

4 *Components of the Plan*

The over all goal of the Downtown Transportation Plan is to improve access to downtown homes and businesses while enhancing the unique attraction of downtown Vancouver.

Given the population and employment targets, the total number of trips to downtown will increase by 30 percent. However, the change in the number of trips is different for each of the modes. The more sustainable modes like walking and biking will increase the most. Outlined below is a short summary of how people will reach downtown destinations if all of the plan components are implemented within the next twenty years.

- Walk trips are expected to more than double.
- Bike trips are expected to more than double.
- Transit trips made during rush hour are expected to increase by 50 to 60 percent.
- Vehicles entering downtown are expected to decrease slightly or remain about the same.

In short, the plan accommodates significant increases in walk, bike and transit trips by recommending major improvements for these modes. At the same time, these improvements also achieve an overall reduction in vehicle congestion that will benefit motorists and goods movement and ultimately the economic vitality of the downtown.

The following sections describe each component of the Downtown Transportation Plan.

4.1 Road Network Plan

Traffic congestion is one of the biggest concerns in an urban core. It not only affects the accessibility of the urban core, but its economic health. Therefore, one of the main goals of the downtown transportation plan is to minimize traffic congestion. This is accomplished by maintaining an efficient network of streets for traffic circulation.

The current street system within the downtown has evolved over the years to accommodate the flow of traffic. Measures such as turn restrictions, traffic signals, rush hour parking restrictions and one-way streets all contribute to the effective flow of traffic in and around downtown. Currently, the traffic signal management system is being upgraded to better co-ordinate the city's 650 signals and optimize traffic circulation. The good news is that congestion within the downtown is not an overwhelming problem. In comparison to other parts of the region, downtown Vancouver has surprisingly manageable congestion despite its concentration of jobs and residents.

If congestion is not the primary problem in the downtown, why do anything at all?

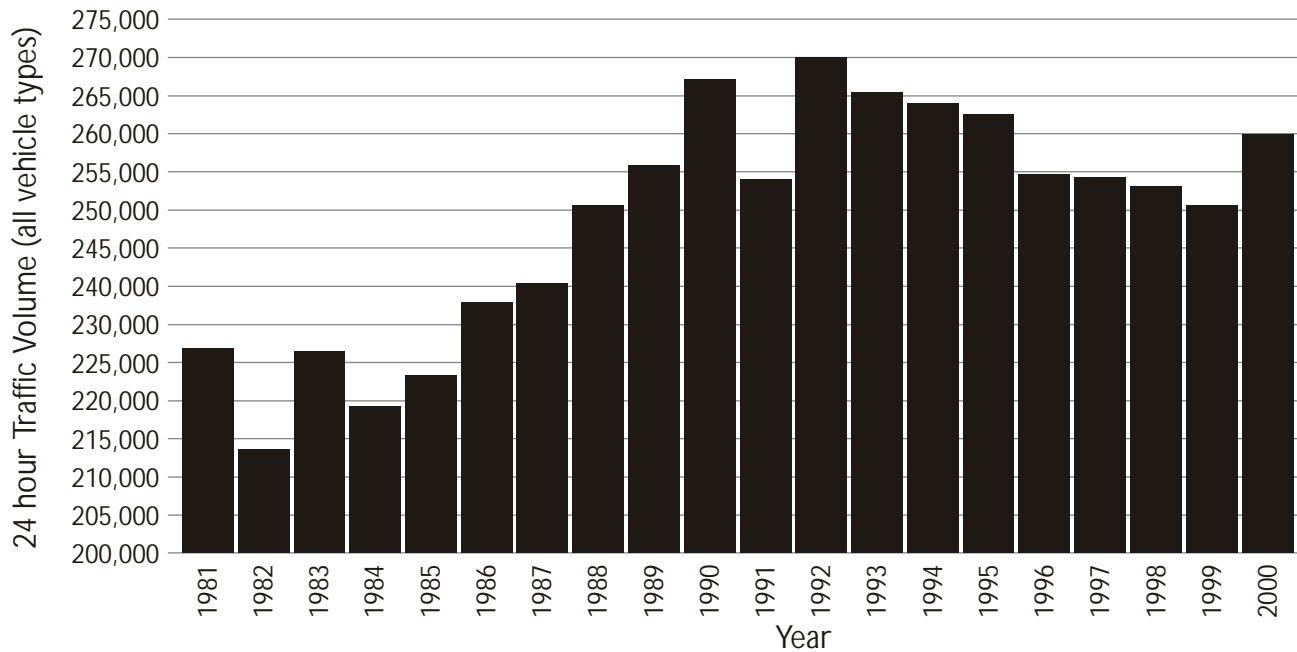
Things may look good now, but with the increasing population and employment downtown, the number of trips into downtown is expected to increase significantly. Without any intervention, this could mean a lot more cars driving around the downtown. This would not only increase congestion, but the general desirability of the downtown as a place to work, live or play diminishes. As well, building more roads to accommodate more traffic is not only difficult and expensive in a densely developed environment, but it is not sustainable. Many North American cities with extensive freeway systems are a testament to the fact that building more roads induces more people to drive and does not solve congestion problems.

4.1.1 Future Trends

Auto trips will remain a significant proportion of the total number of daily trips into downtown in the AM rush hour (approximately 33% in 2021). Therefore, the accessibility of the downtown by auto needs to be well accommodated. It is an appropriate choice for many circumstances and should be recognized as a component of a balanced transportation system. The strategy is to provide a balanced transportation system that provides people with several mode choices that includes the car.

The 1997 Transportation Plan set a goal of no increased road capacity into the downtown and that traffic volumes into the downtown should be maintained at current (1996) levels. This may seem unrealistic given the growth in traffic and resulting increase in congestion in many parts of the region. But it is an achievable goal for the downtown. *Figure 4.1-A* shows that the 24-hour traffic volumes into the downtown over the last 10 years have levelled off and are gradually declining. With the projected employment growth in the downtown, this downward trend may be difficult to maintain. But, with the provision of transportation choices, appropriate land use policies and other incentives, the number of cars entering the downtown in 2021 is projected to remain about the same as today. Given this volume of traffic, the challenge is to maintain a manageable level of congestion in the future with the current road network, the expected growth in trips, and the provision of transportation choices that are often competing for the same road space.

Figure 4.1-A
24 Hour Traffic Volume Entering Downtown Vancouver



4.1.2 Principles

The following key principles guide the evaluation of the downtown road network:

- a) Minimize Traffic Congestion. This is one of the most important factors for the Downtown Transportation Plan and is an expectation of the general public. Traffic congestion not only affects auto traffic, but it affects the operation of transit buses and commercial vehicles and impacts the environment in which pedestrians and cyclists travel.
- b) Provide access to key destinations and support new land uses in the downtown. The emerging residential neighbourhoods in the downtown are an example of the changing land uses that may require changes to the road network system.
- c) Provide a balanced transportation system. A number of transportation choices need to be provided within the downtown to meet demands and influence future travel choices.
- d) Enhance safety and user comfort for all modes.

4.1.3 Methodology

The following key tasks were completed in analysing potential changes to the road network:

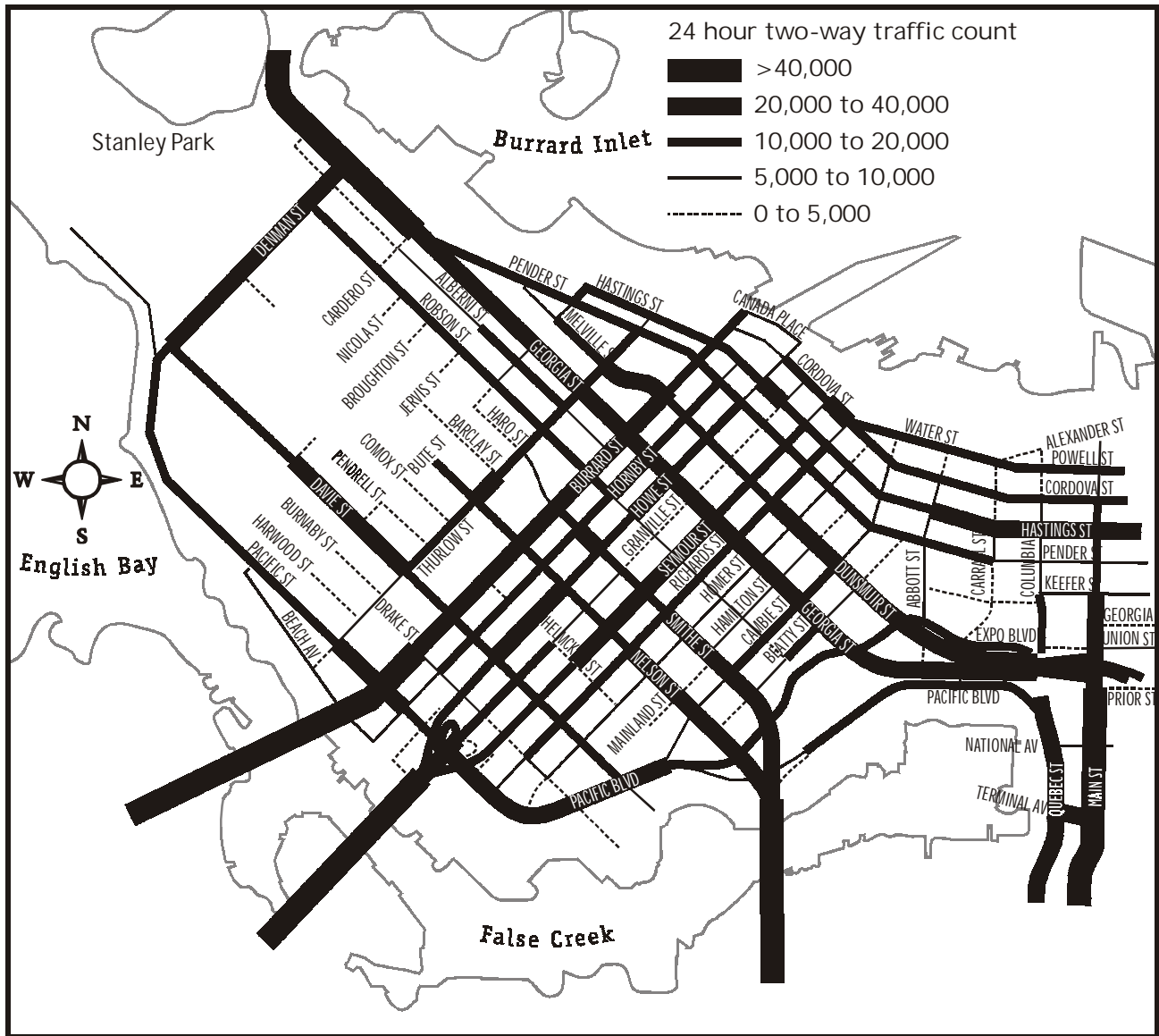
- Inventory the existing street system;
- Analyse existing operating conditions;
- Identify areas of concern and potential solutions;
- Determine future land uses and travel demand forecasts;
- Develop alternate scenarios for the road network;
- Determine traffic operating conditions plus other performance measures for the existing and alternate road network scenarios; and
- Evaluate and recommend the preferred road network.

In developing scenarios for the overall road network, each change along a specific street was first evaluated individually in terms of benefits and impacts to all road users and property owners. If the results were positive, it was then co-ordinated with all other specific changes that were positive to create a new road network. The new road network was then evaluated using the regional traffic model (EMME/2) to determine its impact on congestion and accessibility by comparing it to the existing road network for today and for 2021. At this stage, other performance measures, such as environmental considerations, are also used to evaluate the new road network. As can be expected, there were a number of iterations made to ensure that the proposed changes to the road network achieved the best results.

Before considering any road network changes, one must first understand the contribution of all the streets for moving traffic. *Figure 4.1-B* shows the 24-hour traffic counts for most streets within the downtown peninsula except the West End residential neighbourhood. Most streets in the downtown core are busy streets. As expected, the bridges leading into the downtown carry the highest volume of traffic with over 60,000 vehicles per day on each. Traffic from the east across the "neck" of the peninsula is more distributed over a number of streets, with higher concentrations along Hastings Street, and the Dunsmuir and Georgia viaducts.

Figure 4.1-B
24 Hour Traffic Volume

(Based on available count data from 1990-2000 with some interpolation)



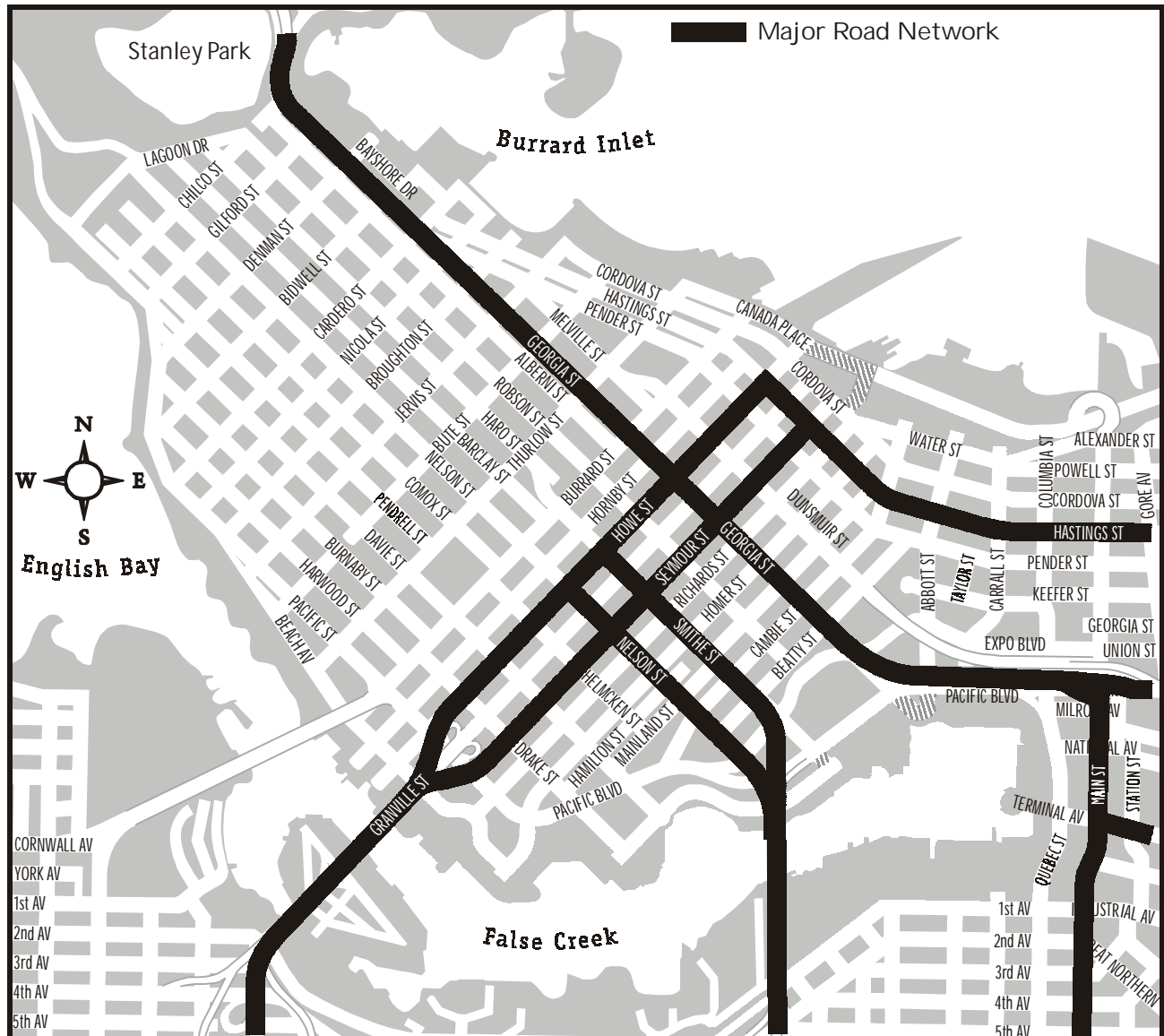
Just as important as identifying the busiest streets in the downtown, Figure 4.1-B also reveal the streets with the lowest traffic volumes. These streets, such as Carrall Street, Helmcken Street, Beatty Street, Drake Street and Homer Street were examined closely because they offer opportunities for more significant changes without reducing the function and efficiency of the downtown street network as a whole. Many of these streets were used to provide better local access or more transportation choices.

4.1.4 Major Road Network

In 1999, several streets within the downtown were designated as part of the Regional Major Road Network *Figure 4.1-C*. The purpose of the Major Road Network (MRN) is to maintain regional mobility by providing continuity through municipalities for all types of traffic. Municipalities receive capital and operating funds from TransLink to maintain and upgrade the Major Road Network. Although Vancouver retains ownership and control of designated MRN streets, the streets would be co-managed with TransLink and issues regarding maintenance standards, people carrying capacity and truck routes need to be mutually agreed upon.

4.1-C

Downtown Major Road Network



The designation of some downtown streets as part of the MRN was done in advance of a completed Downtown Transportation Plan. Because of this, it was recognized that revisions might be necessary.

A review of the existing MRN streets downtown confirms they are all appropriate. They all carry high volumes of regional traffic and buses to, from and across the downtown, which is recognized as a major regional activity centre. The streets create a continuous network by connecting to the MRN streets outside the downtown, such as Hastings Street, Main Street, Terminal Avenue, Cambie Street and Granville Street. Therefore, it is recommended that the existing MRN streets in the downtown be confirmed.

A review of other downtown streets for potential inclusion in the MRN resulted in the following observations:

- Burrard Street, from Burrard Street Bridge to Hastings, is one of the busiest streets in the downtown with traffic volumes similar to Georgia Street. Burrard could qualify as an MRN street based on its support of major regional transit services, its designation as a truck route, its role in providing network continuity, its accommodation of regional traffic to and across the downtown, particularly between the north shore municipalities and UBC. Consideration of Burrard Street as an MRN street should also include the Burrard Street Bridge and its connections to the rest of the MRN (i.e. Burrard Street to Broadway, Nelson, Smithe and Hastings streets).
- Granville Street from the Granville Bridge to Hastings Street is a major transit corridor. Granville Mall carries more people by all modes than any other downtown street, including the Lions Gate Bridge. Its role in providing efficient transit service in Vancouver is critical in reducing congestion along other MRN streets in Vancouver.

A more detailed review of each of the above streets is required prior to making any recommendations regarding its potential role as part of the MRN. In order to be included, they must meet the existing set of criteria established by TransLink and member municipalities. Many of these criteria have been referred to in the observations above. As more of the criteria are met, the more regionally important the street becomes. The reviews must also consider potential changes in streetscape, street usage and land use as the downtown area evolves.

Moreover, ongoing review of the adequacy of the MRN is essential. In future, more streets may need to be considered. For example, Dunsmuir Street and viaduct complement Georgia Street and viaduct. Main Street is both a truck route to the Port and has high transit and traffic volumes. When evaluating such streets for MRN, land use implications and streetscape needs for adjacent development will have to be fully understood and considered. Such streets will be brought forward to Council as need be.

One advantage of designating streets as part of the MRN is the funding contributions received from TransLink for maintenance and capital improvements. This source of funding is substantial and could help pay for changes along those streets (e.g. upgrades to the Burrard Street Bridge or streetscape enhancements along Granville Street).

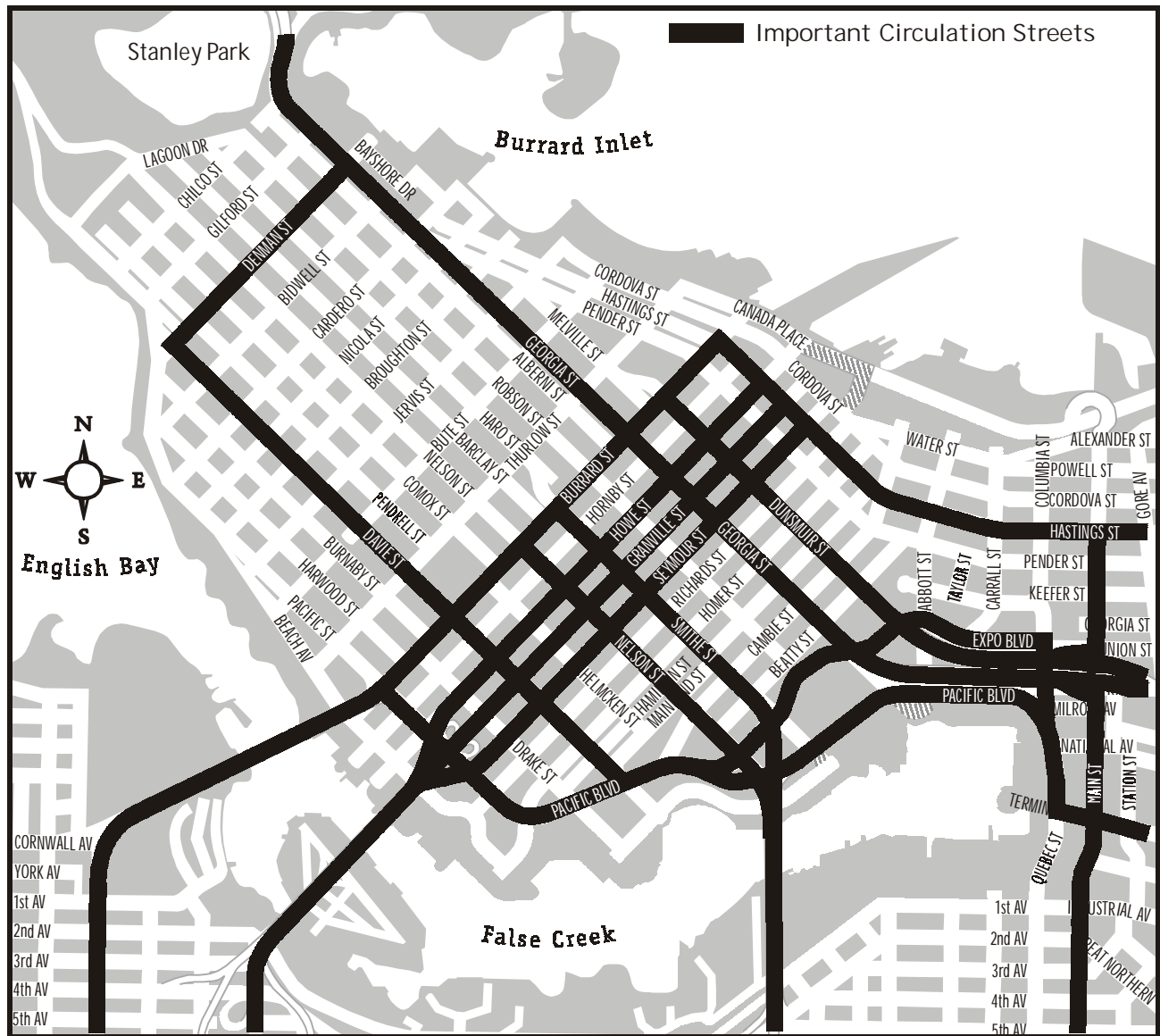
One disadvantage is the sharing of control in making future street modifications, particularly with respect to people carrying capacity. This uncertainty suggests that the role of the street (in terms of transportation, adjacent land uses, and streetscape context) should first be confirmed prior to its inclusion as part of the MRN. Given that the future role of Burrard Street is becoming more apparent with the Burrard Bridge Sidewalk Study and the Transit Priority Study, it is recommended that Burrard Street be further evaluated and pursued for potential inclusion as part of the MRN. Similarly, Granville Street and Mall should also be further evaluated and pursued for inclusion as part of the MRN after establishing its transportation role and context.

The urban and streetscape context of Main Street through Chinatown, and Dunsmuir Street and Viaduct are less certain as these streets evolve. Therefore, it is recommended that they be reviewed in further detail in the future.

4.1.5 Circulation Streets

Many streets within the downtown serve an important function in terms of providing circulation routes for traffic destined to various areas. *Figure 4.1-B* helps to demonstrate this by showing that a number of downtown streets carry traffic volumes in excess of 10,000 vehicles per day in both directions. *Figure 4.1-D* highlights some of the more significant circulation streets, including all the streets designated as part of the Major Road Network. These streets complete the connections between major downtown access points. Preserving adequate vehicular capacity along these corridors would help protect adjacent streets from overflow traffic and minimize congestion. It should be noted that both Water and Cordova streets are important circulation streets that provide an important link to east side of Vancouver, but have not been included because Hastings is identified as the primary east-west connection across the neck of the peninsula.

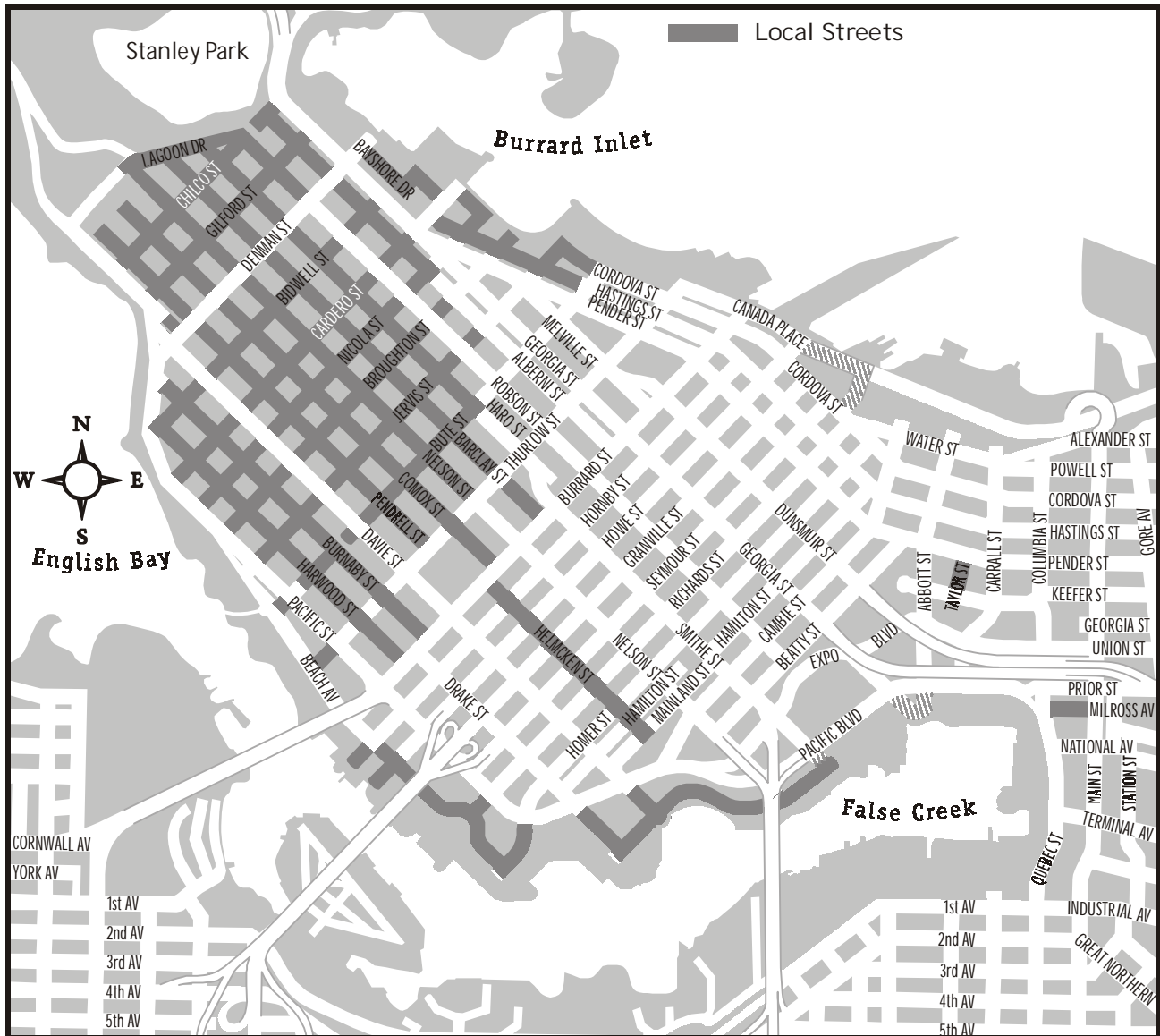
4.1-D
Important Downtown Circulation Streets



Some examples of important circulation streets that are not designated as part of the Major Road Network are Denman and Davie streets. Both these streets provide the necessary access routes to the West End neighbourhood and are also bus routes. Although changes to these streets may be recommended to provide greater transportation choices or more pleasant street environments, it will be necessary to carefully consider the impacts to traffic circulation. Changes that may be too restrictive on traffic circulation could lead to congestion and diversion of traffic to other more sensitive neighbourhood streets or lanes. Therefore any changes to circulation streets with high traffic volumes, such as those shown on *Figure 4.1-D*, need to consider the consequences of traffic congestion and its impacts on neighbouring streets.

To provide further clarity of the role of the various streets in the downtown, it is simpler to identify local streets or streets that primarily provide access to the adjacent land uses and are not required to accommodate any through traffic. This is shown on *Figure 4.1-E* and covers most local streets in the West End, Coal Harbour and False Creek North neighbourhoods. All other streets that have not been identified as either an important circulation street or a local street serve a role that ranges between the two (local collector street to secondary arterial street). A precise definition of these streets is avoided because the role of some streets varies along the length of the street making it difficult to classify. Alberni, between Denman and Burrard, Thurlow Street between Cordova and Beach, and Nelson, between Denman and Cambie Bridge, are a few examples. In avoiding a specific definition, more latitude is provided to ensuring that the street is evaluated and potentially changed based on its role in serving the transportation needs of the adjacent land uses and of the downtown as whole. As well, as the downtown evolves, it enables the street to change without being constrained by its definition. Therefore, it is recommended that all local streets and major arterial streets in downtown be identified, and that all other streets be recognized as providing some contribution to the overall circulation needs of the downtown without a specific classification.

Figure 4.1-E
Local Streets



4.1.6 Road Network Changes

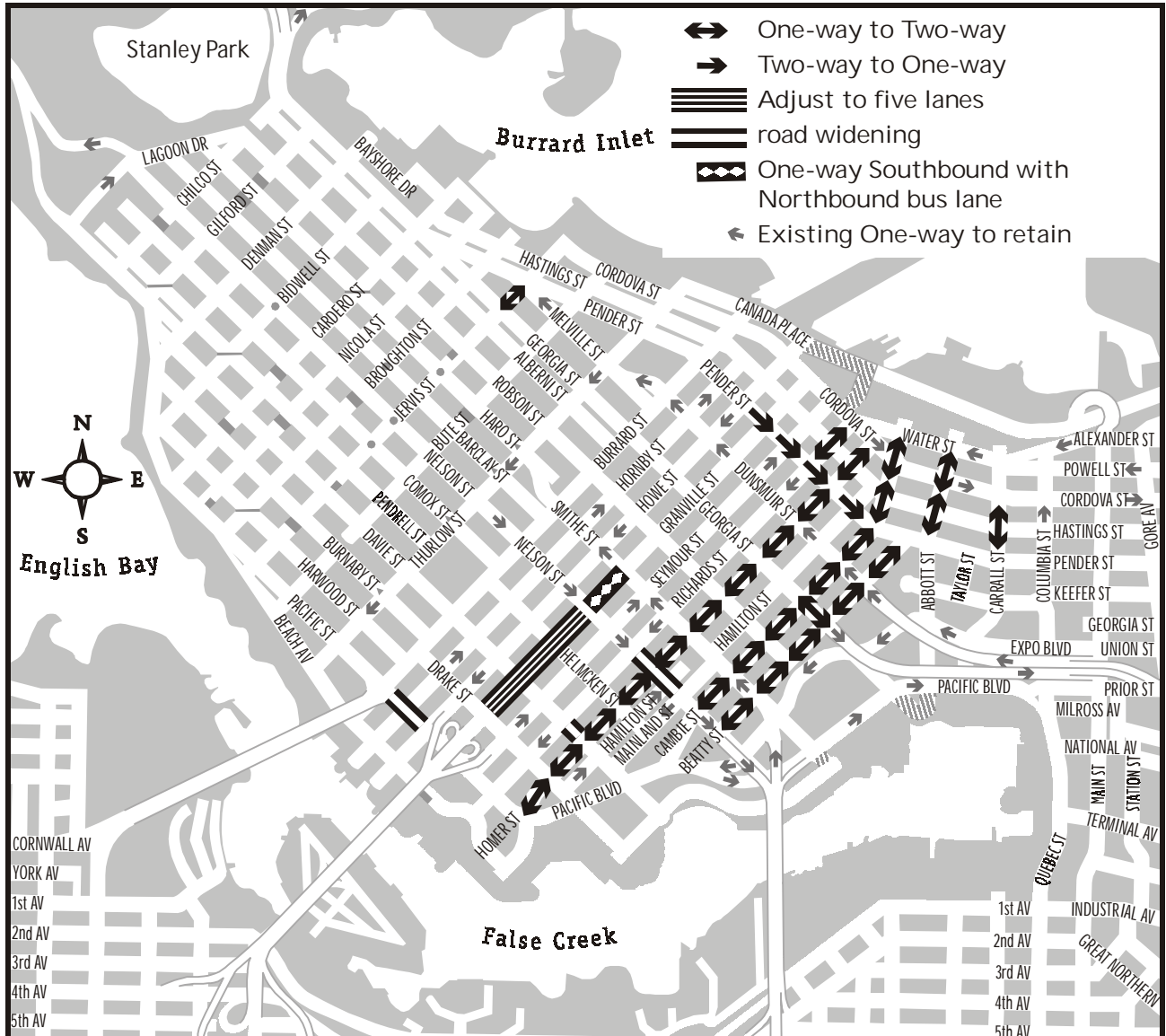
Several changes to the road network are proposed to achieve the goals of the Downtown Transportation Plan. Many of the changes centre around the question of whether a street should be a one-way street or a two-way street given the existing traffic volumes, the land uses and the ability of the street to meet other transportation objectives (pedestrian, bicycle and transit needs).

Many streets within the downtown core are one-way streets. These one-way streets provide safe and efficient traffic operations, and work best in pairs or couplets. In particular, one-way streets reduce conflicts at intersections, provide more orderly traffic flow, and provide better crossing gaps for pedestrians and side street vehicles. On the other hand, two-way streets generally have lower operating speeds because of the friction from opposing traffic, provide better accessibility

to land uses by reducing trip lengths, and provide more convenient and safer loading operations (e.g. tour buses) on both sides of the street. Both street operations have merits, but depending upon the overall objectives, one may be more advantageous.

Figure 4.1-F summarizes the proposed changes to the road network. For each street, a brief description of the change and the rationale for the change are provided below. Several streets where no changes are recommended are included in the list below to document the discussion and resulting conclusions.

4.1-F
Road Network Changes



Carrall Street (between Cordova and Pender) - is recommended for conversion from a one-way southbound to a two-way street. The current traffic volumes along this section of street can be accommodated with a two-way street. Carrall Street south of Pender Street is currently a two-way street and this proposal would extend it north to Cordova. It is not extended further to Powell Street and Water Street because it would make the already complex intersection at Maple Tree Square more complicated and less safe by introducing additional conflicts. In addition to providing better accessibility to the area, making Carrall Street two-way facilitates the creation of bike lanes in both directions.

Abbott Street (between Water and Pender) - is recommended for conversion from a one-way northbound to a two-way street. The current traffic volumes along this street can be accommodated with a two-way street. Abbott Street south of Pender is currently a two-way street and this proposal would extend it north to Cordova. It would provide better accessibility to the area.

Beatty Street - is recommended for conversion from a one-way northbound to a two-way street. The current traffic volumes along this street can be accommodated with a two-way street with minor re-distributions, and new southbound capacity is provided to offset proposed changes to Cambie Street. The conversion would provide better accessibility to the area, particularly to the hotels located on the west side of the street where bus passengers currently load and unload onto the street. It also facilitates the creation of bike lanes in both directions. However, the implications of the proposed changes on traffic management during stadium events require further resolution.

Cambie Street (between Water and Nelson) - is recommended for conversion from a one-way southbound to a two-way street. Current traffic volumes on Cambie Street are relatively high because it is a route used by many motorists to gain access the Cambie Street Bridge. Conversion of this street will reduce the southbound capacity and result in some diversion of southbound traffic to other streets. This diversion is mitigated by the proposed conversion of both Beatty and Homer to two-way streets, which overall, would provide additional southbound capacity. Overall, it is expected that the traffic volumes among the north-south streets in the area (Homer, Hamilton, Cambie, Mainland) will be more balanced because they will all be two-way streets. In addition to providing better accessibility to the area, the conversion would facilitate the introduction of an efficient two-way transit service in the area where other alternatives are more circuitous. Because of the narrower street width between Nelson and Smithe, and because of the complications at the intersection of Cambie and Nelson, northbound general traffic cannot be introduced. However, a northbound counter-flow bus lane and the full time removal of some parking are proposed to maintain two-way transit service along this block. See Spot Improvement #5 in Section 4.8 for more details. In the longer term, when the site on the west side of Cambie Street between Nelson and Smithe redevelops, this block should be considered for widening and introducing two-way mixed traffic.

Homer Street (between Cordova and Pacific) - is recommended for conversion from a one-way northbound to a two-way street. The current traffic volumes along this street can be accommodated with a two-way street with some traffic redistributions, and new southbound capacity is provided to offset proposed changes to Cambie Street. The conversion would provide better accessibility to the area, particularly with the reopening of the Ford Centre, the new residential developments, and the restrictive but necessary one-way street system in Yaletown on Mainland and Hamilton streets.

Richards Street (between Cordova and Pender) - is recommended to remain one-way southbound, but that a northbound counter-flow bus lane be added. Full two-way operation of the street would offer few potential benefits for general traffic. The counter-flow bus lane would improve bus access to Cordova Street at Waterfront Station and could offset bus looping problems if Pender Street were to be made one-way eastbound. It would also facilitate a two-way bike connection between downtown and the waterfront.

Granville Mall (between Hastings and Smithe) - is recommended for further review. It's role as a transit, pedestrian and service vehicle corridor, entertainment district and future greenway should be maintained. Currently the mall is the busiest street in the downtown, carrying more people than any other street by all modes. It is also the busiest transit corridor in the downtown. Therefore, transit efficiency along the street should not be diminished. However, Granville Street/Mall does require an upgraded streetscape and some form of mall management to help revitalize the area.

Granville Street (between Smithe and Nelson) - is recommended for conversion from a two-way street to a one-way southbound street with a northbound counter-flow lane for buses, taxis and other authorized vehicles. The street changes are to address the congestion and conflicts created at the intersection of Granville and Smithe largely by northbound vehicles turning left. Due to the high volume of pedestrians crossing Smithe at the western crosswalk and the high volume of southbound buses, the capacity for northbound vehicles to turn left is limited. This back up of left turning traffic creates congestion and has resulted in the intersection experiencing the highest number of bus-related collisions and the second highest number of rear-end collisions within the central business district (*Safety Review for the Downtown Transportation Plan*, Hamilton Associates, 2001). This change will require all general traffic to turn right at Nelson, resulting in reduced congestion and improved safety at the intersection of Granville and Smithe. This change will also provide more parking/loading opportunities for taxis and commercial vehicles.

Granville Street (between Nelson and Drake) - is recommended for conversion from a six-lane street to a five-lane street with a centre lane that features left-turn bays and could include a planted median. The changes would address the fact that the current width of travel lanes is less than desirable and often results in transit buses straddling two traffic lanes. Current traffic volumes along this street would be manageable because the existing number of lanes approaching the intersections would be maintained and the current number of lanes does not operate efficiently due to the narrow widths. The change would also address Granville Street, between Davie and Drake, which experiences the third highest number of collisions with parked vehicles within the central business district (*Safety Review for the Downtown Transportation Plan*, Hamilton Associates, 2001). An added benefit is the opportunity to widen the sidewalks on both sides of the street by about one metre in total. This would be consistent with the objective to enhance the pedestrian environment.

Thurlow Street (between Nelson and Pacific) - is recommended to remain as a one-way street with traffic calming measures implemented. Conversion to a two-way street was considered to improve accessibility to the area and reduce speeds. However, offsetting the benefits were the increased traffic congestion in the southbound direction, an increase in traffic noise with the introduction of vehicles travelling uphill between Pacific Street and Davie Street, and an increase in northbound traffic that offsets the decrease in the southbound traffic. Therefore the existing one-way street should be traffic calmed with corner bulges to narrow the roadway and facilitate pedestrian crossings, and speed reduction measures implemented where appropriate. In addition, up to 0.5 metres could be added to each sidewalk for the creation of a boulevard with street trees. A major redevelopment of St. Paul's Hospital may necessitate another review of the traffic circulation in the vicinity.

Pender Street (between Cambie and Howe) - is to be considered for conversion from a two-way street to a one-way street. This section of street currently accommodates four narrow lanes of traffic where transit buses, delivery trucks, general traffic, taxis and cyclists all compete for road space. There is a desire to provide bike lanes as part of the downtown bicycle network and parking/loading spaces on the north side of the street. However, this does not appear to be achievable with a two-way street given the existing right-of-way. Because the conversion of this street from a two-way to one-way street will impact other streets and may have significant implications on traffic and transit operations, further detailed analysis with a micro-simulation model is recommended. See spot improvement #47 in Section 4.8 for more details.

Pacific Street (between Burrard and Howe) - is recommended for widening to facilitate the introduction of bike lanes and accommodate the flow of traffic. This could be done in conjunction with the redesign of the Burrard/Pacific and Burrard/Hornby intersections to address general safety issues and improve conditions for all modes. The findings of the Pacific Boulevard Streetscape Design Study also support this widening and needs to be considered along with the False Creek Pedestrian and Bike Crossing Study.

Water and Cordova Streets (between Richards and Main) - are recommended to remain as one-way streets. Water Street should remain a one-way street to preserve the existing sidewalk widths and the ability for buses and other service vehicles to load and unload on the curb lane where this is permitted. Cordova Street should remain as a one-way street to allow the introduction of a streetcar. A two-way Cordova Street with a streetcar running in traffic would reduce sidewalk space significantly, reduce the operational efficiency of the streetcar, and restrict left turns into Gastown. The idea of changing the one-way direction for both streets was also considered, but this would complicate traffic movements, decrease safety and likely increase congestion.

Other One-Way Streets - have also been reviewed and are recommended to be maintained. One-way streets such as Seymour, Howe, Smithe, Nelson, Georgia and Dunsmuir viaducts carry high volumes of traffic and play a significant role in making the downtown highly accessible. They cannot be easily converted to two-way streets without a significant redistribution of traffic and potential reduction of traffic capacity into the downtown, and a significant re-design of the bridge access points.

Extend Downtown Street Grid into Northeast False Creek - Extending the street grid pattern around BC Place stadium into Northeast False Creek will help to integrate this area into the rest of downtown. This includes creating a pedestrian connection along the Georgia Street axis to False Creek, extending Smithe Street east to False Creek, and extending Griffiths Way to False Creek and aligning it with Georgia Street.

Minor Road Widening (approx. 0.5 metres) - are recommended along Davie (between Richards and Homer) and Nelson (between Richards and Mainland). The widening along Davie would make it consistent with the rest of Davie Street, facilitate the introduction of a bus route on Davie and Homer, and remove a block long narrowing that may be contributing to the over-represented head-on collisions at the intersection of Davie and Homer. The widening of Nelson would facilitate the introduction of bike lanes and improve the flow of traffic. It may also address the over-represented side swipe collisions on Nelson at Homer and at Mainland (*Safety Review for the Downtown Transportation Plan*, Hamilton Associates, 2001).

Spot Improvements - There are several potential road network changes identified at specific locations that could achieve a number of goals. Many of the recommended road network changes and spot improvements are described in greater detail in Section 5.0. Some potential ideas include the re-design of the Granville Bridge loops and the re-design of the intersection of Georgia Street and Pender Street.

4.1.7 Traffic Management with Traffic Signals

Traffic signals play a major role in controlling the flow of downtown traffic as nearly every downtown intersection is equipped with a traffic signal. In order to maintain efficient traffic flow, the City co-ordinates many of the signals downtown to provide motorists with sequential green lights (a "green wave") on most one-way streets, as well as two-way streets where one direction of travel predominates. In most cases, signals are set to allow traffic moving at 50 km/h to receive sequential green lights. In some cases this speed may be excessive as it means that motorists must maintain the speed limit as a minimum speed in order to keep moving - even minor delays may cause drivers to either speed to catch the next green light or stop at a red light. Speeds of 50 km/h and up are also uncomfortable for cyclists and nearby pedestrians, and require that motorists maintain a relatively narrow field of vision. In order to improve comfort and safety for all road users, it is recommended that the progression speed be reduced from 50 km/h to 40 km/h on some downtown streets

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 efficiency 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.

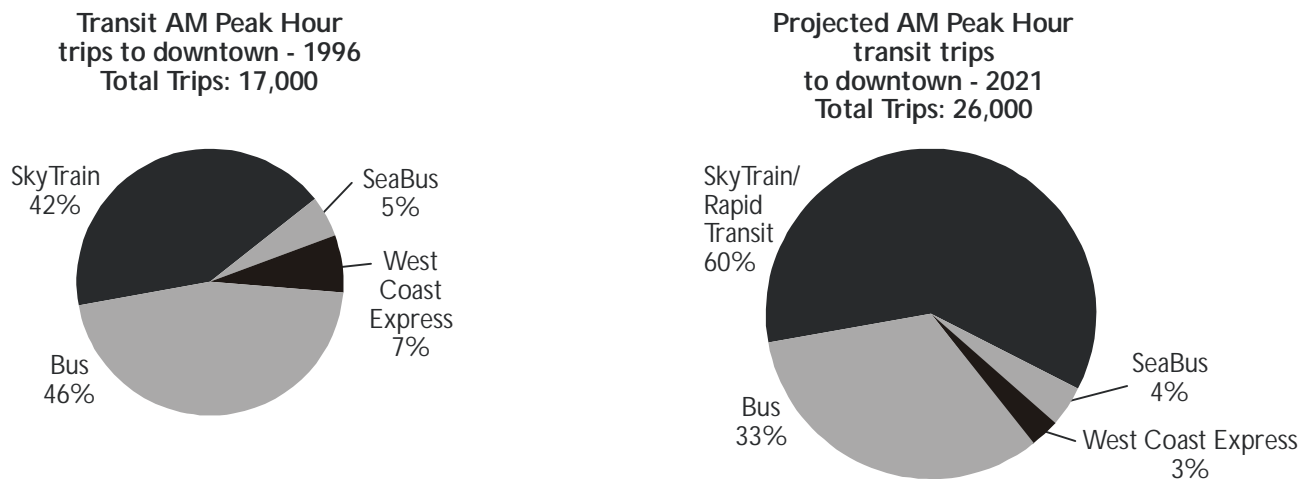
4.2 Transit Plan

Transit is the most popular way to commute to downtown. Currently about 40% of all morning rush hour commuters to downtown arrive by bus, SkyTrain, SeaBus or West Coast Express. Downtown Vancouver is more reliant on transit for access than any other destination in the region. The importance of transit access to downtown will increase significantly by 2021. Over the next twenty years the total number of transit trips to downtown is expect to increase by 45%. The Downtown Transportation Plan assumes that transit supply will increase to match this new demand for transit services as outlined in this section. *Figure 4.2-A*

Figure 4.2-A

Transit AM Peak Hour Trips

Source: Downtown Transportation Plan Sub-Area Model



However, TransLink, the regional transportation authority, is responsible for planning, financing and operating the regional transit system. The City of Vancouver has representation on TransLink and Coast Mountain Bus Company boards. The Downtown Transportation Plan was developed in consultation with TransLink.

Goals

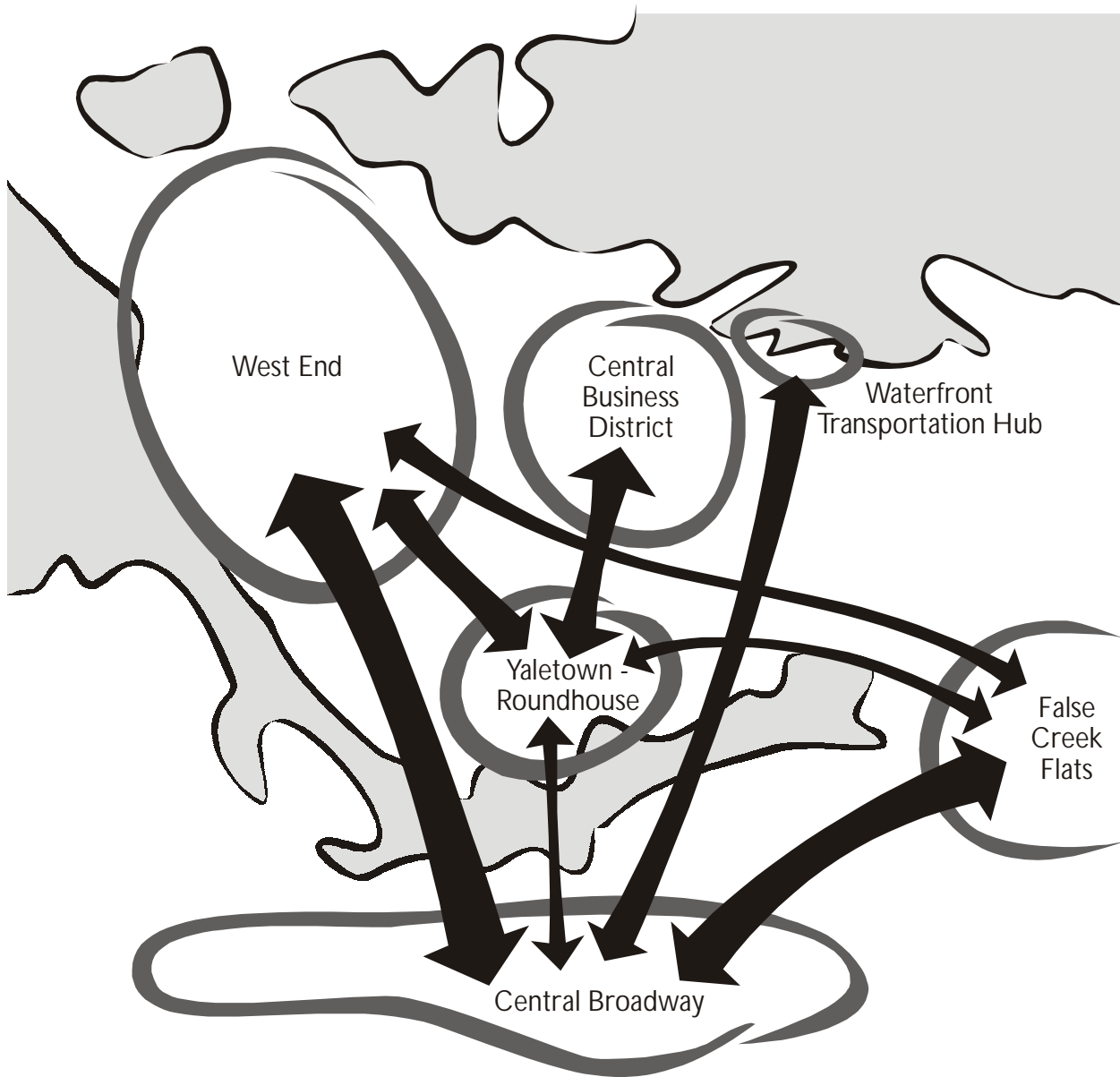
The transit goals of the Downtown Transportation Plan are to support the seamless integration of the various regional transit services, such as SkyTrain, West Coast Express, and SeaBus, and to develop an easy-to-use network of downtown transit routes that serve the existing and emerging neighbourhoods and job centres.

Connecting Neighbourhoods and Job Centres

The Downtown, Central Broadway, and the False Creek Flats are together referred to as the *Metropolitan Core* of Greater Vancouver. The Downtown Transportation Plan proposes better transit connections between the three key existing and emerging job centres in, Downtown, Central Broadway, and the False Creek Flats. These job centres require good transit connections to support a healthy metropolitan core. There is also a need to better connect the densely populated residential areas in Downtown South and the West End to the Central Broadway area.

Figure 4.2-B identifies trips desires lines that are poorly served by transit.

Figure 4.2-B
 Poorly served transit connections



The connection between Downtown and False Creek Flats is currently partially served by the Expo SkyTrain line. Connections to Central Broadway from downtown and from the False Creek Flats are targeted for improved service. Bus routes can provide the needed service in the short term. In the longer term these routes could be converted to or complemented by rail transit services. Ultimately, rapid transit lines should link the three job centres.

False Creek Flats

Portions of the False Creek Flats have been rezoned to change the land use from industrial to high-tech, education, and other higher intensity land uses. By 2021 the Flats could have many other “downtown-like” land uses that could include hotels and retail. Transportation studies have been completed by many of the major land owners, such as Finning and CN, but the City has yet to develop an overall transportation plan that will integrate this area with the rest of the City. There has also been a concern that developments in the Flats could compromise the efficiency of rail service in the City. Further work is needed to assess the needs of rail services (passenger and freight) in the metropolitan core. The City should pursue the development of a detailed transportation plan for False Creek Flats in co-ordination with a rail study.

4.2.1 Rail Rapid Transit

When the Expo SkyTrain line opened in 1985 it was an immediate success. Today, during the morning rush hour the Expo SkyTrain line and the West Coast Express carry half of all transit trips into downtown and require additional trains to meet the demand. With the anticipated expansion of rail rapid transit, the total number of rapid transit trips is expected to double the number of morning rush hour trips to 16,000. In fact, nearly all of the new motorized trips into downtown are expected to be on rapid transit.

One of the attractive features of rapid transit is that all of these new trips are accommodated in a way that has less impact on the immediate livability than any arterial street.

(a) Expo and Millennium SkyTrain Rapid Transit Lines

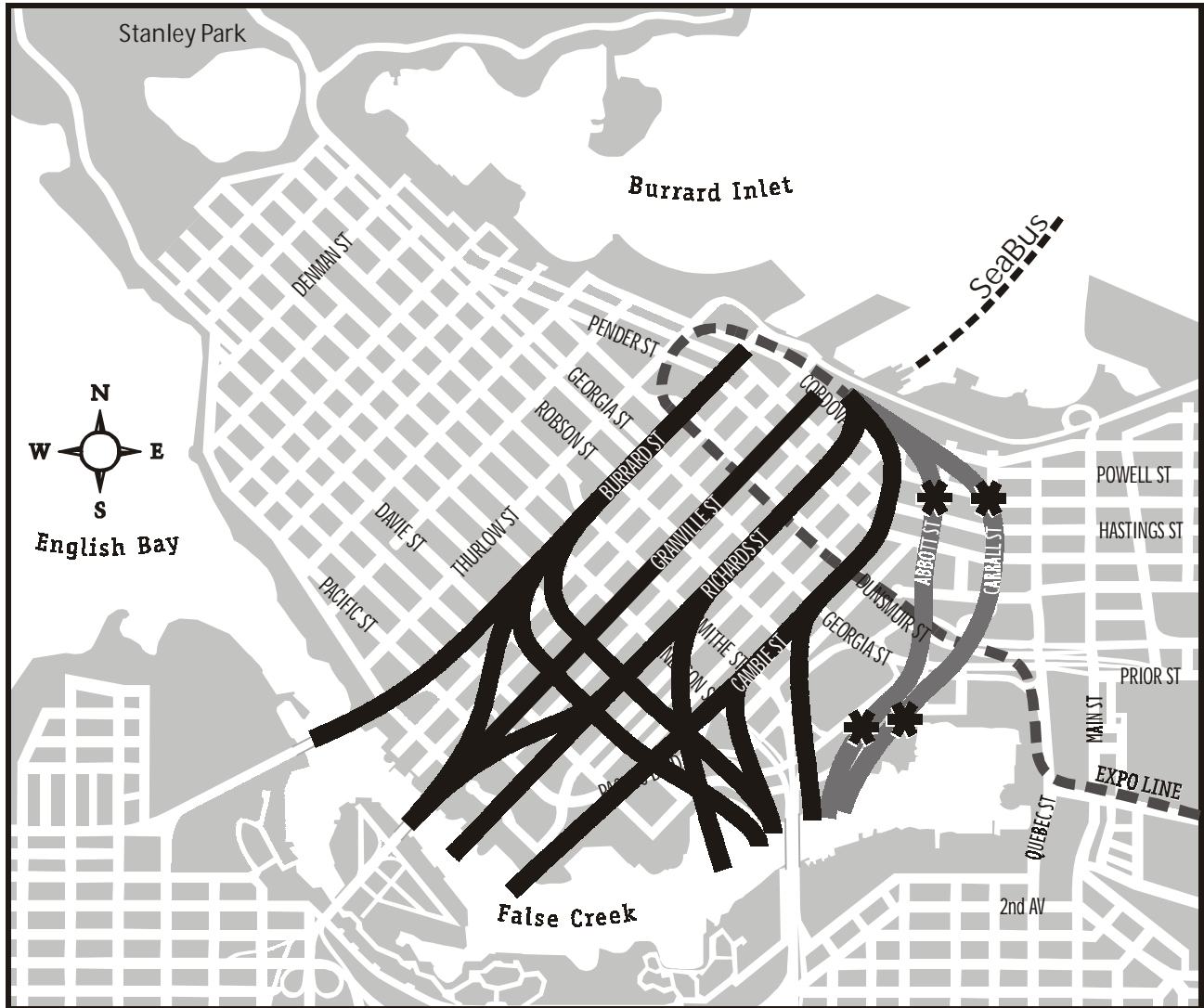
Rapid transit is expected to carry 90 percent of new motorized trips into downtown generated between 1996 and 2021. About half of these new trips would be carried on the existing Expo SkyTrain line and the other half would be on the new Richmond rapid transit line. While the Millennium SkyTrain Line does not directly serve downtown, many riders will use the Millennium line to reach downtown by transferring to the Expo SkyTrain line at Commercial Drive or at a point further west when the Millennium line is extended to Central Broadway. When the first phase of the Millennium line opens in September 2002, an increase in the number of trips to downtown on the Expo line is expected. The Millennium line extensions to Central Broadway-Granville and ultimately to Coquitlam will further increase ridership on SkyTrain into the Metropolitan Core.

(b) Richmond/Airport Rapid Transit Line

The Downtown Transportation Plan anticipates the construction of a north-south rapid transit line to Richmond and the airport. The Richmond/Airport rapid transit line will represent the biggest single improvement to access into the downtown and it will be the single most important addition to transit service to the downtown peninsula. Council has adopted a policy that supports a Richmond rapid transit line in a tunnel (subway) along the Cambie corridor.



A 1990 study for a Richmond rapid transit line identified the potential downtown alignments shown in *Figure 4.2-C*. These alignments have been reviewed for their ability to serve downtown employment centres.

Figure 4.2-C
Potential alignments for a rapid transit line to Richmond



1990 N.D. Lea Study

Alignments on the following downtown streets were compared; Burrard, Granville, Richards, Cambie, Abbott, and Carrall.

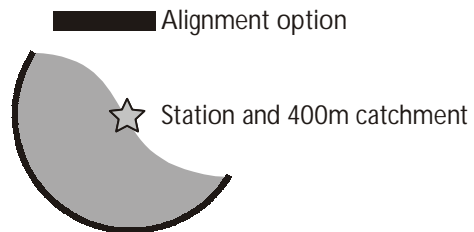
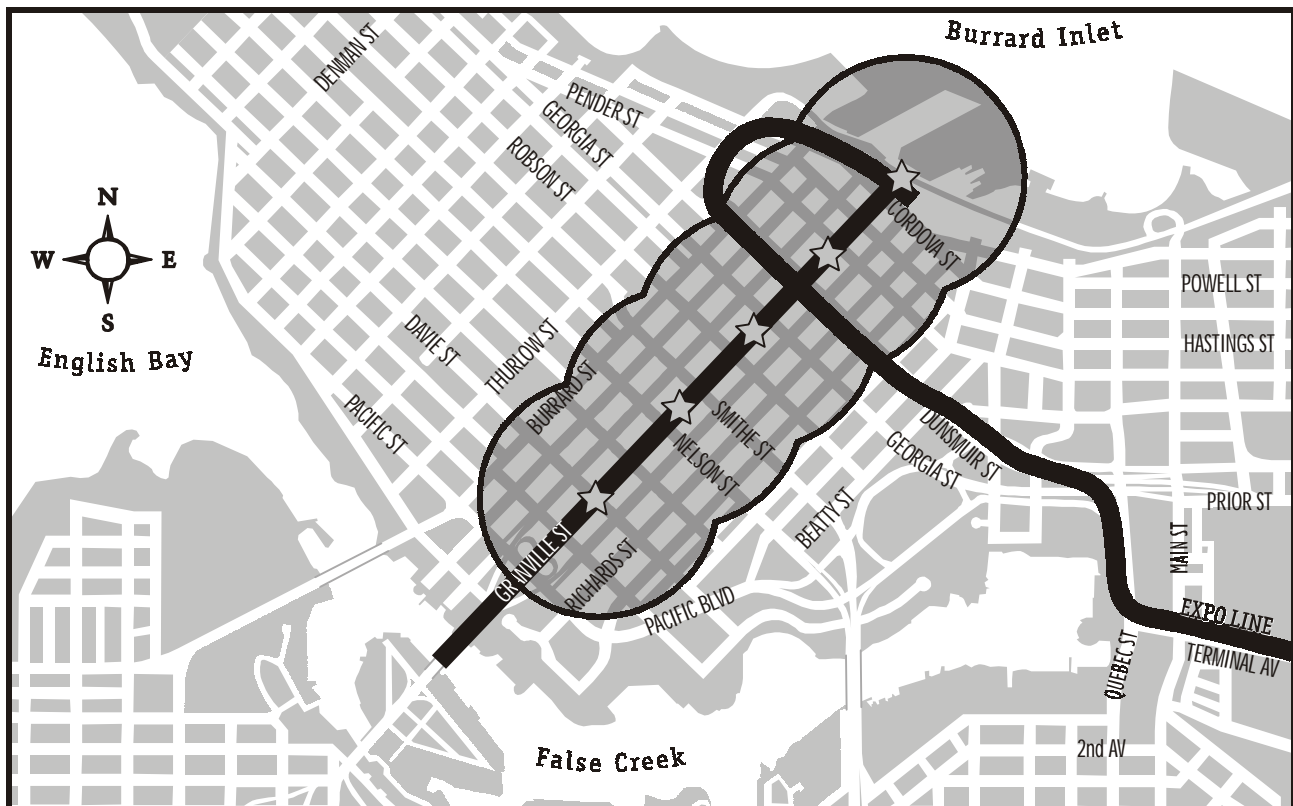
-  Council removed Carrall and Abbott from consideration.
-  Alignment options

The potential alignments fall into three broad categories defined by the rapid transit technology:

Surface Light Rail: A surface light rail line would require two dedicated traffic lanes for trains running in both directions. An additional lane is required for station platforms. A good street for surface light rail should have few or no vehicle driveways and low traffic volumes to minimize any increase in congestion. The best alignment option for this technology is Granville Street. Surface light rail on other streets, such as Burrard, Hornby, or Howe, would compromise access to properties and result in significant increases to traffic congestion. Note that a surface alignment is not compatible with the City policy that supports rapid transit to Richmond in a tunnel along the Cambie corridor. *Figure 4.2-D.*

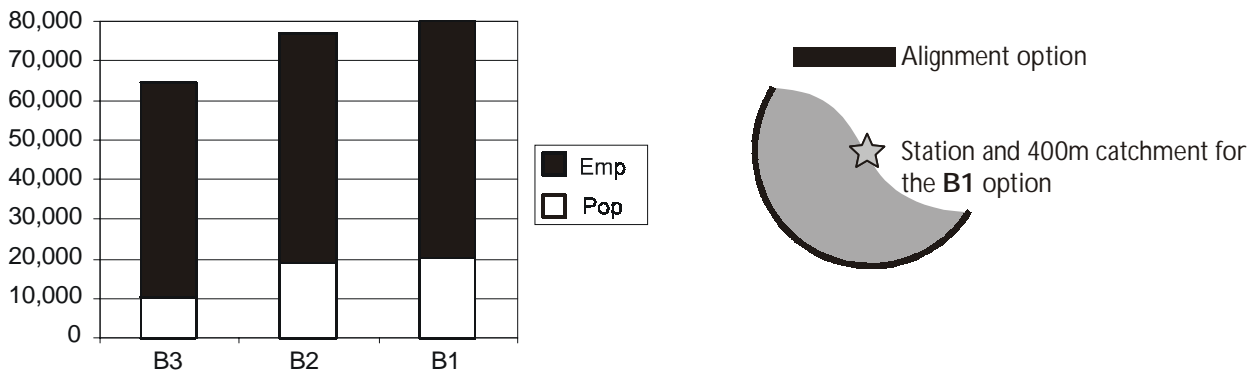
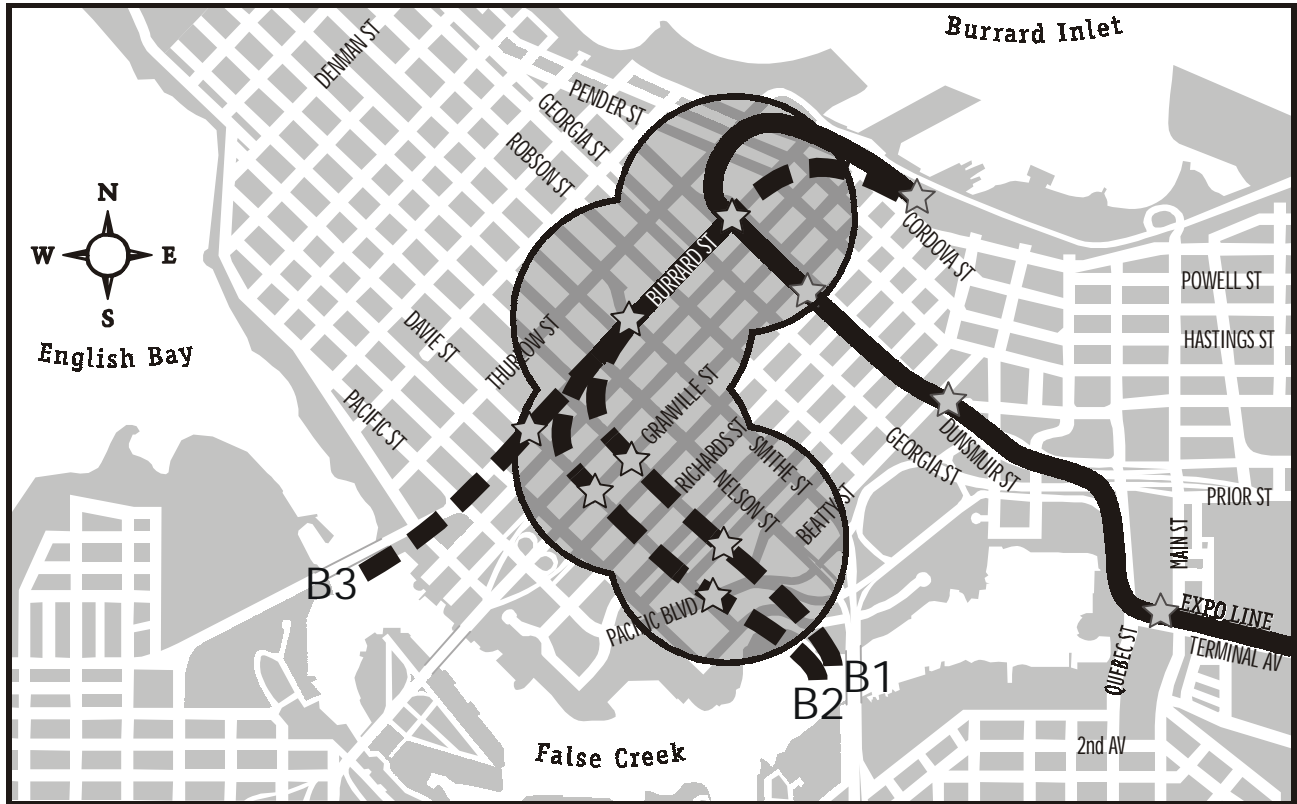
Figure 4.2-D

Potential alignment and station catchment for the Richmond/Airport rapid transit line as surface LRT



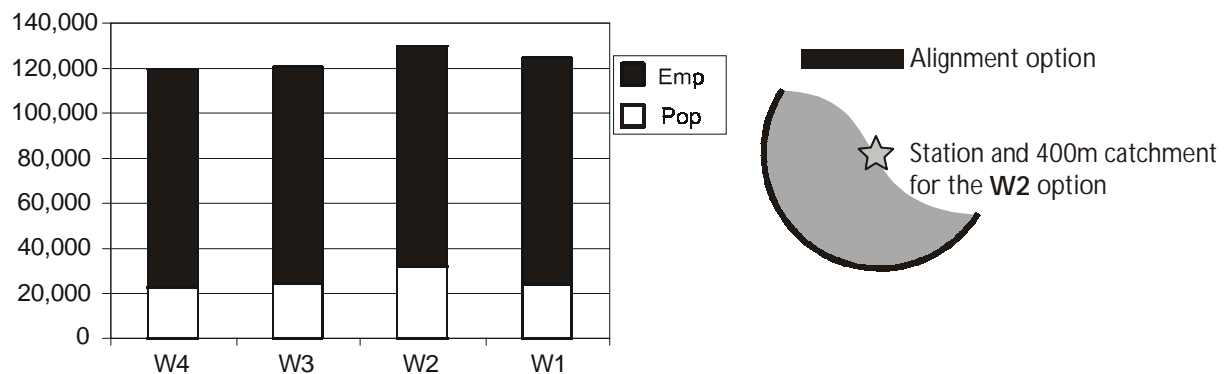
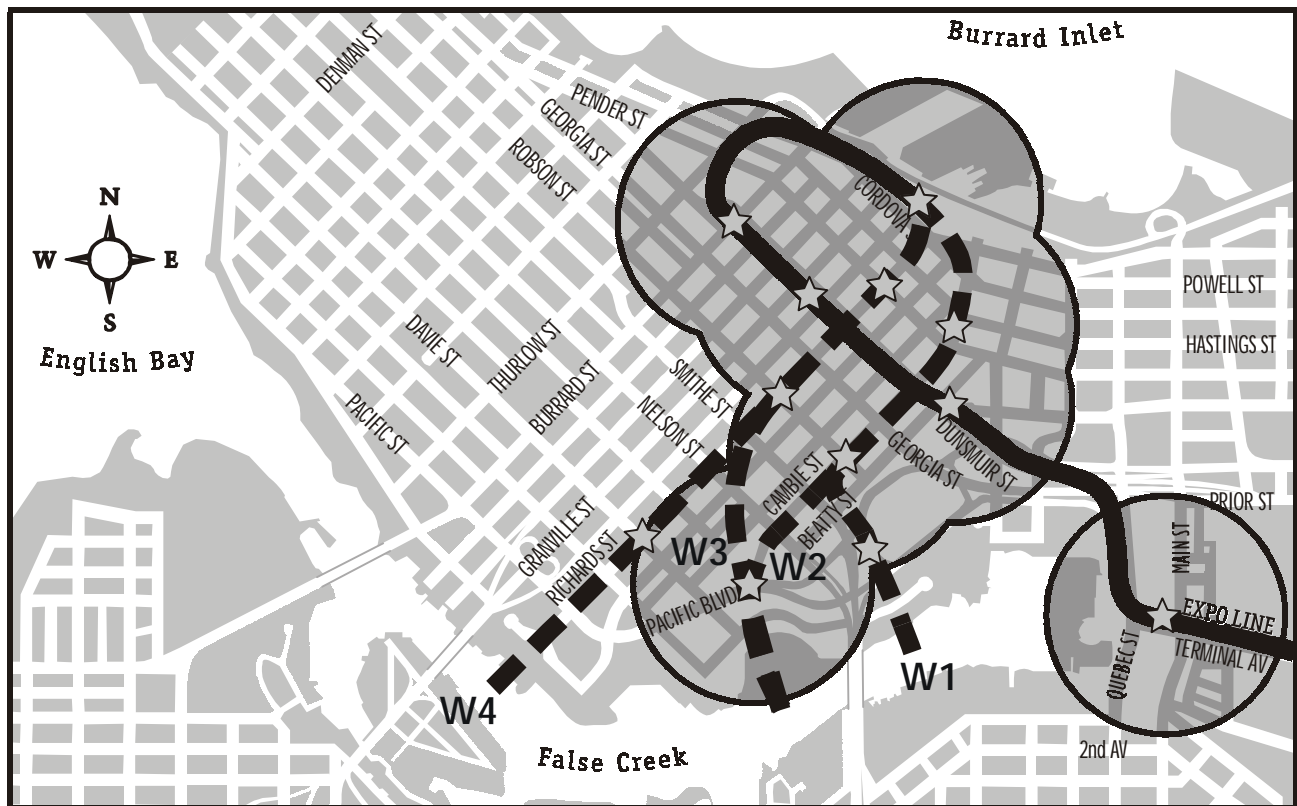
Tunnel Rapid Transit: Tunnel alignments require adequate right-of-way (street width) and few underground developments. Malls, parking, and other major utilities exist under streets like Granville and Howe. This limits the ability to implement rapid transit under these streets. Rapid transit lines in tunnels can use SkyTrain or other rail technology. *Figure 4.2-E.*

Figure 4.2-E
 Potential alignments and catchment for the Richmond/Airport rapid transit line in a tunnel under Burrard Street



Tunnel SkyTrain as an extension of the Expo line: The Richmond rapid transit line could be built as an extension of the existing Expo line. If this technology option were chosen, potential alignments would see the Expo line extended from Waterfront Station east and south. Due to the constraints of right-of-way and turn radius, the potential alignments are limited to Richards and Cambie Streets. *Figure 4.2-F.*

Figure 4.2-F
Potential alignments and catchment for the Richmond/Airport rapid transit line as an extension of the Expo SkyTrain line



Given the fact that a number of land use changes have occurred since 1990, the Downtown Transportation Plan examined potential downtown alignments in terms of the station catchment area. The number of jobs and residents within a five minute walk (400m) from a station were studied for eight alignments. The study showed that all alignments provided good catchment but that alignments that operate as an extension of the existing Expo line serve the most downtown jobs and residents - *Figure 4.2-G*.

Figure 4.2-G

Downtown catchment for the Richmond/Airport-Vancouver Rapid Transit Line

		1990 N.D. Lea Study	2001 Ward Study
Technology	Favoured Alignment	Jobs 400m (2006)**	Res + Jobs 400m (2021)
Surface rail	Granville Street	90,000	12,000 + 61,000 = 73,000
Tunnel rail	Burrard Street	114,000	20,000 + 60,000 = 80,000
SkyTrain	Cambie Street	137,000	22,000 + 107,000 = 130,000

* Note that the surface LRT is not directly comparable to the tunnel alignments due the difference in time required to access the station platform and that surface LRT has been removed from consideration.

** The N.D. Lea Study used a downtown employment projection of 190,000 by 2006. The Ward Study used a downtown employment projection of 175,000 by 2021.

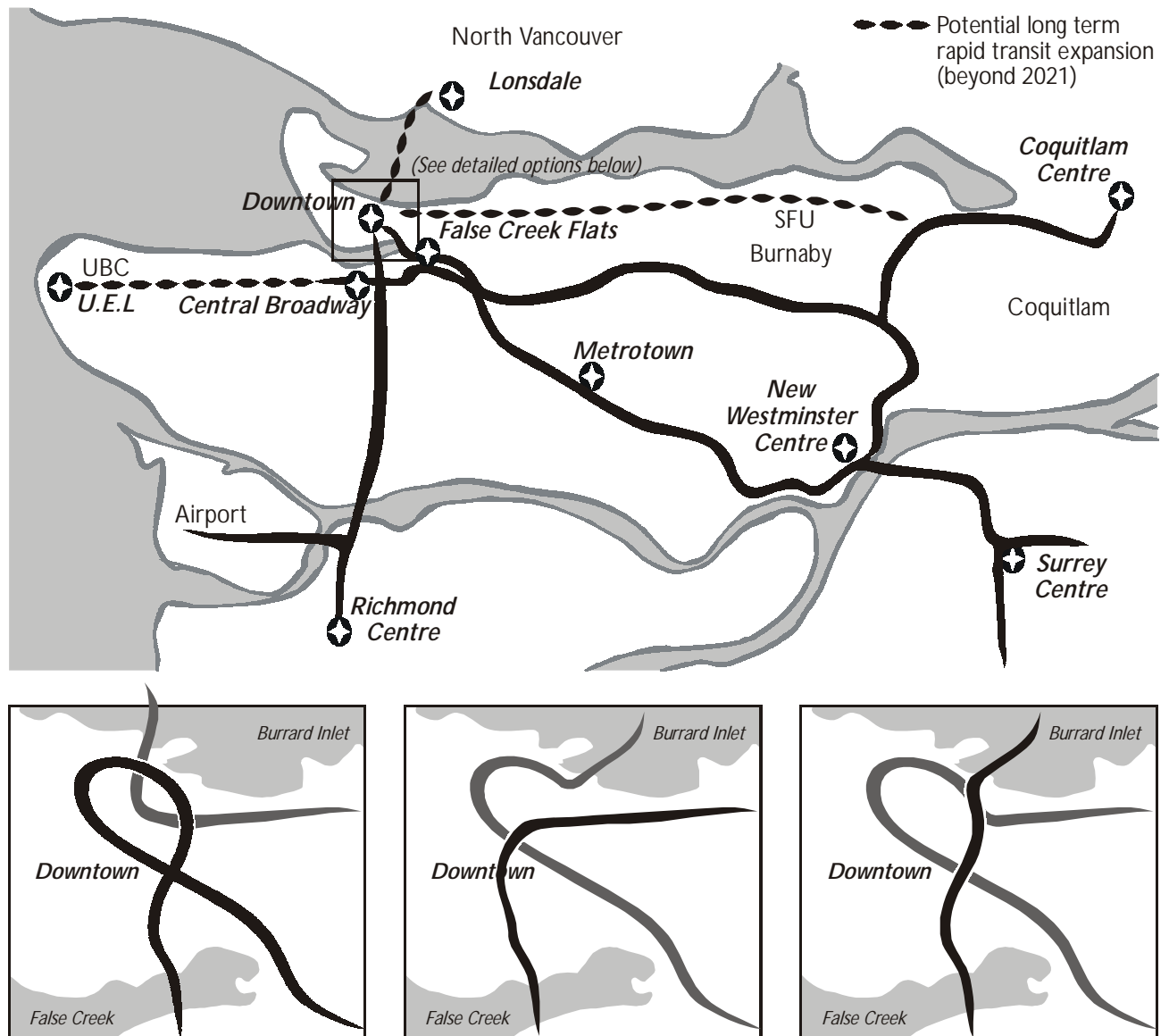
The City of Vancouver supports an underground alignment along the Cambie corridor from the Fraser River to downtown. This alignment has the potential to achieve the highest overall catchment for downtown and the City at large and achieves the most ridership. In the downtown the Richmond rapid transit line should have a station in Downtown South, the central business district (centred at Burrard and Dunsmuir) and at the transportation hub at Waterfront Station, using tunnel rail technology.

Richmond rapid transit line will replace most, if not all, of the suburban express buses that currently use Seymour and Howe Streets. With most of the buses removed the role these two streets should be reviewed by the City. For example, the bus lanes may no longer be required and could be used for other modes. As part of the implementation of the Richmond/Airport rapid transit line the City should review the opportunities for using the existing bus lanes on Seymour and Howe Streets for other sustainable modes or for additional parking or landscaping.

(c) Beyond 2021

In the longer term, (beyond the 2021 planning horizon) future rapid transit lines into downtown could include a line on the Hastings corridor and a line to the North Shore. If the Richmond line is not developed as an extension of the existing Expo line, the downtown section of the alignment should consider possible extensions of this new line to the North Shore and/or along the Hastings corridor - *Figure 4.2-H.*

Figure 4.2-H
Downtown Rapid Transit Terminus and Future Expansion



4.2.2 Downtown Streetcar

Modern cities require a wide range of transit services reflecting complex land use. Experiences in other cities have shown that streetcars provide a high level of service and can be extremely popular with residents, commuters and tourists alike. Streetcar systems in some European cities are the dominant transit service. Modern examples in North America include streetcars in cities such as New Orleans, Portland, San Francisco and Toronto. San Francisco has also focussed on "rider appeal" by refurbishing streetcars from all over the world, resulting in the system becoming an attraction.

Background

As downtown develops to the edges of False Creek and Burrard Inlet, the resulting high-density areas need to be served with transit. The downtown streetcar would provide a quick and efficient alternative to the automobile and provide links to other transit services, such as SeaBus, SkyTrain, West Coast Express, and regular bus and trolley bus services. A right-of-way along the south shore of False Creek from Granville Island to Main Street was purchased by the City from the Canadian Pacific Railway (CPR) in 1995. The City has developed this right-of-way into a demonstration streetcar line.

Council approved a concept plan for a streetcar system in 1999 following a consultant study and an extensive public consultation process. The system is intended as an expansion of the demonstration line in False Creek South, but using the latest technology with a variety of vehicle types, including restored heritage cars, heritage replicas and modern low floor cars. Its purpose is to link a number of activity centres in the downtown that are beyond comfortable walking distance for many.

A preliminary financial study has recently been completed (MacQuarie Bank, 2002). It concluded there is a strong potential to enter into a private public partnership to offset the costs of this system. It also concluded that more detailed ridership and system analysis was necessary before final decisions on the planning should be made.

The city has been preserving corridors to facilitate the implementation of the downtown streetcar. Wherever possible, a separate right-of-way should be used to free this system from road congestion. This would significantly enhance the efficiency and attractiveness of the service.

Corridors have been reserved through Southeast False Creek and the Concord Pacific, Coal Harbour, and Bayshore developments. Possible extensions into the False Creek Flats have been anticipated and rights-of-way will be reserved. Extending the line into False Creek Flats would access a projected 20,000 employees, provide a potential connection to the Millennium SkyTrain line, and would provide a good location for a maintenance facility.

Segregated vs Integrated

One of the major issues is whether the streetcar is segregated within its own right-of-way or runs in traffic. The need for segregation is a function of congestion, ridership levels, trip time requirements, and the need to integrate the proposed streetcar system into the urban fabric through which it runs.

Cities such as Toronto have experienced the need to segregate streetcar lines, such as the Spadina and Harbourfront lines, when some or all of these components begin to impact too greatly on service efficiency. Both San Francisco and New Orleans have segregated portions of their systems.

Portland's light rapid transit line is primarily segregated, but its new downtown streetcar line has been designed to operate primarily in traffic. However, routes for Portland's downtown streetcar line were chosen that were not highly congested, and several streetcar priority measures were incorporated, and more are being discussed in order to further improve efficiency.

Proposed Streetcar Routing

The concept of the streetcar system approved by Council would link major tourist destinations, major residential developments, and significant employment centres on the periphery of downtown and the south shore of False Creek. The Expo SkyTrain line would be linked using the former C.P.R. right-of-way to False Creek South, Granville Island, and eventually Vanier Park - *Figure 4.2-1*. Phase I would connect Granville Island to Science World, Chinatown, Gastown, Waterfront Station and the Convention and Exhibition Centre. The Phase II line downtown would follow Pacific Boulevard connecting BC Place Stadium, GM Place, the various False Creek/Yaletown neighbourhoods, to Granville Street via Drake Street. A future extension from Waterfront Station would connect through the Coal Harbour neighbourhoods and provide a link to the Bayshore development and Stanley Park.

This concept would provide transit service in areas that are growing and in need of transit service, as well as link to transit nodes such as Waterfront Station, Main Street SkyTrain Station, and the Granville corridor. In addition, several employment nodes would be serviced including Burrard Landing, the Convention and Exhibition Centre, the West Hastings corridor, the Plaza of Nations/GM Place/BC Place, and Granville Island. A future extension through the False Creek Flats to the VCC Station would not only link up with the new Millennium Line but service the planned high-tech employment/education area in the False Creek Flats.

System and Fare Integration

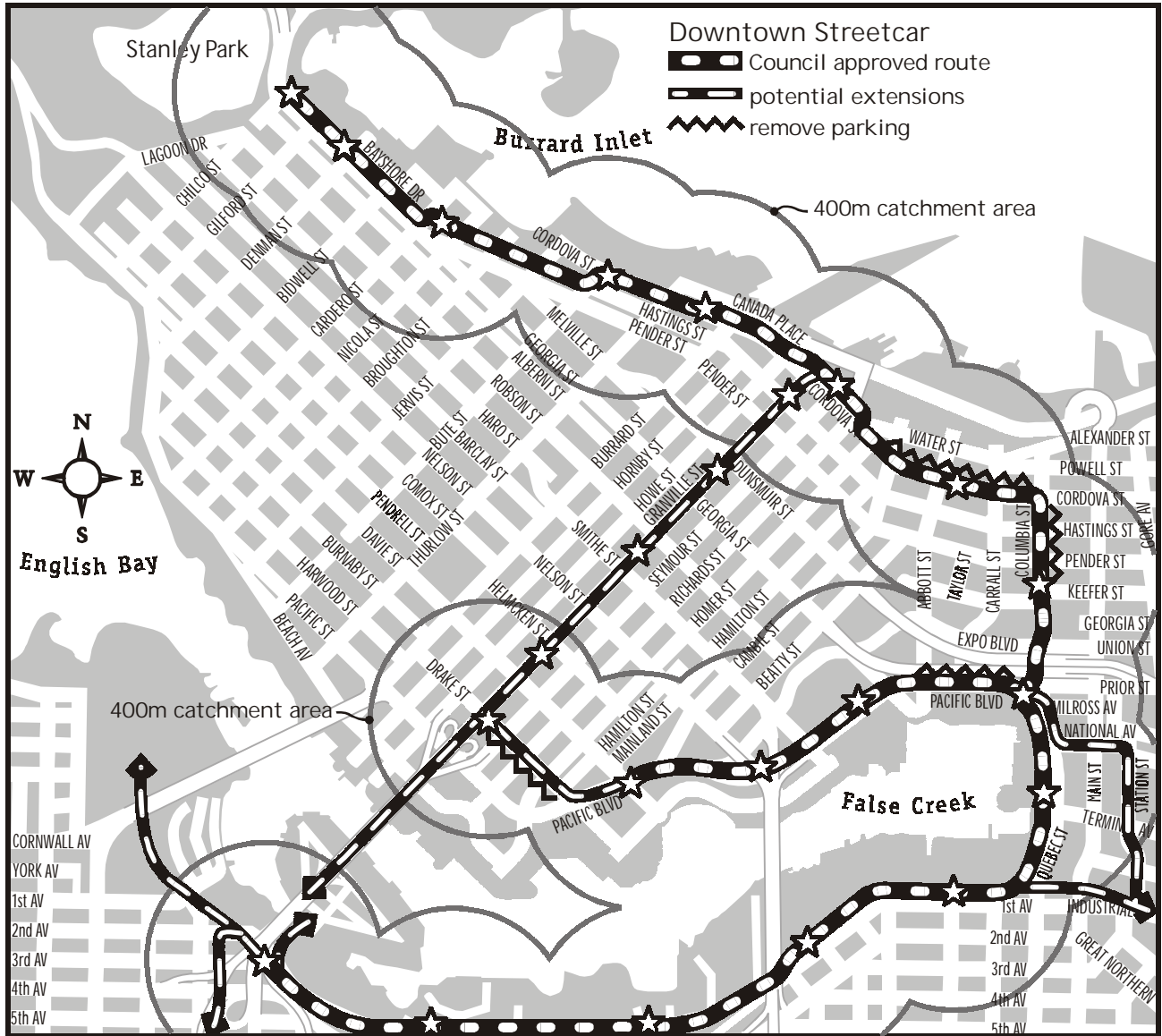
Ridership modelling undertaken by the City of Vancouver, has demonstrated that a significant portion of the streetcar ridership will be originating or terminating their journey on another part of the transit system. It is therefore ideal to have a seamless, easy to use system, where one can transfer from one type of service to another. A financial plan needs to be investigated with TransLink, the City, and the system operator, in order to provide this integration. Above all, the streetcar system should appear to be part of the overall transit system from the rider's perspective. To the extent possible, it should not displace or compete with local bus services; rather it should be complementary to them. Where the overall transit system can be upgraded and/or simplified, some local bus services may need to be reconsidered or their routes reconfigured.

Ridership

Initial streetcar ridership projections were undertaken in the previous 1999 City study using the GVRD's Emme/2 transportation demand model showing both opening day and proposed 2021 ridership. Generally, the more a streetcar operates like a bus operating in general traffic, the less competitive advantage it will have over a bus. Therefore, segregation, and good linkages become important in ridership estimates.

Further ridership analysis is warranted to determine what ridership would be expected in PM peak hour travel, the number of transfers that could be expected between other components of the transit system, rider origin and destination details, and further preference analysis of specialized riders such as tourists.

Figure 4.2-1
Approved and Potential Streetcar Routes



Potential Extensions

Extensions beyond previously described routes should also be investigated further. The possibility of an extension along the Arbutus Corridor involves a privately owned right-of-way, but has been identified in Vancouver’s *Transit Strategy* (April 2002) and should be examined in greater depth. Extensions to Vanier Park also require right-of-way provisions, but should be pursued to increase access to the Kits Point area. Internal CBD connections could also be explored with the Granville/Seymour/Howe and the Robson/Alberni corridors being the prime candidates. Connections from downtown to the north and east could also be investigated. However, some or all of these potential connections may be beyond the 2021 time frame of the Downtown Transportation Plan. *Figure 4.2-1* identifies proposed streetcar routes and potential extensions.

Recommended Adjustments to 1999 Proposals

The recommended route and station locations from the Downtown Streetcar study of 1999 should be adjusted to integrate the recommended changes in the Downtown Transportation Plan. The following minor adjustments to the 1999 proposals are recommended for investigation.

The Pacific Boulevard Line was originally recommended to terminate at the foot of Davie Street. However, due to the complexity of terminating the line in a relatively narrow right-of-way, it is recommended that the line be extended further east on Pacific Boulevard with a station on Pacific at Davie. The original study also proposed continuing down Pacific Boulevard to terminate under the Granville Bridge and provide vertical connections up to the bridge deck. A better routing would be to continue down Pacific Boulevard and turn on Drake Street to terminate at Granville Street, to avoid making the vertical connection. It is also easier to provide a terminus station in this location. Alternative detailed alignments along Pacific Boulevard from Cambie bridgehead to Drake Street are also shown in a proposed Pacific Boulevard redesign approved by Council in May 2002.

It is recommended that the north side alignment along Pacific Boulevard be pursued first, due to the more direct connections to public facilities and the relatively simpler alignment. The south side alignment on Pacific Boulevard could still be pursued as an alternative. Double tracking should also be considered.

In terms of station locations on the Pacific Boulevard Line, a station is recommended for the Quebec/ Pacific Boulevard intersection that could serve both the Waterfront Line and the Pacific Boulevard line. The station location on the north side of Pacific Boulevard at BC Place is recommended to be moved further to the east between BC Place Stadium and GM Place, for better access to the latter and to allow a redesign of the lower level entry to BC Place. The previously proposed station at Abbott Street would not be necessary. In addition, the station proposed for Expo and Pacific Boulevard is recommended to be moved further east under the Cambie Bridge where better bus and pedestrian connections to the bridge exist. There is also more room to build a station at this location.

Changes are recommended for termination of the Waterfront line in front of Waterfront Station, where a transit hub on Cordova Street is proposed. See spot improvement #50 in Section 5.1 for a detailed description.

The station on Cordova Street is recommended to be moved slightly further east from Abbott Street, where a connection through to Blood Alley exists and the building arcade would provide more room for pedestrian movements.

The potential extension through the False Creek Flats to the VCC Skytrain Station is illustrated on Industrial Avenue to the termination point near Clark Drive. An additional route could be considered for Station Street from Industrial Avenue turning west on National Avenue and connecting into the system at Quebec and Pacific Boulevard. The potential benefit of this line would be a direct connection to the Main Street SkyTrain station stairs, a direct connection to the train station and bus depot, and a direct connection to the proposed high tech industrial park north of the train station. In addition, by routing the False Creek Flats Line on this alignment, it would take pressure off the Quebec alignment which already has two services (Pacific Boulevard Line and Waterfront Station Line) planned for this one section.

If double tracking is required on the Waterfront line and if a track on Water Street is not desirable due to heritage impacts, an additional segregated alignment could be considered south on Abbott Street and either east on Keefer to Columbia or continuing south and connecting up with Pacific Boulevard. This would have the potential benefit of double tracking the line but maintaining segregated right-of-way, as opposed to running in traffic for a significant distance on Cordova Street and Columbia Street.

4.2.3 Local Bus Routes

New neighbourhoods are rapidly emerging in Coal Harbour, Downtown South, and False Creek North. In the next 20 years, transit ridership wholly within downtown is expected to increase by 85 per cent in the morning rush hour, mostly on local bus routes. A major goal of the Downtown Transportation Plan is to improve local transit service to and from these neighbourhoods and to improve connections and circulation within the entire Metropolitan Core, including the Medical/Civic precinct on Central Broadway and the emerging high-tech precinct in False Creek Flats.

Objectives

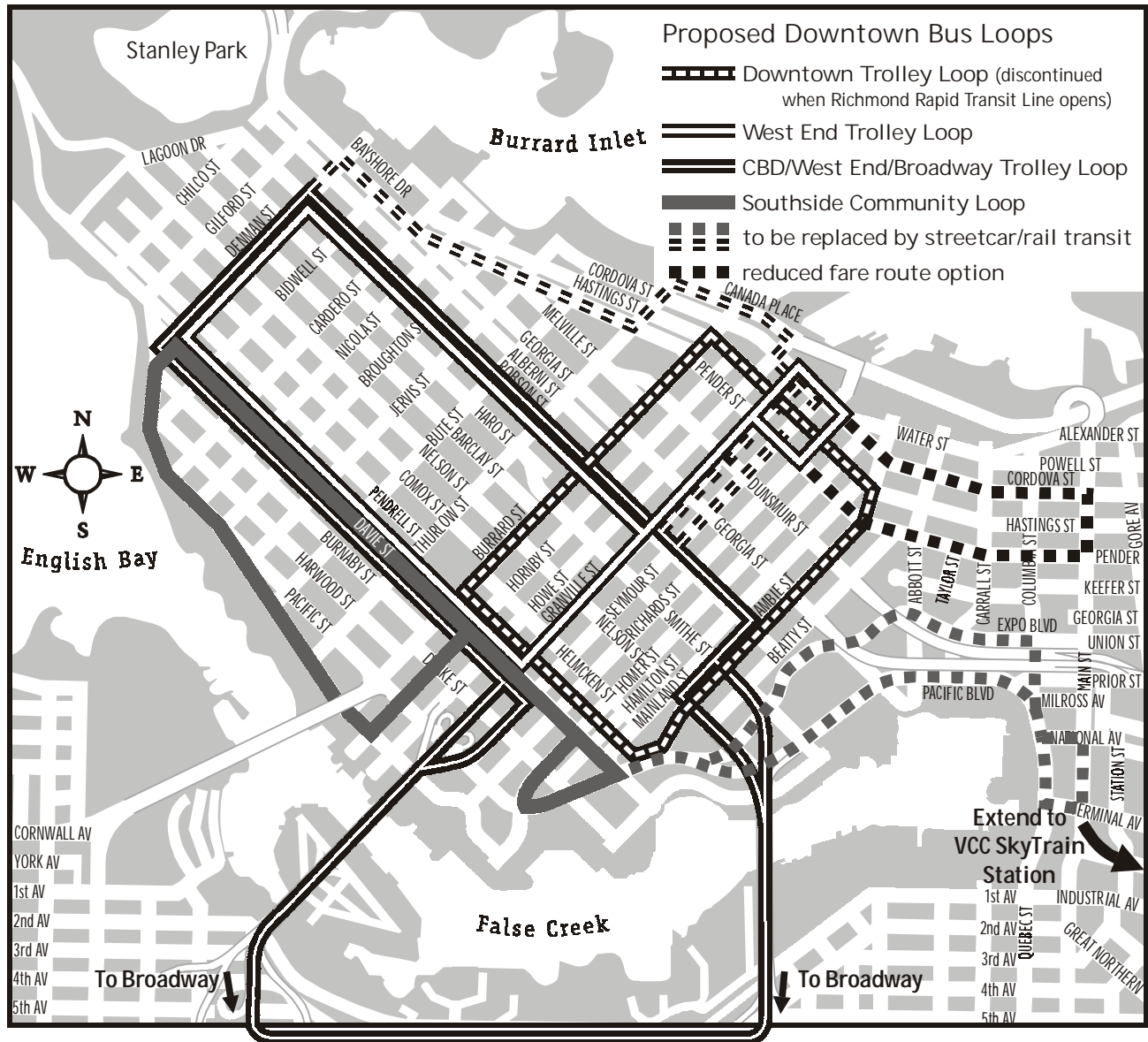
- Improve legibility: use direct routes, minimize turns, and operate in both directions on the same street wherever possible. Avoid one-way loops except where required by one-way streets and for terminal loops.
- Provide direct transit service to major activity centres such as SkyTrain stations and the central business district.
- Serve desire lines that are currently poorly served (e.g. West End to Central Broadway, CBD to Central Broadway, Yaletown-Roundhouse to downtown.) with a single, no-transfer, transit connection. See *Figure 4.2-B*.
- Replace poorly performing services in the Yaletown-Roundhouse Downtown South area with a more legible, useful service.
- Maintain service to topographically isolated communities such as Beach Avenue.
- Keep West End transit service on arterial streets.
- Use electric trolley buses where possible, and smaller, low-noise community buses where not. Use streets with existing trolley overhead where possible.

Proposed downtown circulator bus routes

The plan proposes four bus routes that loop within the metropolitan core. These downtown bus routes are illustrated conceptually in *Figure 4.2-J*. Two of the routes are modifications to existing downtown bus routes and the other two are entirely new routes. They provide the following connections:

Connection	
West End to Downtown	modify existing route
Beach/Denman to Yaletown	modify existing route
West End to Central Broadway	new route
Downtown South to the CBD	new route

Figure 4.2-J
 Conceptual bus routes to serve the Metropolitan Core

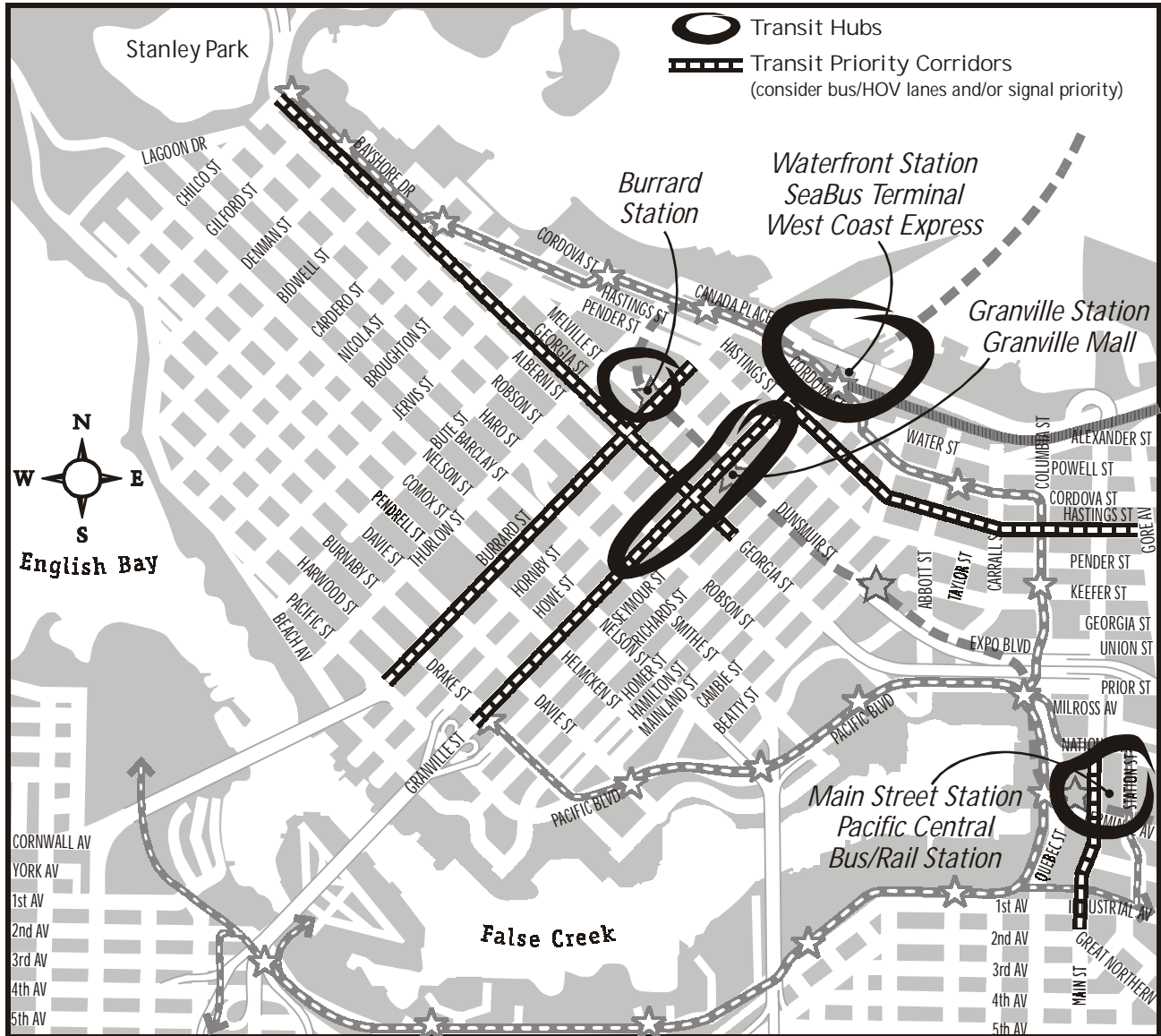


These potential routes illustrated in Figure 4.2-J and described in more detail in Section 5.2, would satisfy the DTP goals and principles. Note that these are conceptual routes only. TransLink would do the detailed route planning with additional consultation and analysis. Note also that some of these connections can be implemented initially with bus service and later replaced with streetcar or rapid transit service.

4.2.4 Transit Priority

Transit will be given priority at improved “transit hubs” and along corridors. See Figure 4.2-K for recommended transit priority locations downtown.

Figure 4.2-K
Transit Priority Locations Downtown



Transit hubs

Good integration and connections between the various bus routes and transit modes are critical for an accessible downtown and will increase the attractiveness of transit. Waterfront Station and the Granville Mall are identified as the two primary transit hubs in the downtown. In addition, Burrard Station and Main Street Station are also important hubs. The Downtown Transportation Plan makes recommendations to enhance these transit hubs.

(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 4.2-1.

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.

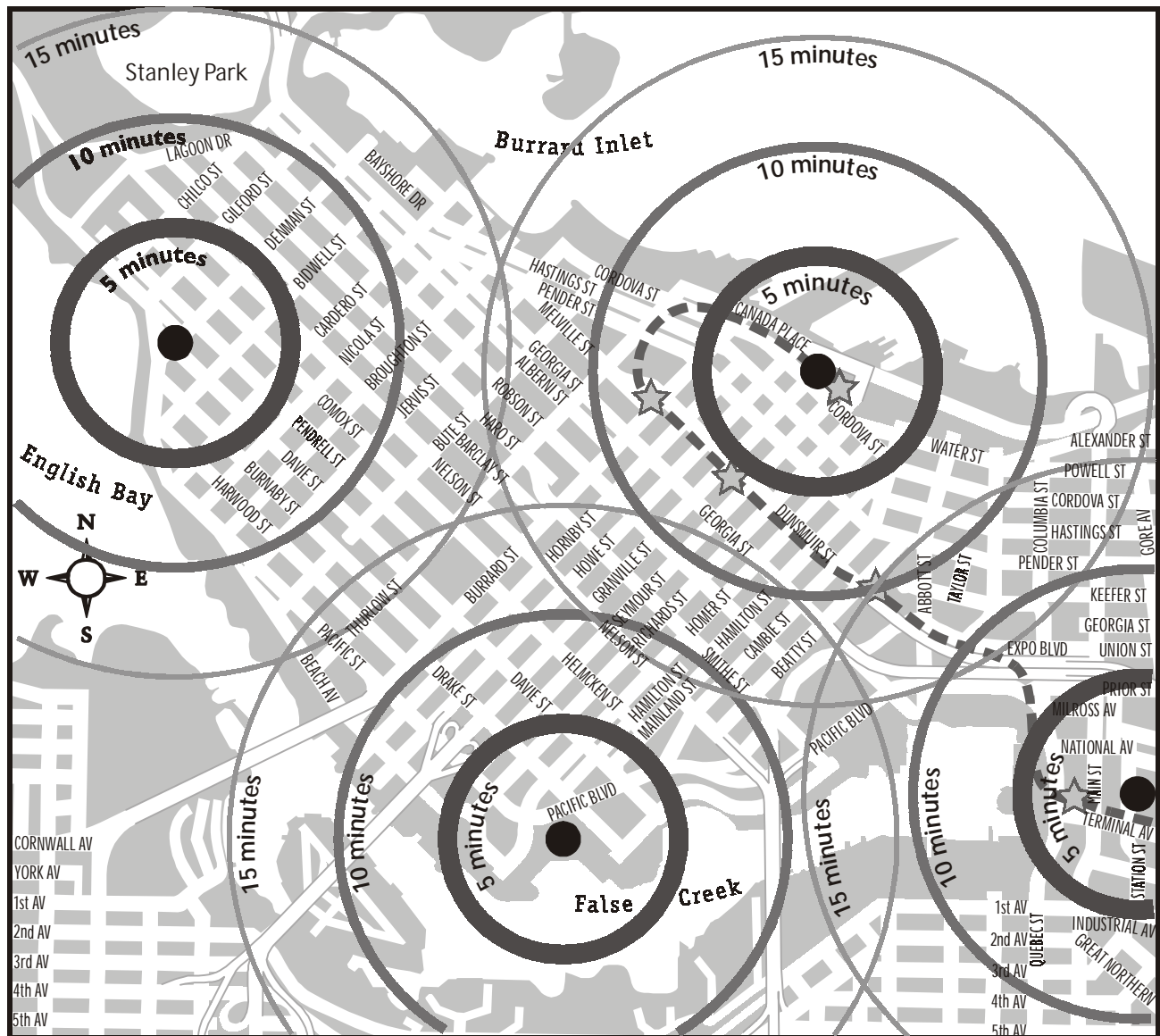
Recommendation TR19: Review the routing and station locations of the 98 B-Line.

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

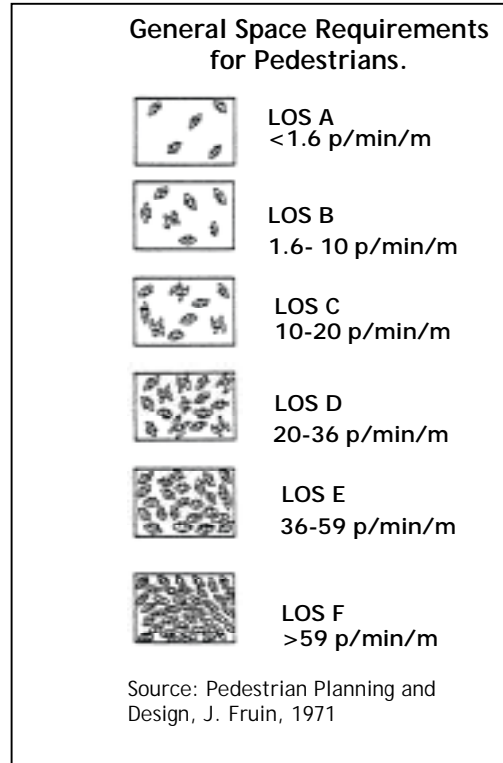
The goal of the Downtown Transportation Plan is to improve the pedestrian environment such that walking becomes a more attractive, safe, efficient and comfortable way to experience the city. The objective is to integrate neighbourhoods by improving connectivity to major destinations including community 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.



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

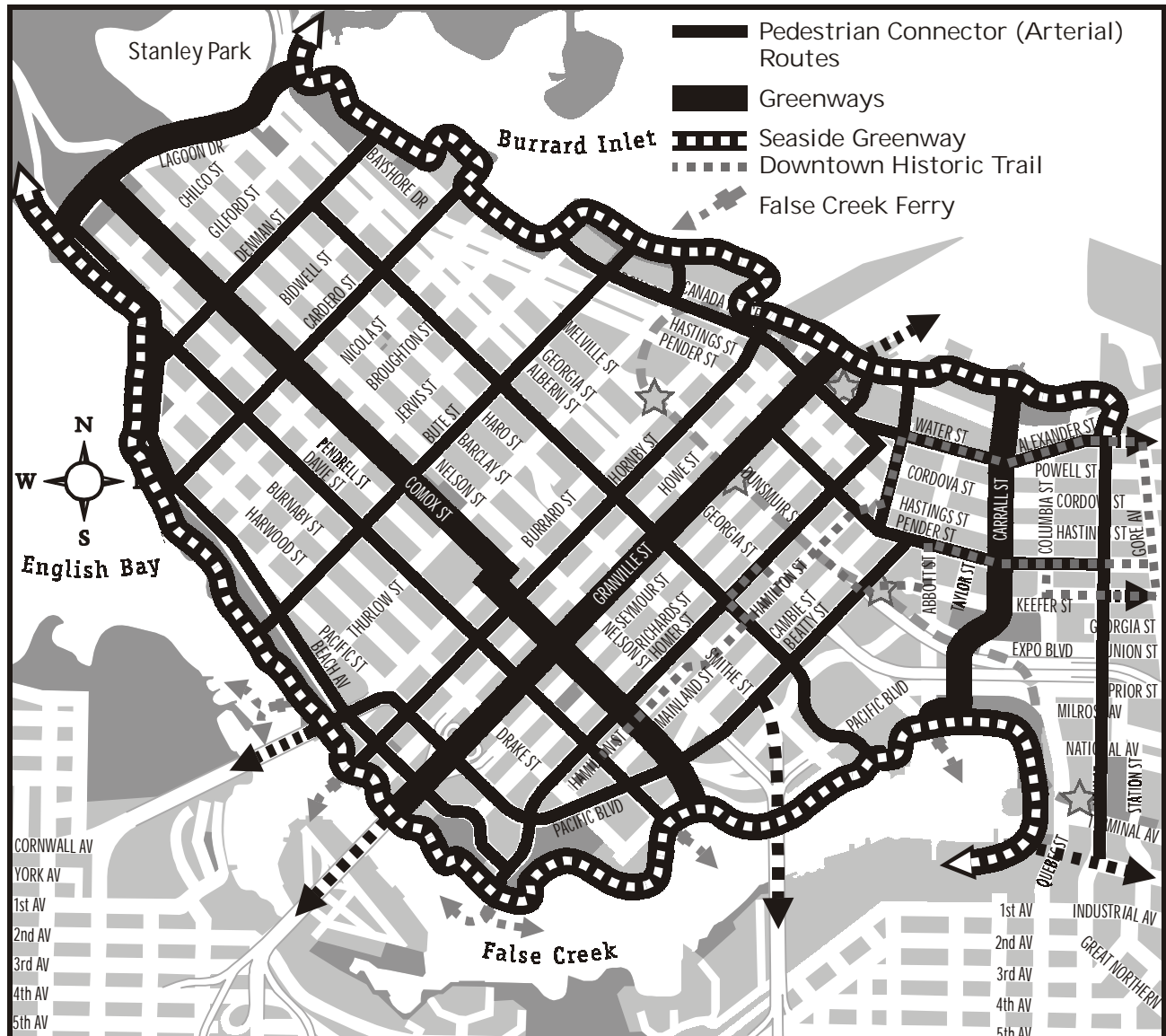
City Council created the Sidewalk Task Force to address specific issues around provision of street furniture and amenities, sidewalk construction and maintenance practices, and encroachments of 'sandwich board' signage, outdoor café seating and tables that obstruct pedestrian flow and undermine safety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

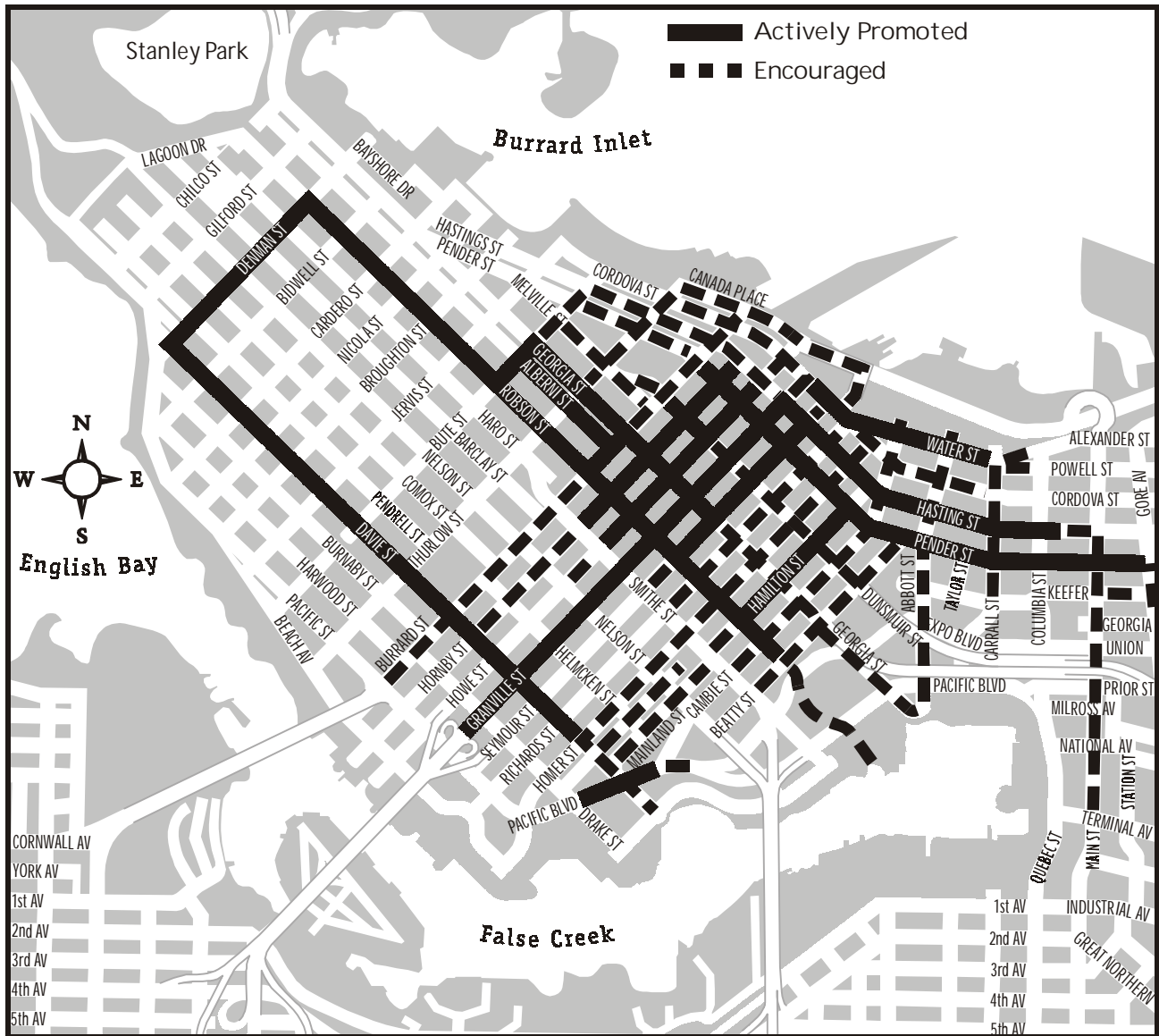
i) Restrict above and below grade Pedestrian Connections

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



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.

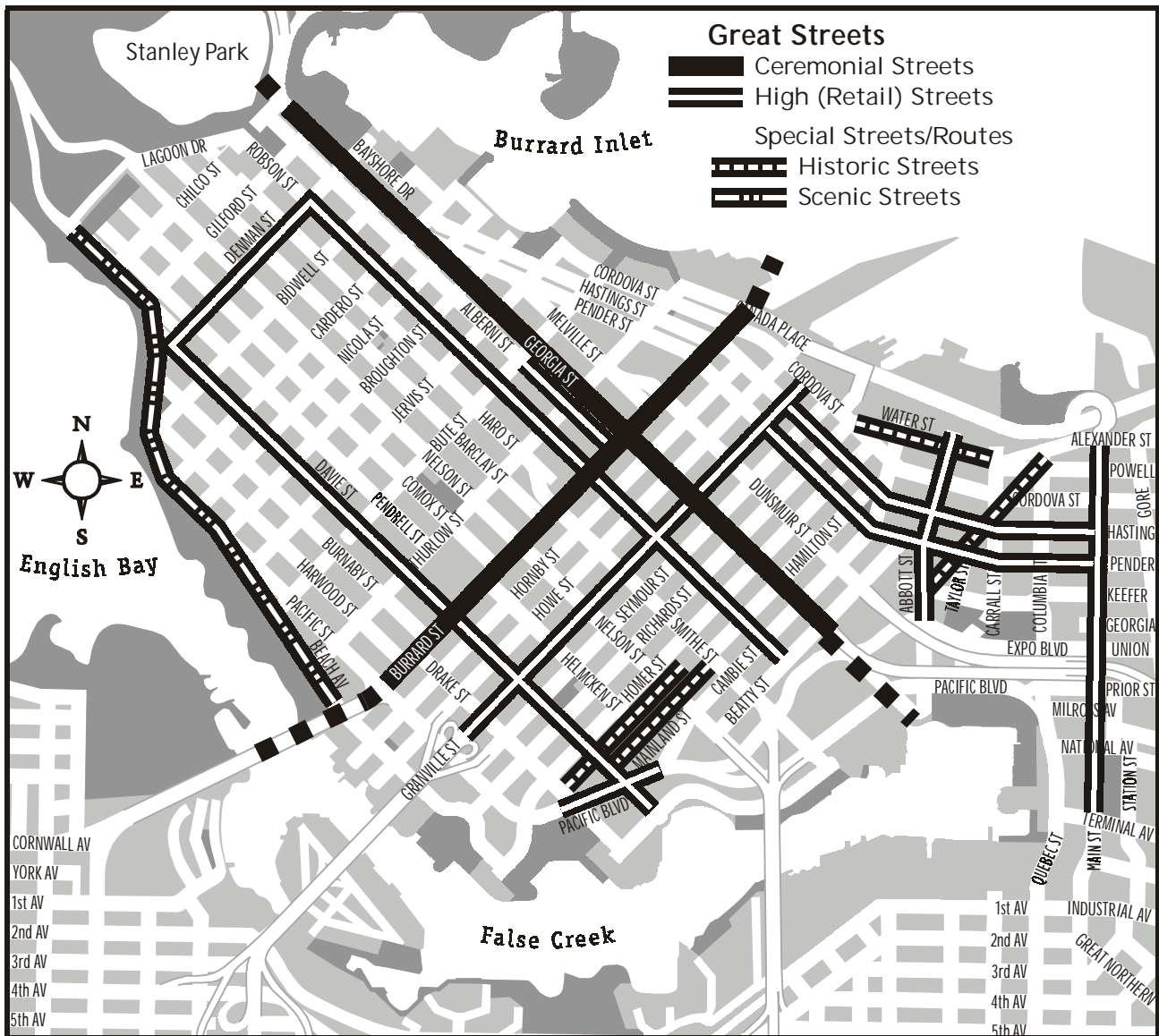
4.3.6 Classification of Pedestrian Routes

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 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.

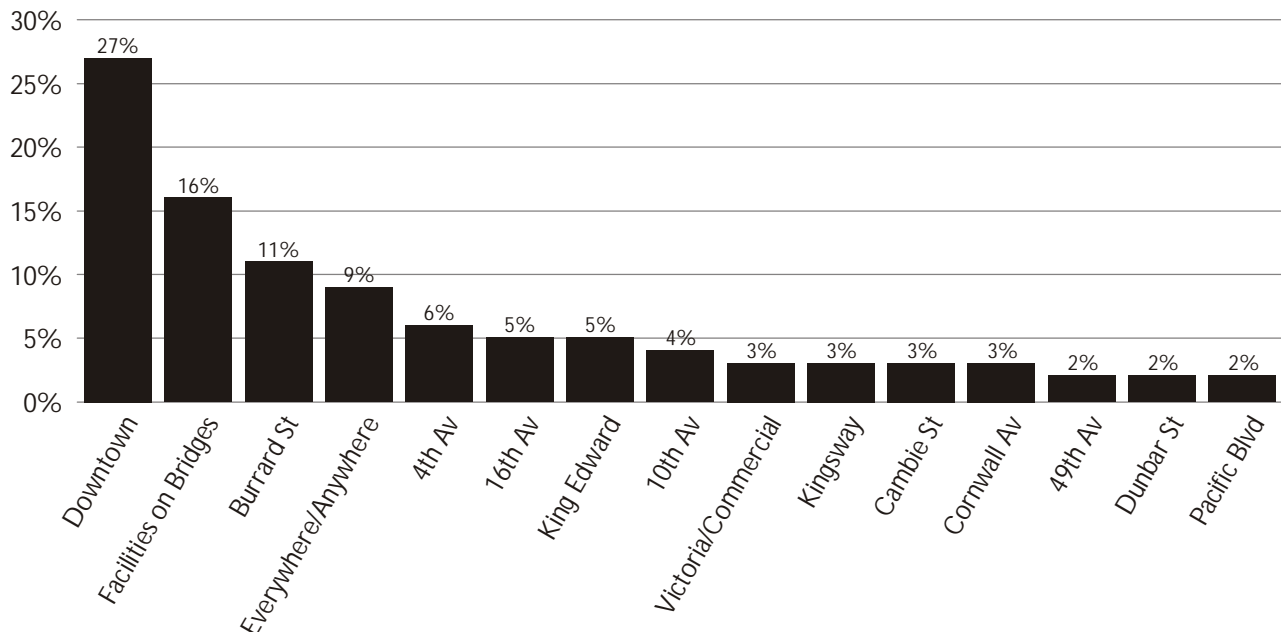
A Trip Diary Survey completed by TransLink between October and December 1999 showed that approximately 90,500 bicycle trips are made on a daily basis for all trip purposes throughout the region. Of that, almost half of those regional bike trips are to destinations in Vancouver. Of the bicycle trips destined 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

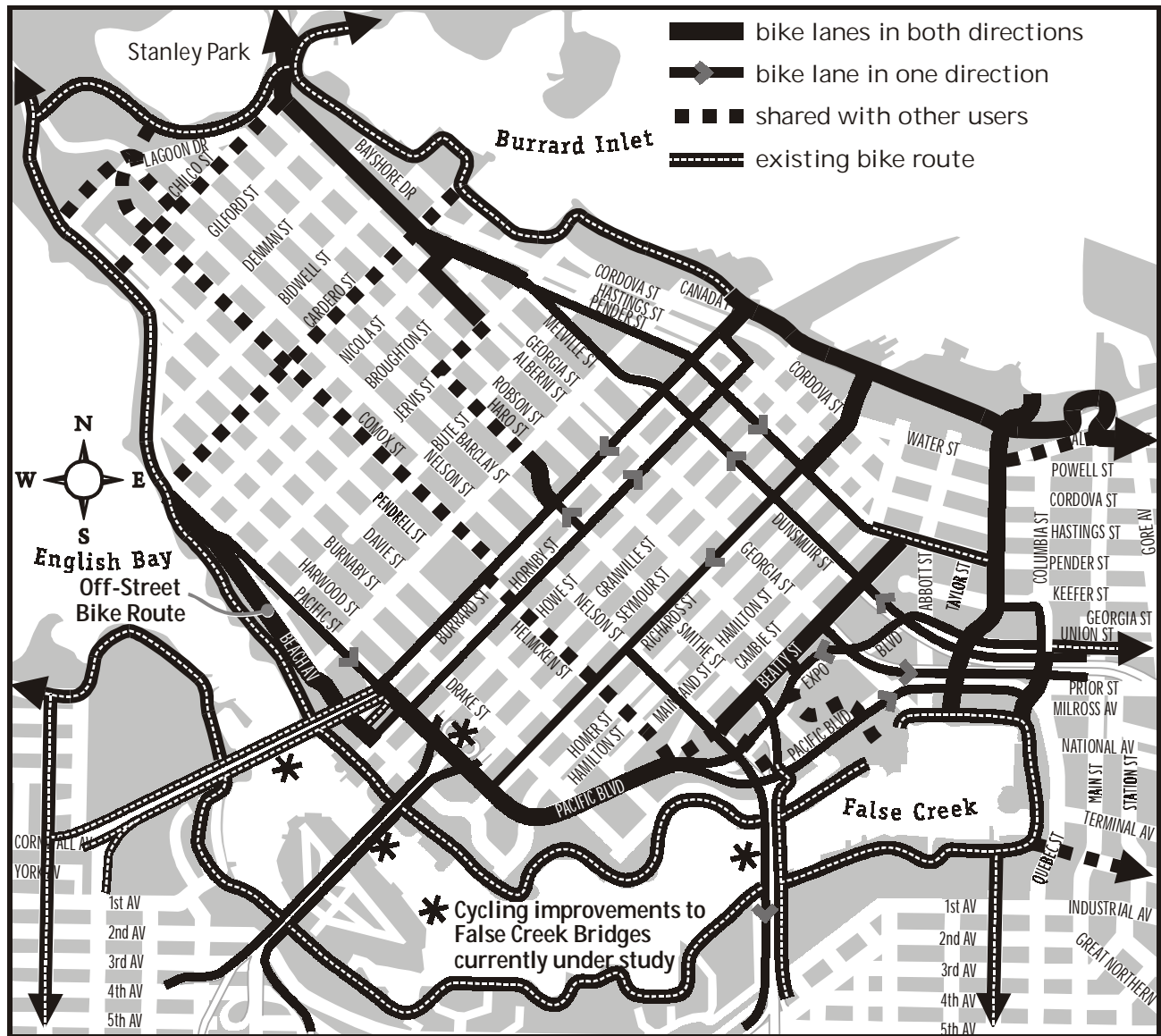
In establishing a bicycle network downtown, the following two principles were used as a guideline:

- (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-stripping 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

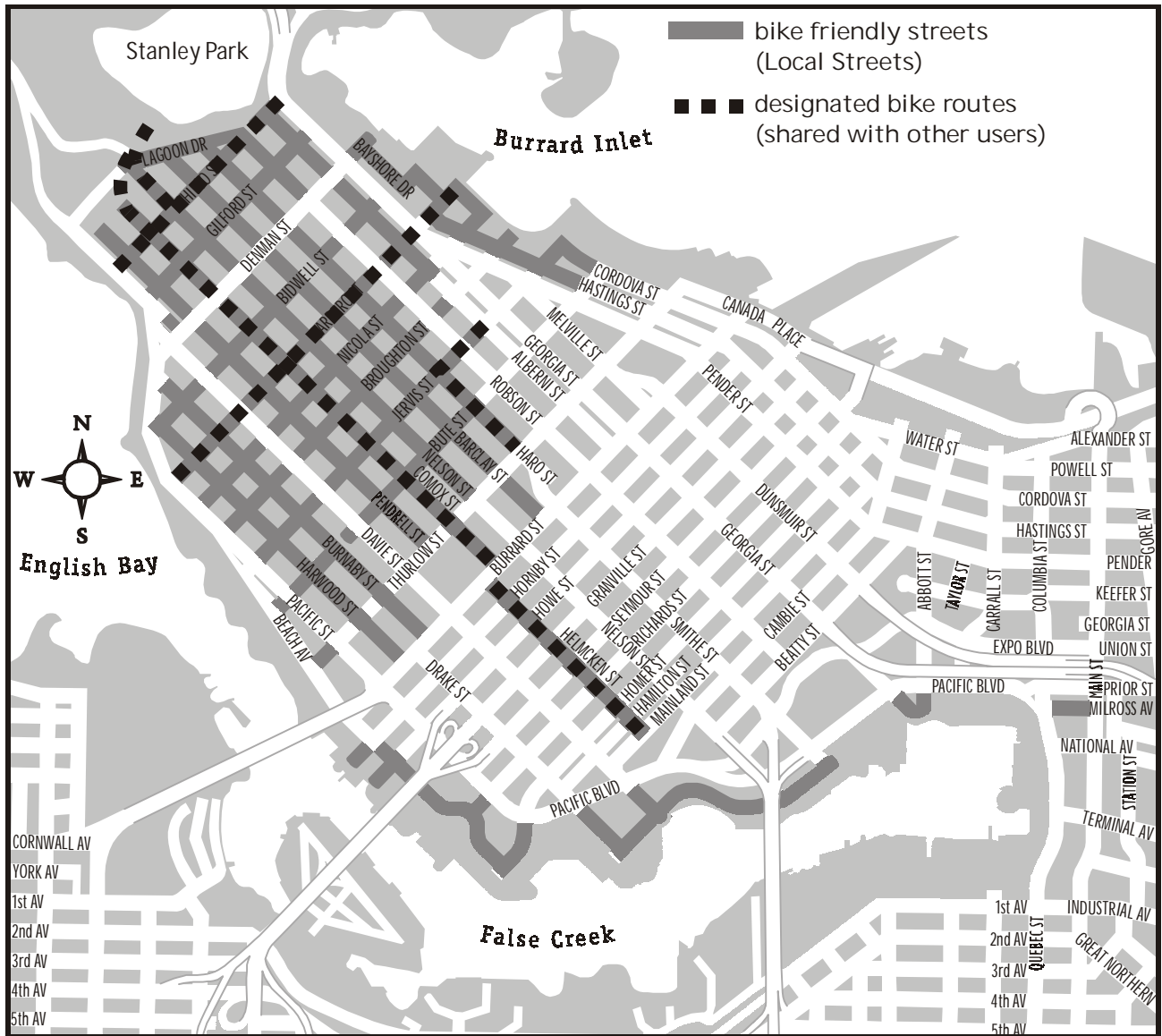
A review of cycling conditions downtown revealed a number of locations that require special attention. These locations were either identified by staff, the public or through a review of past collision statistics. A description of spot improvements can be found in Section 5.0.

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 warranted.

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