signal pre-emption system.

d) **Main Street**
Investigate the potential for introducing bus only queue jumper lanes in the peak periods peak directions on Main between National Avenue and 2nd Avenue, as part of the Vancouver Area Transit Planning process starting in September.

e) **Granville Street**
Enhance streetscape design from the bridgehead to Cordova to improve pedestrian/transit stops. Investigate the potential to improve bus travel times on Granville by providing bus-passing opportunities and optimized signal control.

4.2.5 Transit Fare Structure

Generally three fare zones are in place in Greater Vancouver (West Coast Express has more fare zones). TransLink is currently reviewing the existing fare structure to improve equity across the system.

A downtown "free fare" zone for Vancouver has been suggested in the past. A number of cities, such as Portland, Seattle, and Calgary have some version of a downtown free fare zone. The free fare zones in these cities encourage people to use transit to get around within the central business district. Two main features make Vancouver's downtown unique when compared to other North American cities that have free fare zones. One feature is that the central business district (the area of concentrated office development) is very compact and walkable when compared to other cities. Few people will return to their car to visit another part of the CBD. The other unique feature of our downtown is the large residential population located around the CBD within easy walking distance. These conditions suggest that a *"free fare"* zone may serve more to shift walking commuters to transit than to get car commuters out of their vehicles.

One outcome of the fare review could be an increase in the number of fare zones. This could result in the creation of a new "downtown fare zone", providing the possibility of relatively lower fares for trips wholly within the downtown. Charging lower fares on transit routes that do not leave the City Core should be explored as a means of improving the equity of the relatively short trips on these routes. Note that if a downtown fare zone is created, the coverage of the downtown circulator bus routes should be reviewed to ensure that all downtown neighbourhoods will benefit, particularly if a lower fare is applied only to no-transfer trips within the downtown. Charges on parking could also be used to support transit routes that reduce short-distance driving trips downtown.

4.2.6 Transit Area Plan

Bus service changes will be reviewed and finalized as part of TransLink's Area Transit Plan for Vancouver in 2002.

The City will work with TransLink on a public process that will help to guide the development of a new transit area service plan for the City of Vancouver.

Transit Recommendations

Recommendation TR1: *Use easy-to-read colour-coded maps at bus stops to clearly describe the downtown circulator bus routes.*

Recommendation TR2: *Operate downtown circulator bus routes in both directions on the same street and use electric trolley buses wherever possible.*

Recommendation TR3: *Encourage TransLink to investigate using advertising space on event tickets or envelopes to display bus routes and schedules leading to major event facilities, and coordinate with event organizers to charge an additional service fee to provide transit passes to event patrons.*

Recommendation TR4: *Reaffirm the City's commitment to develop a detailed transportation plan for the False Creek Flats in co-ordination with a rail study.*

Recommendation TR5: *Support the development of a rapid transit line from downtown Vancouver to Richmond (and possibly the airport) to achieve City and regional objectives, with stations in Downtown South, the central business district (centred at Burrard and Dunsmuir) and the transportation hub at Waterfront Station, using tunnel rail technology.*

Recommendation TR6: *Consider converting the existing bus lanes on Seymour and Howe Streets for use by other sustainable modes or for additional parking or landscaping as part of the implementation of the Richmond/Airport rapid transit line.*

Recommendation TR7: *Extend the proposed Pacific Boulevard streetcar line along Drake Street to Granville Street.*

Recommendation TR8: *Adjust the location of streetcar stations as detailed in Figure 4.2-I.*

Recommendation TR9: *Extend new streetcar routes for the False Creek Flats, Vanier Park, and along the Arbutus corridor.*

Recommendation TR10: *Consider alternative streetcar alignments on Water Street, Abbott Street or Keefer Street if needed for additional capacity.*

Recommendation TR11: *Investigate the potential for introducing transit/HOV lanes on Burrard Street from Pacific to Pender, in the peak periods/peak directions only, as part of the Vancouver Area Transit Plan.*

Recommendation TR12: *Extend the westbound 3:00 to 7:00 PM HOV lane on Georgia Street east from Burrard to Richards Street.*

Recommendation TR13: *Investigate the potential for a transit signal priority system on Hastings Street, following an operational review of the new 98 B-Line Granville Street transit signal pre-emption system.*

Recommendation TR14: *Investigate the potential for introducing bus only queue jumper lanes in the peak periods on Main Street between National Avenue and 2nd Avenue, as part of the Vancouver Area Transit Planning process.*

Recommendation TR15: *Enhance streetscape design of Granville Street from the bridgehead to Cordova street to improve pedestrian/transit stops.*

Recommendation TR16: *Investigate the potential to improve bus travel times on Granville Street by providing bus-passing opportunities and optimized signal control.*

Recommendation TR17: *Pursue changes to Cordova Street in front of Waterfront station to create additional bus stops, a bus-only lane on Cordova, and accommodate a streetcar station.*

Recommendation TR18: *Work with TransLink on a public process that will help to guide the development of a new transit area service plan for the City of Vancouver.*

Recommendation TR19: *Review the routing and station locations of the 98 B-Line.*

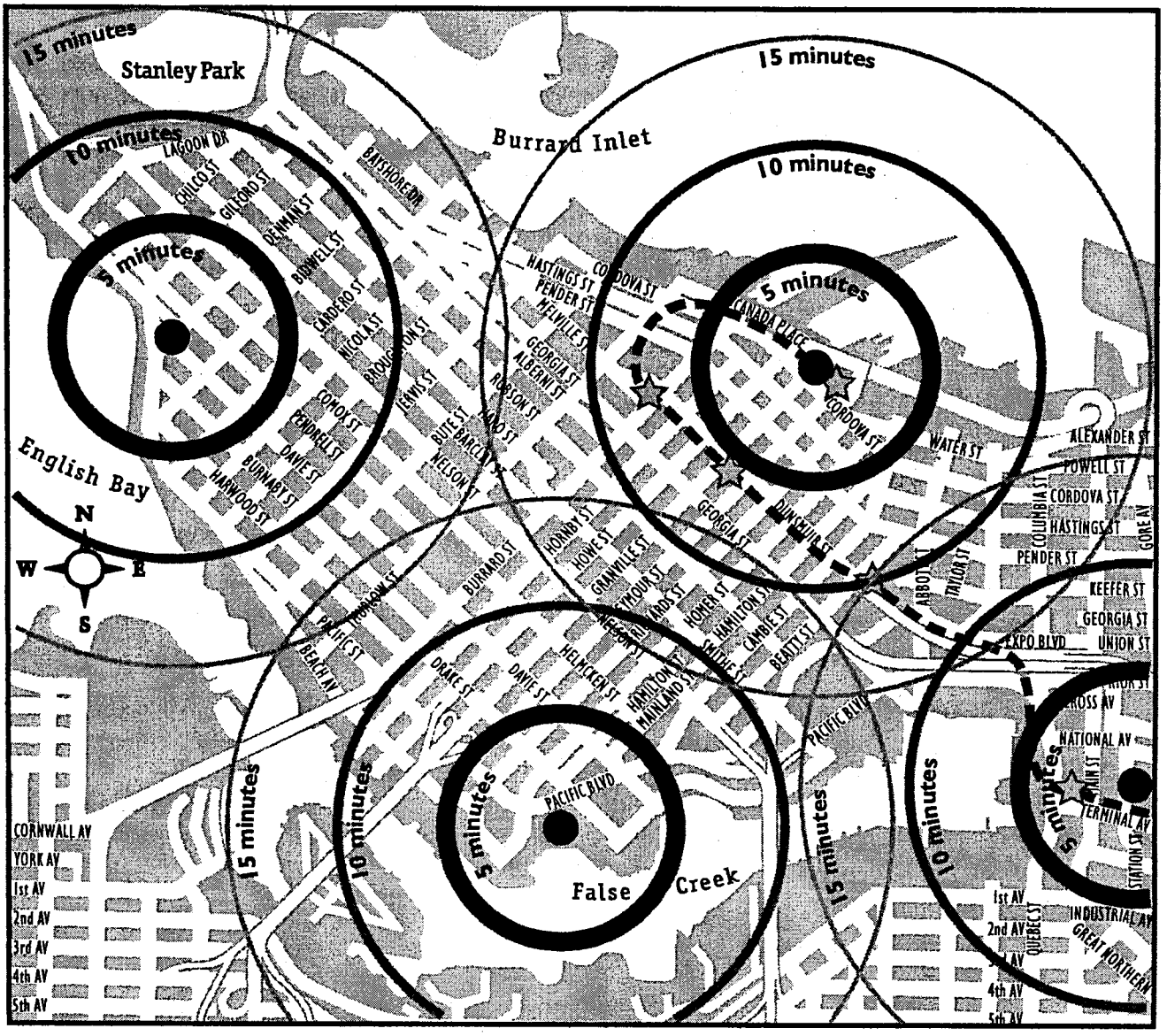
Recommendation TR20: *Encourage Translink to review the potential for a reduced fare for short trips.*

4.3 Pedestrian Plan

Whether you live, work, shop or visit downtown, walking is a significant part of the experience. The total area of the downtown is approximately 1400 acres, yet because of the mix of high-density land uses and an efficient street grid, people downtown are usually within walking distance of their destinations. Major retail streets such as Granville, Robson, Davie, Water and Denman offer a wide variety of shops and services that cater to residents, workers and shoppers from within the downtown and the region. Parks, community centres, libraries, and entertainment venues are all within walking distance of downtown residential neighbourhoods. *see Figure 4.3-A*

Figure 4.3-A

Distances for 5, 10 and 15 minute walks from select locations



With changes in downtown land-uses, there has been an accompanying shift in travel behaviour. Recent data from the 1999 TransLink Trip Diary Survey indicates a dramatic change in the travel modes. In contrast to trends elsewhere in the region, the downtown has seen a reduction in mode share for daily auto trips and transit trips to downtown while walking, on the other hand, has dramatically increased as illustrated in section 3.5.

Downtown's central business district (CBD) provides the largest employment centre in the region. Over half of downtown residents commuting to work also work on the downtown peninsula. New neighbourhoods such as Downtown South, Triangle West, North False Creek and Coal Harbour are emerging around the CBD to provide homes for an estimated 100,000 residents over the next 20 years. Many of these new residents will choose to walk to their jobs within the CBD. The result is a dramatic shift in the way people get around. Patterns of travel in and around the downtown have shifted from single-occupant-vehicles to walking, biking and transit.

Every mode of travel, including transit, car, and bicycle, involves walking as part of the journey. Making all downtown streets more accessible, comfortable and safe for walking is crucial to developing a liveable city where the streets become a place of interest and focus for the community life. The 1996 census showed that close to 40 percent of downtown residents choose walking as their primary mode of travelling to work. Compared to other modes of travel, pedestrian trips have seen the highest growth in the downtown over the past 10 years. The number of trips made on foot will continue to grow, as more people are choosing to live downtown closer to work and shopping.

The Downtown Transportation Plan vision promotes 'pedestrians first', recognizing that pedestrian travel is growing and is important to the economic vitality and liveability of the downtown. The vision is one where the function of the street facilitates movement of people and helps to define the neighbourhood as a place for activity, socializing and commerce.

4.3.1 The Policy Framework for Pedestrians

The Central Area Plan (1991)
The plan promotes "a walkable Central Area" where pedestrians move safely, easily, and comfortably on all streets and where walking, supplemented by transit and bicycles, is the primary means of moving around. The Central Area Plan also promotes policies that enhance pedestrian environments on non-retail streets. This is largely done with buildings that contribute and relate to adjacent streets by providing architectural definition, sidewalk richness, comfort and safety by providing "eyes on the street".

Vancouver's Transportation Plan (1997)
This plan provides the overall transportation priorities for the city emphasizing pedestrians. "Facilities for pedestrians will be improved within the Downtown, including pedestrian priority areas, wider sidewalks, more priority for crossings, pedestrian short-cuts, pedestrian environment improvements, and better pedestrian and cyclist connections to bridges, and seawalls."

Vancouver Greenways Plan
The Vancouver Greenways Plan was approved by Council in July 1995. It identified conceptual route alignments throughout the city including several corridors through the downtown. The Downtown Transportation Plan has recommended a number of specific greenways for implementation.

4.3.2 Goals and Guiding Principles

The goal of the Downtown Transportation Plan is to improve the pedestrian environment such that walking becomes a more attractive, safe, efficient and comfortable way to experience the city. The objective is to integrate neighbourhoods by improving connectivity to major destinations including community centres, shopping streets, transit nodes, institutions, as well as entertainment and recreational facilities. This plan recommends investment in pedestrian facilities and improvements to the pedestrian environment with the goal of not just accommodating walking but encouraging walking as an attractive transportation alternative.

4.3.3 Assessment of Pedestrian Needs

Encouraging pedestrian travel requires investment and appropriate design of the pedestrian realm so that the "level of service" (LOS) for pedestrian movement improves. LOS is a qualitative scale to assist in the evaluation of pedestrian comfort and ease of movement along sidewalks. In general, higher levels of pedestrian concentration (between LOS D -LOS F) results in a decreased level of comfort and increased friction of movement. Within the downtown, sidewalks are typically operating between LOS A and LOS C.

Through the course of public workshops, walkabouts and stakeholder meetings, the public provided comments and identified a wide range of issues. In public meetings, citizens called for the following:

- Create a network of pedestrian routes throughout the downtown;
- Provide mid-block crossings, where needed, to facilitate pedestrian desire lines;
- Provide adequate space for pedestrians on busy retail streets;
- Encourage walking in the downtown; and
- Promote safety and education of pedestrian issues.

General Space Requirements for Pedestrians.

LOS A
<1.6 p/min/m

LOS B
1.6- 10 p/min/m

LOS C
10-20 p/min/m

LOS D
20-36 p/min/m

LOS E
36-59 p/min/m

LOS F
>59 p/min/m

Source: Pedestrian Planning and Design, J. Fruin, 1971

4.3.4 Other Pedestrian Related Initiatives

Pedestrian Study, City of Vancouver (2001/2002)
City Council approved funding for a Pedestrian Study to monitor pedestrian trends (volumes, opinions on pedestrian issues) at selected downtown locations. This study will provide pedestrian counts along major commercial streets within the downtown core. An opinion survey has been completed as part of this study. Some of the major findings include:

- 21.7 percent expressed concern about people who are threatening;
- 17.4 percent said crossings are difficult due to lack of pedestrian signals;
- 13.7 percent complained about conflicts with turning vehicles;
- 9.9 percent complained about dangerous drivers;
- 72 percent of respondents indicated crossings at signals were good or very good; and
- 70 percent of respondents indicated that the amount of space on sidewalks was generally good or very good.

Some additional specific concerns included:

- The crossing distance at Pacific and Davie is too long for the allotted time;
- Pedestrian crossing at Pacific and Burrard needs to be improved; and
- Crossing Georgia at Nicola Street is difficult.

Streetscape Design Study (2002)
A Streetscape Design Standards Manual will provide standards for sidewalk paving design and materials, street furniture, street trees and landscaping, lighting, public amenities, public signs ('way finding') and other streetscape elements within the public street right-of-way. The manual will provide a classification of streets based on their role and function within the public realm.

Street Furniture Program
In 1999, the City initiated a study to explore opportunities for private sector delivery and maintenance of improved street furniture. The Downtown Transportation Plan supports the provision of increased pedestrian amenities that help to enhance the pedestrian realm with benches, public toilets, litter receptacles, bus shelters, signage for way finding, consolidates newspaper vending boxes, and which help to animate streets with kiosks and public art. A report to Council is expected in 2002.

False Creek Pedestrian and Cycling Crossing Study
The City is currently investigating options for providing safe and effective pedestrian and cycling connections across False Creek. Existing facilities allow pedestrians and cyclists to cross False Creek by private ferry systems and three high-level bridges: Burrard, Granville, and Cambie. While these existing facilities are functional, enhancements to the existing False Creek crossings would improve access and increase convenience for pedestrians and cyclists. The next phase of the False Creek Pedestrian and Cycling Crossing Study will integrate bridge facilities with the pedestrian routes recommended in the Downtown Transportation Plan.

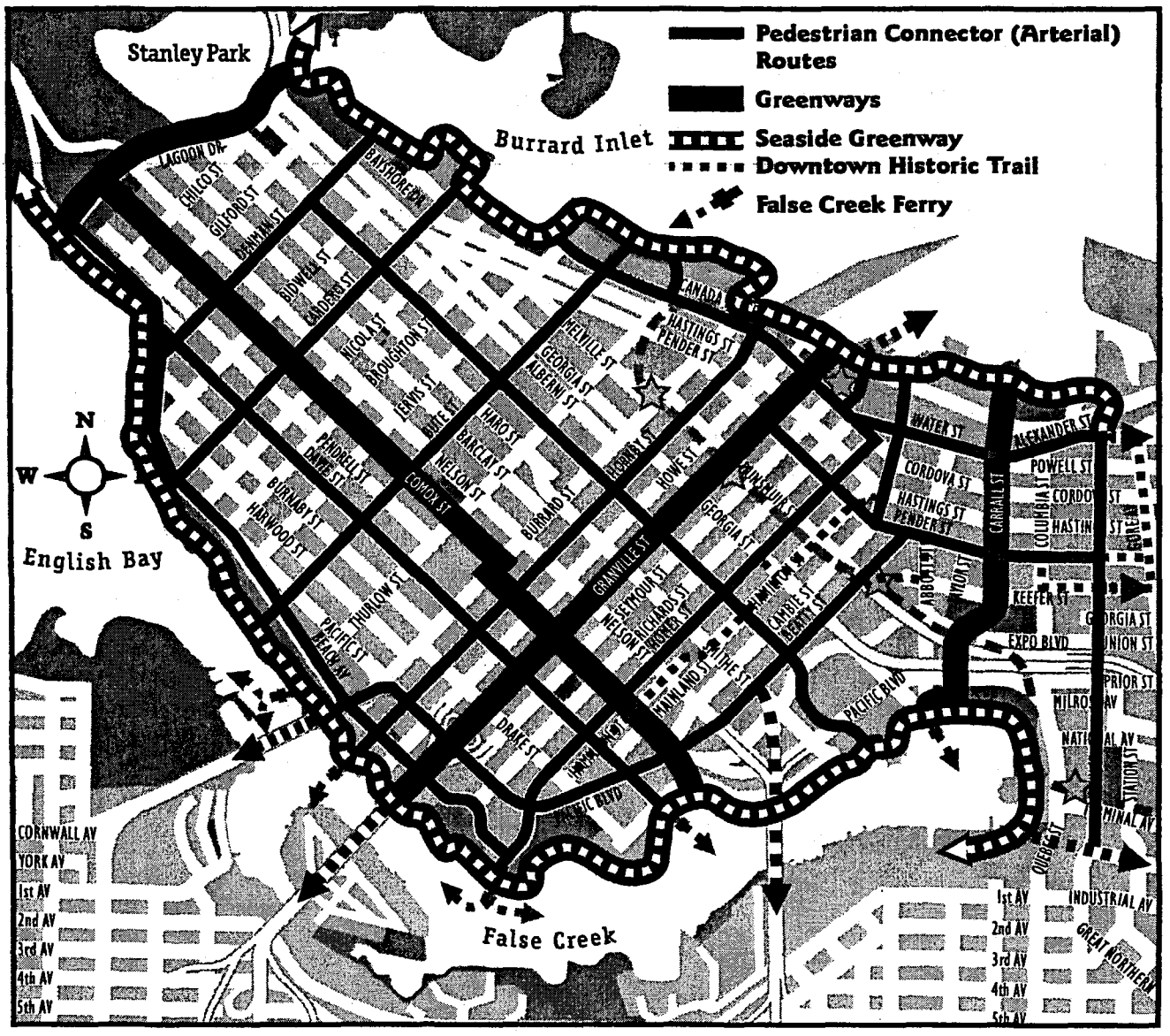
Sidewalk Task Force
City Council created the Sidewalk Task Force to address specific issues around provision of street furniture and amenities, sidewalk construction and maintenance practices, and encroachments of 'sandwich board' signage, outdoor café seating and tables that obstruct pedestrian flow and undermine safety and comfort.

4.3.5 Proposed Policies

a) Pedestrian Routes and Greenways

Adopt the Pedestrian Route network identified in *Figure 4.3-B* to facilitate and promote walking as a more attractive transportation alternative. These routes will provide improved links between neighbourhoods, parks, community centres, open spaces, as well as transportation nodes such as SkyTrain Stations, False Creek passenger ferries, Waterfront Station, and major commercial precincts.

Figure 4.3-B
Pedestrian Routes and Greenways



b) Curb Ramps

Curb ramps provide a smooth transition between the street and sidewalk. Curb ramps should be provided at each corner of an intersection that aligns with the pedestrian crossings through intersections. Ideally, two ramps should be provided at each corner. Tactile surfaces should be provided to aid sight-impaired pedestrians to navigate safely across intersections.

c) Restricted Pedestrian Crossings

Restricted pedestrian crossings are located at busy intersections like the intersection of Georgia and Denman Streets where high volumes of turning movements and pedestrian crossings create potential for conflicts and traffic queues. Where safety can be maintained and traffic impacts managed, restricted pedestrian crossings should be removed.

d) Mid-Block Crossings

The downtown peninsula has an efficient and dense grid of streets with most intersections signalized to provide convenient and safe crossings for pedestrians. In some areas blocks are longer and the distance between crosswalks at intersections increased. Some of the longer blocks exist between Burrard and Bute Streets and along Pacific Boulevard.

The provision of mid-block crossings is recommended near significant pedestrian generators that create high demands for pedestrian crossing at mid-block. Some suggested locations for mid-block crossings include:

- Dunsmuir at Melville: Significant volumes of pedestrians cross Dunsmuir between Burrard SkyTrain Station and the Bentall Centre and bus stops to the north. (see spot improvement #45 in section 5.1)
- Canada Place Way extension (between Burrard and Thurlow): A mid block crossing should be provided across the future extension of Canada Place Way between the proposed Vancouver Convention and Exhibition Centre expansion and the proposed hotel/office development. This will facilitate better connections between the public open space and the 'arrival court' of the hotel where there will be a desire for mid-block pedestrian crossings.
- Pacific Boulevard (at Plaza of Nations): The Northeast False Creek Urban Design Study recommended that the pedestrian overpass between the BC Place Stadium and the Plaza of Nations be replaced with an "at-grade" signalized crosswalk mid-block between Terry Fox Way and Griffiths Way.
- Expo Boulevard and Pacific Boulevard: Facilitate improved north-south pedestrian movement/access across the 'neck' of the downtown by providing a mid-block crossing at Expo and Pacific Boulevard perpendicular to the south-west corner of Andy Livingston Park where the off-street pedestrian pathway ends. A mid-block crossing at this location will help improve pedestrian connectivity and access between Northeast False Creek and the Downtown Eastside.

e) Sidewalk Crossings at Lanes

Where lanes intersect sidewalks at block-ends there is increased potential for vehicle and pedestrian conflicts, as buildings tend to obstruct sight lines between motorists and pedestrians. Where there is high potential for conflict, the following improvements are recommended:

- Provide sidewalk continuity across lanes by extending sidewalk treatment and maintaining the same elevation;
- Install different surface treatments to highlight potential conflict area;
- Provide stop-line for vehicles on lane surface; and
- Install mirrors where practical to increase visibility.

f) Informational Signage ("way finding")
Pedestrian signage can help pedestrians navigate along designated pedestrian routes including Greenways, Great Streets, and Pedestrian Connectors. Signage should indicate major destinations along the route, provide distances between destinations and features along the route. The signage should be visible, easy to understand, and consistent for easy recognition and identification. Further work will be needed to design and implement a universal system of pedestrian signage for downtown as part of future public realm work (also see Public Realm in Section 4.8).

g) Pedestrian Bulges
Pedestrian or corner bulges narrow the road width at intersections reducing the crossing distance and improving visibility of pedestrians. The reduced crossing distance allows pedestrian crossings to be made in less time, increasing intersection efficiency and reducing pedestrian exposure to traffic. Bulges also prevent motorists from parking too close to the intersection thereby improving the overall intersection safety.

Pedestrian or bus bulges are recommended in locations where pedestrian crossings are long and traffic capacity would not be compromised. Some sample locations for pedestrian bulges may include:

- Denman Street at Morton Avenue (see spot improvement #2 in section 5.1)
- Pacific and Cambie;
- Pacific and Davie (2001 opinion survey identified this signal crossing time as being too short);
- Thurlow and Comox; and
- Helmcken and Homer.

Priority for implementing pedestrian bulges should be focused on proposed pedestrian routes where traffic operations can be improved.

h) Parking and Loading Access
Where possible, reduce the number of curb cuts for driveways and parking access along identified pedestrian routes. If it is not possible to achieve vehicular entry off the back lane or alternative streets, then access may be permitted in limited circumstances. Where possible on large sites (corner or double fronting), crossings should be located on the street with lower pedestrian volumes. The design of entry driveways shall minimize the number of curb cuts and maximize potential green space by consolidating both exit and entry in the same location. Further work between Engineering and Planning to include this principle as part of the Parking Bylaw and other documents is recommended.

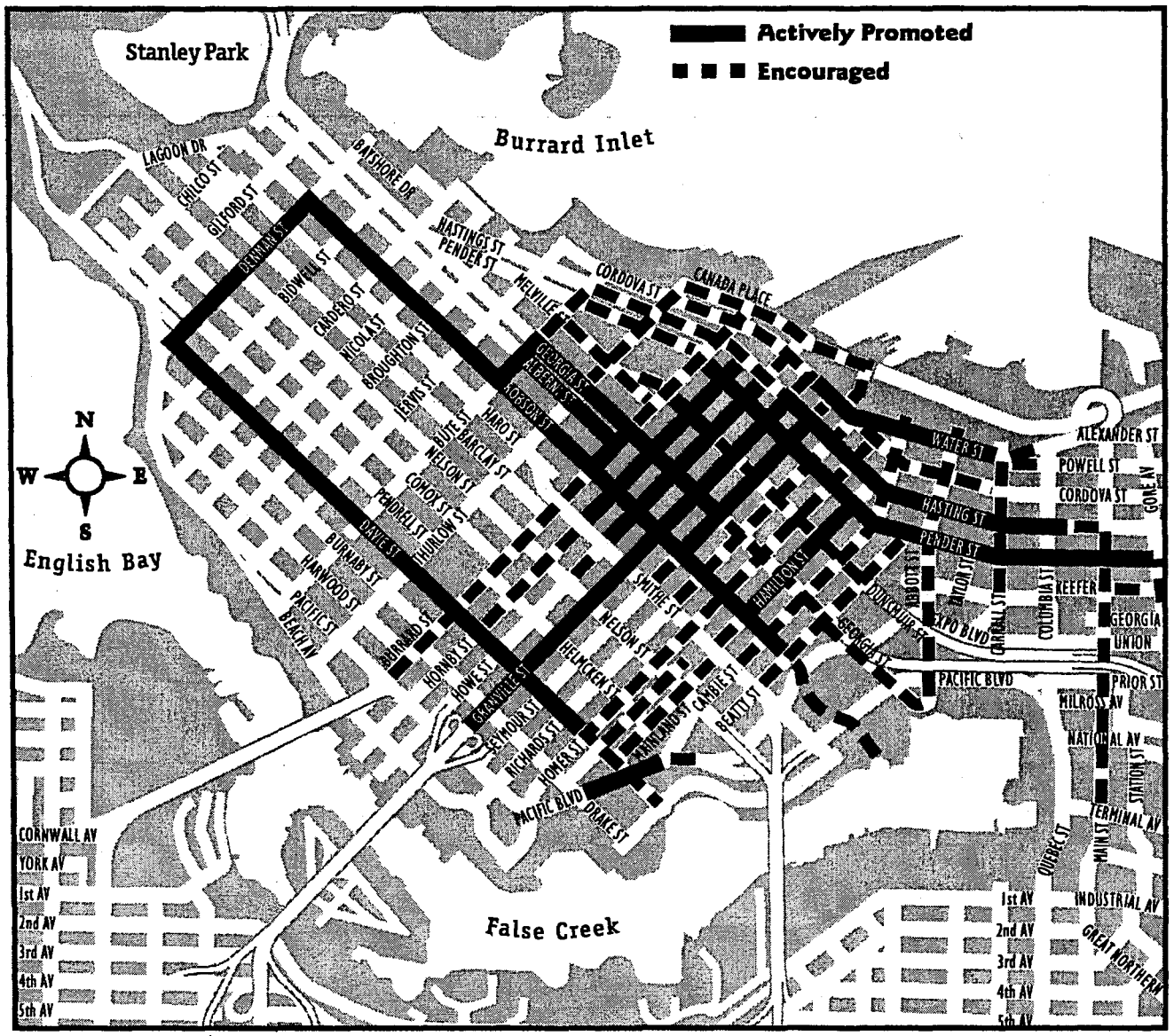
i) Restrict above and below grade Pedestrian Connections
The goal of the DTP is to focus pedestrian activity along streets to help achieve the goals of "an alive and walkable downtown" and to make streets feel safer and more vibrant. Underground or aboveground pedestrian connections are not encouraged except for providing links to underground transit stations.

j) Pedestrian Weather Protection

Pedestrian weather protection is a building element that provides shelter from rain and wind, including awnings, canopies and building recesses. It is recommended that the Central Area Weather Protection Guidelines be amended to provide pedestrian weather protection on retail/commercial streets where guidelines currently do not require pedestrian weather protection. Pedestrian weather protection should be compatible with the building and street character as well as provide suitable light and sun penetration. Where weather protection is already provided around transit stops, avoid the redundancy of additional transit shelters that do not provide additional benefits and which may create potential obstacles along the sidewalk. *(See Figure 4.3-C).*

Figure 4.3-C

Pedestrian Weather Protection



City of Vancouver Downtown Transportation Plan

k) Provide Barrier Free Access

Barrier free access (also referred to as universal design) allows unimpeded access for all pedestrians including those in wheelchairs, scooters, and others with sight and hearing impairments. Areas that currently are deficient in providing barrier free access include:

- Granville SkyTrain Station. Staff are working with the developer to provide barrier free access to the SkyTrain station as part of the development application at 600 Granville Street (688 Dunsmuir St.)
- Vancouver Convention and Exhibition Centre: The proposed expansion to the trade and convention centre will generate increased pedestrian activity. Barrier free access from the Seawall to Thurlow Street south of the proposed Arts Centre should be provided.
- Georgia Street (at eastern end) to Pacific Boulevard. Future consideration should be given to creating a barrier free pedestrian link from the eastern end of Georgia at Beatty Street to the Pacific Boulevard. Specific design details will be provided and reviewed through the Northeast False Creek planning process (See spot improvement #36 in section 5.1).

l) Provide Pedestrian Connections to the Central Waterfront

While physically close to the downtown, access to the Central Waterfront is currently limited to the Main Street overpass and Waterfront Road. The rail yards create a significant physical barrier to pedestrians accessing Portside Park and future development throughout the Eastlands. Future pedestrian connections from the downtown to the Central Waterfront district are recommended via Carrall and Richards Streets.

m) Provide Improved Pedestrian Access to the Coal Harbour Waterfront

Major sections of the Coal Harbour waterfront are nearing completion, including extensions to the waterfront path, Harbour Green Park and a new community centre. Increased pedestrian traffic is moving between the West End, Triangle West and the Coal Harbour waterfront. To make Coal Harbour highly accessible to pedestrians from a variety of points in the downtown, pedestrian amenities should be increased such as pedestrian activated signals, shorter crossing distances, signage, and landscaping especially along Denman, Cardero, Bute, Burrard and Hornby.

n) Provide wider pedestrian crosswalks at busy intersections

Wider pedestrian crosswalks allow greater pedestrian volumes to cross at one time and help to avoid pedestrians overflowing crosswalks. These may be appropriate at intersections with high pedestrian volumes such as Robson and Hornby, Granville, and Georgia and Robson and Burrard, where pedestrian volumes are almost twice the vehicular volumes in the afternoon rush hour. Other intersections including Burrard and Georgia and Main and Hastings also have significant pedestrian volumes that make crossing the street difficult. Recommended improvements include setting the vehicle stop line back to allow for wider crossings thereby improving pedestrian flow and minimizing pedestrian/vehicle conflicts and providing textured crosswalks where appropriate.

o) Pedestrian Holds

Pedestrian waiting times at fixed time signals can also be reduced through the removal of 'pedestrian holds'. Such holds delay the start of the walk phase in order to allow right or left turning traffic to proceed across the crosswalk before pedestrians begin crossing. Pedestrian holds can be a hazard to persons with visual disabilities since these persons use the sound of parallel vehicle traffic starting as a cue to begin crossing. About 30 pedestrian holds have been removed over the past few years with only 24 remaining, all located in the downtown. Pedestrian holds should be removed where vehicle volumes will not cause significant turning queues. Activation of the pedestrian holds should be limited to peak hours to avoid pedestrians being delayed unnecessarily. Locations where pedestrian holds may be removed include:

- Seymour and Smithe (west side);
- Seymour and Hastings (east and west side);
- Howe and Hastings (south side);
- Cambie and Dunsmuir (south side);
- Cambie and Georgia (south side); and
- Hornby and Dunsmuir (south side).

Additional locations where pedestrian holds are deemed to provide limited benefit to traffic circulation will also be removed. However, any plans to remove pedestrian holds that benefit transit buses will have to include consultation with TransLink.

p) Pedestrian Push Buttons

Provide pedestrian push buttons at intersections where it is possible to give pedestrians greater priority. In the future, ITS systems that detect the presence of pedestrians at crossings may be substituted for the manual systems currently in use. Sensory devices should be provided to aid those with sight or hearing impairments. At fully actuated signals such as at Davie and Pacific, pedestrian push buttons should be eliminated.

q) Pedestrian Short Cuts

Walking distance is an important factor influencing the number of pedestrian trips. By shortening route distances, pedestrian trips will be more convenient and timely. These pedestrian pathways will help to create shorter blocks, better connectivity and provide more route choice and variety for pedestrians. Where opportunities exist, introduce public pathways between buildings to create more opportunities for pedestrian short-cutting between long blocks.

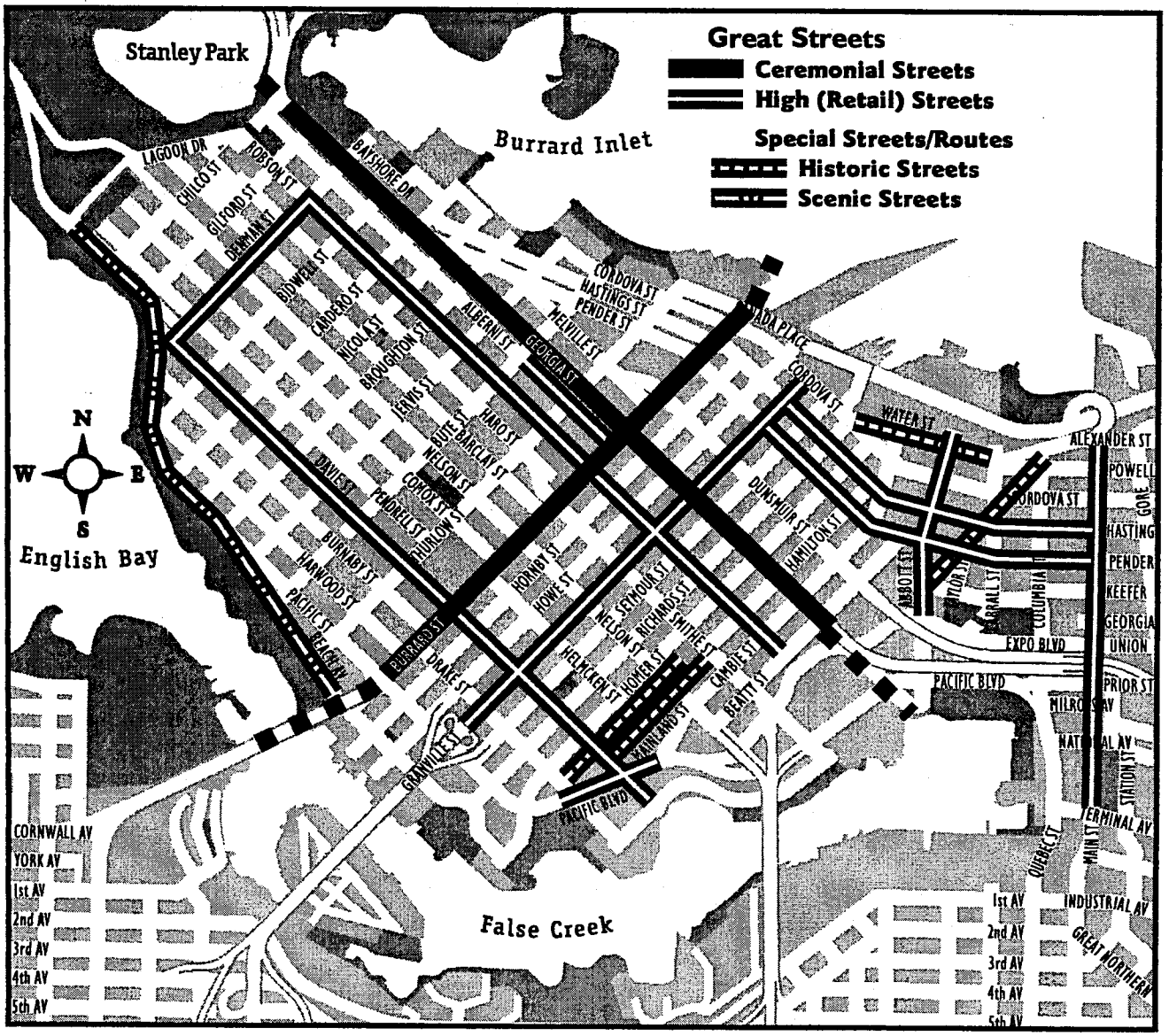
4.3.6 Classification of Pedestrian Routes

The following classification of pedestrian routes is intended to identify streets that are considered good candidates for a downtown pedestrian network. Some streets may fall under more than one classification.

Great Streets

Great Streets have historic significance, unique architectural features, or a setting that distinguishes them from other streets and make them suitable for special uses. These streets play a significant role in the public life of the city and provide for special uses including parades, festivals, or more everyday experiences such as sightseeing, shopping, or entertainment. In order to design these streets it is helpful to categorise them further according to their purpose or function. *See Figure 4.3-D.*

Figure 4.3-D
Great Streets



a) Ceremonial Streets

These are major streets that have a peninsula-wide connection and gateway function where one would expect a ceremonial procession to be held. These streets have wider rights-of-way, are aligned with major public institutions and play a significant role in shaping the urban fabric of downtown.

Burrard Street:
This street has been selected as a ceremonial street because it provides an historic and memorable gateway into the centre of downtown. It is recommended that high quality pedestrian amenities, including additional trees, water fountains, benches, signage and banners be provided along its length. Substantial pedestrian activity will be generated at its northern terminus with the proposed expansion of the trade and convention centre, a future hotel, civic theatre, and offices. Sidewalk designs and widths should provide pedestrians with a sense of history and grandeur. It is recommended that design guidelines for the street be developed in accordance with this vision.

Georgia Street:
This street has been selected as a ceremonial street because of its historical and symbolic importance to the city. It connects Stanley Park, the Hotel Vancouver, Library Square, the Art Gallery, QE Theatre and a series of plazas and forecourts. Georgia Street has historically been the street of major processions, celebratory and community events and already has an approved public realm design treatment.

b) High (Main) Streets

These are streets that are easily identified as major neighbourhood or city-wide shopping and entertainment locations. High Streets typically have retail and/or services uses on both sides of the street extending for at least three blocks in length, and are typically public transit routes. Streets like Davie, Denman, Robson and Granville help define a neighbourhood and provide more than just shopping and services but become an important gathering place and the focus of public life. *See Figure 4.3-D.*

c) Special Streets (Historic and Scenic Character)

These are streets that have an historic, scenic or functional significance and may also have scenic qualities or distinct design.

i. **Historic Street**
Sections of Hamilton, Mainland, Water Street and the CPR right-of-way, and have been identified as Historic Streets or routes. Both Hamilton and Mainland provide unique pedestrian experiences along the historic loading dock areas of Yaletown. Due to their unique nature these streets should be designed to accommodate heavy pedestrian activity and complement the historic character of the buildings and land-uses.

ii. **Scenic Street**
These routes typically relate to significant landscape features such as the waterfront or major park space and provide views of the city's natural setting such as the shoreline, open water or the mountains. Beach Avenue is acknowledged and frequently used as a scenic route for car travellers, cyclists and pedestrians. A proposed extension of the English Bay bike/pedestrian system is proposed along Beach Avenue from Stanley Park to Hornby Street to provide an off-street facility from Stanley Park (West End) to Burrard Bridge.

d) Greenways

Greenways are multi-use recreational routes that provide greater priority to pedestrians and cyclists through the use of traffic diversions, pedestrian activated signals, wider sidewalks with landscaped boulevards, increased numbers of trees, pedestrian oriented lighting, pedestrian oriented signage and street furniture including drinking fountains, seating, and public art. Greenways can take many different forms. They can be waterfront promenades, urban walks, environmental demonstration trails, heritage walks, and nature trails. Their role is to expand opportunities for urban recreation and to enhance the experience of nature and city life. One of the most successful Greenways in terms of design and use is the Seaside Greenway route. The Seaside Greenway provides dedicated pathways for cyclists, in-line skaters, and pedestrians that are separated from general vehicular traffic. Introducing the concept of a greenway within the downtown street network is a challenge because in addition to providing improved safety, increased amenities and benefits for pedestrians and cyclists, there is also a need to manage effective vehicular and transit access.

The Downtown Transportation Plan recommends that several streets be designated as Greenways. An important element in the design of each greenway will be the involvement of the community in the design and implementation process. These and other additional improvements may be implemented by the Greenways Team after further study and public consultation.

The Greenways identified below will integrate into the city-wide system of greenways as well as other transportation networks including buses, rapid transit, bikeways, commuter rail, future streetcar stations, and the pedestrian ferries on False Creek.

Granville Street: High transit volumes, surrounding land-uses, entertainment district status, and renewed confidence as a retail street make Granville Street an important pedestrian route. Granville Street also serves as a gateway into the downtown for many tourists and residents. The False Creek Pedestrian/Cycling Crossing Study identified improvements to Granville Bridge making this an important pedestrian link between False Creek South, Granville Island and Downtown. Pedestrian activity and volumes are among the highest in the city and as such it is recommended that significant investments be made into the pedestrian realm along the street. A commercial streetscape/entertainment district/greenway design scheme is recommended to be developed for Granville Street (between the bridgehead and Cordova Streets), in consultation with stakeholders.

Parkway (Helmcken and Comox Streets) Together these streets serve to link into the regional Parkway Greenway. This route will connect Burnaby's Central Park to Vancouver's Stanley Park. This greenway will proceed along quiet, well-treed residential streets in the West End, past the historic Mole Hill block adjacent to Nelson Park, and finally through Yaletown connecting to the Seaside Greenway and the False Creek ferry system. The development of a custom greenway design that introduces landscaping treatments (trees, shrubs, and flowerbeds), public art, street furniture, improved visibility of pedestrians through pedestrian bulges, pedestrian oriented lighting and improved signage is recommended. Local vehicle access will be maintained along the Greenway and special attention will be given to securing sufficient parking for local businesses. Some improvements may include:

- Incorporating designs that provide significant landscaping treatments (trees, plants, shrubs, etc), environmental benefits (such as reduced rainwater run-off), noise mitigation from traffic, improved street definition, increased protection from rain and sun, and increased separation of pedestrians from traffic;
- Providing traffic diversions at select locations to reduce traffic volumes along this greenway. A special landscaped traffic diversion island (right in / right out) is suggested where Comox meets Thurlow (See spot improvement #19 in section 5.1);
- Installing pedestrian activated signals for crossing Denman at Comox Street; Thurlow at Comox Street;

- Providing pedestrian bulges to reduce pedestrian crossing distances across Granville at Helmcken; Thurlow at Comox; Helmcken at Homer; Helmcken at Richards Street; Pacific Boulevard at Cambie Street (See spot improvement #17 in Section 5.1);
- Using special surface materials that may include interlocking pavers for sidewalks and coloured pavement for cyclists;
- Providing special design attention to be given to the cycling and pedestrian crossing between Helmcken and Comox Street at Burrard (See spot improvement #8 in section 5.1);
- Removing bollards at eastern street-end of Helmcken at the lane (just east of Mainland St.) to provide unimpeded access for pedestrians;
- Incorporating roadway treatment that signals to drivers that this is a pedestrian priority area; and
- Redesigning the southern end of Cambie Street between Pacific Boulevard and Nelson Street by reducing roadway width and reallocating the centre median to provide increased width on the western sidewalk thereby enhancing the entrance into the Parkway Greenway.

Carrall Street
This street has been identified as a desirable 'water to water' greenway that will cross the 'neck' of the downtown peninsula. It links a series of parks, plazas and historic sites. It provides a visual connection to Chinatown via Pender Street and also links to the historic CPR right-of-way. At the northern end, the Carrall Street greenway will provide an improved pedestrian connection to the Port Lands via a future pedestrian overpass. On the southern end, an improved pedestrian link is proposed by providing signalized mid-block crossings of Expo and Pacific Boulevards. Pedestrian improvements may include the redesign of the street to include bike lanes, improved weather protection, increased landscaping treatment, slowing traffic (by converting to two-way from Pender to Hastings Street) and increased pedestrian safety and visibility through enhanced pedestrian lighting and textured crosswalks. Additional improvements could include redesigning the intersection of Carrall, Powell, Water and Alexander with raised crosswalks. See spot improvement #52 in section 5.1.

Lagoon Drive Greenway Link
This greenway link will provide an important connection between the English Bay Seawall path connecting to Lagoon Drive and the Chilco underpass and eventually connecting to the Coal Harbour Seawall route to the north. Recommended improvements may include better way-finding signage, better separation between cyclists and pedestrians and pedestrian oriented lighting.

e) Pedestrian (Arterial) Connector Routes

Pedestrian (Arterial) Connector Routes provide easy, direct, safe routes across the downtown peninsula. These streets are intended to be fully accessible to all pedestrians including those with mobility challenges. They will form part of a dense pedestrian network throughout the downtown as illustrated in Figure 4.3-B. These routes will also play an important role in integrating new neighbourhoods and developments in Downtown South, False Creek North and Coal Harbour. These routes will be the primary routes that pedestrians will choose when walking to their destination. Significant pedestrian improvements may include:

- Wider sidewalks;
- Corner bulges;
- Enhanced landscaping;
- Public Art;

- Resting areas;
- Pedestrian oriented signage and maps;
- Pedestrian oriented lighting;
- Safer sidewalk crossings at lanes and intersections;
- Street furniture including benches for resting;
- Enhanced weather protection; and
- Curb ramps.

The pedestrian arterial routes are described below.

North / South Routes

Denman Street
This route provides a 'water to water' connection from English Bay to Coal Harbour along a vibrant retail street. Recommendations for improvements include removing parking restrictions along the west side of Denman to create an additional buffer between pedestrians and moving traffic as well as providing other sidewalk enhancements. This street has also been identified by as a High Street and the Greenways Plan as part of the City Centre Circuit Greenway.

Cardero Street
This route was selected because of the existing pedestrian investments already made via traffic calming measures and mini-parks along the street. This route also provides a 'water to water' connection from English Bay park to the new park along the eastern edge of the Bayshore Hotel. A pedestrian actuated light should be installed at Beach Avenue to facilitate safer pedestrian crossing.

Bute Street
Through a series of public workshops, Bute Street was repeatedly identified as an important pedestrian route serving Coal Harbour, Triangle West, and West End residents. The existing high pedestrian volumes demonstrate that it is already a preferred route for many. At the north end, Bute Street reinforces the sense of entry into Harbour Green Park on Coal Harbour. A pedestrian actuated signal should be considered at Hastings Street to create a safer, and more comfortable pedestrian crossing.

Hornby Street
This route connects two large pedestrian generators—Granville Island to the south and the Vancouver Convention and Exhibition Centre to the north. Along its way, this route provides connections to several significant architectural buildings including the Hotel Vancouver, the Vancouver Art Gallery, Cathedral Place, the Electra, the Wall Centre and Canada Place. Double rows of mature trees and a street-end closure at Hastings provide a pleasant pedestrian environment that connects to Canada Place.

Homer Street
This route links a series of major civic institutions, including the Vancouver Public Library and the 'Centre in Vancouver for the Performing Arts', as well as linking the historic districts of Yaletown and Gastown. At the southern end the route connects to the future False Creek ferry dock, providing linkages to destinations across False Creek. At the northern end it would connect to the future port lands development using a new street at the foot of Richards Street.

Beatty Street
Major sports facilities, hotels, historic buildings and landmarks make this street an interesting and active pedestrian route. At the southern end of Beatty the route would link to Helmcken/Comox and the Parkway Greenway. At the northern end it would connect to the Stadium SkyTrain station and International Village.

Main Street
With the build-out of City Gate and future projected growth of around 25,000 employees in False Creek Flats, Main Street will become an important pedestrian link between existing and emerging neighbourhoods and employment centres. At its northern end, the Main Street overpass provides access to Portside Park and the future development of the Eastlands. At Terminal Avenue it connects to a SkyTrain station.

East/West Routes

Beach Avenue
This route is a supplemental route to the busy Seaside path along English Bay and may help to relieve some of the conflicts between pedestrians and cyclists on that facility. At the eastern end it will connect to the Beach Neighbourhood, including George Wainborn and David Lam Parks. At the western end it connects to Denman Street and continues into Stanley Park. The addition of rush hour parking along sections of Beach Avenue will help to calm traffic and create a buffer between moving traffic and pedestrians.

Pacific Street / Boulevard
Pacific Street / Boulevard provides a grand entry into the emerging neighbourhoods around False Creek North and Downtown South. This street will provide an important pedestrian link to the three bridges crossing False Creek in addition to linking into the future greenway at Cambie and Helmcken Street. A recently approved redesign scheme was developed in coordination with the Downtown Transportation Plan. This scheme will increase pedestrian amenities, including street furniture, trees, pedestrian bulges and medians through a multi-way boulevard and flexible amenity area.

Davie Street
This street serves the West End, Yaletown and False Creek neighbourhoods with shopping, restaurants, entertainment venues and other services. At the eastern end, the Aquabus connects to the south side of False Creek. Davie Street was also recommended as part of the City Centre Circuit in the Greenways Plan, linking popular destinations of the downtown. See spot improvement #20 in section 5.1.

Robson Street
This is downtown's premier shopping street for both tourists and residents. It connects major attractions such as the Vancouver Art Gallery, Pacific Centre, Robson Square and the Robson Public Market. It is also an important connection between the central business district and Stanley Park to the west, as well as BC Place to the east. The street is heavily used by pedestrians travelling between the West End and downtown and is identified as part of the City Centre Circuit Greenway. Improved connections to False Creek are proposed as part of the North East False Creek Study.

Pender Street
This street provides important links into the eastern part of downtown. Investments in the pedestrian realm will help to integrate this neighbourhood with surrounding areas. Planning initiatives with community input are proposed. Pender Street has been identified as part of the Downtown Historic Trail that will lead through several historic areas including Gastown and Chinatown. The possibility of converting a section of Pender Street to a one-way street will be studied.

Cordova/Water/Alexander Street
Cordova between Homer and Jervis connects the proposed expansion of the Vancouver Convention and Exhibition Centre, a future hotel, civic theatre, as well as other existing hotels and the intermodal transportation node at Waterfront Station. It will serve as a major tourist route connecting Gastown and linking into the Historic Trail on the eastern end, as well as connecting to Harbour Green Park and the Coal Harbour Community Centre at the western end.

Central Waterfront Port Lands
A continuous waterfront pedestrian access route is recommended to connect between the Coal Harbour Seaside Greenway west of Canada Place to the Main Street overpass and continuing along Alexander Street. The route alignment through this area is still conceptual and will be refined in consultation with the Vancouver Port Authority when future development plans are reviewed. This recommendation is consistent with the Central Waterfront Port Lands Policy Statement (1994).

For specific pedestrian improvements also refer to the Conceptual Designs and Spot Improvement in Section 5.0.

Pedestrian Recommendations

Recommendation PD 1 *Implement the Pedestrian Route network as illustrated in Figure 4.3-B and adopt the Great Street network as illustrated in Figure 4.3-C*

Recommendation PD 2 *Provide curb ramps that align with the crosswalks at each intersection.*

Recommendation PD 3 *Remove restricted pedestrian crossings where safety can be maintained and where traffic impacts can be managed.*

Recommendation PD 4 *Provide mid-block crossings near significant pedestrian generators where safe and where and direct connections are desired.*

Recommendation PD 5 *Create improved sidewalk crossings at rear lanes to improve safety.*

Recommendation PD 6 *Design and implement a universal downtown way-finding system of pedestrian signage.*

Recommendation PD 7 *Implement pedestrian or corner bulges in locations where pedestrian crossings are long and traffic capacity would not be greatly impacted.*

Recommendation PD 8 *Minimize the number of curb cuts for driveways and parking access across all sidewalks, particularly identified pedestrian routes.*

Recommendation PD 9 *Restrict above and below grade pedestrian crossings to increase street level activity.*

Recommendation PD 10 *Provide pedestrian weather protection on retail/commercial (high) streets.*

Recommendation PD 11 *Provide barrier-free access to new and existing developments to accommodate the largest number of pedestrians.*

Recommendation PD 12 *Provide pedestrian connections to the Central Waterfront via Carrall and Richards Street alignments.*

Recommendation PD 13 *Provide improved pedestrian access to the Coal Harbour Waterfront by providing pedestrian activated signals, shorter crossing distances, signage and landscaping where possible.*

Recommendation PD 14 *Provide wider crosswalks at intersections with high pedestrian volumes.*

Recommendation PD 15 *Remove pedestrian holds to give pedestrians greater priority where vehicle volumes will not result in significant turning queues.*

Recommendation PD 16 *Increase the convenience for pedestrians at intersections by installing automatic pedestrian detectors to provide pedestrians with the walk signal and provide sensory devices for sight and hearing impaired pedestrians.*

Recommendation PD 17 *Introduce public pathways between buildings to create more opportunities for pedestrian short-cuts where opportunities exist.*

Recommendation PD 18 *Redesign the intersection of Carrall/Powell/Water/Alexander*

Recommendation PD 19 *Widen sidewalks on Davie Street between Burrard and Jervis using building setbacks.*

4.4 Bicycle Plan

Bicycling in the City of Vancouver has been encouraged since the adoption of the 1988 Bicycle Master Plan. At that time, an origin-destination survey of cyclists showed that cycling was most prevalent in the northwest quadrant of the City which includes the Kitsilano and Point Grey neighbourhoods. The plan recognized cycling as a viable mode of transportation and proposed the integration of cyclists into the transportation network largely through the shared use of existing roadway space.

The first bike route created within the downtown peninsula was the Seaside Bike Route in 1990. The route was developed around the shoreline of Stanley Park and False Creek, and connects to the University Endowment Lands. This route was an off-street bicycle facility primarily catering to recreational cyclists. This route has been so successful that it has been widened and upgraded to deal with congestion and conflicts between cyclists, in-line skaters and pedestrians.

In 1992, the City adopted the Bicycle Network Study that recommended a network of bicycle routes along local streets (bikeways) to serve existing cyclists and encourage more people to cycle. The use of local streets was seen as a viable solution because it provided cyclists with a route that was more pleasant (less air and noise pollution), less congested and almost as direct in comparison to the busy arterial street system. This attracted many cyclists away from the arterial street system, thus reducing potential conflicts between motorists and cyclists. This approach cannot be extended into the downtown because there are few local streets with very low traffic volumes within the downtown core.

In 1997, the Vancouver Transportation Plan was adopted with the recommendation to prepare a Downtown Transportation Plan that included bike lanes. It also recommended that the downtown bike lanes be given the highest priority in the City's bike program. The plan targeted walk/bike trips to make up 18% of all daily trips within the downtown by 2021. In 1999 the target was exceeded. The daily walk/bike trips to downtown destinations made up 32% of all daily trips to downtown in TransLink's Trip Diary Survey.

In 1999, a comprehensive review of the city's bicycle network was completed by staff and compiled in a document entitled, 1999 Bicycle Plan: Reviewing the Past, Planning the Future. The review, which included a survey of 900 cyclists, showed that there is a strong desire by cyclists to have a network of interconnected bicycle routes in the downtown core to complement the network of bikeways throughout the rest of the City. It also showed that investment in a cycling network of over 100 km of bikeways, has encouraged more people to cycle.

In 2000, bike lanes on Pender Street between Carrall and Cambie were implemented as part of the street's reconstruction. In the same year, the Pender Street bike lanes were extended westward to Georgia Street on a trial basis, with a bus/bike lane between Cambie and Howe, and with a wide marked curb lane shared with traffic between Howe and Georgia.

4.4.1 Cycling Demand Downtown

Before developing any bicycle route network within the downtown peninsula, the demand for such a network was first confirmed.

A Trip Diary Survey completed by TransLink between October and December 1999 showed that approximately 90,500 bicycle trips are made on a daily basis for all trip purposes throughout the region. Of that, almost half of those regional bike trips are to destinations in Vancouver. Of the bicycle trips destined to Vancouver, about 18% (8,000 trips) are destined to the downtown peninsula. Given the size of the downtown peninsula relative to the rest of the City of Vancouver, it attracts the most cyclists relative to any other similar sized area in the region.

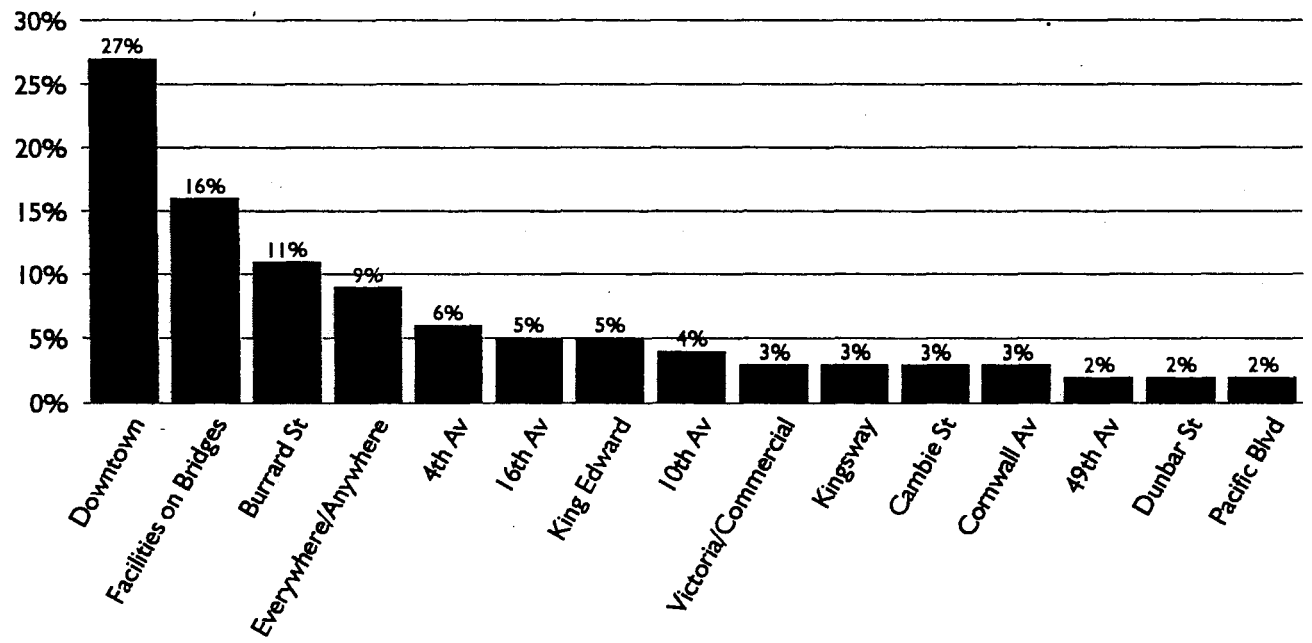
An analysis by TransLink of the 1996 Census for journey to work trip by bicycles yielded a similar conclusion (Cycling and the Journey to Work: An Analysis of the 1996 Census Results for the Greater Vancouver Regional District, 2001). The City of Vancouver receives 50 percent of all bike to work trips in the region, by far the greatest number. Within Vancouver, the downtown peninsula receives the highest number of bike to work trips. The second and third highest destinations are Central Broadway and Kitsilano, respectively.

Traffic counts throughout the City indicate that the majority of cyclists on arterial streets are located within the downtown core, followed closely by the Broadway corridor. A survey of almost 900 cyclists (Bicycle Plan 1999) showed that the majority wanted to see cycling routes in the downtown, followed by improved facilities on bridges and Burrard Street (see Figure 4.4-A).

Figure 4.4-A

"Where would you like to see cycling routes in Vancouver?"

(1999 Bicycle Plan Survey of 900 cyclists)



Given these findings, one could conclude that the downtown peninsula is the best location for the provision of bicycle facilities within the GVRD or within the City of Vancouver because of its high concentration of cyclists. Despite the fact that cycling represents only a small percentage (2.3 %) of all daily trips into the downtown as determined by TransLink's Fall 1999 Trip Diary Survey, it

represents about 8,000 trips into the downtown. Put into perspective, 8,000 trips are equivalent to all the transit passengers served by 230 buses in the morning peak hour along Granville Mall. It is more than the number of people crossing Lions Gate Bridge in the morning peak hour. While the percentage of cyclists is small, the absolute numbers and related impacts on the transportation system are significant. It should be noted that TransLink's survey occurred during Vancouver's wettest months (November and December) in Vancouver and that the survey includes all people 5 years and older. Other surveys which only include adults 16 years and older show cycling as a high as 7% percent of all daily trips in Vancouver (Regional Travel Survey, Canadian Facts, July 2000).

It should also be noted that a bicycle network within the downtown would help to provide a wider range of sustainable transportation choices that respond to downtown's changing land uses and transportation needs, and add to the quality of life.

4.4.2 Future Growth

Cycling has been growing steadily over the past 10 years. Counts from all sources have shown growth ranging from as low as 30 percent over a five year period to as high as 400 percent over a one year period, depending on the location, time of day and time of year the count was conducted. Typically, higher growth rates are associated with physical improvements such as the provision of a bicycle facility. It is estimated that cycling into the downtown has more than doubled in the last five years based on a comparison of TransLink's 1994 and 1999 trip diary surveys. This growth is occurring largely without any provision of cycling facilities within the downtown, and without any significant improvements to the bridges that connect downtown to the rest of the city.

Although it is certain that the number of cycling trips into the downtown will grow given past trends, it is difficult to accurately predict the future growth potential to 2021. The past trend in downtown cycling correlates with the trend in downtown residential growth. This link appears reasonable because cycling is a viable option for many of those that live and work downtown. As well, growth in cycling has an upper limit, similar to residential growth which is limited to the zoned capacity within the downtown. Using this approach, it is estimated that the number of daily bike trips into the downtown will more than double from 8,000 in 1999 to about 18,000 in 2021.

The 2021 estimate is very rough in that it is based on limited data and sample sizes. It also does not consider residential growth in the central area just outside the downtown peninsula nor the fact that past trends occurred without improvements to bike facilities to and within the downtown. It also focuses on commuter trips when recreational trips around the downtown are a significant occurrence. Therefore, further work may be required to try to set a more accurate mode share target for bicycles. In the meantime, the above data suggests that a four-percent daily mode share for all trip purposes in 2021 might be a reasonable target.

Many new cyclists were attracted to newly developed bike routes outside the downtown peninsula. Given these past experiences, there are indications of a latent demand for cycling. Other examples include the significant growth of cyclists using the Seabus (75% per year for three years) once it became available in 1990, and the significant increase in cycling (over 100%) across the False Creek bridges during the 2001 transit strike. Bicycle latent demand was also examined by N.D. Lea Consultants when upgrades to the Lions Gate Bridge were discussed (Discussion Paper #7 - Bicycle (and Sidewalk) Access Issues, October 1997). They concluded that improvements to Lions Gate Bridge could induce a sharp initial increase in bicycle traffic (75% to 200%) followed by 6% annual growth. These data suggest that the future bicycle mode share in the downtown could be higher than the four percent suggested above.

4.4.3 Why Bike Lanes?

There are two main types of bicycle facilities: off-street and on-street. Off-street facilities generally refer to bike paths completely segregated from auto traffic. This type of bicycle facility has been pursued around the periphery of the downtown peninsula and forms the majority of the Seaside Bike Route. There are almost no other opportunities for off-street bike facilities within the downtown peninsula because of the density of development and limited road space.

On-street bike facilities generally refer to shared wide curb lanes (integrated with general traffic) or marked bicycle lanes (separated from general traffic). Based on a literature review by Hamilton and Associates (Safety Review for the Downtown Transportation Plan, 2001), they came to the conclusion that "bike lanes were found to reduce bicycle collisions by between 35 and 50 percent". Bike lanes would also make cyclists more visible and could reduce auto crashes by improving the turning radius at intersections. A study of Bike Lanes Versus Wide Curb Lanes published by the Federal Highway Administration of the U.S. Department of Transportation in October 1999 concluded that both bike lanes and wide curb lanes are appropriate for improving riding conditions for bicyclists.

Currently the City of Vancouver has a policy of providing wide curb lanes to accommodate cyclists whenever the opportunity arises. This has already been done along some downtown streets. With higher traffic volumes in the downtown peninsula, bike lanes are generally preferred where there is adequate width because they provide increased comfort levels for cyclists and are more likely to increase the amount of cycling than wide curb lanes. An added benefit is reduced congestion and conflicts with motorists because of the ability for motorists to more easily pass a cyclist who is in a separate lane. A survey of cyclists conducted as part of the Bicycle Plan 1999: Reviewing the past, Planning the Future also showed that the majority of cyclists prefer bike lanes over shared wide curb lanes along arterial streets by a margin of about 2 to 1. Therefore, proposals for bike facilities within the downtown focus on providing bike lanes.

In reviewing appropriate locations for bike lanes, several factors were considered:

- A bike lane should be 1.5 metres wide.
- A bike lane should be adjacent to the curb or full-time parking, but not adjacent to rush hour regulated parking spaces due to the confusion for both motorists and cyclists.
- A parking lane adjacent to a bike lane should be 2.5 metres wide to reduce the risk of cyclists being hit by opening car doors.
- The general traffic lane adjacent to the bike lane should be 3.0 metres wide, typical of many traffic lanes along Vancouver's arterial street system.

4.4.4 The Approach

In establishing a bicycle network downtown, the following two principles were used as a guideline:

a) To provide direct connections to existing routes and key destinations in and around the downtown. Particularly important are links from the central business district, where the majority of cyclists are destined, to all the bridges, the Seaside Bike Route, and the Adanac and Ontario Bikeways.

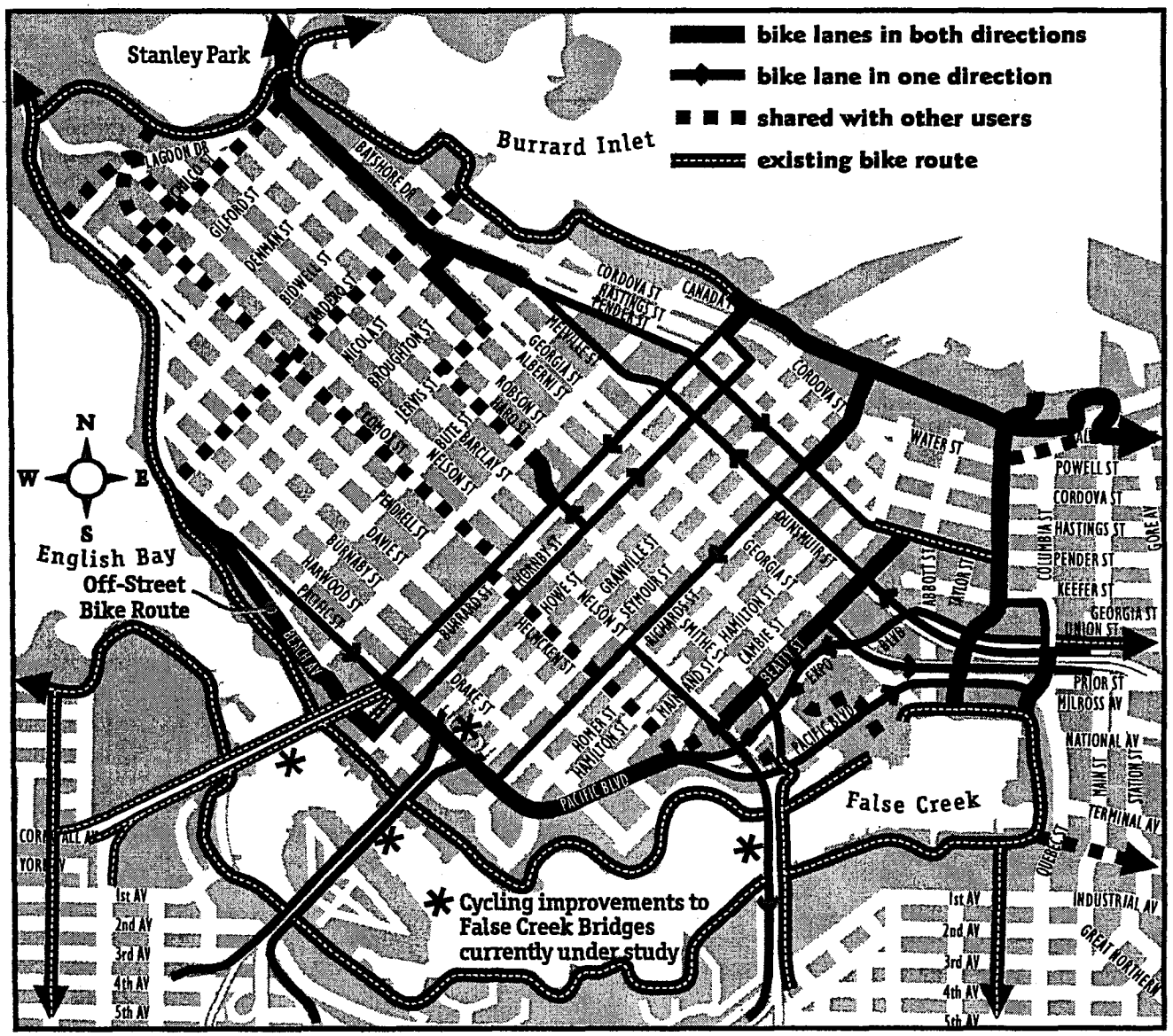
b) To minimize the impact to the transportation network by avoiding the removal of traffic lanes and, where possible, not significantly affecting the on-street parking inventory.

4.4.5 The Recommended Network

The recommended cycling network is shown on Figure 4.4-B. The majority of the bicycle lane network is achieved by re-striping roadways, slightly narrowing the existing traffic lanes to standard widths. The existing street widths resulted in the creation of several one-way couplets of bike lanes to avoid removing traffic and parking lanes. Overall, approximately 25 km of bike lanes are proposed within the downtown peninsula (representing about 6 percent of the total road space). This can be done with minimal impact to other road users and at relatively low cost. The resolution of a bike facility along Pender Street is outstanding and it is recommended that further detailed analysis be conducted with TransLink and other stakeholders. A brief description of each proposed route is provided below.

Figure 4.4-B

Downtown Vancouver Bicycle Network



North-South Routes

Carrall Street - This route provides a north-south connection across the "neck" of the peninsula and helps to complete the recreational bike loop around the Downtown and Stanley Park. It is also a part of the proposed Greenway network in downtown. Some parking will need to be removed from one or both sides of the street to accommodate the bike lanes. A connection over the existing rail tracks at the north end to connect to an east-west route along the Port Roadway should be provided. In the shorter term, a diversion over the Main Street Overpass may be necessary.

Beatty Street - Beatty Street is proposed for conversion from a one-way street to a two-way street. This will facilitate the implementation of bike lanes on both sides of the street. The existing width of Beatty Street allows this to be done without much impact to the existing two travel lanes and two parking lanes. The bike lanes on Beatty would serve as the main access route to and from the Cambie Street Bridge. This is also facilitated by the striping of bike lanes (by narrowing the existing traffic lanes) on Smithe and Nelson streets at the northern end of the Cambie Street Bridge.

Richards Street - A southbound only bike lane can be accommodated on Richards Street if it remains a one-way street. This is accomplished by narrowing the existing lanes and relocating rush hour parking regulations from the west side of the street to the east side.

Burrard/Hornby Streets - a one-way couplet of bike lanes is proposed along Burrard and Hornby streets. For northbound cyclists, a one-way northbound bike lane is proposed along Hornby Street adjacent to full-time parking spaces along the east side of the road. The width of Hornby Street can accommodate a bike lane by narrowing the two existing travel lanes and making the two curb lanes full-time parking lanes. The existing rush hour regulations on the west side of the street would need to be removed. For southbound cyclists, a one-way southbound bike lane is proposed along Burrard Street either adjacent to the curb or adjacent to bus/loading zones. The six existing traffic lanes on Burrard Street are maintained, but narrowed to achieve room for the bike lane. The parking lane on the west side of the street (southern half only) would need to be removed all day instead of just during the afternoon rush period. Approximately 40 parking spaces would be affected. A benefit of full time parking restrictions on the west side is the availability of a third moving lane throughout the day for better traffic circulation and transit service.

East-West Routes

Port Road - The easterly extension of the Coal Harbour seawall for both recreational and commuter cyclists is proposed along the Port Roadway corridor, over the Main Street overpass and continuing east along Alexander Street. This connection is desirable given its directness, level grade and role in completing the downtown "loop". Because the Port Roadway is under the authority of the Vancouver Port Authority, this requires their co-operation and commitment. It is recommended that this be pursued in consultation with the Port Authority. This is consistent with the Central Waterfront Port Lands Policy Statement adopted by the Port Corporation and City Council in 1994.

Georgia/Pender/Dunsmuir - This route is the main east-west connection between the Lions Gate Bridge and the Adanac Bikeway (Union Street). At the westerly end, eastbound and westbound bike lanes are being provided along Georgia Street as part of its reconstruction. Although eastbound and westbound bike lanes on Pender Street are desirable, the narrow width of Pender Street between Howe and Cambie makes this difficult without compromising transit or business interests along the street. One potential solution is converting Pender Street from two-way to one-way eastbound along this section. This would allow for the creation of a one-way couplet of bike lanes, eastbound on Pender and westbound on Dunsmuir. This was described above in the Road Network section. It is recommended that further detailed analysis be conducted given the complexities of the changes and a desire by many to maintain two-way traffic and transit services along Pender Street.

An eastbound bike lane could begin at Georgia Street and travel along Pender to the existing bike lanes on Pender between Cambie and Carrall. A connection could then be made via Carrall, Keefer and Columbia to connect to the Adanac Bikeway on Union Street. The implications of this bike lane include the removal of parking on the south side of Pender between Nicola and Jervis, the creation of a permanent parking lane on the south side of Pender between Jervis and Thurlow, the creation of a permanent parking/loading lane on the north side of Pender between Howe and Cambie, the relocation of westbound buses from the proposed one-way section of Pender, and the removal of some parking on Carrall, Keefer and Columbia.

A westbound bike lane could begin on Union at Main and would offer two potential routes. One is along the proposed westbound bike lane across the Dunsmuir Viaduct, along Dunsmuir and Melville streets, connecting with Pender Street at Jervis. For the majority of its length, existing parking and travel lanes would be maintained, with the exception of Dunsmuir Street between Richards and Burrard, where parking would be need to be removed because of the narrow street width. The parking removal will help to improve traffic flow and safety in this narrow section of Dunsmuir. The alternative westbound bike route is to use Columbia, Keefer, and Carrall streets to connect to the existing bike lanes on Pender Street. Westbound cyclists on Pender Street would then head southbound on Beatty to reconnect with the westbound bike lanes on Dunsmuir.

Alberni/Bute/Haro/Smithe - This route provides an alternative east-west route connecting the Burrard/Hornby bike lanes to the Georgia Street bike lanes. The route is a combination of a shared on-street bike facility within the West End residential area (Haro and Bute streets), and two-way bike lanes on Haro and Alberni where they would have little impact on existing parking and moving lanes. On the one-way section of Smithe Street between Hornby and Burrard, there would only be a westbound bike lane.

Comox/Helmcken - This shared on-street bike route would become part of the east-west Greenway/Bikeway across the peninsula joining Stanley Park with the Yaletown and False Creek North neighbourhoods. Helmcken Street is particularly narrow for cyclists and motorists to share the road space. Some parking spaces would likely be removed as part of the redesign of the street into a Greenway.

Pacific/Expo Boulevard - Pacific and Expo Boulevards would provide a ring road for cyclists and help to connect the False Creek Bridges with the Adanac Bikeway and Science World where many bike routes converge. Between Richards and Quebec, bike lanes can be accomplished relatively easily because of the wider street widths. In fact, the bike lanes could help to narrow the width of the street and are considered to be an important component of a new streetscape design for Pacific Boulevard. West of Richards, Pacific Street narrows significantly and some road widening or parking removal would be required to construct the bike lanes.

4.4.6 Bridge Connections

With the current upgrades to the Lions Gate Bridge and Stanley Park Causeway, bicycle access from the North Shore will be accommodated. Still outstanding are the improvements to the False Creek Bridges to accommodate current and future demands. This review is currently being undertaken as part of the False Creek Pedestrian and Bicycle Crossing Study. This study will incorporate the findings of the Downtown Transportation Plan to ensure that a seamless bike network is created between downtown and the rest of the City. Further work on the Granville Bridge loops and Granville Street will explore potential bike connections to Granville Bridge.

4.4.7 Spot Improvements

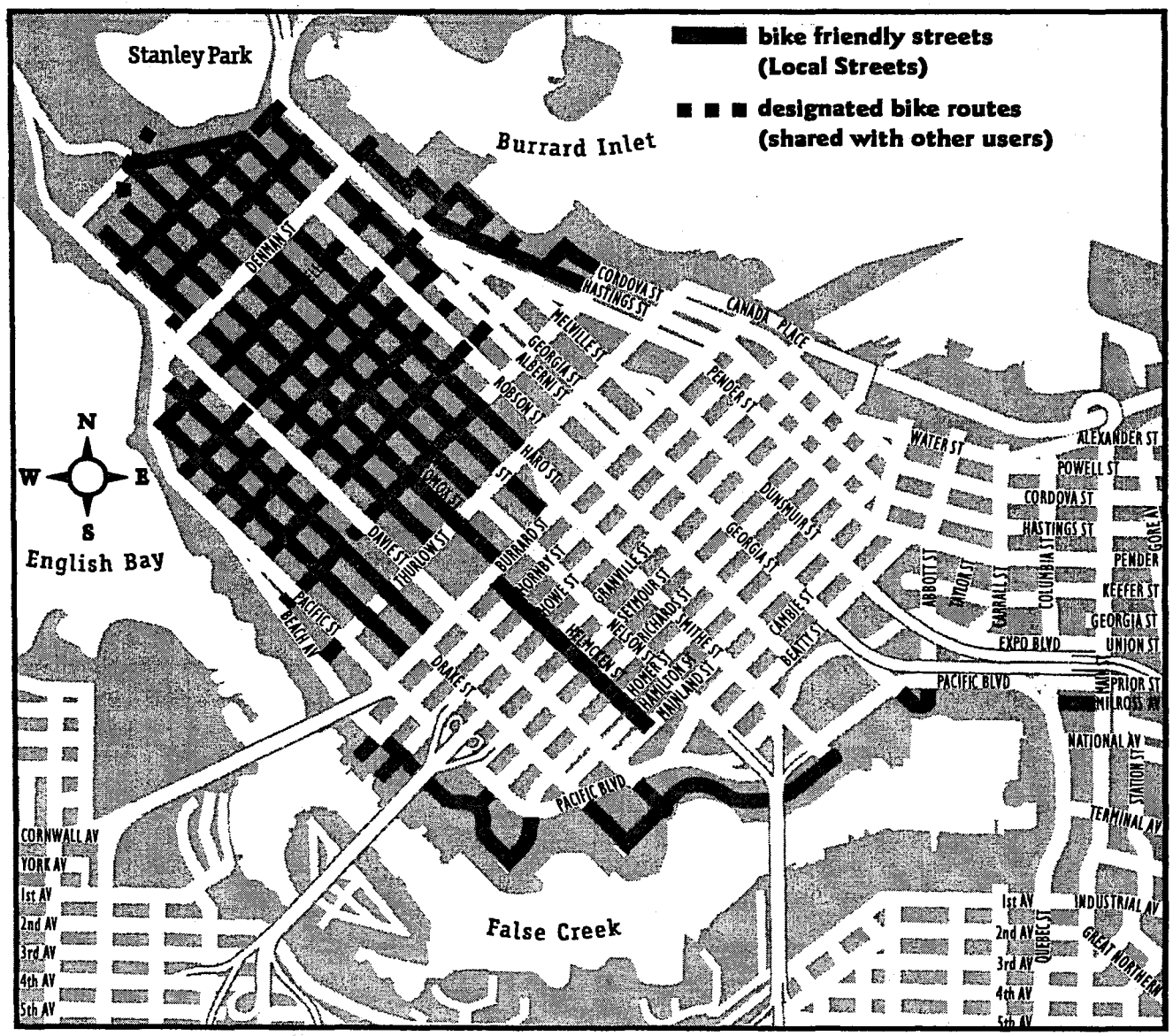
A review of cycling conditions downtown revealed a number of locations that require special attention. These locations were either identified by staff, the public or through a review of past collision statistics. A description of spot improvements can be found in Section 5.0.

4.4.8 Other Bicycle Policies and Proposals

In conjunction with the proposed network of downtown bike lanes, there are a number of related recommendations. These include exploring the use of coloured asphalt to further delineate the bike lanes from the rest of the roadway, installing "bike boxes" or advance bicycle waiting areas at intersections, providing traffic signal progression speeds suitable for cyclists, and promoting and educating road users about the role of bike lanes.

Existing bike policies must also continue to be pursued. Specifically, where no bike lanes are proposed, existing arterial streets that are reconstructed or re-striped should provide wider curb lanes. Along local streets in the West End, Coal Harbour and Downtown South, potential barriers to cycling should be eliminated and bicycle friendly street designs utilized wherever possible. The recommended bicycle friendly streets are shown on *Figure 4.4-C* and they include the creation of bikeways along Chilco and Cardero.

Figure 4.4-C
Bike Friendly Streets



Finally, required end-of-trip facilities (bike racks, bike locker, showers, change rooms, etc.) should continue to be pursued through the Parking By-Law for off-street facilities and through new programs, such as the Street Furniture Program. These end-of-trip facilities should be provided as cycling usage increases and may require the development of special public bicycle parking facilities.

Finally, a comprehensive way-finding/destination signage system should be developed to provide orientation to the City's bicycle network system. This would not only encourage more people to cycle, but would be useful to many downtown tourists.

4.4.9 Future Considerations

Based on public feedback on the proposed bike network, several items need to be recognized.

a) The proposed bike network is viewed by some as only providing a basic network of bike routes. Many other streets such as Robson Street between Burrard and Beatty, Homer Street, Georgia Street and Thurlow Street have been suggested, but not recommended at this time. The primary reasons are the lack of street width or the impact on other transportation modes. Many suggest that a plan for 2021 should be bolder and should include the reallocation of more road space from auto traffic. While this may be necessary in the future, it is not required given the projected demand and this proposal which provides a bicycle network while maintaining all other modes of travel. Should conditions change significantly, the approach to the downtown bicycle network will need to be re-evaluated.

b) Others are concerned that the bike network would add to traffic congestion or feel that bike lanes are not the most appropriate bike facility for the downtown. Based on the data available and the analysis completed, the proposed bicycle network should be achievable with minimal traffic impacts. More detailed analysis and consultations should be undertaken as part of the implementation phase. Upon completion of each bike route, close monitoring is expected to measure the impacts of the facility. This would allow future modifications to ensure the success of the bicycle network.

Bicycling Plan Recommendations

Recommendation BK1 *Implement the downtown bicycle network shown in Figure 4.4-B.*

Recommendation BK2 *Evaluate alternatives to the proposed bike facility along Pender and Dunsmuir.*

Recommendation BK3 *Upgrade False Creek Bridges to better accommodate bicycles.*

Recommendation BK4 *Provide related bike facilities to encourage and make bicycling safer and more convenient (e.g. bike parking facilities, way-finding/destination signage, education).*

Recommendation BK5 *Create bicycle friendly streets along all local streets within the downtown.*

Recommendation BK6 *Monitor and assess the development and impact of the bicycle network on a regular basis and expand the network as warrented.*

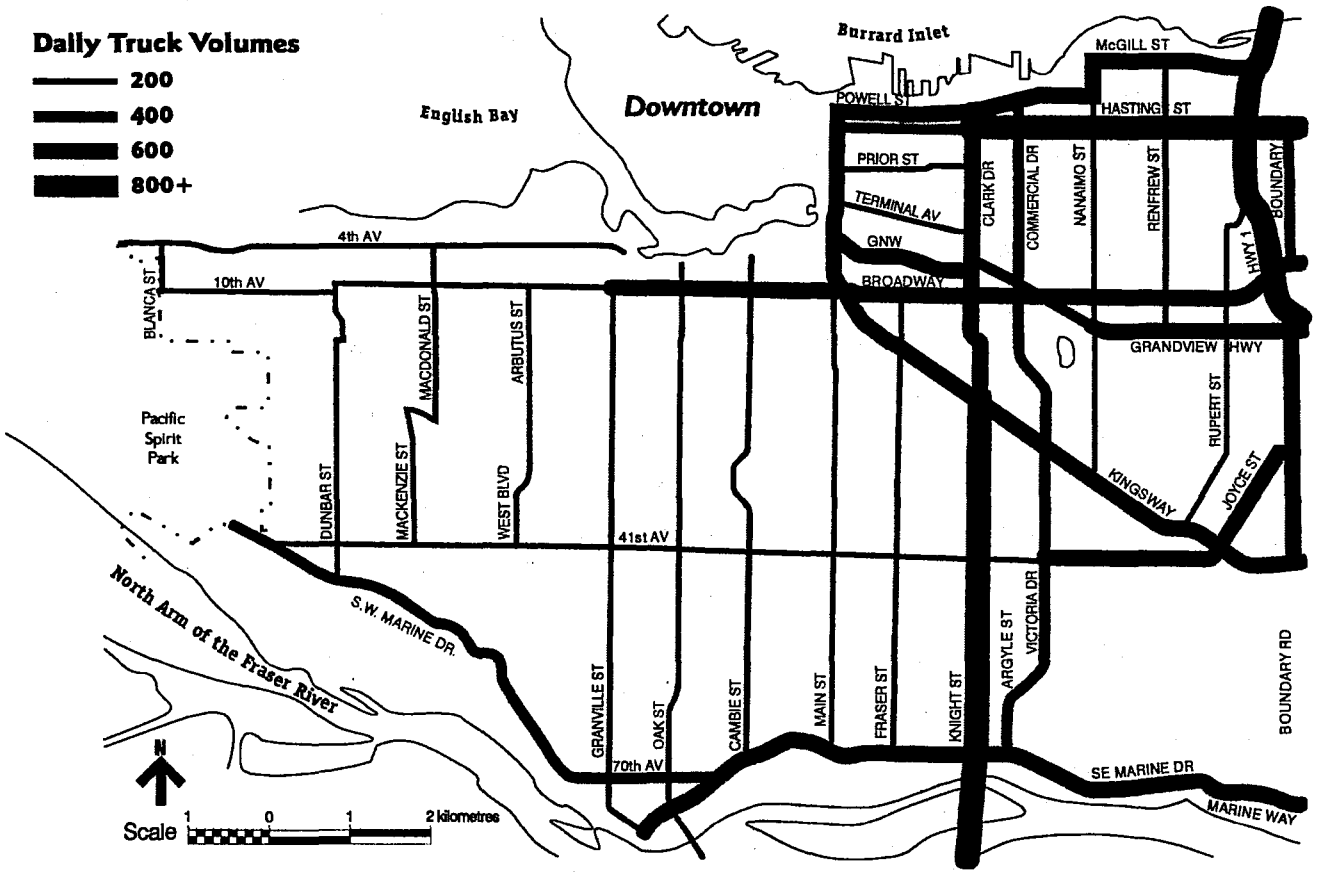
Recommendation BK7 *Design all new streets and multi-use paths to adequately accommodate cycling.*

4.5 Goods Movement Plan

The economic health and competitiveness of the central business district are dependent upon its ability to move goods efficiently. This efficiency is often measured by the time it takes to deliver goods while travelling along the road or rail network. The road network is relied upon for most businesses in the downtown. Therefore the biggest problem for goods movement in the downtown is any delays that may result from an overall increase in traffic congestion. The Downtown Transportation Plan goals of minimizing traffic congestion and the promotion of alternative modes to the automobile are consistent with the objective of providing an efficient goods movement system.

The 1997 *Transportation Plan* recognized the importance of good truck access in the city by maintaining the existing truck route network. The downtown truck route network was reviewed with a similar intent to enhance truck access to main destinations without encouraging the use of streets where residential land uses are becoming more dominant. Currently, there are no major truck accessibility problems within the downtown because congestion is limited. Discussions with the BC Trucking Association confirmed this finding. Also, there is very little heavy truck traffic in the downtown as shown by Figure 4.5-A. Delivery vans and light trucks are common in the downtown, while most heavy trucks going downtown are usually related to construction or Port activities. The availability of loading zones appears to be the most important issue for efficient goods movement.

Figure 4.5-A
Heavy Truck Volumes (Transportation Plan 1997)



In 1999, several truck routes were removed from the Yaletown area in light of the emerging residential land uses. It was determined that Yaletown's removal from the truck route network would not significantly affect deliveries to the area. The report also suggested a review of other potential changes to the Downtown Truck Routes and Truck Area as part of the Downtown Transportation Plan.

4.5.1 The Port

The Port is a major point for the receiving, conveyance and distribution of goods throughout the region. It is one of the most concentrated sources of trucks and generator of heavy trucks in the downtown peninsula. Trucks from the Port predominantly head east towards Highway #1 or southeast towards the Knight Street Bridge. Fortunately, truck traffic within the downtown peninsula is well accommodated by the existing Port Road along the Burrard Inlet waterfront. The Port Road is controlled by the Vancouver Port Authority to serve their needs and contributes significantly to the efficient movement of Port related goods. It also reduces the potential impact of heavy truck traffic on downtown streets. Therefore, the Port Road should be maintained for Port related traffic and restricted from general traffic. The exception to this may be the use of the Port Roadway, by agreement with major downtown destinations near the waterfront (such as Burrard Landing and Granville Square developments), to allow servicing of these sites.

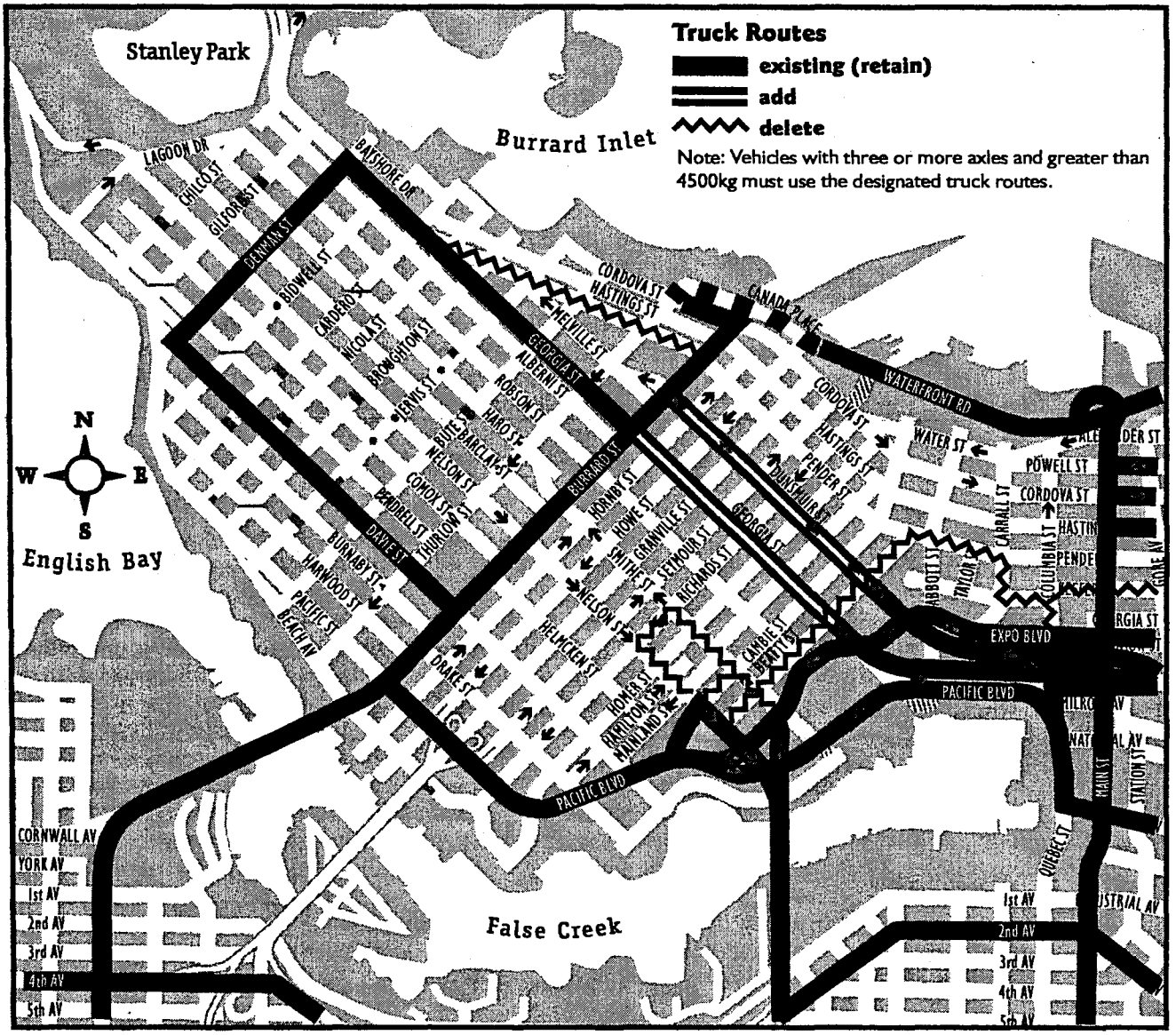
4.5.2 Truck Routes

Large vehicles, like semi-trailer trucks, with three or more axles and a gross vehicle weight greater than 5,500 kg must use designated truck routes. For destinations not on a truck route, the shortest route between the destination and the closest truck route must be used. Figure 4.5-B shows the designated truck routes within the downtown. It should be noted that the Lions Gate Bridge is not a designated truck route. Although this is related to the carrying capacity of the bridge, it also helps to significantly reduce heavy truck traffic that might otherwise shortcut through the downtown and add to traffic congestion, and air and noise pollution.

Also shown in Figure 4.5-B is the recommended additions and deletions to the truck route network. Both Dunsmuir and Georgia streets between Burrard and Beatty are recommended to be added to the truck route network. This is based on the observation that heavy trucks are currently encouraged to use the Georgia and Dunsmuir viaducts to exit and enter the downtown peninsula from the east. If these trucks are coming from or destined to locations along Denman Street, the current truck route network would require them to travel along Pacific Boulevard, Burrard Street and Davie Streets. This routing is not only more circuitous, it also has greater impacts to the more sensitive residential land uses located along those streets. In comparison, the use of Georgia and Dunsmuir streets are more direct, and they do not have as many residential land uses.

Recommended deletions to the truck route network include Pender Street between Burrard and Georgia streets, and a series of streets generally north of Expo Boulevard. Pender Street as a truck route is seen as redundant given the availability of Georgia Street. The streets north of Expo Boulevard recommended for deletion include parts of Smithe, Nelson, Richards, Homer, Cambie, Beatty, Carrall, Keefer, Columbia and Gore. It appears that these streets were once appropriate when the land uses in the area were predominantly industrial. Now, with the emerging residential and high-tech office uses they appear unnecessary and too circuitous to be of any significant value to the truck route system. In comparison, Expo and Pacific boulevards provide a better connection for heavy trucks travelling east-west across the southern part of the peninsula. These deletions do not suggest that heavy trucks are not allowed on the streets, rather that they are not encouraged and should only be used if it is the desired destination or if it is the shortest route between the destination and the closest truck route.

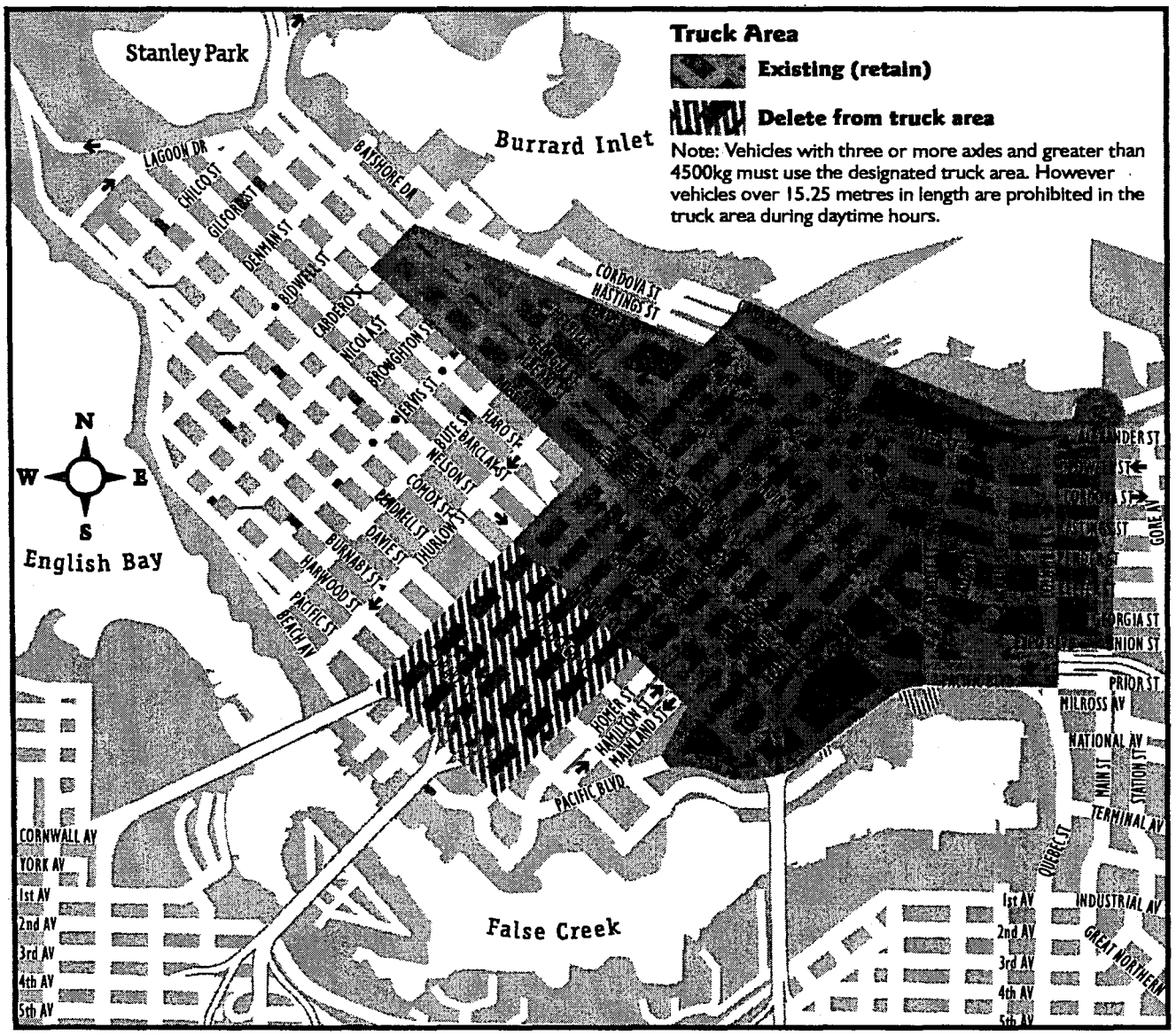
Figure 4.5-B
Downtown Truck Routes



4.5.3 Truck Area

The Downtown Truck Area, as shown on *Figure 4.5-C*, enables the majority of trucks making deliveries in the downtown to complete their trips in the most efficient manner at any time throughout the day. It achieves this by not restricting truck operators to streets that are only the most direct route between a truck route and a destination or origin. However, trucks within the Truck Area must not exceed 15.25 metres in length between the hours of 7:00 a.m. and 6:00 p.m. For vehicles exceeding 15.25 metres in length and requiring access to destinations within the truck area, they would be confined to travel in the evenings. This has the effect of minimizing any potential congestion problems created by long trucks on many downtown streets during the day. Because of the benefits of allowing most trucks to travel efficiently within the downtown core and the ability to minimize potential traffic congestion during the day by longer trucks, the Downtown Truck Area should be maintained.

Figure 4.5-C
Downtown Truck Area



A review of the Downtown Truck Area suggested that the area bounded by Burrard, Nelson, Richards and Pacific should be removed (see Figure 4.5-C). Similar to the rationale for removing Yaletown from the truck area, the area described above is an emerging residential area (Downtown South). The impact of the change to trucks wishing to access the area is not significant. The deletion of the truck area acknowledges the changing land uses in the area from industrial/warehouses to residential.

4.5.4 On-Street Loading Zones

There is significant competition for the use of the curb lane along many downtown streets. Needs such as bus stops, loading zones, passenger zones, taxi zones, tour bus zones, consular parking zones, police zones, valet services, general public parking, bike lanes and moving traffic all compete for the curb lane. These needs are increasing as more trips to the downtown are made because of land use developments and the increasing employment and population. On the other hand, the curb lane supply remains static given that very few new streets are being constructed. Therefore, changes to the use of the curb lane along downtown streets are inevitable.

The allocation of curb space to the various uses to achieve a balance requires a careful assessment of the competing demands for curb space. The demand for curb space is expected to increase in the future. Because the delivery of goods to businesses is essential, the needs of truck loading must be accommodated. The following principles are recommended:

a) Truck loading requirements should be provided off-street. This is accomplished in new developments by ensuring that appropriate loading bays are incorporated as required by the Parking By-law. Reviews of the by-law should be done periodically to ensure they reflect the actual truck loading needs. As well, the unnecessary relaxations of the bylaw should be avoided in the downtown, especially if it may result in additional on-street loading activities; and

b) Where no off-street alternatives exist, on-street truck loading zones should be considered one of the higher priorities for use of the curb space. However, its provision must be balanced with other high priorities such as bus stops, safety and traffic flow considerations. It should be noted that on-street loading zones should not be provided if it is simply a desire for more convenient loading in comparison to an available off-street loading zone.

Despite all the changes proposed by this plan, the total number of full time on-street parking spaces within the downtown is maintained. In fact, the number of on-street parking spaces available during the rush hours is increased significantly. This was, in part, a response to the increasing demands on the use of on-street curb space. Although they are referred to as on-street parking spaces, these spaces would also provide additional spaces for on-street loading zones. In comparison to the provision of general public parking, the provision of on-street truck loading zones should take precedent. This is because off-street public parking spaces are available throughout the downtown core.

One location with problematic on-street loading conditions is Canada Place Way. The competition for the use of the north curb lane is particularly high during the peak tourist season among tour buses, shuttle buses, taxis, passenger vehicles and delivery trucks. Careful management of the street activities is helping to maintain order, but a permanent solution will require the provision of additional off-street facilities. This should be pursued as part of the convention centre expansion.

4.5.5 Rear Lanes

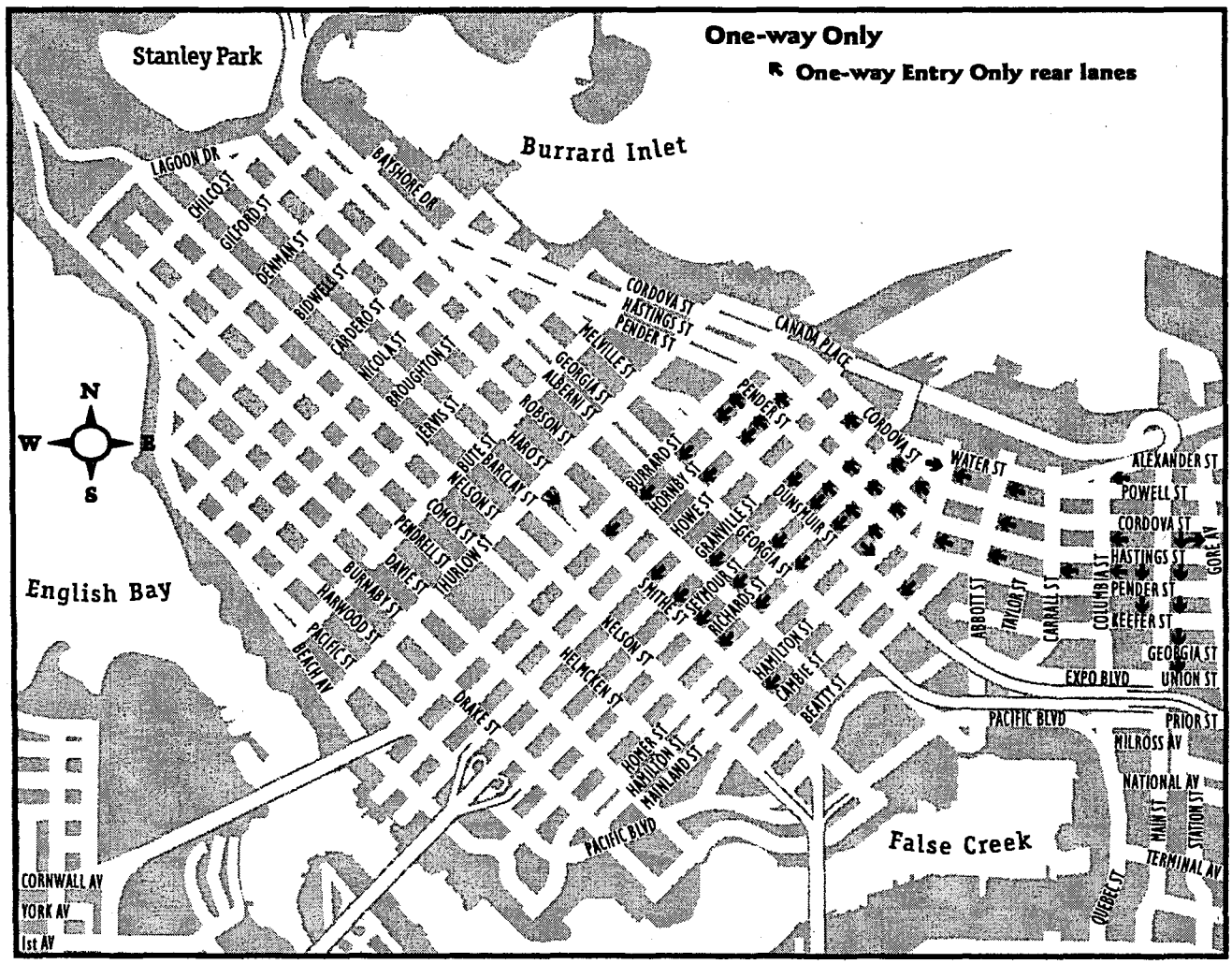
Rear lanes within the downtown commercial core are a valuable resource, and their use by delivery vehicles should be promoted over the use of street space. This would reduce the competition for the use of on-street curb spaces. It would also enhance the pedestrian environment by eliminating sidewalk conflicts resulting from the loading activities and relocating higher polluting and noisier trucks away from the sidewalk.

Currently, all commercial lanes within the downtown core and throughout the City allow commercial vehicles to stop along the lane for the purposes of loading and unloading, as long as enough width remains along the lane to allow other commercial vehicles to pass. This system contributes a significant proportion of commercial loading spaces within the downtown, especially

for older buildings with no off-street loading spaces. Commercial vehicles with obvious commercial markings are identified with a provincially issued permit. Commercial vehicles with no obvious commercial markings require a Vancouver issued municipal plate. In recent years, municipal plates issued by the City of Vancouver have increased and there are potential abuses by those that do not really require a municipal plate. To reduce the demand on the limited commercial loading spaces in the lanes and on the street, it is recommended that the fees and the eligibility requirements for such municipal plates be assessed regularly to ensure that only those who need these plates would purchase them.

Many commercial rear lanes in the downtown core are also designated as one-way entry. See *Figure 4.5-D*. This encourages one-way traffic flow through the lane and helps to minimize congestion, especially in lanes that have a lot of commercial vehicles and are encumbered by large waste bins and utility poles. Traffic egress from these lanes can be from either end, therefore the lanes remain essentially a two-way lane once traffic has entered. These lanes appear to be functioning well with no complaints from adjacent property owners. As well, no congested lanes have been identified that would benefit with the one-way entry system. Therefore it is recommended that the existing lanes with one-way entry be maintained with a review for future additions or deletions as circumstances dictate.

Figure 4.5-D
One-way Entry Only - Rear Lanes



To further enhance the rear lane as an efficient and attractive servicing area, it is recommended that all encumbrances be removed to the extent possible. Existing large waste bins should be relocated off-street or consolidated to minimize impact, utility poles should be removed and utilities be put underground, and geometric changes (widenings, corner cuts, etc.) should be made to facilitate truck access into and within the lane. Any geometric changes should also consider impacts to pedestrians as outlined in section 4.3.

4.5.6 Tour Buses

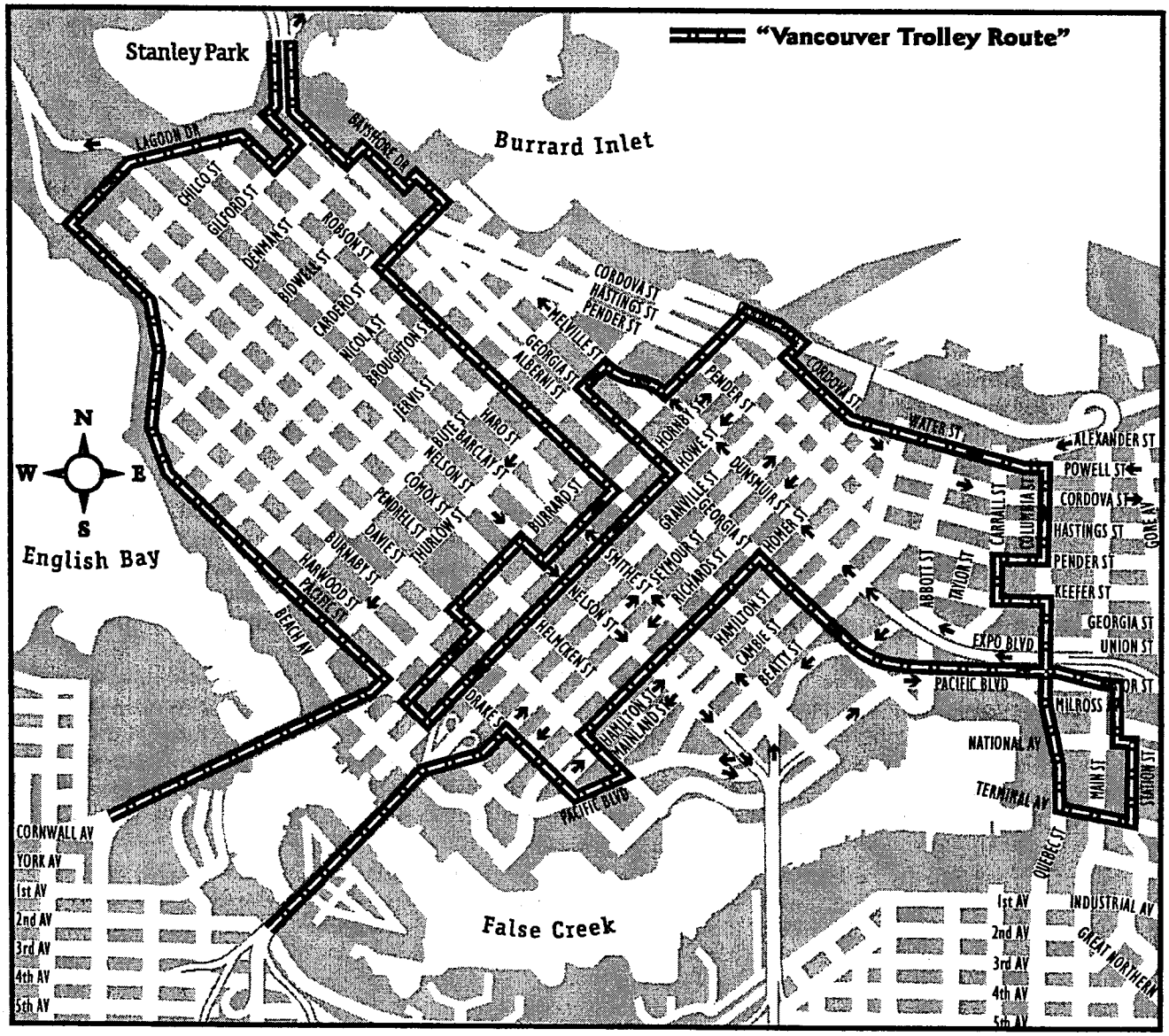
Tour buses are an important component of the tourist industry and they make a significant contribution to the overall downtown economy. The number of hotels and the major tourist attractions within the downtown (Stanley Park, Canada Place, Gastown, Chinatown, BC Place, GM Place and Science World) are a testament to this fact. With the emerging residential uses within the downtown and increasing numbers of tour buses, the conflict between residential neighbourhoods and the tour bus industry has grown. In 1999, a Bus Impact Task Force was created to provide Council with advice on various aspects of bus usage and to explore methods to manage the growth of bus traffic and improve the ability of residents and the bus and motor coach industry to co-exist with one another. One of the recommendations of the Task Force was for the Downtown Transportation Plan to create a downtown motor coach network that would include truck routes and major arterial streets.

Generally, all three-axle tour buses are required to use designated truck routes. For destinations not on a truck route, the shortest route between the destination and the closest truck route must be used. This applies to all unscheduled three-axle chartered tour buses that enter the downtown for a wide variety of reasons including the delivery of passengers to special events at BC Place, GM Place, or Canada Place, to conferences at hotels, or to a variety of tourist destinations.

In addition to the unscheduled tour buses, there are a number of regularly scheduled tour buses that are further regulated by the Provincial Motor Carrier Commission and whose routing can be influenced by the City of Vancouver. They include the scheduled bus tours for sightseeing tourists, the scheduled tour buses to transport tourists between their hotels and the airport (Airporter), and the semi- scheduled tour buses that transport people to and from the cruise ship terminal or through the downtown towards Whistler (Whistler Express). These tour buses have special approved routes through the downtown as shown in *Figures 4.5-E, 4.5-F, 4.5-G*. The figures show the significant variation in routes depending upon factors such as the location of hotels, the location of tourist attractions, and scenery. From a tour bus operator's perspective, there is also a desire to select the most efficient route between destinations to minimize operating costs. This must be balanced with the need to minimize impacts on residential or other sensitive areas within the downtown.

Figures 4.5-E

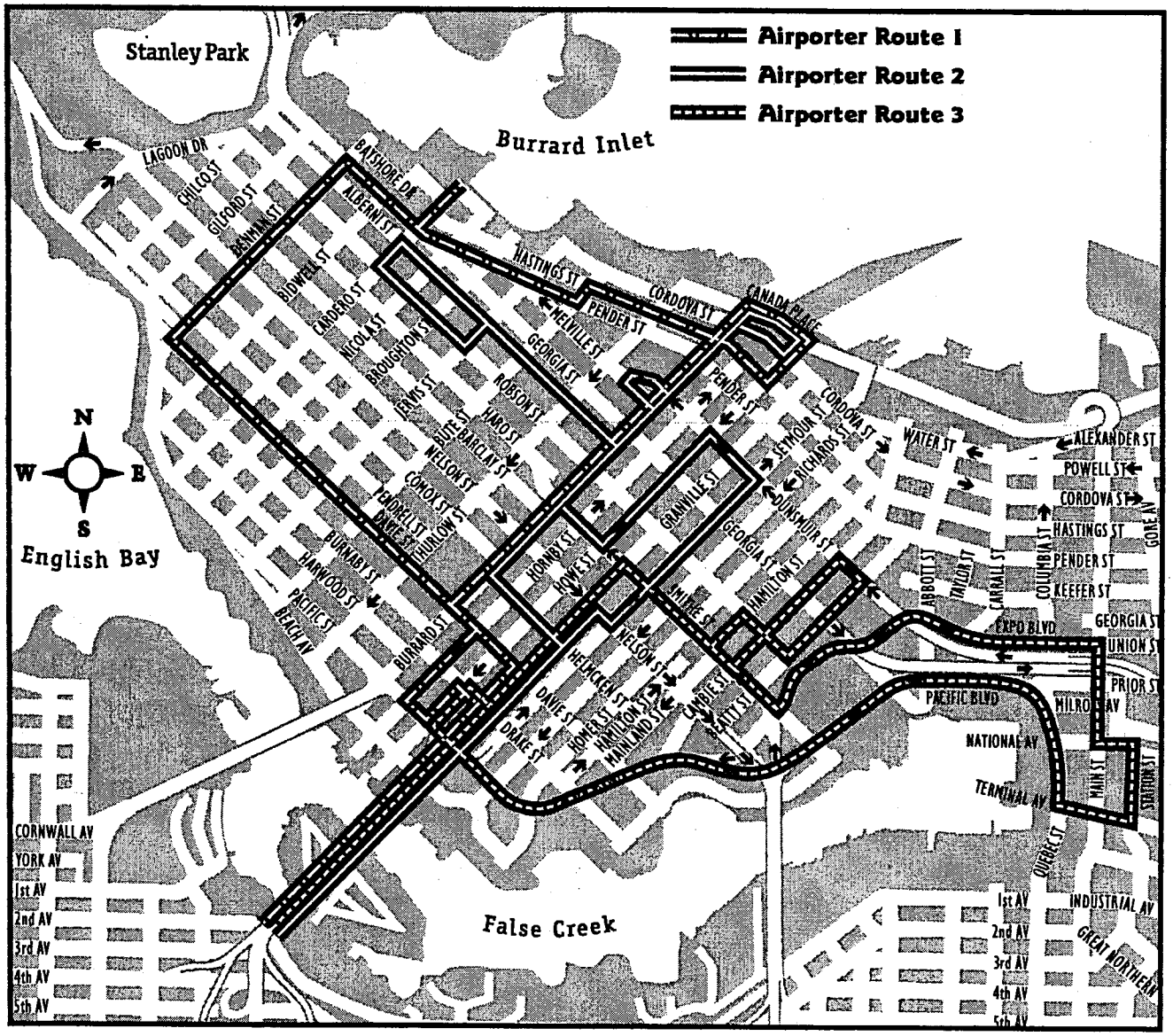
Current Tour Bus Routes *(Summer 2002)*



City of Vancouver Downtown Transportation Plan

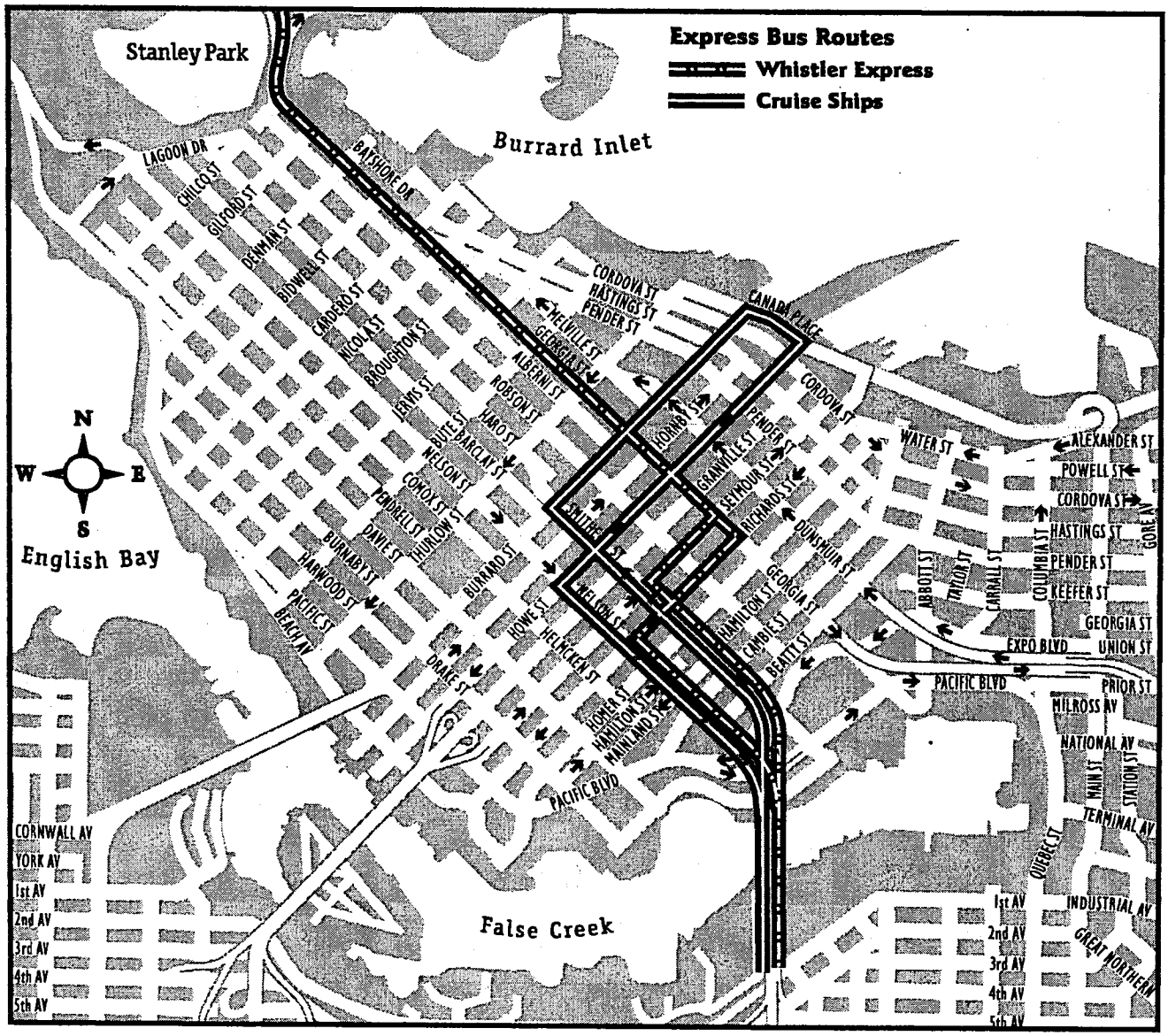
Figures 4.5-F

Current Airporter Bus Routes *(Summer 2002)*



Figures 4.5-G

Current Express Bus Routes *(Summer 2002)*



City of Vancouver Downtown Transportation Plan

As recommended by the Bus Impact Task Force, consideration was given to the creation of a downtown motor coach network. It was concluded that such a network would not be practical for the following reasons:

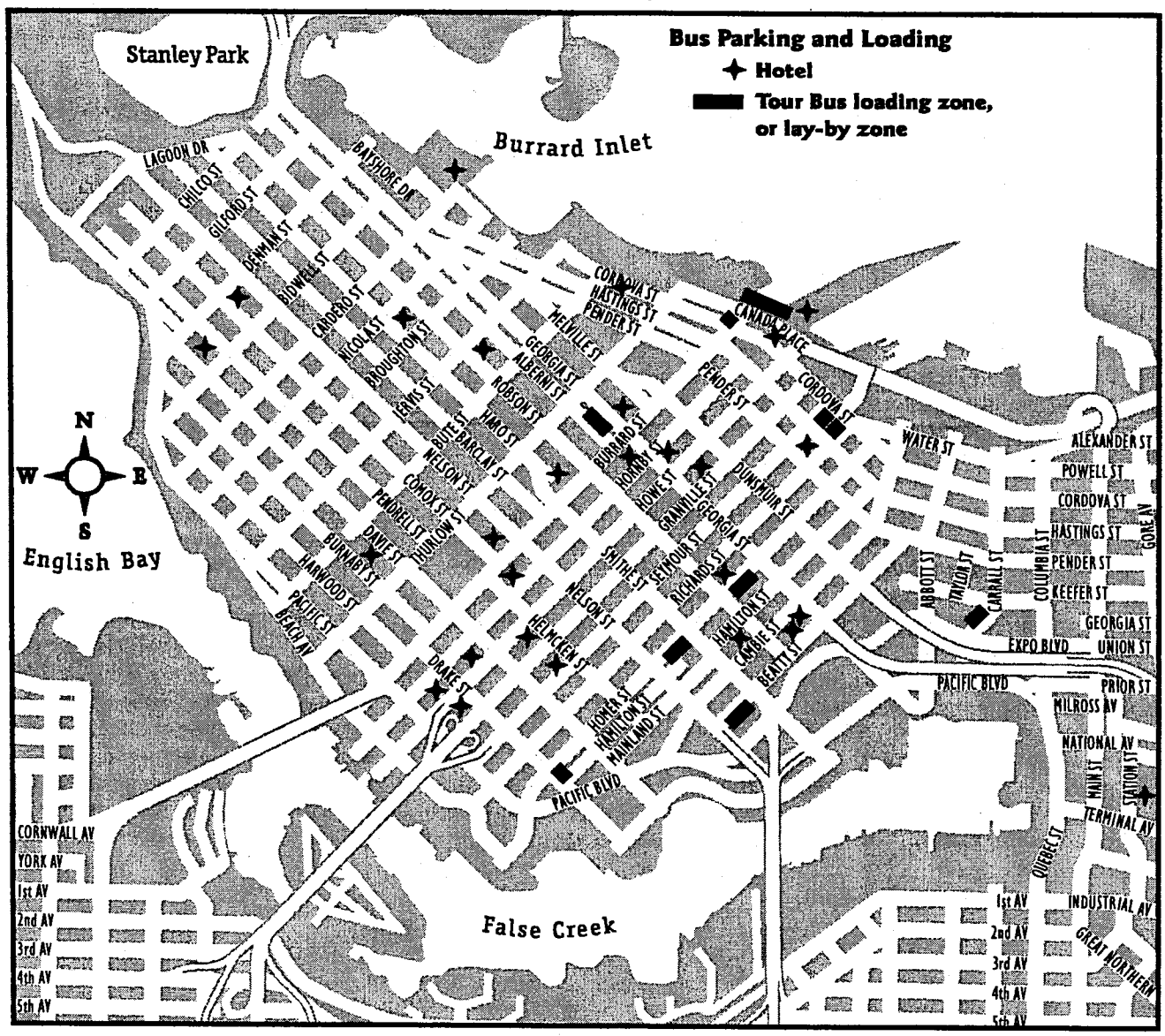
- The differing needs of the various tour bus operations both scheduled and unscheduled;
- The necessity to update the network frequently to reflect changing conditions (e.g. new hotels, new tourist destinations, road construction activities, changes to the road network or tour bus loading and parking areas);
- The inclusion of many streets within the network of tour bus routes, both sensitive and and less sensitive streets, because of the need to access specific hotels or tourist destinations; and
- The lack of flexibility to manage the scheduled tour buses on a route by route basis. An approved network of bus tour routes may result in some streets experiencing a disproportionately higher number of tour buses in comparison to other streets.

It is recommended that scheduled tour bus routes within the downtown be managed on a case-by-case basis to better reflect the needs of the bus tour operators and to better manage the impacts to sensitive areas within the downtown. This would allow the greatest flexibility in mitigating the impacts of tour bus routes that must go through sensitive areas.

The establishment of tour bus routes does not solve the problems of the tour buses themselves. The complaints about tour buses are often about the noise and air pollution they generate while stopped or parked. These are best managed with the education of tour bus operators and the enforcement of tour bus regulations. The most important of these regulations is the requirement to shut off engines while parked or stopped for more than three minutes. Therefore an education program or reminder to tour bus operators is recommended along with a responsive enforcement program. The other important aspect is to minimize the unnecessary circulation of tour buses while searching for a parking space or a tour bus, commercial loading or passenger zone to pick up or drop off passengers. Given the scarcity of curb space and the challenge of managing these spaces, it is recommended that the tour bus parking and loading provisions within the Parking Bylaw be adhered to, given the recent review of hotel loading facilities. Where necessary and practical, additional on-street tour bus parking and loading zones should be provided. Figure 4.5-H shows the current locations of on-street tour bus parking and loading zones.

Figure 4.5-H

Tour Bus Parking and Loading Zones *(Summer 2002)*



City of Vancouver Downtown Transportation Plan

Goods Movement Recommendations

Recommendation GM1 *Modify the downtown truck route network as shown in Figure 4.5-B.*

Recommendation GM2 *Remove Downtown South from the Truck Area.*

Recommendation GM3 *Review the truck loading requirements in the Parking By-law to ensure they are adequate and avoid relaxations.*

Recommendation GM4 *Monitor the municipal commercial plate program to reduce unnecessary demands on the limited on-street loading facilities.*

Recommendation GM5 *Maintain the existing system of one-way entry only to many of the rear lanes within the Central Business District and remove all lane encumbrances to the extent possible.*

Recommendation GM6 *Manage the motor coach and tour bus routes on a case-by-case basis to provide flexibility in managing conflicts.*

Recommendation GM7 *Manage tour buses by undertaking an education and enforcement program, and where necessary and practical, provide additional on-street tour bus parking and loading zones.*

Recommendation GM8 *Avoid downtown relaxations of the tour bus parking and loading provisions within the Parking By-law.*

Recommendation GM9 *Pursue additional off-street loading facilities as part of the convention centre expansion.*

4.6 Parking

The price and availability of commuter parking directly affects future demand for vehicular travel to downtown. Managing the supply of parking is one of the few tools available to local jurisdictions in British Columbia for influencing transportation mode split. Other tools, such as gasoline taxes and bridge tolls, are generally not available to local jurisdictions.

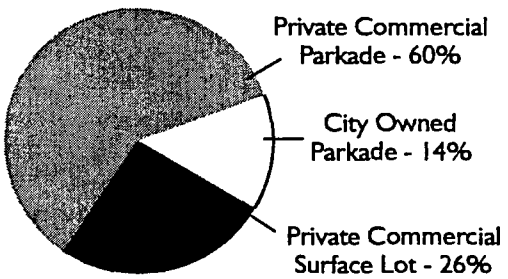
Commuters constantly trade time, convenience and out-of pocket costs (gasoline, transit fares, possible tolls, etc.) in deciding on transportation modes. Higher driving and parking costs (time and money) reduce the demand for vehicular travel. Lower costs and greater availability of parking, other things being equal, will result in more vehicular trips. Analysts concluded from a recent consumer survey that almost half of all transit trips by GVRD residents arose from traffic congestion and parking availability or costs in downtown Vancouver in TransLink's 1999 Regional Travel Survey (Canadian Facts, 2000).

4.6.1 Background

The City of Vancouver has a long history of concern for both the potential negative impact of commuter autos and for assuring the accessibility and economic viability business in downtown Vancouver, especially relative to other business centres in the region. This has meant simultaneously pursuing policies regulating the development of commuter parking and other policies assuring the availability of short-term parking for downtown Vancouver.

In 2000 there were about 50,000 off-street commercial parking stalls with about 13,000 in surface lots (mostly on undeveloped land), 7,000 in city-owned parkades and about 30,000 in off-street commercial parkades. See figure 4.6-A. These represent a decrease of about 3,000 parking stalls from 1998, primarily the result of surface lots vanishing with development.

Figure 4.6-A
Commercial Off-street Parking Stalls by Type and Provider



Commercial developers are required to provide a specified number of parking spaces under the Vancouver Parking By-law. Developers may choose to make a payment-in-lieu of providing parking in much of the downtown. Unlike suburban municipalities and most city areas outside of downtown, Vancouver's parking by-law specifies minimum required and maximum permitted parking stall ratios to regulate commuter parking availability in the downtown area.

4.6.2 Downtown Parking By-laws

Vancouver has had a variety of parking standard amendments since establishing stringent parking supply restraints in 1975. It was apparent by 1979 that the 1975 standards were too restrictive. The recommendation of a Special Advisory Committee that a new standard of a maximum of one space per 1000 square feet (93 m2) be generally allowed was adopted by Council in May 1979.

An extensive review of the 1979 standard was carried out in 1983-1984. That review generally confirmed that the office parking standard maximum of about one space per 93 m^2 continued to be effective and was consistent with transit modal share objectives. The 1984 review was the last comprehensive review of Vancouver's downtown parking requirements to be carried out, and culminated in the creation of the Parking By-law in 1986.

4.6.3 Projected Future Parking Supply and Objectives

Assuming that developers build the maximum number of parking spaces allowable in their developments under the current Parking By-law, 54,000 parking spaces in downtown Vancouver are projected for 2021, an eight percent increase over the year 2000. Although this represents an increase in the absolute numbers of parking spaces from 2000, it also represents a tightening of overall parking supply. The total overall number of commercial parking spaces per employee, which was .44 in 1990 and .37 in 2000, would be reduced still further to .32.

In 1996, the total number of commercial parking spaces was capable of accommodating some 40 percent of downtown employment, and the proportion of car drivers was 38 percent of all trips in the AM peak hour. The EMME/2 regional transportation model projects that 29 percent of AM peak hour trips will be drivers to downtown destinations in 2021. The projected total number of projected parking stalls in 2021 would accommodate about 31 percent of total employment.

Since it has been almost two decades since Vancouver's Parking By-law for commercial properties was reviewed, a review is recommended to better monitor parking supply for comparison with parking demand and to assure that adequate, but not abundant, supply is provided. A contribution towards such studies may be available from TransLink. Figure 4.6-B below depicts some of the relevant key standards in Vancouver's Parking By-law with those of other cities - Seattle and Portland in the United States and Calgary, Montreal and Toronto in Canada.

Figure 4.6-B

Comparison of Off-Street Parking Requirements for Vancouver and Other Selected Cities, 2002

Type of Land Use		Retail	Hotels	Offices
Vancouver	Minimum	1 stall per 93 - 115 m^2	0.3 per room	1 stall per 93 - 115 m^2
	Maximum	1 stall per 80 - 100 m^2	0.5 per room	1 stall per 80 - 100 m^2
Seattle	Minimum	0.9 stalls per 94.7 m^2 in areas with high transit access 1.2 stalls per 94.7 m^2 with moderate transit access	1 stall per 4 rooms	1 stall per 123 m^2 in high transit areas 1 stall per 91 m^2 in moderate transit services
	Maximum	None	None	None
Portland	Minimum	No minimum	No Minimum	No Minimum
	Maximum	1 stall per 94.7 m^2	1 stall per room	0.7-1 stall per 94.7m^2 (graded by transit accessibility)
Toronto	Minimum	1 stall per 100 m^2	1 space per 371 m^2	1 stall per 300 m^2
	Maximum	1 stall per 25 m2	1 space per 100 m^2	1 stall per 135 m^2
Montreal	Minimum	1 stall per 350 m^2	1 stall per 5 rooms	1 stall per 350 m^2
	Maximum	1 stall per 150 m^2	1 stall per room	1 stall per 150 m^2
Calgary	Minimum	1 stall per 140 m^2	1 stall per 3 rooms in Central Business Area	1 stall per 140 m^2 north of the CPR 1 stall per 90 m^2 south of the CPR
	Maximum	1 stall per 56 m^2 where retail exceeds 9300 m^2	None	None

The planned opening of the Millennium SkyTrain line in late 2002 and the availability of additional transit services to downtown would make such a review timely. The next future comparable opportunity would be the development of rapid transit services to Richmond.

Managing commuter parking has used the "carrots" and "sticks" approach to elicit desirable behaviour by commuters. Changes in consumer behaviour with respect to other environmental issues - recycling for instance - has followed extensive communications programs. Thus, communication programs in cooperation with major employers should be formulated to encourage employees to carpool or not drive to downtown jobs. It is downtown commuters that generally have the greatest range of alternatives. Such a program might begin with City employees in downtown and near-downtown locations and may involve the Office of Sustainable Development if appropriate.

4.6.4 Qualitative Considerations

Parking can have a significant impact on downtown's streetscape and retail environments. Commercial parking in the downtown area is generally required to be off-street in underground facilities. Surface parking lots are generally not permitted, and those that do exist are sites awaiting redevelopment. The Downtown Transportation Plan recommends a number of streets for pedestrian priority. Driveway entrances across sidewalks on these streets would conflict with pedestrian movements and should therefore be discouraged. Generally, driveways across all sidewalks downtown and in the West End downtown should be discouraged as well.

In Section 5 of the Downtown Official Development Plan, a number of downtown areas are identified as having a deficiency of parking spaces. Accordingly, parking garages not ancillary to another use on the site were permitted within the areas shown in Figure 4.6-C. Figure 4.6-D depicts the availability of off-street commercial parking by sub-area within downtown in 1996 and projected to 2021 on the basis of anticipated development and capacity. It shows that in the longer term, there will likely not be a parking shortfall. It is recommended that Section 5 be reviewed to confirm its need.

Figure 4.6.-C

Areas in which Freestanding Parking Garages are Permitted

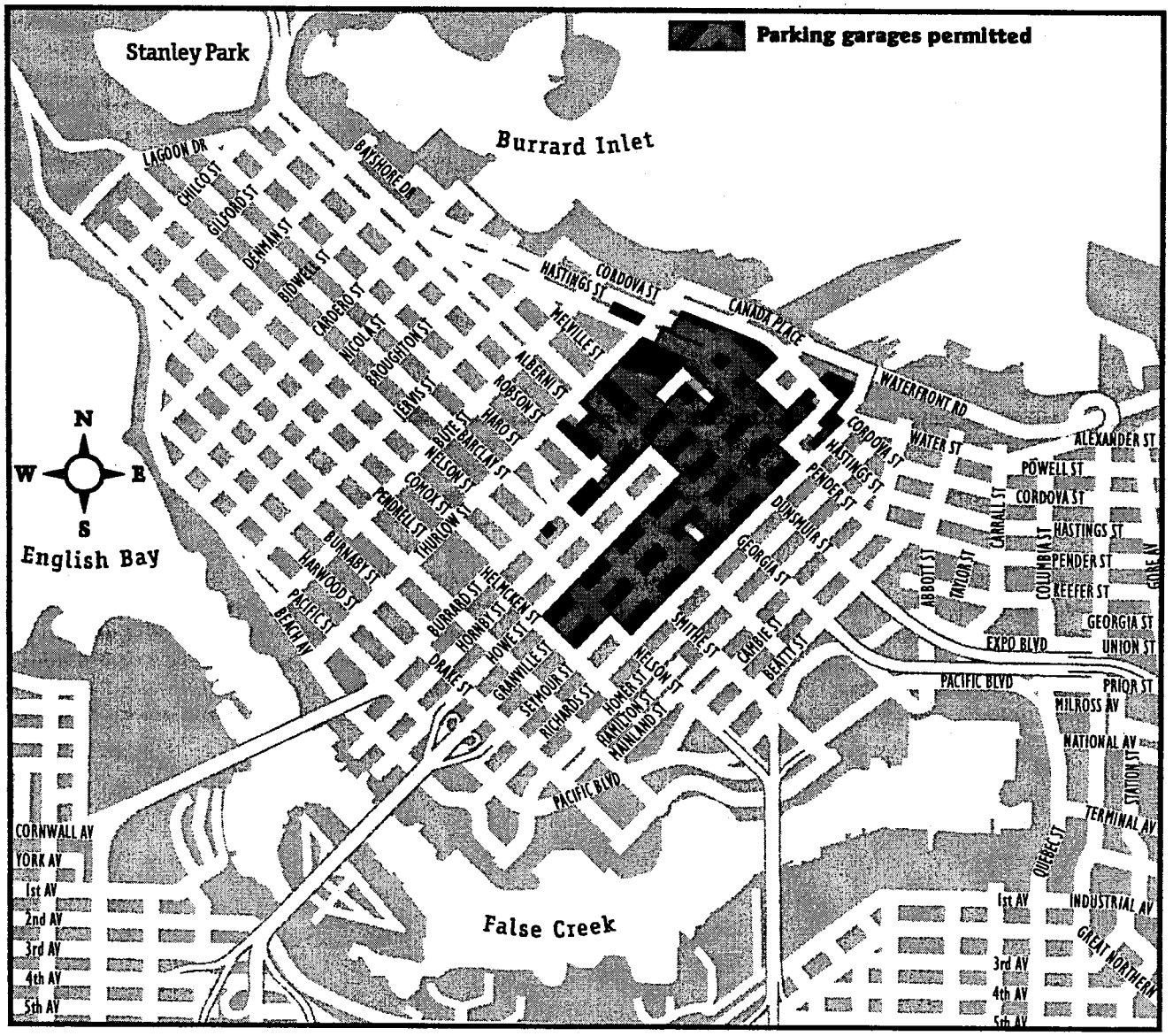
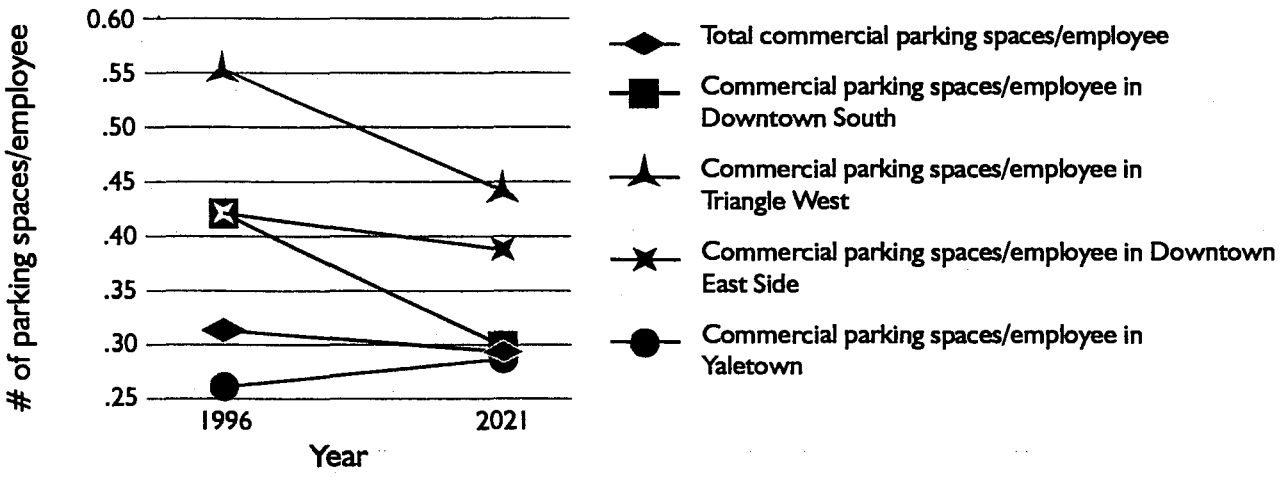


Figure 4.6-D

Number of Commercial Parking Spaces/Employee in Downtown Sub-Areas



One of the primary concerns being addressed in this recommendation is the lack of street animation on frontages occupied by parkades. The renovation of existing parkades to add active uses to street level edges needs to be encouraged. This could begin with City-owned facilities.

4.6.5 Short-stay Parking

Ensuring the adequacy of short-stay parking is one of the primary objectives of the City. Given its importance to downtown retail customers and business, there is no desire to reduce the amount of short-stay parking. A review of parking opportunities near the Granville retail/entertainment and Robson retail corridors shows that parking opportunities will increase between 1996 and 2021 by about 300 spaces along Granville. No change is projected in the Robson Street business area. Together with other information and data, it is concluded that short-stay parking in at least a couple of critical locations will stay the same or become more plentiful in the future.

4.6.6 Car Co-ops

Car co-ops may be a partial solution to the social and environmental problems stemming from excessive dependence on automobiles. They enable residents, especially in dense urban areas such as downtown Vancouver, to enjoy some of the benefits of auto ownership without the cost of full-time ownership and maintenance. Vancouver already possesses one such co-op with about 800 members, most of whom live in the central area. As is shown in Figure 4.6-E, the Vancouver Co-operative Auto Network possesses a variety of plans for a variety of car use patterns. Several civic policy innovations have been designed to facilitate the co-ops operations. Foremost is an amendment to on-street parking by-laws allowing co-op cars to park legally in all residential permit zones. Although suitable arrangements seem to have been made for car retrieval locations throughout the downtown, this is the one area in which the City might assist in the future.

Figure 4.6-E
Car Sharing Programs and Characteristics

Name of Program / Web Address	Number of Cars for Rent	Number of Members	Costs
Vancouver Co-operative Auto Network *www.cooperativeauto.net*	49	800	One-time $20 membership fee and a $500 refundable security deposit. There are membership plans that cater to different needs. **The Higher Usage Plan:** for those driving more than 3000 km/year (over 250 km per month) $35 monthly admin fee, $1.75 per hour (to a max. of $21 daily) and 17¢ for every kilometre driven. **The Moderate Usage Plan:** for those driving less than 3000 km /year (from 100 to 250 km per month) $12.50 monthly admin fee, $1.75 per hour (to a max. of $21 daily) and 27¢ for every kilometre driven. **The Lower Usage Plan:** for those driving less than 1000 km/year (100 km per month or less) $60 yearly admin fee, $1.75 per hour (to a max. of $21 daily) and 32¢ for every kilometre driven.
Seattle Flexcar *www.flexcar.com*	44	4000	**Test Drive Membership Plan:** $25 fee to join, and to rent, $3.50/hr +$0.90/mile **Bronze Membership:** $250 fee + $20/month, and to rent $2/hr + $0.90/mile Gas and Insurance are included
Portland Car Sharing *www.carsharing-pdx.com*	25	500	One-time $25 membership fee and a $250 refundable security deposit. In addition, there is a $10/month or $100 /year fee. To rent: $2/hr + $0.40/mile Gas and Insurance are included

4.6.7 Regional Parking Policies

Many studies, both locally and in other regions, have concluded that an ad hoc municipality-by-municipality approach to planning for parking will likely be ineffective in managing overall travel demand. A regional approach is necessary. Such an approach has the potential to overcome the limitations of municipalities pursuing their respective self-interests.

Because local development policies and standards are within municipal jurisdiction, municipalities need to be closely involved in developing a regional strategy. TransLink's and the GVRD's parking controls are currently limited to the levying of a seven percent tax on fee paid parking, scheduled to increase to 21 percent in 2005. The GVTA (Greater Vancouver Transportation Authority) legislation does enable TransLink to levy a flat parking space tax on any facility in the region (by area or parking space). Since TransLink's powers are limited to taxation, there is need to implement more robust parking supply and pricing policies. Limiting parking taxes to fee paid

spaces means effectively a tax on downtown Vancouver, which is inequitable. A fairer, broader-based tax would have roughly equal impact on all municipalities in the region.

TransLink's Strategic Transportation Plan, 2000-2005 recommends developing a regional parking strategy with the region's municipalities by the end of 2000 to manage the supply, pricing and regulation of parking. Although this has already been initiated, more progress needs to be made.

It is anticipated that a regional strategy would feature the levying of parking charges on a stall basis, as opposed to a tax on parking fees paid that has its greatest impact on parking and costs in the City of Vancouver. A transformation of parking charges is a key component of TransLink's overall transit ridership objectives.

4.6.8 Off-street Residential Parking

The City of Vancouver's policy with respect to residential parking downtown has been to accommodate without encouraging car ownership among downtown residents. Past policy development has been careful about ensuring only minimal parking for residents is provided to avoid leasing to downtown commuters. Downtown South parking requirements based on residential unit size is one good example. There is a need to continue to undertake periodic surveys of downtown residents to ensure that the Parking By-law continues to reflect car ownership.

4.6.9 On-street Parking

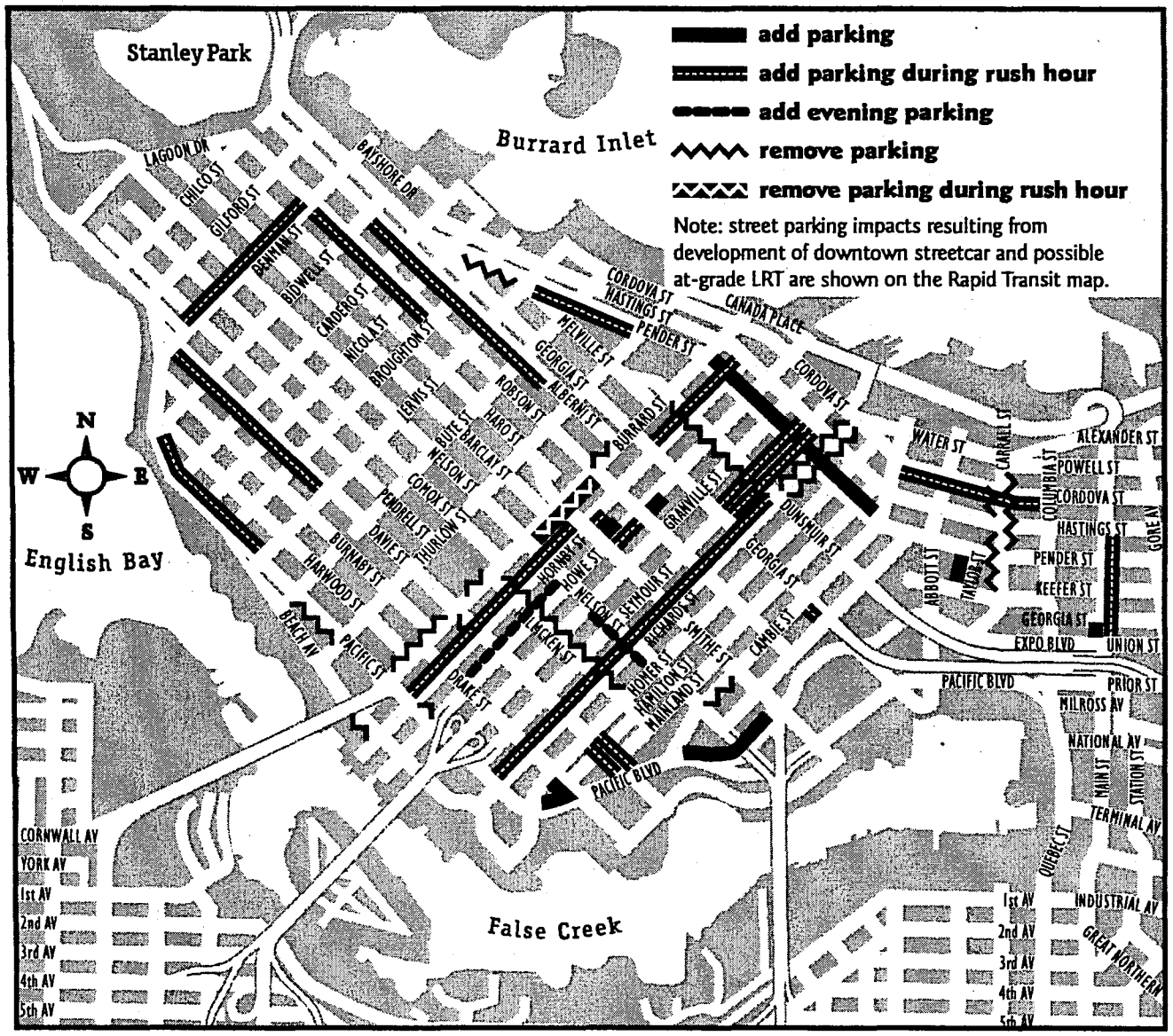
On-street parking provides access to downtown businesses and properties. On-street parking also enhances pedestrian comfort and safety by providing a buffer between pedestrians and moving traffic. In an urban context, such buffers serve the same role as boulevards in less dense contexts. In 2000, there were a total of about 4,700 on-street parking spaces in non-residential areas. About 3,600 of these were controlled by parking meters. Many spaces are available most of the day, but some might be restricted for parts of the day due to rush hour regulations.

Parking proposals have been developed to accommodate plans for the different modes of transportation, including transit and cycling, while also maximizing the continued availability of on-street parking. Additional full-time parking would increase opportunities for corner bulges at many downtown locations.

On-street Parking Recommendation Summary

Figure 4.6-F summarizes the on-street parking recommendations of the Downtown Transportation Plan. About 130 parking spaces are to be added to the on-street inventory. The biggest concentration of such spaces would be along the north side of Pender Street between Burrard and Cambie. While these spaces are desirable for businesses on this street, especially hotels, they are dependent on the recommendation to make Pender Street one-way in this section. Other additions are shown on Drake, Expo, Howe, Main, Pacific and Taylor Streets where prohibiting parking along these street sections appear unnecessary.

Figure 4.6-F
Changes to On-street Parking



A total of about 125 spaces would be eliminated to provide for improved bus priority measures (east side of Burrard, Nelson to Robson Streets), general traffic improvements (Cambie Street, Smithe to Nelson) and cycling facilities (proposed Carrall and Helmcken/Comox Greenways, Burrard Street south of Nelson and the south side of Pacific Street, Bute to Jervis).

Assessment shows rush hour parking prohibitions may be eliminated for about 600 spaces at specific locations. Locations include portions of Beach, Alberni, Hornby, Seymour, Richards, Pender, Cordova, Main, Davie, Denman and Robson Streets. New rush hour parking prohibitions are proposed to be added on Burrard Street to reduce congestion and facilitate transit operations.

Parking is not permitted on a number of downtown streets for the entirety of the day because the curb lane is required for traffic operations. However, on many of these streets, parking would be suitable during the evening when traffic is generally not congested. As in other places downtown,

parking on such streets would help to make streets more comfortable for pedestrians. Streets suggested for evening parking after 8 p.m. include Howe and Nelson Streets

The elimination of a further 77 spaces to assist the implementation of the proposed streetcar on Cordova and Columbia Streets and on Pacific Boulevard and Drake Street is recommended. This is further detailed in section 4.2.

Overall, the on-street parking proposals in the Downtown Transportation Plan would see little or no net change in the total number of parking spaces and the net addition of approximately 570 spaces during rush hours.

4.6.10 Motorcycle Parking

Motorcycles comprise less than two percent of Vancouver=s registered vehicles. Their numbers in recent years have tended to decrease slightly. Motorcyclists have expressed some concern about the cost of on-street parking, some reasoning that motorcycles should be encouraged because they are smaller and usually more energy-efficient. This may not, of course, be sufficient cause to provide free on-street parking for motorcycles, but it may be sufficient rationale to establish smaller on-street spaces with smaller fees specifically for motorcycles.

The City of Vancouver established a number of test demonstrations for free on-street motorcycle parking in 1999. Evaluation thus far has determined that there does not appear to be a high demand for special provisions for motorcycle parking. Should demand increase, further review may be necessary.

Parking Recommendations

Recommendation PK1 *Regularly review downtown residential and commercial off-street parking standards to ensure that adequate, but not abundant, parking is provided to meet needs.*

Recommendation PK2 *Formulate communication programs in co-operation with major employers to encouraging employees to car pool or not drive to downtown jobs.*

Recommendation PK3 *Discourage driveways across all sidewalks in the downtown, particularly along pedestrian oriented streets and bikeways.*

Recommendation PK4 *Review existing policies that permit the development of free-standing parking garages.*

Recommendation PK5 *Consider renovating city-owned parkades to animate street frontages and encourage private owners to do the same.*

Recommendation PK6 *Urge TransLink and the GVRD to develop and implement an equitable regional parking policy to achieve regional livability and transportation goals in consultation with affected municipalities.*

Recommendation PK7 *Adjust on-street parking regulations as per Figure 4.6-F to better balance the needs of all users.*

Recommendation PK8 *Monitor the demand for special on-street parking provisions for motorcycles.*

4.7 Intelligent Transportation Systems

Intelligent Transportation Systems (ITS), refers to the use of technology to make our transportation system safer and more efficient. This technology includes computer hardware and software, sensors and monitors, telecommunications devices, display devices and data warehousing. ITS has a number of applications that are relevant to the downtown transportation system.

The importance of ITS has been recognized by TransLink. TransLink has created an ITS Corporation (a subsidiary of TransLink) to help co-ordinate ITS initiatives regionally and provincially. In this regard, TransLink has developed a Provincial ITS Vision and Strategic Plan to ensure that ITS is developed and deployed such that it can be shared by various agencies and used for a variety of applications without duplicating effort.

ITS includes providing current information to travellers, making transit faster and more convenient, managing traffic movements safely, and improving emergency response times. For example, the auto industry has developed car navigation systems and sophisticated collision avoidance warning systems to make driving more convenient and safer. These advancements would serve the needs of many drivers throughout the region including the downtown. However, given the Downtown Transportation Plan goals of minimizing congestion and creating a better transportation balance by providing more transportation choices, the objective is to use ITS to meet those goals.

4.7.1 Current ITS applications

Many ITS technologies are already being used within the City. A new state-of-the-art traffic signal management system (TSMS) was recently installed to monitor and co-ordinate Vancouver's 650 traffic signals, with the capability to expand to 1200 signals. The TSMS has increased the ability to control and co-ordinate the signal system in conjunction with new technologies. These include co-ordinating the traffic signal timings to encourage traffic flow at desired speeds (progression speed), and adjusting signal timings to cater to rush hour traffic demands or special events.

Other existing examples include:

- Closed circuit TV cameras to monitor traffic conditions from the traffic control centre at City Hall;
- Microwave vehicle detection systems and traffic counting equipment to monitor, count and classify vehicles on a continual basis;
- Intersection safety cameras to detect and identify vehicles running a red light, as well as their speed, date and time of infraction;
- Audible and tactile push buttons for pedestrians to aid those that are hearing or visually impaired;
- Wireless technology for more effective and efficient parking enforcement;
- Internet connections to provide information on road construction activities;
- Electronic Fare Box/Smart Card throughout the transit system; and,
- Automatic vehicle location system to help provide up-to-the-minute arrival time information and signal priority measures for the 98-B Line buses.

4.7.2 Potential Downtown ITS Applications

It is recommended that ITS technologies be pursued to make downtown travel by pedestrians, cyclists and transit passengers more convenient and safe. ITS should also be used to minimize overall road congestion by making the most efficient use of available road space. Examples of some potential future applications are outlined below:

- Use of microwave detection systems or similar technology to give priority to specific modes (like pedestrians, cyclists and transit buses) at signalized intersections or other select locations. Currently, loop detectors or push buttons may unintentionally give priority to modes other than the one targeted;
- Adaptive traffic control signal system that optimizes traffic flow and minimizes congestion by continually evaluating the traffic conditions and automatically adjusting traffic signal timings accordingly;
- Use of the traffic signal control system to establish of a 40 km/h progression speed during peak periods to better reflect current and safe vehicle operating speeds in dense downtown residential neighbourhoods;
- Provision of real-time up-to-the-minute transit schedule information at all bus stops and through the internet;
- Allow transit buses, behind schedule, to extend the green phase of a traffic signal to get back on schedule;
- Use of traffic micro-simulation analysis to help evaluate traffic conditions for proposed changes to the transportation network;
- Use of ITS for road pricing and other transport demand management measures in co-ordination with TransLink;
- Provision of traveller information through wireless technology, roadside displays, the telephone or the internet. The information could include road and weather conditions, parking availability, real-time video images, bus tracking, construction activities, bike routes and transit routes;
- Management of traffic and other data as a commodity for potential use by third parties; and,
- Use of wireless technology or smart cards to manage and operate parking meters.

Intelligent Transportation Systems Recommendations

> ***Recommendation IT1*** *Pursue ITS technologies to make downtown travel by pedestrians, cyclists and transit passengers more convenient and safe, and minimize overall road congestion.*

4.8 Public Realm

The Downtown Transportation Plan is envisaged as an important first step in developing and implementing a transportation system to serve the downtown for the next 20 years plus. It is also the first step in the development of a public realm plan for downtown Vancouver. The 1991 Central Area Plan identified public realm as one of the policy areas in which future plans would be formulated.

For the downtown to remain competitive for conferences, special events (Winter Olympic Games) and tourism, as well as an attractive location for offices and residents, a consistent and high quality of public realm is important. A major goal of the Downtown Transportation Plan has been to improve the liveability of downtown for the thousands of new residents that have chosen to call downtown home. For all trips to downtown destinations, walking and other non-motorized transportation have become the most common mode of transportation, and greater ease, safety and comfort in making those trips will, along with improved access to the downtown, help downtown to remain an attractive place to live and do business, as well as to visit, shop and have fun.

Public Realm work has been undertaken on a sub-area basis, but not comprehensively in the downtown. Examples of sub-areas with public realm plans are Downtown South, Triangle West, Library West, Georgia Street, Yaletown and Yaletown Edge and the Coal Harbour and False Creek North areas. Even these plans often do not cover every component of the urban public realm. Lighting and sometimes water are, for instance, frequently neglected.

The contribution of public realm planning to the quality of downtown life is nonetheless well accepted. One of the most outstanding results is the Seawall recreational biking and pedestrian way system. More recently, the city embarked on a comprehensive redesign of downtown Pacific Boulevard with the assistance of renowned urban designers Allan Jacobs and Elizabeth Macdonald in conjunction with the Downtown Transportation Plan. It likely marks the first time in the city's history that a street has been subjected to such a thorough urban design review. The result, including the positive reception given the result, both officially and publicly, provides evidence of the benefits of a comprehensive approach to the design of the public realm. Understanding the transportation role of Pacific Boulevard with the downtown transportation network was key to the success of this project. In May 2002 the City once again decided to subject a major, or great, street - Granville Street and Mall - to similarly thorough review and design. The task in some respects daunting - to take one of Vancouver's oldest streets with numerous historic buildings and with limited right-of-way, and design it such that it might accommodate the ten bus routes that use it without loss of transit efficiency. Pacific Boulevard/Street and Granville Street/Mall nonetheless illustrate two factors important in the future design of the downtown public realm:

- roads and transportation links are a major component of the public realm; and
- a comprehensive approach to public realm design increases the appeal of the result.

A public realm plan for downtown will include both publicly owned lands and privately owned lands to which the public has access. The public realm plan will include streetscape design, particularly for ceremonial and high streets, and design standards, a street furniture strategy, the design and programming of open spaces and park acquisition for emerging users, urban greening and greenways, way-finding and the integration of semi-public spaces. The Public Realm Plan would focus on the design of these projects, as well as other projects that may be incremental in nature upon redevelopment of sites. None of this diminishes the role of streets in providing access to downtown Vancouver. In this manner, a Public Realm Plan would provide guidance to projects in the Downtown regardless of who finances them or whether they are done bit by bit or all at once. The Streetscape Design Standards Manual could be a model for this type of work. It is recommended that a strategy and work program for undertaking a comprehensive public realm plan for downtown be developed.

Public Realm Recommendation

***Recommendation PR 1:** Develop a strategy and work program for undertaking a downtown public realm plan.*

4.9 Water Transportation

The issue of water transportation to the downtown peninsula is a natural opportunity. The downtown peninsula is bordered on the south by False Creek and on the north by the Burrard Inlet. This section reviews the potential for greater use of the surrounding waters for transportation to and from the peninsula.

Surface transport on water is common in many cities. The instances of the canals of Venice or of the crossing of the Bosporus in Istanbul are legendary. The most cited examples in North America include Seattle and San Francisco. Washington State Ferries provides both car and passenger ferry service to numerous points across Puget Sound from downtown Seattle. The number of ferry passengers entering San Francisco on a daily basis, mostly from the north, increased from 6,000 to 20,000 following a 1989 earthquake and has stayed at that level since.

One major difference between many of these cities and Vancouver is the existence of fixed link (bridge or tunnel) alternatives and the distance traversed by water craft. Most of these instances lack or have limited fixed links or possibilities. Most of the ferry services traverse relatively long distances with none or few alternative fixed links. Investment in infrastructure, as well as the space required, to provide for the transition between land and water is often considerable.

These conditions generally don't apply in the case of Vancouver. The opportunity for water transportation service to supplement fixed link connections is nevertheless present in Vancouver, and public water transportation services exist on both Burrard Inlet and False Creek.

Burrard Inlet

Burrard Inlet separates the North Shore communities from the rest of the Lower Mainland. Approximately 180,000 people currently live on the North Shore and population is projected to reach about 220,000 in 2021. Two bridges, the Lions Gate and Iron Workers' Memorial (Second Narrows), connect the North Shore to the City of Vancouver. TransLink has provided passenger ferry service from Lonsdale Quay in North Vancouver to Waterfront Station in downtown Vancouver since 1977. The current SeaBus provides service with up to 15 minute intervals in peak periods.

In 1995, BC Transit commissioned Sandwell Inc. to examine potential marine connections between the North Shore and Vancouver, as well as upgrading of the existing SeaBus service. Having met the threshold criteria, three alternatives were studied in more detail by the consultants. Two of these proposed service locations were eventually rejected because they were not competitive with bus services, and one was in too remote a location on the North Shore. The report concluded that none of the short-listed alternatives were financially feasible. Cost recovery factors for each option were less than 35 percent, while existing bus services for the North Shore then averaged 43 percent. Only one option (Seymour) resulted in increased transit ridership above existing bus services. The Seymour option might be more cost effective as further housing and development occurs east of the Seymour River. Further studies need to be undertaken to confirm the market for alternative services, initially vessels of 100 person capacity or less.

Upgrading of SeaBus service was investigated as well. Service expansion in three stages over a ten year period in 2010 was foreseen: 1) increase in seating capacity/vessel by 33 seats; 2) decreasing service headway to 12 minutes; and 3) purchasing a third vessel.

In addition to the existing and potential marine transit services examined, past studies of Vancouver's Burrard inlet (*Blueways)* have stressed the need to retain public docks for short-term use by boaters, water taxis and smaller passenger ferries. Harbour Green Park (Coal Harbour) and Burrard Landing are the most often mentioned locations.

False Creek

Transportation planning for the crossing of False Creek has focused for the most part on the three existing bridges or fixed links. Physical expansion of these links to accommodate larger numbers of pedestrians and bicyclists has been the primary focus. Marine transport crossings are not generally viewed as competitive with those using the fixed links and certainly not if the fixed links remain free from direct costs to users. There nevertheless remains a niche market for marine transportation along and across False Creek, primarily focused on service to Granville Island, the location of Vancouver's largest public market, as well as Vancouver's premier tourist destination. As the bridge ramps often meet the surface some distance from the edge of the Creek, marine travel is also often advantageous to other commercial and residential areas immediately adjacent to the Creek.

Passenger ferry service across False Creek is provided by two private services. Boardings on the Creek are on docks owned by Canada Mortgage and Housing Corporation, the Coast Guard, private companies and the City of Vancouver, including direct administration by the Vancouver Park Board. Only one route currently accommodates bicycles. Additional docks that might be used by the passenger ferry services will likely be added in connection with further development along the Creek, primarily in the north and southeast False creek areas. Many users foresee a need for more consistent service to various points. Through its control of moorage and licence fees, the City of Vancouver can play an instrumental role in defining the services

5 Implementation Ideas

The ideas in this section are an outcome of the consultation process that occurred during the development of the Plan. When developing the Downtown Transportation Plan it was important to assess the feasibility of the various proposals to ensure that there is a practical way to implement each of the plan components. Developing conceptual designs was a way to test the practicality of the plan.

This section illustrates how many of the major plan components could be implemented. Section 5.1 addresses site-specific issues, called "spot improvements". Spot improvements were identified by input from the public, the safety study, and staff analysis. Sometimes spot improvements were identified in response to a policy recommendation outlined elsewhere in the plan. Section 5.2 describes the conceptual downtown bus routes in more detail.

The accompanying approaches and illustrations are intended to provide suggestions when undertaking further detailed analysis and design development. In all cases, the usual public and stakeholder consultation process would be followed prior to implementing the various plan components. In addition, a comprehensive approach that includes the integration of public realm issues could be undertaken.

The suggestions that follow illustrate the feasibility of some of the recommendations in the Plan. However, in the end, the actual designs and solutions that are built may be quite different from the ideas in this section.

5.1 Spot Improvements

Figure 5-A shows the locations of all the implementation ideas. *Figure 5-B* summarizes issues and the transportation modes impacted.

The spot improvements listed in *Figure 5-B* have additional descriptions that can be found chronologically after the table. All will require follow-up analysis and consultation before pursuing any particular design.

Figure 5-A
Locations of Spot Improvements

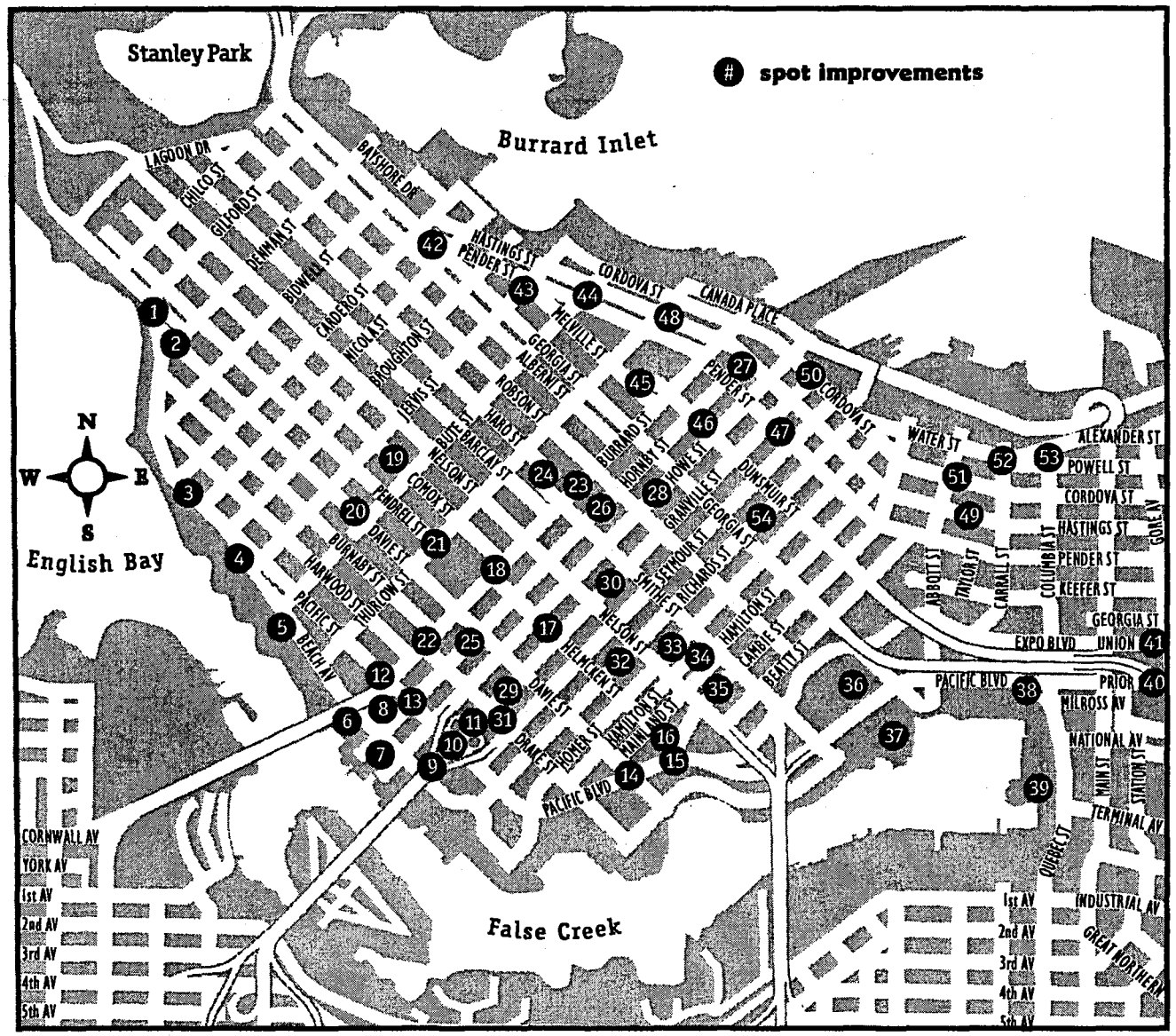


Figure 5-B

List of Spot Improvements

Item	Location	Pedestrian	Cycling	Transit	Road Network
1	Normalize the intersection of Morton Avenue at Beach Avenue	X			
2	Explore options for Morton Avenue to enhance landscaping	X			X
3	Improve pedestrian and cyclist crossing of Beach Avenue at Bidwell Avenue	X		X	
4	Redesign the intersection of Pacific Street and Beach Avenue	X			X
5	Extend the Beach Avenue Off-Street Bike Route from Bidwell St to Hornby St	X	X		
6	Improve the Seaside Route for cyclists under the Burrard Bridge	X	X		
7	Improve the Seaside Route for cyclists at Hornby and Howe Streets		X		
8	Improve Seaside Route connection to Burrard Bridge for cyclists	X	X		
9	Improve the crosswalks on the Granville Bridge at the Seymour and Howe ramps	X	X		X
10	Improve the crosswalks on Pacific Street under the Granville Bridge	X	X		X
11	Redesign the Granville Bridge Loops	X	X		X
12	Redesign the intersection of Pacific St and Burrard St	X	X		X
13	Widen Pacific Street between Burrard and Hornby St		X		X
14	Redesign the intersection of Pacific Blvd at Davie St	X	X	X	X
15	Redesign the intersection of Pacific Blvd at Cambie St	X	X		X
16	Improve pedestrian and cyclist access through Helmcken Park between Mainland and Pacific	X	X		
17	Redesign Helmcken Street as a pedestrian and cyclist friendly greenway	X	X	X	X
18	Create a cyclist connection between Helmcken and Comox across Burrard St	X	X		
19	Enhance the crosswalk on Comox St across Thurlow St		X		
20	Widen sidewalks on Davie Street using building setbacks	X			
21	Improve the streetscape and pedestrian environment on Thurlow Street	X			
22	Create a southbound bike lane on Burrard Street		X		X
23	Remove parking on Burrard between Nelson and Robson in the PM peak hour		X	X	X
24	Enhance the crosswalk on Smithe Street at Haro Street	X	X		
25	Remove parking westbound on Davie Street between Burrard and Hornby		X	X	

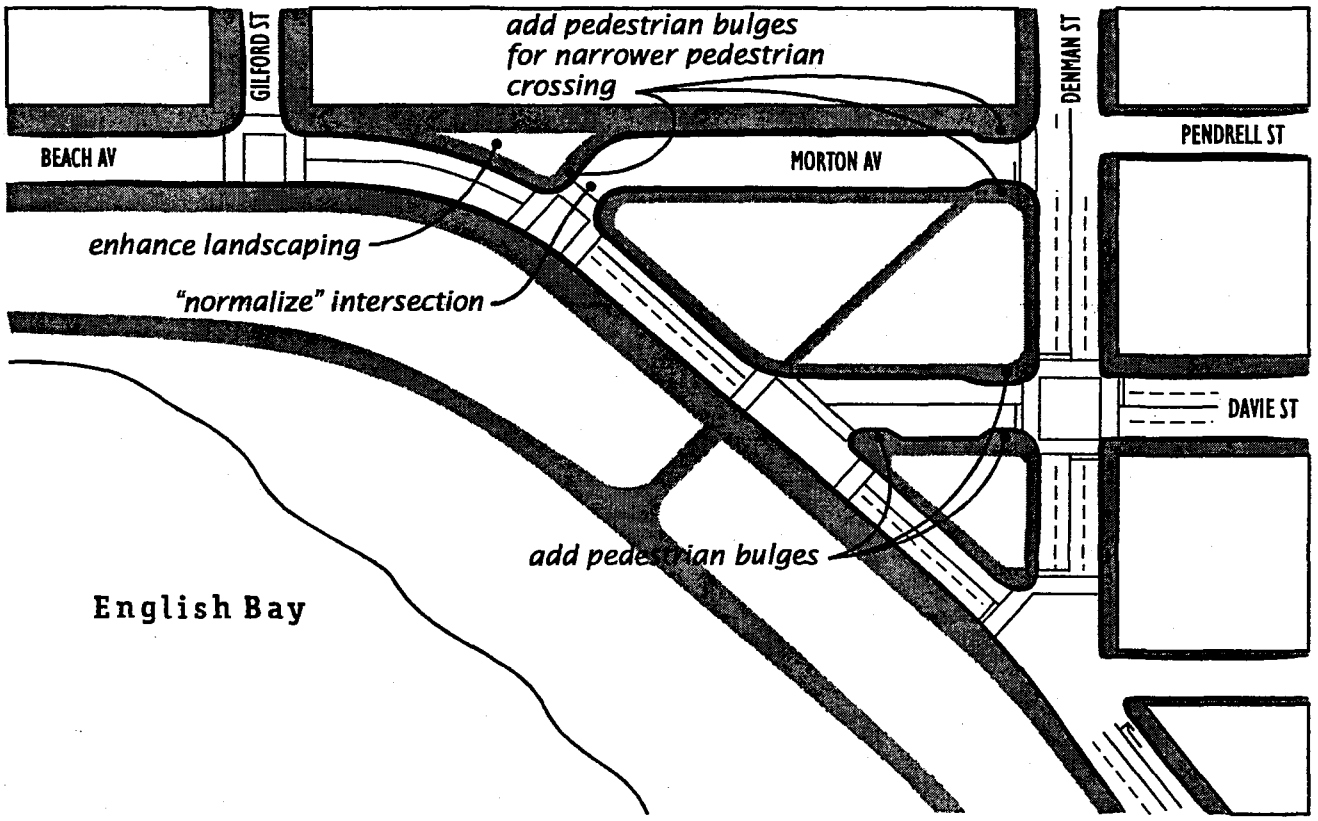
Item	Location	Pedestrian	Cycling	Transit	Road Network
26	Create a bike lane on Hornby Street from Pacific to Hastings Street				X
27	Adjust the intersection of Hornby Street at Hastings Street to accommodate a cyclist left turn		X		
28	Change the parking access ramps on Howe Street between Georgia Street and Smithe Street	X			X
29	Widen sidewalks on Granville Street between the Bridge and Nelson Street	X			X
30	Prohibit general traffic northbound on Granville Street between Nelson Street and Smithe Streets	X		X	X
31	Route the Pacific Boulevard Streetcar line along Drake Street to Granville Street			X	X
32	Create a southbound bike lane on Richards Street		X		X
33	Convert Homer Street to a two-way street	X			
34	Create a direct pedestrian connection between Hamilton Street end and the intersection of Hamilton between Nelson and Smithe	X			
35	Create a northbound bus lane on Cambie Street from Nelson Street to Smithe Street			X	X
36	Integrate the Northeast False Creek development into the downtown by extending the street grid into the site	X			
37	Improve pedestrian and cyclist continuity through the Plaza of Nations	X	X		
38	Modify the intersection of Pacific and Quebec to better accommodate the streetcar and cyclists		X	X	X
39	Facilitate cyclist connection through the Science World area		X	X	
40	Improve cyclist access through the intersection of Prior Street and Gore Avenue		X		
41	Improve crossing conditions for cyclists crossing Gore Avenue at Union Street	X	X		
42	Normalize the intersection of Georgia and Pender Streets	X	X		X
43	Prohibit southbound access onto Jervis Street from Pender Street	X	X		X
44	Enhance the streetscape on Bute Street between Robson Street and Cordova Street	X			
45	Enhance the crosswalk on Dunsmuir at Melville (mid-block crossing)	X	X		
46	Create a westbound bike lane and widen the traffic lanes on Dunsmuir Street		X		X
47	Create an eastbound bike lane on Pender Street and provide loading zones		X	X	X
48	Redesign Hastings Street between Burrard To Bute to eliminate the narrow traffic lanes				X

Item	Location	Pedestrian	Cycling	Transit	Road Network
49	Improve conditions for pedestrians on Hastings Street between Main Street and Cambie Streets	X			X
50	Redesign Cordova Street in front of Waterfront Station to enhance the transit hub	X	X	X	X
51	Create a streetcar route on Cordova Street between Bute Street and Columbia Street	X		X	
52	Redesign the intersection of Water/Carrall /Powell /Alexander	X	X	X	X
53	Increase the space for pedestrians and landscaping on Columbia Street between Powell Street and Alexander Street	X	X		X

Descriptions of Conceptual Designs and Spot Improvements

1. Normalize the intersection of Morton Avenue at Beach Avenue

The angled geometry of this intersection creates a long and awkward crosswalk for pedestrians. Pedestrian bulges can be used to "normalize" this intersection, make the crossing narrower for pedestrians and improve conditions for all users.



2. Explore options for Morton Avenue to enhance landscaping

Pedestrian bulges at this intersection would improve this crosswalk and could be used to further beautify the area. Morton Avenue could be made into a one way street. This would allow for some sidewalk widening that could be used for outdoor restaurant seating or for additional landscaping.

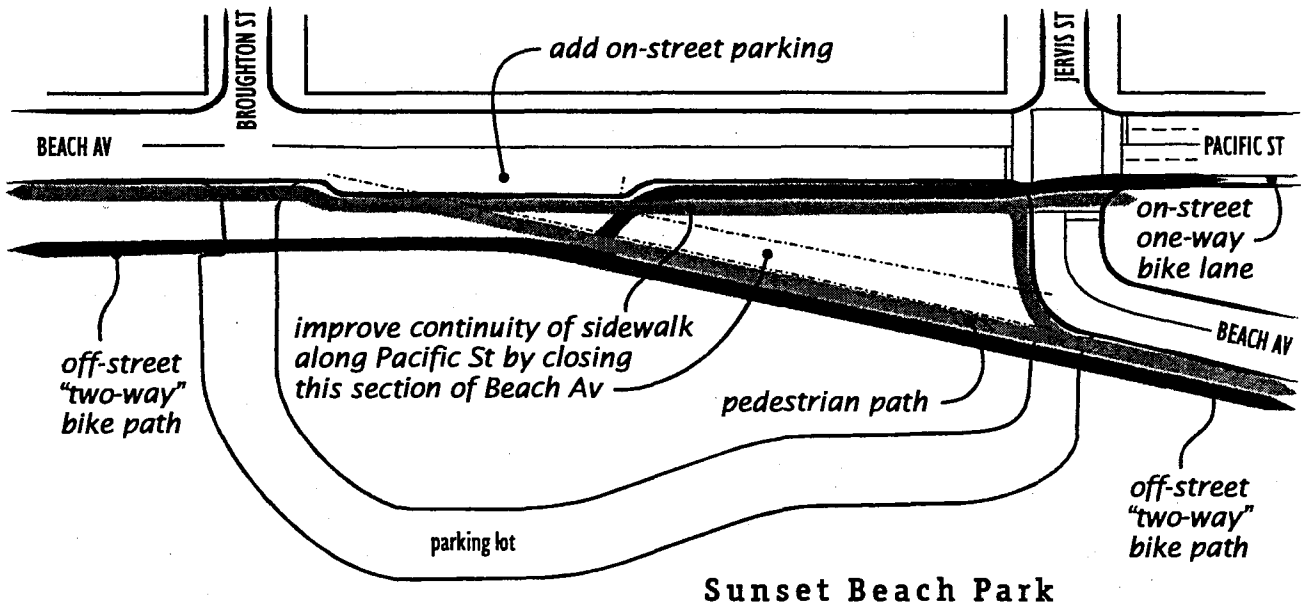
3. Improve pedestrian and cyclist crossing of Beach Avenue at Bidwell Street

This intersection is angled such that it affects visibility. Pedestrian bulges and a cyclist push button would improve conditions for cyclists and pedestrians.

4. Redesign the intersection of Pacific Street and Beach Avenue

The Issue
The pedestrian crossing at Beach and Pacific is uncomfortable due to cars continuing on Beach Avenue where it splits into Beach Avenue and Pacific Street. An eastbound bike route through this intersection would provide a needed connection to the Burrard Bridge.

The Approach
A closure of the one leg of Beach Avenue as shown below would both increase the open space as well as improve pedestrian crossing and bike routing options. Lost curbside parking could be replaced on Pacific as shown.



5. Extend the Beach Avenue Off-Street Bike Route from Bidwell St to Hornby St

The Issue
Beach Avenue is 36' wide between Granville and Jervis with parking on both sides. Bike route connections are needed coming off of Burrard Bridge and linking up with the West End. In addition, better bike access between the Vancouver Aquatic Centre and the English Bay Bikeway would be beneficial.

The Approach
An extension of the off-street Seaside Bikeway is proposed for the south side of Beach Avenue in a 2-way bike configuration terminating at Hornby Street. This would provide the opportunity to link to both the Vancouver Aquatic Centre and the Burrard Bridge as shown below.(See illustration following Spot Improvement #7).

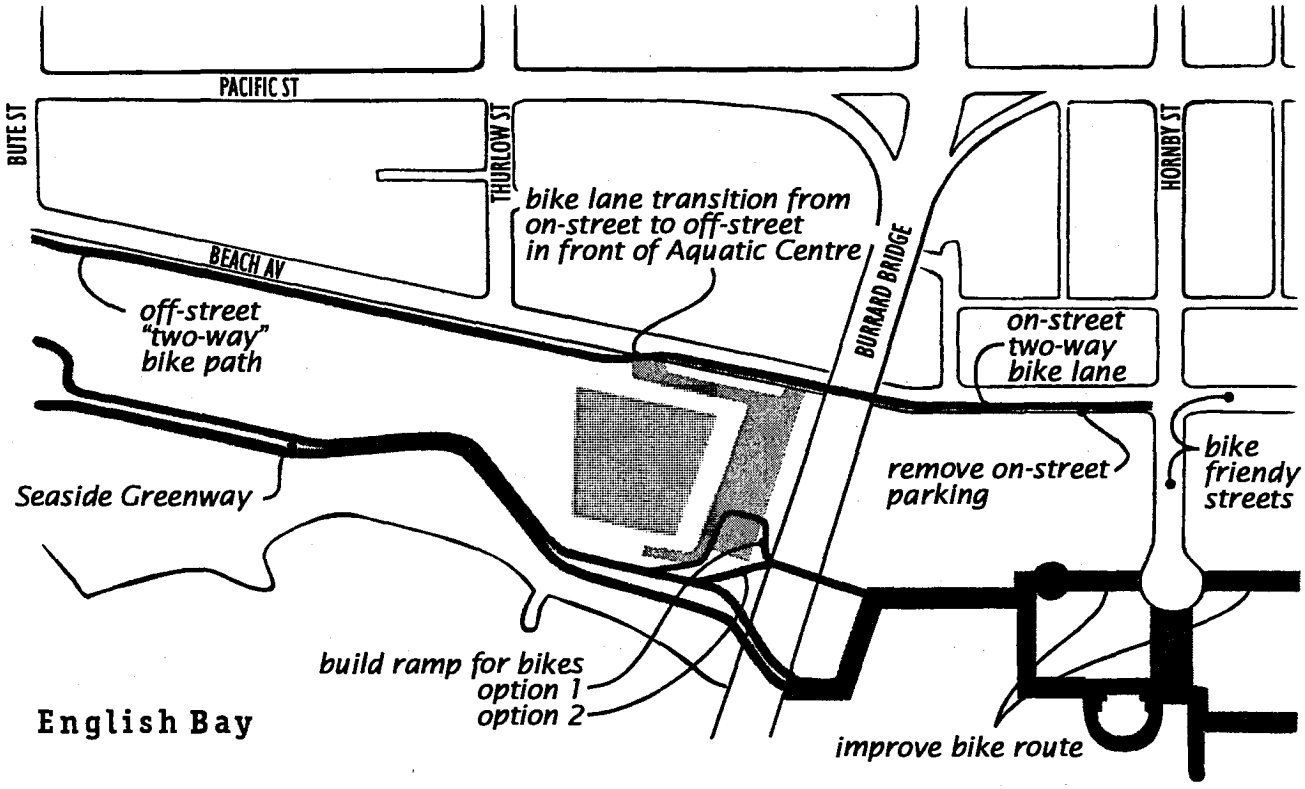
6. Improve the Seaside Route for cyclists under the Burrard Bridge

The Issue
A tight and limited vision corner exists at the Southwest corner of the 1000 Beach property. This busy corner has a downhill slope coming from under the Burrard Bridge. Pedestrian and wheeled-user conflicts are common.

The Approach
An alternative bike and in-line skating route could be designed through the breeze way and up into the Burrard Bridge area, by-passing the tight corner on the waterfront walkway. (See illustration following Spot Improvement #7).

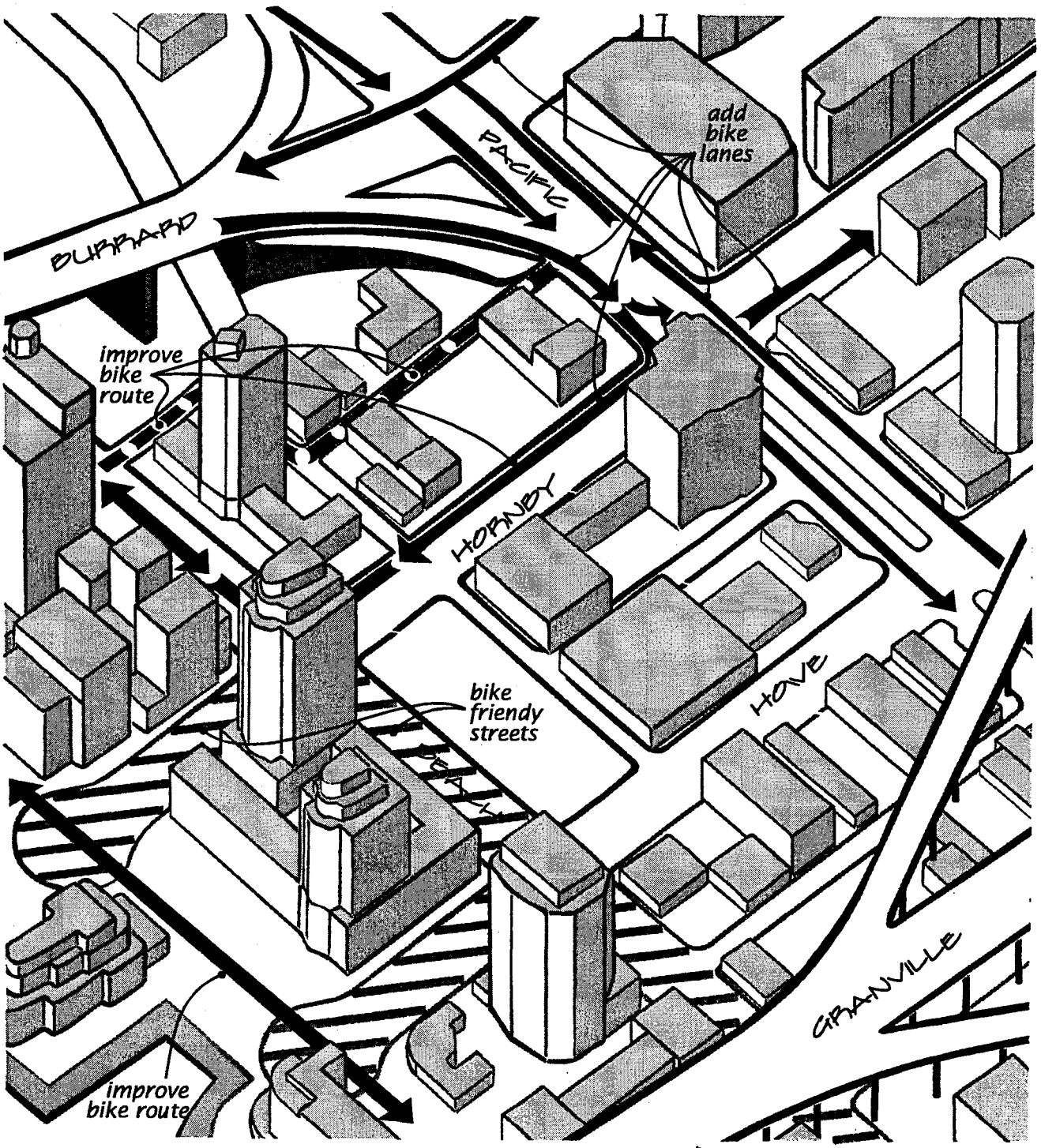
7. Improve the Seaside Route for cyclists at Hornby and Howe Streets

Cycling and in-line skating through these intersections can be awkward due to the curb and bollard design and location. Changes that would improve conditions for cyclists and in-line skaters are recommended and could include diversion or separation of the bike route from other users.



8. Improve Seaside Route connection to Burrard Bridge for cyclists

A direct and comfortable bike route is needed to connect the Burrard Bridge bike facility with the seaside Bikeway. This will be examined as part of the design development of an improved bike facility on the Burrard Bridge.

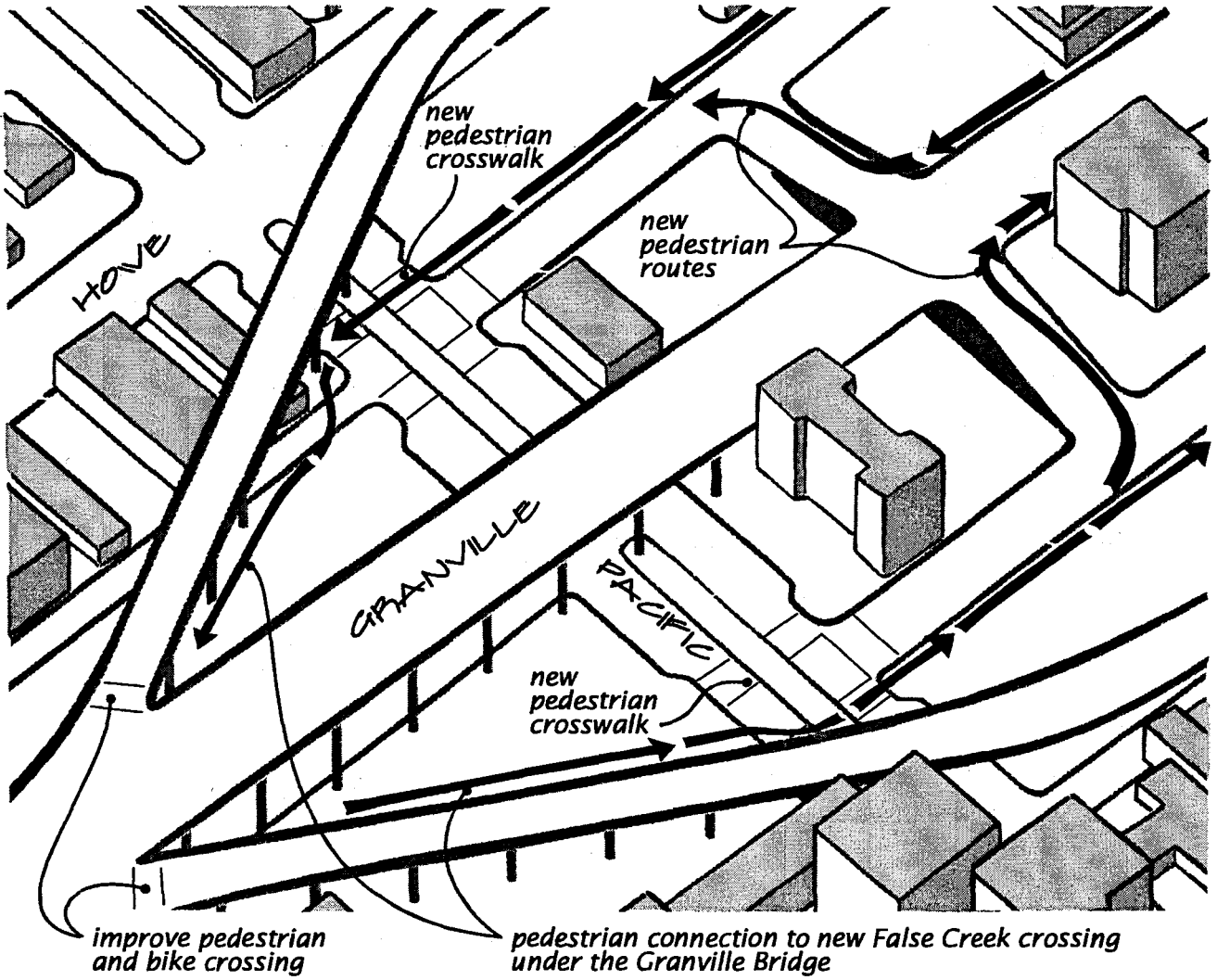


9. Improve the crosswalks on the Granville Bridge at the Seymour and Howe ramps

Pedestrians and cyclists that travel between the Granville Bridge and Granville Street downtown must cross the path of fast moving cars using the Seymour and Howe ramps. Changes that improve the pedestrian crosswalk will be considered as part of the False Creek Pedestrian/Cyclist Crossing Study. A bike facility on the Granville Bridge will also be evaluated as part of that work.

10. Improve the crosswalks on Pacific Street under the Granville Bridge

Crossing Pacific Street under the Granville Bridge is a challenge due to the grade changes and the vision obstruction caused by the bridge columns. This issue should be addressed as part of the re-design of the bridge "loops" (the cloverleaf interchange with Pacific Street). One possible solution is described in item 11 below.



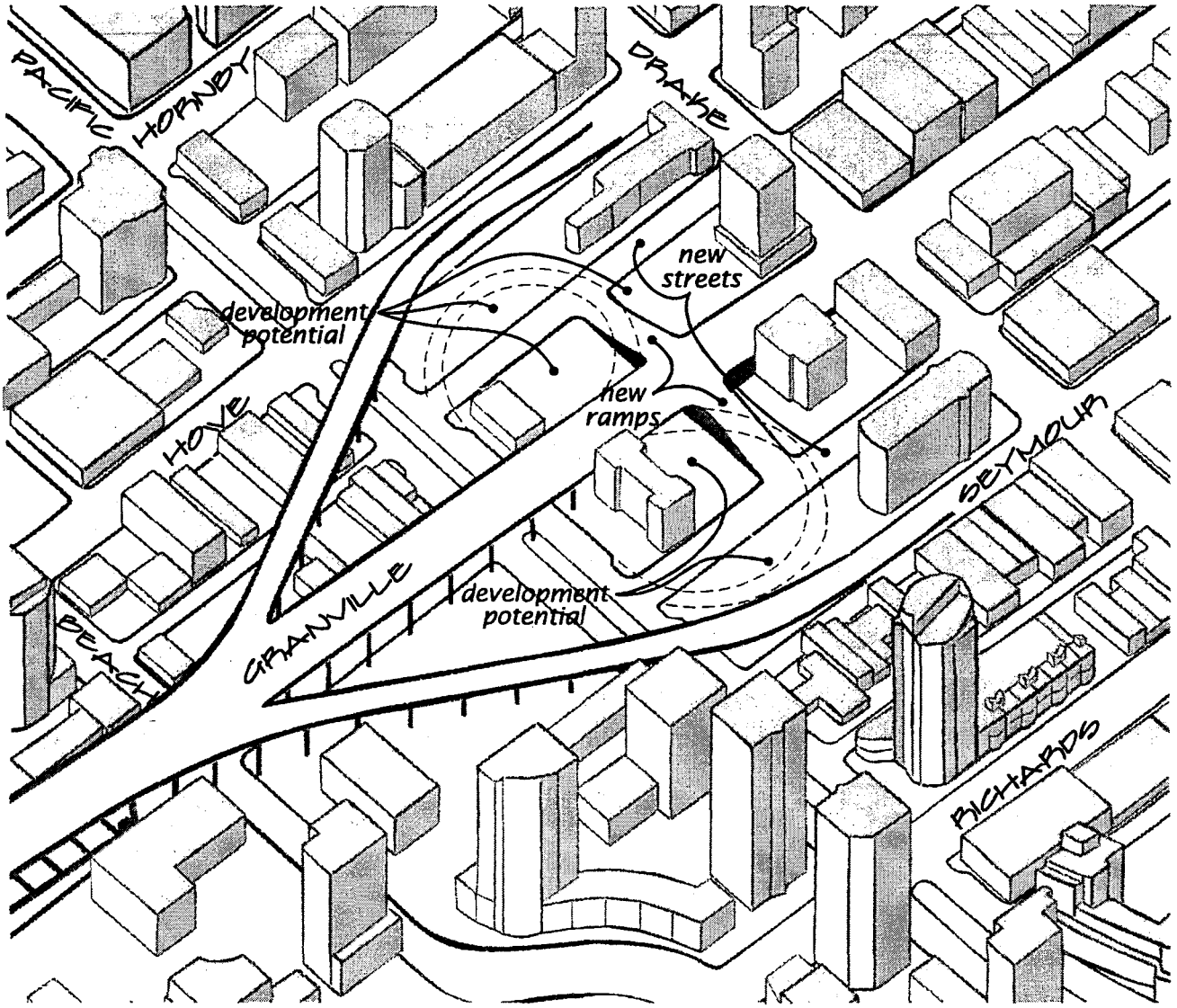
11. Redesign the Granville Bridge Loops

The Issue

False Creek Bridges are a critical link to the downtown peninsula. However, where the bridges connect to land, the ramps can often be problematic for development of the land and for making pedestrian and bike connections. Development adjacent to ramps can often be compromised as well. In regard to the Granville Bridge, access south on Granville Street down to False Creek is difficult for pedestrians, cyclists and even vehicles.

The Approach

A redesign of the Granville Bridge Loops is proposed. This road design could maintain or improve vehicular access to this area. In addition, the development potential of the land parcels would be enhance and could offset the costs of reconstructing the roads. The city's street grid could be extended into the site, providing good access both to and through the parcels in the loops area, for vehicles, pedestrians and cyclists. In addition, the area could be developed into a southern gateway or anchor for Granville Street, acting as a catalyst for further development of the southern end of the street



12. Redesign the intersection of Pacific Street and Burrard Street

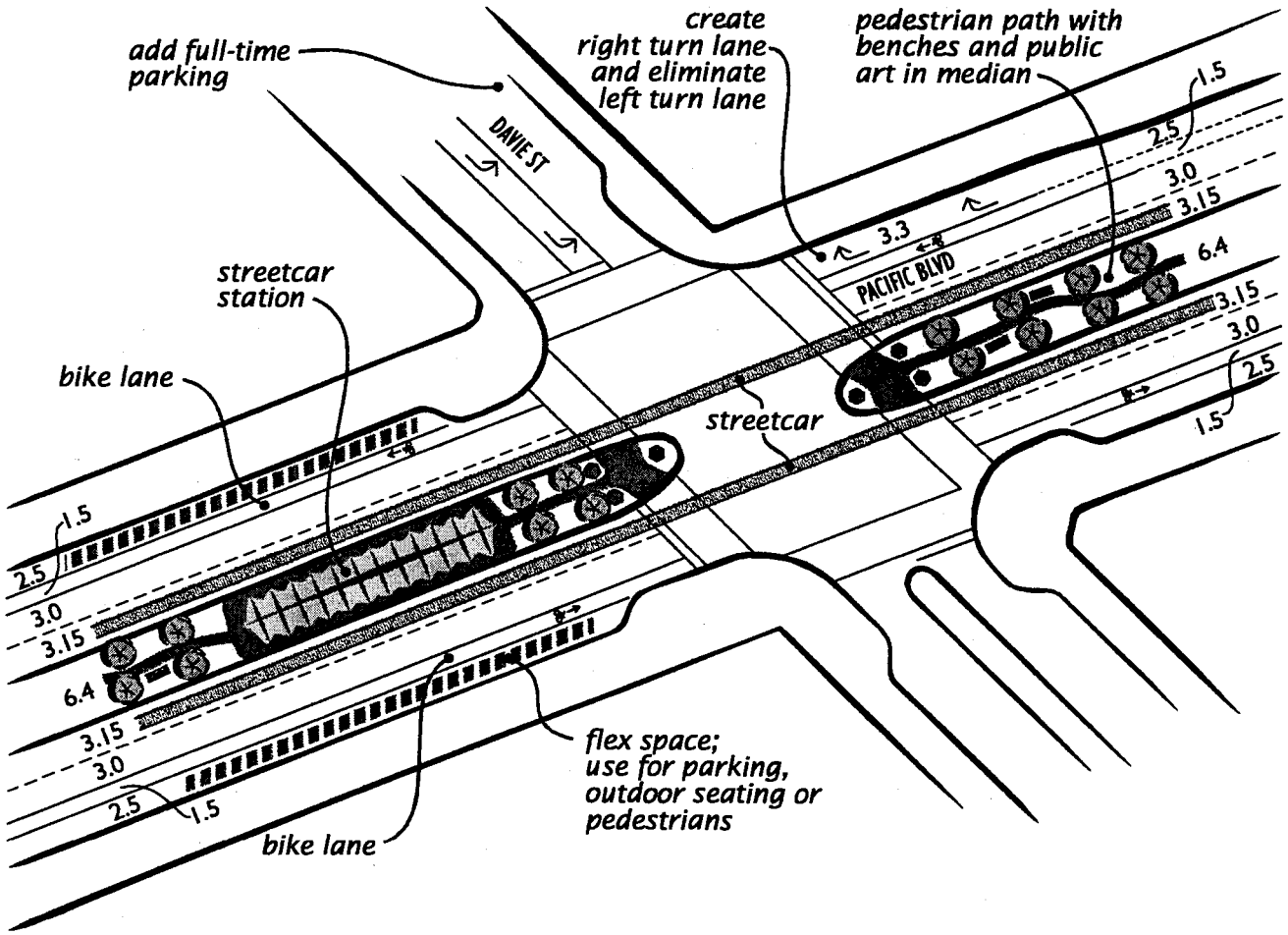
Pedestrian, bike and vehicular conflicts exist at the Burrard and Pacific intersection. These conflicts will be addressed as part of the Burrard Bridge Study and as part of the implementation of bike lanes on Burrard, Pacific, and Hornby Streets. Also required as part of the intersection redesign is the provision of a direct connection to the north end of the Burrard Bridge from the Seaside Bike Route.

13. Widen Pacific Street between Burrard and Hornby Streets

Bike lanes need to be routed off the Burrard Bridge and onto Pacific and Hornby Street. The current width of Pacific in this section is insufficient but a potential redesign of this section will be undertaken as part of the Burrard Bridge study.

14. Redesign the intersection of Pacific Boulevard at Davie Street

This intersection was part of the Pacific Boulevard redesign study and Council has approved a design concept.



15. Redesign the intersection of Pacific Boulevard at Cambie Street

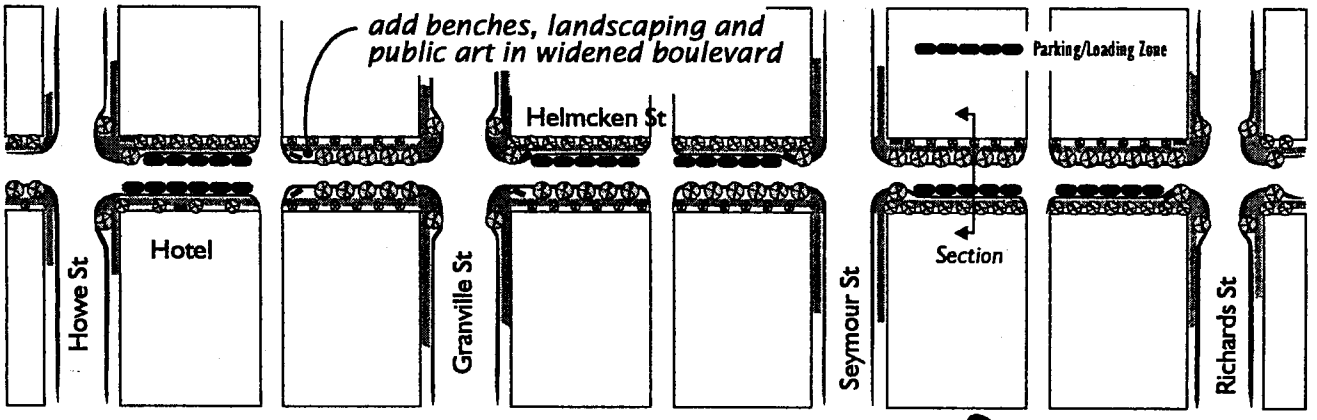
This intersection was part of the Pacific Boulevard redesign study and Council has approved a design concept.

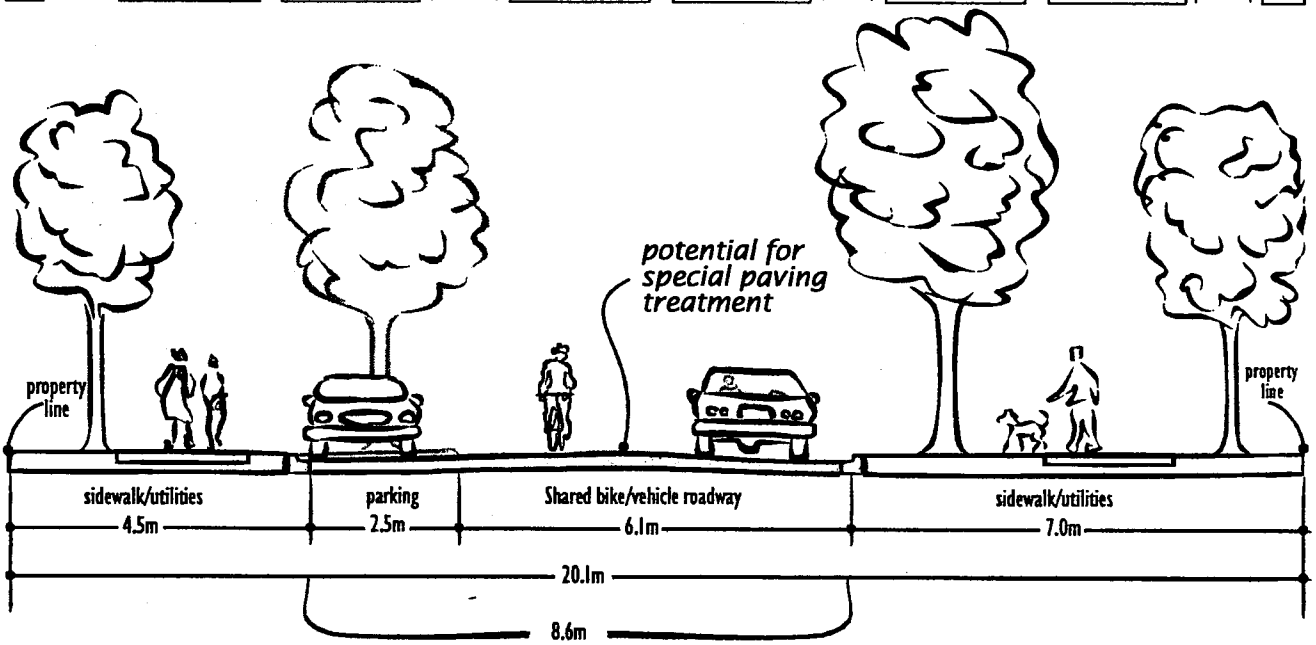
16. Improve pedestrian and cyclist access through Helmcken Park between Mainland and Pacific

Between Mainland and Pacific the Helmcken Greenway passes through a surface parking lot, crosses a lane and passes through Helmcken Park. Along the property lines that separate the lane from the park and parking lot are a series of bollards and chains that define the lane but make if awkward for pedestrians and cyclists to negotiate. Repositioning the bollards and chains in cooperation with the owner of the parking lot could improve conditions for all users.

17. Redesign Helmcken Street as a pedestrian and cyclist friendly greenway

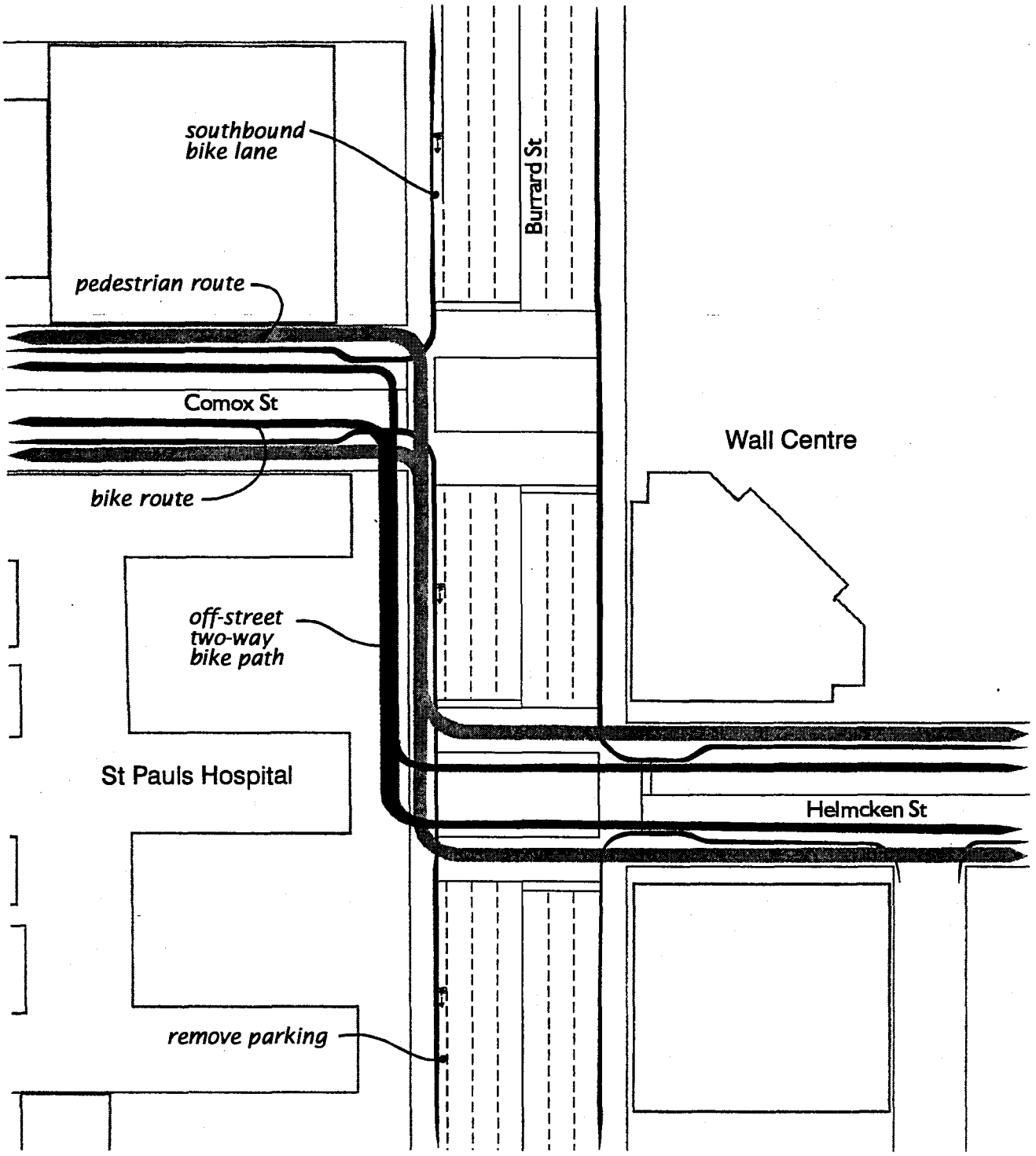
Redesign Helmcken as a highly pedestrianized "woonerf street" along the lines of streets seen on Granville Island. This would include multiple curb bulges, open spaces, traffic calming, landscaping and other pedestrian features. Additional landscaping could be provided if some of the street parking is removed.





18. Create a cyclist connection between Helmcken and Comox across Burrard

This offset intersection poses additional complexities for routing cyclists across Burrard along the proposed bikeway/greenway. A combination of bike lanes and off-street bike facility on Burrard Street in front of the St. Paul's hospital could provide a way to facilitate this movement.



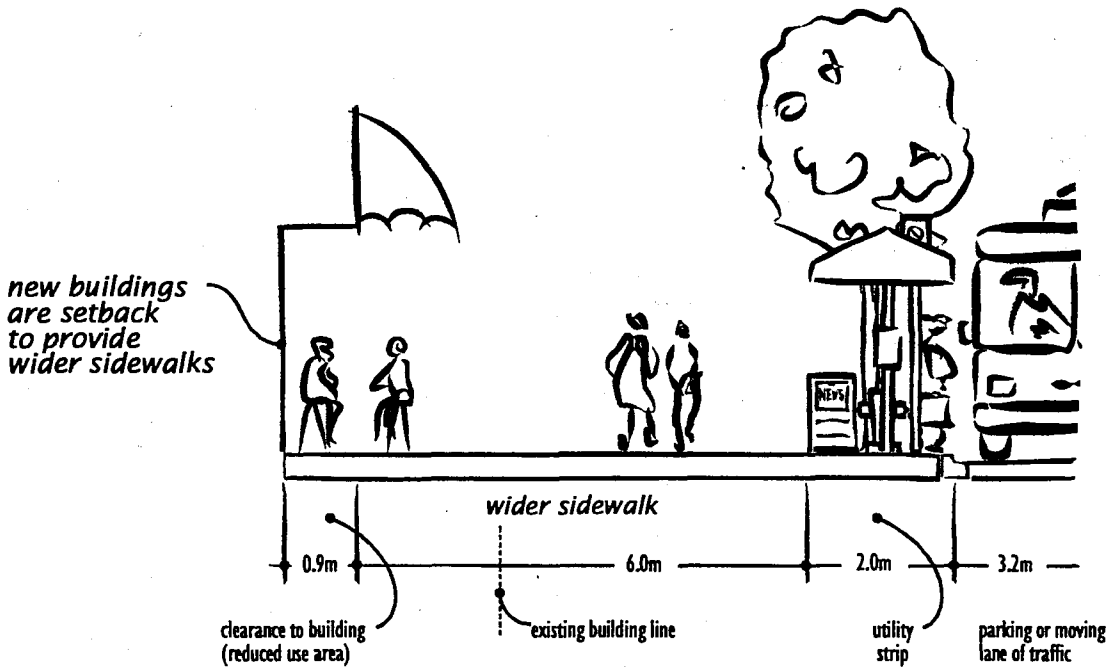
19. Enhance the crosswalk on Comox Street across Thurlow Street

Crossing Thurlow Street at Comox can be difficult for some at this un-signalized intersection. The pedestrian crossing could be enhanced with a traffic signal and corner bulges.

20. Widen sidewalks on Davie Street using building setbacks

Davie Street is a neighbourhood centre for the West End and Downtown South, attracting significant vehicular, transit, and pedestrian volumes. The sidewalks must accommodate pedestrians and sidewalk activities that make the street interesting like flower displays and outdoor seating for restaurants. Pedestrian volumes are projected to increase significantly as the population in Downtown South increases.

To accommodate the demand for sidewalk space, new buildings on Davie Street between Burrard and Jervis could be setback 7 feet similar to Robson Street or Davie Street in Downtown South.



21. Improve the streetscape and pedestrian environment on Thurlow Street

The Issue

Thurlow Street is primarily a residential street, but lacks street trees and boulevards that are typical elsewhere in the West End. Pedestrian access across Thurlow could also benefit from some streetscape improvements. Access to St. Paul's Hospital needs to be considered with any redevelopment proposals.

The Approach

A process that involves both the hospital and the surrounding residents could be undertaken to redesign the streetscape in order to determine a preferred solution on Thurlow Street. At the very least, an opportunity exists with the current one-way configuration to create curb bulges that would improve pedestrian crossings of Thurlow Street. In addition approximately 2' of boulevard space can be added in each curb lane providing the opportunity for street tree planting along the majority of the street.

22. Create a southbound bike lane on Burrard Street

The Issue
With significant bus traffic on Burrard Street, TransLink has requested some additional bus priority measures to avoid general congestion. In addition, cyclists need a route from Downtown to the Burrard Bridge.

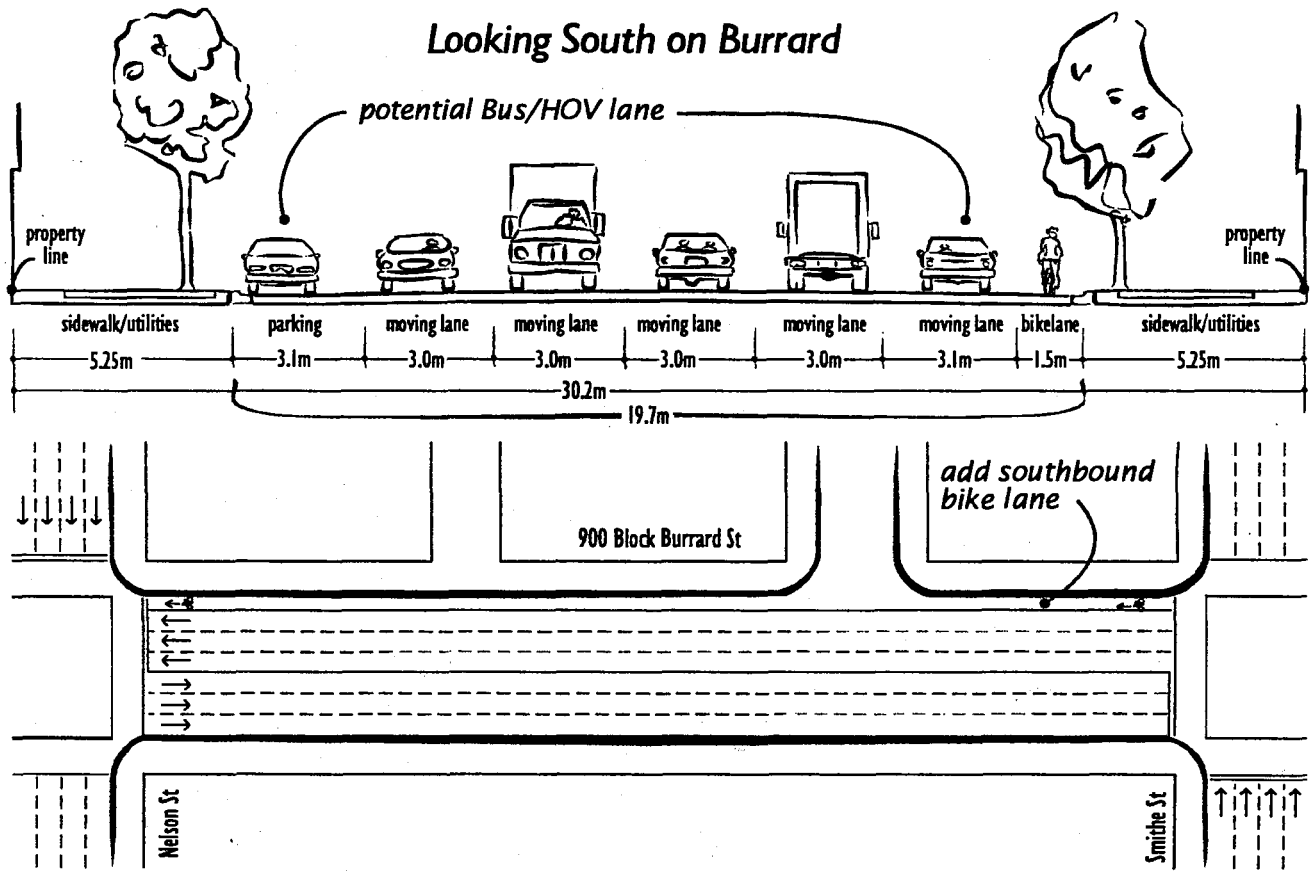
The Approach
A southbound bike lane could be provided on Burrard Street by narrowing the six existing lanes to standard widths without losing any vehicular capacity. In the northern section, a bus lane and/or loading zone with some parking could be designed in the curb lane with a bike lane between it and the travel lane.

In the south, by removing part-time parking on the west side of the street, a bike lane could be designated adjacent to the curb. This would also provide three southbound general traffic lanes at all times of the day.

23. Remove parking on Burrard between Nelson and Robson in the PM peak hour

The northbound curb lane is currently a parking lane with restricted hours. No stopping is enforced in the morning and afternoon peak traffic periods. However the two blocks between Nelson and Robson permit parking during the 3 to 6 PM rush hours. This creates some congestion during this period.

TransLink has requested some additional bus priority measures to avoid general congestion on Burrard Street. The DTP would remove parking on these blocks during the afternoon rush hours to create a bus lane, HOV lane, or general traffic lane to reduce delays for transit passengers and motorists.



24. Enhance the crosswalk on Smithe Street at Haro Street

At the location where Smithe Street becomes Haro Street (mid block between Burrard St and Thurlow St), the north sidewalk can be confusing and awkward for people walking along the street.

This could be corrected by normalizing the intersection. This would improve conditions for all users.

25. Remove parking westbound on Davie Street between Burrard and Hornby

This would improve vehicular circulation and transit travel times.

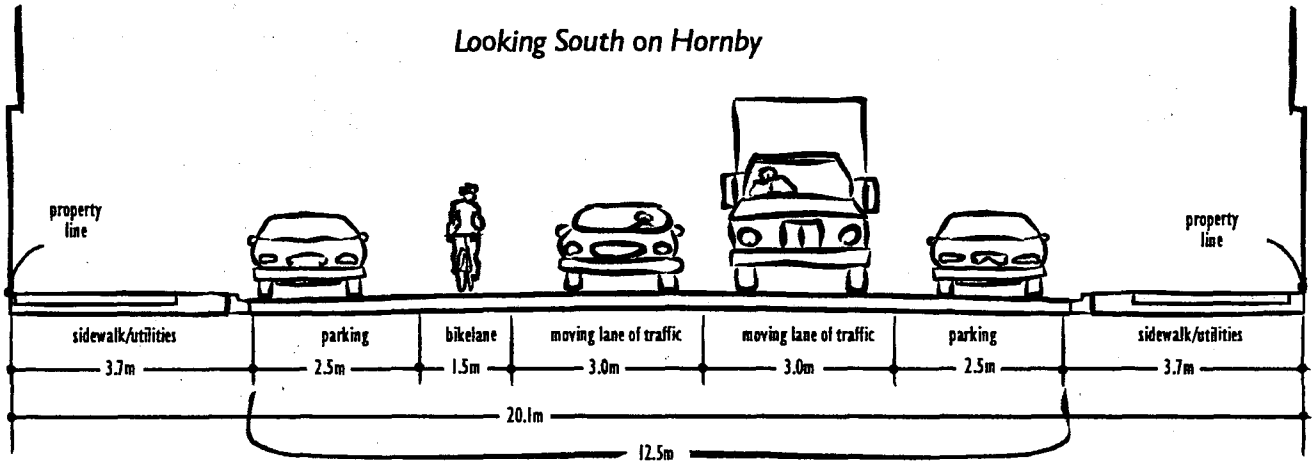
26. Create a bike lane on Hornby Street from Pacific to Hastings Street

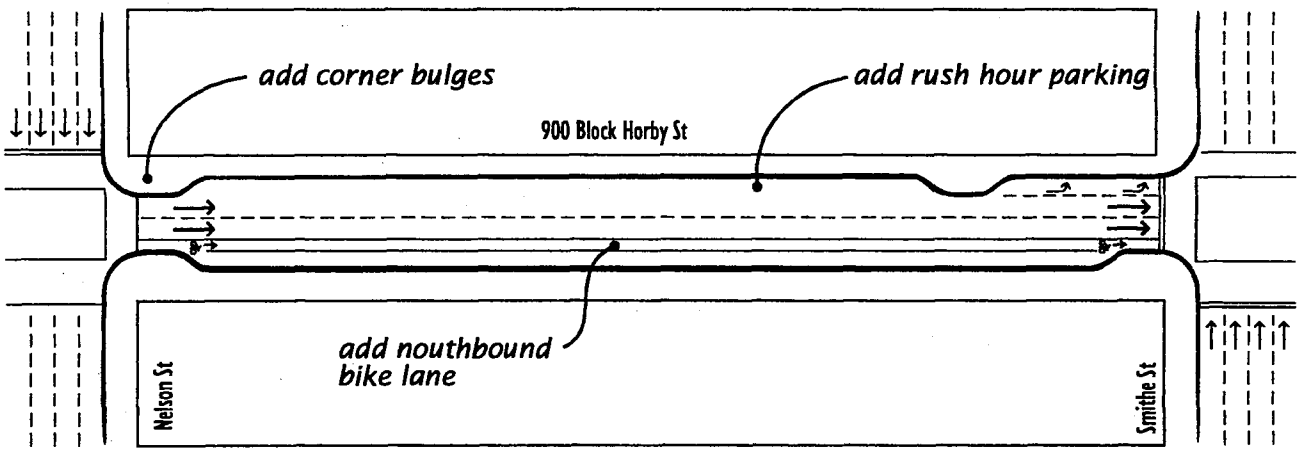
The Issue

Hornby Street provides an opportunity for a one-way bike lane feeding off of Burrard Bridge into downtown. This would combine with a Burrard bike lane to provide both north and south access to and from Burrard Bridge.

The Approach

A northbound bike lane would be provided on Hornby adjacent to the eastern curb lane. This would be accomplished by narrowing the existing lanes to standard lane widths on Hornby resulting in no loss of vehicular capacity. Parking in the existing east curb lane would become full time.





27. Adjust the intersection of Hornby Street at Hastings to accommodate a cyclist left turn

Northbound cyclists on Hornby Street must make a left turn on Hastings Street to continue north on Burrard Street. Special provisions may be required at the Hornby/Hastings intersection as the demand for cyclist left turns increase.

28. Change the parking access ramps on Howe Street between Georgia and Smithe

A series of underground parking access ramps compromise the pedestrian situation along this stretch of Howe Street. A redesign of the pedestrian environment should be undertaken with particular emphasis on pedestrian /vehicular ramp conflicts. Preferred designs of underground ramps exist on Hornby Street between Nelson and Robson and could be used as prototypes for a Howe Street redesign.

29. Widen sidewalks on Granville Street between the Bridge and Nelson Street

The Issue

The south end of Granville Street has a six-lane cross-section with narrow lane widths. Consequently, vehicular movements are compromised, especially if a bus or truck is using the street. Sidewalks are also narrow for this area, which has seen increased night-time pedestrian activity and will see more pedestrians as the population of Downtown South increases. The streetscape in general is in need of refurbishing.

The Approach

Changing the six-lane cross-section to a five-lane cross-section would provide standard lane widths as well as left turn bays and a median down the centre of the street. This would provide opportunities for greening of the street with additional street trees. With five traffic lanes, there is some space available for wider sidewalks. This would help strengthen the link between the Granville Mall and the proposed Granville Loops redevelopment. Also a redesigned Granville Street should consider curb extension and textured crosswalks, especially at Davie Street, to improve pedestrian safety (Safety Study for the Downtown Transportation Plan, Hamilton and Associates, 2001).

30. Prohibit general traffic northbound on Granville Street between Nelson and Smithe

Currently all northbound traffic on Granville Street (except transit and authorized vehicles) are required to turn left across a busy crosswalk at Smithe Street where the Mall begins. This results in long queue of vehicles, delays, and unusually high collision rates for buses, cars and pedestrians.

The plan recommends restricting northbound traffic on this block to transit and authorized vehicles only. This would require all other northbound general traffic to turn right at Nelson. This would improve safety for all users and provide a northbound stopping lane on Granville for loading, taxis, and police vehicles (in front of the community police office).

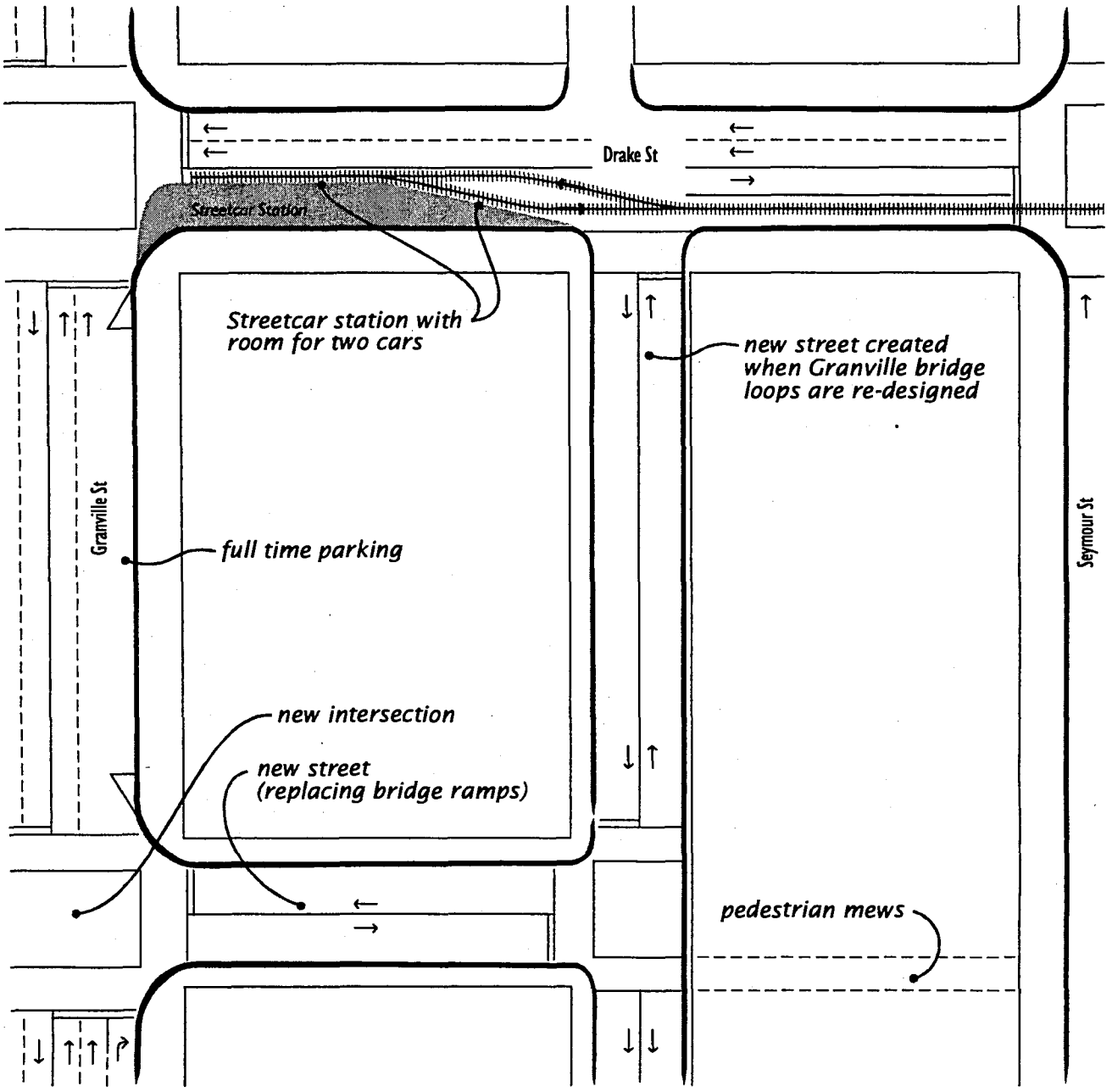
31. Route the Pacific Boulevard Streetcar line along Drake Street to Granville

The Issue

A streetcar extension is proposed from the Roundhouse along Pacific Boulevard and up Drake Street terminating at Granville Street. This would provide good connections to Granville transit and an opportunity to terminate the line on a low volume street.

The Approach

The streetcar could run in the regular traffic lanes, or alternatively, the streetcar could run along the south curb lane of Drake Street. A terminus for the streetcar could be located just east of Granville Street. This would require changing Drake Street to one-way westbound between Seymour and Granville Street. Good traffic circulation could be maintained by a redesign of Granville Loops (see item 11).

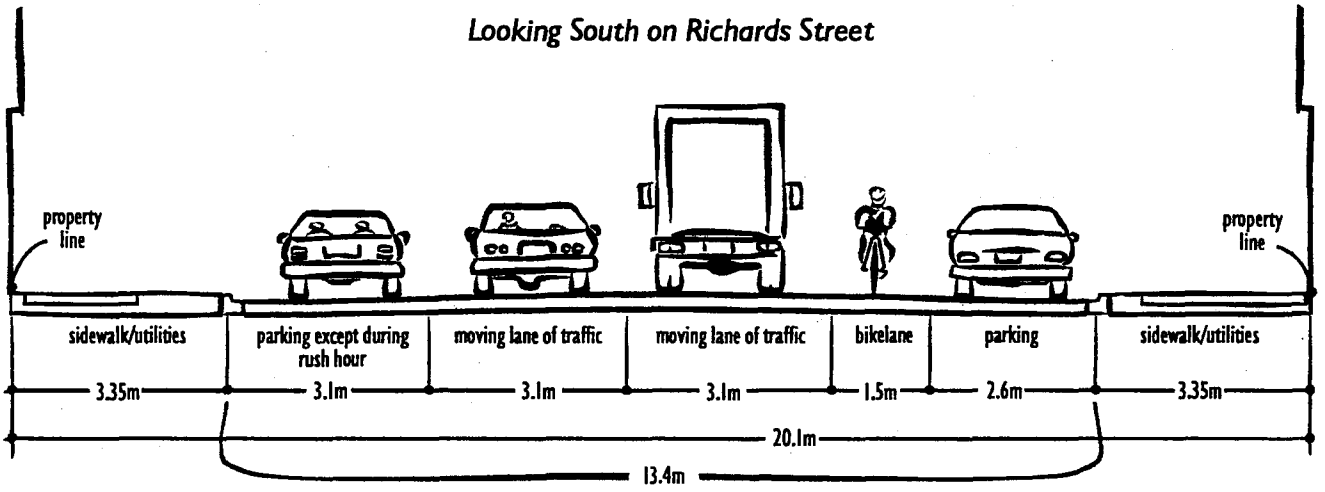


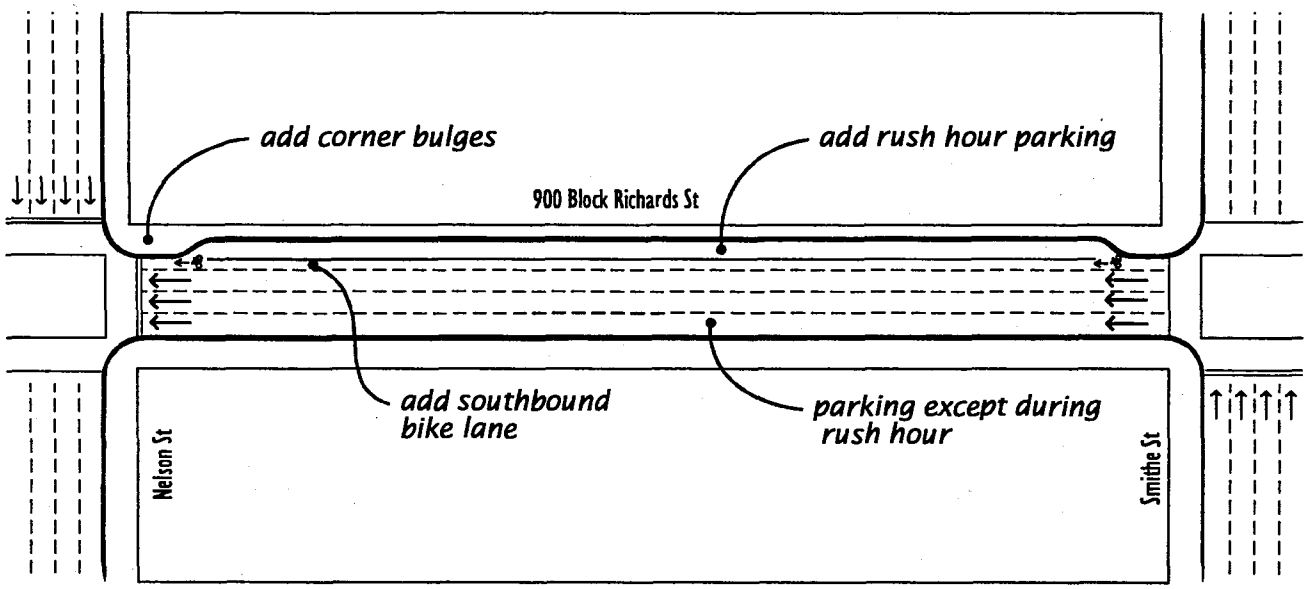
32. Create a southbound bike lane on Richards Street

The Issue
Richards Street is proposed to remain one-way, however, it is a residential area for a significant length of the street and a southbound bike lane is proposed to help provide access to the Granville Bridge.

The Approach
Part-time parking can be converted to full-time parking on the west side of Richards, while still providing adequate flow in the remaining lanes. A bike lane could be provided next to the parking on the west side of the street. With full-time parking corner bulges could also be added at most corners. On some blocks the extra road width could be converted to pedestrian space while still maintaining the bike lane and standard width vehicle lanes.

In the north, Richards between Pender and Cordova Street could be designed to provide two-way access for buses and bikes





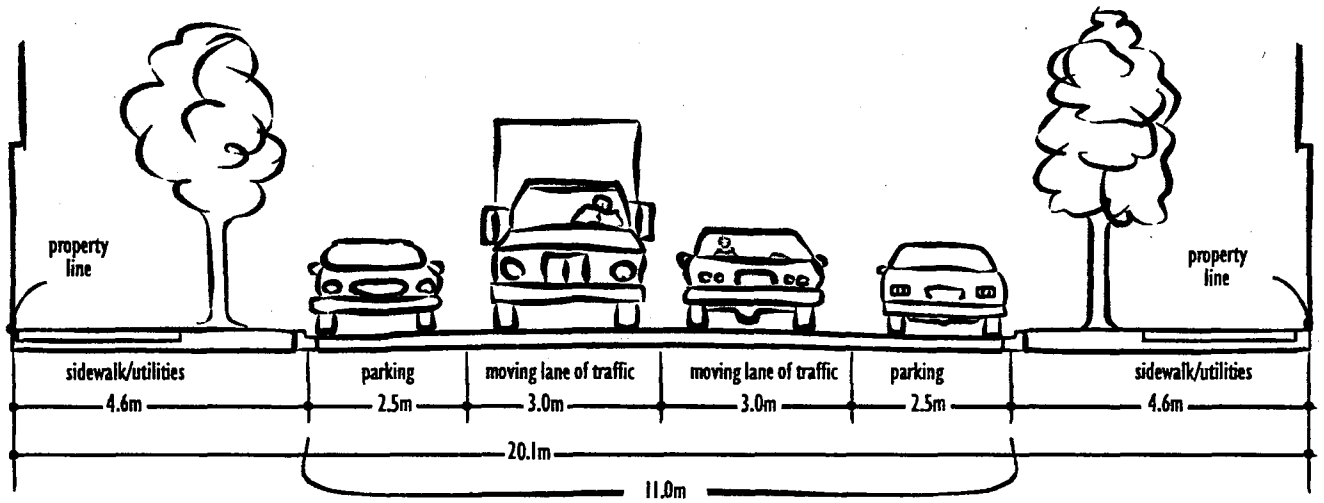
33. Convert Homer Street to a two-way street

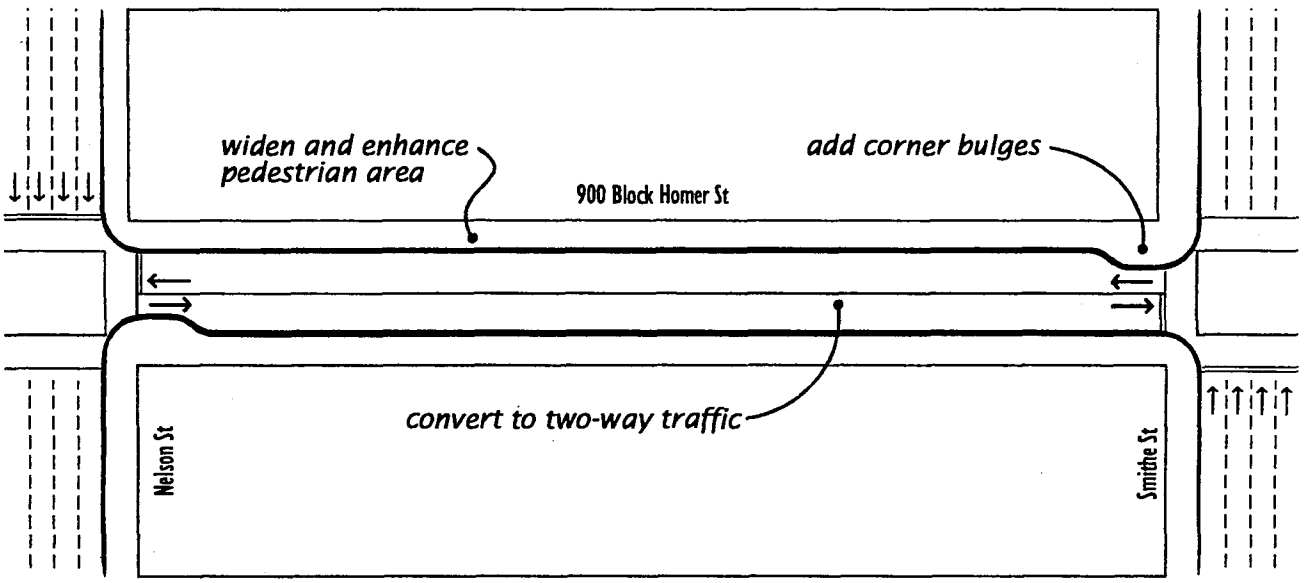
The Issue

Downtown Vancouver is currently served with a number of one-way couplets. However a number of one-way streets are not bridge access streets and are not required to be one-way for vehicular flows. Homer Street is one of these streets. Two-way access would reduce circulation required to access properties. Homer Street is identified as a pedestrian arterial.

The Approach

Homer Street could be made two-way with permanent parking on both sides of the streets in most locations. This, in combination with pedestrian bulges at some corners, would help to calm traffic. Widened sidewalks from Georgia Street to Pacific Boulevard would enhance the pedestrian zone.





34. Create a direct pedestrian connection between Hamilton Street end and the intersection of Hamilton between Nelson and Smithe

Hamilton Street is discontinuous at Smithe Street. To improve pedestrian circulation and enhance personal safety in this area a pedestrian connection should be incorporated in the future development to provide a pedestrian connection between the Hamilton dead end and the intersection of Hamilton Street and Smithe Street.

35. Create a northbound bus lane on Cambie Street from Nelson to Smithe

Vehicle access through the intersection of Nelson and Cambie Streets is difficult for motorists travelling northbound on Cambie Street. Cambie Street is proposed to be two-way with bus service on it. The section between Smithe and Nelson is limited by a parking ramp on the west side of Cambie Street.

In the short term, a one-way bus only access could be provided northbound on Cambie Street. In the long term, a redesign could incorporate vehicular access northbound when redevelopment of the adjoining property provides an opportunity to remove the ramp.

36. Integrate the Northeast False Creek development into the downtown by extending the street grid into the site

Extending the street grid pattern around BC Place stadium into Northeast False Creek will help to integrate the site into the rest of the downtown. This includes creating a pedestrian connection from the intersection of Beatty and Georgia down to False Creek, extending Smithe Street east to False Creek, and extending Griffiths Way to False Creek and aligning it with Georgia Street.

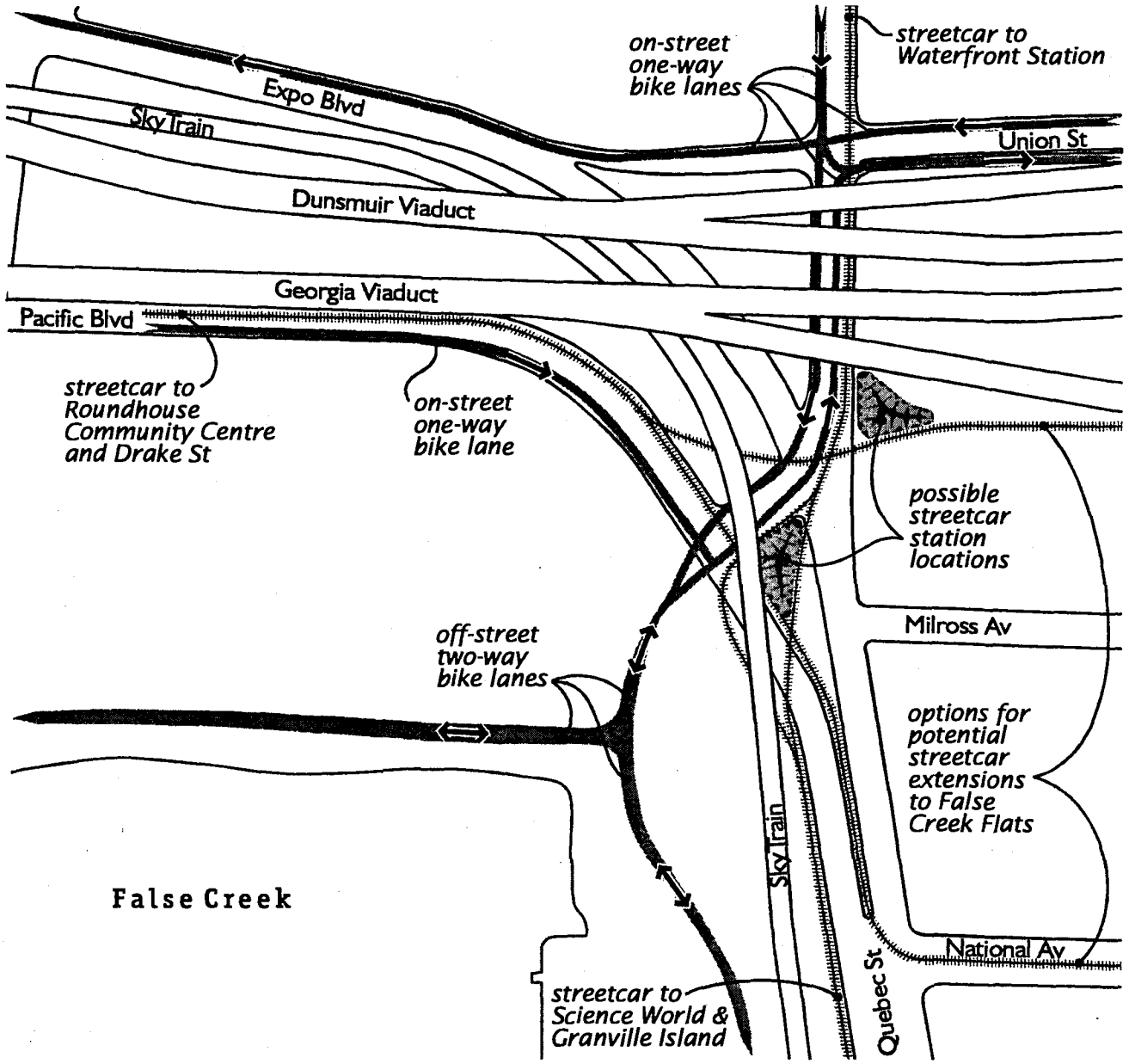
37. Improve pedestrian and cyclist continuity through the Plaza of Nations

A waterfront building at the Plaza of Nations disrupts the continuity of the Seaside recreational route. Better continuity is recommended when opportunities arise.

38. Modify the intersection of Pacific and Quebec to better accommodate the streetcar and cyclists

The Issue
The Pacific and Quebec corner will become a junction between 2 streetcar lines. It also needs to provide bike lanes through the intersection. The aesthetics of the area need improving through a detailed design study.

The Approach
Two possible locations for a streetcar station junction are shown below, with links both to Gastown and Pacific Boulevard to the north and False Creek Flats and Southeast False Creek to the south. Bike lanes could also be incorporated to connect existing and proposed bike routes. Further design work in the area and under the viaducts could be part of future redevelopment proposals. In addition, northbound cyclists require a more visible signal indication of when to cross Pacific Boulevard.



39. Facilitate cyclist connection through the Science World area

A number of major bike routes converge near Science World (Ontario, Adanac, Seaside, Pacific Blvd, BC Parkway). The existing on-road connection is along Quebec Street and is considered to be a difficult cycling environment. Most cyclists use alternatives such as the Science World parking lot and the plaza in front of Science World, resulting in conflicts between cyclists, pedestrians and parking activities.

Changes in this area could help to define the bike routes and reduce conflicts between cyclists, pedestrians, and motorists.

40. Improve cyclist access through the intersection of Prior Street and Gore Avenue

Cyclists using the proposed bike lane on the Georgia Viaduct will need to negotiate this intersection to continue east. This demand should be addressed as part of the design of the intersection when Gore is extended south of Prior Street.

41. Improve crossing conditions for cyclists crossing Gore Avenue at Union Street

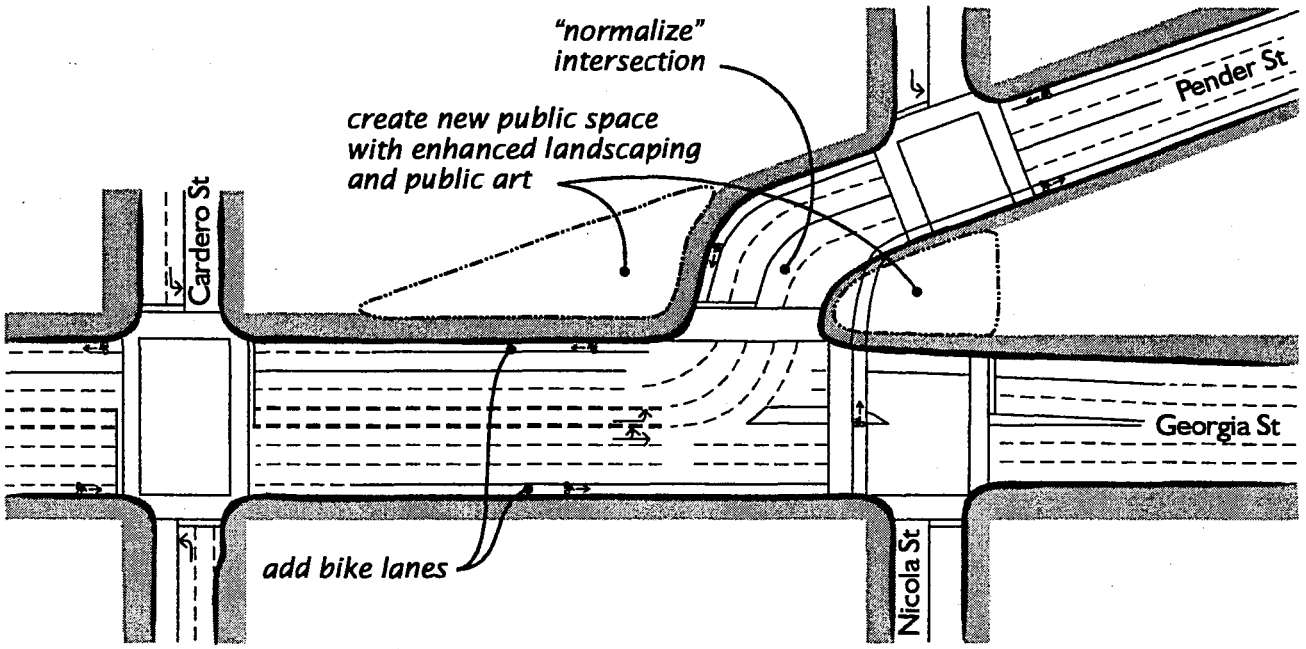
42. Normalize the intersection of Georgia and Pender Streets

The Issue

The intersection at Georgia and Pender has one of the longest pedestrian crossings in the City. Cyclists require a safe connection between the bike lanes on Georgia Street and the bike lanes on Pender Street.

The Approach

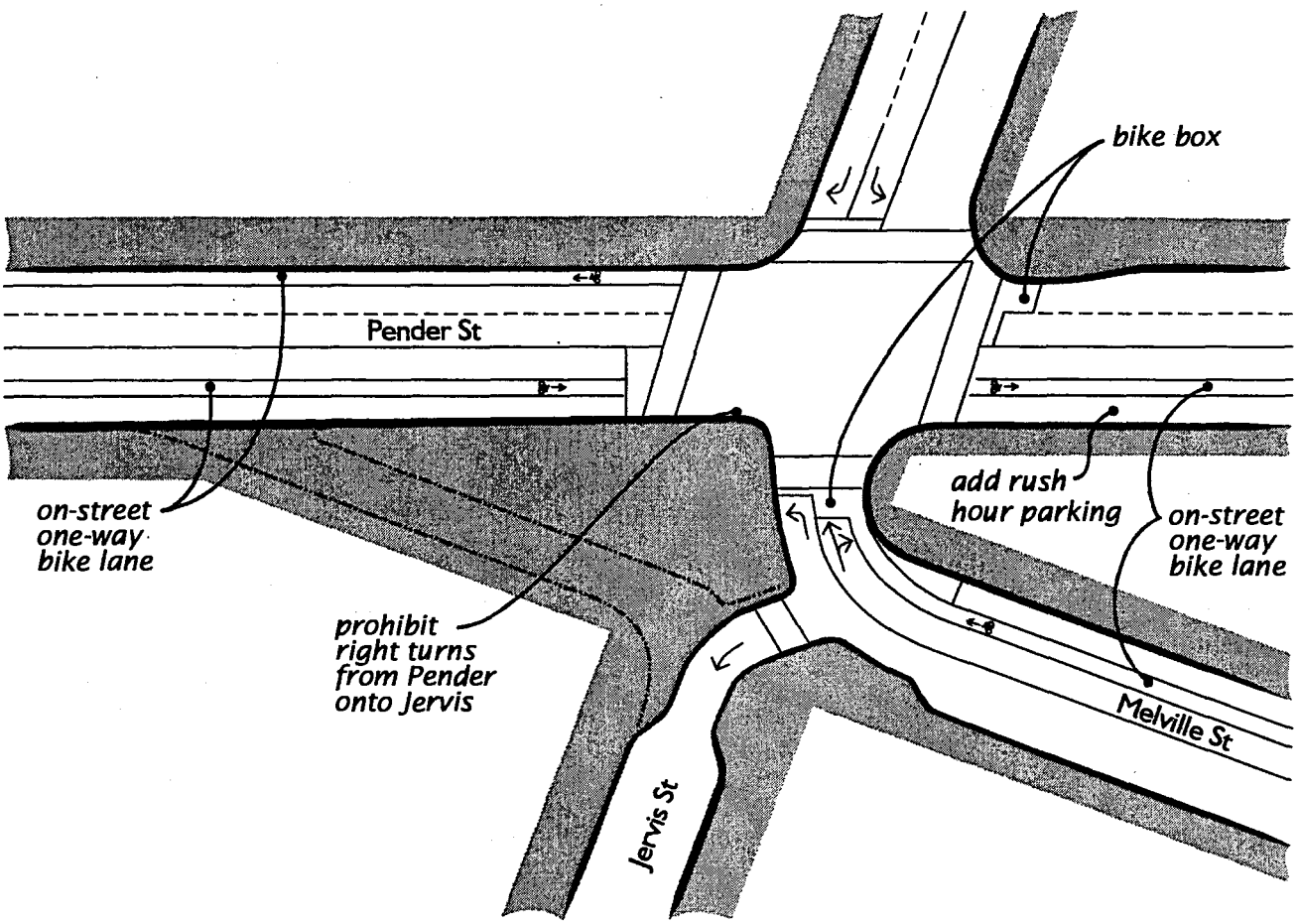
A significant public parkette that both increases green space and improves pedestrian connections could be created. Bike lanes will be incorporated into a redesigned intersection.



43. Prohibit southbound access onto Jervis Street from Pender Street

The Issue
The intersection at Jervis and Melville is confusing for drivers and difficult for pedestrians to negotiate. The Triangle West area is also a densely populated residential area and has limited park and open space.

The Approach
An expanded a parkette at the intersection could be created as well as provide for better pedestrian connections and vehicular movements. A bike lane can also be designed through the intersection to connect the westbound bike lane on Melville to the westbound bike lane on Pender Street.



44. Enhance the streetscape on Bute Street between Robson and Cordova Street

Bute Street in this section leads down to a major new Waterfront Park but a variety of sidewalk and street tree conditions compromise the quality. A redesign should be undertaken with the surrounding community in order to improve the pedestrian environment along this gateway street leading to the Waterfront Park. Boulevard strips and street trees exist in some blocks and the street should be redesigned to have boulevard and street trees from Robson all the way to the park if possible.

45. Enhance the crosswalk on Dunsmuir at Melville (mid-block crossing)

With a major bus transit service and the Bentall Centre on one side of the street and a SkyTrain station on the other side, the pedestrian crossing demand is high mid-block on Dunsmuir between Thurlow and Burrard Streets. The existing mid-block crossing on Melville Street is not particularly well marked. This crossing should be better marked and made more visible.

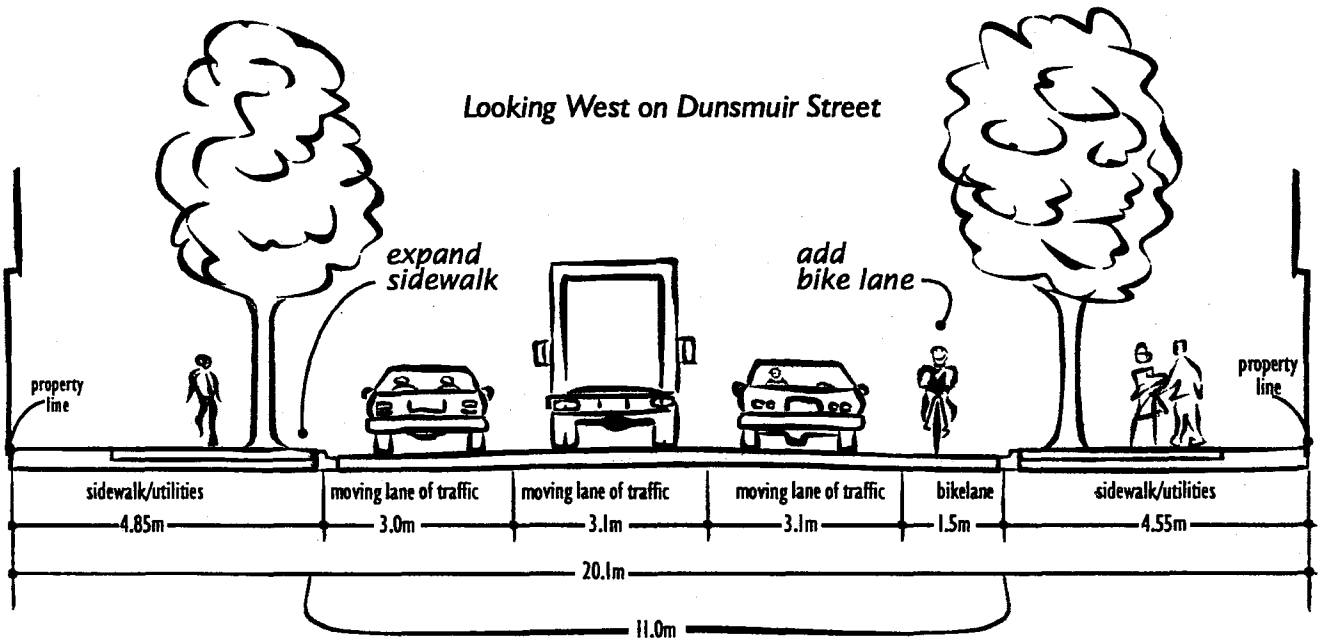
46. Create a westbound bike lane and improve the traffic lanes on Dunsmuir

The Issue

Currently Dunsmuir is a street that has a variety of curb-to-curb widths as well as lane widths. This increases confusion for both automobile and truck drivers. It also has a variety of sidewalk widths. A westbound bike lane could work with an eastbound Pender bike lane to provide better bike access in the area.

The Approach

A more standardized treatment of Dunsmuir Street would benefit the street as shown below. Lane widths have been made as constant as possible with the extra space used to widen the sidewalks and create a westbound bike lane on the north side of the street



47. Create an eastbound bike lane on Pender Street and provide loading zones

The Issue

The current design of Pender Street between Cambie and Hornby is confusing for both vehicle drivers and bike riders. In addition, Hotels on the north side of Pender could use on-street loading zones. Pender is also an important bus route and Translink would like to improve bus operations.

The Approach

A public process needs to be undertaken to look at both the preferred one-way and two-way options for Pender Street.

48. Redesign Hastings Street between Burrard To Bute to eliminate the narrow traffic lanes

This section of Hastings Street has traffic lane widths that are to narrow. A redesign of the street should be undertaken to make it more functional while balancing all other users.

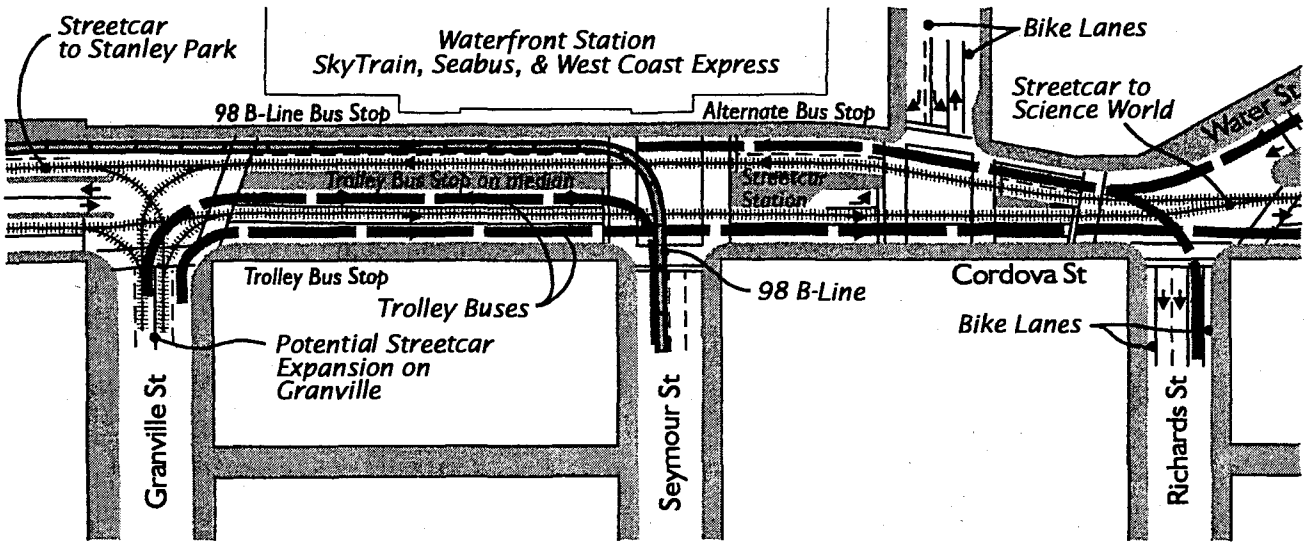
49. Improve conditions for pedestrians on Hastings Street between Main and Cambie Streets

This section of Hastings Street has a high incidence of pedestrian collisions. Measures should be taken to reduce the frequency of collisions and these may include additional lighting, curb extensions, and textured crosswalks to improve pedestrian safety and visibility. (Safety Study for the DTP, Hamilton and Associates, 2001)

50. Redesign Cordova Street in front of Waterfront Station to enhance the Transit Hub

With West Coast Express, SkyTrain, SeaBus, helicopters, and seaplanes, Waterfront station is the pre-eminent multi-modal transfer station. Currently the curb space available and the one-way street system limit bus access to the station.

One option would be to create a northbound bus lane on Richards Street. This would improve bus access to the station. In addition a "bus station", built as an island median in the middle of Cordova Street, would provide additional curb space for bus stops. The additional bus zones would allow for the West End bus route and the Oak and Cambie bus routes to terminate at the enhanced Waterfront station. The sidewalks on Cordova east of Granville Street are narrow. Changes to Cordova Street should seek to improve the conditions for pedestrians.



51. Create a streetcar route on Cordova Street between Bute and Columbia

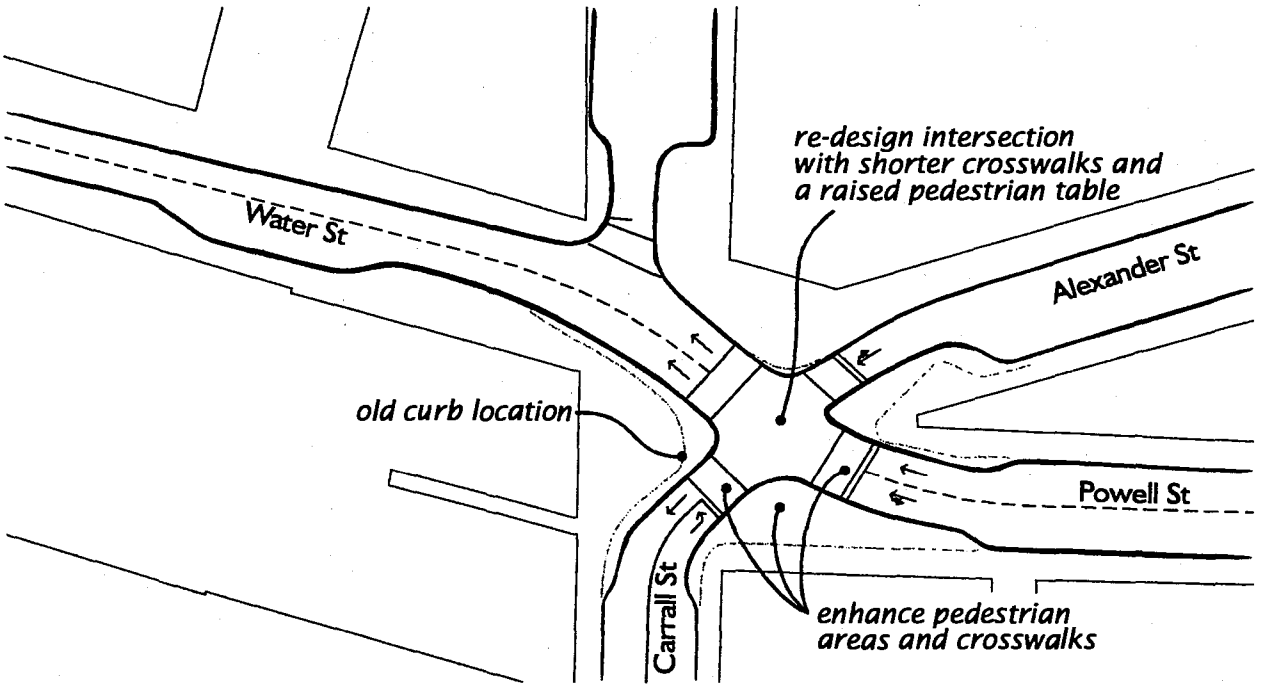
The Issue
The Downtown Streetcar will follow Cordova Street. Gastown business interests have raised the possibility of a two-way Cordova Street, which would necessitate running the streetcar in traffic. However, a two-way Cordova Street would require removal of parking at intersections as well as additional parking limitations during rush periods. Running a streetcar in traffic negates the effectiveness of a streetcar if it's in a congested area for a significant distance. Left turn bays would also be limited by a streetcar operation to prevent vehicular conflicts at intersections.

The Approach
Cordova Street should remain one-way with a single segregated streetcar line in the north curb lane. This would provide full time parking on the south side of the street and an opportunity for a streetcar station with direct access to Blood Alley.

52. Redesign the intersection of Water/Carrall /Powell /Alexander

The Issue
This is a complex intersection with some uncomfortable pedestrian crossings. In addition, a bike facility is required on Carrall across Water Street. The Gastown paving starts near Carrall Street but the historic area extends almost to Main Street. The street-ends north of Water Street vary in design quality, with the Carrall Street end being the best design. Businesses and residents complain about the speed of traffic on Water Street.

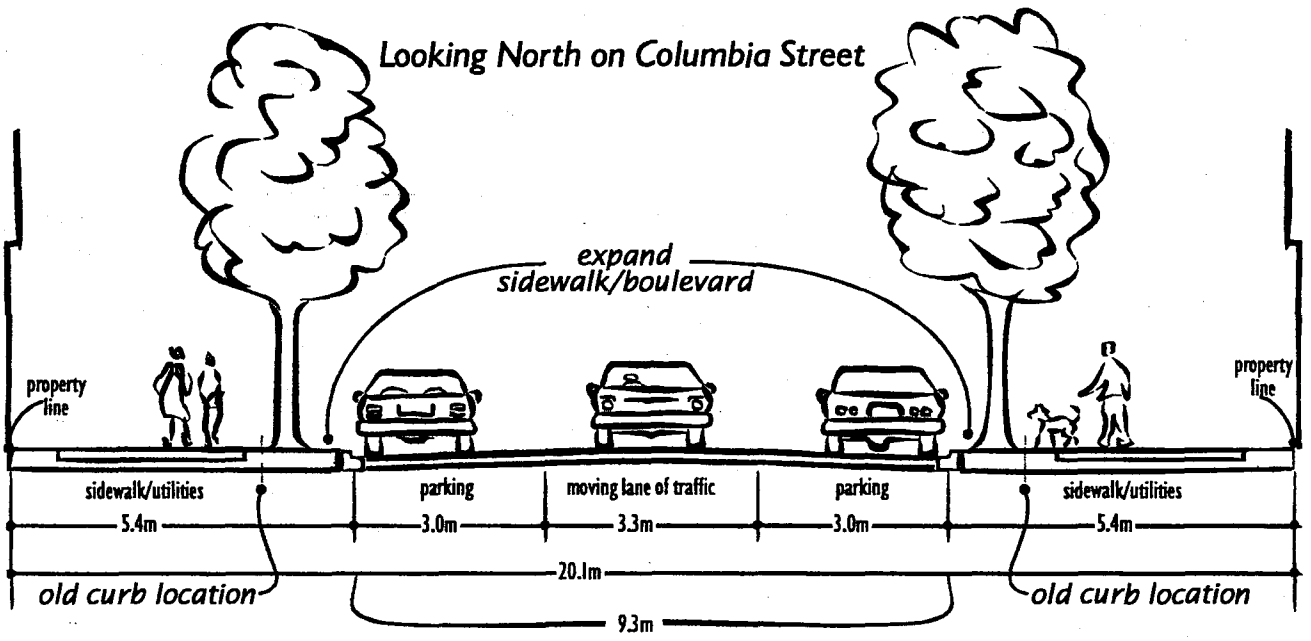
The Approach
Extending the pavement treatment further east, as well as providing a raised pedestrian table east of Carrall Street, would help set the tone for the rest of Water Street in terms of traffic speed. A redesign of the Water/Carrall intersection can improve pedestrian comfort and accommodate a bike route through the intersection. In addition, a raised intersection could be considered at Cambie and Water as part of the Cambie Street pedestrian arterial route.



53. Increase the space for pedestrians and landscaping on Columbia Street between Powell and Alexander

The Issue
Currently Columbia Street is a four-lane street that terminates at Alexander. It is a very low volume street with two lanes turning right and two lanes turning left. Public open space is in short supply in the east part of Gastown.

The Approach
Columbia Street between Powell and Alexander would be narrowed to one travel lane and two parking lanes, with the additional space developed as public open space or widened sidewalks.



5.2 Conceptual Bus Routes

The following bus routes are conceptual only. The routes were developed to satisfy many of the issues raised in the Transit Plan (section 4.2). Any changes to existing routes and the introduction of any new bus routes will be developed through further consultation as part of TransLink's Transit Area Service Plan.

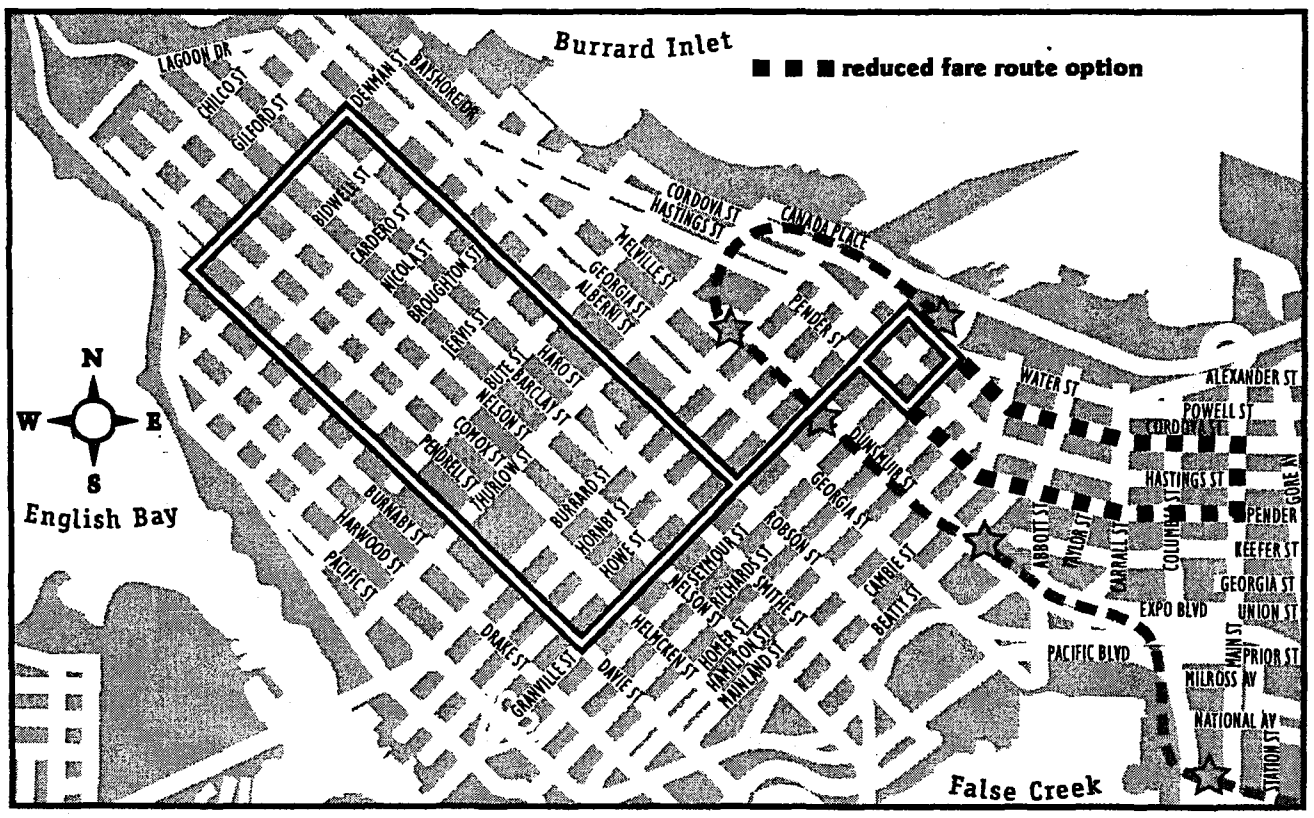
5.2.1 Adjust the West End Bus Loop

The West End loop is the main transit service in the West End. This service is popular and operating well. Therefore the route shown in *Figure 5-C* maintains the existing 5 Robson/6 Davie route largely as is given its success in meeting travel demands and being legible by transit users. The route changes at the eastern end improve connectivity to Waterfront Station by rerouting to Cordova Street and deleting the unproductive extension to Library Square. Service from the West End to the Library Square is provided by the Central Broadway Loop described later in this section.

Options

- With proposed changes to Richards and Cordova streets, the Waterfront station loop for these services could be reversed to become Granville, Pender, Richards, Cordova, Granville. This would improve connectivity and help relieve pressure on the blocks of Hastings between Richards and Granville.
- Use the proposed "transit hub" at Waterfront station as the terminus and change Davie & Denman from a layover point to a timing point to increase connectivity within the West End while maintaining service reliability.

Figure 5-C
West End Loop



5.2.2 Create a new Downtown Bus Loop

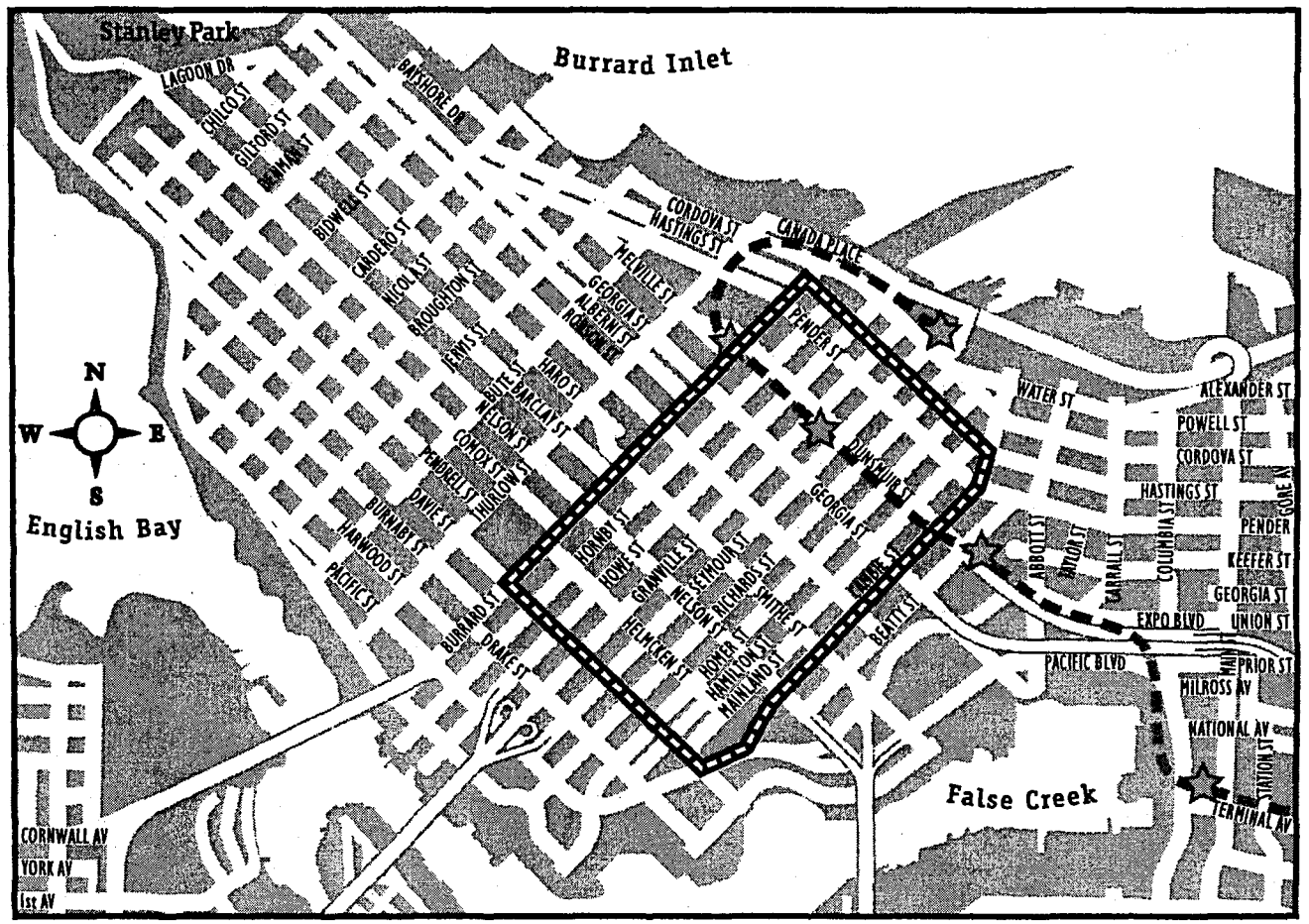
This bus route, shown in *Figure 5-D*, replaces much of the existing #1 and #2 services in Downtown South with a more legible and consistent routing. Downtown South is within easy walking distance to many downtown destinations, so this service is designed to better serve longer trips that are less attractive as walk trips. This is why the loop traverses Burrard Street rather than Granville Street. This route also improves local bus service on Burrard and serves major connections at Burrard Station, Davie & Granville, Cambie & Dunsmuir (one block from Stadium Station) and Hastings & Seymour (one block from Waterfront Station).

Options

- Providing only the clockwise loop (#1) could be considered since this would not unduly compromise travel times between the key points of the loop (Pacific & Davie and Burrard Station), since they are on opposite corners, and would help avoid the need to modify Cambie Street. However, service on the major streets (especially Burrard, Davie and Cambie) would be unbalanced.
- The Richmond rapid transit line could follow either Davie/Burrard or Cambie. Due to the potential for duplication of service on either Burrard or Cambie, this service would need to be reviewed once a decision is made on the alignment for the rapid transit line.

Figure 5-D

Downtown Bus Loop



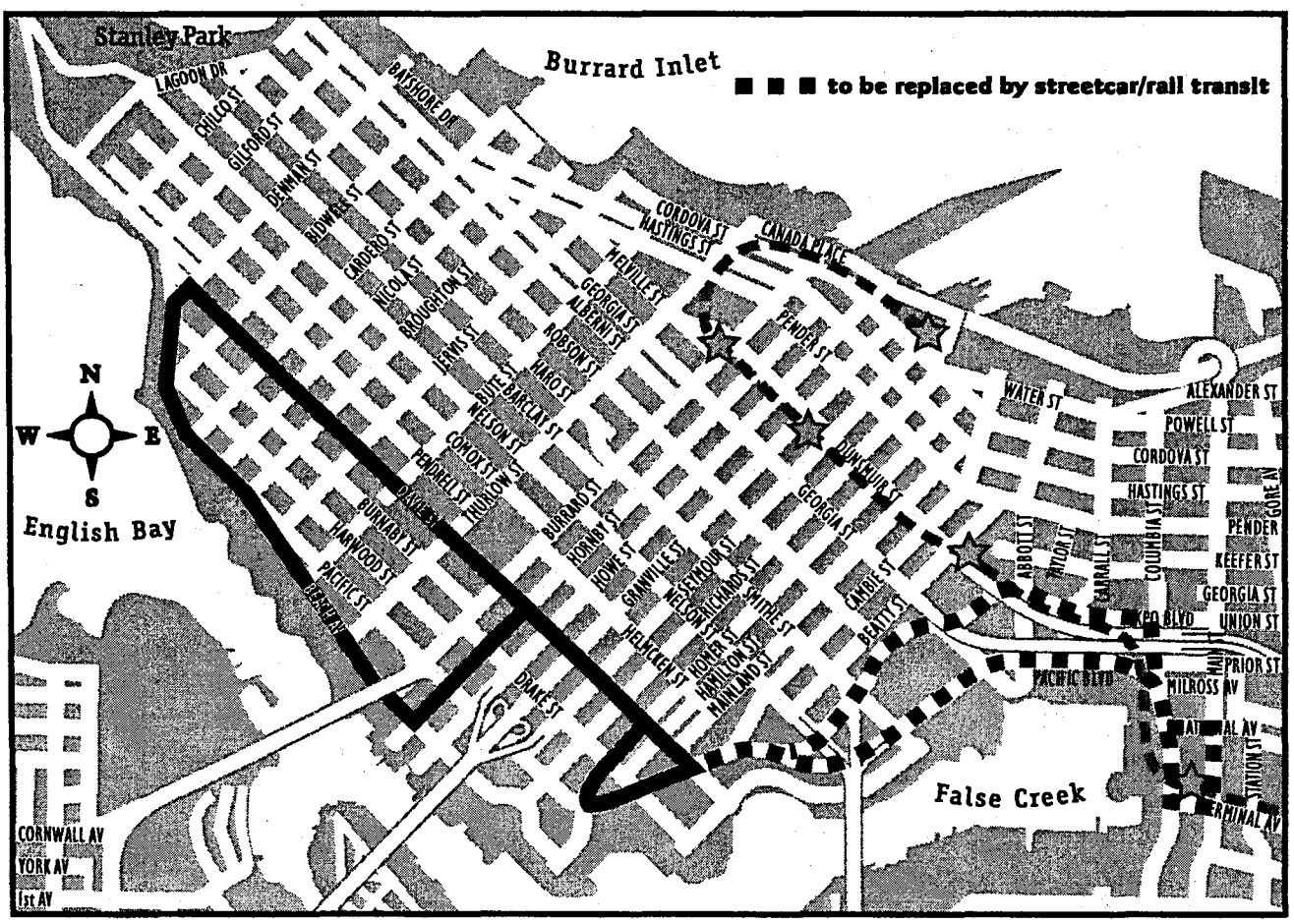
5.2.3 Modify the Beach/Yaletown Community Bus route

The suggested route for a Beach Avenue /Yaletown community bus is shown in *Figure 5-E*. This route replaces the existing #1 Beach with a route that reduces duplication on major corridors while reallocating service to route segments that are uniquely served by this route. The route maximizes transfer connections to downtown along Davie to offset the loss of a one-seat ride to downtown. Given that the demand on this route is not sufficient to justify electric trolleybuses, small, low-noise community buses should be used to reduce impacts on residential areas.

Options

- Operate the route in only one direction during evenings. Select the direction that provides the most direct service from transfer points to residential areas.
- Extend the route along Pacific and Expo boulevards to either International Village/Stadium Station, or to the Main Street SkyTrain station area and to False Creek Flats. The latter extension could help build ridership for the streetcar line proposed for this corridor and provide a West End/Yaletown - SkyTrain connection that bypasses the downtown core.
- Delete route east of Granville to reduce overlap with the Downtown East Loop and allow better service on Beach.

Figure 5-E
Beach/Yaletown Community Bus



5.2.4 Create a West End to Central Broadway Bus Connection

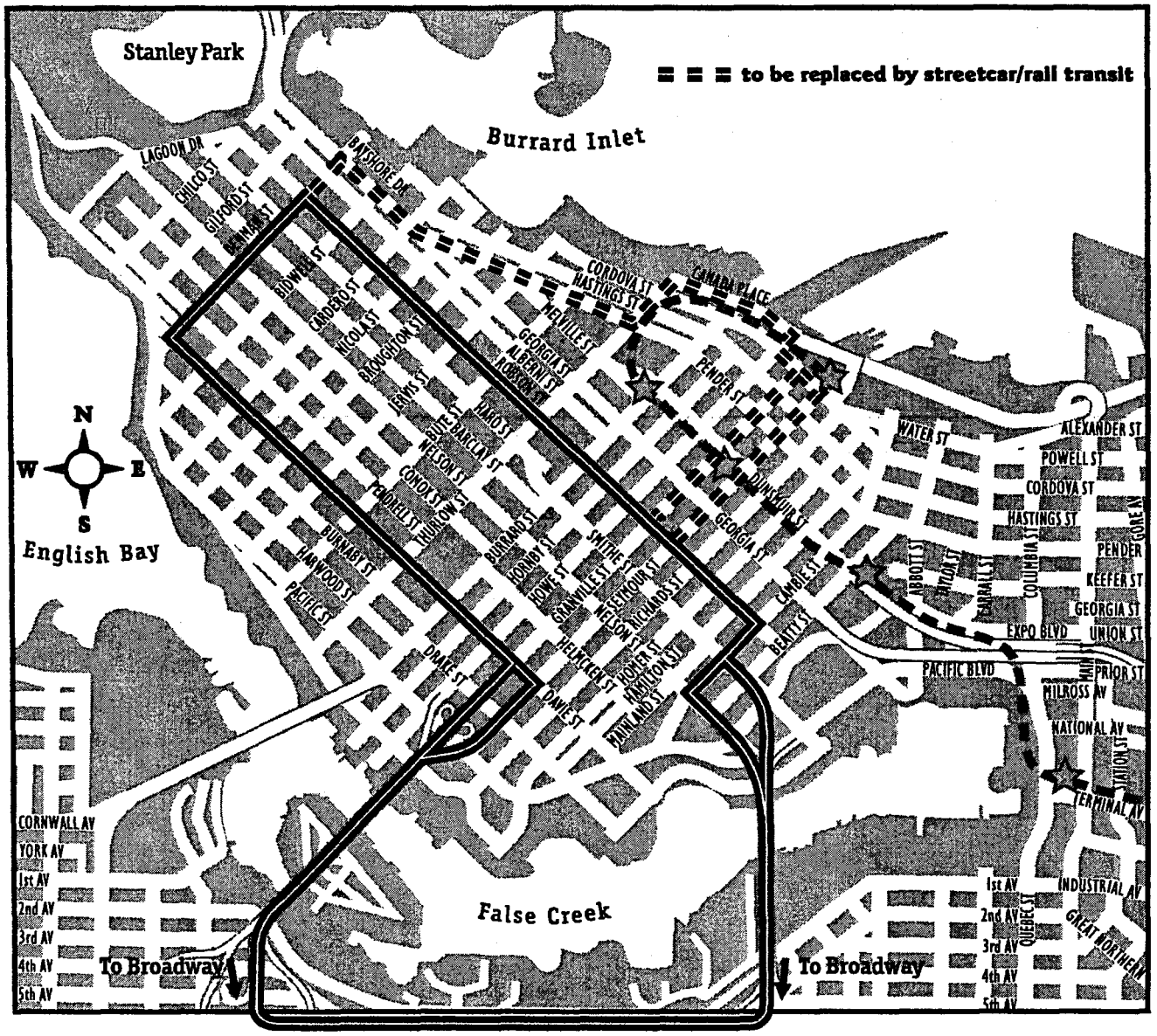
The West End - Central Broadway travel market is large but currently not well served by transit, with one or two transfers required for a relatively short trip. Residents of Downtown South who live south of Helmcken Street face much the same options. The proposed Central Broadway Loop, shown in *Figure 5-F*, serves this demand and provides better access to Library Square and the Cultural Precinct. In the past the *Fairview Belt Line*, part of which would be replicated by the proposed service, was BC Electric's busiest streetcar route. The transportation model also projects that this would be the second busiest downtown bus route after the West End Loop.

Options

- Locating a layover point on the route is problematic - it may be simpler to design a point-to-point service by deleting the Coal Harbour part of the route and terminating the route at Waterfront Station and Denman/Georgia.
- The route could be modified to stay on Robson between Cambie and Denman in both directions in order to better serve the West End - Central Broadway market while still covering some of the CBD. The existing Cambie-Oak (15/17) service could be reconfigured to provide direct access to Waterfront Station.
- The Richmond/Airport rapid transit line could provide a good connection between Central Broadway (Fairview) and Waterfront Station. In addition, the proposed streetcar would provide service along Cordova/Hastings/Georgia. When these rail services are built the bus service could be relocated to run on Robson between Cambie and Denman rather than along Cordova/Hastings/Georgia. This would provide improved service between the West End and the Library precinct and on to Central Broadway.

Figure 5-F

West End to Central Broadway



6 Evaluation of the Plan

Assessment Tools

A number of tools were used to help develop and assess the Downtown Transportation Plan. Greater Vancouver's regional transportation model (EMME/2) was used to assess various transportation scenarios in Section 6.1. Other tools relating to environment, traffic safety and streetscape were also developed and used. Application of a noise impact study is described in Section 6.2. The development and application of an assessment model with respect to streetscape and transportation and land use suitability is described in Section 6.3. Downtown air quality is discussed in Section 6.4, and the results of a traffic safety study are discussed in Section 6.5.

6.1 The EMME/2 Transportation Model

The EMME/2 model refers to a computer program that is used to help plan transportation infrastructure. This particular computer model is used in 58 countries by over 580 organizations, such as cities, metropolitan areas, transit agencies, consulting firms, and universities.

The main function of the EMME/2 model is to assign trips to a multi-modal transportation network (vehicle, transit, walk, etc.) based on the fastest (least expensive) mode and route for an individual trip. EMME/2 emulates actual behaviour whereby people, through trial and error, are able to select the quickest route to work or school. This method of trip assignment onto a transportation network generally works well for vehicle and transit trips. The model is less accurate at predicting walk and bike trips. For walk and bike trips it is more helpful to look at trends and demographics.

The model is most accurate as a 'comparative' tool and should be used primarily in that role. This means the model can look at different transportation network options and different land uses and compare statistics such as the average vehicle speeds and transit ridership. These statistics contribute to the broader evaluation of the various network options.

6.1.1 The Downtown Sub Area Model

The EMME/2 model created for the Downtown Transportation Plan is called a "sub area model". It is based on the regional transportation computer model used by the Province, TransLink and the GVRD, and it has greater detail in the downtown sub area. For example, the downtown sub area model divides the downtown peninsula into 190 areas (traffic zones) that generate and attract trips. These are approximately the size of a city block. This compares with 34 downtown traffic zones in the regional model. Practically all of the downtown streets and transit services are coded into the model. Due to the differences in on-street parking and bus schedules there is a different transportation network for both the AM and PM rush hours.

The model was calibrated for the year 1996 using information from various sources, including population and employment data from the Canada Census, traffic volumes, transit ridership, etc. The model was calibrated for both the AM and PM rush hours to replicate the vehicle volumes and transit ridership that occurred in 1996.

New scenarios were then created for the year 2021. These scenarios require projected land-use (population and employment) and the future transportation network for 2021. Tranport 2021 - The Long-Range Transportation Plan for Greater Vancouver was used as the basis for the future transportation network. In the downtown it includes a future rapid transit line to Richmond and a number of transportation demand measures such as tolls on the Lions Gate and Second Narrows Bridges.

6.1.2 Evaluation using the EMME/2 Model

The process of evaluation using the EMME/2 model requires the creation of, not one, but many different scenarios. Future scenarios are examined to help test the sensitivity of things such as transport demand management measures or specific changes in the transportation network. The model generates performance results, such as vehicle volumes, average vehicle speed, and transit ridership for a specific scenario. Indicators such as total trip hours and distance for all users provides a measure of relative system performance. The results are summarised below.

a) 1996 vs. 2021 DTP

Comparing the 1996 transportation network with the Downtown Transportation Plan (DTP) fully implemented in 2021, the model results show that the recommended Plan would help reduce overall traffic congestion due to reduced vehicle volumes and would encourage more transit ridership. The model shows that there are similar benefits in both the AM and PM rush hours. Some results comparing the AM rush hour for 1996 and 2021 are summarised below:

- Vehicle trips to downtown decrease by 2 to 3 percent;
- transit ridership increases by 57 percent;
- average vehicle speeds increase by 3 percent; and
- average transit speeds increase by 14 percent.

There are significantly fewer vehicles on Georgia, Burrard, Pender, Denman, Davie, Beach and Hastings Streets. The effects of the increased population in Downtown South are reflected in more southbound traffic in the AM peak across the Granville and Cambie Bridges. During the AM peak hour, over 5,000 additional passengers will be using the Expo SkyTrain line (total of 12,500), 8,000 to 9,000 will be using the Richmond-Airport rapid transit line down the Cambie corridor, and 5,000 will be using the Millennium line in Central Broadway. Over 700 additional passengers per hour on the SeaBus offset fewer vehicle trips on the Lions Gate Bridge.

b) 2021 vs. 2021 no TDM

The model incorporates the transport demand management (TDM) measures that are recommended in the Transport 2021 Long-Range Transportation Plan. These measures include:

- tolls on major bridges,
- increased parking fees,
- increased gas taxes,
- some telecommuting, and
- employer programs that reduce trip auto trips.

If the recommended transport demand management (TDM) measures are not implemented, the results change significantly. When the 2021 results with and without TDM are compared we find that without TDM there would be;

- 15 percent more vehicle trips to downtown;
- 8 percent fewer transit tips; and
- Average vehicle speeds would be 11 percent slower.

This shows that TDM will play a significant role in minimizing downtown congestion and therefore should be pursued.

c) 2021 vs. 2021 no Richmond RT

Another scenario that was examined was "what if the Richmond rapid transit line is not built by 2021?" The 2021 results without a Richmond rapid transit line are as follows:

- there would be 2.2 percent more vehicles during rush hour,
- vehicles would travel nine percent slower,
- resulting in 18 percent more vehicle hours (number of vehicles multiplied by the travel time), and
- the average transit speeds would be 10 percent slower than if a rapid transit line is built.

This shows that a rapid transit line to Richmond would result in less traffic congestion and faster transit travel times than a scenario without rapid transit to Richmond.

d) 2021 vs. 2021 no DTP

It is also useful to compare the 2021 "no DTP" scenario with the 2021 DTP scenario. When these two scenarios are compared we find that the DTP has only a minor affect on most of the statistics produced by the model. However, most notably the DTP increases the number of transit trips originating in downtown by three percent primarily as a result of the new downtown bus and streetcar routes that are proposed. In particular, the model shows that a West End to Central Broadway bus service could attract significant ridership. Overall the DTP generates fewer vehicle trips and more transit trips. The recommended DTP will provide greater transportation choices without increasing traffic congestion.

6.1.3 Conclusion

The best over-all network performance is achieved with the implementation of;

- the downtown transportation plan along with;
- the Transport 2021 recommended transport demand management measures; and
- the Transport 2021 recommended transportation network, including a rapid transit line to Richmond and an extension of the Millennium line to Central Broadway.

6.2 Noise Impact

Measurements of street noise levels were undertaken by the Vancouver-Richmond Regional Health Board at selected locations throughout the downtown peninsula. Points were chosen to coincide with GIS co-ordinates used in the 1971 Greater Vancouver Noise Survey (Barron and Strachan, Consulting Acoustical Engineers, 1971: A Community Noise Survey of the Greater Vancouver Regional District). Both background noise levels and noise emanating from immediate (usually transportation vehicles) sources are measured.

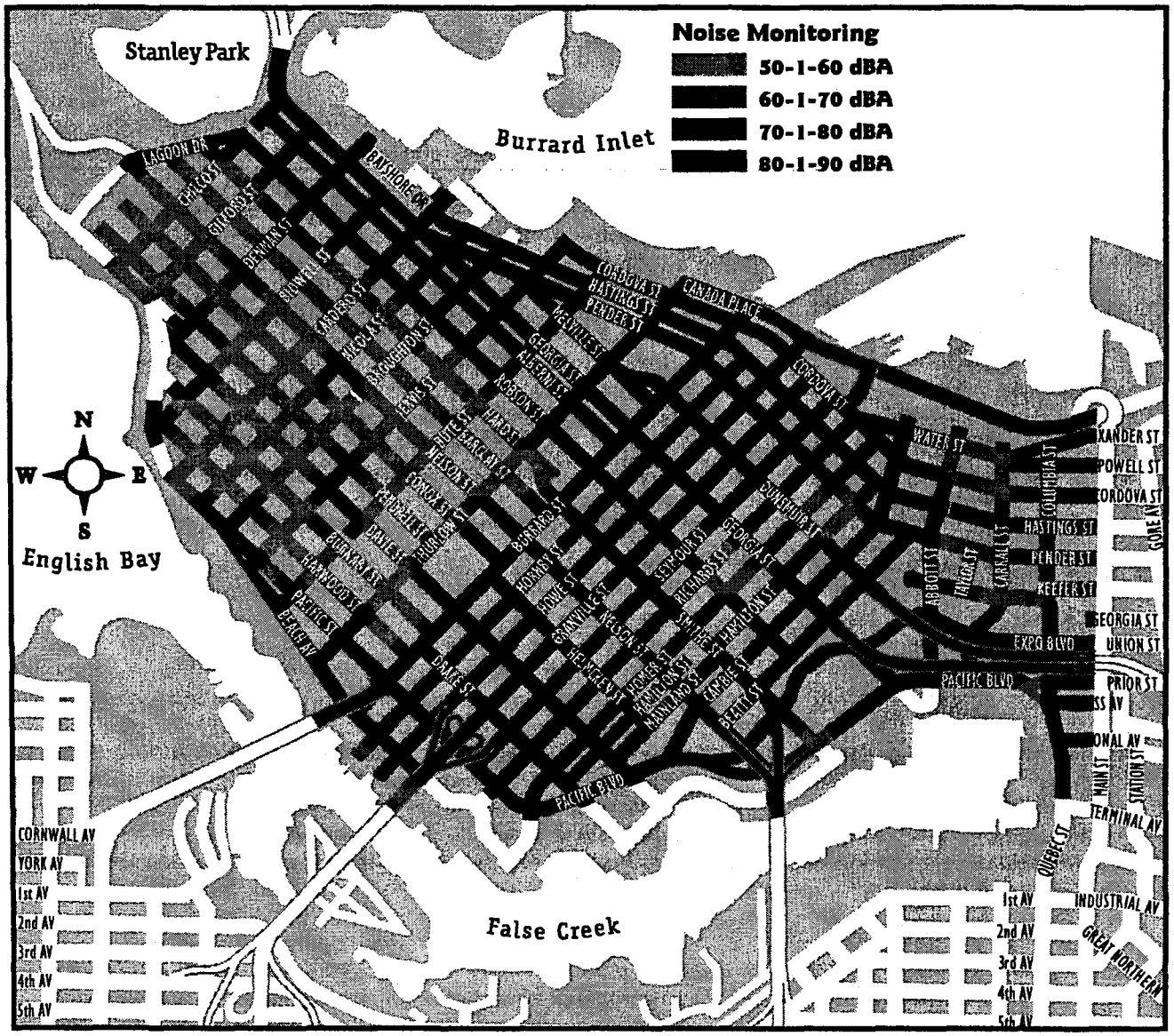
Noise monitoring was accomplished using a Larson Davis model 820 Precision Integrating Sound Level Meter. The meter was calibrated twice daily while the monitoring study was in the field. A windscreen was used at all locations, and the instrument was held at least one meter above ground at the abutting property line. That environmental conditions (wind, speed, temperature, rainfall) and atypical noise sources, including construction and maintenance activities, allows more sensitive reading of the resulting noise map. Three one-minute noise level measurements were taken using an A-weighted rating scale at each sampling location. Leq (average noise level over one minute), L10 (10th percentile during time interval), L50 (median noise level during time interval) and L90 (90th percentile) were recorded after each measurement.

A noise map was developed by taking the mean Leq measured at each location and assigning that noise level to the area within the grid immediately surrounding the measurement location. Noise levels in four ranges (under 55 dBA, 55-64 dBA, 65-74 dBA and 75 and over dBA) are shown in Figure 6-A. The noise map should be interpreted with caution as it was developed with limited data collected. The local noise conditions at the time of measurement may have also affected the results. Further analysis is required before making any conclusions.

Figure 6-A

Noise Incidence Reference Map 2001

source: Vancouver/Richmond Health Board



The map shows that the quietest areas of the downtown peninsula occur in the primarily residential areas of the West End. Lord Roberts elementary school (both the main site on Bidwell and the annex on Nelson Street) are within this quiet area, as are a few small parks and green spaces and the street ends near False Creek in the area between the Burrard and Granville

Bridges. Other residential areas, such as those in the False Creek North area may be similarly quiet, but were not included in the area of detailed study. Parts of Gastown were similarly quiet. The Coal Harbour residential area was not nearly so tranquil, but construction activity was likely the cause of the higher measurements.

Noisier areas indicated by the noise map include St. Paul's Hospital on Burrard Street. The mean Leq measured in front of the hospital on Burrard Street was 85.3 dBA. Measurements taken on the Thurlow Street frontage were 59.2 and 66.4 dBA.

Other noisy areas are those residential sites on the major arterial road corridors of the downtown peninsula. The average Leq for residential sites on Burrard, Granville, Denman, Georgia, Hastings and Pacific Boulevard is 69.4 decibels. This is above the acceptable World Health Organization standard of 55 dBA for outdoor living spaces, and would result in high noise levels in residential spaces in which windows were opened. Noise levels on Davie Street between Hornby and Richards, on most of Seymour Street south of Nelson and on Howe Street near Davie were over 75 dBA.

The general noise level in some commercial areas of downtown also appears to be relatively high. The mean Leq for all commercial sites was 67.0 decibels. Thirty of 110 commercial monitoring sites exceeded the 70 dBA noise level recommended for outdoor commercial areas by the WHO. The noisiest areas downtown, all with noise measurements of over 85 dBA, included Burrard Street at Robson and Helmcken and the intersection of Granville and Smithe Streets.

6.3 Streetscape and Land Use / Transportation Suitability

While the environmental focus of most transportation plans is on air and noise assessment, the Downtown Transportation Plan strives to include factors directly related to liveability and to streetscape. The firm Baker, McGarva, Hart Architecture (BMH) was retained to examine most of the commercial streets on the downtown peninsula, as well as the major streets in the West End. The study's main goal was to produce an assessment model that could be used to evaluate potential transportation impacts on a street's pedestrian environments and land uses. The assessment included such elements as land use along the street, the characteristics of the pedestrian realm, the level of privacy afforded properties along a street and the overall vibrancy of the street. These qualities became the basis for scoring a street's robustness and resulting sensitivity to changes in street charateristics. While the study is subjective in method, its strength lies in its transparent and systematic disaggregation of the features that comprise robustness of streets and the sensitivity of uses along streets.

Figure 6-B
Street Adaptability Formula

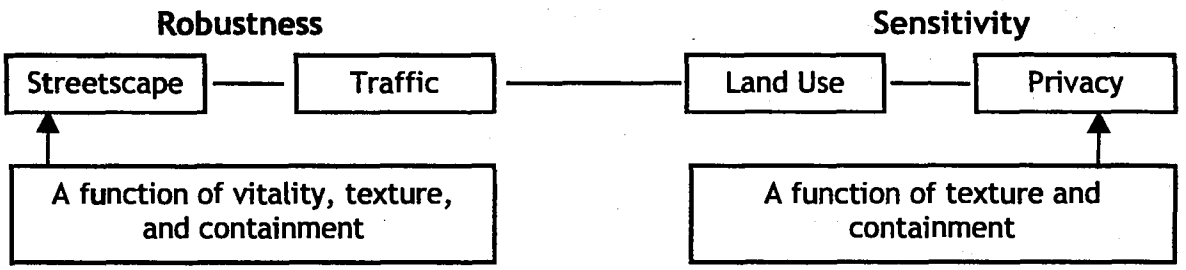


Figure 6-B depicts the streetscape elements and their relationship to one another. The idea of the 'streetscape' includes an increasing and expanding series of realms based on what a pedestrian experiences while travelling down a street. First, the area immediately surrounding

the pedestrian, typically including the sidewalk property, is assessed for level of vitality. This first level of experience is influenced by such factors as the condition of the sidewalk material, detailing of the sidewalk, the level of activity spilling out from adjacent land uses and the general desirability to be on that sidewalk. At the next level is the area that includes the buffer zone between the sidewalk and the traffic flow to one side and the area between the sidewalk and the property line on the building side. This area, also referred to as texture, is affected by such factors as the level of landscape planting, the frequency and nature of street parking, the location of the sidewalk within the right-of-way and the quality of the area between the buildings and the sidewalk. The final level affecting the pedestrian experience is the overall containment of the street, including the scale of building fronts. These three elements - vitality, texture and containment, mediated by traffic volumes, comprise the robustness of the street.

The second aspect of the study, identified as sensitivity, measures the sensitivity of land uses on a street to changes in the characteristics of a street. Sensitivity is a function of land use and privacy, mediated by texture and containment.

Armed with the scoring method, BMH staff filmed all the streets in the study area and then reviewed the videotape of the streets and scored each block of each street. Figures 6-C and 6-D show streetscape robustness and land use sensitivity respectively by street and block.

Figure 6-C
Robustness
source: Baker, McGarva, Hart Architecture

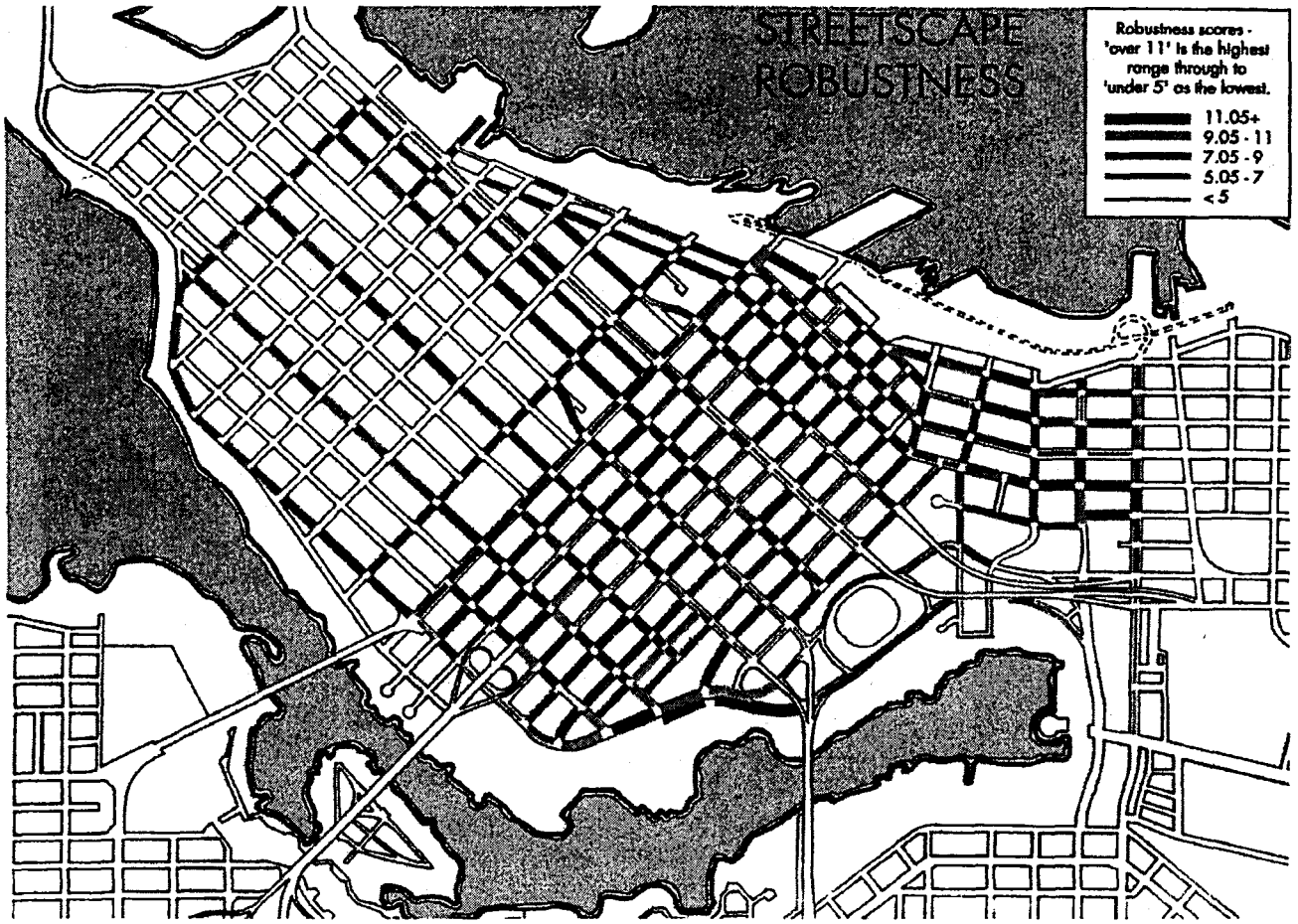
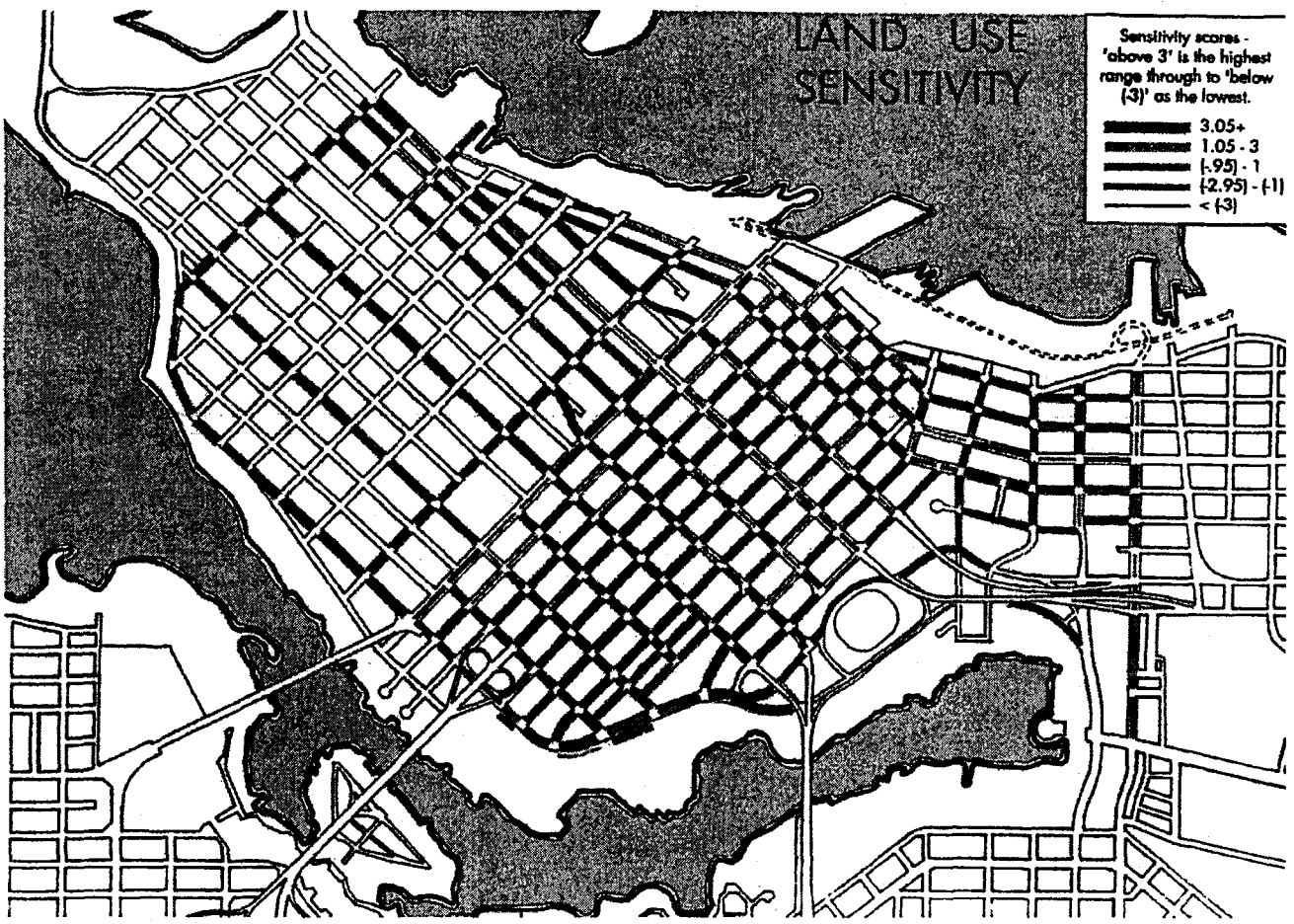


Figure 6-D
Sensitivity
source: Baker, McGarva, Hart Architecture



Not surprisingly, the major streets in the West End, such as Robson, Alberni, Davie and Denman are the most robust on the downtown peninsula. The streets of Gastown and Chinatown, especially Water and Pender Streets, but also parts of Cordova and Keefer Streets, stand out as fairly robust ones as well. Hastings Street, formerly downtown Vancouver's main retail street, lacks robustness east of Victory Square. Within the downtown core, Granville, Hornby, Homer and Pender Streets are fairly robust streets. Those streets serving primarily as access routes to the bridges and viaducts connecting downtown Vancouver to the rest of the city - Dunsmuir and Georgia, Nelson and Smithe and Howe, Richards and Seymour Streets also stand out as lacking robustness. The one-way couplet of Beatty and Cambie Streets seem also to lack robustness.

The BMH study represents a significant contribution to the city's resources with respect to judging the worthiness of proposed changes in streets. The study report includes detailed instructions for applying the model in determining the likely results of proposed street changes. It is a tool that can be applied to streets where significant changes are proposed and where streetscape and liveability are at issue. Application of the tool on a consistent basis will also assist the city in monitoring the overall liveability of its streets. The model is applied to a number of downtown streets below. It is anticipated that it could be applied to a number of others in the near future, either in the context of follow-up studies to this report or related public processes likely to be initiated in the near future. Figure 6-E summarizes the potential contexts for application of the assessment model to various downtown streets.

Figure 6-E

Streetscape Assessment of Downtown Vancouver Streets

Street	Status of Assessment
Denman	No significant change
Pacific Street	Included herein
Pacific Boulevard	Pacific Boulevard Study
Expo Boulevard	Northeast False Creek ODP
Davie	No significant change
Nelson	No significant change
Smithe	No significant change
Thurlow	Community follow-up process
Burrard	Undecided scenario
Howe	No significant change
Seymour	No significant change
Richards	Included herein
Hornby	Included herein
Cambie	Included herein
Homer	Included herein
Hamilton	No significant change
Mainland	No significant change
Beatty	Included herein
Drake	Streetcar implementation
Helmcken	Greenway design
Robson	No significant change
Georgia	Undecided scenario
Dunsmuir	Community follow-up process
Melville	No significant change
Pender	Community follow-up process
Hastings	Community follow-up process
Alberni	No significant change
Cardero	No significant change
Cordova	Streetcar implementation
Powell/Water	Community follow-up process
Abbott	Included herein
Carrall	Greenway design
Columbia	Streetcar implementation
Keefer	No significant change
Main	Community follow-up process
Granville	Granville study

A significant instance of the model leading to the seeking of plan alternatives is with respect to Pacific Street from Burrard west to Jervis Street. This is a narrow roadway not much more than 10.5 metres curb-to-curb width with two moving lanes of traffic and two parking lanes for much of the day. Rush hour regulations are currently applied to peak hour parking on alternate sides for the AM and PM peak periods. The street is not very robust, currently ranking about in the middle of downtown streets - Figure 6-C. There is a desire to have a bicycling corridor in both directions, connecting the West End and Stanley Park to the Cambie bridgehead and Beatty Street. One proposal is to strip parking on both sides and add boulevards to both sides and bike lanes in each direction. Such an action, though, would see a reduction in robustness, mostly as a result of decreases in containment as a result of removal of on-street parking. On the other hand, a proposal to place only an eastbound bike lane in place of parking on the south side of the street and to accommodate westbound bike traffic on a new bike lane on Beach Avenue through this section while still adding boulevards to both sides, reflects a solution that is estimated to increase the robustness of the street.

Proposals for two other streets - Homer Street from Pacific to Cordova and the same blocks of Richards Street - also illustrate the benefits of applying the model. The Downtown Transportation Plan proposal for Homer Street, which is identified for pedestrian priority (Section 4.3), is to change it from a one-way to a two-way street and to add two feet of boulevard to each side. It is estimated that such actions would change its score from an average street - with some very robust blocks - to one whose robustness was well above the current average for most of its length. The Downtown Transportation Plan proposal for Richards Street is to place full-time parking on the west side and to stripe a southbound bike lane on the west side as well. Such an action would move the street's overall score from one that was less than average to one that would be at least the current average.

A number of other streets for which changes are recommended in the Downtown Transportation Plan have also been assessed. Cambie Street is proposed to be converted from a one-way to two-way street. The result of implementing this change would likely increase robustness by one point. By making Beatty Street two-way, adding bike lanes in both directions and adding street trees to a street needing them, the overall level of robustness of the street increases by four points. The proposal to add full-time parking to the west side of Hornby Street, stripe a bike lane adjacent to the parking lane on the east side of the street and then add curb bulges most of its length would increase its robustness score by 2 - 2.5 points. This would improve the street from one that is above average in robustness for most of its length to one that would currently rank in the top 20th percentile in robustness. Abbott Street's texture and containment already make it an above average street. The adding of curb bulges where possible for most of its length would result in increased robustness that would also might see the street demonstrate a level of robustness in the upper 20th percentile for current scores. The overall increase in robustness of the streets for which significant changes are proposed in the Downtown Transportation Plan underscores the usefulness of the model as a planning tool.

6.4 Air Quality

Greater Vancouver's four health boards co-operated in undertaking a comprehensive and comparative assessment of air quality in the report, *Evaluation of ambient air pollution in the Lower Mainland of British Columbia: Public health impacts, spatial variability and temporal patterns*, released in March 2001. The report was completed by Dr. M. Brauer of the School of Occupational and Environmental Hygeine at UBC. Dr. Brauer compared the levels of air pollutants in the Lower Mainland with cities of similar or larger size in western North America (Seattle, Portland, Denver, San Antonio, Minneapolis-St. Paul, Phoenix and Los Angeles, San Diego and San Francisco in California). The results of the comparative analysis is outlined below.

Ozone - Ozone concentrations in the Lower Mainland were lower than in any of the comparison cities for which information was available. Vancouver concentrations were similar to, but less than, those in Denver, Portland and Seattle, and about half those prevailing in Los Angeles.

Carbon Monoxide - The 2nd highest 8 hour averages in the Lower Mainland were lower than all but two of the comparison cities (San Francisco-Oakland and San Antonio) for which data were available. Levels were about one-third those of Los Angeles, the city with the highest concentrations. They were about half those of Denver and about 40% less than in the neighbouring cities of Portland and Seattle.

PM_{10} - The 2nd, 3rd and 4th highest 24 hour averages were measured. PM_{10} concentrations in the Lower Mainland were generally lower than any of the comparison cities. Levels in Phoenix, which experienced the highest concentrations for all three periods, were more than twice as high as in Vancouver. Occasional higher readings occur at some monitoring stations in the Lower Mainland that would be in the mid-range of the comparison cities. However, Vancouver's low ranking disappears when the station with the highest readings is compared with San Francisco-Oakland, Portland and San Antonio.

Nitrogen dioxide - Concentrations of NO_2 in the Lower Mainland were in the midrange of the cities reviewed. Lower Mainland NO_2 concentrations were well below those found in Denver, Phoenix, Los Angeles or San Jose and somewhat higher than Seattle, Portland, San Francisco, Sacramento or San Antonio.

Sulfur Dioxide - As one might expect for western North America, sulfur dioxide levels (annual average ppm) were relatively low in all cities; SO_2 concentrations in the Lower Mainland were significantly lower than those in Seattle and Denver, but slightly higher than for Minneapolis, Los Angeles or San Francisco.

Downtown Air Quality

Air quality on the downtown peninsula is currently assessed on the basis of continuous measurement at a station located on the 2nd level of Robson Square, one of about 30 continuously operating air quality stations throughout the Lower Mainland. The next closest measuring station and the only other station located in the City of Vancouver is in Kitsilano (near Arbutus and West 10th Streets at the former site of GVRD headquarters). Substances measured at the downtown location include CO (Carbon Monoxide), SO_2 (Sulphur Dioxide), O_3 (Ozone) and COH (Coefficient of Haze). PM_{10} (Particulate Matter < 10μ) is measured at the Kitsilano station, but not at the Robson Square site. While the CCME (Canadian Council of Ministers of the Environment) adopted a protocol for $PM_{2.5}$ (Particulate Matter < 2.5 μ) in 1998 and a volumetric standard in 2000, no continuous stations in the GVRD have yet been equipped with the new permanent measurement equipment for the smaller particulate matter. The GVRD has nevertheless adopted the Canada-wide standards for $PM_{2.5}$ and plan to implement them in the future.

Despite the density of population and employment and motor vehicles on the downtown peninsula, downtown air quality is generally excellent. For the year 1999, the last year for which complete annual data have been reported by the GVRD Air Quality Branch, the Robson Square station registered only 2 hours in which the air quality did not meet the 'desirable' objective. A reading of less than desirable, but nonetheless acceptable ('fair' quality) was obtained for COH for 2 hours during the year.

However, the excellent air quality registered for downtown does not consider O_3, NO_X or PM_{10}, which are not measured at the downtown monitoring site. The nearby Kitsilano measuring station recorded 18 hours in which O_3 was in the 'fair' quality range and a further 315 hours in which PM_{10} levels were in the 'fair' range (acceptable, but less than desirable). The Kitsilano station ranked 5th worse among the 13 stations in the GVRD measuring PM_{10} levels. PM_{10} was responsible for over 82 percent of 'fair' air quality in 1999 at the GVRD's 31 monitoring stations.

Conclusion

As indicated, downtown air quality is generally good. The measurement of additional variables would add to our knowledge of downtown air quality.

Air quality monitoring and mitigation measures in Greater Vancouver are within the jurisdiction of the GVRD's Air Quality Branch. As indicated, and despite the concentration of both residential and employment populations downtown, the air quality monitoring station at Robson Square does not measure some critical pollutants, including ozone and nitrous oxides. It should be augmented by the ability to measure these parameters, as well as newer ones (PM_{10} and $PM_{2.5}$) whose measurement is just being implemented across the GVRD.

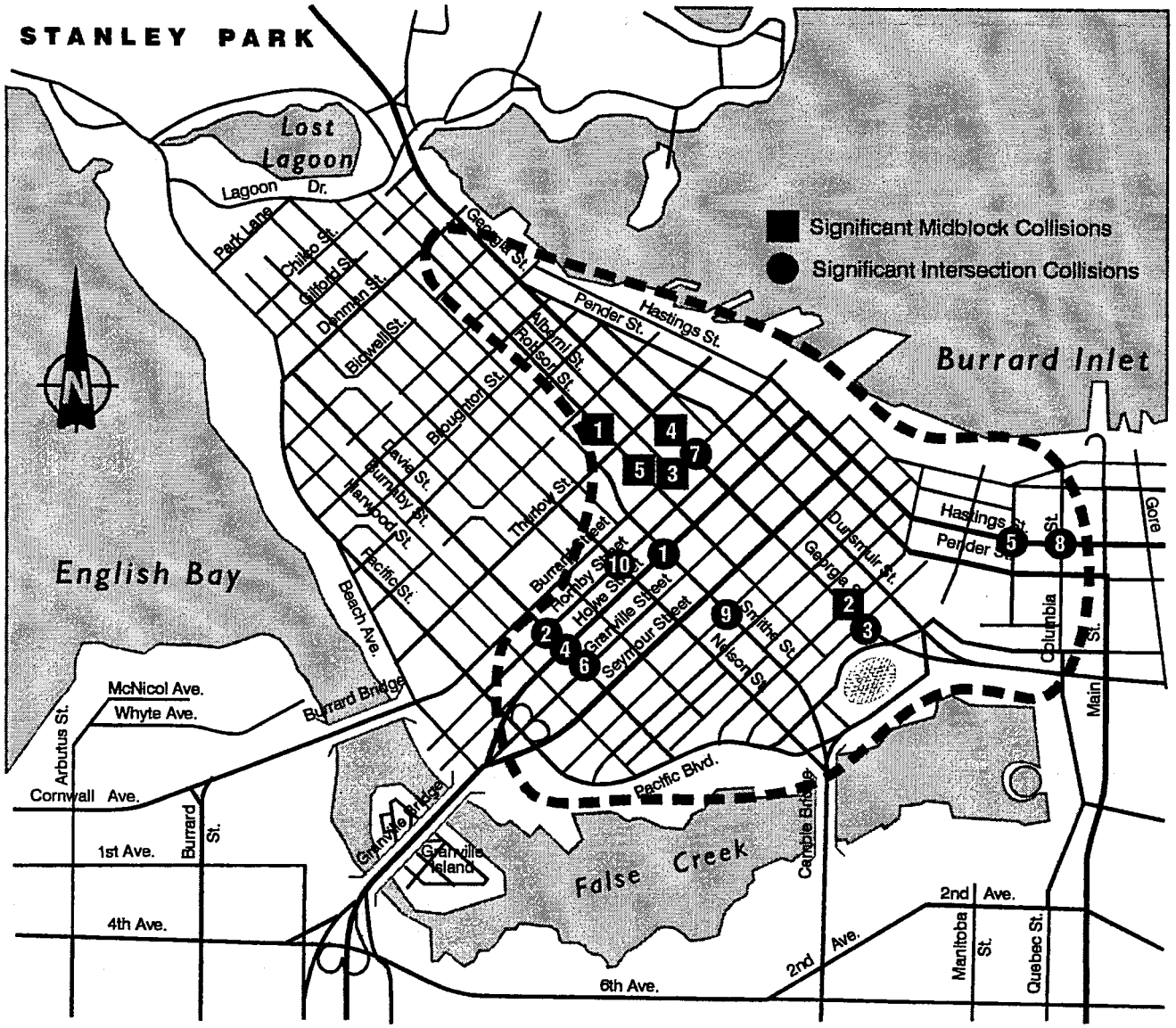
6.5 Traffic Safety

To address traffic safety issues within the downtown core, a Safety Review for the Downtown Transportation Plan was completed by Hamilton Associates with funding assistance from ICBC. The study identified traffic safety issues and potential improvement options that could be considered in the development of the Downtown Transportation Plan. Collision records for the period between 1992 and 1996 were reviewed and analysed to determine the collision frequency, collision rate, and collision severity at mid-block and intersection locations. The top ten intersection locations and the top 5 mid-block locations in terms of highest collision risk and insurance claims were identified and potential countermeasures were suggested. These are shown in *Figure 6-F*.

Figure 6-F

Locations with High Frequency of Collisions (Collision frequency adjusted for traffic volume)

source: Hamilton Associates



An analysis of individual intersection and mid-block collision data was also completed to establish collision characteristics by time, severity, type, weather, road surface, lighting and vehicle type. Compared to average downtown collision characteristics, locations with an over-representation of a particular collision characteristic were identified. For example, locations with higher than average pedestrian related collisions or head-on collisions were identified.

The results of the study helped to focus attention to some areas of concern and, where appropriate, recommendations were made in the plan to address them. In many cases, potential solutions to problem locations were related to traffic management items that were specific to that location. These were referred to the Traffic Management Branch of Engineering Services for consideration.

The safety review also provided useful information by completing a literature search on general safety impacts of potential network changes. The changes include:

- converting from two-way to one-way street operation and vice-versa;
- introducing exclusive bus, trolley-bus or streetcar lanes;
- introducing exclusive bicycle lanes;
- introducing traffic management or calming measures; and
- introducing left turn bays.

The information provided was considered in the development of the Downtown Transportation Plan.

Evaluation Recommendations

Recommendation EN1: *Apply street robustness and land use sensitivity analysis where future significant public consultation is involved in street changes and where significant change may affect streetscape and liveability issues.*

Recommendation EN2: *Request the GVRD Air Quality Branch to increase the parameters monitored by its downtown monitoring station to include the full range of substances and parameters monitored by the GVRD and that a baseline be established in the near future for ozone and particulate matter.*

7 Implementation and Funding

The recommendations in the Downtown Transportation Plan are summarized below. The majority of the recommendations can be started within three years, subject to available resources and funding. Recommendations such as providing wider crosswalks at locations with high pedestrian volumes could be completed within three years. The development of a network of bike lanes could begin immediately but would not be completed until some time afterwards. The pursuit of a rapid transit line may take 10 or more years to complete. In the very short-term, it is recommended that an implementation strategy be developed for the Downtown Transportation Plan. This strategy, to be completed by January 2003, would establish the required resources and the potential funding sources and estimate timelines.

In following-up on all the recommendations of the Downtown Transportation Plan, the intent should be to complete the recommendations at the earliest possible time. This would provide benefits to all users sooner. To this end, it is recommended that progress in achieving the Downtown Transportation Plan recommendations be monitored and reported back regularly, in co-ordination with the Vancouver Transportation Plan's monitoring program.

It should be noted that the pursuit of some of the recommendations requires the co-operation of other agencies, most notably, TransLink. Agreement from TransLink is required or desired on all transit-related recommendations. Fortunately, TransLink will be undertaking a Transit Service Area Plan for Vancouver later this year. The transit recommendations of this plan can be fully considered at that time. And as noted below (Section 7.1), the development of the major rapid transit lines, as well as the transport demand management (TDM) assumptions of the 2021 transportation system, are also significant for the overall performance of the transportation system. While failure to achieve either transport demand management assumptions underlying the regional transportation model or to undertake contemplated transit improvements will have little effect on modal shares for downtown trips, they have significant implications for transportation network performance characteristics.

7.1 Summary of Recommendations

Population and Employment Study Recommendations

Recommendation PE 1 *Undertake follow-up studies of the demand for and supply of residential and commercial space in the Downtown Peninsula.*

Road Network Plan Recommendations

Recommendation RN1: *Confirm the existing designated MRN streets (Hastings, Georgia, Smithe, Nelson, Howe, Seymour and Main (south of Prior)).*

Recommendation RN2: *Pursue Burrard Street and Granville Street for potential inclusion as part of the Major Road Network.*

Recommendation RN3: *Conduct a future review of other potential MRN streets (such as Main and Dunsmuir) after considering potential land use and streetscape development.*

Recommendation RN4: *Distinguish and recognize the role of important circulation streets and local streets in future street modifications.*

Recommendation RN5: *Convert Carrall, Abbott, Beatty, Cambie and Homer to two-way streets.*

Recommendation RN6: *Maintain Granville Street's role as a transit, pedestrian and service vehicle corridor, entertainment district and future greenway. Transit efficieny along Granville Street should not be diminished.*

Recommendation RN7: *Reconfigure Granville Street south of Smithe Street to improve traffic circulation, widen sidewalks and reduce conflicts.*

Recommendation RN8: *Maintain Water and Cordova Streets as one-way streets.*

Recommendation RN9: *Further Evaluate Pender Street between Cambie and Howe for potential conversion from a two-way to one-way eastbound street.*

Recommendation RN10: *Widen roadways at specified locations to facilitate vehicular circulation, bus movements and bike lanes.*

Transit Recommendations

Recommendation TR1: *Use easy-to-read colour-coded maps at bus stops to clearly describe the downtown circulator bus routes.*

Recommendation TR2: *Operate downtown circulator bus routes in both directions on the same street and use electric trolley buses wherever possible.*

Recommendation TR3: *Encourage TransLink to investigate using advertising space on event tickets or envelopes to display bus routes and schedules leading to major event facilities, and coordinate with event organizers to charge an additional service fee to provide transit passes to event patrons.*

Recommendation TR4: *Reaffirm the City's commitment to develop a detailed transportation plan for the False Creek Flats in co-ordination with a rail study.*

Recommendation TR5: *Support the development of a rapid transit line from downtown Vancouver to Richmond (and possibly the airport) to achieve City and regional objectives, with stations in Downtown South, the central business district (centred at Burrard and Dunsmuir) and the transportation hub at Waterfront Station, using tunnel rail technology.*

Recommendation TR6: *Consider converting the existing bus lanes on Seymour and Howe Streets for use by other sustainable modes or for additional parking or landscaping as part of the implementation of the Richmond/Airport rapid transit line.*

Recommendation TR7: *Extend the proposed Pacific Boulevard streetcar line along Drake Street to Granville Street.*

Recommendation TR8: Adjust the location of streetcar stations as detailed in Figure 4.2-I.

Recommendation TR9: Extend new streetcar routes for the False Creek Flats, Vanier Park, and along the Arbutus corridor.

Recommendation TR10: Consider alternative streetcar alignments on Water Street, Abbott Street or Keefer Street if needed for additional capacity.

Recommendation TR11: Investigate the potential for introducing transit/HOV lanes on Burrard Street from Pacific to Pender, in the peak periods/peak directions only, as part of the Vancouver Area Transit Plan.

Recommendation TR12: Extend the westbound 3:00 to 7:00 PM HOV lane on Georgia Street east from Burrard to Richards Street.

Recommendation TR13: Investigate the potential for a transit signal priority system on Hastings Street, following an operational review of the new 98 B-Line Granville Street transit signal pre-emption system.

Recommendation TR14: Investigate the potential for introducing bus only queue jumper lanes in the peak periods on Main Street between National Avenue and 2nd Avenue, as part of the Vancouver Area Transit Planning process.

Recommendation TR15: Enhance streetscape design of Granville Street from the bridgehead to Cordova street to improve pedestrian/transit stops.

Recommendation TR16: Investigate the potential to improve bus travel times on Granville Street by providing bus-passing opportunities and optimized signal control.

Recommendation TR17: Pursue changes to Cordova Street in front of Waterfront station to create additional bus stops, a bus-only lane on Cordova, and accommodate a streetcar station.

Recommendation TR18: Work with TransLink on a public process that will help to guide the development of a new transit area service plan for the City of Vancouver.

Recommendation TR19: Review the routing and station locations of the 98 B-Line.

Recommendation TR20: Encourage Translink to review the potential for a reduced fare for short trips.

Pedestrian Plan Recommendations

Recommendation PD 1 Implement the Pedestrian Route network as illustrated in Figure 4.3-B and adopt the Great Street network as illustrated in Figure 4.3-C

Recommendation PD 2 *Provide curb ramps that align with the crosswalks at each intersection.*

Recommendation PD 3 *Remove restricted pedestrian crossings where safety can be maintained and where traffic impacts can be managed.*

Recommendation PD 4 *Provide mid-block crossings near significant pedestrian generators where safe and where and direct connections are desired.*

Recommendation PD 5 *Create improved sidewalk crossings at rear lanes to improve safety.*

Recommendation PD 6 *Design and implement a universal downtown way-finding system of pedestrian signage.*

Recommendation PD 7 *Implement pedestrian or corner bulges in locations where pedestrian crossings are long and traffic capacity would not be greatly impacted.*

Recommendation PD 8 *Minimize the number of curb cuts for driveways and parking access across all sidewalks, particularly identified pedestrian routes.*

Recommendation PD 9 *Restrict above and below grade pedestrian crossings to increase street level activity.*

Recommendation PD 10 *Provide pedestrian weather protection on retail/commercial (high) streets.*

Recommendation PD 11 *Provide barrier-free access to new and existing developments to accommodate the largest number of pedestrians.*

Recommendation PD 12 *Provide pedestrian connections to the Central Waterfront via Carrall and Richards Street alignments.*

Recommendation PD 13 *Provide improved pedestrian access to the Coal Harbour Waterfront by providing pedestrian activated signals, shorter crossing distances, signage and landscaping where possible.*

Recommendation PD 14 *Provide wider crosswalks at intersections with high pedestrian volumes.*

Recommendation PD 15 *Remove pedestrian holds to give pedestrians greater priority where vehicle volumes will not result in significant turning queues.*

Recommendation PD 16 *Increase the convenience for pedestrians at intersections by installing automatic pedestrian detectors to provide pedestrians with the walk signal and provide sensory devices for sight and hearing impaired pedestrians.*

Recommendation PD 17 *Introduce public pathways between buildings to create more opportunities for pedestrian short-cuts where opportunities exist.*

Recommendation PD 18 *Redesign the intersection of Carrall/Powell/Water/Alexander*

Recommendation PD 19 *Widen sidewalks on Davie Street between Burrard and Jervis using building setbacks.*

Bicycling Plan Recommendations

Recommendation BK1 *Implement the downtown bicycle network shown in Figure 4.4-B.*

Recommendation BK2 *Evaluate alternatives to the proposed bike facility along Pender and Dunsmuir.*

Recommendation BK3 *Upgrade False Creek Bridges to better accommodate bicycles.*

Recommendation BK4 *Provide related bike facilities to encourage and make bicycling safer and more convenient (e.g. bike parking facilities, way-finding/destination signage, education).*

Recommendation BK5 *Create bicycle friendly streets along all local streets within the downtown.*

Recommendation BK6 *Monitor and assess the development and impact of the bicycle network on a regular basis and expand the network as warrented.*

Recommendation BK7 *Design all new streets and multi-use paths to adequately accommodate cycling.*

Goods Movement Recommendations

Recommendation GM1 *Modify the downtown truck route network as shown in Figure 4.5-B.*

Recommendation GM2 *Remove Downtown South from the Truck Area.*

Recommendation GM3 *Review the truck loading requirements in the Parking By-law to ensure they are adequate and avoid relaxations.*

Recommendation GM4 *Monitor the municipal commercial plate program to reduce unnecessary demands on the limited on-street loading facilities.*

Recommendation GM5 *Maintain the existing system of one-way entry only to many of the rear lanes within the Central Business District and remove all lane encumbrances to the extent possible.*

Recommendation GM6 *Manage the motor coach and tour bus routes on a case-by-case basis to provide flexibility in managing conflicts.*

Recommendation GM7 *Manage tour buses by undertaking an education and enforcement program, and where necessary and practical, provide additional on-street tour bus parking and loading zones.*

Recommendation GM8 *Avoid downtown relaxations of the tour bus parking and loading provisions within the Parking By-law.*

Recommendation GM9 *Pursue additional off-street loading facilities as part of the convention centre expansion.*

Parking Recommendations

Recommendation PK1 *Regularly review downtown residential and commercial off-street parking standards to ensure that adequate, but not abundant, parking is provided to meet needs.*

Recommendation PK2 *Formulate communication programs in co-operation with major employers to encouraging employees to car pool or not drive to downtown jobs.*

Recommendation PK3 *Discourage driveways across all sidewalks in the downtown, particularly along pedestrian oriented streets and bikeways.*

Recommendation PK4 *Review existing policies that permit the development of free-standing parking garages.*

Recommendation PK5 *Consider renovating city-owned parkades to animate street frontages and encourage private owners to do the same.*

Recommendation PK6 *Urge TransLink and the GVRD to develop and implement an equitable regional parking policy to achieve regional livability and transportation goals in consultation with affected municipalities.*

Recommendation PK7 *Adjust on-street parking regulations as per Figure 4.6-F to better balance the needs of all users.*

Recommendation PK8 *Monitor the demand for special on-street parking provisions for motorcycles.*

Intelligent Transportation Systems Recommendations

Recommendation IT1 *Pursue ITS technologies to make downtown travel by pedestrians, cyclists and transit passengers more convenient and safe, and minimize overall road congestion.*

Public Realm

Recommendation PR 1: *Develop a strategy and work program for undertaking a downtown public realm plan.*

Environmental Assessment Recommendations

Recommendation EN1: *Apply street robustness and land use sensitivity analysis where future significant public consultation is involved in street changes and where significant change may affect streetscape and liveability issues.*

Recommendation EN2: *Request the GVRD Air Quality Branch to increase the parameters monitored by its downtown monitoring station to include the full range of substances and parameters monitored by the GVRD and that a baseline be established in the near future for ozone and particulate matter.*

Implementation and Funding

Recommendation IF1: *Develop an implementation strategy for the Downtown Transportation Plan.*

Recommendation IF2: *Monitor the progress in achieving the Goals of the Downtown Transportation Plan in co-ordination with the Vancouver Transportation Plan's monitoring program.*

7.2 Funding

The cost of transportation improvements has generally been paid in one of three ways:

1. Senior government (provincial and federal) contributions;
2. The City's capital budget; and
3. Development charges (Development Cost Levies (DCLs) or Community Amenity Contributions (CACs)).

These three sources would be examined for potential funding sources for the implementation of the Downtown Transportation Plan. Since 1999, TransLink has made available capital and operating funds for links in the Major Road Network. The City's capital program has been the main financial vehicle for local transportation projects. To address the need for additional capital funds to accommodate future growth, interim city-wide charges on new developments began to be levied in 2000, expanding a tool that had only been used in a few localized areas within Vancouver. Currently, a formal city-wide financing growth strategy is being developed and should be a consistent third source of funding in the future.

As a sub-set of the city-wide financing growth strategy, public benefit strategies have been developed for parts of the Central Area. These areas include Triangle West, Downtown South and other major development areas (False Creek, Coal Harbour and Burrard Landing). The public benefit strategies in these areas helped to outline potential public benefits, their costs, potential funding sources and timelines for implementation. This concept can be expanded to include the downtown or the entire Central Area. Upon completion of the Downtown Transportation Plan and the Streetscape Design Standards (also being undertaken currently), an opportunity exists to undertake an overall Public Benefits Strategy for the Downtown as directed by Council in 1998. The proposed changes in the Downtown Transportation Plan could result in a need for substantial capital funding over a 20-year period.

Other Public Benefit Strategy work needs to be done in the downtown area on parks, social housing and daycare. A significant part of this work has already been completed in sub-area plans, and converting this into a comprehensive strategy would be the biggest challenge. This could potentially be done in tandem with the transportation requirements as part of a comprehensive approach to the comprehensive Public Benefits Strategy for the downtown.

Acknowledgements

The Downtown Transportation Plan is an initiative of Vancouver City Council. Following the Vancouver Transportation Plan, Council requested staff to undertake a comprehensive review of the downtown transportation network. The purpose of the plan is to help achieve the city's transportation goals for the downtown and to guide decisions to 2021. Council created a joint Engineering and Planning team to prepare the plan and approved a consultation process to engage and obtain input from the public. The Project Team would like to thank the public who attended the many meetings, workshops, and walk-abouts, and who provided feedback during the plan's development. The final Plan reflects the time and effort downtown residents, businesses and commuters dedicated to the project. The Project Steering Committee (listed below) provided valuable guidance to the team. Finally, we want to thank the many staff in Engineering and Planning who assisted us and who provided comments on the plan.

Downtown Transportation Plan Steering Committee

Mayor Philip Owen

Councillor Gordon Price

Councillor Fred Bass

Judy Rogers, City Manager

Dave Rudberg, General Manager of Engineering Services

Larry Beasley, Director of Current Planning

Ann McAfee, Director of City Plans

Ian Adam, Assistant City Engineer, Transportation

Downtown Transportation Plan Project Team

Doug Louie, Senior Transportation Engineer, Engineering Services

Jeffrey Patterson, Senior Planner, Planning

Ian Fisher, Engineering Services

Richard Johnson, Planning

Lon Laclaire, Engineering Services

John Madden, Planning

Dean McKay, Community Services

Katia Robichaud, Engineering Services

MUSTEL GROUP

In association with

TSI consultants

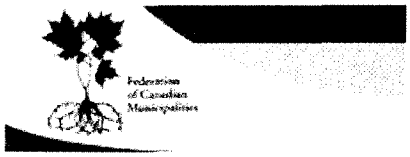
Tourist and Recreational Usage of Proposed Downtown Streetcar

November 30, 2004

Presented to:

City of Vancouver, Engineering
Vancouver, BC

402 - 1505 West Second Avenue Vancouver BC V6H 3Y4
general@mustelgroup.com www.mustelgroup.com Tel 604 [illegible] Fax 604 [illegible]



This study has been produced with assistance of the Green Municipal Enabling Fund, a Fund financed by the Government of Canada and administered by the Federation of Canadian Municipalities. Nothwithstanding this support, the views expressed are the personal views of the author(s), and the Federation of Canadian Municipalities and the Government of Canada accept no responsibility for them.

Contents

Executive Overview

Introduction

The City of Vancouver has developed preliminary plans for a Downtown Streetcar service to provide public transit to key tourist and recreational destinations, as well as to emerging downtown residential neighbourhoods (i.e., Southeast False Creek). An initial phase of the service would be built to run between Waterfront Station and Granville Island with a Phase 1 extension to Stanley Park and a Phase 2 route from Science World to Granville on Pacific (serving the Yaletown/GM Place/BC Place area), although note that future phases are not dependent on each other. At this time the City has commissioned marketing research to assess the potential interest in the Downtown streetcar concept and to develop some planning level ridership estimates for such a service among tourist and potential resident recreational users. Mustel Group has conducted the market research and TSi Consultants has developed planning level ridership estimates.

Two market research surveys were conducted between July 29 and August 24, 2004. One survey was completed on-site among over 600 tourists visiting six Downtown tourist destinations along the proposed Phase 1 route and the Stanley Park extension destination. The results were weighted by interview location based on annual tourist controls. The second, a random telephone survey, was completed among 1,200 Greater Vancouver residents 16 years of age and over, whereby over 700 qualified as recreational travelers to Downtown Vancouver for non-commuting purposes in the past three months (i.e., for shopping, personal business, entertainment, recreational or social reasons). The resident survey was weighted to match 2001 census on the basis of age within gender and area of residence.

The key findings are summarized in this *Executive Overview* with a more comprehensive, illustrated presentation of the results in the *Detailed* Findings section of this report.

Key Findings

Downtown Tourist Travel Characteristics

- **Length of Vancouver visit:** Majority of tourists visit less than one week
    - Median = 4 days
    - Mean = 6 days

- **Local accommodation:** Over half say they are staying in the Downtown area. But note, there is a greater propensity to encounter tourists staying Downtown at these locations, due to greater proximity of the interviewing sites to their accommodation.

- **Downtown trip party size:** Most tourists travel in groups of two or more (84%).
    - Median = 2 people
    - Mean = 2.9 people

- **Main mode** to today's Downtown destination: A number of different modes are used with no single mode predominating – walking, private or rented vehicle are the top two (28-29% each), followed by transit (20%).

    - Those who traveled by private or rented vehicle tended to use off-street parking just slightly more than street parking (51% and 43%, respectively).

- **Destinations visited/plan to visit:** Tourists were asked if they had visited or planned to visit any of a list of specific Downtown tourist destinations.
    - Among tourists, the top destination is Stanley Park (88%).
    - Second most popular are: Robson-Granville Street shopping area, Gastown and Granville Island (69-71% each).
    - Chinatown (54%) and Waterfront/Canada Place (40-45%) appeal to a considerable proportion of tourists.
    - Yaletown and Science World appear to attract a minority of tourists (23% and 21%, respectively) and BC Place or GM Place are the least likely of these destinations for the tourist segment (12%).

Recreational Resident Characteristics

- **Demographically:** GVRD residents who visit Downtown for recreational purposes in the past three months (not for work/school commuting) are largely similar to the population overall.
    - Just slightly more recreational visitors are residents of the City of Vancouver (37% vs. 30% among residents in total).
    - About one-in-five of these recreational visitors also work or go to school Downtown.

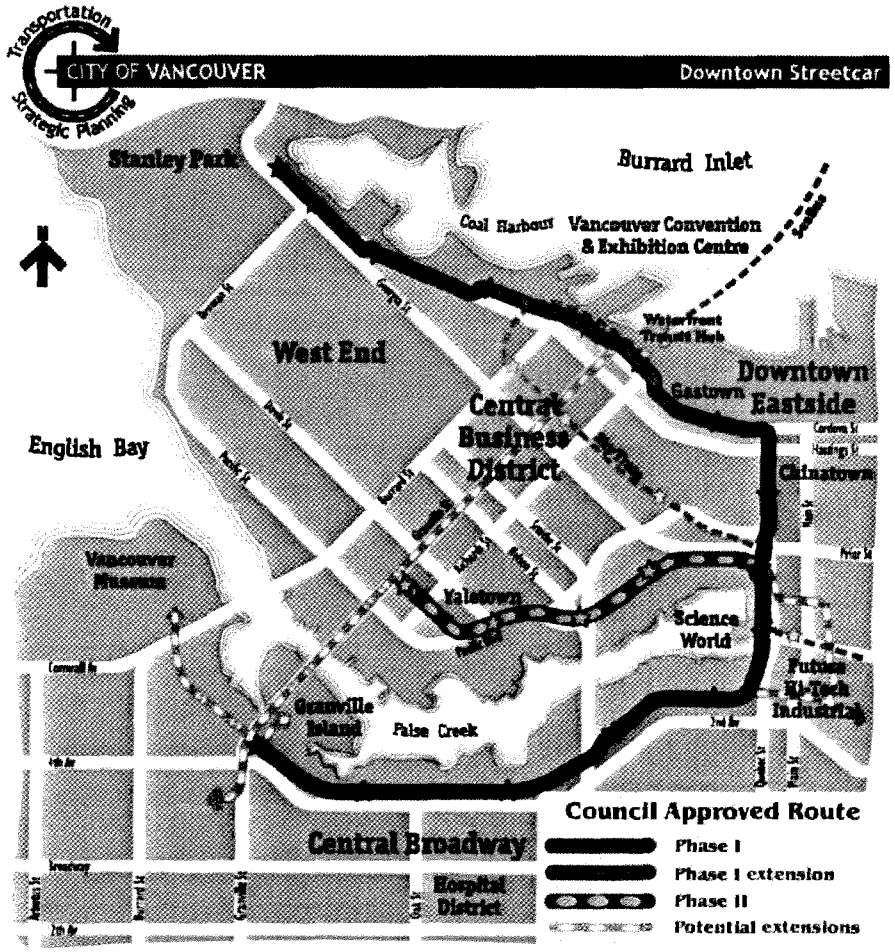
- **Usual mode** to Downtown Vancouver: private vehicle is the most popular mode for shopping, personal business, entertainment or recreational trips Downtown (61%) with most traveling for these purposes in carpools of two or more (46%). Nevertheless, nearly half (46%) say that transit is a usual mode for traveling Downtown.
    - Note that 12% mention both private vehicle and transit as a usual mode for going Downtown (but not necessarily in the same trip).

- In total, 7% use other sustainable modes (mainly walking, but also some cycling). There is minimal mention of rollerblading, skateboarding or wheelchairing.

Appeal of Proposed Downtown Vancouver Streetcar

- **Streetcar concept:** The following concept description was presented to respondents.

> *Modern, rail-based street cars would run through Downtown Vancouver and around False Creek, as seen on this map … covering major tourist destinations, such as Canada Place, Gastown, Chinatown, Science World and Granville Island.*
>
> *Streetcars would run approximately every 10 minutes in both directions. Streetcar systems like this are quieter than buses, non-polluting, wheelchair and bike-accessible and offer a very smooth ride.*
>
> *Riders of the streetcar would be able to use their fare to transfer onto the rest of the Greater Vancouver transit system of SeaBus, SkyTrain and transit buses.*
>
> *The service would cost in the range of 2 to 3 dollars.*

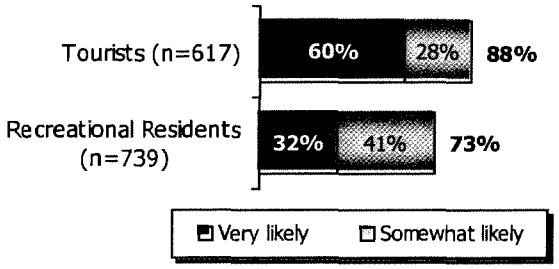


Updated map (full survey materials appended).

Note that in concept testing consumers tend to overstate their future intentions, particularly a service or product that is completely new (in this case new to Vancouver). As a result, ridership forecasts (later in this report) are based on down-weighted survey results verified against independent estimates developed using other techniques (e.g., preliminary EMME/2 estimates, benchmarking of similar systems currently operating worldwide). This multi-staged approach ensures that the ridership estimates are robust as they do not rely solely on one estimation method.

- **Reported interest in using streetcar:** The following survey findings on the likelihood of use, though not down-weighted, indicate the level of enthusiasm for the streetcar idea. Tourists in particular are very likely to use the new service. Although these results must be treated with caution in terms of user projections, the findings clearly reveal that the streetcar in concept has broad support among those who visit the Downtown – both tourists and recreational residents.

Likelihood of Using Streetcar Service



Q.8) TOURISTS: If this streetcar service was available, how likely would you be to use it to travel to this particular location?

Q.9) RECREATIONAL RESIDENTS: If this streetcar service was available, how likely would you be to use it to travel to the Downtown Vancouver areas we mentioned?

- **Appeal of specific destinations:** Tourists and recreational residents agree on the top two streetcar destinations, but tourists are generally more enthusiastic and committed about using the streetcar. (*These results are not down-weighted*)
    - Stanley Park ranks first:
        - Tourists: 85% "very/somewhat likely"; 64% "very likely"
        - Recreational residents: 69% "very/somewhat likely"; 34% "very likely"
    - Granville Island ranks a close second:
        - Tourists: 81% "very/somewhat likely"; 57% "very likely"
        - Recreational residents: 61% "very/somewhat likely"; 38% "very likely"
    - The next most popular streetcar destinations are:
        - Tourists: Gastown-Waterfront-Chinatown (71-77% total likely with 45-48% "very likely")

  - Recreational residents: the sports arenas: GM Place/BC Place (52% total likely with 23% "very likely") and then Gastown and Waterfront (45-49% total likely; 21-22% "very likely")

- **Barriers to using streetcar:**
  - Tourists: Prefer to walk for exercise and prefer or need rented vehicle
  - Recreational residents: Satisfaction with current transit and preference for using own vehicle

- **Main appealing features of streetcar:**
  - Tourists: Easy, convenient access firstly, but also service frequency, good price, environmentally friendly and general convenience
  - Recreational residents: Service frequency and needed destinations/good access to destinations are top encouragements to use the streetcar, but also the non-polluting/environmentally friendly feature is appealing.

- **Expectation to combine with streetcar with other modes:**
  - Tourists: Most (59%) would combine streetcar use with transit, specifically with buses (42%), SkyTrain (33%) and SeaBus (19%)
  - Recreational residents: The vast majority (87%) of potential streetcar users would connect to another mode- divided between the transit system (largely buses and SkyTrain, 41-42% each) and private vehicles (36%) necessitating parking availability. Note that recreational residents say that private vehicles (largely carpools) and public transit (mainly buses) are the main modes that streetcars would replace. About half (48%) of potential streetcar users say that the streetcar would replace transit.

- **Other marketing issues:** Among recreational residents, heaviest use would be on weekends (88% vs. 53% weekdays) and the preferred payment method is cash (64%).

- **Influence of specific factors on streetcar use:** Tourists and recreational residents agree on the top three factors that would have greatest importance in the decision to use the streetcar.
  - Service frequency
  - Destinations served
  - Ability to transfer for free to other transit
  - As well, the availability of day passes is of high importance to tourists.
  - Also of interest, the style of streetcar is not an issue with little differentiation in greater preferences for the modern or historic style.

Planning Level Ridership Forecast

Downtown Streetcar ridership estimates were calculated for the Phase 1 system (Waterfront to Granville Island), if open today and fully mature (i.e., in operation for 2 to 3 years). Similarly, estimates were prepared for the Phase 1&2 system Stanley Park to Granville Island and Science World to Yaletown.

- If the system were open today and fully mature, Phase 1 (Waterfront to Granville Island) annual boardings for the tourist and recreational markets are estimated at 2.1 to 3.5 million. Adding the preliminary model-based estimate for commuting/education trips produces total annual boards ranging from 3.1 to 4.5 million.

- Phase 1&2 (Stanley Park to Granville Island and Yaletown) annual boardings for the tourist and recreational markets are estimated at 3.8 to 5.9 million. Adding the commuting/education model estimate produces total annual boards ranging from 7.2 to 9.3 million.

- Further details of annual ridership estimates are presented in Section III of the *Detailed Findings* by market segment (including tourist and recreational resident plus a model-based commuter/education estimate) and by summer/winter daily boardings.

- The initial "planning-level" ridership estimates should be verified against independent benchmarking of similar systems currently in operation worldwide.

- When the streetcar design and operational characteristics are refined, more accurate ridership forecasts can be considered for the tourist and recreational markets using structured stated-preference surveys.

Conclusions

Clearly the potential recreational markets for the proposed Downtown Streetcar support the service concept integrated with the current transit system. There is a high level of interest expressed in the idea and people recognize the benefits such a service would provide.
In sum,

- Significant interest is indicated among both tourists and recreational residents.
- Tourists are the most enthusiastic, suggesting that the streetcar service has potential to enhance greater tourist growth for Vancouver.
- The Phase 1 routing will serve popular destinations with Stanley Park and Granville Island being the most frequented.
- Service frequency should be approximately 10-minute intervals or less.
- Streetcar fares and pricing should be integrated with the whole public transit system.
- The type of streetcar (modern vs. historic styling) is not a key factor.

At this stage, the planning level ridership estimates appear promising. The following next steps are recommended;

- These planning level ridership estimates need to be assessed in terms of fiscal and operational feasibility.
- The estimates should also be assessed for reasonableness against independent benchmarks of similar types of existing services elsewhere.
- To obtain more accurate design level tourist and ridership estimates, specific stated preference surveys should be conducted.

Foreword

Background and Objectives

The City of Vancouver has developed concept plans for a Downtown Streetcar system. Designed to initially connect several key tourist and recreational destinations, as well as emerging downtown residential neighbourhoods (i.e., Southeast False Creek), the Downtown Streetcar service would be built in phases and would introduce a different rail transit experience into Vancouver's array of transportation choices. Use of attractive modern or historic style light rail vehicles could add interest and distinctly identify the new service to recreational and other users. This initiative not only meets City and regional transportation objectives, but also is consistent with Downtown sustainability and tourist enhancement goals. Accordingly, the proposed Downtown Streetcar may have the potential to attract a broader and different type of market than traditional transit services, since streetcars generally draw proportionately more local recreational travelers and tourists and thereby, may be used as heavily on weekends as weekdays.

On behalf of the City, Mustel Group Market Research, in association with TSi Consultants, has conducted two market research surveys and subsequent analysis to serve two main purposes:

i) To quantitatively assess potential demand for the Downtown Streetcar among key recreational use target groups: local resident recreational travelers and non-resident visitors – by measuring likelihood of use and sensitivity to marketing variables;

ii) To gauge consumer interest, in terms of perceptions, benefits, deterrents to use, as well as general acceptance of a streetcar system for the City and various other travel characteristics that may have an impact on usage.

Methodology

Recreational Residents - Telephone Methodology

A telephone survey was conducted with a random sample of 1,200 Greater Vancouver residents 16 years of age and over, including regular transit users and non-users who would consider using a Downtown streetcar if the service met their needs. Qualifiers, those who define the potential market for the Downtown streetcar, for the full survey were screened further on having traveled to downtown Vancouver in the past three months for shopping, personal business or entertainment/recreation purposes. Non-qualifiers were asked some basic demographics only, for sample weighting purposes.

The sample included a proportionate random sample of respondents from across the Greater Vancouver Regional District, which was then boosted by an additional oversample of residents of the City of Vancouver. This resulted in a total of 1,200 interviews with qualifying and non-qualifying residents in order to achieve a total of 739 interviews with qualifiers.

At the data processing stage, minor weighting adjustments on the basis of age within gender and area were made to match the sample (including non-qualifiers) to the most recent Statistics Canada 2001 census data for the area. Weighting details are appended.

Sample Selection

Several steps were taken to ensure the sample was randomly selected allowing the results to be projectable.

First, households contacted were randomly selected using an up-to-date database of published, residential listings. Once contact was made, the individual within the household was also selected at random (using the "next birthday" method). A procedure of alternating male and female interviews was used to ensure a gender-balanced sample.

A minimum of five attempts were made to obtain an interview with the selected household/individual to minimize potential bias due to non-response.

Data Collection

The questionnaire was designed with input from the City and TransLink, and when finalized, translated into Chinese and programmed into Mustel Group's CATI software. A total of 109 interviews were completed in Chinese. The survey was pre-tested prior to data collection.

All interviewing was conducted August 6 to August 24, from Mustel Group's Vancouver-based CATI (computer assisted telephone interviewing) centre, where interviewers are continuously supervised and monitored. Field work was conducted from 4:00 pm to 9:00 pm weekday evenings and from 10:00 am to 4:00 pm on weekends.

Onsite Methodology

Personal intercept interviews were conducted with non-resident visitors (tourists) to Vancouver at key tourist destinations. This included visitors to Vancouver from other parts of BC and Canada as well as overseas tourists and those in Vancouver just for the day en route to a cruise.

A detailed sampling plan was developed to cover six key locations along the proposed streetcar route and to cover days of the week and day-parts. In total, a target of 600 interviews with 100 per location was planned.

The locations and distribution of actual interviews completed were as follows:

Actual Interview Completed			
	TOTAL WEEKDAY	TOTAL WEEKEND	TOTAL INTERVIEWS
Waterfront Station	62	43	105
Gastown	63	46	109
Chinatown	29	21	50
Science World	61	40	101
Granville Island	111	40	151
Stanley Park	45	56	101
TOTAL	**371**	**246**	**617**

The fieldwork period ran from Thursday July 29 until Friday August 6, 2004.
During each day, interviews were conducted primarily from 10:00 am to 6:00 pm with interviews distributed throughout the day such that approximately half are conducted before 2:00 pm and half after 2:00 pm. Interviewing was also extended at certain destinations that attract tourists during the evening hours (e.g. Gastown, Chinatown).

Care was taken to schedule interviewers at locations according to how busy each location was likely to be on any given day. This was important when accounting for weekdays versus weekend and for the civic holiday occurring during the fieldwork period.

It was also necessary to be able to respond to variations in tourist traffic flow. This was particularly apparent in the case of the Chinatown location. Here it was found that tourist traffic was not as dense as expected. When attempts were made to address this by interviewing late into the evening during the night market interviews became skewed towards males.

In response to this it was agreed with the City of Vancouver that efforts be switched from Chinatown to the much heavier traffic area of Granville Island.

Prior to fieldwork commencing a list of contact information was supplied to Mustel Group by the City of Vancouver in order to obtain permission or simply inform out of courtesy relevant individuals or organizations at each of the interview locations.

Interviewers were provided with detailed instructions as to where to conduct their intercept surveys for each location and to take care not to impact on access to stores or attractions to avoid upsetting local business owners. They were further instructed to interview a spread of ages and gender and respondents from a range of party sizes where possible.

Waterfront Station: Surveys were conducted on City property (public areas) around Waterfront Station. Interviewers were instructed to avoid venturing towards Canada Place, World Trade centre, Pan Pacific Hotel or the promenades at the sides of these buildings. However, interviewing was conducted on public sidewalks across from these areas where tourists could be encountered.

Gastown: The focus here was mainly on Water Street (both sides) including around Storyeum and other attractions and also Cordova Street.

Chinatown: The focus here was on Pender and Main Streets, including the Chinese Gardens. Some additional interviewing time was completed in Chinatown during Friday and Saturday evenings to pick up traffic at the evening market.

Science World: Interviewing did not start at the Science World location until Saturday 31st July as they were conducting their own survey on site until Friday 30th. Interviews were conducted around the Science World attraction.

Granville Island: Here it was important to avoid a bias to ferry passengers, achieved by moving around to a mix of central traffic areas.

Stanley Park: Interviewing was conducted at general areas that included the bus loop and Lost Lagoon, the Totem Poles, Devonian park and particularly the area around the info booth near the aquarium.

Interviewers were supplied with copies of the questionnaire in English and Chinese. They were further supplied with a show-card displaying a map of the proposed streetcar route, approximate travel times of the streetcar and photographs of modern streetcars currently operating in other cities. A letter of authorization was also supplied by the City explaining the purpose of the survey and providing contact details should any respondent have further questions.

At the data processing stage, the tourist sample was weighted by interview location on the basis of annual tourist controls, developed from Tourism Vancouver, BC Tourism and specific site traffic counts as available.

Details of the weighting for both tourists and recreational resident surveys are found in the *Appendices*. Copies of the questionnaires and materials used in both of these studies are also appended.

Results

The results are presented in the format of an *Executive* Overview and a more comprehensive, illustrated *Detailed Findings* section.

Base sizes shown in graphs and tables reflect actual (rather than weighted) number of interviews completed. The following notations are used to indicate numerical differences in summary tables of this report (at the 95% level of confidence).

Significantly higher ▲ Directionally higher ▲ Significantly lower ▼ Directionally lower ▼
Significantly higher means that there is less than 5% probability of the results occurring by chance.

Terms and definitions used: Note that throughout this report, the following terms are used with reference to these definitions:

"Tourist" refers to non-residents of the GVRD who were intercepted on-site in six proposed Streetcar destination areas.

"Recreational Resident" refers to those GVRD residents 16 years of age and over who are either current transit users or non-users who would consider using a Downtown streetcar and who traveled to the Downtown areas of interest in the past three months for non-work/school purposes. These respondents qualified for the telephone survey.

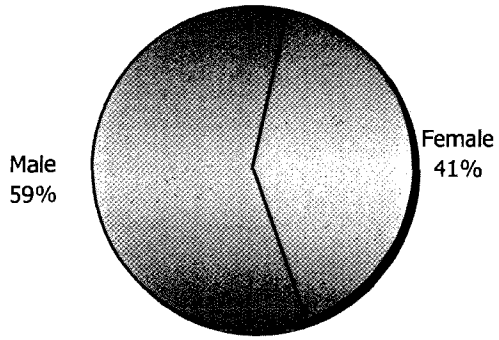
I. Detailed Findings – Tourist Market

1.0 Tourist Demographic Profile

Tourists (non-resident visitors) were intercepted on-site at or near six proposed streetcar destinations. The demographic characteristics of the tourists interviewed are shown below.

Gender: While there was an attempt to alternate interviews with men and women, respondents were skewed to males at most locations (54-62%), but particularly in Chinatown (82%). Persons traveling alone to *any* of these destinations tended to be male (70%), therefore increasing the likelihood of intercepting men, since only one person per trip party was interviewed.

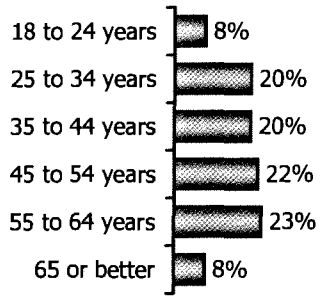
Gender of Tourist Sample



Base: Total tourists (n=617)

Age: The age of tourists interviewed was evenly distributed across ages 25-64, but with fewer in the youngest and oldest categories (8% in each). There are also some differences by destination. The Science World sample had a lower representation of visitors 55 years of age and over (11%) and, to a lesser extent, so did the Stanley Park sample (19%). The Chinatown sample had the largest proportion less than 35 years of age (54%).

Age Category

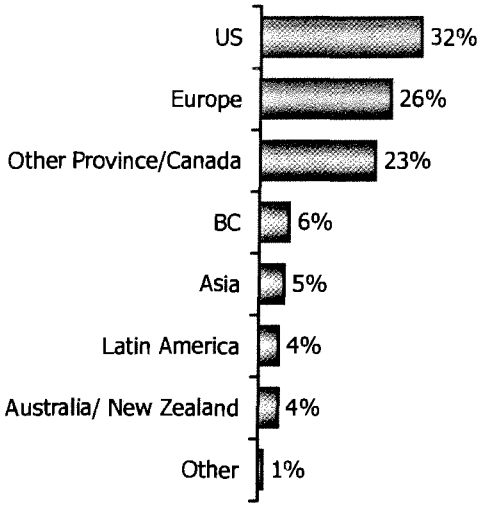


Base: Total tourists (n=617)

Q.14) Into which of the following age categories do you fall?

Home residence: Most non-resident visitors were from the US (32%), followed by Europe (26%) and other Canadian provinces (23%). Europeans were encountered more at the Waterfront Station location (42%).

Area of Home Residence



Base: Total tourists (n=617)

Q.15) Where is your home residence?

2.0 Tourists' Vancouver Stay Profile

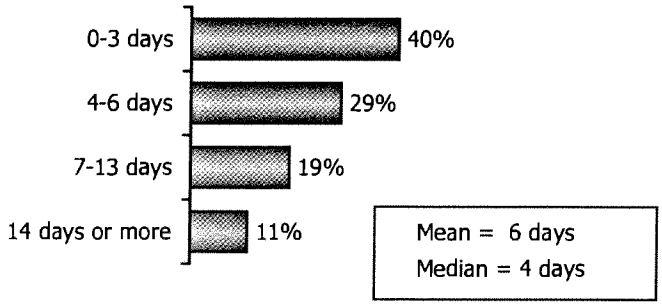
2.1 Length of Vancouver visit -- Tourists

The majority of these Downtown tourists are visiting the Greater Vancouver area for less than one week (69%) with the median being 4 days and the mean 6 days. Note the following differences:

- Tourists who have come to a streetcar destination by public transit tend to have a longer stay in Greater Vancouver (9 days on average, median 6 days). Perhaps more time is required to become familiar with the transit system, or this is not their first visit. Among those who are here for a shorter visit, there may be a greater urgency to find the quickest means of travel within the City.

- Those who have accommodation outside of the Downtown Vancouver area tend to be staying in the Greater Vancouver region longer (7-8 days average, median of 6 days).

Length of Visit to Greater Vancouver



Base: Total tourists (n=617)

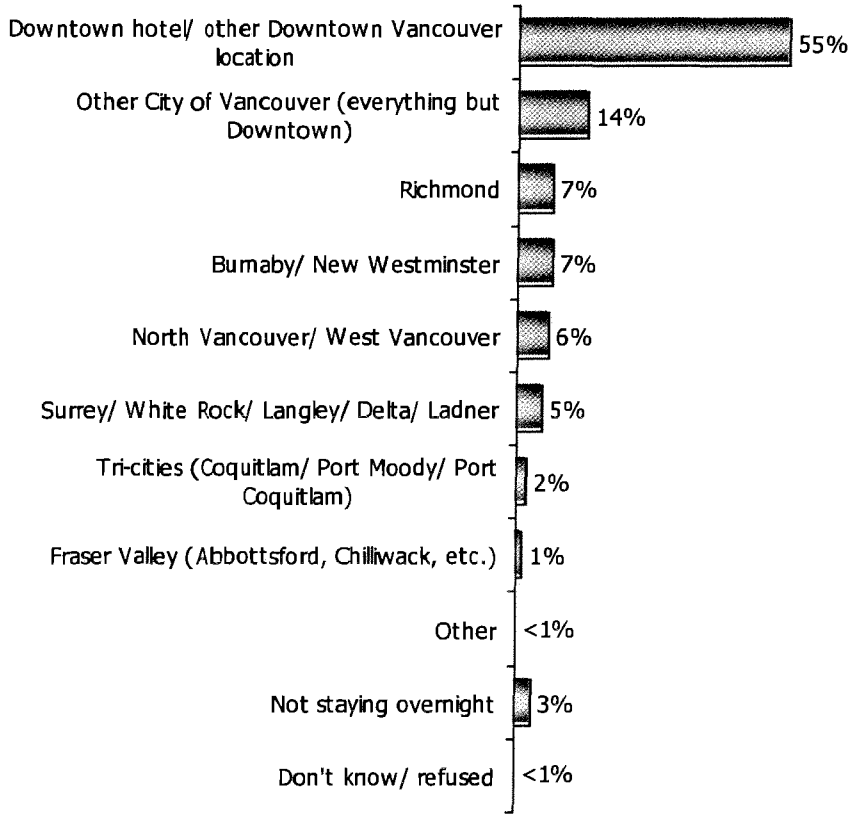
Q.4) How many days will you be visiting the Greater Vancouver area on this trip?

2.2 *Local accommodation -- Tourists*

Over half of the tourists interviewed at the proposed streetcar destinations indicated that they are staying in the Downtown area. Since these proposed streetcar destinations are more easily accessible and quicker to get to for people staying Downtown, note that they also have a higher likelihood of being intercepted on-site.

Tourists visiting less than one week are most likely to be staying Downtown (about two-thirds 64%).

Local Accommodation



Base: Total tourists (n=617)

Q.5) Where are you staying while in Vancouver?

3.0 Tourists' Downtown Trip Characteristics

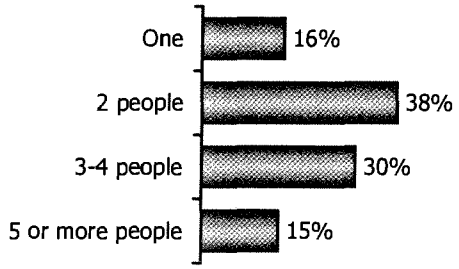
3.1 Downtown trip party size -- Tourists

Most tourists have come Downtown accompanied by others; just 16% are alone. The mean party size is 2.9 people; the median is two.

- Those who have traveled Downtown today by transit are in somewhat smaller trip parties (on average, 2.4).

- Waterfront and Chinatown visitors appear to have slightly smaller trip party sizes (means of 2.4 and 2.1, respectively).

Trip Party Size



Mean = 2.9 in Downtown trip party
Median = 2.0 in Downtown trip party

Base: Total tourists (n=617)

Q.2) First of all, including you, how many people are in your trip party today on this visit to this location (i.e., Stanley Park, Waterfront Station, Gastown, Chinatown, Science World, Granville Island)?

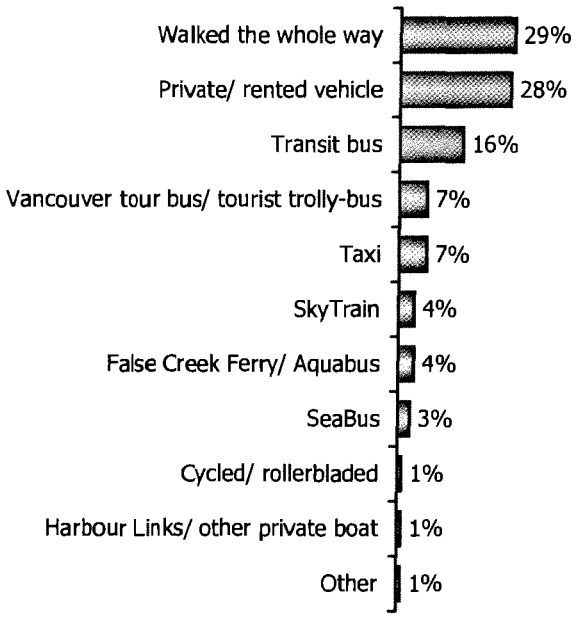
3.2 *Main mode to this destination -- Tourists*

The most popular modes among tourists to travel to these destinations are walking (29%), private or rented vehicle (28%), followed by transit (20%).

There are differences based on where the visitor is staying, party size and destination.

- ***Local accommodation:*** Those staying in the suburbs are more likely to travel by private/rented vehicle (59%). Those staying downtown are more apt than others to walk (42%), while those in other parts of the City of Vancouver use transit more than other groups (34%).
- ***Party size:*** Tourists in parties of three or more are more likely to use a private/rented vehicle (42%)
- ***Downtown destination:*** The most popular modes are:
  - Granville Island: Private or rented vehicle (42%).
  - Gastown and Chinatown: Walking (46% and 50%, respectively).
  - Science World: SkyTrain (32%) or private vehicle (30%).
  - Waterfront: Walking (35%) or transit (bus 22%, SeaBus 8%)
  - Stanley Park: Private/rented vehicle (35%) or walking (22%) or transit bus (22%)

Main Mode to Destination



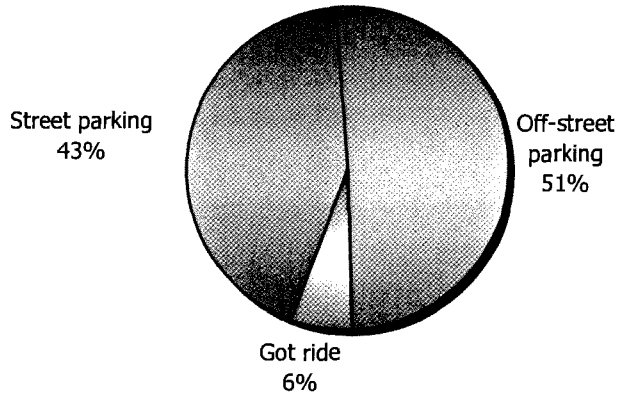
Base: Total tourists (n=617)

Q.3a) What main type of transportation did you use to arrive at this location today?

3.3 Use of Downtown parking -- Tourists

Those who used a private or rented vehicle were asked if the vehicle was parked and if so, where. Nearly all tourists who arrived by automobile parked downtown (94%), rather than being dropped off (6%). Those who parked were divided with somewhat more parking off the street (51%) than using street parking (43%).

Use of Downtown Parking



Base: Total who drove a private/rented vehicle to this location (n=164)

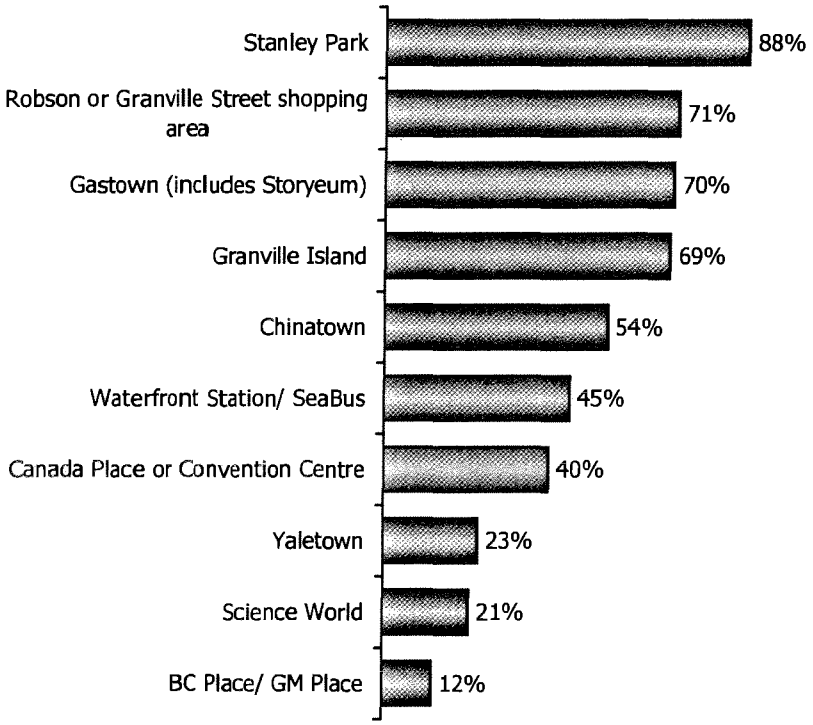
Q.3b) Did you (or a member of your party) park the car or did you get a ride here?

3.4 Destinations visited/plan to visit -- Tourists

Respondent tourists were asked which of specific Downtown tourist destinations they had already visited or were planning to visit during their stay in Vancouver. Not surprisingly, perhaps, Stanley Park is the top destination (88%). Three destinations vie for second position in the ranking: Robson-Granville Street shopping area (71%), Gastown (70%) and Granville Island (69%). Chinatown is a planned destination for over half (54%) and Waterfront/Canada Place for just under half (40-45%).

The least likely destination for tourists is BC Place/GM Place (12%), followed by Yaletown (23%) and Science World (21%).

Destinations Visited or Plan to Visit



Base: Total tourists (n=617)

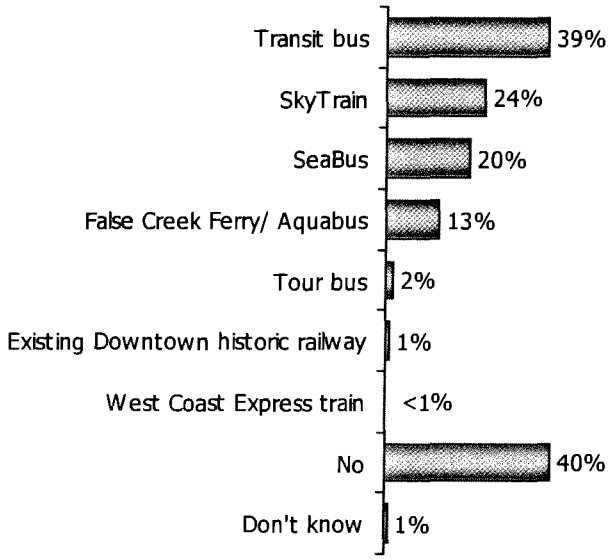
Q.6a) Which, if any, of the following destinations have you visited or are you planning to visit during your stay in Greater Vancouver?

3.5 Transit use to planned/visited destinations -- Tourists

A majority tourists have or expect to use transit while visiting Vancouver. Although only one-in-five identified transit as the main mode of transportation to the location where they were interviewed, a majority of tourists (59%) claim that they have or plan to use transit to visit their planned Downtown destinations. Among those who did ***not*** use transit to this destination, about half (48%) state that they either took or planned to take transit to other destinations Downtown. The most popular (and most available) is transit bus (38%), followed by SkyTrain (24%) and SeaBus (20%).

SkyTrain is somewhat more popular among those who were intercepted at Science World (46%) and Waterfront (38%), compared to the tourist sample in total (24%).

Transit Use to Destination



Base: Total tourists (n=617)

Q.6b) Did you take or plan on taking any types of transit to any of the above destinations?

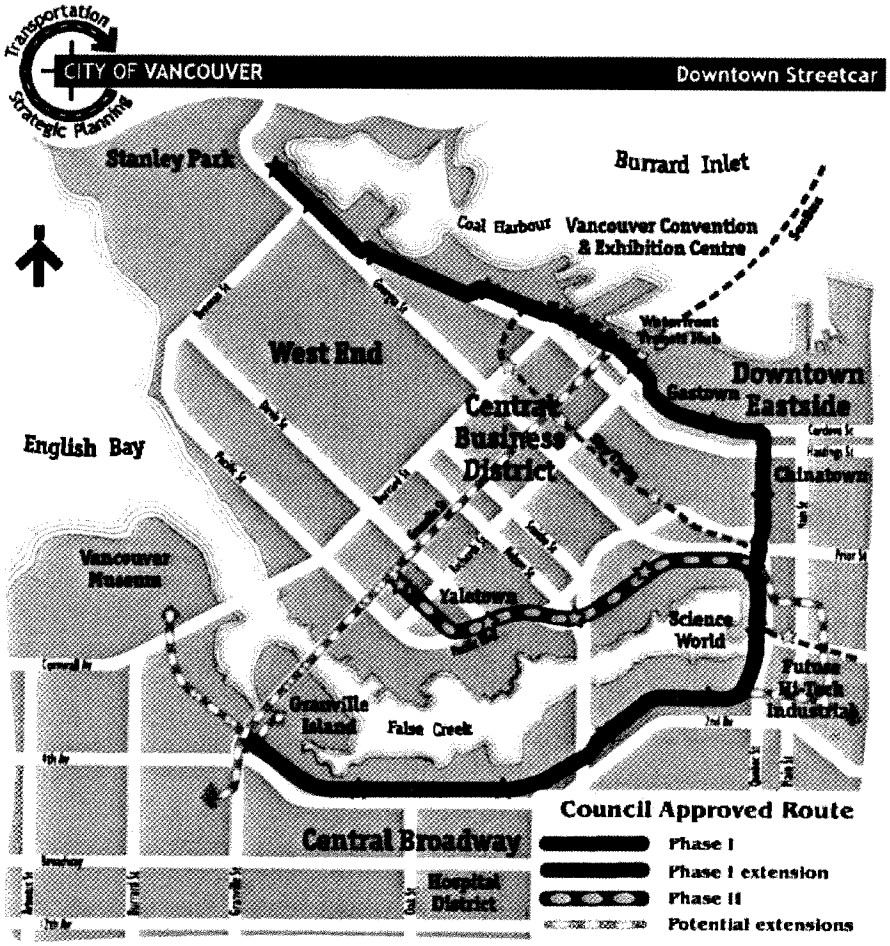
4.0 Appeal of Downtown Streetcar Overall Concept to Tourists

4.1 Interest in using streetcar service concept -- Tourists

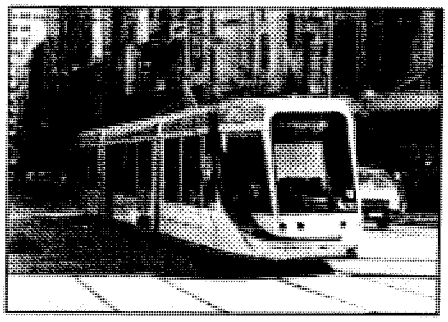
Introduction to concept testing: Tourists heard a concept description of the proposed Downtown Streetcar service, as follows:

> *Modern, rail-based street cars would run through Downtown Vancouver and around False Creek, as seen on this map ... covering major tourist destinations, such as Canada Place, Gastown, Chinatown, Science World and Granville Island.*
>
> *Streetcars would run approximately every 10 minutes in both directions. Streetcar systems like this are quieter than buses, non-polluting, wheelchair and bike-accessible and offer a very smooth ride.*
>
> *Riders of the streetcar would be able to use their fare to transfer onto the rest of the Greater Vancouver transit system of SeaBus, SkyTrain and transit buses.*
>
> *The service would cost in the range of 2 to 3 dollars.*

Respondents on-site also were handed a map showing the main route and extension routes, with the stops identified and photos showing a few examples of possible styles of modern streetcars. The following map is slightly updated (actual survey materials used are appended).



Approximate Running Times: Every 10 minutes
Approximate Journey Times: Waterfront to Science World – 10 minutes
Science World to Granville Island – 8 minutes



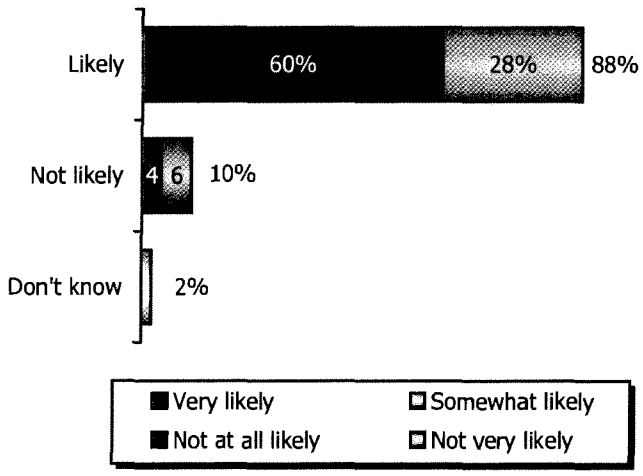
It is important to bear in mind that consumers tend to overstate their future intentions when hearing a concept, particularly a service or product that is completely new (in this case new to Vancouver). Therefore, the ridership forecasts found in Section III of this report are based on down-weighted survey results verified against independent estimates developed using other techniques (e.g., preliminary EMME/2 estimates, benchmarking of similar systems currently operating worldwide). This multi-staged approach ensures that the ridership estimates are robust as they do not rely solely on one estimation method.

Overall Findings: Most Downtown tourists say that they are likely to use such a streetcar service (88%). Six-in-ten respondents said they are "***very*** likely" to use the proposed streetcar to travel to the location where they were interviewed (60%).

Somewhat more likely to use the proposed service are:

- Those who used transit today to the destination (68% very likely).
- Those who would combine use of the streetcar service with transit (73% very likely).
- Tourists staying anywhere in Vancouver or in the nearest suburbs (North Shore/Burnaby/New Westminster/Richmond (59-64% very likely)

Likelihood of Using Streetcar Service



Base: Total tourists (n=617)

Q.8) If this streetcar service was available, how likely would you be to use it to travel to this particular location? Would you say: very likely, somewhat likely, not very likely or not at all likely?

4.2 Barriers to Streetcar Use among Tourists

Among those not interested in using the streetcar, reasons focus on two main issues:

- Some tourists prefer to walk (38%), most likely wanting the exercise.
- Another key reason for not using the streetcar is that some tourists prefer or need to have a rented vehicle (31%).

Reasons Unlikely to Use Streetcar

	Total (65) %
Prefer to walk	38
Prefer to have/ need vehicle/ rented vehicle	31
Inconvenient (with kids, for today's route, for a large group, too far from streetcar stop, etc.)	17
Close/easy to get to destination from where staying, not far to walk	11
Miscellaneous other	11

Base: Total not very/not at all likely to use the Streetcar service

Q.9) Why are you not likely to use it?

4.3 Appealing Features to Tourists

After hearing the description and rating their likelihood of using the proposed streetcar, those who said they were likely to use the service were asked to describe what specific features they particularly liked or what would most encourage them to use it.

- Easy, convenient access to the main tourist sites (34%) is at the top of the list, particularly among Chinatown tourists (51%).
- Other frequently mentioned features include:
  - The service frequency (21%)
  - The good price (23%)
  - Being environmentally-friendly (22%)
  - Offering general convenience/ease (20%)

Appealing Features that Would Encourage Use of Streetcar

	Total (543) %
Easy/ convenient access to main tourist sites/ good for visitors	34
Good price	23
Non-polluting/ environmentally friendly	22
Frequency	21
Easier/ more convenient	20
Get on and off anywhere/ easy to access	14
Quick/ saves time	13
Park and Ride available/ don't have to worry about parking	12
Comfortable	10
Easier to sightsee/ see the view	6
Quiet	6
Can reduce/ avoid traffic congestion	5
Connect/ transfers to main transit	4
DayPass	2
Bike friendly	2
Modern	2
Wheelchair accessibility	1
Air conditioned	1
Miscellaneous comments	8
Nothing in particular	1

Base: Total not very/not at all likely to use the Streetcar service

Q.10) What specific features or characteristics of the streetcar service would most encourage you to use it? What do you particularly like about it?

5.0 Tourist Expectation to Combine Streetcar with Transit

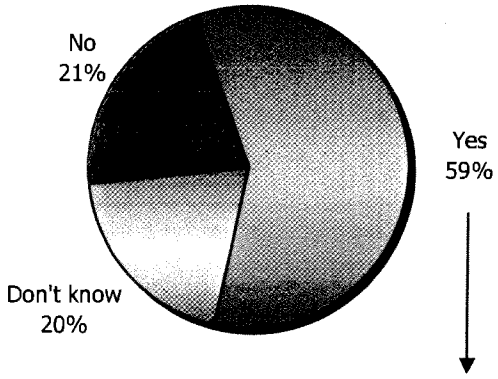
Among tourists claiming that they are likely to use the streetcar, a majority say that they would combine its use with other modes of transit. Bus (the most available form of transit) is named the most (42%), followed by SkyTrain (33%) and then SeaBus (19%).

More likely to say they would transfer to/from other forms of transit include the following:

- Those who used transit to the destination where intercepted (81%)
- Tourists under 35 years of age (69%)
- Those intercepted at Waterfront Station (73% in total with 50% of them saying bus, 47% SkyTrain and 34% SeaBus)
- Those who have a longer stay in the Vancouver area (68%)

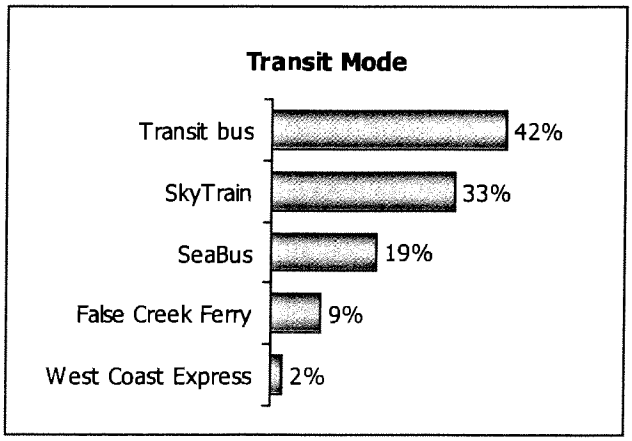
We noted earlier that 59% of all tourists surveyed plan to or already have used transit to one of the selected downtown destinations that would be served by the proposed streetcar line. Two-thirds of this group expects to combine the streetcar with other transit modes (67% of the 59% of tourists).

Combining Use of Streetcar with Other Transit



Base: Total very/somewhat likely to use Streetcar service (n=543)

Q.11) Would you be combining your use of the Streetcar with any other transit modes?



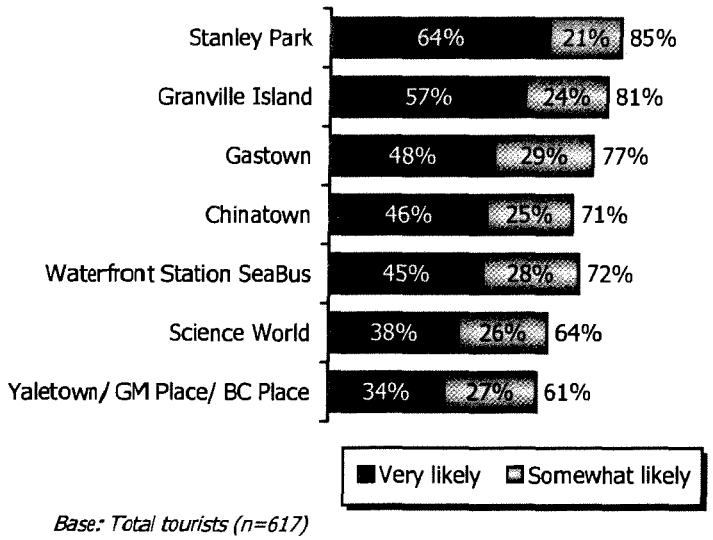
6.0 Tourists' Likelihood of Using Streetcar to Specific Destinations

Tourists interested in the streetcar after hearing the concept description were then asked their likelihood of taking the streetcar to each of the other destinations on the proposed Phase 1 route, as well as the likelihood of using the service to the extended Phase 2 route destinations. These findings (shown here "as reported likelihood" with no down-weighting) are further indicators of the general appeal of using the streetcar to travel to these other destinations. As noted earlier, consumers tend to overstate their intentions; therefore, the survey results are down-weighted in the forecasting exercise and used as one of several sources of input to arrive at planning level ridership estimates (Section III).

Overall Findings: Stanley Park, the most popular tourist destination, also appears to be the most popular streetcar destination (85% in total, 64% very likely to use), followed next by Granville Island (81% in total and 57% very likely). The Gastown-Chinatown-Waterfront cluster of destinations ranks as third most popular (about 71-77% interested and 45-48% very likely to use). Science World and the Yaletown/GM Place/BC Place cluster are relatively less powerful in attracting users for the streetcar (61-64% total interested and 34-38% very likely).

There is a high degree of consistency across the survey intercept locations. About 84-91% at each site say "very or somewhat" likely to take the streetcar to that destination and about 61-72% are "very likely" with no statistically significantly differences by location. Although most Stanley Park visitors are interested in using the streetcar to that destination (85% in total "very *or* somewhat likely"), they appear to be ***less*** enthusiastic than visitors to the other Downtown streetcar destinations (48% "very likely" vs. 61-72% for most other interviewing locations).

Likelihood of Using Streetcar to Specific Destinations



Base: Total tourists (n=617)

Q.12) For each of the following please tell me how likely you would be to use the proposed streetcar service to travel to this Downtown Vancouver destination? Would you say: very likely, somewhat likely, not very likely or not at all likely?

7.0 Influence of Specific Factors on Streetcar Use – Tourists

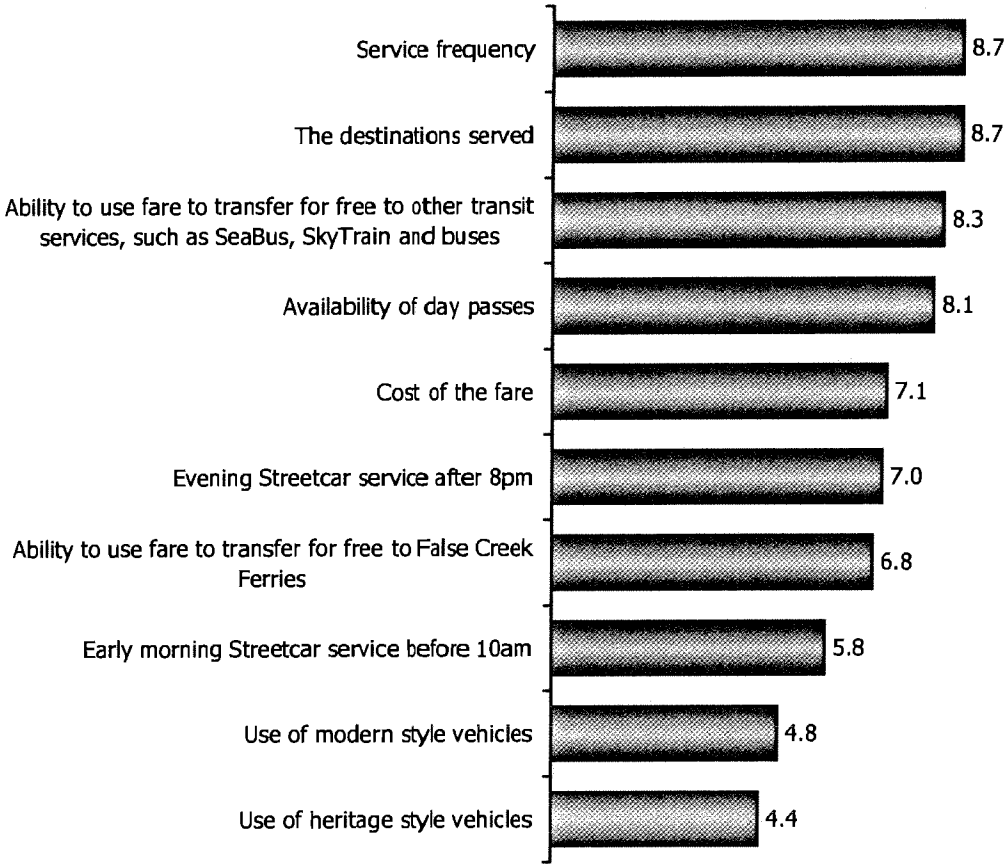
To gain a better understanding of which features have greater influence on the potential use of the streetcar service, all tourists interviewed were asked to rate the importance of a set of features in their decision to use the streetcar. A 10-point rating scale was used where 10 means "of highest importance" and one means "of no importance at all".

Greatest influence: The most important factors to tourists are: the ***destinations served*** and ***service frequency.*** A large majority agrees that these are of high importance (averaging 8.7 on the 10-point scale). Also of considerable importance are the ***ability to transfer for free to other transit*** and the ***availability of day passes*** (means of 8.3 and 8.1, respectively).

Moderate influence: *Cost of the fare, evening service* (after 8pm) and *free transfer to False Creek ferries* have moderate influence; these features receive mean scores in the 6.8 to 7.1 range and are of high importance to about 45-55% of tourists. Of somewhat lesser influence is *early morning service* (before 10am).

Lowest influence: Of least importance to tourists is the ***type of vehicles used,*** with modern style vehicles only marginally ahead of heritage style.

Degree of Influence of Specific Factors on Decision to Use Streetcar among Tourists



	% High Importance (8-10)	% Low Importance (1-3)
Service frequency	83%	3%
The destinations served	85%	4%
Ability to use fare to transfer for free to other transit services, such as SeaBus, SkyTrain and buses	74%	5%
Availability of day passes	75%	8%
Cost of the fare	51%	12%
Evening Streetcar service after 8pm	55%	16%
Ability to use fare to transfer for free to False Creek Ferries	45%	14%
Early morning Streetcar service before 10am	37%	28%
Use of modern style vehicles	22%	37%
Use of heritage style vehicles	19%	48%

Base: Total tourists (n=617)

Q.13) Next I'm going to read some factors that may or may not influence your decision to use the streetcar service. Please rate each on a 10-point scale, where "10 means that this is of highest importance" and "1 means of no importance at all" in your decision to use the streetcar

II. Detailed Findings – Recreational Resident Market

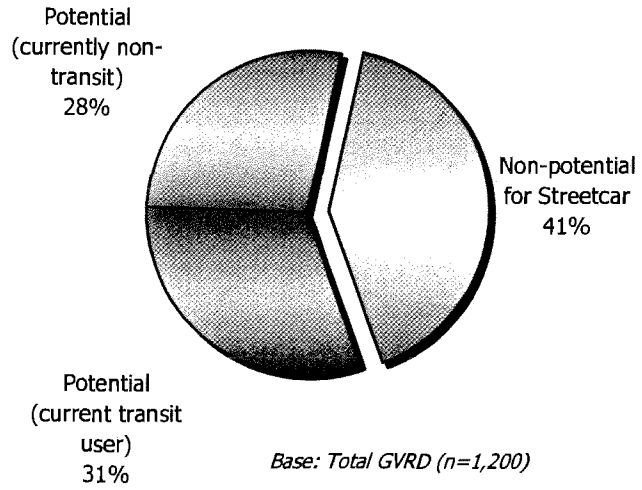
8.0 Recreational Resident Potential Market for Streetcar

A cross-section of Greater Vancouver residents were screened on the basis of the following ***qualifying criteria*** in order to identify the "recreational resident" market for the proposed downtown streetcar service:

- Greater Vancouver Regional District (GVRD) residents 16 years of age and over,
- Who are either current transit users or non-transit users who would be interested in using a Downtown Streetcar,
- Who have traveled to the Downtown Core, including Stanley Park, Gastown, Chinatown, False Creek and Granville Island, during the past three months,
- For the purpose of shopping, personal business, entertainment or recreation.

The screening process revealed that about 59% of residents 16 years and over in the Greater Vancouver Regional District (GVRD) make up the potential recreational resident market for a Downtown Streetcar service. This potential market is divided quite evenly between current transit users and current non-users.

Downtown Streetcar
- Potential Recreational Resident Market -



Base: Total GVRD (n=1,200)

Q.4) Do you currently take any of the following at least once a month on a regular basis:

Q.5) If new, modern streetcar service was available, would you consider taking it if the service met your needs?

Q.6a) Do you travel to any of these areas of Downtown Vancouver at least once every 2-3 months ... for shopping, personal business, entertainment or recreational purposes?

9.0 Recreational Resident Profile

9.1 Demographic profile – Recreational Residents

In terms of the demographic profile, the potential recreational resident market for a streetcar service is largely similar to the population overall. There are, however, some differences – none dramatic, but a few statistically significant (at the 95% confidence level) and some are noted as "directional" differences (only significant at the 90% confidence level). Differences from the current transit user profile are also noted.

- ***Area of residence:***
  - As would be expected, the potential streetcar market has a somewhat greater representation of City of Vancouver residents (37%) than found in the GVRD overall (30%), but somewhat less than among current transit users (44%)
  - Somewhat lower representation from the outer suburbs south of the Fraser and from the Tri-Cities (23% and 10%, respectively, versus 28% and 13% respectively in the total GVRD). Current transit users have significantly less representation from south of Fraser suburbs (16%).

- ***Employment status:***
  - There are slightly fewer retired people in the potential market segment (11% versus 14% in the GVRD overall) and
  - Directionally more students (14% of potential streetcar users) compared to the total GVRD (11%). Among current transit users, students represent a notably larger segment (22%).

- ***Age:***
  - Compared to the total GVRD, the potential market has directionally more young residents (18% are in the 16-24 year old group) and
  - Directionally fewer seniors 65 years or older (12%).
  - Current transit users, however, include significantly more youth (26% vs 15% in the total GVRD).

- ***Income:***
  - The potential streetcar market also has directionally more representation from those with household incomes of $55,000 or more per annum (50% versus 46% for the GVRD in total and 39% among the current transit using market).

Recreational Residents Demographic Profile

	Total GVRD (1,200) %	Total Recreational Residents (Qualifiers) (739) %	Current Regular Transit Users (475) %
Gender			
Male	49	50	45
Female	52	50	55 ▲
Age			
16 to 24	15	18 ▲	26
25 to 34	19	20	20
35 to 44	22	20	15
45 to 54	19	20	17
55 to 64	11	10	9
65 years and over	15	12 ▼	13
Area of Residents			
City of Vancouver	30	37 ▲	44 ▲
City of Vancouver East of Main Street	15	18	25 ▲
City of Vancouver West of Main Street	11	14	15
Downtown including the West End, Coal Harbour, Yaletown	4	6	5
Surrey/ White Rock/ Langley/ Delta	28	23 ▼	16 ▼
Tri-Cities/ Ridge Meadows	13	10 ▼	11
Burnaby/ New Westminster	11	11	12
Richmond	9	10	9
North Vancouver/ West Vancouver	9	9	7
Number of People in Household			
1	13	14	13
2	31	32	30
3 or more	56	55	57
Mean # of people	3.0	3.0	3.0
Employment Status			
Employed for pay	50	50	49
Retired	18	14 ▼	16
Self-employed/ work from home	15	16	9
Student	11	14 ▲	22 ▲
Homemaker	9	8	7
Unemployed currently	4	5	6

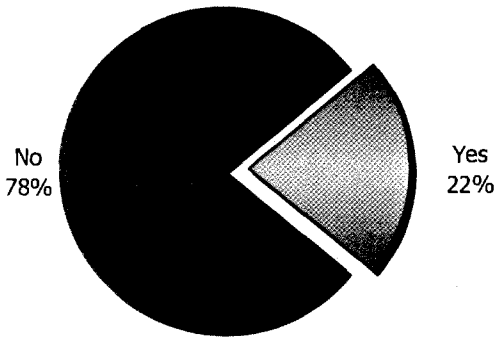
continued

Recreational Residents Demographic Profile (cont'd)	Total GVRD (1,200) %	Total Recreational Residents (Qualifiers) (739) %	Current Regular Transit Users (475) %
Income			
Less than $55,000	33	34	43 ▲
Less than $20,000	7	8	13
$20,000 to less than $35,000	13	15	16
$35,000 to less than $55,000	11	11	12
$55,000 or more	46	50 ▲	39 ▼
Less than $65,000	9	8	10
$65,000 to less than $80,000	12	14	9
$80,000 to less than $100,000	10	11	8
$100,000 or more	12	13	10
Refused/ don't know	21	16	18

9.2 Work/school downtown -- Recreational Residents

Just over one-in-five recreational residents also work or go to school in the Downtown area. The majority of these commuters currently use transit on a regular basis, that is at least once a month (67%).

Work or Attend School in Selected Downtown Areas



Base: Total Recreational Residents (n=739)

Q.6b) And do you work or go to school (when school is in session) in these areas of Downtown Vancouver?

9.3 *Current regular transit use -- Recreational Residents*

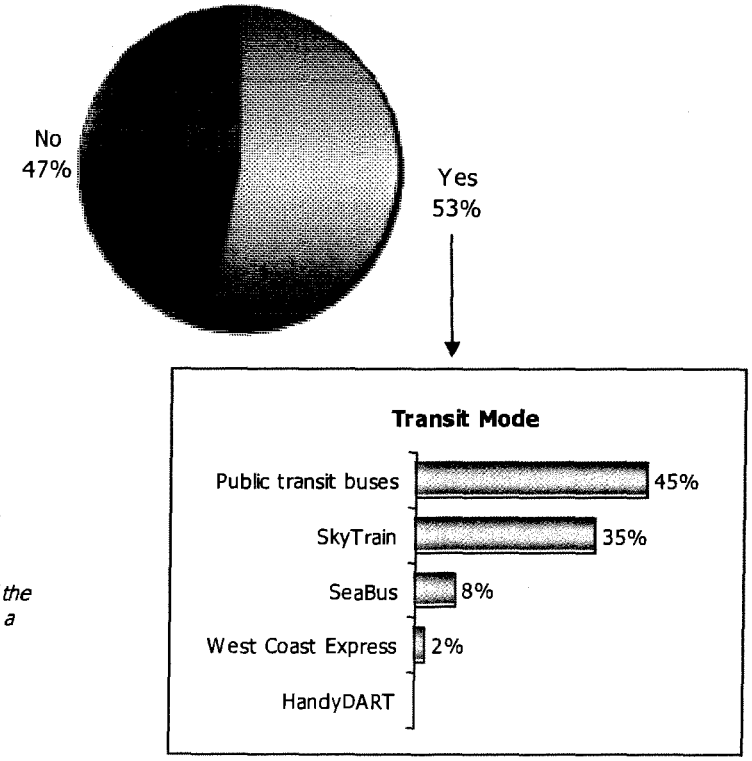
Among recreational resident qualifiers, just over half currently are transit users, that is, taking transit at least once a month on a regular basis (but not necessarily to the Downtown area). This compares to an overall rate of about 37% found in this study among the GVRD population 16 years of age and over. Note that a difference would be expected, as the recreational resident market for the streetcar currently travel to downtown Vancouver for non-work/school purposes and downtown destinations are well-served by transit.

Most users report taking transit buses, the most widely available transit mode. SkyTrain is also used by a significant proportion of current transit users. As a result, the current transit system is already relatively familiar to many recreational residents who are potential users of a streetcar service.

Similar to the typical transit user profile, recreational residents who are more likely to be current users of transit are:

- Those residing in the City of Vancouver, where service levels are higher (67%)
- Those who work or go to school downtown (67%)
- The younger segment under 35 years of age (65%)
- Students (82%) and
- The less affluent with household incomes below $55,000 (67%).

Current Regular Transit Users



Base: Total Recreational Residents (n=739)

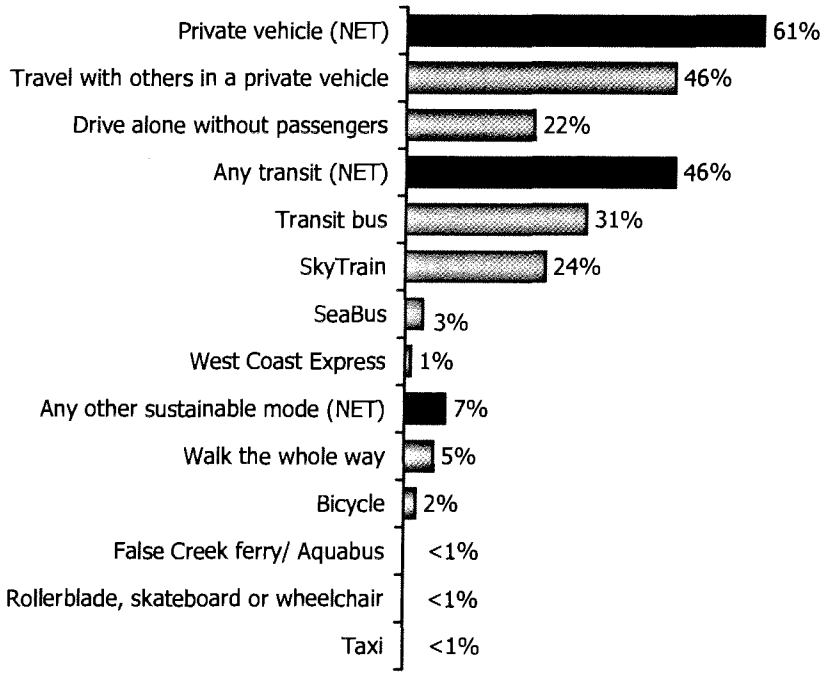
Q.4) Do you currently take any of the following at least once a month on a regular basis:

9.4 *Usual mode to travel downtown for non-work/school purposes -- Recreational Residents*

Private vehicle is currently the most popular mode of transportation to the downtown for shopping, personal business, entertainment or recreation. A majority of recreational residents (61%) travel downtown by private vehicle with nearly half (46%) carpooling and about one-in-five (22%) traveling by Single Occupant Vehicle (SOV). Transit is also a common method of travel to the downtown areas (46% usually use a form of transit). Transit bus and then SkyTrain are the main transit modes used.

- Note that 12% mention both private vehicle and transit as a usual mode for going Downtown (not necessarily in same trip, however).
- In total, 7% use other sustainable modes (mainly walking, but also some cycling). There is minimal mention of the False Creek ferries, rollerblading, skateboarding or wheelchairing.

Usual Mode to Selected Downtown Areas for Non-work/school Purposes



Base: Total recreational resident potential for Streetcar (n=739)

Q.7) So ... when you make shopping, personal business, entertainment or recreational trips to these Downtown areas, what main type of transportation do you usually use?

10.0 Overall Appeal of Downtown Streetcar to Recreational Residents

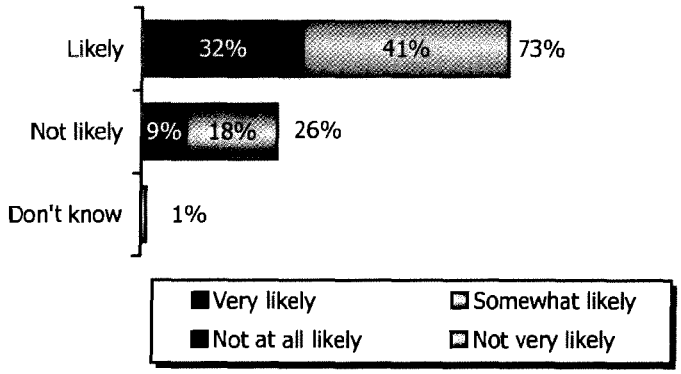
10.1 Reported interest in using streetcar service – Recreational Residents

When downtown recreational residents are presented with the proposed streetcar concept description and asked how likely they would be to use this service when traveling downtown for non-work/school purposes, we find a high level of interest reported. While the majority (73%) claim to be very or somewhat likely to use the service to travel downtown, the response is not as strongly enthusiastic as found among tourists. Only one-third say they are "very likely" to use the service (compared to six-in-ten tourists saying "very likely"). Nevertheless, keep in mind that people tend to overstate their intentions to use a service and that the results presented here are not down-weighted. The ridership forecasting section of this report provides estimates of usage with appropriate down-weighting of recreational residents' usage predictions, verified against several other independent estimates and source data.

Both current transit users and non-users of transit express almost identical levels of overall interest in the streetcar service. The ridership estimates detail any differences in projected usage levels (Section III).

Stronger interest (about 40-45% saying "very likely") is found among those on the North Shore and in the South of the Fraser (Surrey/White Rock/Delta/Langley)

Likelihood of Using Service



Base: Total recreational resident potential for Streetcar (n=739)

Q.9) If this streetcar service was available, how likely would you be to use it to travel to the Downtown Vancouver areas we mentioned?

10.2 Barriers to Streetcar Use among Recreational Residents

Recreational residents who are *unlikely* to use the streetcar service give a variety of reasons for disinterest. The top two deterrents are:

- Satisfaction with the current transit system (23%)
- Preference for using own vehicle (22%)

Reasons Unlikely to Use Streetcar

	Total Recreational Residents Unlikely to Use (208) %
Regular transit serves my needs	23
Prefer to have/ need vehicle/ would have to drive downtown to access it anyway	22
Don't travel downtown enough/ dislike traveling to downtown	17
More for tourists/ good if I have visitors	14
Doesn't serve destination(s) I travel to/ don't travel to destinations it serves/ don't change locations once I'm downtown	13
Expensive	10
Prefer to walk	7
Doesn't serve my area/ live too far away/ does not help my commute	6
Travel with too many people/ always more than just me	4
Creates traffic problems	4
Have/ prefer other means of transportation	2
Other	13
No particular reason	1

Base: Total not very/not at all likely to use the Streetcar service to travel to downtown Vancouver

Q.10) Why are you not likely to use it?

10.3 Appealing Features to Recreational Residents

Those recreational residents who are likely to use the streetcar were asked what features they particularly like and what would encourage them to use the streetcar. While a broad array of features is appreciated, the primary aspects that appeal to recreational residents are:

- Service frequency (33%)
- Destinations they need/good for getting around downtown (31%)
- Non-polluting/environmentally friendly (23%)

Features/Characteristics That Would Encourage Use of Streetcar

	Total Recreational Residents Likely to Use (520) %
Frequency/ regularity	33
Destinations I like to travel to/ good for traveling around downtown	31
Non-polluting/ environmentally friendly	23
Park and Ride available/ don't have to worry about parking	13
Good price	12
Easier/ more convenient	11
Get on and off anywhere/ easy to access	10
Quick/ saves time/good transfer time/ good for multiple errands	11
Easy/ convenient access to main tourist sites/ good for visitors	9
More spacious	8
Connects/ transfers to main transit	8
Quiet	8
Easier to sightsee/ wee the views/ big windows	7
Can reduce/ avoid traffic congestion	6
Unique/ not just a bus/ more fun (incl. mentions of San Francisco)	6
Bike friendly	4
Comfortable/ smooth ride	4
Nostalgia/ heritage aspect	2
Wheelchair/ stroller accessibility	1
Modern/ futuristic	<1
Other	10
No particular reason/ don't know	4

Base: Total very/somewhat likely to use the Streetcar service to travel to downtown Vancouver

Q.11) What specific features or characteristics of the streetcar service would most encourage you to use it? What do you particularly like about it?

11.0 Recreational Residents' Likelihood of Using Streetcar to Specific Destinations

Interest in the proposed streetcar destinations was also probed by asking the likelihood of using the downtown streetcar service for shopping, personal business, entertainment or recreational purposes.

This measure reveals that ***the top two*** destinations are similar to those chosen by tourists.

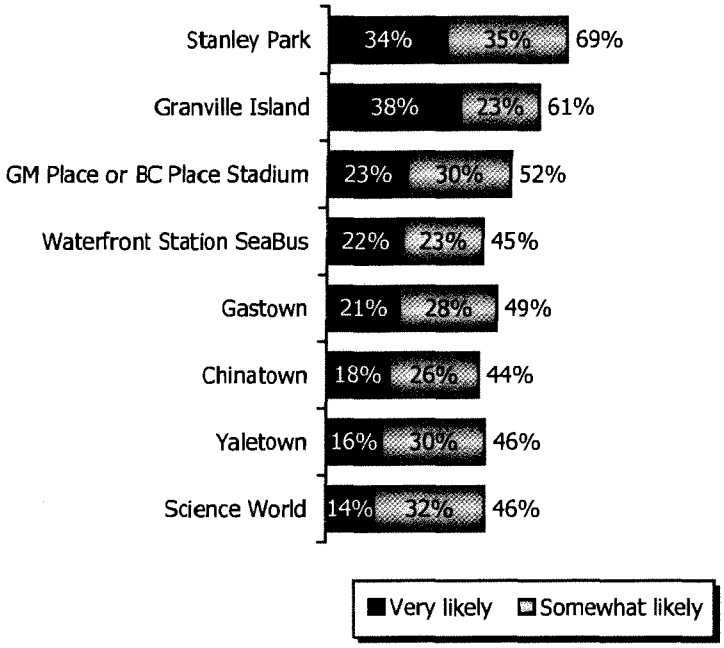
- ***Stanley Park*** is the favourite destination for a majority of recreational residents bound for downtown (69%).
- ***Granville Island*** is the second most popular (61% in total).
- Both of the top two streetcar destinations garner similar levels of strong interest ("very likely" ratings of 34% and 38%, respectively).

The ***next most*** desired locations among recreational residents are:

- the ***sports arenas,*** GM Place/BC Place Stadium (52% in total, and 23% "very likely")
- ***Gastown*** (49% in total, 21% "very likely")
- ***Waterfront***(45% in total, 22% "very likely")

The remaining destinations (Chinatown, Yaletown and Science World) tend to interest somewhat under half of recreational residents in total (about 44-46% with "very likely" scores ranging from 14-18%).

Likelihood of Using Streetcar to Specific Destinations



Base: Total Recreational Residents - Qualifiers (n=739)

Q.12) Please tell me how likely you would be to use the proposed streetcar service to travel to each of the following Downtown Vancouver destinations ... for shopping, personal business, entertainment or recreational trips.

Q.14) If the streetcar route were extended, how likely would you be to use the proposed streetcar service to travel to the following destinations:

12.0 Recreational Residents' Mode Changes Due to Streetcar

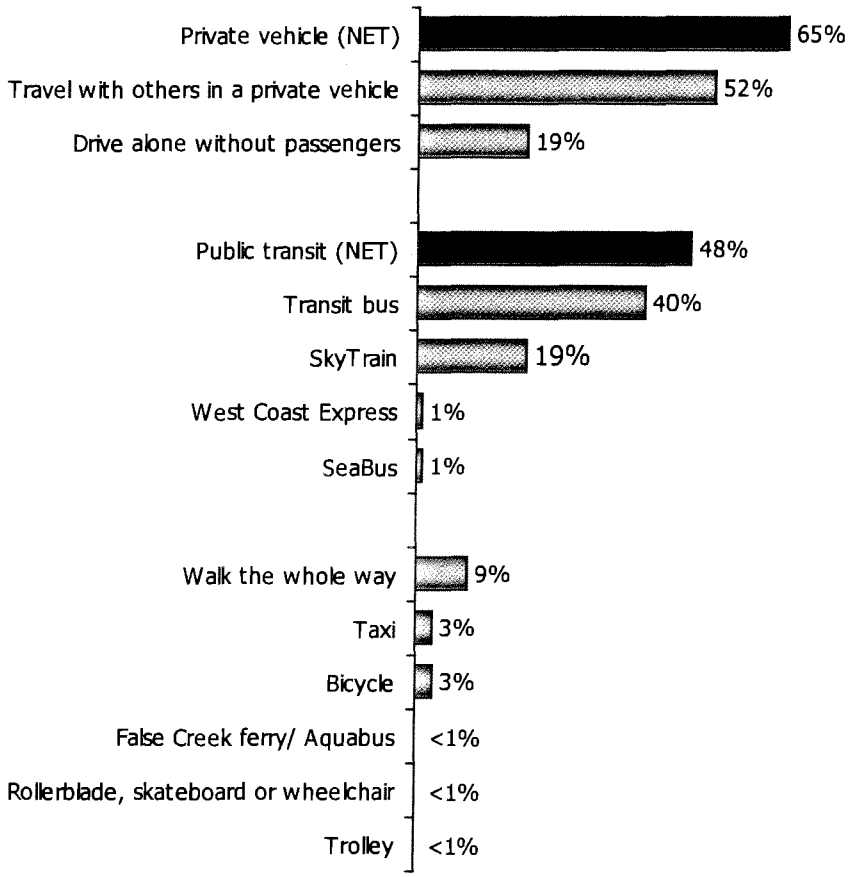
12.1 Mode replaced by streetcar – Recreational Residents

The main modes that the streetcar service would replace are:

- private vehicle use (largely those carpooling) and
- public transit (mainly buses)

Given that about half of the potential streetcar market is made up of current transit users, the proportion mentioning that it would replace transit is reasonable.

Mode Streetcar Would Replace for Recreational Residents



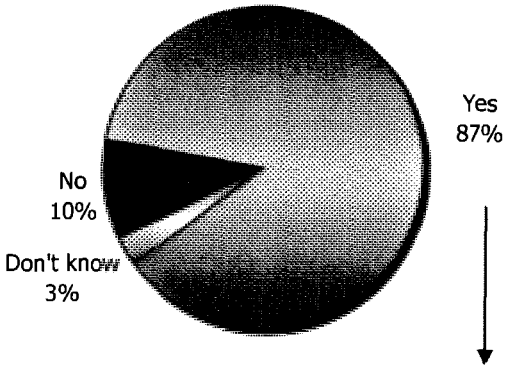
Base: Total somewhat/very likely to use the proposed Streetcar to any of the listed destinations (including extension) (n=629)

Q.16) Next, thinking about your use of the streetcar to any of the possible destinations we've been talking about, what mode of transportation would the streetcar trips replace, that is, what mode would you use if the streetcar was not available?*

12.2 Combining streetcar use with other modes – Recreational Residents

It is clear that recreational residents understand the downtown streetcar concept, as the vast majority who are likely to use the service realize that they would need to combine its use with other modes (e.g., to get downtown). In spite of many saying that transit trips would be replaced by the streetcar trips, the existing transit system is expected to be the main mode-connector (largely transit buses and SkyTrain with 41-42% mentions each), but nearly as many would connect using a private vehicle (36%). This undoubtedly assumes that parking is available for auto users to integrate with the system.

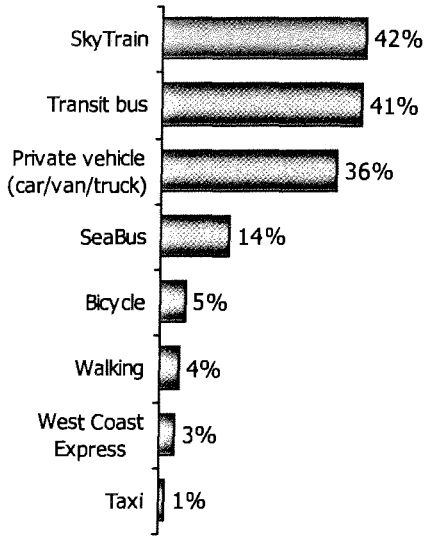
Expectation to Combine Streetcar Use with Other Modes



Base: Total somewhat/very likely to use the proposed Streetcar to any of the listed destinations (including extension) (n=629)

Q.17) Would you combine the use of the streetcars with any other modes?

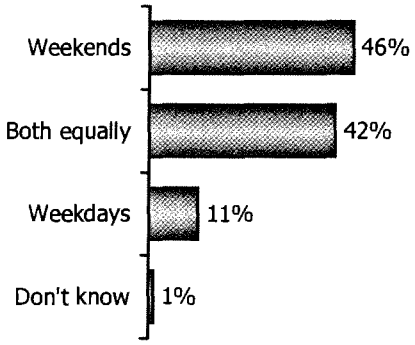
Other Modes of Transportation



13.0 Recreational Residents' Days Most Likely to Use Streetcar

As expected, recreational residents likely to use the streetcar say they would be most inclined to use it on ***weekends*** (88%). But a large proportion of likely streetcar users say that they would use the service on weekdays (53% in total); most of these weekday users would be *both* weekday and weekend users (42% of those likely to use the streetcar).

Most Likely Days for Use Among Recreational Residents



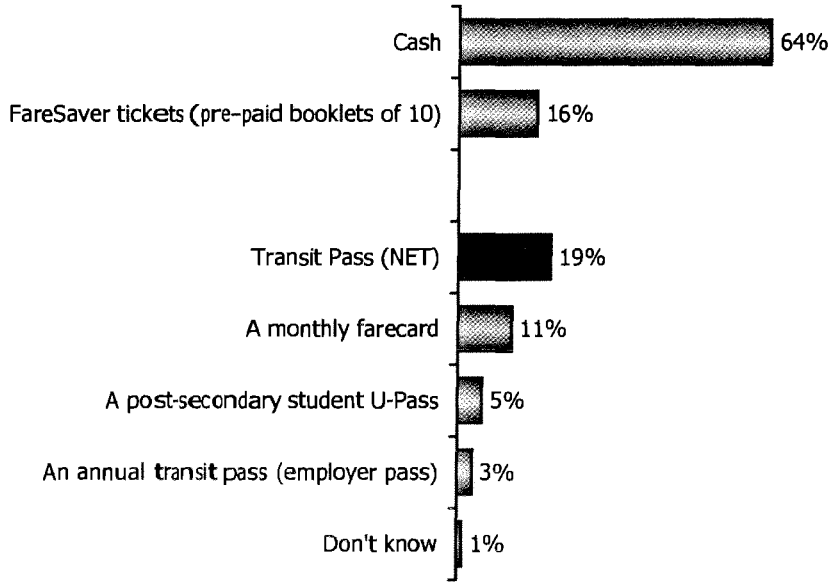
Base: Total somewhat/very likely to use the proposed Streetcar to any of the listed destinations (including extension) (n=629)

Q.18) Would you be most likely to use the streetcar on weekdays or weekends or both equally?

14.0 Recreational Residents' Method of Payment for Streetcar

Cash would be the preferred method of payment among recreational residents, as 64% choose it as the method they'd be most likely to use. Those who reside outside of the City of Vancouver and non-transit users are the most likely to use cash payment. The stronger preference for paying by cash is not surprising. Among current transit users, 48% pay by cash (Source: TransLink Rider Satisfaction Research, 2004) and furthermore, as the potential streetcar market includes about half who are not regular transit users, one would expect a higher rate of cash fares.

Method of Payment Most Likely to Use Among Recreational Residents



Base: Total somewhat/very likely to use the proposed Streetcar to any of the listed destinations (including extension) (n=629)

Q.19) Would you be most likely to pay for the streetcar trip using cash, FareSaver tickets or a transit pass?

15.0 Influence of Specific Factors on Streetcar Use – Recreational Residents

Recreational residents were presented with the same set of possible decision-making factors as were given to tourists and asked to rate these features/factors in terms of their importance when deciding whether to use the streetcar. One additional factor was added for the recreational residents – this was *"availability of Park & Ride facilities to connect to transit and the streetcar."* Respondents rated these factors on a ten-point scale where 10 meant "of highest importance" and one mean "of no importance at all".

Recreational residents have many similar attitudes as tourists regarding the importance of specific service features that would influence their decision to use the streetcar. However, the order of priority is slightly different for a few of the influential factors.

The ***ability to transfer for free to other transit*** receives the number one rating among recreational residents (8.6 out of 10), while it is in third place for tourists (8.3). ***Service frequency*** and ***destinations served*** are the next most important to recreational residents. (These features rank as number one and two most important for tourists.)

Cost of fare is slightly more important to recreational residents (7.5 vs. 7.1 for tourists).

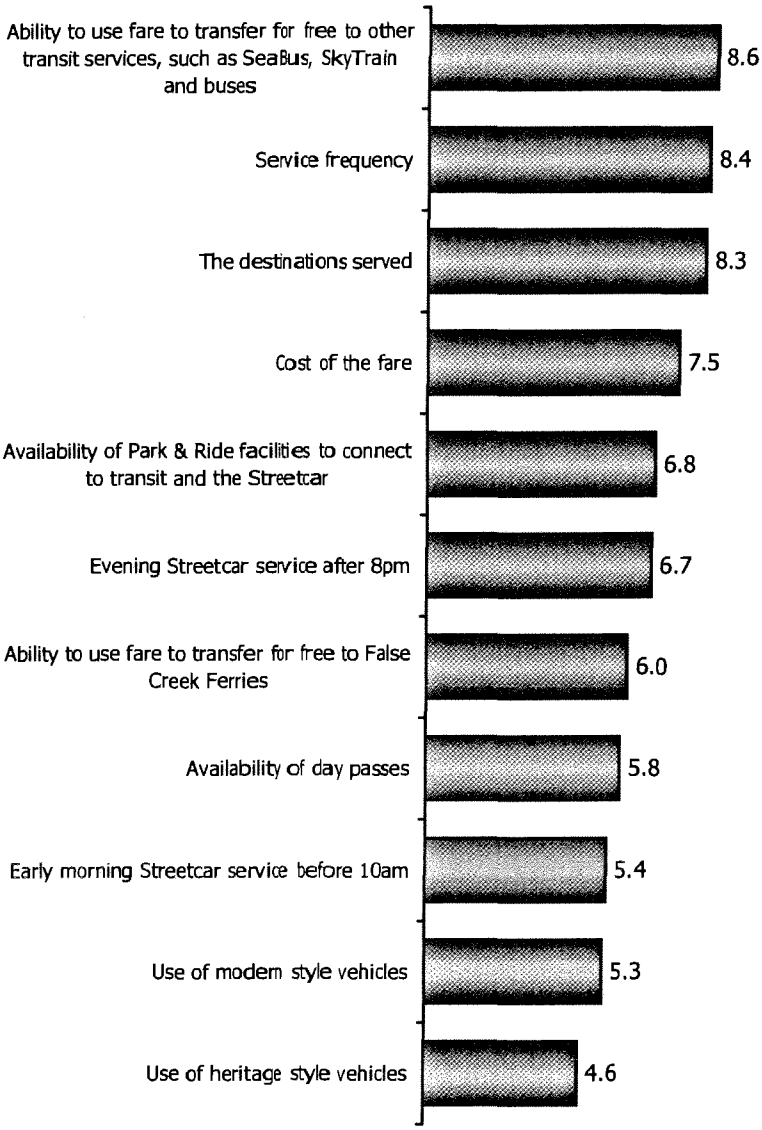
Availability of Park and Ride facilities is of moderate importance to recreational residents (6.8 out of 10).

As might be expected, the relative importance of day passes is much less important to recreational users (5.8) than to tourists (8.1).

In terms of subgroups:

- Cost is more important to those in households with 3 or more people (7.8) and for students (8.0) and the younger under 35 year old segment (7.9).
- Ability to transfer for free to transit is more important to regular transit users (8.9), of course, those on the North Shore (9.1), students (9.0), larger households (8.8) than their to their counterparts.
- Service frequency is more important to those on the North Shore (8.9) than others.
- Free transfers to the False Creek Ferries (7.3) and evening service (7.4) is more important to those who live downtown than those elsewhere.
- The style of vehicle is of least importance, but the modern style appears to consistently be slightly ahead of the heritage style. Perhaps the idea of comfort is associated with modernity.

Influence of Specific Factors on Decision to Use Streetcar among Recreational Residents



	% High Importance (8-10)	% Low Importance (1-3)
Ability to use fare to transfer for free to other transit services, such as SeaBus, SkyTrain and buses	82%	4%
Service frequency	75%	3%
The destinations served	76%	3%
Cost of the fare	58%	7%
Availability of Park & Ride facilities to connect to transit and the Streetcar	55%	20%
Evening Streetcar service after 8pm	48%	15%
Ability to use fare to transfer for free to False Creek Ferries	39%	24%
Availability of day passes	34%	26%
Early morning Streetcar service before 10am	32%	33%
Use of modern style vehicles	22%	26%
Use of heritage style vehicles	16%	36%

Base: Total somewhat/very likely to use the proposed Streetcar to any of the listed destinations (including extension) (n=629)

Q.19) Would you be most likely to pay for the streetcar trip using cash, FareSaver tickets or a transit pass?

III. Ridership Forecasts

16.0 Introduction

An important objective of this study was to estimate annual tourist and recreational ridership for the Downtown Vancouver Streetcar. These ridership estimates were developed by TSi Consultants, transportation specialist engineers. Phase 1 of the Streetcar would provide service between Waterfront and Granville Island with numerous stops including Gastown, Chinatown and Science World. An extension of Phase 1 from Waterfront to Stanley Park is under consideration, as is a Phase 2 route from Science World to Granville Street along Pacific Boulevard. For the purpose of this study, ridership estimates have been developed for the following configurations:

- Phase 1 – Waterfront to Granville Island
- Phases 1&2 - Stanley Park to Granville Island and Science World to Granville Street (via Pacific Boulevard)

The service would feature modern low-floor streetcars operating at a 10-minute frequency throughout the day. Fares would be in the 2 to 3 dollar range and would be integrated with the TransLink fare system.

The previous sections provide a discussion of the tourist and recreational survey results without adjustments for overstated intentions to use the proposed Streetcar. The market research surveys simulate 100 percent customer awareness and there is a tendency for respondents to overstate their intentions when presented with new service options. Therefore, it is necessary to down-weight the responses according to the characteristics of the individual and to verify the resulting ridership estimates against other independent estimates.

For this study the primary ridership forecasts are based on the results of the market research surveys. These forecasts have been verified against preliminary modelling estimates and should be reconciled with independent benchmarking of similar systems operating worldwide. It is important to note that these estimates are for the year 2004 and assume the ridership is fully mature. Typically, ridership on a new system can take 2 to 3 years to mature, or "ramp-up", as new customers gradually adjust their behaviour. As the system will not be operational in 2004, ridership estimates should be factored to account for growth in tourism and local demographics between 2004 and opening day.

17.0 Tourist Market

17.1 Forecasting Approach

The tourist market survey obtained responses from more than 600 individuals on their interest and potential use of the Downtown Vancouver Streetcar service. Respondents were surveyed at six tourist destinations in the downtown area (Stanley Park, Waterfront, Gastown, Chinatown, Science World and Granville Island). Following receipt of the survey results, the following steps were undertaken to produce tourist ridership estimates:

1. Established annual tourist controls to each survey site based on Tourism Vancouver, Tourism BC and site statistics.
2. Estimated average number of sites visited per tourist stay.
3. Developed tourist survey expansion factors.
4. Analyzed average Streetcar boarding rates per site and down-weighted likelihood of use information.
5. Prepared annual tourist boarding forecasts.

In 2003, Tourism Vancouver reported approximately 8.0 million overnight visits to Greater Vancouver[1]. Based on the first six months of this year (8 percent increase over 2003), annual visits will likely exceed 8.5 million in 2004. Approximately 65 percent of the visitors stay in paid accommodation of which 55 percent are located in the downtown area[2]. Therefore, visitors staying in downtown paid accommodation are estimated at approximately 3.0 million for 2004.

Annual visitor estimates were only available for three of the six sites (i.e., Granville Island, Science World and Stanley Park). Therefore, information from the tourist survey (e.g., non-qualifier rates and average site visits per stay) was used to construct annual tourist controls and expansion factors for each destination. The following table provides a summary of the total annual tourist visit estimates (all modes) for each location (note that this table does not include visits by GVRD residents).

1 Tourism Vancouver Visitor Volume Model, Grant Thorton LLP.
2 Tourism British Columbia, BC Visitor Study "The Report on Visitors to Greater Vancouver".

Estimate of 2004 Annual Tourist Visits to Six Sites (all modes)	
Survey Location	Annual Visits by Tourists (M)
Stanley Park	4.00
Waterfront	2.22
Gastown	3.29
Chinatown	2.43
Science World	0.24
Granville Island	5.90

A key feature of the market survey design is that individuals are asked to rate their intended usage according to a four-point scale (i.e., very likely, somewhat likely, not very likely and not at all likely). The stated trip rates are then down-weighted depending on the characteristics of the respondent (e.g., transit user vs. non-transit user). For this study, scale weightings were based on standard weights used in previous transit studies in the Greater Vancouver area. Note that these factors represent a discounting of "stated" trips in the range of 40 to 90 percent.

Down-weighting Factors		
Stated Intent of Use	Transit	Non-Transit
Very likely	0.60 – 0.40	0.25 – 0.15
Somewhat likely	0.30 – 0.20	0.12 - 0.08

Next, average Streetcar boarding rates were developed based on the origin of the tourist and the average number of sites visited. For example, an individual staying in a downtown hotel and visiting Science World and traveling back to the Gastown/Waterfront area would board the Streetcar twice (Waterfront->Science World, Science World -> Gastown). A detailed analysis of the potential boarding combinations was undertaken to arrive at average board rates depending on the tourist's origin and number of sites visited per day. These values range from 1 to 2 per site, with an average value of 1.25 (assuming a maximum of 3 sites visited per day).

The average board rates and the down-weights were then applied to the survey responses to estimate tourist ridership for Phase 1 and Phases 1&2 of the Downtown Streetcar.

An example calculation for streetcar trips to/from the Waterfront/Gastown area is shown based on the central estimate down-weights, resulting in an estimate of 0.6 million annual rides from a base of 5.5 million annual visits. Part A shows the expanded annual streetcar trips by mode and stated intent prior to down-weighting (1.75 million trips). Part B shows the down-weights and Part C shows the average board factors. The down-weights and average board factors are applied to the un-weighted trips to arrive at an estimate of 0.6 million annual rides. Similar calculations are undertaken for the other sites to arrive at the total streetcar ridership estimate. Note the calculation below has been simplified for presentation purposes.

Annual Streetcar Usage – Waterfront/Gastown Example		
A. Annual streetcar trips by stated intent and current mode (M)	**Transit**	**Non-Transit**
Very likely	0.50	0.70
Somewhat likely	0.25	0.30
B. Down-weights (central)		
Very likely	0.50	0.20
Somewhat likely	0.25	0.10
C. Average Board Factors	1.25	1.25
D. Annual Ridership Forecast (M)	0.39	0.21
	0.60	

17.2 Tourist Ridership Estimates

Annual tourist ridership estimates were developed for Phase 1 (Waterfront to Granville Island) and Phases 1&2 (Stanley Park to Granville Island and Science World to Granville Street) of the Downtown Streetcar. Estimates are presented as Low, Central and High, based on the down-weighting ranges. In 2004, a fully mature Phase 1 system could attract between 1.3 and 2.1 million tourist boardings per year, with a central forecast of 1.7 million. The extension of the line to Stanley Park and Yaletown could increase ridership levels to 2.2 to 3.5 million annual tourist boardings, with a central forecast of 2.8 million.

Annual Tourist Boarding Estimates (M)		
Annual Boardings	Phase 1	Phases 1&2
Low	1.3	2.2
Central	**1.7**	**2.8**
High	2.1	3.5

Note that these estimates represent initial "planning-level" forecasts, as many of the details regarding the Streetcar system have not yet been determined (e.g., station locations, running time, frequency, fare levels and bus integration). Once these details have been finalized, design-level estimates could be developed for the final configuration. Design-level estimates would include details on line and station boarding activity for specific time periods and time horizons.

18.0 Recreational Resident Market

18.1 Forecasting Approach

The resident market survey obtained responses from 1,200 residents, with more than 700 qualifiers (i.e., individuals that made recreational trips to the Downtown area in the past three months (for purposes, such as shopping, personal business, entertainment, recreation or social reasons)) While respondents were also asked if they worked Downtown, the criteria for qualifying was based on recreational use and the context for streetcar usage was also based on recreation uses only. The survey was expanded by household location according to region, age and gender.

Ridership estimates for the recreational market were developed as follows:

1. Survey records were reviewed for over-reporting and adjusted as required (information from recent trip diary surveys were used to establish maximum annual recreational trip rates for the proposed Streetcar).
2. Analyzed stated usage and applied down-weightings.
3. Prepared annual recreational resident boarding forecasts.

As residents were asked to report the number of one-way trips to/from each site, total annual boardings were derived directly from the survey. Again, as survey respondents tend to over-state their stated usage, the same down-weighting factors were applied as for the tourist market segment. Note that resident recreational trips were analyzed according to mode and place of residence.

18.2 Recreational Resident Ridership Estimates

Annual recreational resident ridership estimates were developed for both phases of the Downtown Streetcar. Estimates are presented as Low, Central and High, based on the down-weighting ranges. In 2004, a fully mature Phase 1 system could attract between 0.8 and 1.4 million recreational resident boardings per year, with a central forecast of 1.1 million. The extension of the line to Stanley Park and Yaletown could increase ridership levels to 1.6 to 2.4 million annual recreational resident boardings, with a central forecast of 1.9 million.

Annual Recreational Boarding Estimates (M)		
Annual Boardings	Phase 1	Phases 1&2
Low	0.8	1.6
Central	**1.1**	**1.9**
High	1.4	2.4

19.0 Preliminary Modelling Analysis

19.1 EMME/2 Modelling Assumptions

The market research analysis produced ridership estimates for tourists and recreational residents. Modelling analysis was undertaken for both phases to provide a crosscheck estimate of the recreational ridership component and provide a basis for generating a preliminary total annual boarding estimate.

For this analysis, existing AM and Midday EMME/2 models were used as a basis for developing daily and annual recreational ridership estimates. The AM model includes four trip purpose: (i) to work; (ii) to grade school; (iii) to post secondary school; and (iv) to other. The Midday model also includes four trip purposes: (i) to/from work; (ii) business; (iii) home-based other; (iv) non-home based other. Each transit trip purpose was assigned separately to distinguish the volume by purpose on the streetcar in each time period. Work and school purposes were combined into a commuting/education purpose. To other (AM), home-based other and non-home based other (Midday) were combined into the recreational/personal purpose. AM and Midday boarding estimates were then factored to annual estimates. Note that the resident telephone survey requested information on shopping, personal business, entertainment and recreational trips. These purposes are consistent with the "other" trip purposes used by the EMME/2 models.

Note that the models were not refined (e.g., traffic zone disaggregation) or recalibrated for the downtown area. Therefore, these modelling estimates should be considered "high-level" and will be superseded when more detailed model forecasts become available from the Downtown Streetcar Design, Layout and Ridership Study.

Key modelling assumptions are outlined below:

- Base year 2003 demographics, road and transit network assumptions.
- Streetcar fare of $2 (fully transferable with TransLink system).
- Streetcar track alignments and operating assumptions based on BSW Streetcar Study[3].
- EMME/2 AM. and Midday models include commuter, education and recreational/personal trip purposes.
- Tourist ridership is not included in the modelling analysis.

3 Baker McGarva Hart - SNC/Lavalin - Ward Consulting, Vancouver Downtown Streetcar Study.

19.2 Model-based Ridership Estimates

AM and Midday boarding estimates were developed for the recreational/personal and commuter/education markets and then expanded to annual estimates for 2003. Again, these estimates assume system ridership is fully mature or ramped-up, which usually takes 2 to 3 years.

Annual Model-based Boarding Estimates (M)		
Annual Boardings	Phase 1	Phases 1&2
Commuting/Education	1.0	3.4
Recreational/Personal	**0.8**	**2.1**
Total	1.8	5.5

Phase 1 of the Streetcar is estimated to attract approximately 1.8 million annual boardings, with recreational/personal trips accounting for 0.8 million of the total. Phases 1&2 appear to result in a significant increase in ridership, as the line would better serve West End and Coal Harbour residents. Total annual ridership for Phases 1&2 is estimated at approximately 5.5 million, which includes 2.1 million recreational/personal trips.

The model-based recreational estimate for Phase 1 of 0.8 million is at the low end of the range developed from the market research approach (0.8M to 1.4M). The model estimate for Phases 1&2 of 2.1 million falls in the middle of the market research-based range (1.6M to 2.4M). As many of the details regarding the Streetcar system have not yet been determined, the differences between the market research and model estimates are within an acceptable level of tolerance.

20.0 Ridership Summary

20.1 Annual Ridership Estimates

Annual ridership estimates for the Downtown Streetcar have been developed from the market research survey results for the tourist and recreational resident markets. These estimates have been crosschecked against model-based estimates for recreational trips.

If the system were open today and fully mature (i.e., in operation for 2 to 3 years), Phase 1 (Waterfront to Granville Island) annual boardings for the tourist and recreational markets are estimated at 2.1 to 3.5 million. Adding the preliminary model-based estimate for commuting/education trips produces total annual boards ranging from 3.1 to 4.5 million.

Phases 1&2 (Stanley Park to Granville Island and Yaletown) annual boardings for the tourist and recreational markets are estimated at 3.8 to 5.9 million. Adding the commuting/ education model estimate produces total annual boards ranging from 7.2 to 9.3 million.

Total Annual Boarding Estimates (M)			
	Low	**Central**	**High**
Tourists	1.3	1.7	2.1
Recreational	0.8	1.1	1.4
Commuter/Education (model-based)	1.0	1.0	1.0
Phase 1 – Total	**3.1**	**3.8**	**4.5**
Tourist	2.2	2.8	3.5
Recreational	1.6	1.9	2.4
Commuter/Education (model-based)	3.4	3.4	3.4
Phases 1&2 – Total	**7.2**	**8.1**	**9.3**

Note that these estimates represent initial "planning-level" forecasts, as many of the details regarding the Streetcar system have not been determined (e.g., station locations, running time, frequency, fare levels and bus integration). While the estimates have been verified against preliminary model results, they should be benchmark against other systems currently in operation worldwide. While many of the characteristics of the Downtown Streetcar may be unique, the benchmarking comparison ensures that market research or model-based forecasts are within an appropriate order-of-magnitude.

20.2 Daily Ridership Estimates

Due to the level of tourist patronage, the Downtown Streetcar will be subject to a higher level of seasonal fluctuation than conventional transit services. Preliminary daily ridership estimates have been developed for the average weekday during the summer and winter seasons. During the winter season, the Phase 1 central forecast is 11,500 daily boards, increasing to 13,500 during the summer months (approximately 17 percent higher). For Phases 1&2 the central forecast for the winter season is 25,500 daily boards, increasing to 28,500 during the summer (approximately 12 percent higher). As Phases 1&2 attract a higher proportion of commuters the seasonal fluctuation is not as pronounced.

Total Daily Boarding Estimates

	Low	Central	High
Summer Season			
Phase 1	11,000	13,500	16,000
Phases 1&2	25,000	28,500	33,000
Winter Season			
Phase 1	9,500	11,500	13,500
Phases 1&2	23,000	25,500	29,000

Appendices

1. Questionnaires & Materials Used
   a) Recreational Resident Questionnaire
   b) Tourist On-site Questionnaire
   c) Streetcar Concept: Route map and example photos
   d) Letter of Authorization

2. Report of Calls

3. Sample Weighting and Population Statistics

1. Questionnaires & Materials Used

MUSTEL GROUP
MARKET RESEARCH

Downtown Streetcar Study: Recreational Residents – (A236-2)
August 9, 2004
Questionnaire – FINAL Version

Introduction
Hello, I'm ____ of Mustel Group Market Research, a professional opinion research firm.

We are conducting a short survey among residents of Greater Vancouver on behalf of the City of Vancouver, in partnership with the Greater Vancouver Transportation Authority/TransLink. Please be assured we are not selling or soliciting anything and all responses are kept strictly confidential.

Just to randomize our interviews, may I please to speak to the male/female in this household, who is over 16 and whose birthday comes next? (ALTERNATE ASKING FOR MALE/FEMALE) (ARRANGE CALLBACK/RE-INTRODUCE IF NECESSARY)

1. GENDER [OBSERVE & RECORD]

- ❑ MALE
- ❑ FEMALE

Persuaders—only if needed:

- This is strictly an opinion survey; we are not selling or soliciting anything.
- The survey is being conducted for the City of Vancouver, Engineering Services.
- This study is important to help City planners better understand the opinions and needs of people in your area.
- All responses are strictly confidential and anonymous; your identity is never revealed to anyone else, including the client.
- It is extremely important that we include the opinions of all people, regardless of the type of transportation they use (cars, public transit, etc.) or how little they travel around the city.
- Survey length ranges from 3 minutes up to about 8 minutes, depending on your answers.
- CONTACT ONLY IF NECESSARY:
  Dale Bracewell, Transportation Engineer, City of Vancouver, 604-871-6440

Privacy Issues:

- Mustel Group is committed to protecting your privacy and the confidentiality of your personal information.
- Mustel Group is committed to keeping the personal information you share with us confidential.
- The information you provide will only be used for the purposes of this research. Under no circumstances do we sell contact lists or personal information to others.
- The information you provide will be retained only for the time it is required for the purposes of this research.
- Mustel Group will protect the information you provide with appropriate safeguards and security measures.
- We are fully compliant with the new federal privacy legislation (New act is called PIPEDA: Personal Information Protection and Electronic Documents Act)
- The information you provide will be combined with the responses given by all other survey respondents and reported only in aggregate form. Your answers will remain completely confidential and anonymous.

Screener

2. **First of all, does anyone in your household work for** a marketing research company, the City of Vancouver, TransLink, Coast Mountain Bus Company, SkyTrain, SeaBus, Albion Ferry, West Coast Express, Metro Shuttle or DW Services? IF YES TO ANY THANK AND TERMINATE AS OCCUPATIONAL NON-QUALIFIER.

3. **a)** EVERYONE: **To be sure we are including all areas of Greater Vancouver, may I please have your postal code?**

   DISPLAY POSTAL CODE FROM SAMPLE ___ ___ ___ ___ ___ ___
   (RE-ENTER IF DIFFERENT) ___ ___ ___ ___ ___ ___

   b) EVERYONE: **In which municipality do you live?**
   (PROBE IF NEEDED.)

   - ❑ City of Vancouver → PROBE: Is that:
     - ❑ Downtown including the West End, Coal Harbour, Yaletown
     - ❑ City of Vancouver West of Main Street
     - ❑ City of Vancouver East of Main Street
   - ❑ Burnaby/New Westminster
   - ❑ Richmond
   - ❑ North Vancouver/West Vancouver
   - ❑ Tri-cities (Coquitlam/Pt. Moody/Pt. Coquitlam)
   - ❑ Surrey/White Rock/Langley/Delta/Ladner/ Tsawwassen/ Pitt Meadows/Maple Ridge

4. **Do you currently take any of the following at least once a month on a regular basis:**

   - ❑ Public transit buses
   - ❑ SkyTrain
   - ❑ SeaBus
   - ❑ West Coast Express
   - ❑ HandyDART
   - ❑ NONE OF THESE **→ SKIP TO Q.5**

   IF USE ANY TRANSIT → SKIP TO Q.6

5. IF NON-TRANSIT: **If new, modern streetcar service was available in Downtown Vancouver, would you consider taking it if the service met your needs?**

   - ❑ Yes
   - ❑ No/don't know → **SKIP TO BASIC DATA**

6. CURRENT AND POTENTIAL TRANSIT/STREETCAR USERS: **For this study we are interested in your visits to Downtown Vancouver. By "Downtown Vancouver" we mean** your travel to any of the following areas: the Downtown core, including Stanley Park, Gastown and Chinatown, False Creek and Granville Island. (IF ASKED: includes Science World, Yaletown, GM Place and BC Place)

6a) Have you visited any of these areas of Downtown Vancouver in the past 3 months ... for shopping, personal business, entertainment or recreational purposes? REPEAT AREA DEFINITION IF NEEDED. DISPLAY DEFINITION.

- ❑ **Yes (QUALIFIER)**
- ❑ No/don't know (NON-QUALIFIER)

6b) And do you work or go to school (when school is in session) in <u>these areas</u> of Downtown Vancouver? REPEAT AREA DEFINITION IF NEEDED. DISPLAY DEFINITION OF "Downtown Vancouver"

- ❑ **Yes**
- ❑ **No**

AFTER Q6b ... RECREATIONAL RESIDENT NON-QUALIFIER:
IF Q6a = LESS THAN ONCE IN 3 MO. OR DON'T KNOW → SKIP TO BASIC DATA

<u>QUALIFIERS</u>:
Please note that for the rest of our questions in this study we are only interested in your current and potential visits to these Downtown areas for the following trip purposes: shopping, personal business, entertainment or recreation.

7. So ... when you make shopping, personal business, entertainment or recreational trips to these Downtown areas, what <u>main</u> type of transportation do you usually use? ONE ANSWER, IF POSSIBLE. READ IF NECESSARY. REPEAT AREA DEFINITION IF NEEDED.

- ❑ Private vehicle → PROBE: Do you usually:
  - ○ drive alone without passengers?
  - ○ Or travel with others in a private vehicle?
- ❑ Walk the whole way (from your origin)
- ❑ Rollerblade, skateboard, or wheelchair
- ❑ Transit bus
- ❑ SkyTrain
- ❑ SeaBus
- ❑ West Coast Express
- ❑ False Creek Ferry / Aquabus
- ❑ Taxi
- ❑ Other (specify)

8. Now, I'd like to get your opinion on an alternative transportation service for the Downtown area. Here is a description.

- Modern, rail-based street cars would run through Downtown Vancouver and around False Creek, covering major tourist destinations. The basic route would include these specific stops: Waterfront Station, Gastown, Chinatown, Science World and Granville Island.
- Streetcars would run approximately every 10 minutes in both directions. Streetcar systems like this are quieter than buses, non-polluting, wheelchair and bike-accessible and offer a very smooth ride. The streetcar has more interior space and larger windows than a bus.
- Riders of the streetcar would be able to use their fare to transfer onto the rest of the Greater Vancouver transit system of SeaBus, SkyTrain and transit buses.
- The service would cost in the range of 2 to 3 dollars for 90 minutes of travel.

9. If this streetcar service was available, how likely would you be to use it to travel to the Downtown Vancouver areas we mentioned? (REPEAT DEFINITION AS NEEDED) (IF NEEDED: The streetcar service would connect to the rest of the public transit system.)

Would you say: very likely, somewhat likely, not very likely or not at all likely?

- ❑ Very likely
- ❑ Somewhat likely
- ❑ Not very likely
- ❑ Not at all likely
- ❑ DON'T KNOW

10. IF Q9=NOT VERY/NOT AT ALL LIKELY: **Why are you <u>not</u> likely to use it?** (PROBE FULLY FOR DETERRENTS TO USING STREETCAR)

_____

_____

[NOW SKIP TO Q14)

11. IF Q9=VERY/SOMEWHAT LIKELY TO USE: **What specific features or characteristics of the streetcar service would most encourage <u>you</u> to use it? What do <u>you</u> particularly like about it?** PROBE FOR SPECIFICS; UP TO 3 PROBES.

_____

_____

12. IF Q9=VERY/SOMEWHAT LIKELY: **Please tell me how likely you would be to use the proposed streetcar service to travel to <u>each</u> of the following Downtown Vancouver destinations ... for shopping, personal business, entertainment or recreational trips.**

RANDOMIZE LIST. For [INSERT DESTINATION] ... **would you say: very likely, somewhat likely, not very likely or not at all likely to take the streetcar?**

	Very likely	Somewhat likely	Not very likely	Not at all likely	DON'T KNOW
Waterfront Station/SeaBus?					
Gastown?					
Chinatown?					
Science World?					
Granville Island?					

13. IF ANY IN Q12=VERY/SOMEWHAT LIKELY:

13a) First **thinking about the warmer months from <u>May to October</u> ...** being as realistic as possible ... **about how many <u>one-way trips in an average week or month</u>**, if any, do you think you would make **by streetcar** <u>for shopping, personal business, entertainment and recreational purposes</u> to these destinations? INSERT DESTINATION IF "VERY/SOMEWHAT LIKELY" IN Q12.

For example, a trip from your home to Gastown, including any transfers, would count as <u>one</u> one-way trip.

(About how many one-way trips in an average week or month) **by streetcar <u>to/from</u>** → READ DESTINATION ...	Waterfront Station/ SeaBus?	Gastown ?	Chinatown?	Science World?	Granville Island?
Per week (CONFIRM # 1-WAY)					
Per month (CONFIRM # 1-WAY)					

ALWAYS CONFIRM NUMBER AND ASK: Including one-way trips coming back?

13b) And now thinking about the cooler months from <u>November to April</u> ... again please be as realistic as possible. **About how many <u>one-way</u> trips in an <u>average week or month</u>**, if any, would you make ... (**by streetcar** for <u>shopping, personal business, entertainment and recreational purposes</u>)?

(About how many one-way trips in an average week or month) **by streetcar <u>to/from</u>** → READ DESTINATION	Waterfront Station/ SeaBus?	Gastown ?	Chinatown?	Science World?	Granville Island?
Per week (CONFIRM #)					
Per month (CONFIRM #)					

ALWAYS CONFIRM NUMBER AND ASK: Including one-way trips coming back?

14. EVERYONE: **If the streetcar route were extended, how likely would you be to use the proposed streetcar service to travel to the following destinations:** RANDOMIZE AND READ DESTINATIONS; FOR EACH: Would you say: very likely, somewhat likely, not very likely or not at all likely?

	Very likely	Somewhat likely	Not very likely	Not at all likely	DON'T KNOW
Stanley Park?					
Yaletown?					
GM Place or BC Place stadium?					

15. IF VERY/SOMEWHAT LIKELY TO ANY IN Q14, CONTINUE:

IF Q9 = "VERY/SOMEWHAT LIKELY", GO DIRECTLY TO Q15a TEXT.
IF Q9 = "NOT VERY/AT ALL LIKELY", READ INTRO: **If the streetcar route were extended to Stanley Park, Yaletown and GM Place/BC Place, we'd like to know approximately how many streetcar trips you would make to these destinations.**

15a) Thinking only about the warmer season from May to October ... being as realistic as possible ... about how many one-way trips by streetcar, if any, do you think you would make in an average week or month for shopping, personal business, entertainment and recreational purposes to: INSERT DESTINATION IF "VERY/SOMEWHAT LIKELY" IN Q14.

For example, a trip from your home to Stanley Park, including any transfers, would count as one one-way trip.

(About how many one-way trips in an average week or month) **by streetcar to/from** → READ	Stanley Park?	Yaletown?	GM Place or BC Place Stadium?
Per week (CONFIRM #)			
Per month (CONFIRM #)			

ALWAYS CONFIRM NUMBER AND ASK: Including one-way trips coming back?

15b) And now thinking only about the cooler season from November to April ... again please be as realistic as possible. About how many one-way trips by streetcar, if any, would you make in an average week or month (for shopping, personal business, entertainment and recreational purposes)?

(About how many one-way trips in an average week or month) **by streetcar to/from** → READ	Stanley Park?	Yaletown?	GM Place or BC Place Stadium?
Per week (CONFIRM #)			
Per month (CONFIRM #)			

ALWAYS CONFIRM NUMBER AND ASK: Including one-way trips coming back?

16. IF VERY/SOMEWHAT LIKELY TO Q9 or Q14: **Next, thinking about your use of the streetcar to <u>any</u> of the possible destinations* we've been talking about, what mode of transportation would the streetcar trips replace, that is, what mode would you use if the streetcar was <u>not</u> available? (MULTIPLE ANSWER OK)**

* DESTINATIONS LIST <u>INCLUDING</u> EXTENSION ROUTE (REPEAT ONLY IF ASKED): Waterfront Station, Gastown, Chinatown, Science World, Granville Island, Stanley Park, Yaletown, GM Place or BC Place Stadium.

- ❑ Private vehicle → PROBE: Do you usually:
  - drive alone without passengers,
  - Or travel with others in a private vehicle?
- ❑ Walk the whole way (from your origin)
- ❑ Rollerblade, skateboard, or wheelchair
- ❑ Transit bus
- ❑ SkyTrain
- ❑ SeaBus
- ❑ Taxi
- ❑ Other (specify)

17. IF VERY/SOMEWHAT LIKELY TO Q9 or Q14: **Would you <u>combine</u> the use of the streetcars with any other modes?** IF YES: **Which ones?**

- ❑ YES → PROBE: which ones?
  - Private vehicle (car/van/truck)
  - Transit bus
  - SkyTrain
  - SeaBus
  - West Coast Express
  - Other (specify)
- ❑ NO

18. IF VERY/SOMEWHAT LIKELY TO Q9 or Q14: **Would you be <u>most</u> likely to use the streetcar on weekdays or weekends or both equally?**

- ❑ Weekdays (Monday-Friday)
- ❑ Weekends (Saturday-Sunday)
- ❑ Both equally
- ❑ DON'T KNOW/VARIABLE

19. IF VERY/SOMEWHAT LIKELY TO Q9 or Q14: **Would you be <u>most</u> likely to pay for the streetcar trip using cash, FareSaver tickets or a transit pass?** (PROBE IF TRANSIT PASS: Would that be a monthly FareCard, an annual transit pass or a post-secondary student U-Pass)**?**

- ❑ Cash
- ❑ FareSaver tickets (pre-paid booklets of 10)
- ❑ Transit pass → PROBE: Would that be:
  - A monthly FareCard
  - An annual transit pass (employer pass) or
  - A post-secondary student U-Pass?
- ❑ DON'T KNOW

20. IF VERY/SOMEWHAT LIKELY TO Q9 or Q14
Next I'm going to read some factors that may or may not influence your decision to use the streetcar service.

Please rate each on a 10-point scale where "10 means this is of highest importance" and "1 means of no importance at all."

RANDOMIZE LIST.
Starting with/next is: READ ITEM. **How important would this be in your decision to use the Downtown streetcar?**

	Rating
a) Cost of the fare	
b) Availability of day passes	
c) Service frequency	
d) Ability to use fare to transfer for **free** to other transit services, such as SeaBus, SkyTrain and buses	
e) Ability to use fare to transfer for **free** to False Creek ferries	
f) Early morning streetcar service before 10am	
g) Evening streetcar service after 8pm	
h) Use of heritage style vehicles	
i) Use of modern style vehicles	
j) Availability of park & ride facilities to connect to transit and the streetcar	
k) The destinations served	

Demographics
As we near the end, I have just a few more questions to make sure our sample represents all types of residents ...

21. Into which of the following age categories do you fall?

- ❑ 16 to 24 years
- ❑ 25 to 34 years
- ❑ 35 to 44 years
- ❑ 45 to 54 years
- ❑ 55 to 64 years
- ❑ 65 or better
- ❑ REFUSED

22. Including you, how many people are there in your household?

RECORD NUMBER

23. And how many are 16 years of age and over?

RECORD NUMBER

24. Are you currently: (READ LIST)

- ❑ Employed for pay
- ❑ Self employed/work from home
- ❑ Homemaker
- ❑ Retired
- ❑ Student
- ❑ Unemployed currently
- ❑ REFUSED

25. Which of the following categories best describes your total annual household income before taxes?

- ❑ **Less than $55,000**→ PROBE: **Is that:**
  - ○ Less than $20,000
  - ○ $20,000 to less than $35,000, or
  - ○ $35,000 to less than $55,000
- ❑ **Or $55,000 or more** → PROBE: **Is that:**
  - ○ less than $65,000
  - ○ $65,000 to less than $80,000
  - ○ $80,000 to less than $100,000, or
  - ○ $100,000 or more
- ❑ DON'T KNOW
- ❑ REFUSED

Thank you. Finally, in case my supervisor may wish to verify this survey, may I please have your first name or initial? _____

Mustel Group and the City of Vancouver thank you very much for your participation! Have a nice day/evening!

MUSTEL GROUP
MARKET RESEARCH

Downtown Streetcar Study: Tourists/Visitors – (A236-1)
Questionnaire – FINAL July 28, 2004

ON-SITE LOCATION:

❑[1] Stanley Park	❑[2] Waterfront	❑[3] Gastown
❑[4] Chinatown	❑[5] Science World	❑[6] Granville Island

Intro/Screener
Hello, I'm ___ of Mustel Group Market Research, a professional opinion polling firm.

We are conducting a very brief survey on behalf of the City of Vancouver among people who are visiting the Greater Vancouver area.

A. Just to confirm, are you a tourist or non-resident visitor (that is, just visiting and not a resident of Greater Vancouver)?

YES → CONTINUE
NO → THANK AND TERMINATE (AND TALLY N-Q IF RESIDENT OF GVRD)

NON-QUALIFIER TALLY: RESIDENT OF GVRD									
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

Please be assured we are not selling or soliciting anything and all responses are kept strictly confidential.

Persuaders—only if needed:
- This is strictly an opinion survey; we are not selling or soliciting anything.
- The survey is being conducted for the City of Vancouver, Engineering Services.
- This study is important to help the City better understand the opinions and needs of visitors.
- All responses are strictly confidential and anonymous; your identity is never revealed to anyone else, including the client.
- The survey averages about 5 minutes.
- CONTACT: Dale Bracewell, Transportation Engineer, City of Vancouver, 604-871-6440
- SHOW LETTER OF AUTHORIZATION from Dale Bracewell, as needed.

Privacy Issues—only if needed:
- Mustel Group is committed to protecting your privacy and the confidentiality of your personal information.
- Mustel Group is committed to keeping the personal information you share with us confidential.
- The information you provide will only be used for the purposes of this research. Under no circumstances do we sell contact lists or personal information to others.
- The information you provide will be retained only for the time it is required for the purposes of this research.
- Mustel Group will protect the information you provide with appropriate safeguards and security measures.
- We are fully compliant with the new federal privacy legislation (New act is called PIPEDA: Personal Information Protection and Electronic Documents Act)
- The information you provide will be combined with the responses given by all other survey respondents and reported only in aggregate form. Your answers will remain completely confidential and anonymous.

1. GENDER [OBSERVE & RECORD]
[IF 2+ IN PARTY, ALTERNATE MALE/FEMALE]

- ❑1 MALE
- ❑2 FEMALE

2. First of all, including you, how many people are in your trip party today on this visit to this location (i.e., Stanley Park, Waterfront Station, Gastown, Chinatown, Science World, Granville Island)?

WRITE IN # (including yourself) [ ]

3. a) What main type of transportation did you use to arrive at this location today? ONE ANSWER. DO NOT READ. READ ONLY TO CLARIFY.

- ❑1 Walked the whole way
- ❑2 Transit bus
- ❑3 SkyTrain
- ❑4 SeaBus
- ❑5 Private/rented vehicle
- ❑6 Taxi
- ❑7 False Creek Ferry/ Aquabus
- ❑8 Existing Downtown Historic Railway (SAT/SUN ONLY; SERVICE FROM SCIENCE WORLD TO GRANVILLE SLAND ONLY)
- ❑9 Vancouver Tour bus/ Tourist trolley-bus
- ❑96 Other (specify) _____

→ **IF PRIVATE RENTED VEHICLE**

3. b) Did you (or a member of your party) **park the car or did you get a ride here?**

❑1 Yes ❑2 Got a ride

IF PARKED:

→ **3. c) Was it street parking?** ❑1 Yes ❑2 No

4. Where are you staying while in Greater Vancouver? PROMPT IF NEEDED

- ❑1 Downtown hotel/ other <u>downtown</u> Vancouver location
- ❑2 Other City of Vancouver (everything but downtown)
- ❑3 Burnaby/New Westminster
- ❑4 Richmond
- ❑5 North Vancouver/West Vancouver
- ❑6 Tri-cities (Coquitlam/Pt. Moody/Pt. Coquitlam)
- ❑7 Surrey/White Rock/Langley/Delta/Ladner/ Tsawwassen/ Pitt Meadows/Maple Ridge
- ❑96 OTHER (SPECIFY)_____
- ❑98 DK/REF

5. How many days will you be visiting the Greater Vancouver area on this trip?

- ❑1 Less than one day **OR** WRITE IN # days: [ ]
- ❑98 DK/REF

6. a) Which, if any, of the following destinations have you visited or are you planning to visit during your stay in Greater Vancouver? READ, CHECK AT LEAST ONE

- ❑1 Stanley Park
- ❑2 Canada Place or Convention Centre
- ❑3 Waterfront Station/SeaBus
- ❑4 Gastown (INCLUDES STORYEUM)
- ❑5 Chinatown
- ❑6 Science World
- ❑7 Granville Island
- ❑8 Yaletown
- ❑9 BC Place / GM Place
- ❑10 Robson or Granville street shopping area

6. b) Did you take or plan on taking any types of transit to any of the above destinations?

- ❑1 Transit bus
- ❑2 Skytrain
- ❑3 Seabus
- ❑4 False Creek Ferry / Aquabus
- ❑5 Existing Downtown Historic Railway (FOR SCIENCE WORLD AND GRANVILLE ISLAND)
- ❑6 West Coast Express train
- ❑96 Other (SPECIFY)_____
- ❑97 No
- ❑98 DK/REF

7. Now, I'd like to get your opinion on an alternative transportation service. Here is a description. HAND RESPONDENT PHOTOS AND ROUTE MAP. READ DESCRIPTION THEN POINT OUT GREEN ROUTE AS YOU READ.

Modern, rail-based street cars would run through Downtown Vancouver and around False Creek, as seen on this map ... covering major tourist destinations, such as Canada Place, Gastown, Chinatown, Science World and Granville Island.

Streetcars would run approximately every 10 minutes in both directions. Streetcar systems like this are quieter than buses, non-polluting, wheelchair and bike-accessible and offer a very smooth ride.

Riders of the streetcar would be able to use their fare to transfer onto the rest of the Greater Vancouver transit system of SeaBus, SkyTrain and transit buses.

The service would cost in the range of 2 to 3 dollars.

8. If this streetcar service was available, how likely would you be to use it to travel to this particular location? Would you say: very likely, somewhat likely, not very likely or not at all likely?

- ❑4 Very likely
- ❑3 Somewhat likely
- ❑2 Not very likely
- ❑1 Not at all likely
- ❑98 DK/REF ⟶ **GO TO QUESTION 12**

9. IF NOT VERY OR NOT AT ALL LIKELY: Why are you not likely to use it? (PROBE FULLY FOR DETERRENTS TO USING STREETCAR)

_____

_____

IF NOT VERY/NOT AT ALL LIKELY → NOW GO TO Q12

10. IF VERY/SOMEWHAT LIKELY TO USE: What specific features or characteristics of the streetcar service would most encourage you to use it? What do you particularly like about it? PROBE FOR SPECIFICS.

_____

_____

11. Would you be combining your use of the Streetcar with any other transit modes? If yes, which ones?

❑[1] YES: ***PROBE***
❑[2] NO
❑[9] NOT SURE/DON'T KNOW

11.a Which ones?
❑[1] Transit bus
❑[2] Skytrain
❑[3] Seabus
❑[4] False Creek Ferry / Aquabus
❑[5] West Coast Express train

12.a-g) EVERYONE: For each of the following please tell me how likely you would be to use the proposed streetcar service to travel to this Downtown Vancouver destination? Would you say: very likely, somewhat likely, not very likely or not at all likely?

	Very likely	Some what likely	Not very likely	Not at all likely	DON'T KNOW
a. Waterfront Station/SeaBus.....	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]
b. Gastown.....	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]
c. Chinatown	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]
d. Science World	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]
e. Granville Island	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]
f. Stanley Park.....	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]
g. Yaletown, GM Place or BC Place .	❑[4]	❑[3]	❑[2]	❑[1]	❑[98]