

ITEM 2  
MANAGER'S REPORT NO. 27  
COUNCIL MEETING 85/04/09

RE: BUS ALRT INTEGRATION: DRAFT CONCEPT PLAN

MUNICIPAL MANAGER'S RECOMMENDATION:

1. *THAT the recommendation of the Director Planning & Building Inspection be adopted.*

\* \* \* \* \*

TO: MUNICIPAL MANAGER 1985 April 02  
FROM: DIRECTOR PLANNING & BUILDING INSPECTION Our File: 08.230

SUBJECT: BUS-ALRT INTEGRATION: DRAFT CONCEPT PLAN

=====  
RECOMMENDATION:

1. THAT Council request BC Transit staff to meet with Council for the purpose of presenting and reviewing the draft ALRT/Bus systems integration plan.
2. THAT a copy of this report be sent to BC Transit, Suite 301, 700 West Pender Street, Vancouver, B.C. V6C 1G8 (for the attention of Mr. John Mills, Director, Metro Planning).

R E P O R T

1.0 INTRODUCTION/SUMMARY

The purpose of this report is to introduce Council to the draft plan for the integration of ALRT and bus transit systems. The draft plan report is a lengthy document and as a consequence has not been reproduced as part of this agenda. Copies have been provided for each member of Council and additional copies are available for review by the public in the Clerk's office.

Council has previously reviewed a preliminary concept for bus/ALRT integration in the context of the 1985/86 Annual Service Plan for the Vancouver Regional Transit System (Item 7, Manager's Report No. 62, Council meeting 1984 October 09). Arising out of consideration of that report Council recommended a number of changes to the preliminary plans for ALRT/bus integration (see Figure 1 attached) and the North Burnaby Area Plan. (It should be noted that the North Burnaby Area Plan was to be implemented in September of this year but we understand that it has now been deferred to mid 1986 by BC Transit).

The preliminary routing concepts defined in the Service Plan were intended for use by BC Transit as a basis for budgeting the 1985/86 service year. Since Council's review of the Service Plan BC Transit and municipal staffs have met to review and discuss BCT's draft plan for ALRT/bus integration. This discussion has resulted in the draft report which is being forwarded to Council for its consideration. Figure 2 attached is from this report and shows the transit routings currently proposed by BC Transit.

It is BC Transit's intent to place a final report before the 1985 June 14 meeting of the Vancouver Regional Transit Commission for endorsement. A finalization of the ALRT-bus integration concept by that date is critical in order to allow sufficient time for the detailed planning required to implement specific routings, define schedules, allocate vehicles specify bus stop locations etc. To expedite the final review process we are recommending that Council invite BC Transit staff to present and defend their proposed ALRT/bus integration plan. BC Transit staff have indicated a willingness to meet with Council.

## 2.0 MUNICIPAL REVIEW

Municipal staff review of the draft ALRT/bus integration report is as below.

### 2.1 Overview

The Residential Neighbourhood Environment Study indicated that on the whole residents in South Burnaby were reasonably satisfied with transit service (conversely residents in North Burnaby were relatively dissatisfied). The changes that are in the offing will significantly improve transit service in South Burnaby. The ALRT system itself constitutes the most significant improvement particularly in terms of meeting inter-municipal travel demand by public transport. Intra-municipal accessibility will be enhanced by the implementation of the transit focal points at the Edmonds and Metrotown ALRT stations. These will be timed-transfer interchanges that will not only feed ALRT but will also support travel to major activity centres (particularly Metrotown) and allow for convenient transfer between bus routes for people travelling to other municipal destinations. The bus routing pattern currently proposed would also improve network coverage and significantly reduce the number of people beyond an acceptable walking distance to transit.

### 2.2 Previous Concerns

Arising out of Council's consideration, at its meeting of 1984 October 09, Council received a staff report on the "1985/86 Annual Service Plan for the Vancouver Regional Transit System" which was then referred to a caucus meeting of Council held on 1984 October 15. Arising out of Council's further consideration of this matter, at the regular Council meeting held on 1984 October 22 the following recommendations were adopted.

- "1. THAT the transit service changes proposed for Burnaby in the Annual Service Plan include further consideration of the following:
  - a. Improved route network coverage such that no developed area of Burnaby is further than 400 meters (1/4 mile) from a transit route/ALRT station.

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- b. Provision of a continuous north-south bus route along Boundary Road (with connections to ALRT at the Patterson or Metrotown stations).
  - c. Stronger north-south ALRT feeder bus linkages, particularly on the South Slope.
  - d. Extension of thr #41 (from UBC) trolley service to Metrotown station.
  - e. Extension of the #38 route (from Phibbs Exchange) to Metrotown station via Patterson station.
  - f. Connection of the #101 route (from Lougheed Mall) to the Edmonds station.
  - g. Provision of transit service to Metrotown via Oakland/Burris.
  - h. Connection of the proposed #136 (Montecito) and the #143 (Forest Grove) routes to provide a local service linkage between Brentwood and Lougheed Mall transit focii.
2. THAT these Council recommendations and a copy of the staff report (Item 7, Manager's Report No. 62, 1984 October 09) be sent to BC Transit."

Apart from recommendation 1 h. which is related to the North Burnaby Area Plan the specific recommendations of Council listed above have been considered and discussed by BC Transit in their draft report (the relevant excerpt of which is appended as Table 1 and includes further staff comment). A comparison of the preliminary plan (Figure 1) and the current plan (Figure 2 indicates that BC Transit has introduced route changes that are responsive to recommendations 1 a. c. and g. above.

The concerns staff expressed relative to the preliminary service plan still apply viz.

"At the broadest possible level we are concerned that the ALRT/bus system interface reflects our understanding of the transit strategy for Burnaby and the Burrard Peninsula. This strategy assumes that the City of Vancouver bus routing will continue to reflect the regular arterial street grid. Proceeding eastward into Burnaby, this regular street grid becomes much less structured and changes its orientation to merge with the New Westminster grid. This factor, as well as lower trip end densities and urban form, have mandated adoption of the transit focus concept as the logical mode of operation.

The transit focal points are located at major activity centres which support bus route convergence. Since Metrotown is a regional town centre, it is appropriate that it be the primary transit focus in the Municipality. Accordingly, we are concerned that the full potential of the regional town centre development and the transit focus concept is fully exploited in order to realize the benefits mutual to town centre development as well as transit operations.

We are somewhat concerned that the implementation of a secondary focus at the Joyce station (within the Vancouver route grid) is inappropriate and may erode the possibility of realizing operational and development benefits. In particular we believe it would be more appropriate to route the Number 28 (Boundary) bus route from Phibbs Exchange through Patterson station to Metrotown and direct the 41st Avenue route from UBC to Metrotown via Kingsway rather than terminating them both at Joyce. Similarly we see merit in the Number 101 route from Lougheed Mall connecting with ALRT at the Edmonds Station rather than proceeding directly to the 22nd Street ALRT station in New Westminster".

We expect that as Metrotown (and the Edmonds area) develops in accordance with adopted plans, travel demand patterns will change, mandating an intensification of feeder services to these activity centres. BC Transit indicate that adjustments to route termini can be made in the future subject to a demonstration of need.

### 3.0 OTHER CONCERNS

The preliminary ALRT-bus integration plan showed a new route (#140, Figure 1) linking Metrotown with SFU via the Municipal Hall area. Such a route would be a welcome improvement to transit service in the Municipality and would greatly improve access to SFU. BC Transit have indicated that they will not be implementing this route with ALRT integration (Figure 2) because of a shortage of hill-climber buses. We understand that it may be possible to introduce this route with the North Burnaby Area Plan.

With the implementation of revised routings to serve ALRT we anticipate that there will be complaints relative to the changes. Some residents may object to changes in routing that disrupt their present travel patterns, make them walk further, etc. Others may object to the introduction of a bus route to their street or a bus stop in front of their house (Figure 3 attached shows the roads with new transit links). Municipal staff are sensitive to these resident concerns and will work with BC Transit to ensure that the changes made minimize disruption if not complaint. A public information program will have to be undertaken by BC Transit to ensure that people are aware of the changes in advance of their implementation.

It should be noted that, as indicated on Figure 3, the operational feasibility of routes is subject to confirmation by field testing.

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#### 4.0 CONCLUSIONS

The implementation of the ALRT-bus integration plan in South Burnaby will considerably improve the provision of public transportation services in that area. BC Transit have recognized the municipal concerns although not all of the changes recommended by Council have been made. Staff's primary concern remains that the opportunity for focusing routes on the major municipal activity centres, particularly Metrotown, is not being fully exploited in BC Transit's current plan.



A.L. Parr  
DIRECTOR PLANNING &  
BUILDING INSPECTION

PL/mcb

cc: Director Engineering

TABLE 1 BC1. Analysis of Municipal Comments

ADDITIONAL MUNICIPAL STAFF COMMENTS

Municipal Comments	Benefits	Disadvantages (Difficulties)	Evaluation	Recommendation
<u>Boundary-Smith</u> The #28 route should operate to Metrotown Station instead of Joyce Station.	1) Would provide direct service to Metrotown from Boundary Rd and North Vancouver 11) Would retain north-south service in front of BC Tel Building	1) Would increase route distance and operating costs 11) Would increase travel times for East Van and Burnaby users destined to downtown Van by 10 to 15% 111) Would increase North Van travel times to ALRT by 10 to 15% 1v) Would disrupt long established transfer connections at Joyce	Principal benefit is the elimination of the transfer for trips to Metrotown Station. On the other hand the Metrotown route would penalize a majority of users for downtown and local Vancouver trips. Furthermore there is an added cost to proposal.	The benefits of the Metrotown route do not outweigh the disadvantages. The service will, however, be subject to a review after implementation.
<u>Boundary Through Service</u> There should be a continuous north-south route along Boundary Road connecting with the ALRT at Patterson Station	1) Would provide through service full length of Boundary Road	1) Boundary Rd south of Kingsway is cut off from most residential development. Existing services on Matheson Cres (Vancouver) and Joffre better serve neighbourhoods north of Boundary 11) North of Boundary service would duplicate #28 route	Demand for a service appears limited. Existing #26, 116 & 28 routes adequately serve the corridor albeit a transfer is required for north-south travel.	A through service along Boundary Rd is not required at this time.
<u>East Burnaby</u> Operate the #101 route (from Lougheed Mall) to Edmonds Station in Burnaby instead of 22nd St Station which is located in New Westminster	1) Would provide a direct connection between Lougheed Mall and Edmonds 11) Would connect East Burnaby with the Edmonds town centre	1) Would eliminate the East Burnaby to Uptown New Westminister connection 11) Would reduce service to the west end of New Westminister	East Burnaby has historically been connected to New Westminister. Uptown New Westminister is a more important activity centre in terms of destinations than Edmonds.	Agree. South of Kingsway the Boundary corridor is best served from both sides as proposed by BC Transit.
<u>41st Ave (Vancouver)</u> The #41 (from UBC) should operate to Metrotown instead of Joyce Station.	1) Would provide direct service to Metrotown and BC Tel Building	1) Would increase route distance and operating costs 11) Would duplicate both the ALRT and the #19 111) Would disrupt long established transfer connections at Joyce	Benefits appear limited. Requiring #41 trips to Metrotown are poorly utilized (see Table 2.2). Benefits do not outweigh the added costs of operation or the disruption to existing travel patterns. Further direct UBC & Vancouver crosstown service will be provided to Metrotown by the #49 route.	Agree with using Household O-D surveys to determine routings. Expect future growth and travel patterns will reinforce the 'municipal' nature of 101 route.
<u>Suncrest-South Slope</u> Stronger north-south feeder routes are required on the South Slope	1) Improve service coverage on the South Slope 11) Provide more direct service to ALRT and Metrotown from the Marine Drive area	1) Severe grades on north-south streets & discontinuous east-west street system limit service coverage 11) Area has limited population base with which to support additional routes	Currently there are about 90 persons walking convenient to bus routes on the South Slope. Additional coverage is warranted however, existing service levels (and hence costs) should be maintained.	Extending routing to Metrotown would not disrupt existing travel patterns since Kingsway/Joyce is the existing terminus. Benefit/cost has not been demonstrated. Capital cost for extending route to Metrotown rather than Joyce station would be less.
<u>Oakland</u> Provide east-west route along Oakland to Metrotown Station	1) Improved service coverage to Oakland area 11) More direct service to Metrotown from Buckingham Heights	1) Will involve some additional costs and duplication of service	Currently there are close to 2000 persons beyond walking distance to a bus route in the Oakland area. A service along Oakland would provide a substitute for service that was previously proposed on Royal Oak.	Proposed routing addresses previous concerns.

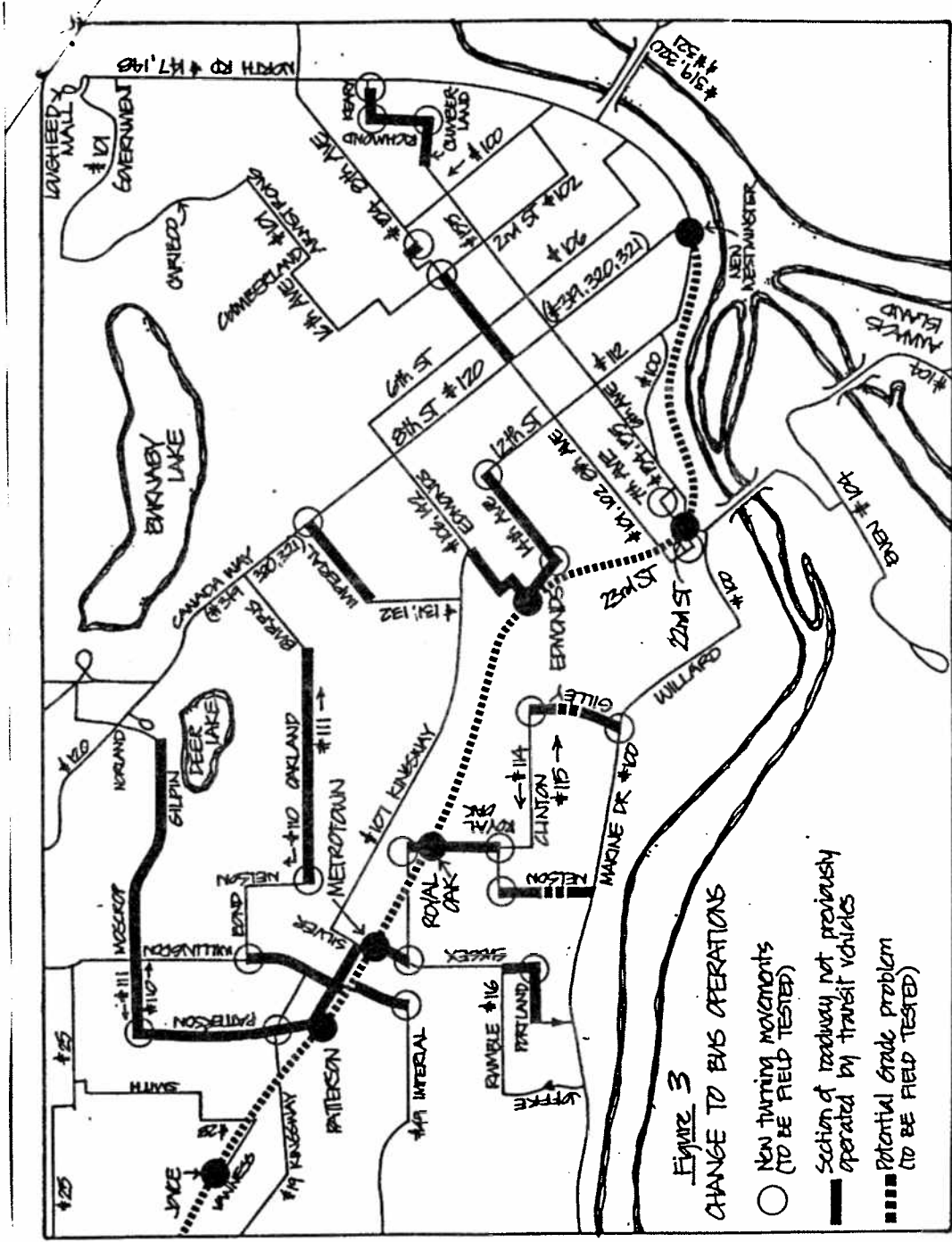
SOURCE BC1 BVS/ALRT INTERACTION PROGRAM (TABLES 1) BVS MAC.

Proposed routing addresses previous concerns.

Proposed routings address previous concerns.



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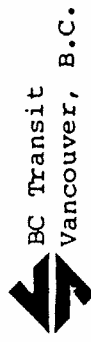
SOURCE: BCT - BUS/FREET INTEGRATION PROGRAM (FAS-2) 1985 MAR.



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South Burnaby-New Westminster  
Bus-ALRT Integration Program 1985  
Concept Plan

March 1985



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HP.

## 1.0 INTRODUCTION

### 1.1 Overview

In January 1986, the first phase of the Advanced Light Rapid Transit System (ALRT) connecting downtown Vancouver with New Westminster will begin operation. The 21 km transit line will have a total of 15 stations located along the route of which six are located in Burnaby and New Westminster.

Bus services that currently parallel the ALRT line will be transformed into feeder bus routes connecting at the new rail stations. It is projected that between 75% and 80% of the passengers boarding ALRT will transfer from the bus system. The success of the ALRT system will in part be determined by the effectiveness of the feeder bus network.

### 1.2 Study Justification

The 1985/86 Annual Service Plan presented a preliminary route network for an integrated bus-rail system in South Burnaby-New Westminster. The plan which was approved by the Vancouver Regional Transit Commission in October 1984, provides the basis for more detailed planning work.

In January 1985 BC Transit initiated an area plan for South Burnaby-New Westminster. The area plan is the process whereby the preliminary route network is transformed into a detailed route plan including levels of service and hours of service. Area planning is being carried out by BC Transit in consultation with staff at the municipality of Burnaby and the City of New Westminster.

### 1.3 Area Plan Objectives

The study has three major objectives:

- i) to maximize the use of the ALRT system for all trips, both line haul and station-to-station
- ii) to provide bus service as directly as possible to the ALRT stations to accommodate trips leaving the catchment area
- iii) to provide bus service to accommodate an increased number of community oriented trips which do not leave the catchment area

To achieve these objectives the following service criteria have been identified:

- i) Service should be designed according to the Commission's approved service design guidelines with respect to acceptable walking distance, levels of service, hours of service, productivity, etc.

- ii) Services should reflect travel desires of the communities served. Local input into route design and scheduling is essential.
- iii) Services should be designed to meet basic operational standards with respect to roadways, grades, including efficient and effective route design.

#### 1.4 Area Plan Scope

The Area Plan is being undertaken in two parts. The concept plan will define the role that public transit can be expected to play in meeting the mobility needs in South Burnaby and New Westminster. It will identify preliminary routing configurations, major and minor focal points, system connectivity requirements, service coverage, service levels as well as estimates of patronage for each component of the system.

The second phase of the study is the service plan. The latter is based on the concept plan and will present in detail specific transit routes, levels of service and an implementation program.

This report deals with the first part. The service plan will be presented at a subsequent date.

## 2.0 EXISTING BUS NETWORK

### 2.1 Description

The existing transit system in South Burnaby/New Westminster is structured around a major east-west connection along Kingsway and Twelfth Street connecting downtown Vancouver with South Burnaby and New Westminster. Local bus routes provide service to residential neighbourhoods connecting with the trunk route in downtown New Westminster, uptown New Westminster, Edmonds Loop and in the Metrotown area.

### 2.2 Strengths of Existing System

The existing system provides a high level of service east-west along the Kingsway corridor. Frequent bus service is operated throughout the day on both the #106 and #112 routes, the two services operating along Kingsway. In New Westminster, local services provide direct service to the downtown area while in South Burnaby local routes provide good coverage of the Metrotown area.

### 2.3 Weaknesses of Existing System

The principal weakness of the existing system is the inability to travel directly between local activity centres. In South Burnaby, for example, travel between Metrotown and the Burnaby Municipal Hall requires a transfer and a circuitous routing. In New Westminster, travel from the West End to Sapperton requires a transfer. In most instances, these local transfers are "untimed" resulting in long, inconvenient waits at transfer points.

### 2.4 Service Coverage

Transit service coverage is currently provided to 94.9% of the existing population in South Burnaby/New Westminster. The principal reasons for not providing 100% coverage are as follows:

- i) topography including steep grades and geographically isolated residential developments preclude transit access
- ii) discontinuous and inadequate local street network is not conducive to efficient transit operation

The major areas outside the 450 metre walking distance guideline including the number of units and estimated population are summarized below in Table 2.1.

Table 2.1  
Existing Areas Beyond Transit Service Coverage

Area	Municipality	Number of Units	Estimated Population	Remarks
Oakland	Burnaby	679	1969	Local road network inadequate (Note: Oakland-Dover connection will alleviate problem.)
South Slope	Burnaby	321	931	Steep grades preclude north-south routes; east-west routes interrupted by ravines.
Gilpin	Burnaby	127	368	Historically isolated area.
Others	Burn-NW	713	2069	Small isolated pockets; less than 100 homes in each.
TOTAL		1840	5337	

Broken down by municipality, 4,765 persons or 7.1% of the population of South Burnaby is beyond convenient walking distance of a bus route. In the City of New Westminster, 571 persons or 1.5% of the population is outside transit service coverage. Figure 2.1 displays the location of areas beyond the 450 m walking distance guideline.

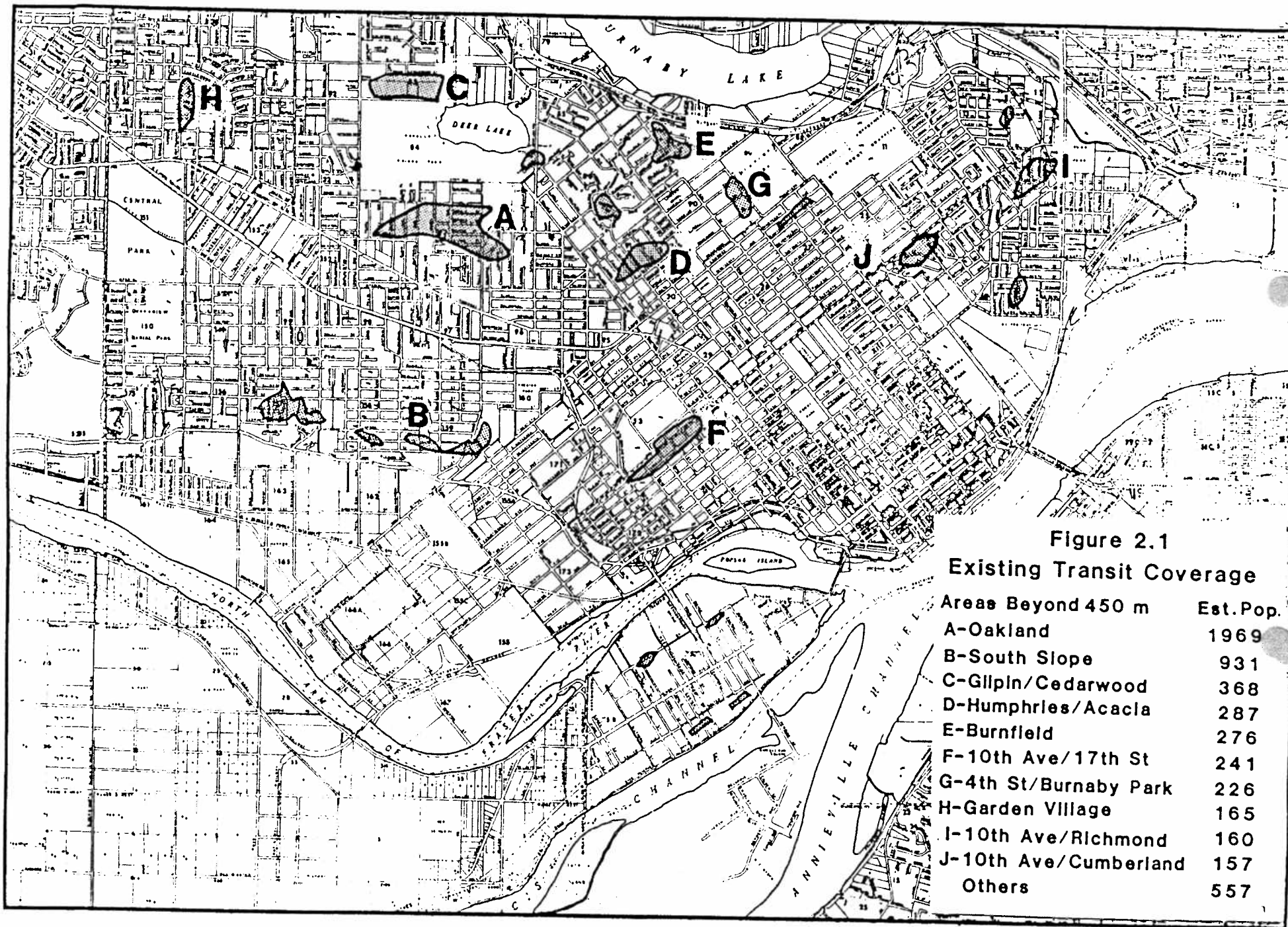
#### 2.5 Existing Ridership

Existing ridership in the study area has been estimated at 8,000,000 on an annual basis. On an average weekday, there are 26,000 transit trips. On Saturdays, ridership declines to 15,000 trips or approximately 60% of the weekday figure. On Sunday and holidays, 10,000 passengers are carried or about 40% of the weekday figure.

In total, transit services in South Burnaby/New Westminster generate 76 rides per capita, compared with 78 region wide.

#### 2.6 External Transit Trips

The above represents a rather global view of ridership in the study area. More important from a service perspective, however, is the number of trips leaving the study area by exit point. Boundary Road is the single most important screenline point where the concentration of transit trips is highest. Table 2.2 below provides a more detailed breakdown of transit trips leaving the study area at the Boundary Road screenline station. Figure 2.2 illustrates the existing ridership at various screenlines during the AM peak period in South Burnaby/New Westminster.



**Figure 2.1**  
**Existing Transit Coverage**

Area Beyond 450 m	Est. Pop.
A-Oakland	1969
B-South Slope	931
C-Gilpin/Cedarwood	368
D-Humphries/Acacia	287
E-Burnfield	276
F-10th Ave/17th St	241
G-4th St/Burnaby Park	226
H-Garden Village	165
I-10th Ave/Richmond	160
J-10th Ave/Cumberland	157
Others	557

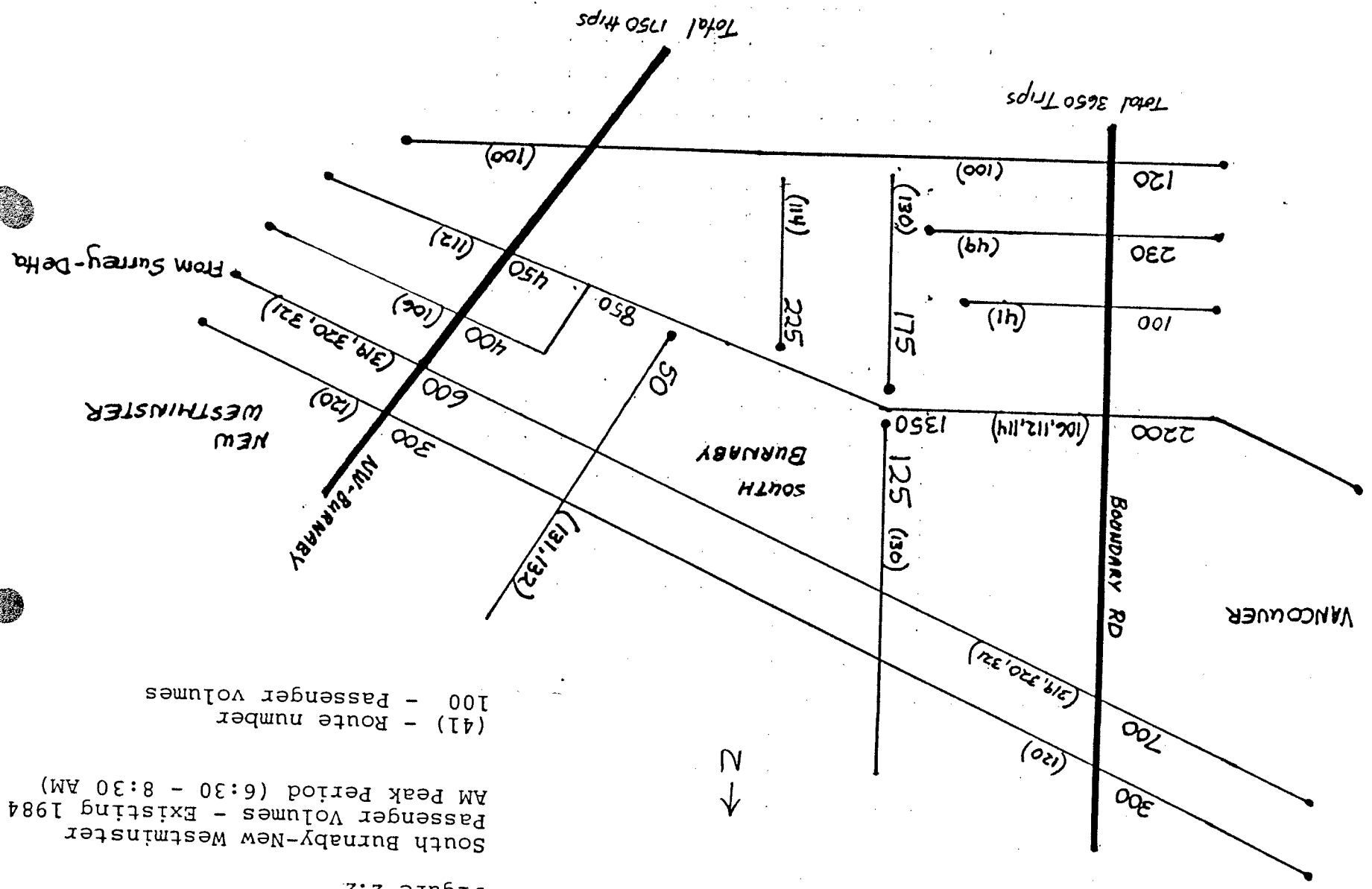


Figure 2.2

South Burnaby-New Westminister  
 Passenger Volumes - Existing 1984  
 AM Peak Period (6:30 - 8:30 AM)

(41) - Route number  
 100 - Passenger volumes

Table 2.2

Transit Trips Leaving Study Area (Daily)

<u>Corridor</u>	<u>Routes</u>	<u>One Hour</u>		<u>24 Hour (Weekday)</u>
		<u>AM Peak (1)</u>	<u>AM Peak (2)</u>	
Kingsway	#106,112,114	1350	2200	6600
	#41	60	100	260
Imperial	#49	130	230	900
Marine Dr	#100	75	120	600
Canada Way	#120	170	300	2200
	#319,320,321	350	700	700 (3)
Total Transit Trips		2135	3650	11260

- (1) AM Peak Hour defined as 7:00-8:00 AM
- (2) AM Peak Period defined as 6:30-8:30 AM
- (3) About 50% of #319, 320 and 321 transit trips originated in Surrey-Delta



**3.0 THE ALRT SYSTEM**

**3.1 Route Description**

The ALRT route will pass through South Burnaby and New Westminster following the BC Hydro rail right-of-way. For much of its route, the right-of-way parallels Kingsway and Twelfth Street, the principal transportation corridor in the study area.

Located within South Burnaby/New Westminster are six ALRT stations, including Patterson, Metrotown, Royal Oak, Edmonds, 22nd Street and New Westminster. A seventh station located at Joyce Road in Vancouver also impacts the study area.

**3.2 Staging Program**

The 1985/86 Annual Service Plan proposed a staging program featuring ALRT capacity increases and bus integration on an incremental basis. Essentially existing bus services in the ALRT corridor would be grouped by sub-area and integrated with the rail service as additional ALRT cars became available for service. The staging program which is designed to take place over a 15 month period, is displayed below in Table 3.1.

**Table 3.1  
Proposed Staging Program**

<u>Date</u>	<u>Sub-Areas</u>	<u>ALRT Peak Hour Capacity (PPHPD)*</u>
January 1986	- East Vancouver - South Burnaby-New Westminster Phase I	4,500
May 1986	- South Burnaby-New Westminster Phase II	6,000
November 1986	- Surrey - Delta - White Rock	8,500
March 1987	- Northeast Sector	10,000

\*PPHPD refers to passengers per hour peak direction

**3.3 Service Specifications**

**3.3.1 Hours of Service**

Hours of service (first and last trains) are based on a full length service day, operating seven days per week. The hours of service have been established based on existing bus hour operation, ridership levels and ALRT maintenance requirements.

Table 3.2 indicates the first and last trains leaving the various line stations.

Table 3.2

**First and Last Trains**  
Effective: January 1986

<u>Station</u>	<u>First Trains</u>			<u>Last Trains</u>		
	<u>M-Fri</u>	<u>Sat</u>	<u>Sun</u>	<u>M-Fri</u>	<u>Sat</u>	<u>Sun</u>
New Westminster	0520	0620	0820	2445	2445	2345
22nd Street	0523	0623	0823	2448	2448	2348
Edmonds	0526	0626	0826	2451	2451	2351
Royal Oak	0529	0629	0829	2454	2454	2354
Metrotown	0530	0630	0830	2455	2455	2355
Patterson	0531	0631	0831	2456	2456	2356
Joyce	0533	0633	0833	2458	2458	2358
29th Avenue	0535	0636	0835	2500	2500	2400
Nanaimo	0536	0636	0836	2501	2501	2401
Broadway	0539	0639	0839	2504	2504	2404
Main	0542	0642	0842	2507	2507	2407
Stadium	0544	0644	0844	2509	2509	2409
Granville	0545	0645	0845	2510	2510	2410
Burrard	0546	0646	0846	2511	2511	2411
Seabus	0547	0647	0847	2512	2512	2412

Eastbound

<u>Station</u>	<u>First Trains</u>			<u>Last Trains</u>		
	<u>M-Fri</u>	<u>Sat</u>	<u>Sun</u>	<u>M-Fri</u>	<u>Sat</u>	<u>Sun</u>
Seabus	0550	0650	0850	2515	2515	2415
Burrard	0551	0651	0851	2516	2516	2416
Granville	0552	0652	0852	2517	2517	2417
Stadium	0553	0653	0853	2518	2518	2418
Main	0555	0655	0855	2520	2520	2420
Broadway	0558	0658	0858	2523	2523	2423
Nanaimo	0601	0701	0901	2526	2526	2426
29th Avenue	0602	0702	0902	2527	2527	2427
Joyce	0604	0704	0904	2529	2529	2429
Patterson	0606	0706	0906	2531	2531	2431
Metrotown	0607	0707	0907	2532	2532	2432
Royal Oak	0608	0708	0908	2533	2533	2433
Edmonds	0611	0711	0911	2536	2536	2436
22nd Street	0614	0714	0914	2539	2539	2439
New Westminster	0617	0717	0917	2542	2542	2442

### 3.3.2 First Trains

The first train is proposed to arrive in downtown Vancouver by 6:00 AM Monday through Friday. On Saturdays, the first train is proposed to arrive one hour later by 7:00 AM while on Sundays the first downtown arrival will be before 9:00 AM. On weekdays and Saturdays, the first train arrival will, for the most part, coincide with the first arrivals in downtown of the existing bus system. On Sunday and holidays, however, the later start up for the ALRT will require some bus routes to begin operation before the rail service. It is proposed that bus services during this period operate essentially an early morning "owl" service with abbreviated routings if necessary. Demand during the early mornings on Sundays is very limited, thus the later start for the ALRT service. In addition, the later start up will allow for a longer shut down time in order to undertake heavy maintenance.

### 3.3.3 Last Trains

The last departures leaving downtown Vancouver are proposed for 2515 (1:15 AM) Monday through Saturday and 2415 (12:15 AM) on Sundays. Beyond 2515 an abbreviated bus service could be implemented along the Kingsway corridor substituting for the ALRT service. On Sundays, the last departure at 2415 is proposed in order to more closely reflect passenger demand on Sunday evenings and to provide an extended shutdown window on Monday morning for heavier maintenance. Once again, a limited bus service along Kingsway would take over from the ALRT starting at 2415.

### 3.3.4 Service Levels (Frequency)

The frequency of service on the ALRT is largely a function of passenger demand, which varies by time of day and day of the week. Unlike the existing bus system, the automated train control system of the ALRT removes the driver cost of individual train units. As a consequence, the staffing requirements at ALRT are virtually independent of service levels operated on the system. Power and running gear costs are the only costs associated with increasing or decreasing service levels.

In view of the independence of service levels and staffing with unattended train operation, coupled with the BC Transit objective of providing a high quality of service, the widest headway proposed is 5 minutes during any period of operation.

It will be necessary, however, to improve service levels during the weekday commuter peaks to provide adequate passenger capacity. In accordance with the proposed staging program peak period service levels during the first four months of operation are set at every 4 minutes.

During the off peak periods, demand is of a lower volume such that service levels will be set as a matter of public convenience as opposed to purely demand. The proposed off peak frequency is every 5 minutes.

### 3.3.5 Train Length

Normal train length for operation will be 4 cars. During peak and mid-day periods, this will deliver sufficient capacity along with high service frequencies. A 4-car train will provide 152 seats with a total capacity of 300 passengers (including standees).

During evenings and Sundays, however, the standard 5 minute headway will yield excess capacity. In order to reduce the capacity while maintaining the high service frequency, train lengths will be reduced to 2-car sets. Uncoupling to 2-car trains will take place following the afternoon peak Monday through Saturday. on Sundays 2-car trains will operate throughout the day.

### 3.3.6 Capacity

Capacity is a function of train length and service levels. During the peak periods a 4 minute headway has been specified using 4-car train sets, yielding a nominal capacity of 4,500 persons per hour per direction (pphpd). During the mid-day period a 5 minute headway will be operated offering 3,600 pphpd. This level of service should be adequate to minimize the amount of standees. During evenings and Sundays when trains are further reduced to 2-car sets, capacity will fall to 1,800 pphpd. Again the level of service has been established to minimize standing.

Table 3.3 displays the capacity by time period.

### 3.3.7 Short Turns

Initially all trains will operate between Seabus and New Westminster. Although there is a provision for a short turn at Metrotown Station, this will not be utilized until peak period service frequencies build up to at least every 2.5 minutes in order to maintain the 5 minute service objective over the entire line.

Table 3.3  
 Preliminary Service Levels SeaBus-New Westminster  
 Effective: January 1986

<u>Monday to Friday</u>		<u>Service Description</u>	<u>Headway (mins)</u>	<u>Train Length (cars)</u>	<u>CAPACITY</u>	
<u>Time Period</u>	<u>Seating PPHPD (a)</u>				<u>Standing PPHPD (b)</u>	
0520 - 0700		Service Build-up	5.0 to 4.0	4	-	-
0700 - 0900		AM Peak	4.0	4	2,280	4,500
0900 - 0930		Reduce to Mid-day	4.0 to 5.0	4	-	-
0930 - 1530		Mid-day Service	5.0	4	1,824	3,600
1530 - 1600		Service Build-up	5.0 to 4.0	4	-	-
1600 - 1800		PM Peak	4.0	4	2,280	4,500
1800 - 1830		Reduce to Evening	4.0 to 5.0	4-2	-	-
1830 - 2540		Evening	5.0	2	912	1,800
<u>Saturday</u>						
0620 - 1800		Mid-day Service	5.0	4	1,824	3,600
1800 - 1830		Reduce to Evening	5.0	4-2	-	-
1830 - 2540		Evening	5.0	2	912	1,800
<u>Sunday</u>						
0820 - 2440		All Day	5.0	2	912	1,800

Notes: (a) PPHPD - passengers per hour per direction  
 (b) Standing - Seated load plus standees

3.4 ALRT Service Coverage

3.4.1 Extended Walk Distance Zone

In the existing bus system, research has indicated that ridership decreases dramatically when a trip origin is further than 450 metres from a bus stop. This relationship reflects the "maximum" distance that an average person is prepared to walk in order to use transit. The 450 metre walking distance zone has been incorporated into the Service Design Guidelines and is used extensively in the planning of new bus routes in the Vancouver region.

At rapid transit stations the principal access mode is the feeder bus. It has been estimated that between 75% and 80% of all ALRT passengers will transfer from feeder buses. The remaining 20 to 25% will be direct walk-on trips. Experience in Edmonton and Toronto, however, suggests that the walk distance impact zone around a rapid transit station, is much greater than that of the traditional bus stop. In Toronto, research<sup>1</sup> indicates that when walk distances are 950 m or less, more people are likely to walk to a station than board a feeder bus to the station. It was concluded that the increased walk distance acceptability is related to the higher levels of service provided by the rapid transit system compared to the feeder bus service.

In North Vancouver, a survey of Seabus riders again indicated the importance of the walk mode. Mode split access to the Seabus Station at Lonsdale Quay was evenly divided between walk and feeder buses both at 41%. Although the survey did not measure the actual walking distance, it is clear that the walk zone extends well beyond the traditional 450 m zone to bus stop.

Figure 3.1 illustrates the modal split of rapid transit access as a function of distance from the station.

#### **3.4.2 Rapid Transit Walk Distance Guidelines**

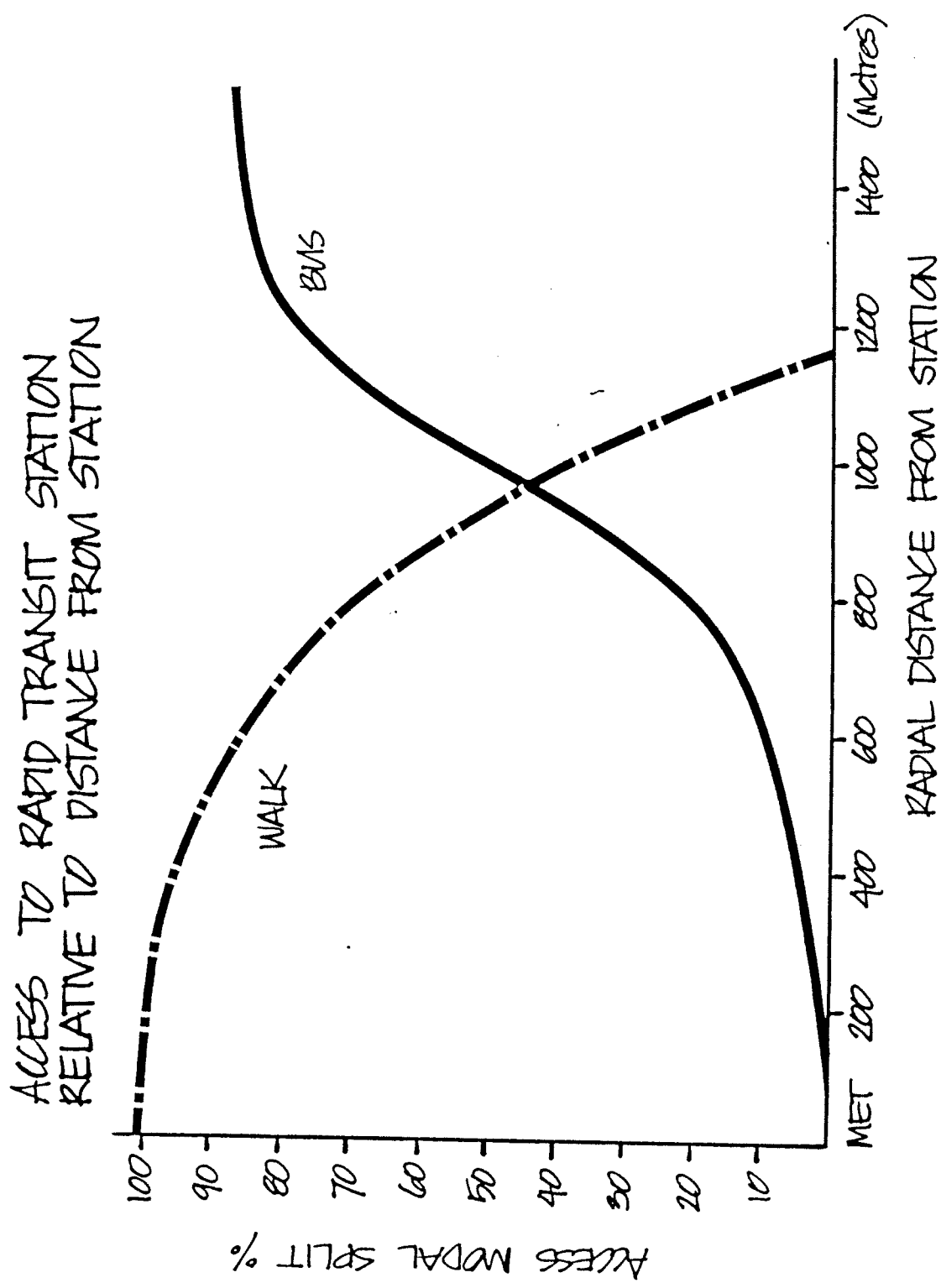
Based on experience in Toronto and Edmonton (and North Vancouver), it is proposed that the walking distance zone around ALRT stations be extended up to 900 metres or approximately double the current bus walking distance guideline. In this zone, it is assumed a majority of trips will walk directly to the ALRT as opposed to using feeder buses to access ALRT. The increased walk distance zone has the potential to reduce the amount of bus capacity required within a short radius of the station location.

#### **3.4.3 ALRT Station Coverage**

The ALRT has its greatest impact in the 450 M to 900 M walk distance zone. In South Burnaby it is estimated that 11.6% of the population is within a 450 m walk distance of station. When the distance is extended to 900 M, the percentage of population within walking distances increases to 34.7%. A similar situation exists in New Westminster. Overall, 30% of the study area's population is within 900 metres or a 10 to 12 minute walk to an ALRT station. Table 3.4 indicates the ALRT station coverage. Figure 3.2 displays the extent of the walking distance zone at each station.

<sup>1</sup> Travel Behaviour Associated with Land Uses Adjacent to Rapid Transit Stations, MGP Stringham, ITE Journal, April 1982.

Figure 3.1



SOURCE: M.G.P. Stringham  
ITE Journal, April 1982

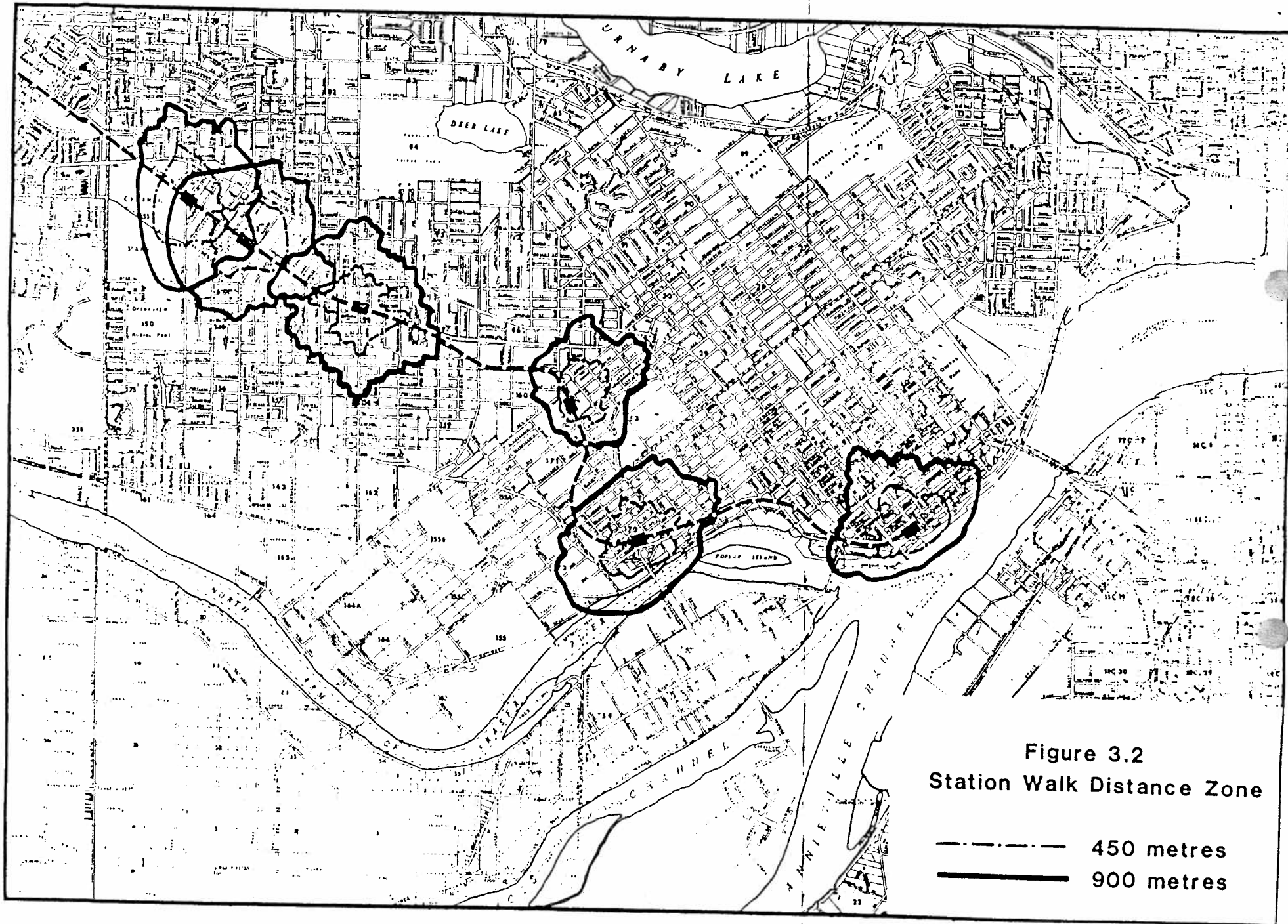


Figure 3.2  
Station Walk Distance Zone

----- 450 metres  
————— 900 metres



Table 3.4  
ALRT Station Coverage

	Within 450 M	Within 450-900 M	Within 900 M Total
1. South Burnaby 1981 Population = 66715			
Number of Persons	7721	15386	23107
% of Population Covered	11.6	23.1	34.7
2. New Westminster 1981 Population = 38550			
Number of Persons	1778	6827	8605
% of Population Covered	4.6	17.7	22.3
3. Total Study Area 1981 Population = 105265			
Number of Persons	9499	22213	31712
% of Population Covered	9.0	21.1	30.1

#### 4.0 DEVELOPMENT OF FEEDER BUS NETWORK

##### 4.1 Municipal Policies Relating to Service Design

BC Transit has reviewed relevant municipal policies with respect to service orientation and transit coverage. These policies have been incorporated into the preliminary route plan and are summarized briefly below.

In Burnaby, the concept of a municipally oriented bus system has been proposed by the Municipality in conjunction with its Comprehensive Transportation Plan. The latter report established the following policy for the provision of transit service in the Municipality.

**"Proposed improvements to the bus system should be based on the concept of developing a more municipally oriented bus system that would better serve major land uses in the Municipality and Region by directing routes to a number of inter-dependent major transit foci and secondary transit interchanges."**

The municipality has identified three major focal points in Burnaby including Metrotown, Lougheed Mall and Brentwood. In addition, two secondary focal points are identified that impact the study area. They include Edmonds (ALRT Station) and the Burnaby Municipal Hall.

Figure 4.1 displays the concept of a municipally-oriented transit system as identified in the Burnaby Transportation Plan.

In addition, the municipality has approved the following policy with respect to service coverage.

**"Improved route coverage such that no developed area of Burnaby is further than 450 metres (1/4 mile) from a transit route/ALRT station."**

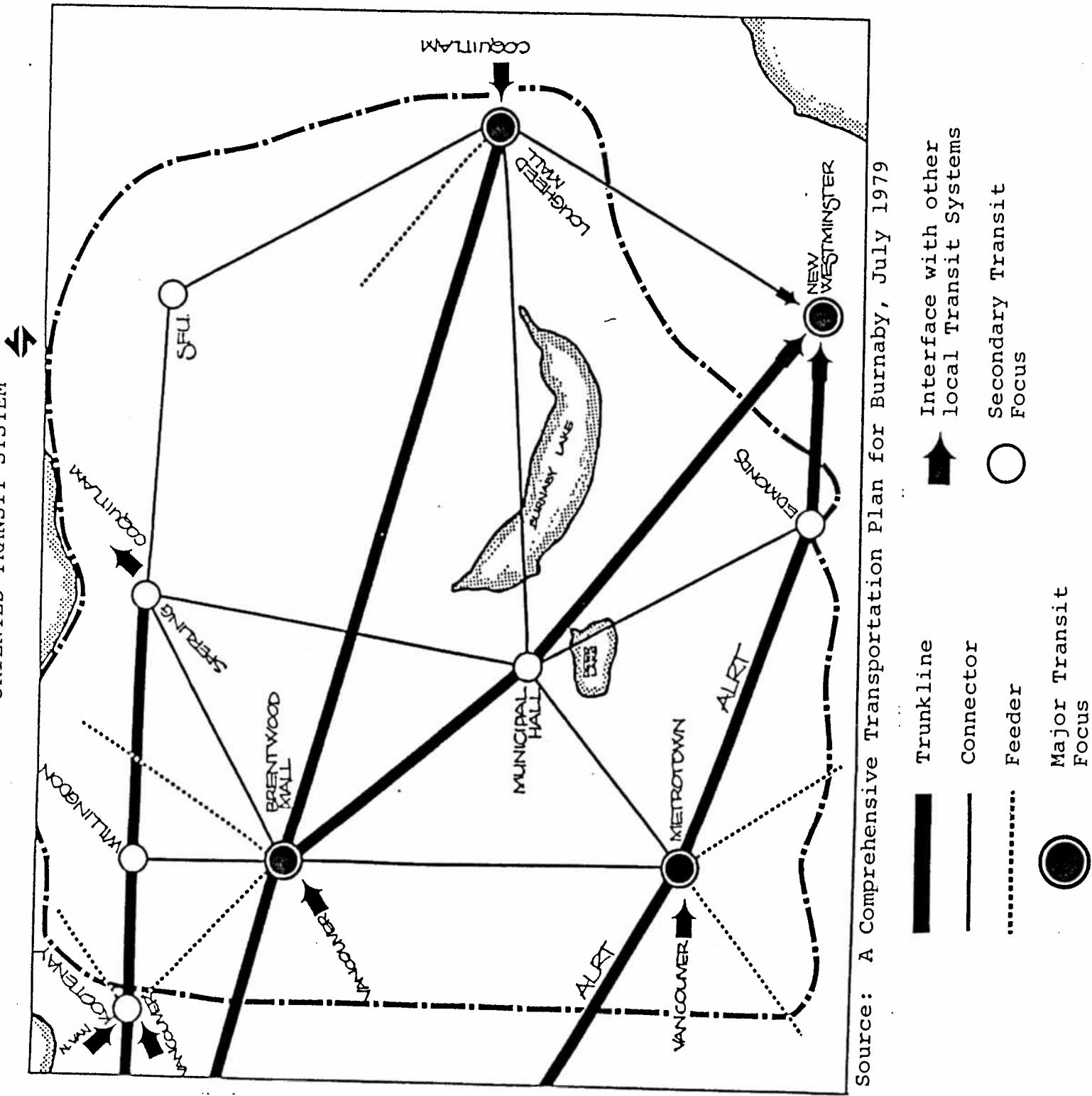
The above policy is compatible with the existing walking distances cited in the Regional Transit Commission's Service Design Guidelines. As discussed previously, 93% of the population in South Burnaby currently falls within this guideline.

##### 4.2 Route Network Strategies







In South Burnaby implementation of a timed transfer focal point system (TRFP) at Metrotown and Edmonds Station is consistent with municipal planning objectives via-a-vis a municipally oriented transit system. Both stations will serve as timed transfer centres featuring bus-to-bus connections for inter-community trips as well as bus-to-rail connections for station to station and external trips. In accordance with the plan, secondary stations located at Patterson and Royal Oak will largely serve adjacent residential development and thus will feature minimal bus-to-rail transfer.

FIGURE 4.1

PRINCIPLE OF MUNICIPALLY ORIENTED TRANSIT SYSTEM



Source: A Comprehensive Transportation Plan for Burnaby, July 1979

-  Trunkline
-  Connector
-  Feeder
-  Major Transit Focus
-  Interface with other local Transit Systems
-  Secondary Transit Focus

In New Westminster a grid system of routes with east-west lines focussed on 22nd Street Station and north-south lines centred on New Westminster Station best satisfies demand. The density of population coupled with the peripheral location of the ALRT stations in New Westminster warrants a grid system of routes connecting with the rail system.

#### 4.3 Components of the Transit System

There are three components in the proposed transit system in South Burnaby/New Westminster. They are the route, the station and the level of service. Each is discussed in turn below.

##### 4.3.1 The Route

The route is the physical aspect of the transit system. The route links residential areas which generate transit trips with activity centres which attract transit trips. Routes have been designed to provide coverage to a 450 metre area on either side of the route. The shape and configuration of the route network is based on an understanding of the community land use pattern and municipal policies relating to service orientation. Most routes operate in both directions, however, in some residential areas a one way service provides improved service coverage at a reduced cost.

##### 4.3.2 The Station

The station or transit centre is the point of interchange in the system. The station provides for efficient transfers between different routes and modes. In Burnaby and New Westminster stations and transit centres have been located adjacent to major activity centres. In this way, transit reinforces land use policies with respect to higher density development.

##### 4.3.3 Level of Service

The level of service provided on a particular route is designed to meet the demand. Included in the level of service is the route frequency which determines the amount of capacity during a specific time period. Also included is the hours of service necessary to serve the majority of the transit market.

In South Burnaby/New Westminster the levels of service and hours of service are subject to minimums which have been established by the Vancouver Regional Transit Commission as a matter of passenger convenience. The following table identifies the minimum policy headways for peak and off peak routes in Burnaby.

<u>Route Type</u>	<u>Peak Period</u>	<u>Mid-day</u>	<u>Evenings-Saturdays</u>
Primary Suburban	30	30	60
Secondary Suburban	60	60	-

The above headways are intended to be a guideline only. In most cases, passenger demand will dictate that headways better than the policy level of service will be utilized.

#### 4.4 Bus-ALRT Integration

The feeder bus network and the ALRT are mutually dependent upon each other for their success. Both the route and the level of service proposed for each community reflect an attempt to optimize the travel opportunities presented by an integrated system. Bus routings will provide the collector/distribution function in sub-areas around each station. The ALRT will provide the line haul or station to station link.

In South Burnaby/New Westminster, feeder bus hours of operation will be synchronized with the hours of operation of the train. In some instances, however, bus services will provide service before the start-up of ALRT and after the ALRT shutdown. Where low volume feeder routes exist, early night and Sunday termination may be utilized to reduce operating costs.

## 5.0 PROPOSED FEEDER ROUTE NETWORK

### 5.1 Status of Preliminary Plan

The preliminary Bus-ALRT integration plan was approved by the Vancouver Regional Transit Commission in October 1984. At the same time both the Municipality of Burnaby and the City of New Westminster provided comments on the preliminary plan with respect to service orientation and coverage. These comments have been evaluated and some changes are recommended to the preliminary plan.

In addition, the preliminary plan was developed assuming that changes to North Burnaby would be implemented in the fall of 1985. The latter plan, however, has been delayed to later in 1986 thus some routing configurations will not be available. The revised plan reflects this change in timing and therefore assumes the South Burnaby changes will precede the North Burnaby changes. Some changes to the existing North Burnaby system are proposed where duplication with the South Burnaby feeder bus network exists.

### 5.2 Municipal Comments and Evaluation

The Municipality of Burnaby and the City of New Westminster have provided a number of comments with respect to the preliminary service plan. The municipal comments were as follows:

#### Municipality of Burnaby

- i) Extension of the #28 route (from Phibbs Exchange) to Metrotown Station via Patterson Station.
- ii) Provision of a continuous north-south route along Boundary Road (with connections to ALRT at the Patterson or Metrotown stations).
- iii) Connection of the #101 route (from Loughheed Mall) to the Edmonds Station.
- iv) Extension of the #41 (from UBC) trolley service to Metrotown Station.
- v) Stronger north-south ALRT feeder bus linkages particularly on the South Slope.
- vi) Provision of transit service to Metrotown via Oakland.

#### City of New Westminster

- i) The #155 should operate past Royal Columbian Hospital to provide connection from the West End and Uptown New Westminster.

The comments have been analyzed and evaluated against the policies and standards utilized in determining the preliminary route network. Table 5.1 displays the analysis of the various comments and recommends several service changes in light of the municipal requests.

### 5.3 Revised Route Plan

As a result of the municipal input, coupled with the delay of the North Burnaby route changes, an alternative feeder bus plan has been developed. The plan features the following:

#### Municipality of Burnaby

- i) Improved service coverage in the Suncrest and South Slope areas
- ii) Improved service coverage in the Oakland and Gilpin areas
- iii) Overall transit service coverage improved from 93% to 96%

#### City of New Westminster

- i) Improved east-west service to the Royal Columbian Hospital

The following provides an overview of each of the proposed route changes. Table 5.2 lists the proposed bus connections at each of the ALRT stations.

#### #28-Phibbs Exchange/Joyce Station

The preliminary routing is unchanged. A detailed review of the service will be undertaken after a 6 month period with a possibility the southern terminus may be changed from Joyce Station to Metrotown Station.

#### #100-Airport/New Westminster Station/Port Coquitlam

The #100 route between the Airport and Port Coquitlam via New Westminster Station is unchanged.

#### #101-22nd St Station/Lougheed Mall

The #101 route which connects East Burnaby and Lougheed Mall with 22nd Street Station may be changed pending the results of a household survey. The household survey will attempt to determine if the principal destinations for East Burnaby residents are in uptown New Westminster or Edmonds and Kingsway. A change in terminus from 22nd St Station to Edmonds Station may be an outcome of the survey.

#### #102-22nd St Station/New Westminster Station

The #102 operates from 22nd St Station via 8th Avenue, 2nd Street and Columbia to New Westminster Station. This routing is unchanged from the preliminary plan.

**Table 5.1  
Analysis of Municipal Comments**

Municipal Comments	Benefits	Disadvantages (Difficulties)	Evaluation	Recommendation
<p><u>Boundary-Smith</u></p> <p>The #28 route should operate to Metrotown Station instead of Joyce Station.</p>	<p>i) Would provide direct service to Metrotown from Boundary Rd and North Vancouver</p> <p>ii) Would retain north-south service in front of BC Tel Building</p>	<p>i) Would increase route distance and operating costs</p> <p>ii) Would increase travel times for East Van and Burnaby users destined to downtown Van by 10 to 15%</p> <p>iii) Would increase North Van travel times to ALRT by 10 to 15%</p> <p>iv) Would disrupt long established transfer connections at Joyce</p>	<p>Principal benefit is the elimination of the transfer for trips to Metrotown Station. On the other hand the Metrotown route would penalize a majority of users for downtown and local Vancouver trips. Furthermore there is an added cost to proposal.</p>	<p>The benefits of the Metrotown route do not outweigh the disadvantages. The service will, however, be subject to a review after implementation.</p>
<p><u>Boundary Through Service</u></p> <p>There should be a continuous north-south route along Boundary Road connecting with the ALRT at Patterson Station</p>	<p>i) Would provide through service full length of Boundary Road</p>	<p>i) Boundary Rd south of Kingsway is cut off from most residential development. Existing services on Matheson Cres (Vancouver) and Joffre better serve neighbourhoods</p> <p>ii) North of Boundary service would duplicate #28 route</p>	<p>Demand for a service appears limited. Existing #26, 116 &amp; 28 routes adequately serve the corridor albeit a transfer is required for north-south travel.</p>	<p>A through service along Boundary Rd is not required at this time.</p>
<p><u>East Burnaby</u></p> <p>Operate the #101 route (from Lougheed Mall) to Edmonds Station in Burnaby instead of 22nd St Station which is located in New Westminster</p>	<p>i) Would provide a direct connection between Lougheed Mall and Edmonds</p> <p>ii) Would connect East Burnaby with the Edmonds town centre</p>	<p>i) Would eliminate the East Burnaby to Uptown New Westminister connection</p> <p>ii) Would reduce service to the west end of New Westminister</p>	<p>East Burnaby has historically been connected to New Westminister. Uptown New Westminister is a more important activity centre in terms of destinations than Edmonds.</p>	<p>A household O-D survey in East Burnaby would assist in determining most appropriate terminus</p>



Municipal Comments	Benefits	Disadvantages (Difficulties)	Evaluation	Recommendation
<p>41st Ave (Vancouver)</p> <p>The #41 (from UBC) should operate to Metrotown instead of Joyce Station.</p>	<p>1) Would provide direct service to Metrotown and BC Tel Building</p>	<p>1) Would increase route distance and operating costs</p> <p>11) Would duplicate both the ALRT and the #19</p> <p>111) Would disrupt long established transfer connections at Joyce</p>	<p>Benefits appear limited. Existing #41 trips to Metrotown are poorly utilized (see Table 2.2). Benefits do not outweigh the added costs of operation or the disruption to existing travel patterns. Further direct UBC &amp; Vancouver cross-town service will be provided to Metrotown by the #49 route.</p>	<p>The #41 should terminate at Joyce Station. The #49 will provide a direct UBC and Vancouver service to Metrotown Stn. Future extension of #41 is possible due to trolley extension.</p>
<p>Suncrest-South Slope</p> <p>Stronger north-south feeder routes are required on the South Slope</p>	<p>1) Improve service coverage on the South Slope</p> <p>11) Provide more direct service to ALRT and Metrotown from the Marine Drive area</p>	<p>1) Severe grades on north-south streets &amp; west street system limit service coverage</p> <p>11) Area has limited population base with which to support additional routes</p>	<p>Currently there are about 930 persons beyond convenient walking distance to a bus route on the South Slope. Additional coverage is warranted however, existing service levels (and hence costs) should be maintained.</p>	<p>Develop alternative routing configuration to improve coverage on the South Slope. This should be achieved within the previously identified service level.</p>
<p>Oakland</p> <p>Provide east-west route along Oakland to Metrotown Station</p>	<p>1) Improved service coverage to Oakland area</p> <p>11) More direct service to Metrotown from Buckingham Heights</p>	<p>1) Will involve some additional costs and duplication of service</p>	<p>Currently there are close to 2000 persons beyond walking distance to a bus route in the Oakland area. A service along Oakland would provide a substitute for service that was previously proposed on Royal Oak.</p>	<p>Develop routing to connect the Oakland area with Metrotown Station.</p>

Table 5.1 - Page 3

Municipal Comments	Benefits	Disadvantages (Difficulties)	Evaluation	Recommendation
<p><u>Service to Royal Columbian Hospital</u></p> <p>The #155 should operate Richmond, Sherbrooke (or Keary), Columbia, Braid to provide service to Royal Columbian Hosp.</p>	<p>i) Uptown and the West End areas of New Westminster would have direct service to Royal Columbian Hospital</p>	<p>i) Sherbrooke street is narrow and would thus present some operating problems</p> <p>ii) Intersection of Keary and Columbia requires modification to allow safe turning movements</p>	<p>The proposed routing change can be accommodated at no additional cost. A routing via Keary is better than Sherbrooke.</p>	<p>Change #155 route if necessary street improvements are implemented.</p>

Table 5.2  
Revised Bus Routes by Station Location  
Burnaby-New Westminster

<u>Patterson Station</u>	
#110	Metrotown Station/Municipal Hall/Metrotown Station
#111	Metrotown Station/Municipal Hall/Metrotown Station
<u>Metrotown Station</u>	
#19	Metrotown Station
#49	UBC/Metrotown Station
#107	Edmonds Station/Metrotown Station
#110	Metrotown Station/Municipal Hall/Metrotown Station
#111	Metrotown Station/Municipal Hall/Metrotown Station
#114	Burnaby South/Metrotown Station
#115	Burnaby South/Metrotown Station (peak periods only)
#116	Suncrest/Metrotown Station
#130	Kootenay Loop/Metrotown Station
<u>Royal Oak Station</u>	
#114	Burnaby South/Metrotown Station
#115	Burnaby South/Metrotown Station (peak periods only)
<u>Edmonds Station</u>	
#106	Edmonds Station/New Westminster Station
#107	Edmonds Station/Metrotown Station
#112	Edmonds Station/New Westminster Station
#131	Kootenay Loop/Edmonds Station
#132	Kootenay Loop/Edmonds Station
#142	SFU/Edmonds Station
<u>22nd Street Station</u>	
#100	Airport/New Westminster Station/Port Coquitlam (E/R and W/B)
#101	22nd Street Station/Lougheed Mall
#102	22nd Street Station/New Westminster Station
#104	22nd Street Station/Queensboro/Annacis Island
#154	Mundy
#155	Como Lake
<u>New Westminster Station</u>	
#100	Airport/New Westminster Station/Port Coquitlam (E/B and W/R)
#102	22nd Street Station/New Westminster Station
#106	Edmonds Station/New Westminster Station
#112	Edmonds Station/New Westminster Station
#120	New Westminster Station/Vancouver
#147	Clarke
#148	Loco
#319	Scott
#320	Hjorth
#321	King George Highway

#104-22nd St Station/Queensboro/Annacis Island

The #104 route provides feeder service from 22nd St Station to Queensboro and Annacis Island. The routing is unchanged from the preliminary plan.

#106-Edmonds Station/New Westminster Station

The #106 provides service along 6th Street in New Westminster connecting with Edmonds Station and New Westminster Station. The routing is unchanged from the preliminary plan.

#107-Edmonds Station/Metrotown Station

The #107 route operates along Kingsway between Edmonds Station and Metrotown Station. On the eastern end, the service has been rerouted via Kingsway, Edmonds to Edmonds Station in place of Salisbury.

#110-Metrotown Station/Municipal Hall/Metrotown Station

The #110 route replaces portions of the #115 and #140 routes in the preliminary plan. The new service operates in a clockwise loop via Patterson, Moscrop, Gilpin to the Burnaby Municipal Hall returning via Canada Way, Oakland, Willingdon to Metrotown Station. Along Oakland the route provides expanded service area to approximately 1200 persons.

Proposed service levels are every 20 minutes during peak hours and every 30 minutes at all other times.

#111-Metrotown Station/Municipal Hall/Metrotown Station

The #111 is a new (counter-clockwise loop) route which operates in the opposite direction of the #110 route. It provides a Metrotown to Municipal Hall connection as well as improving coverage in the Oakland, Burris area.

Proposed service levels are every 20 minutes during peak hours and every 30 minutes during the daytime. During evenings and Sundays, only the #110 route provides service to the area.

#112-Edmonds Station/New Westminster Station

The #112 provides service along 12th Street in New Westminster connecting Edmonds Station with New Westminster Station. The routing is unchanged from the preliminary plan.

#114-Burnaby South/Metrotown Station

The #114 route has been modified to provide improved service coverage to the South Slope neighbourhood in Burnaby. The revised routing features a clockwise loop via Royal Oak, Rumble, Nelson, Marine, Gilley, Clinton to Royal Oak. In total 383 persons are who are currently beyond walking distance of a bus route will be served by the modified route.

Service levels are every 30 minutes at all times. During peak periods, the #115 route provides service in the opposite direction on a 30 minute frequency.

#115-Burnaby South/Metrotown Station

The #115 is a new route that provides peak period service in the opposite direction to the #114 route. Service levels are every 30 minutes peak periods only. The two routes combine to provide a 15 minute frequency between the South Slope and Metrotown Station.

#116-Suncrest/Metrotown Station

The #116 route is a short feeder route connecting the Suncrest area with Metrotown Station. To improve service coverage it is proposed that the existing loop be widened to operate via Sussex, Portland, Patterson in the westbound direction. The eastbound route would be unchanged. An additional 206 persons would be served by the modified routing.

#130-Kootenay Loop/Metrotown Station

The northern terminus of the #130 route will remain as Kootenay Loop as a result of the delay to the North Burnaby Plan. The existing section of the line south of Metrotown Station will be transferred to the #116 Suncrest route.

#131/132-Kootenay Loop/Edmonds Station

The #131 and #132 routes will replace the #141 route connecting the Central Burnaby and Buckingham Heights area with Edmonds Station. The #132 route no longer operates via Royal Oak and Spruce as a result of the new service along Gilpin. South of the Burnaby Municipal Hall the #131/132 are proposed to operate via Imperial in place of Burriss (the #110 and 111 routes serve Burriss). Also the #131/132 route will be extended from the present terminus at Edmonds Loop to Edmonds Station to provide an ALRT connection.

#142-SFU/Edmonds Station

The #142 route between SFU and Edmonds Station will be continued as a temporary replacement for the #140 SFU/Metrotown route. The latter route has been delayed because there are not enough "hillclimber" vehicles to operate the longer route distance.

The revised route plan is displayed in Figure 5.1 Table 5.3 identifies in detail the contrasts with the preliminary plan including changes to service coverage and an assessment of the impact on users. Finally Figure 5.2 displays new streets that buses would be operated on and where field testing will be required before a final routing decision can be made.

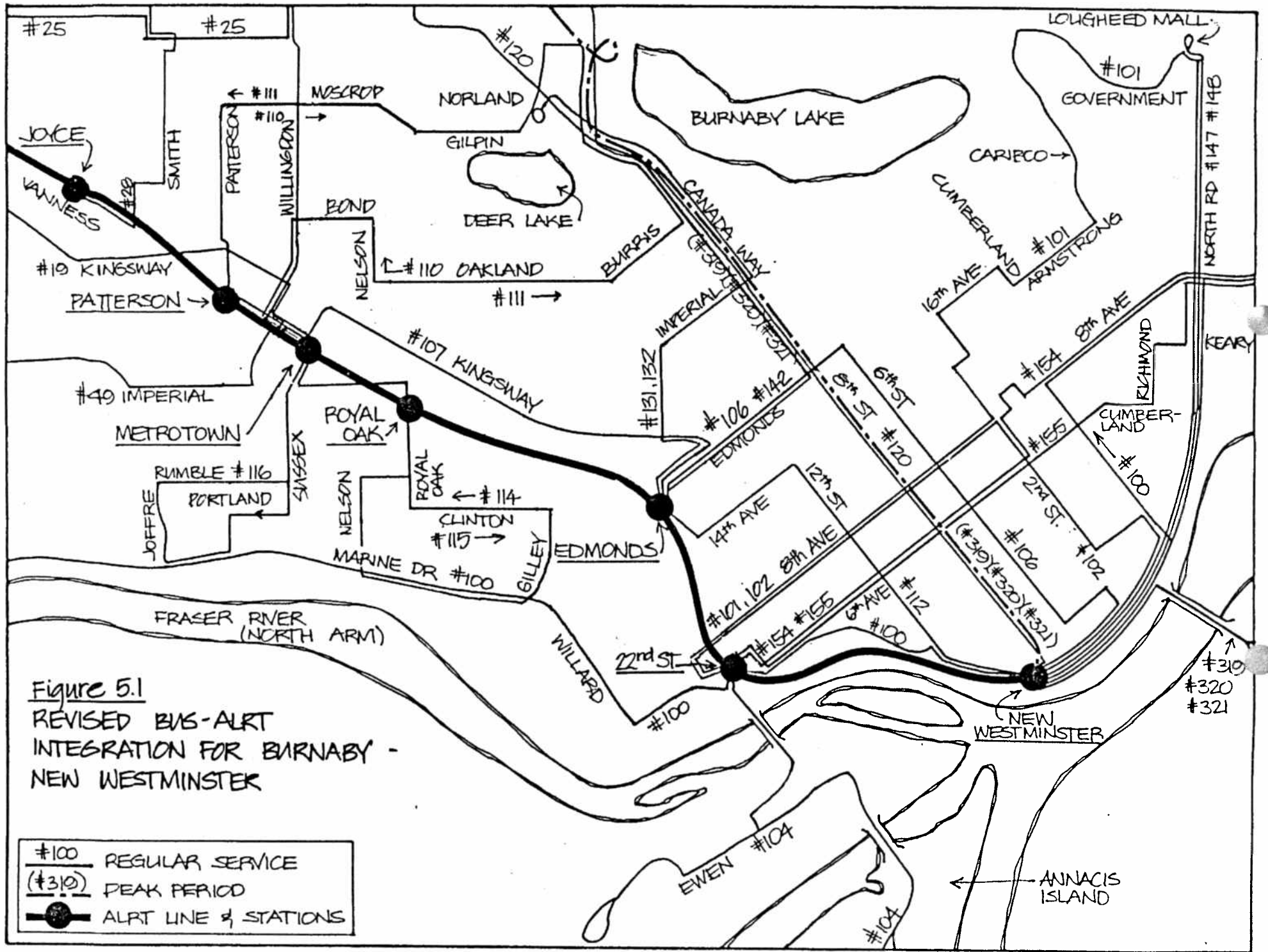


Table 5.3  
Contrasts with Preliminary Plan

Route	Description of Change	Service Coverage	Deleted	Impact on Users
#111	Central Burnaby New route to operate between Metrotown and Municipal Hall via Oakland, Burriss, Canada Way	Provides addi- tional service coverage to Oakland Street. Also replaces #140 north of Kingsway. In total, 1183 new persons served by route.	New route	1) Will improve Oakland coverage 11) Provides Municipal Hall-Metrotown connection
#114	South Slope Operate route in a loop south of Royal Oak Station, S/B via Nelson, E/B Marine, N/B Gilley, W/B Clinton. During peak periods, operate a two-way loop (designated as #115)	Provides addi- tional service coverage to South Slope. In total, 383 new persons served by route.	Coverage east of Gilley to Edmonds Stn discont- inued. No loss of coverage.	1) Will improve South Slope coverage 11) Provides connec- tion to Marine Dr and #100 route
#115	Central Burnaby Operate route from Metrotown Station via Patterson, Moscrop, Gilpin to Municipal Hall (renumber #110). Operate route in loop arrangement in conjunction with route #111.	Replaces #140 along Gilpin east of Royal Oak. Serves 368 new persons	No loss of coverage	1) Service replaces #140 as Metro- town-Municipal Hall connector 11) Provides east- west route across Gilpin/Moscrop 111) Serves 2 high schools; will reduce need for special school trips
				1) Loss of direct service to Joyce Station
				1) Loop routing increases travel times for users 11) Connection to Edmonds Station discontinued
				1) New route Negative

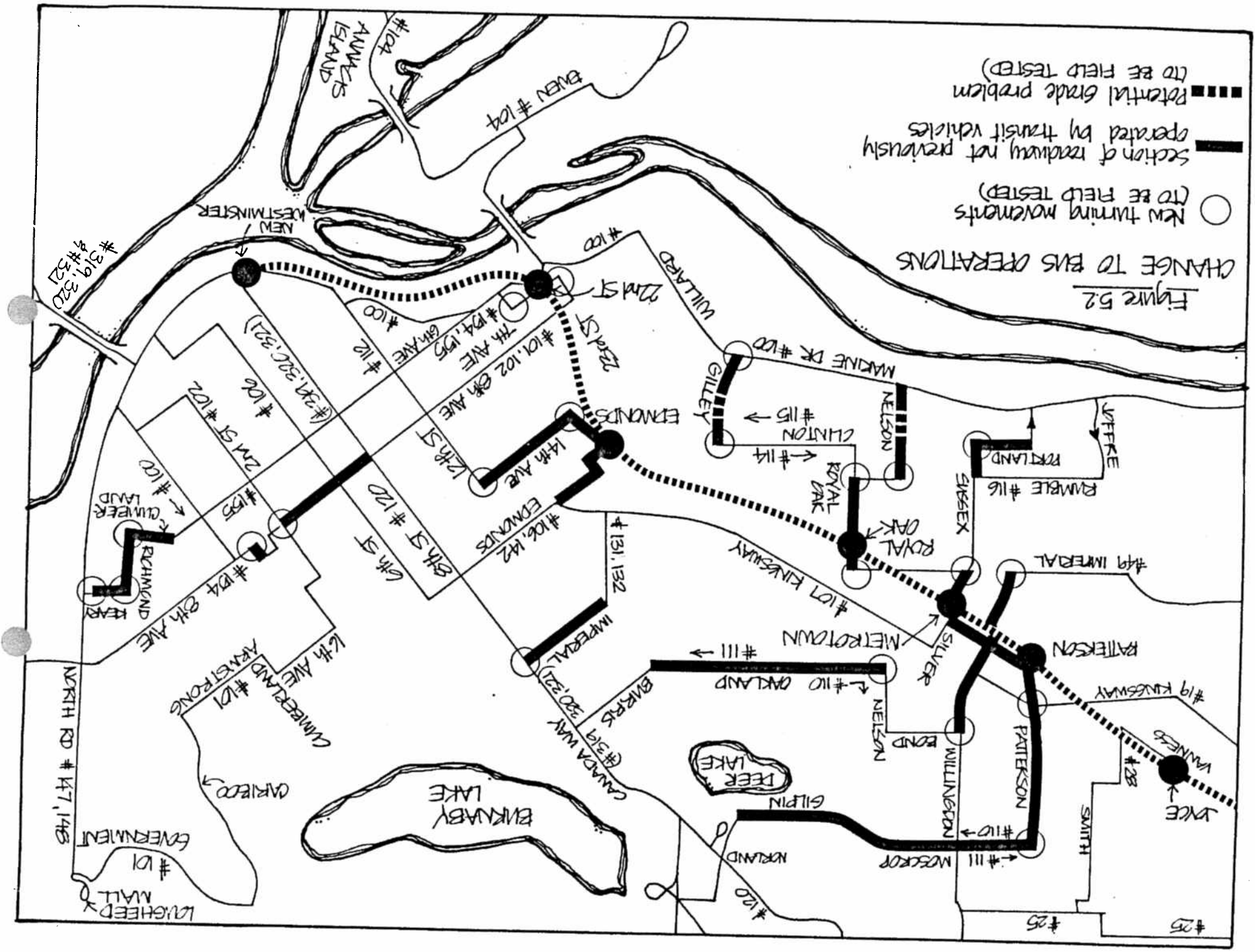
Table 5.2 - page 2

Route	Description of Change	Service Coverage		Impact on Users	
		Additional	Deleted	Positive	Negative
#116	<u>Suncrest</u> Operate service S/B on Sussex to Portland, then W/B on Portland to Patterson. Then regular route via Patterson, Marine, Joffre, Rumble, Sussex and return to Metrotown	Provides improved coverage to area south of Rumble and Sussex. In total 206 new persons served by route	No loss of coverage	i) Improved coverage south of Rumble and Sussex	Loss of two way service along Rumble between Sussex and Patterson
#140-SFU	<u>Central Burnaby</u> Original proposal delayed due to insufficient "hillclimber" vehicles; continue to route #142 SFU; extend to Edmonds Station	No additional coverage	Loss of service along Nelson, Royal Oak, Gilpin; 777 persons offset by #110-111	i) Continue existing service between SFU and Edmonds until sufficient hillclimber vehicles are available to operate SFU/Metrotown Station link	i) Loss of direct SFU-Metrotown connection
#141	<u>Buckingham Heights</u> Service replaced by two routes; #110/111 operating on Canada Way, Burris and #131/132 operating on Canada Way, Imperial, Salisbury	Improved coverage to Buckingham Hts. In total, 368 new persons served by new routes.	Loss of service coverage along Sperling, Stanley, Walker. In total 305 persons outside 450 m walk dist.	i) Will improve Buckingham Hts coverage ii) Provides Burris area with direct service to Metrotown	i) Burris area does not have direct service to Middlegate and Edmonds Station ii) Some existing service coverage lost
#155	<u>Sapperton (New Westminster)</u> Service operated via Keary, Columbia, Braid (subject to street improvements)	Improved access to Royal Columbian Hospital. In total 142 new persons served	No loss of coverage	i) Direct service from West End and Uptown New West to Royal Columbian Hospital	i) Westbound #154 & #155 service from Columbia & Braid leaves from different stop locations



○ New turning movements (to be field tested)  
 — Section of roadway not previously operated by transit vehicles  
 ■■ Potential grade problem (to be field tested)

Figure 5.2  
CHANGE TO BUS OPERATIONS



#### 5.4 Staging Program

The revised route plan is to be implemented in two phases. Phase I is scheduled for start up in January 1986 while Phase II will follow in May 1986.

##### 5.4.1 Phase I

Phase I will feature a complete revamping of services including the introduction of the timed transfer focal points at Metrotown and Edmonds Station. During this phase there will be some duplication of service along the Canada Way corridor. The duplication will provide uptown New Westminster and Central Burnaby users with a choice between an ALRT and an all-bus route to Vancouver.

##### 5.4.2 Phase II

In May 1986, peak period passenger capacity on the ALRT line will increase by 33% from 4500 pphpd to 6000 pphpd. During this phase most of the duplication between ALRT and buses along Canada Way will be discontinued. This includes terminating the #319, 320 and 321 routes at New Westminster Station as well as possible adjustments to the #120 service.

## 6.0 IMPACT OF BUS-ALRT INTEGRATION

### 6.1 Reassignment of Existing Ridership

Existing passenger volumes have been reassigned to simulate the impact of an integrated bus-ALRT system. The results are displayed in figure 6.1.

The forecast is based on the existing passenger volumes cited in figure 2.1 and thus do not include a provision for growth. The forecast is for the AM peak period (7-9 AM) inbound only. The critical points in the system are the Boundary Road and the Burnaby-New Westminster screenlines. It should be noted that the passenger volumes indicated for the various stations and linkages are dependent on the bus connections outlined in the revised service plan and displayed in figure 5.1.

### 6.2 Assumptions

The location of the ALRT stations relative to the existing Kingsway corridor will allow for convenient transfer of most of the existing #106, 112 and 114 passenger volumes to ALRT. It is projected that 95% of the current volume crossing the Boundary Road screenline will transfer to the ALRT. The remaining 5% are assumed to be local trips to the Joyce and Kingsway area and have therefore been assigned to the #19 local service. The #19 has also been assigned the traffic on the existing #41 route which will be discontinued with the introduction of ALRT.

On the Canada Way corridor it is assumed that a majority of the traffic crossing the Boundary Road screenline will be assigned to ALRT where travel time savings are apparent even with a transfer. Approximately 30% of the existing passenger traffic has been retained for local Hastings Street destinations.

### 6.3 Location of Ridership Growth

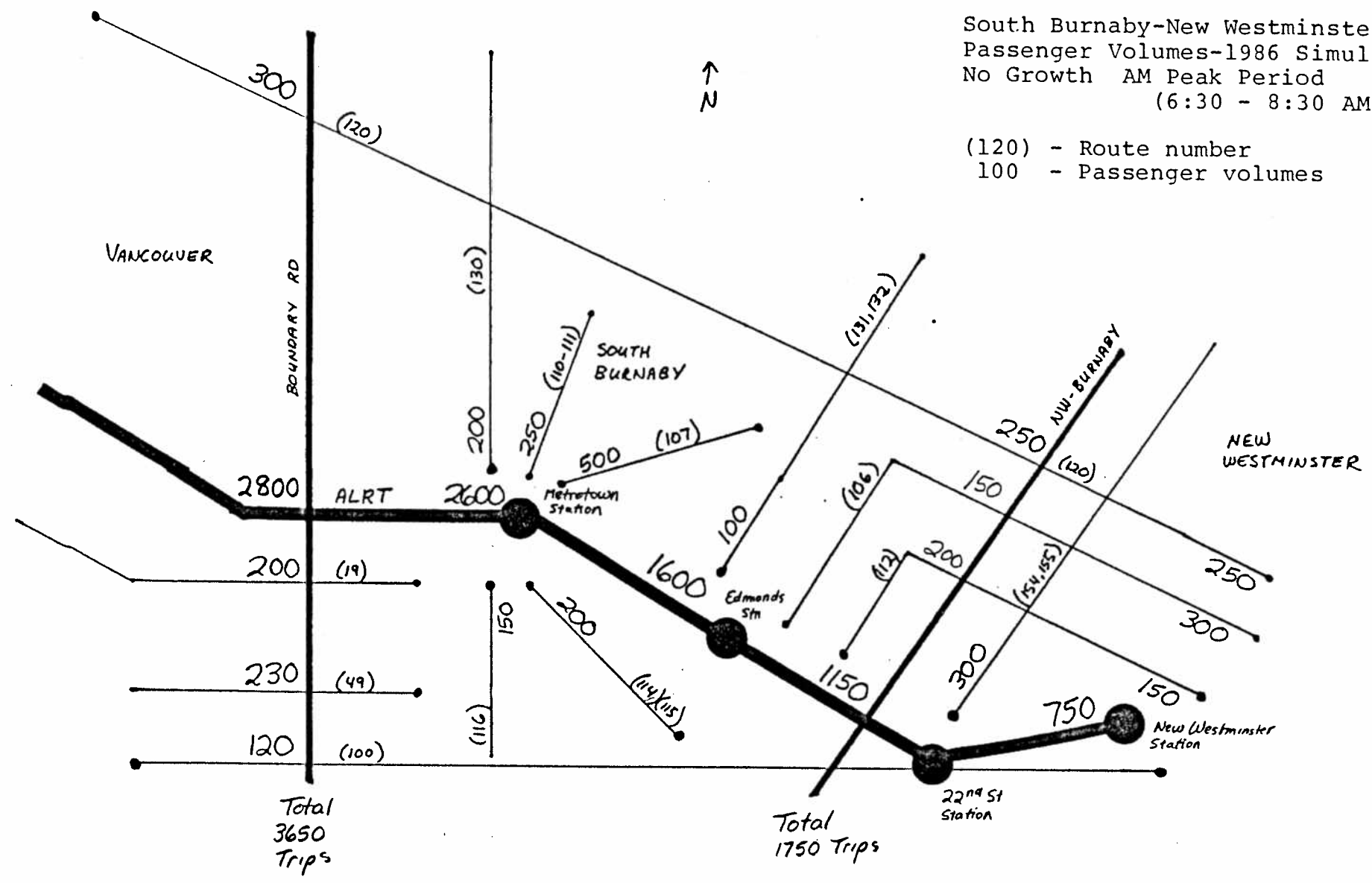
The ALRT line will provide an attractive, high quality transit service that will promote higher levels of ridership. In South Burnaby, 35% of the population will be within a 900 metre walk of an ALRT station. In New Westminster, 22% of the population will be within walking distance. For many of these persons, ALRT will be the only transit mode used. It is reasonable then, to expect the greatest potential for growth to occur in these areas.

Outside areas within walking distance of an ALRT station, the greatest growth potential rests in neighbourhoods where existing transit services have low frequencies and involve transfers to reach downtown Vancouver. The improved travel time for ALRT along with better transferring facilities will offer potential for ridership growth.

Figure 6.1

South Burnaby-New Westminster  
 Passenger Volumes-1986 Simulated  
 No Growth AM Peak Period  
 (6:30 - 8:30 AM)

(120) - Route number  
 100 - Passenger volumes



The areas with the least potential for growth are likely to be those where there is currently frequent and direct bus service which are beyond walking distance of an ALRT station. In these situations, the combination of feeder bus service and a transfer to ALRT may actually limit growth potential, as the transfer will offset the improved travel times provided by ALRT over an express bus system.

#### 6.4 Growth Provision

Experience with the Calgary LRT system indicated that total corridor transit ridership increased by about 30% after the start-up of LRT service. Ridership gains were highest during the peak periods for work trips. At the downtown screenline the volume of transit trips increased by almost 80%. This would seem to suggest that a higher rate of growth can be expected in the outer areas than in the inner city.

South Burnaby-New Westminster falls between the inner city (City of Vancouver) and the outer areas (Surrey-Delta-Coquitlam). It appears reasonable to suggest that the rate of growth in South Burnaby-New Westminster will be higher than that experienced in the City of Vancouver. At the same time, it is also likely that the rate of growth in South Burnaby-New Westminster will be lower than in Surrey-Delta-Coquitlam.

A target that appears reasonable is a 25% increase in total ridership and a 35% increase in the number of South Burnaby-New Westminster transit trips crossing the Boundary Road screenline.

Table 6.1 displays the impact of bus-ALRT integration in terms of ridership, service coverage, hours of service and vehicle requirements. Figure 6.2 illustrates the impact of the projected growth at the various screenlines during the AM peak period.

Table 6.1  
**Impacts of Bus-ALRT Integration  
 on South Burnaby/New Westminster  
 (First Phase)**

	Existing Transit System		Bus-ALRT No Growth (a)		Bus-ALRT Growth Targets	
<b>Peak Vehicle Requirement</b>						
Buses	63		39		39	
ALRT Trains (b)	-		9		9	
<b>Operating Hours (Weekly)</b>						
Buses	4,960		3,475		3,475	
ALRT Trains	-		1,200		1,200	
Total Hours	4,960		4,675		4,675	
Population	105,000		105,000		105,000	
Population not Served	5,300		2,900		2,900	
Percentage of Population Served	95%		97%		97%	
Annual Ridership	8,000,000		8,250,000		10,000,000	
Annual Rides per Capita	76		78.5		95	
AM Peak Boundary Road Screenline Trips	3,650 (c)		3,750		4,900	
Total Weekday Trips	26,000		26,800		33,000	
Total Bus Trips	26,000		18,300		22,500	
Total ALRT Trips	-		8,500		10,500	

Notes:

- (a) Assumes a straight reassignment of existing bus trips to ALRT
- (b) Proportion of ALRT trains required to carry Burnaby/New West riders
- (c) Two hour AM peak (0630-0830). Includes Canada Way and Kingsway corridor

South Burnaby-New Westminster  
 Passenger Volumes-1986 Simulated  
 35% Growth Target  
 AM Peak Period (6:30 - 8:30 AM)  
 (120) - Route number  
 100 - Passenger Volumes

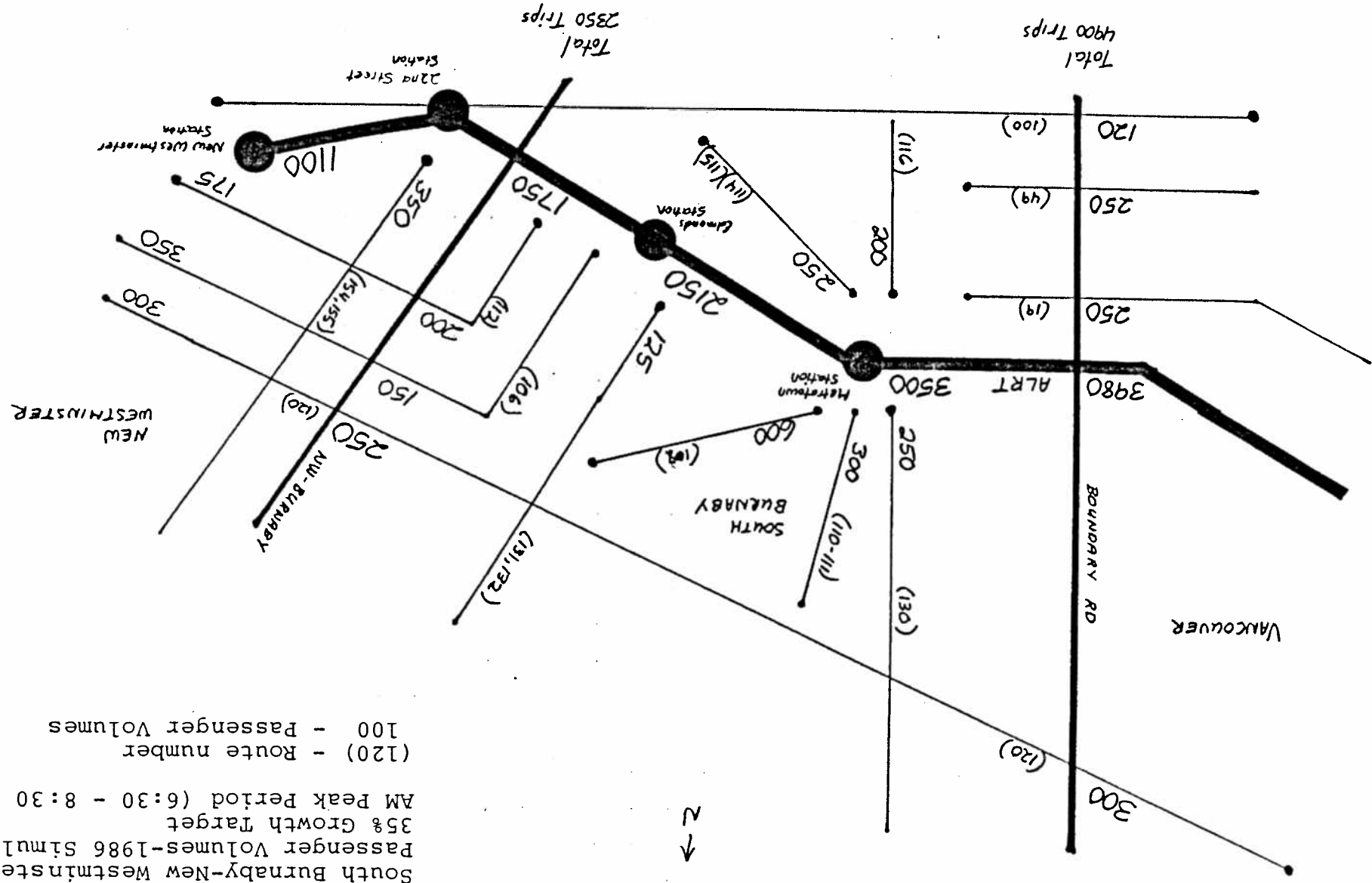


Figure 6.2

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Appendix  
Route Functions  
For Revised Bus-ALRT Integration Plan

March 1985



#101 22nd Station/Lougheed Mall

Route Description

From 22nd Street Station via 22nd Street, 8th Avenue, 2nd Street, 11th Avenue, 1st Street, 16th Avenue, Cumberland, Armstrong, Cariboo, Government, Austin to Lougheed Mall.

From Lougheed Mall via Austin, Government, Cariboo, Armstrong, Cumberland, 16th Avenue, 1st Street, 11th Avenue, 2nd Street, 8th Avenue, 23rd Street, 7th Avenue to 22nd Street Station.

Residential Collection

Along 8th Avenue in New Westminster; East Burnaby and Cariboo development (future)

Shopping Facilities

Uptown New Westminster; Lougheed Mall

Community, Recreational and Institutional Facilities

George Derby Hospital; Moody Park Arena; Century House

Schools

Cariboo Secondary; New Westminster Secondary

Employment Centres

Lougheed Mall; Uptown New Westminster

Network Connections

- i) Lougheed Mall
- ii) 22nd Street Station

Preliminary Service Levels

Peak: 30 minutes  
Mid-day: 30 minutes  
Evenings: 60 minutes

#102 22nd Street Station/New Westminster Station

Route Description

From 22nd Street Station via 22nd Street, 8th Avenue, 2nd Street, Royal, McBride, Columbia, McNeely, Carnarvon, 8th Street to New Westminster Station.

From New Westminster Station via 8th Street, Columbia, McBride, Royal, 2nd Street, 8th Avenue, 23rd Street, 7th Avenue to 22nd Street Station.

Residential Collection

Along 8th Avenue and 2nd Street

Shopping Facilities

Uptown and downtown New Westminster

Community, Recreational and Institutional Facilities

Moody Park Arena, Century House, St. Mary's Hospital

Schools

New Westminster Secondary

Employment Centres

Downtown New Westminster; uptown New Westminster

Network Connections

- i) 22nd Street Station
- ii) New Westminster Station

Preliminary Service Levels

Peak: 30 minutes  
Mid-day: 30 minutes  
Evenings: 60 minutes

#104 22nd Street Station/Annacis Island/Queensboro

Route Description

From 22nd Street Station via 22nd Street, 8th Avenue, 20th Street, Queensboro Bridge, Howe, Ewen, Pembina, Derwent to Chester and return via Derwent, Pembina, Ewen, Boundary, River Road, Westminster Highway, Gilley, Smith, Westminster Highway, River Road, Boundary, Ewen, Howe, Queensboro Bridge, Marine Drive, 23rd Street, 7th Avenue to 22nd Street Station.

Note: In the PM, route operates to Gilley and Smith before Derwent and Chester.

Residential Collection

Along Ewen and Pembina in Queensboro

Community, Recreational and Institutional Facilities

Queensboro Community Centre

Employment Centres

Queensboro; Annacis Island Industrial Park

Network Connections

i) 22nd Street Station

Preliminary Service Levels

Peak: 30 minutes

Mid-day: 30 minutes

Evenings: 60 minutes, with early night termination

#106 Edmonds Station/New Westminster Station

Route Description

From Edmonds Station via 19th Street, Edmonds, 6th Street, Agnes, Elliott, Columbia, McNeely, Carnarvon, 8th Street to New Westminster Station.

From New Westminster Station via 8th Street, Columbia, Elliott, Agnes, 6th Street, Edmonds, 19th Street to Edmonds Station.

Residential Collection

Along Edmonds and 6th Street

Shopping Facilities

Edmonds-Middlegate area; 6th Street; Uptown and downtown New Westminster

Community, Recreational and Institutional Facilities

Eastburn Community Centre; Edmonds Seniors Centre; Moody Park Arena; New Westminster City Hall; St. Mary's Hospital

Colleges and Schools

Douglas College; New Westminster Secondary; Edmonds Jr. Secondary

Employment Centres

Downtown New Westminster; uptown New Westminster

Network Connections

- i) Edmonds Station
- ii) New Westminster Station

Preliminary Service Levels

Peak: 15 minutes  
Mid-day: 20 minutes  
Evenings: 30 minutes

#107 Metrotown Station/Edmonds Station

Route Description

From Metrotown Station via Central Boulevard, Silver, Kingsway, Edmonds, 19th Street to Edmonds Station.

From Edmonds Station via 19th Street, Edmonds, Kingsway, Silver, Central Boulevard to Metrotown Station.

Residential Collection

Along Kingsway

Shopping Facilities

Metrotown; Kingsway; Edmonds-Middlegate

Community, Recreational and Institutional Facilities

Bonsor Community Centre; Edmonds Seniors Centre

Schools

Burnaby South Secondary

Employment Centres

Metrotown

Network Connections

- i) Metrotown Station
- ii) Edmonds Station

Preliminary Service Levels

Peak: 10 minutes  
Mid-day: 15 minutes  
Evenings: 20 minutes

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#110 Metrotown Station/Municipal Hall/Metrotown Station

Route Description

From Metrotown Station via Central Boulevard, Patterson, Grange, Barker, Sardis, Patterson, Moscrop, Gilpin, Deer Lake Place, Municipal Hall Loop, Deer Lake Place, Norland, Sprott, Kensington, Canada Way, Burris, Oakland, Dover, Nelson, Bond, Willingdon, Central Boulevard to Metrotown Station.

Note: Reverse loop as #111

Residential Collection

Along Patterson, Moscrop, Gilpin, Burris and Oakland

Shopping Facilities

Metrotown

Community, Recreational and Institutional Facilities

Bonsler Community Centre; Central Park; Burnaby Municipal Hall; Burnaby Lake Sports Complex

Schools

Burnaby Central Secondary; Moscrop Jr. Secondary

Employment Centres

Metrotown; Burnaby Municipal Hall area

Network Connections

- i) Metrotown Station
- ii) Patterson Station
- iii) Burnaby Municipal Hall

Preliminary Service Levels

Peak: 20 minutes  
Mid-day: 30 minutes  
Evenings: 30 minutes

#111 Metrotown Station/Municipal Hall/Metrotown Station

Route Description

From Metrotown Station via Central Boulevard, Willingdon, Bond, Nelson, Dover, Oakland, Burris, Canada Way, Kensington, Sprott, Norland, Deer Lake Place, Municipal Hall Loop, Deer Lake Place, Gilpin, Moscrop, Patterson, Grange, Patterson, Central Boulevard to Metrotown Station.

Note: Reverse loop as #110

Residential Collection

Along Bond, Oakland, Burris, Gilpin, Moscrop, Patterson

Shopping Facilities

Metrotown

Community, Recreational and Institutional Facilities

Bonser Community Centre; Burnaby Lake Sports Complex; Burnaby Municipal Hall; Central Park

Schools

Burnaby Central Secondary; Moscrop Jr. Secondary

Employment Centres

Metrotown; Burnaby Municipal Hall area

Network Connections

- i) Metrotown Station
- ii) Patterson Station
- iii) Burnaby Municipal Hall

Preliminary Service Levels

Peak: 20 minutes

Mid-day: 30 minutes

Evenings: Area served by #110 route

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#112 Edmonds Station/New Westminster Station

Route Description

From Edmonds Station via 19th Street, 14th Avenue, 12th Street, Columbia, Carnarvon, 8th Street to New Westminster Station.

From New Westminster Station via 8th Street, Columbia, 12th Street, 14th Avenue, 19th Street to Edmonds Station.

Residential Collection

Along 12th Street

Shopping Facilities

12th St; downtown New Westminster

Schools

St. Thomas Moore

Network Connections

- i) Edmonds Station
- ii) New Westminster Station

Preliminary Service Levels

Peak: 15 minutes  
Mid-day: 20 minutes  
Evenings: 30 minutes



#114 Burnaby South/Metrotown Station

Route Description

From Metrotown Station via Central Boulevard, Sussex, Imperial, Royal Oak, Rumble, Nelson, Marine Drive, Gilley, Clinton, Royal Oak, Imperial, Sussex, Central Boulevard to Metrotown Station.

Residential Collection

South Slope area

Shopping Facilities

Royal Oak and Rumble; Metrotown; Sears

Community, Recreational and Institutional Facilities

Bonsler Community Centre

Schools

MacPherson Jr. Secondary

Network Connections

- i) Metrotown Station
- ii) Royal Oak Station
- iii) Nelson and Marine (to #100)

Preliminary Service Levels

Peak: 30 minutes (see #115 route for additional peak service)  
Mid-day: 30 minutes  
Evenings: 30 minutes

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#115 Burnaby South/Metrotown Station

Route Description

From Metrotown Station via Central Boulevard, Sussex, Imperial, Royal Oak, Clinton, Gilley, Marine Drive, Nelson, Rumble, Royal Oak, Imperial, Sussex, Central Boulevard to Metrotown Station.

Residential Collection

South Slope area

Shopping Facilities

Royal Oak and Rumble; Metrotown; Sears

Community, Recreational and Institutional Facilities

Bonser Community Centre

Schools

Macpherson Jr. Secondary

Network Connections

- i) Metrotown Station
- ii) Royal Oak Station
- iii) Nelson and Marine (to #100)

Preliminary Service Levels

Peak: 30 minutes  
Mid-day: served by #114  
Evenings: served by #114

#116 Suncrest/Metrotown Station

Route Description

From Metrotown Station via Central Boulevard, Sussex, Portland, Patterson, Marine, Joffre, Rumble, Sussex, Central Boulevard to Metrotown Station.

Residential Collection

Suncrest area

Shopping Facilities

Metrotown

Employment Centre

Metrotown

Network Connections

- i) Metrotown Station
- ii) Patterson and Marine (to #100)

Preliminary Service Levels

Peak: 15 minutes

Mid-day: 30 minutes

Evenings: 30 minutes

OTHER ROUTE CHANGES

#100 Airport/New Westminster Station/Port Coquitlam

Contrast with Present

- i) Operate route to 22nd Street Station. Eastbound buses route via 7th Avenue, 22nd Street Station, 22nd Street, 8th Avenue, 20th Street, Marine and Stewardson Way. Westbound buses route via Stewardson Way, 22nd Street, 7th Avenue, 22nd Street Station, 22nd Street, 7th Avenue
- ii) Operate route to New Westminster Station. Eastbound buses route via Stewardson Way, 12th Street, Columbia, Carnarvon, 8th Street to New Westminster Station. Westbound buses via Columbia to New Westminster Station
- iii) Discontinue short turn route to 6th Street and Royal
- iv) Reroute service via Willard, Trapp. Discontinue Marine Drive section between Willard and Trapp

#130 Kootenay Loop/Metrotown Station

Contrast with Present

- i) Eliminate Gilpin, Wildwood, Burke routing in favour of through route on Willingdon
- ii) Discontinue route via Bond, Nelson, Kingsway, McKay. Operate buses via Willingdon, Central Boulevard
- iii) Terminate route at Metrotown Station. Operate Suncrest as separate route (#116)

#131/132 Kootenay Loop/Edmonds Station

Contrast with Present

- i) Discontinue #132 service via Royal Oak, Spruce
- ii) Operate routes via Canada Way, Imperial, Salisbury, Kingsway, Edmonds, Rumble, 19th Street to New Westminster Station

#142 SFU/Edmonds Station

Contrast with Present

- i) Extend route via Edmonds, 19th Street to Edmonds Station

#154 Munday/#155 Como Lake

Contrast with Present

- i) Discontinue #154 and 155 service to downtown New Westminster, extend service westbound to 22nd Street Station.

