



BUREAU OF TRANSIT SERVICES

DRAFT MEMORANDUM ON
TRANSIT SERVICE PLANNING
TO COMPLEMENT DOWNTOWN
PENINSULA PLANS OF THE
CITY OF VANCOUVER



SUMMARY STATEMENT ON DOWNTOWN TRANSIT SERVICES PLANNING

FOR PRESENTATION TO VANCOUVER CITY

COUNCIL, SEPTEMBER 23, 1975

In our previous meeting with City Council, we explored some of the basic principles we apply in our transit service design work. We also touched on a number of specific concerns that we have over our ability to maintain service in Vancouver without priority measures on Downtown streets.

The accompanying memorandum has been prepared to outline how we have been planning our transit services within the planning process for Council's Downtown Plans including the West End, the Burrard Inlet Waterfront, and the False Creek areas. We have been developing this memorandum to serve as the context for our programme of immediate transit service improvements and expansion on the Downtown Peninsula. We have been pursuing long range planning for transit service above the present bus service and, are very mindful of the need for our immediate stage improvements in transit to respect, and begin to facilitate, the development of transit improvements and new services.

Our Bureau of Transit Services staff have as their responsibility the investigation of transit service needs, and the planning of appropriate services. In the course of our review of services in Vancouver City and adjacent communities, we have identified a number of situations that need to be set right before we can get our transit services playing the role that is now seen for transit in the metropolitan area.

Specifically, we must represent before Council the concerns our passengers have in their daily use of transit services. On some of our routes, we do not have sufficient passenger capacity to carry all those persons waiting for our buses. This means we often pass people by or crowd people on board our buses, and we are very sure that neither of these situations would be tolerated by Members of City Council as would-be transit riders. In adding more buses, we now have problems in moving through traffic and in keeping our buses running on time. We have very crucial running time problems that make bus service unreliable and less attractive when transfer connections are missed with buses in other communities. We also have such numbers of bus routes arriving in Downtown that we have problems

in finding enough available curb space to park our vehicles while awaiting their return trip time. We have been seeking transit priority measures for our services in the Downtown area and we would like Council to be given the opportunity to see that problems of transit on the streets of Downtown Vancouver have an effect on the quality of our service throughout the metropolitan area.

The general programme for public transit in Greater Vancouver was presented by the Minister of Municipal Affairs, the Honourable James G. Lorimer in July of 1974. The general concept towards which the various efforts of the transit agencies in the Provincial Programme are being directed, is basically that of an upgraded set of area wide local BUS and FastBUS services, and future services of commuter trains, passenger ferries, and light rail transit in major development corridors.

You are perhaps aware of our progress with the Cross-Inlet Transit Ferries where construction of the vessels is underway and design of temporary land terminals is being discussed with local authorities. Our plans call for operation of the service in Spring of next year. This service is the first stage of the Advance Transit System set of improvements, and will provide improved service between Vancouver and North Shore communities.

Regarding our investigation of a Commuter Train service on the Canadian Pacific Railway mainline into Vancouver, we are currently involved with a Consultant study of a potential service into the Granville Station on Cordova.

The concept plan for a possible main passenger exchange tying in with the railway station at Granville and Cordova, was published last year. It outlined how the several future transit services would come together for the convenience of our passengers. The Granville Waterfront Station, as it is currently planned, would accommodate passenger service of Canadian Pacific passenger trains, the Cross-Inlet ferries, future commuter trains and light rail transit, and CityBUS, FastBUS and Town and Country BUSES.

We are continuing with our programme of planning and preliminary engineering for the Light Rail network in our Advance Transit System. We reached an understanding with Mayor and Council that we could work out where in Downtown Vancouver there could "streetcar" type operation of Light Rail services, as a first step in this particular programme, and in the process, confirm probable underground alignments for an ultimate system. We feel we have advanced with this work with Vancouver City Officials to the point where discussion with Council is essential on our proposals.

To return then to the immediate improvements proposals, we are presenting for Council in the accompanying memorandum a picture of how we see our transit services "serving" and "fitting in" with the Downtown Peninsula plans of City Council, the overall concept of transit services in the Downtown area for which we seek approval in principle, and authorization of City Council to proceed with the necessary changes and additions to our bus routes.

We welcome the opportunity to explore with Council our programme on the one hand, and the expectations of City Council for transit services on the other. We feel perhaps as Mayor and Aldermen do, that there really is not much to be gained in professing support for programmes to get more people to use public transit, and ongoing appreciation of transit service needs, without commitment to actions to give transit priority the use of streets in Downtown Vancouver and in other urban centres in the metropolitan area.

We look forward to our meeting and discussion with Council and Staff on September 23rd. We are hopeful that we will receive the support of Council and thereby be enabled to report progress to our Minister.

Director and Staff
Bureau of Transit Services
Department of Municipal Affairs
Province of British Columbia

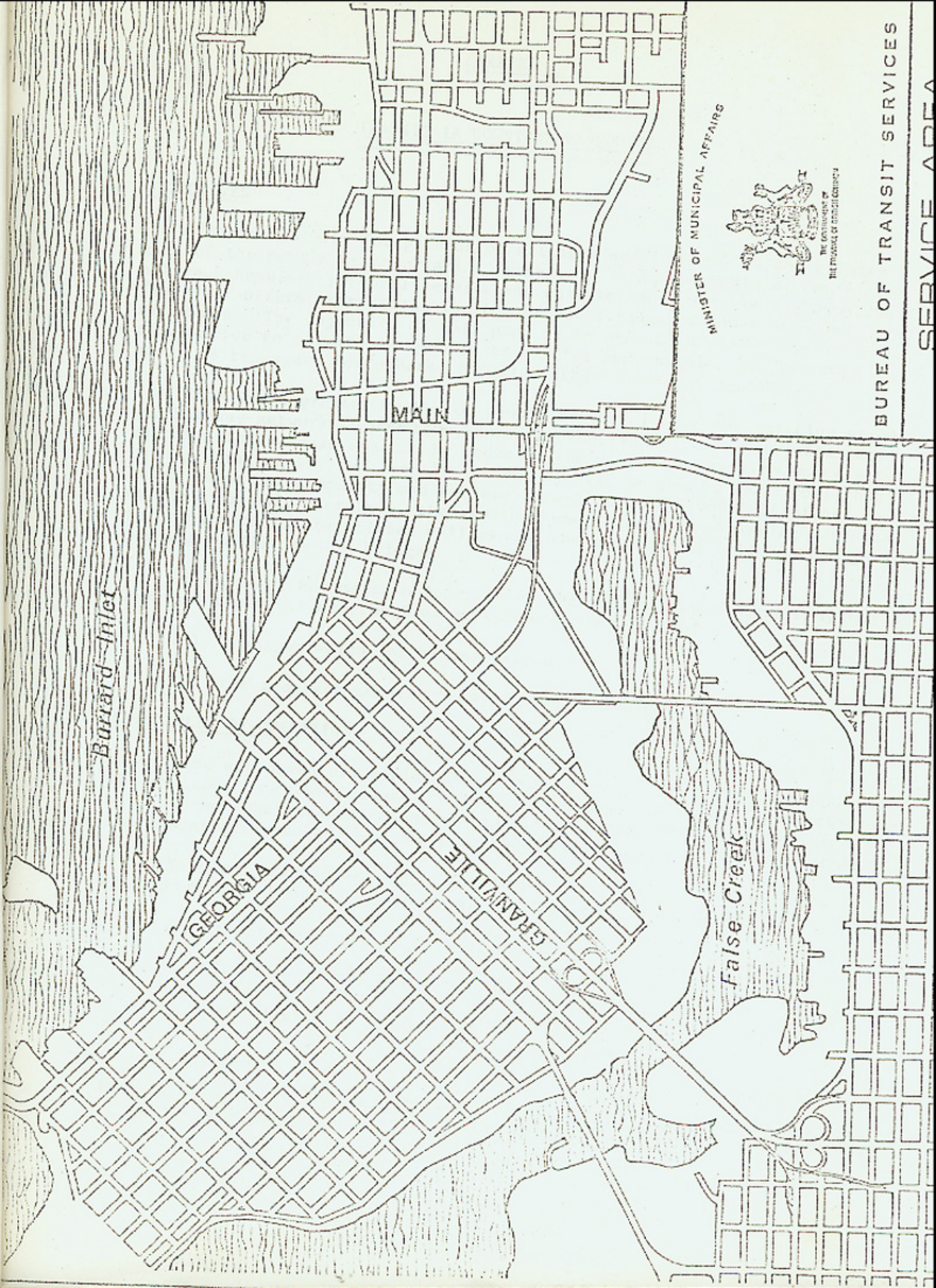
INTRODUCTION

Following the completion of the City of Vancouver's various planning studies dealing with the development, redevelopment and definition of activity centres on the Downtown Peninsula, the Bureau of Transit Services commenced a reassessment of the demand for public transit in the area. The review concentrated on the entire Downtown Peninsula as defined in Figure No. 1. False Creek and the Burrard Inlet serve as natural boundaries to the south and north respectively, while the western and eastern limits are Stanley Park and Main Street due to the changes in levels of activity.

This report deals with the implementation of the objectives of the transit system and the general principles of operation. Mobility and service are the guidelines of the transit route plan and the proposed operational improvements on City Streets. Drawing heavily on the City Planning Department's reports on the West End, The Waterfront and False Creek, in addition to the recent work of the Downtown Study Team, the service review analyzed potential Downtown travel demand, both internal and external. Chapter 2 deals with the results of the demand analysis and forms the basis of the planned improvements summarized in following sections.

The planned service design for Downtown Vancouver includes some modifications which will have greater impact at a later date. Chapter 3 includes an examination of the probable future stages of transit development in Greater Vancouver. Some of these, improvements such as the Light Rail Transit system, the surface and subway lines and the commuter train, require further planning and negotiation. They have been presented in Chapter 3 in order that some of the current stage modifications may be placed in the proper perspective.

This report should not be considered independently of the policy guidelines and objectives of the planning documents cited throughout. The transit system proposed in the following chapters has been planned to serve as a device for implementing the varied community goals contained in the planning reports.



Burrard Inlet

GEORGIA

MAIN

GRANVILLE

False Creek

MINISTER OF MUNICIPAL AFFAIRS



THE CORPORATION OF
THE CITY OF VANCOUVER

BUREAU OF TRANSIT SERVICES

SERVICE AREA

TRANSIT IN DOWNTOWN VANCOUVER:

A. OBJECTIVES

"Basic mobility for persons of all ages and incomes" is the primary goal of the public transportation system. As the regional centre for office, shopping, personal service and entertainment activities, Downtown Vancouver offers attractions for the broadest range of Lower Mainland residents. The objective of this plan is to provide a viable and convenient alternative to private automobile travel for some people, and the only means of transport for others, to all of these Downtown activities.

Enabling a greater number of people to travel over the existing street and highway network to Downtown Vancouver contributes to a more efficient use of existing road space. By reducing the demand for roadway space and thus parking areas, the transit system may also be considered a tool that helps shape the community and achieve livability. The more efficient utilization and, therefore, the greater benefit from the existing investment in transportation facilities will remove the pressure to build more highways, parking facilities and bridges.

In summary, the major objectives of the public transportation system in Downtown Vancouver and the Greater Vancouver Region are:

- (i) transportation for all people; and
- (ii) the greatest benefit from existing resources.

B. PRINCIPLES OF OPERATION

There are seven principles of transit operation that form the basis of the proposed Downtown network. The actual implementation of these principles will enhance the attractiveness of transit services for patrons by minimizing the amount of inconvenience and time required to get to a final destination.

The seven principles can be sub-divided into three common service characteristic areas for purposes of explanation. These are:

- (i) direct routing;
- (ii) minimize unnecessary transfers;
- (iii) minimal walking distance to final destinations.

¹ Honourable James C. Lorimer, Policy Statement: Public Transportation for British Columbia; Department of Municipal Affairs, Victoria, April 1973.

(i) Direct Routing

PRINCIPLE No. 1



Travelling in Common: Public transit, or "transport in common" as it is sometimes called, is essentially a system of shared rides. This basic service characteristic dictates that, in most cases, the direct route between two points will minimize trip times for the largest number of people. Diversions of a route, to serve specific needs of one or two groups will increase travel times for patrons not destined for a point on the path of diversion. The effect, therefore, of the diversion is a less attractive service for the majority of travellers.

PRINCIPLE No. 2

Service to Developing Areas: In any transitional area (such as the "Education/Cultural) Complex" around Dunsmuir and Beatty) located at a distance from existing activity streets, transit service may be required. There are two approaches to this problem:

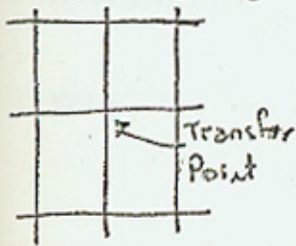
- (a) divert existing routes from active streets such as Granville, or
- (b) add new services.

The first approach looks appealing since every street has a bus route on it. In reality, however, each route taps a different area of the city, meaning that patrons from some parts will not be carried to the prime destination and will face additional walking time. The preferred solution is to add new routes from the service hinterland to the transitional area and/or establish a secondary route within the central business district connecting the prime area with the developing area.

(ii) Minimal Transfers:

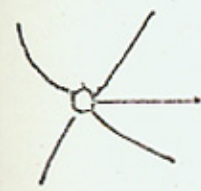
PRINCIPLE No. 3

RANDOM SCHEDULE



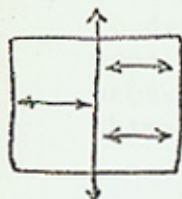
Random Schedules and Timed Transfer Focal Points: In the metropolitan area there are a multitude of potential origins and destinations of transit patrons. Since any one route cannot serve every origin or destination, the ability to transfer from one route to another is an important element of the transit system. The transit network in Greater Vancouver has been designed to maximize the ability to transfer from one route to another in order to complete one's trip. In the medium and high density urban areas a "Random scheduled" approach is adopted. On a close geographic spacing (i.e. 1/2 mile grid) with high frequency service, waiting times at transfer points are minimal and connections in each direction are possible. The Suburban areas with a lower density of development present a different problem in trying to minimize transfers. The "Timed Transfer Focal Point" concept brings all local bus routes together at a central place at specific times. In the suburban communities frequency of service is much lower than in urban areas and the waiting time at transfer points if a "random scheduled" approach was adopted, would be greater than or equal to the slack time at a "timed transfer focal point". The central business district acts as a timing point for regional services that must connect at various suburban activity centres (e.g. Lougheed Mall).

TIMED TRANSFER FOCAL POINT



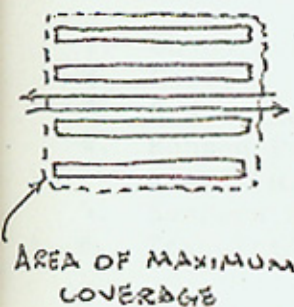
(iii) Minimal Walking Distance to Final Destination:

- PRINCIPLE No. 4 Straight-thru; centre of Gravity: The routing of a service through the centre of any area (i.e. origins and destinations) will minimize the total walking distance to the transit route from the area. A route that follows the periphery of an area will increase the walking distance for one-half of the total area.



- PRINCIPLE No. 5 Transit and Pedestrians: Since a transit patron is a pedestrian both before and after riding on the system, the concepts of pedestrianization and increasing the modal split must not be treated independently. If it is attractive to be a pedestrian, it will be attractive to be a transit patron. Furthermore, pedestrian oriented areas, such as Granville Mall, have many local destinations and origins. In order to maximize the interaction between these points, a pedestrian needs a shuttle service. An added feature of bringing the transit network together with the pedestrian area is the self-policing function created by many people on a street.

- PRINCIPLE No. 6 One-Way vs. Two-Way Streets: In urban areas, such as the central business district, it is reasonable to expect people to walk two blocks to a transit route. Therefore, where a transit route operates in both directions on the same street, an area two blocks on each side of the street receives maximum service. On the other hand, if route directions are split due to a one-way street system the area of maximum coverage is reduced significantly. Walking distances are affected by the separation of the transit routes as a result of the one-way street system. A two-way operation provides the best coverage by minimizing walking distances.



- PRINCIPLE No. 7 Nearside-Farside Stops: The location of bus stops at intersections can affect the time required for a transit patron/pedestrian to reach a destination. Nearside stops at signalized intersections permit the passenger to alight before proceeding through the intersection, possibly delayed by the traffic signal. As a pedestrian the individual has maximum four-way accessibility to destinations before the transit vehicle negotiates the intersection. Given possible delays as a result of the signals or vehicular traffic, a patron will shorten the total trip length through a system of nearside stops. In terms of traffic operations, a nearside stop arrangement is superior, since cross traffic is not obstructed at multiple stop locations by vehicles blocking the intersection waiting for buses to load. Also, street capacity is increased on streets where parking is permitted (except in the bus zone) when nearside stops are employed.

² Jane Jacobs, The Death and Life of Great American Cities, (New York: Random House

³ J. E. Baerwald (ed.) Traffic Engineering Handbook: (Washington: Institute of Engineers, 1965).

C. DOWNTOWN ACTIVITY AREAS

Prior to preparing a transit plan for Downtown Vancouver, it is necessary to determine the centres of attraction and generation within the Service Area. Although the City's Downtown Study Team has defined 15 character areas, the expanded Service Area boundaries and general transit service characteristics have contributed to a composite system of activity areas.

Figure Number 2 defines the eleven activity areas that have been employed for purposes of planning the transit network. An analysis of each areas' land use pattern, intensity of development and future potential has been contributed by the City of Vancouver's Planning Department reports on Downtown Vancouver, The West End and False Creek.⁴

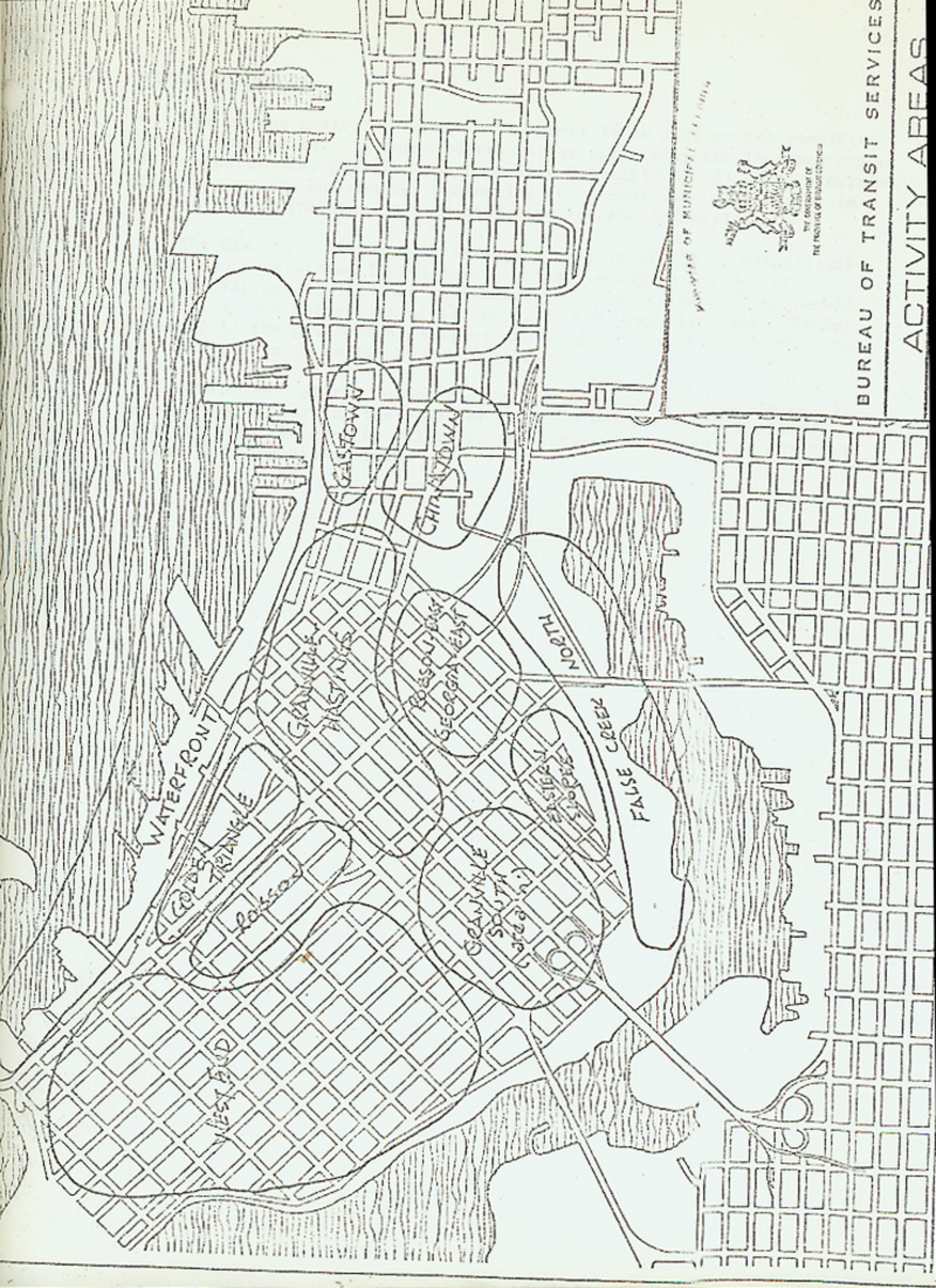
The following Table No. 1: "Nature of Activity and Demand", defines the general activity characteristics of each of the eleven sub-areas, including the time of day during which transit will be required.

TABLE No. 1
NATURE OF ACTIVITY AND DEMAND

<u>Activity Area</u>	<u>Nature of Activity</u>	<u>Demand</u>
1. Chinatown	Social, Cultural, Retail	Base & Evening
2. Gastown	Retail	Base & Evening
3. Granville-Hastings Retail	Retail, Office	Base, Evening & Some P
4. Robson East, Georgia East & Area H.	Educational, Cultural Office	Base & Evening
5. Eastern Slopes	Housing & Warehousing	Base & Minor Peak
6. Transition Area N	Restaurants, Hotels, Small Offices	Base & Evening
7. Robson Strasse/Robson Square	Retail, Recreational, Office Hotel	Base, Evening & Some P
8. Golden Triangle/Financial District	Office, Hotel	Heavy Peak
9. West End Residential	Residential	Base, Evening & Peak
10. North Side False Creek	Residential	Base, Evening
11. Waterfront	Residential, Office, Retail	Base, Evening & Peak

Note: The "Base" period extends approximately from 9:00 a.m. to 3:00 p.m.

⁴ Downtown Study Team: Report for Discussion; Downtown Vancouver, Planning Concepts for Future Development and Process for Control of Development (Van. 1975)



WATERFRONT

GOLDEN TRIANGLE

CASSON

WEST END

GRANVILLE
HASTINGS

GASTOWN

CHINATOWN

ROSOL EAST
GEORGIA EAST

GRANVILLE
SOUTH

NORTH

EASTSIDE

FALSE CREEK

MAYOR OF MUNICIPAL COUNCIL



BY ORDER OF THE
THE PROGRESS OF PUBLIC WORKS

BUREAU OF TRANSIT SERVICES
ACTIVITY AREAS




D. PEDESTRIANIZATION

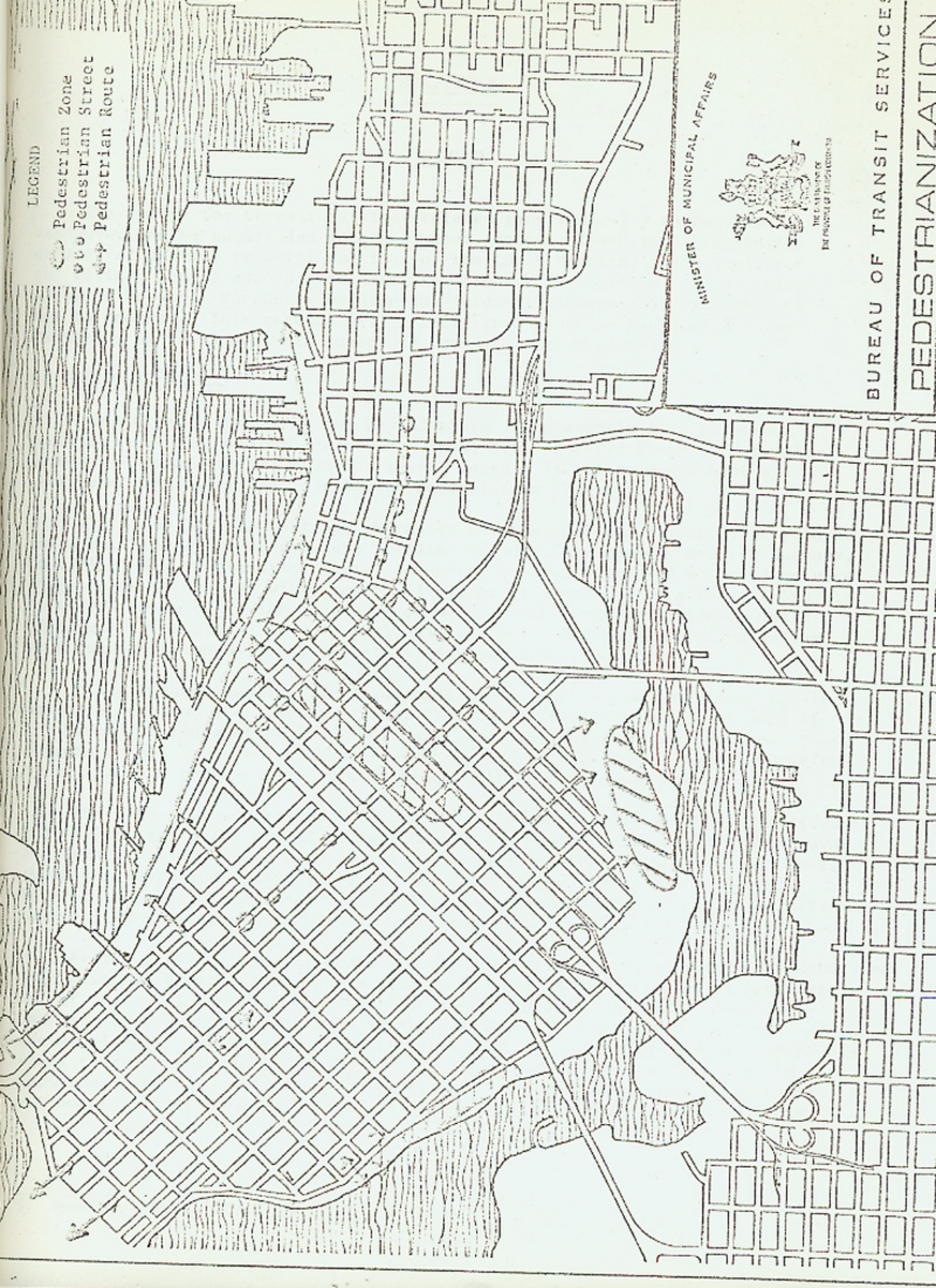
One of the goals for Downtown Vancouver is to improve the amenities for the pedestrian. In terms of transit acceptability the implementation of this particular goal is important (See Principle No. 5). The provision of places to sit and weather protection for pedestrians will assist in creating an environment that is conducive for the pedestrian.

The Granville Street Mall is a good example of the integration of transit and pedestrian facilities. Further pedestrianization of Downtown Vancouver will involve linkages from the major office, retail, residential and entertainment precincts to the Granville Mall. To be successful, the pedestrian linkages will require street level activities and amenities such as benches and shelters.

Development of the "conceptual pedestrian network" (Figure No. 3) is an integral part of the plan for Downtown Vancouver. The transit plan has been designed to relate to the pedestrian network as envisaged by the Downtown Study Team.

LEGEND

-  Pedestrian Zone
-  Pedestrian Street
-  Pedestrian Route



MINISTER OF MUNICIPAL AFFAIRS



THE CITY OF MONTREAL
THE PROVINCE OF QUEBEC

BUREAU OF TRANSIT SERVICES

PEDESTRIANIZATION

DEMAND

The demand for transit services related geographically to Downtown Vancouver can be subdivided into two major groups. There is a "regional" demand for service from all sections of the Lower Mainland and beyond, for the office, retail and entertainment functions. In addition, the activity areas in Downtown Vancouver require an "internal" system that will connect one to another. This section will briefly examine these two demand characteristics in terms of their impact on transit service planning.

A. REGIONAL DEMAND

From Greater Vancouver and beyond there are presently five principal entrances to the Downtown Peninsula. These are: Burrard Street, Granville Street and Cambie Street from the south; Georgia Street from the east and west; and Hastings Street (including Pender) from the east.

The Granville and Hastings entrances are the most heavily used for transit purposes. These two streets are utilized by most City routes, and the Burnaby, Coquitlam, New Westminster, North Vancouver, Surrey, Delta and Richmond services. These routes, together with Fraser Valley services and the Straights of Georgia Ferry-BUS route carry large numbers of people into Downtown Vancouver daily. Hastings Street alone, in June 1975, had 109 buses per hour scheduled during rush hours between Main and Granville, in each direction.

Other figures dealing with passenger loads in these two corridors leading into the downtown are also revealing. The following table indicates some of the passenger loads at peak periods only, from the suburban communities. These figures do not include local routes such as the 14-HASTINGS or the 20-GRANVILLE which also use these corridors more frequently than the suburban services.

The other three corridors, Burrard, Cambie and Georgia are less significant regionally, yet serve the Kitsilano, Cambie and South Vancouver, West Vancouver and Fraser Valley areas, respectively. In terms of transit vehicles per hour, these corridors are considerably lighter than the two prime entry routes. However, Burrard, Cambie and Georgia Streets provide access to the major office centre, the entertainment/cultural area, the retail core and Stanley Park.

At the present time the transit system is carrying 20,000 people per rush hour into Downtown Vancouver via these five corridors. This represents approximately 45% of the total Downtown work-force. If the employee population downtown reaches 180,000 by the year 2000 as projected by the Downtown Study Team, and the modal split is increased significantly (i.e., a greater percentage of people using transit to travel downtown,) major improvements will be necessary to accommodate the regional demand.⁵ (This will be particularly crucial for the two heaviest corridors, Hastings and Granville. Services from the suburban

5. Downtown Study Team, op. cit. pg. 11 & 42

TABLE No. 2

HASTINGS AND GRANVILLE CORRIDORS1. Hastings Corridor

<u>Route</u>	<u>Area Served</u>	<u>Passenger Load (Peak Hr.)</u>	<u>Year of Count</u>
Barnett-980	Pt. Coquitlam	291	1975
Lougheed-933	Coquitlam	431	1975
Scott-619	N. Delta, New West	120	1975
Hjorth-620	N. Surrey	120	1975
King George-621	Surrey, New West	120	1975
910-911-714-81	North Shore	2256	1975
Kingsway-54/55	Burnaby	<u>972</u>	1975
	TOTAL	4310	

2. Granville Corridor

<u>Route</u>	<u>Area Served</u>	<u>Passenger Load (Peak Hr.)</u>	<u>Year of Count</u>
Richmond-60	Richmond	773	1975
Deas Island-650	White Rock, Ladner	100	1975
N. Delta/Deas-610	North Delta	120	1975
Tsawwassen-602 and 603	Tsawwassen	200	1975
Ladner-608	Ladner	80	1975
	TOTAL	<u>1273</u>	

residential growth areas such as Surrey, Coquitlam and Richmond utilize these two corridors as entry points to the Downtown Peninsula).

The destinations for the regional demand are not concentrated in any one activity area, but rather are spread throughout the downtown core. Penetration of regional services and the coverage given to downtown destinations must be maximized if the transit system is to fulfill its objectives. Regional services, therefore, must accommodate trip patterns for shopping, entertainment and personal services as well as the journey-to-work.

B. INTERNAL SERVICE

Within the Downtown Peninsula transit services are required by residents, employees, shoppers and visitors. Each of the eleven activity areas, described in the previous section, has a variety of needs in terms of links to other areas of Downtown Vancouver and the metropolitan region. Figure No. 4 graphically represents the conceptual movement patterns for the service area.

Some of the patterns depicted in Figure No. 4 are wholly contained within the boundaries of the service area. For example: the connection between the retail component of the Robsonstrasse district and the Granville-Hastings Retail area for shoppers, and the desire to link the West End residential population with the office complexes in the Golden Triangle and Granville-Hastings precincts.

One linkage wholly contained within the Service Area is somewhat unique. The pattern of movement through the Waterfront district from Gastown and Chinatown to Stanley Park has been designated by the Waterfront Planning Group.⁶ This would primarily be a tourist attraction, but may well function as an internal distribution system through the Waterfront area and the Gastown/Chinatown precincts.

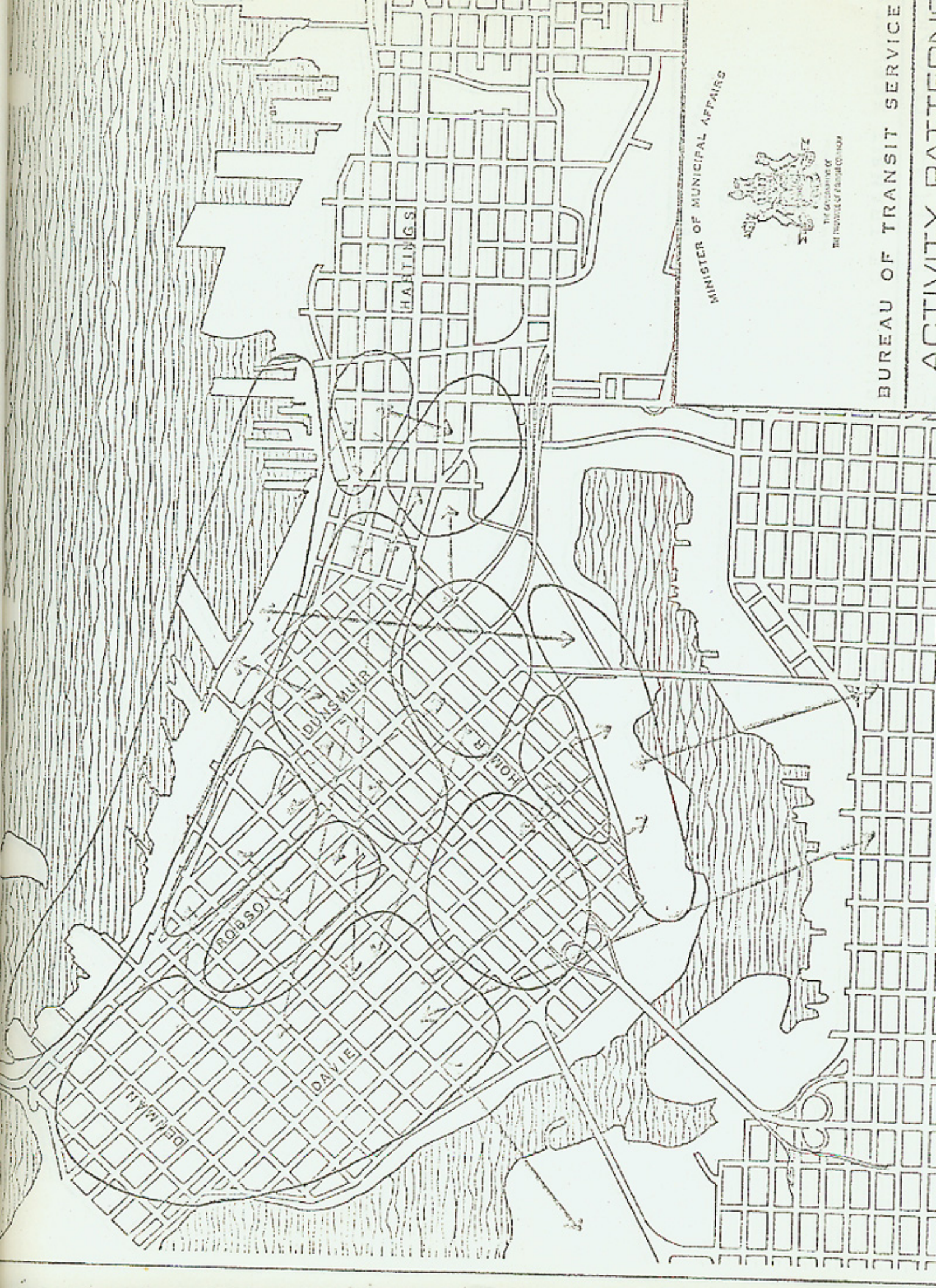
The other movement patterns indicated on Figure No. 4 involve trips to destinations outside the Downtown Peninsula. Residents in the West End and the North Side False Creek areas will have requirements for travel to destinations such as City Hall, the Hospitals, U.B.C., the Broadway employment area and so on.

The final internal movement pattern, not specifically shown on Figure No. 4 is the movement of people along a street within each activity area. Shopping streets such as Granville and Robson encourage movement along them by the very nature of the activities located there. Similarly, trips for social purposes within the West End District will contribute to the total internal movement pattern of the peninsula.

C. IMPLICATIONS FOR SERVICE DESIGN

Within the Downtown Peninsula, some streets are better suited for public transit than others. This may be due to the activities along them or their geographic position relative to activity centres.

6. R. C. Mann; Official Development Plan for the Downtown Waterfront, City of Vancouver, 1974



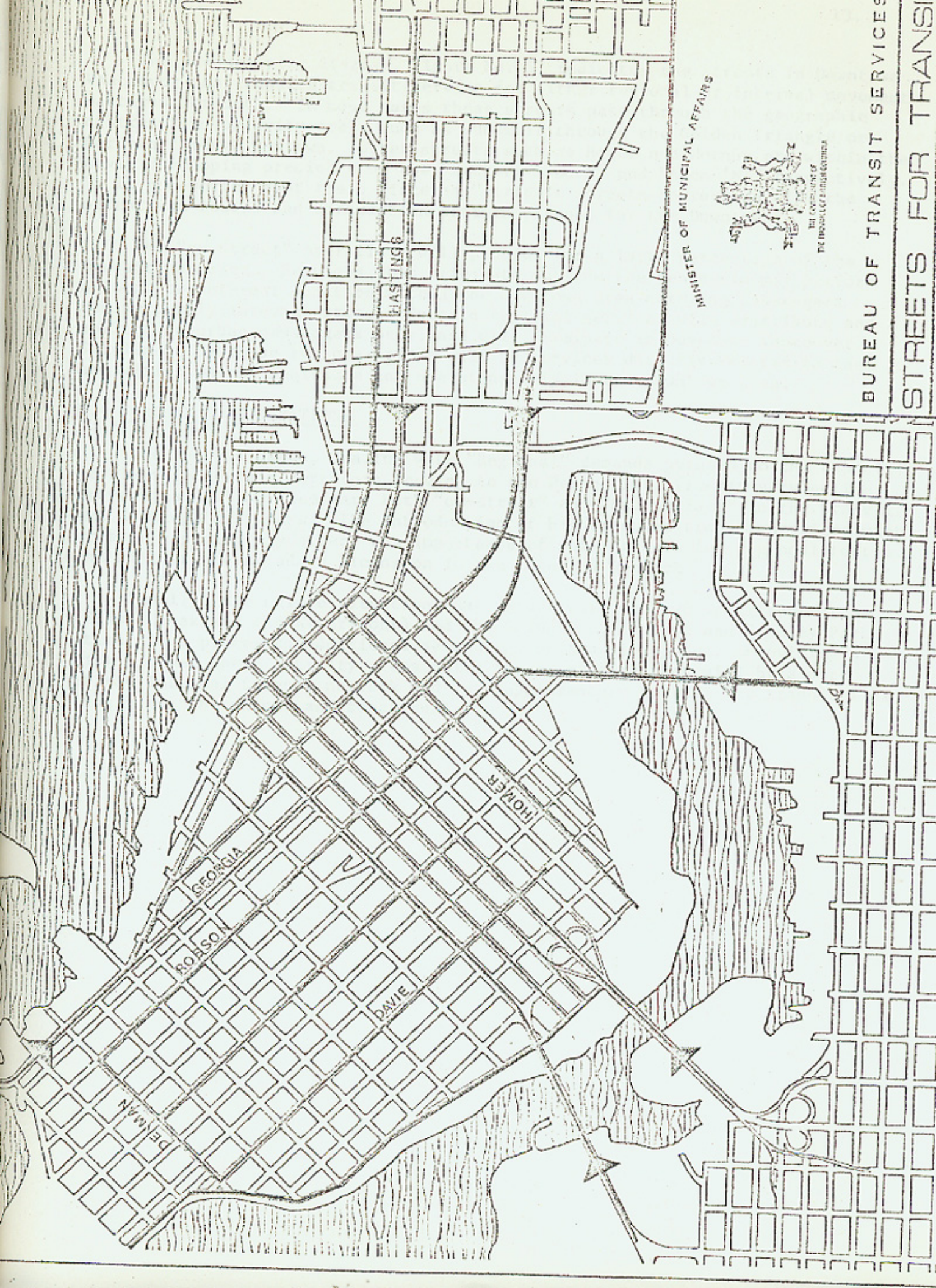
MINISTER OF MUNICIPAL AFFAIRS



THE CORPORATION OF
THE CITY OF TORONTO

BUREAU OF TRANSIT SERVICE

ACTIVITY PATTERNS



MINISTER OF MUNICIPAL AFFAIRS



THE COMMISSIONER OF
THE DEPARTMENT OF MUNICIPAL AFFAIRS

BUREAU OF TRANSIT SERVICES
STREETS FOR TRANSIT

The accompanying diagram, Figure No. 5, indicates the streets in Downtown Vancouver that require transit service for either regional or internal movement patterns, or both. In most cases these streets pass through the geographic centre of an activity area, such as Dunsmuir through the Golden Triangle or Cordova through Gastown. Other streets such as Homer and Hornby are within the newly developing precincts of the "Eastern Slopes" and "Area 'N'" respectively. It is noteworthy that these "internal" transit streets correspond with the pedestrian routes and circulation pattern planned for the Downtown.

The "on-street" operations will provide for a large percentage of the transit capacity. Services that originate outside the peninsula may perform a local or internal function within the Downtown area carrying passengers making purely internal trips. Certain regional services will distribute and collect suburban passengers only, and will terminate in Downtown Vancouver. Supplementing these two operations will be services directly related to the activities on the peninsula and operating only in the Downtown area.

D. FURTHER CONSIDERATIONS

The section above, dealing with "Regional" demands pointed to the capacity problems in certain corridors leading to the Peninsula. Transit service improvements will be necessary both "on-street" and "sub-surface" in the Granville and Hastings corridors. The introduction of higher speed transit services with greater capacity may affect the importance of some streets for regional routes, and will create an added dimension in the internal network.

Finally, the unique situation that exists with the two waterfront areas (False Creek and the Waterfront) and the Chinatown, Gastown and Stanley Park attractions places an additional demand on the transit system. Providing a link between these activity areas calls for a solution that will be a part of the internal transit network and yet supplementary to it. The transit link itself must be unique and functional.

ROUTE LAYOUTS IN DOWNTOWN VANCOUVER

The previous chapter set forth the demands for transit in Downtown Vancouver and indicated the streets which require local (i.e., "internal") service. This section of the report translates the stated demand function into a route layout for transit services. Presented below are two stages of transit improvements. The "Advanced Transit System" (Figure No. 6) will substantially increase the passenger capacity in several of the critical corridors, and will be fully implemented in the longer-term. Immediate improvements, of which the bus element is the most important, are proposed to take effect in 1976.

A. THE ADVANCED TRANSIT SYSTEM

(i) The Burrard Inlet Ferry

As a specific solution to the congestion problems at the First and Second Narrows Bridges, the cross-inlet ferry will provide a rapid transit style operation in a novel setting. With a capacity of 400 passengers each, the two vessel fleet can transport approximately 2400 people per hour in each direction. The crossing of Burrard Inlet will take eight minutes.

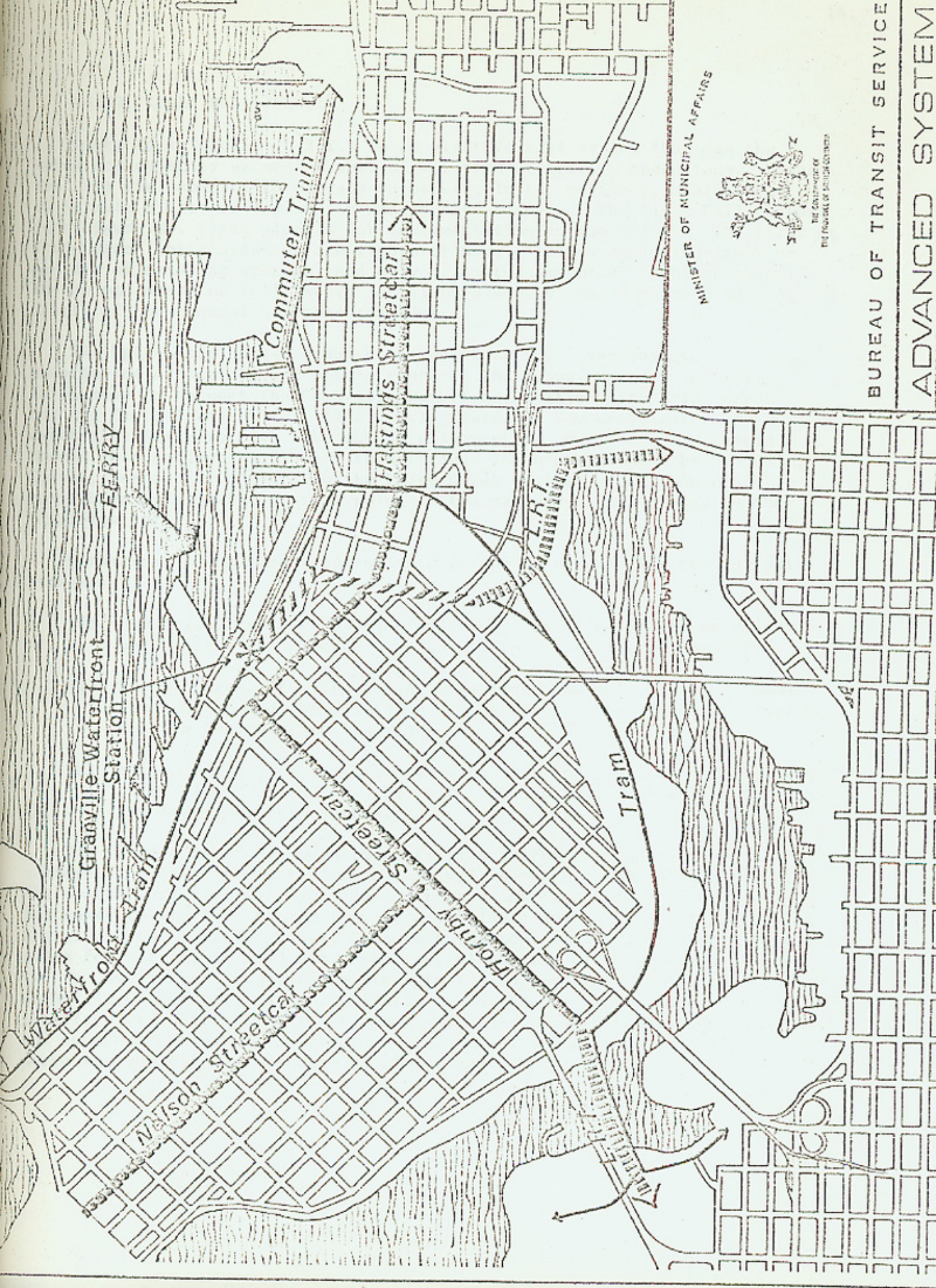
The C.P.R. Station at Granville and Cordova is planned to serve as the southern terminus of the Burrard Inlet Ferry service. As additional elements of the transit network are developed, the Granville Waterfront Station will take on increased importance as a transportation terminal and interchange.

The ferry operation between Lonsdale on the North Shore and the Granville Waterfront Station, is planned for implementation by mid 1976.

(ii) Commuter Train

Taking full advantage of the railway rights-of-way that bisect the Lower Mainland, the second major improvement in transit services will be the proposed C.P.R. Commuter Train from Port Moody and Port Coquitlam. As a peak-hour only service that will terminate at the Granville Waterfront Station, the Commuter Train will substantially reduce travel times from the suburban communities and alleviate the congestion problem in the Barnett/Hastings corridor.

Negotiations and studies are currently underway with C.P.R. Rail for the use of the C.P.R. line and operation of the service. Initial plans propose that two peak-hour trips with a total capacity of approximately 3000 people will be implemented by late 1976 or early 1977.



MINISTER OF MUNICIPAL AFFAIRS



THE CORPORATION OF
THE CITY OF TORONTO

BUREAU OF TRANSIT SERVICE

ADVANCED SYSTEM

(iii) Light Rail Transit

Light Rail Transit (L.R.T.) is an electric rail system that has the speed and capacity exceeding that of motorbus or trolley operations. Light Rail has the capacity to operate on-street, in the median or boulevard, on private rights-of-way and in underground tunnels. The Light Rail network (see Figure No. 6) is planned for implementation in two phases. The first or "pre-metro" phase uses surface rights-of-way, often in exclusive-lanes or medians of existing streets, and only a limited amount of Downtown tunnel. The second phase or full "metro" utilizes a subway routed through the entire length of the central business district.

The "pre-metro" phase planned for Downtown Vancouver involves a combination of surface and subway routes. The subway section initially, is planned to connect the Granville Waterfront Station with False Creek for the Central Park L.R.T. line serving Burnaby, New Westminster and eventually North Surrey. The subway alignment is proposed below Cambie Street from Cordova to Pender, then through the block bounded by Dunsmuir, Cambie, Beatty and Pender, to the False Creek railway yards. An easterly connection is possible at that point to the railway rights-of-way in the Grandview cut.

Street-car or on-street operation Downtown is planned for the following streets:

- (a) Hastings Street, to provide additional capacity in the corridor particularly from North Burnaby and the east side of the City.
- (b) Hornby Street, to link the Arbutus Line that will serve Richmond, South Delta and the west side of the City to the Granville Station and the Central Park line; and
- (c) Nelson Street, to serve the growing West End population (projected to be 47,000 by 1988 by the West End Plan, pg. 9) and link it with downtown activity centres.

The final element of the street car plan is the introduction of a surface line along the waterfronts that will serve a number of functions. The southern section will provide a direct connection from Downtown Vancouver to the Planetarium (southern terminus) and an alternate method of travelling to the False Creek, Chinatown, Gastown and Waterfront activity areas for Kitsilano residents. The central portion of the route will link the two waterfront areas, False Creek to the Burrard Waterfront and Granville Waterfront Station. Finally the northerly section provides a waterfront transit system (advocated by the Waterfront Planning Group) and connects Gastown to Stanley Park. The Waterfront tram line will serve the social and recreational places on the periphery of downtown.

B. IMMEDIATE IMPROVEMENTS

Following from the examination of the demand for transit services and building towards the "Advanced" stage network, several modifications must be made to the present bus system downtown. Some routes currently run down streets, such as Richards, which have a minimum of street level activity and very little to attract pedestrians or transit patrons. Other streets have important activities now or have developments planned, yet have too little service. These include Georgia (east), Burrard and Pender. In addition, linkages to several centres outside the Downtown Peninsula, such as City Hall and the Terminal Avenue industrial area, are poor.

Table No. 3, below, outlines the new and revised bus services in Downtown Vancouver. Included in the table are the Downtown portions of each route and the area of demand that each route will cover. Figure No.7, accompanying Table No. 3, graphically illustrates the revised route structure. Not indicated on Figure No. 7 are those routes that are not being modified.

NEW AND REVISED BUS SERVICE

<u>Route Names</u>	<u>Routing (Downtown Portion)</u>	<u>Purpose</u>
ARBUTUS	Burrard Bridge, Burrard, Cordova ¹ , GRANVILLE WATERFRONT STATION the thru-routed with CAMBIE.	Serves the False Creek area south of the bridge (especially Area 10); provides link from the west side to the activity along Burrard; helps the over-loading problems on the MacDonna service to Kitsilano; and connects the Burrard office areas to Granville Waterfront Station.
CAMBIE	Cambie Bridge, Cambie, Cordova, GRANVILLE WATERFRONT STATION, then thru-routed with ARBUTUS.	Links the City Hall/Hospital area directly to: - Robson-east, Georgia-east Cultural/Entertainment area; - the Granville Station; and - the Golden Triangle.
CAMBIE/ROBSON	Cambie Bridge, Robson, Denman ² .	Internal circulation along Robson Street; frequent service to Cultural/Entertainment area and Federal Buildings for West End residents; provides east-west link for those transferring from future L.R.T. line at Robson Square; links West End directly to City Hall/Hospital area; provides direct service to Langara College from West End; provides internal circulation in West End Community; and provides access from hotels and Broadway area to Stanley Park.
OAK	Oak, Sixth, Granville Bridge, Granville Mall, Hastings, then thru-routed with east-end service.	Serves False Creek and Fairview Slopes areas with direct service to Downtown; provides "internal" service on Granville and Hastings.

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OAK	Oak, Sixth, Granville Bridge, Granville Mall, Hastings, then thru-routed with east-end service.	Serves False Creek and Fairview Slopes areas with direct service to Downtown; provides "internal" service on Granville and Hastings.

TABLE No. 3 (cont'd)

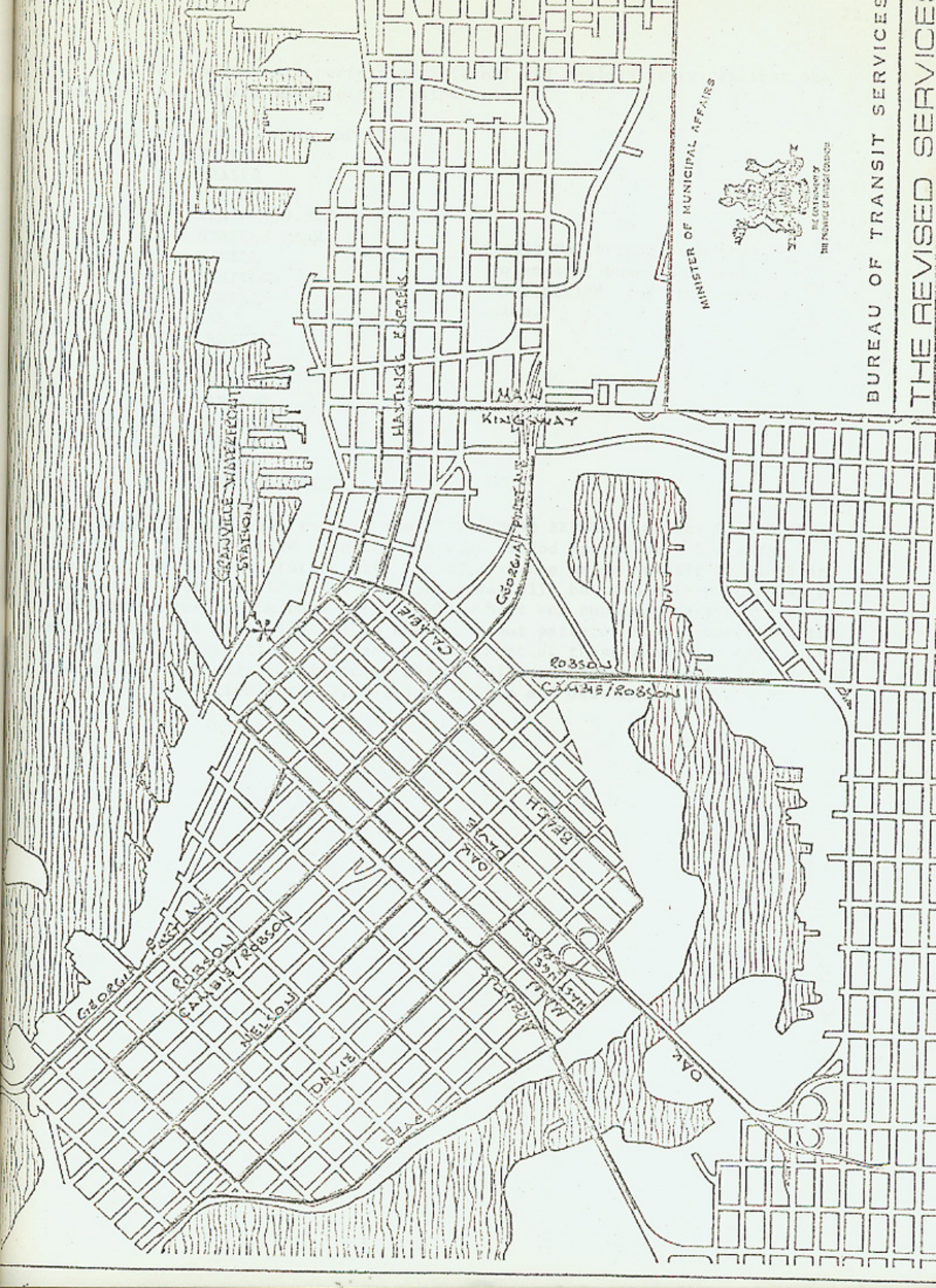
<u>Route Name</u>	<u>Routing (Downtown Portion)</u>	<u>Purpose</u>
GEORGIA-FIRST AVE.	Stanley Park ⁴ ; Georgia, Georgia Viaduct, Venables and then to B.C.I.T.	Serves the industrial area around downtown and N. Burnaby; provides local service on Georgia; Links Main Street services to Granville-Hastings Retail area; serves the Cultural/Entertainment precinct on Georgia; links West End to B.C.I.T. and adds to the east-west component of the Vancouver route
BEACH	Beach (2-way), Homer, Cordova, Core ³	Serves Crystal Pool and N. Shore of False Creek; provides internal service to Eastern Slops and Robson-East/Georgia-East areas.
NELSON	Stanley Park, Nelson (2-way) Cordova, CRANVILLE WATERFRONT STATION	Serves internal circulation in the West End; and links West End and Granville Waterfront Station. This service will eventually be replaced by the NELSON streetcar line.

Notes: 1. Until Cordova Extension is constructed, Pender and Granville will be used.

2. If improvements for transit vehicles on Denman are not possible, the "DAVIE" and "ROBSON" routes will be terminated at English Bay and Lost Lagoon.

3. Loop at Cordova, Core, Powell and Main

4. Trips to Stanley Park would not be run until the reliability problems west of Jervis are solved. Until then it will loop via the block bounded by Bute/Melville/Jervis and Georgia.



GRANDVILLE MARKET STATION

HASTING ST

KINGWAY

GEORGIA STREET

BAY ST

ROBSON

CAMBRIDGE/ROBSON

GEORGIA

SPADINA

ROBSON

CAMBRIDGE/ROBSON

MELBOURNE

DAVIS

BLISS

OAK

RYAN

BEAUFORT

WILSON

ST. JAMES

ST. PATRICK

OAK

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THE GOVERNMENT OF ONTARIO
THE MINISTRY OF MUNICIPAL AFFAIRS

BUREAU OF TRANSIT SERVICES

THE REVISED SERVICE

Bus routes that are performing internal and regional services that the plan does not modify include the following:

- 2 - P.N.E. PARK AND RIDE
- 4 - FOURTH
- 6 - FRASER
- 7 - DUNBAR
- 10 - TENTH - U.B.C.
- 11 - STANLEY PARK
- 12 - POWELL
- 14 - HASTINGS
- 16 - RENFREW
- 17 - OAK
- 20 - GRANVILLE
- 22 - KNIGHT
- 23 - MACDONALD
- 24 - NANAIMO
- 25 - VICTORIA
- 52 - NELSON
- 54 - STRIDE
- 55 - TWELFTH STREET

(Table No. 4 indicates the volumes of buses per peak hour period, for the proposed plan.)

Regional services, such as the 60-RICHMOND EXPRESS and the 933-LOUGHEED FastBUS will be modified slightly for base period operation. Since the Granville Waterfront Station will function as the major transit terminal in the region, services from the suburban areas will be terminate on Cordova at the Station during the base period. Rush-hour and supplementary services on all routes will generally follow their present pattern, thus penetrating the precincts of attractions and generation. Most of these rush-hour only services and peak extras will terminate on the Melville connector. The following table indicates the regional route, point of origin and destination downtown.

TABLE No. 4

TRANSIT VOLUMES ON DOWNTOWN
STREETS UNDER PROPOSED
CBD TRANSIT PLAN

A.M. PEAK, 7:30 - 8:30

Burrard Street northbound from Robson to Pender

Route No.	Volume of buses
2	8
5	14
22	15
910	4
911	2
933	4
980	2
714	2
926	1
15	<u>12</u>
	<u>64</u> buses per hour

Hornby Street northbound from Beach to Hastings

Nelson (prop. West End rt.)	10 (est.)
3	18
34	<u>15</u>
	<u>43</u> buses per hour

Howe Street southbound from Pender to Granville Bridge

4*	9
60	10
602	3
603	2
608	2
650	2
610	<u>4</u>
	<u>32</u> buses per hour

*Terminates in CBD

A.M. PEAK, CONTINUED

Granville Mall southbound from Pender to Robson

Route No.	Volume of buses
6*	8
7	9
10	10
15	8
17	9
8	16
20	<u>17</u>
	<u>77</u> buses per hour

Granville Mall northbound from Robson to Pender

6*	11
8	17
14	7
16	7
17	9
18	11
25	<u>17</u>
	<u>79</u> buses per hour

Seymour Street northbound Granville Bridge to Dunsmuir

4	9
60	15
602	3
603	2
608	2
650	4
610	<u>4</u>
	<u>39</u> buses per hour

*Terminates in CBD

A. M. PEAK., CONTINUED

Cordova Street eastbound Homer to Main

Route No.	Volume of buses
Nelson (pro. West End rt.)	10 (est.)
1	8
3	18
5	14
8	17
12	7
19	14
24	<u>5</u>
	<u>93</u> buses per hour

Cordova Street westbound Main to Granville

1	9
3	17
5	16
8	16
19	<u>16</u>
	<u>74</u> buses per hour

Hastings Street westbound Main to Granville

2	10
7	9
10	10
20	17
34	15
619	3
620	3
621	3
714	2
910	5
911	2
933	11
980	<u>7</u>
	<u>97</u> buses per hour

A.M. PEAK, CONTINUED

Hastings Street eastbound from Granville to Main

Route No.	Volume of buses
2	8
14	7
16	7
25	17
34	15
619	3
620	3
621	2
714	-
910	3
911	
933	4
980	<u>2</u>
	<u>71</u> buses per hour

TABLE No. 5

SUBURBAN FastBUS SERVICES

<u>Route</u>	<u>Origin</u>	<u>Base</u>	<u>Destination</u>
			<u>Peak</u>
910-MOUNTAIN HIGHWAY	North Vancouver	Granville Waterfront Station	Haro-Smithe
911-SEYMOUR	North Vancouver	Granville Waterfront Station	Haro-Smithe
933-LOUGHEED	Coquitlam	Granville Waterfront Station	Hornby at Nels
980-BARNETT	Pt. Coquitlam	Granville Waterfront Station	Hornby at Nels
60 -RICHMOND	Richmond	Granville Waterfront Station	Melville Conne
602-TSAWASSEN HTS.	S. Delta	N/A	Melville Conne
603-TSAWASSEN RING	S. Delta	N/A	Melville Conne
608-LADNER RING	S. Delta	N/A	Melville Conne
610-N. DELTA	N. Delta	N/A	Melville Conne
619-SCOTT	N. Delta	Granville Waterfront Station	Melville Conne
621-KING GEORGE	Surrey, White Rock New Westminster, Burnaby	Granville Waterfront Station	Melville Conne
630-FERGUSON	North Surrey	Granville Waterfront Station	Melville Conne
650-DEAS ISLAND	S. Surrey, White Rock, Ladner	Granville Waterfront Station	Hornby/Pender
820-CANADA WAY	New Westminster, Burnaby	N/A	Larwill Termina

Note: Other North Vancouver routes that connect the Downtown Peninsula and the North Shore will be affected by the introduction of the Burrard Inlet Ferry service. A Service Review is being undertaken by the Bureau of Transit Services for the entire North Shore to orient routes to the ferry terminal and evaluate other transit needs.

C. SUMMARY

The prime considerations in planning the proposed route network were: the provision of direct routing, to minimize unnecessary transferring, and minimal walking distance to the final destinations. The immediate improvements will establish routes on streets that are designated as pedestrian routes, provide service to developing areas, and complete an internal circulation scheme within the Downtown Peninsula.

Longer term improvements will increase the transit capacity to Downtown destinations through the introduction of modes other than the bus. Off-street terminal space and the initial section of subway will also contribute to the attractiveness of the transit system to potential users.

INFRASTRUCTURE AND STATIONS

A. STREET REQUIREMENTS

City and suburban transit services described in the previous chapter will require operating space on Downtown streets. For the most part the transit system can operate in mixed traffic without special on-street improvements. However, in a limited number of cases where the volumes of automobile and truck traffic greatly impede the operational performance exclusive bus lanes have been advocated. Figure No. 8 points out the operational requirements on Downtown streets. For purposes of clarification, Table No. 6 presents the details of these requirements for each street or portion of a street.

Several rather important modifications in the present arrangement of one-way streets is indicated by these requirements. Hornby, Cordova, Cambie and sections of Robson Street are currently one-way. In order to achieve an efficient and effective Downtown bus network, two-way transit operation on these three streets is necessary. (See Chapter 1; Principles of Operation). The plans for areas along these streets include pedestrian activities that support the level of transit services proposed.

Hastings Street and Granville will continue to carry the heaviest concentration of bus movements. The transit mall on Granville, as an exclusive right-of-way, eliminates delays caused by traffic, loading zones and so on. However, for the entire system to function within scheduled frequencies exclusive bus lanes will be necessary on Hastings. Similarly, traffic congestion on Robson (from Jervis to Hornby), Denman, Seymour, Howe and Thurlow (from Melville to Pender) contribute to operational problems throughout the entire Greater Vancouver system. The expected growth in transit ridership and, therefore, in the volumes of buses using city streets prior to the completion of the Light Rail system will more than justify the improvements noted above.

On-street layover space particularly for the suburban FastBUS network will be reduced significantly with the development of the Granville Waterfront Station. Base period services will be oriented to the Station on Cordova where it is planned to have off-street recovery areas. Extra services for rush-hour periods will be held outside the Downtown area until they are required. It will not be necessary, therefore, to provide more than a bus stop position at the points where supplementary services terminate in the morning rush and commence service in the afternoon peak.

TRANSIT OPERATION REQUIREMENT FOR RIGHT-OF-WAY

<u>Street</u>	<u>From</u>	<u>To</u>	<u>Operation</u>
POWELL	Carrall	east	One-way (westbound): mixed traffic
CORDOVA	Burrard	Main	Two-way: mixed traffic
	Main	east	One-way (eastbound): mixed traffic
HASTINGS	Burrard	east	Two-way: exclusive lanes
	Hornby	east	Street track.
PENDER	Georgia	Gore	Two-way: mixed traffic
DUNSMUIR	Thurlo	Main	One-way (westbound): mixed traffic
GEORGIA	Chilco	Seymour	Two-way: mixed traffic
	Seymour	Main	One-way (eastbound): mixed traffic
ROBSON	Chilco/Denman	Jervis	Two-way: mixed traffic
	Jervis	Hornby	Two-way: exclusive lanes
	Hornby	Howe	Pedestrian/Transit Mall
	Howe	Cambie	Two-way: mixed traffic
NELSON	Chilco	Hornby	Two-way: mixed traffic
			Street track
DAVIE	Denman	Granville	Two-way: mixed traffic
BEACH	Chilco	Granville	Two-way: mixed traffic
PACIFIC	Granville	Homer	Two-way: mixed traffic
CHILCO	Beach	Nelson	Two-way: mixed traffic
DENMAN	Davie	Robson	Two-way: exclusive lanes
THURLOW	Melville	Pender	One-way (Northbound): exclusive lanes
BURRARD	Beach	Cordova	Two-way: mixed traffic
HORNBY	Beach	Hastings	Two-way: mixed traffic
			Street Track
HOWE	Pacific	Cordova	One-way (southbound): exclusive lanes
GRANVILLE	Broadway	Nelson	Two-way: mixed traffic
	Nelson	Hastings	Pedestrian/Transit Mall
	Hastings	Cordova	Two-way: mixed traffic
SEYMOUR	Pacific	Cordova	One-way (northbound): exclusive lanes
HOMER	Pacific	Cordova	Two-way: mixed traffic
CAMBIE	Robson	Cordova	Two-way: mixed traffic
CARRALL	Pender	Powell	Two-way: mixed traffic
			Street track
MAIN	Broadway	Cordova	Two-way: mixed traffic
	Prior	Pender	Two-way: mixed traffic

LEGEND

- One Way - Mixed Traffic
- One Way - Exclusive Lane
- Two Way - Mixed Traffic
- Two Way - Exclusive Lane
- Exclusive Lane



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BUREAU OF TRANSIT SERVICES

ROAD

Local City-BUSES that are thru-routed will take recovery at outer terminal sites. Those routes that are wholly within the Downtown area have been planned such that the recovery points are situated on the periphery of the business core. For example, the BEACH, DAVIE and ROBSON routes all terminate at the block bounded by Cordova, Core, Powell and Main. A further example is the proposed terminus at Beach and Hornby for the MAIN and HASTINGS EXPRESS services.

During the "pre-metro" stage some street space will be required for track for the Light Rail system. It is anticipated that the introduction of the higher speed, higher capacity system will reduce the number of buses necessary to serve the same corridors. In order to implement the "pre-metro" phase, surface track is planned for Hastings, Hornby and Nelson Streets. The remainder of the "pre-metro" improvements are planned for private rights-of-way (as shown on Figure No. 8) either on surface or in subway.

B. STATIONS

(i) Granville Waterfront Station: 8

The Granville Waterfront Station, situated on Cordova Street at the north end of Granville is planned to be the major transit terminal in Downtown Vancouver. It will serve as the place where people board/leave various modes of transportation that focus on the Downtown Peninsula and as the main point of interconnection between regional services. The Granville Station will serve as the downtown terminus for the ferry service from the North Shore, the Commuter Train from the north bank, the Light Rail network from the east and south, and the bus system. It will become the most important transit station in the region.

The location of the Granville Waterfront Station relative to other Downtown activity centres is a contributing factor to the role planned for the passenger interchange. Situated within walking distance of the Golden Triangle, Gastown and Granville-Hastings precincts, the Station will serve these activity areas directly. Furthermore, the waterfront location will permit the Granville Waterfront Station to be integrated with passenger facilities for C.P.R. trans-continental trains and the cruise ships at Pier B.C.

There are many other functions that the Granville Station will perform in addition to the interconnection between regional services. As the central place of transit activity, there will be a considerable information distribution function required at the Station. Many of the longer distance TOWN and COUNTRY routes, including those that connect with the B.C. Ferry system, would terminate at the Granville Station. Providing the necessary information regarding all transit services is to be a major component of the Station's function.

As noted earlier in this report, the Granville Waterfront Station is being designed to accommodate the estimated volume of buses that require recovery space downtown. When fully developed it is proposed that the Granville Waterfront Station will provide bus bays for the regional FastBUS network, the TOWN and COUNTRY services and other important provincial carriers.

(ii) Larwill Depot

The present Larwill Bus Depot on Dunsmuir at Cambie will be reduced considerably in importance upon completion of the Granville Waterfront Station. The Canada Way peak hour service to New Westminster and West Vancouver regional bus routes are planned to terminate at the Larwill Depot, and Pacific Stage Lines will continue to utilize the space for special trips, charters and so on. In addition, the Larwill terminal will be available to serve as a marshalling point for rush-hour, supplementary services for commuter routes.

C. BUS STOPS

A revision in the present pattern of bus stops is necessitated by the introduction of new routes and the implementation of the near-side stopping principle set out in Chapter No. 1. The stop arrangements will be worked out jointly by all parties (i.e. the City, B. C. Hydro, and the Bureau of Transit Services) with attention being given to particular turning movement problems, loading zone requirements and building access. Generally, however, a policy of near-side stops should be pursued in order to increase the convenience for the transit patron.

The segregated stop system that has been implemented on Hastings Street between Main and Burrard will be retained. It has the effect of separating local and regional patrons, speeding the loading operation by removing confusion, and generally increasing the flow of transit vehicles along Hastings Street. On other streets where the present volume of transit vehicles is considerably less than on Hastings, a segregated stop system is not warranted.

D. SHELTERS

Wherever possible the provision of weather protection should be integrated into building design and redevelopment. Examples of this principle are evident throughout Downtown Vancouver. Awnings, overhangs and canopies provide suitable protection from inclement weather. In many cases more people can share the area beneath the Hudson's Bay Company canopy on Georgia Street, for example, than the bus shelter on Howe and Burrard at Georgia. In some instances, such as the stops on Howe and Burrard at Georgia, the integration of shelter space with existing buildings is not possible. However, on the Granville Mall, Robson Street, Hastings Street and many other major transit streets the combination is not only possible, but also desirable.

IMPLEMENTATION

A. ALL BUS NETWORK

Initially, the transit system will continue to operate entirely with trolley and diesel buses. With the exception of the Burrard Inlet Ferry project that will connect Downtown Vancouver and the North Shore communities, other elements of the "Advanced Transit System" will take longer to implement in their entirety. A target of April 1976 is proposed as the initial date of implementation of the Downtown bus improvement. This date coincides with the planned inauguration of ferry service across the Inlet and provides sufficient time in which to finalize some of the network details.

Items that require some lead time for implementation include decisions on stop locations, street priority requirements, signing, scheduling new and revised routes, installing trolley wire, and the planning of the Granville Waterfront Station. Since some of these items may require greater time than allowed, portions of the system may have to be modified temporarily, to achieve the desired result. Off-street recovery space at Granville Station is an example. Some on-street space on Cordova may be required as an interim measure, and the Larwill Depot still required for TOWN and COUNTRY services.

B. PRE-METRO STAGE

The bus network cannot accommodate the anticipated increases in transit ridership beyond approximately 1980. The Burrard Inlet Ferry and Commuter Train (planned for introduction in 1976-77) will alleviate some of the pressure that is being placed on the BUS and FastBUS network. However, the anticipated growth in transit patronage will require more service with a capacity greater than conventional buses.

Planning for the Light Rail System is proceeding. Discussions will be held on a continuing basis with municipal officials in order to keep abreast of current development proposals and to share information throughout the planning process.

September 19, 1975

LEM/jlt