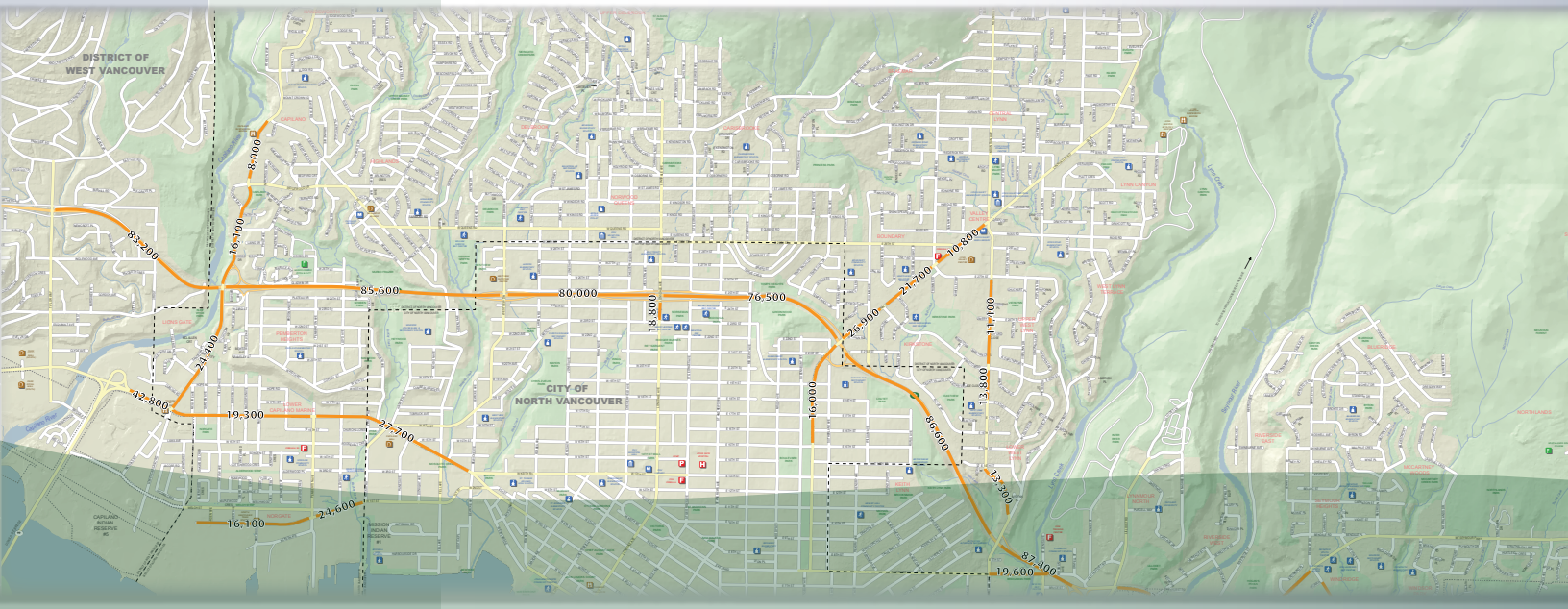
District of North Vancouver

Road Network Study



June 2011

Prepared for:

NORTH VANCOUVER
DISTRICT

355 West Queens Road
North Vancouver, BC
V7N 4N5

Prepared by:

FEHR PEERS

1001 - 4th Avenue
Suite 4120
Seattle, WA 98154
206-576-4220

INTRODUCTION

The purpose of this report is to document the evaluation of road network needs within the District of North Vancouver. These findings will be incorporated into the District's Transportation Plan.

BACKGROUND

A road network plan is an integral part of the District's overall transportation plan. The District's goal is to manage road infrastructure in such a way that enables the efficient movement of goods and people, while improving road safety and minimizing impacts on local neighbourhoods. There are several benefits of improving the road network – improvements in air quality by reducing unnecessary traffic, circulation and congestion, and improving mobility of all modes of transportation, including the delivery of goods and services. In response to these goals, the project team examined the existing roadway network from the perspective of capacity, connectivity, and balance of different modal.

Much of the District's current roadway network lacks a defined grid pattern, dictated largely by the topography and several north-south creeks and rivers. Highway 1 passes through the District from east to west, creating some roadway barriers between the neighbourhoods on the north and south sides of the Highway. While there is sufficient roadway capacity to handle the traffic volumes passing north and south throughout the District, the roadway network creates heavy regional traffic along Highway 1 and the interchanges serving the District. This effect causes backups along east-west routes, notably Main Street/Dollarton Highway and Keith Road. Congestion at the two bridgeheads crossing Burrard Inlet creates traffic backups onto District roadways. Servicing of the port and industrial areas also requires a substantial amount of goods movement on District roadways.

The roadway network evaluation included the following steps:

1. Prepare travel forecasts of future travel demand on the roadway network.
2. Identify roadway segments where additional capacity is needed to accommodate traffic growth.
3. Examine road connectivity needs for all modes.
4. Identify opportunities for roadway reconfiguration to accommodate other modes.
5. Prioritize the roadway projects.

Each of these steps is described below.

EVALUATION RESULTS

Travel Forecasts

The development of a road network strategy for the Transportation Plan underwent a transportation modeling exercise to determine network deficiencies and possible short and long term improvements. The study produced travel forecasts for the year 2021 using the District's EMME/2 travel model. Land use growth estimates used the population and employment scenario developed with Metro Vancouver during preparation of the regional growth strategy in 2010. **Table 1** summarizes the land use estimates, where 2021 values are compared to a model base year of 2006.

TABLE 1 – POPULATION AND EMPLOYMENT GROWTH FORECASTS

Location	Population				Employment			
	2006 Estimated	2021 Projected	Growth	Percent Growth	2006 Estimated	2021 Projected	Growth	Percent Growth
City of North Vancouver	49,423	56,000	6,577	13%	29,048	34,000	4,953	17%
District of North Vancouver	87,086	99,500	12,414	14%	31,018	33,000	1,982	6%
Total	136,509	155,500	18,991	14%	60,066	67,000	6,934	12%

Source: District of North Vancouver; 2021 land uses based on official Community Growth Strategy

The traffic analysis was conducted at a segment level. **Figure 1** shows 2021 daily traffic volume forecasts along major roadways within the District. Apart from Highway 1, which carries in excess of 80,000 vehicles per day (vpd), most of the primary roadways carry volumes less than 30,000 vpd. Higher volumes occur in proximity to Highway 1 and Highway 99 along Main Street/Dollarton Highway, Mt. Seymour Parkway, and Marine Drive. **Appendix A** provides a table showing the details for each road.

Traffic growth was examined during the PM peak hour by comparing forecasts for 2021 to the 2006 base year volumes. The volumes are affected by growth within the District, the City of North Vancouver, and the rest of the Vancouver region

On average, traffic volumes during the PM peak period would increase by 3 to 13 percent from 2006 to 2021. Overall traffic growth on District roads would increase by less than 0.5 percent annually over the 15 year period. This low level of growth is considered to be statistically insignificant given the range of variation inherent in the travel demand model.

The highest growth (13 percent) is forecasted to occur on Marine Drive and West 1st Street to the west of Capilano Road, partially due to the development expected along the Lower Level Road Western Extension on Squamish Nation lands. Traffic growth is lowest (3-4 percent) on roads heading north from Highway 1 and to the east along Mt Seymour Parkway and Dollarton Highway.

The road networks used in the 2021 model went through several iterations. Roadway projects were identified from previous District planning efforts and examination of existing and future travel patterns using the model. The final network reflects the projects shown in **Figure 2** and **Table 2**.

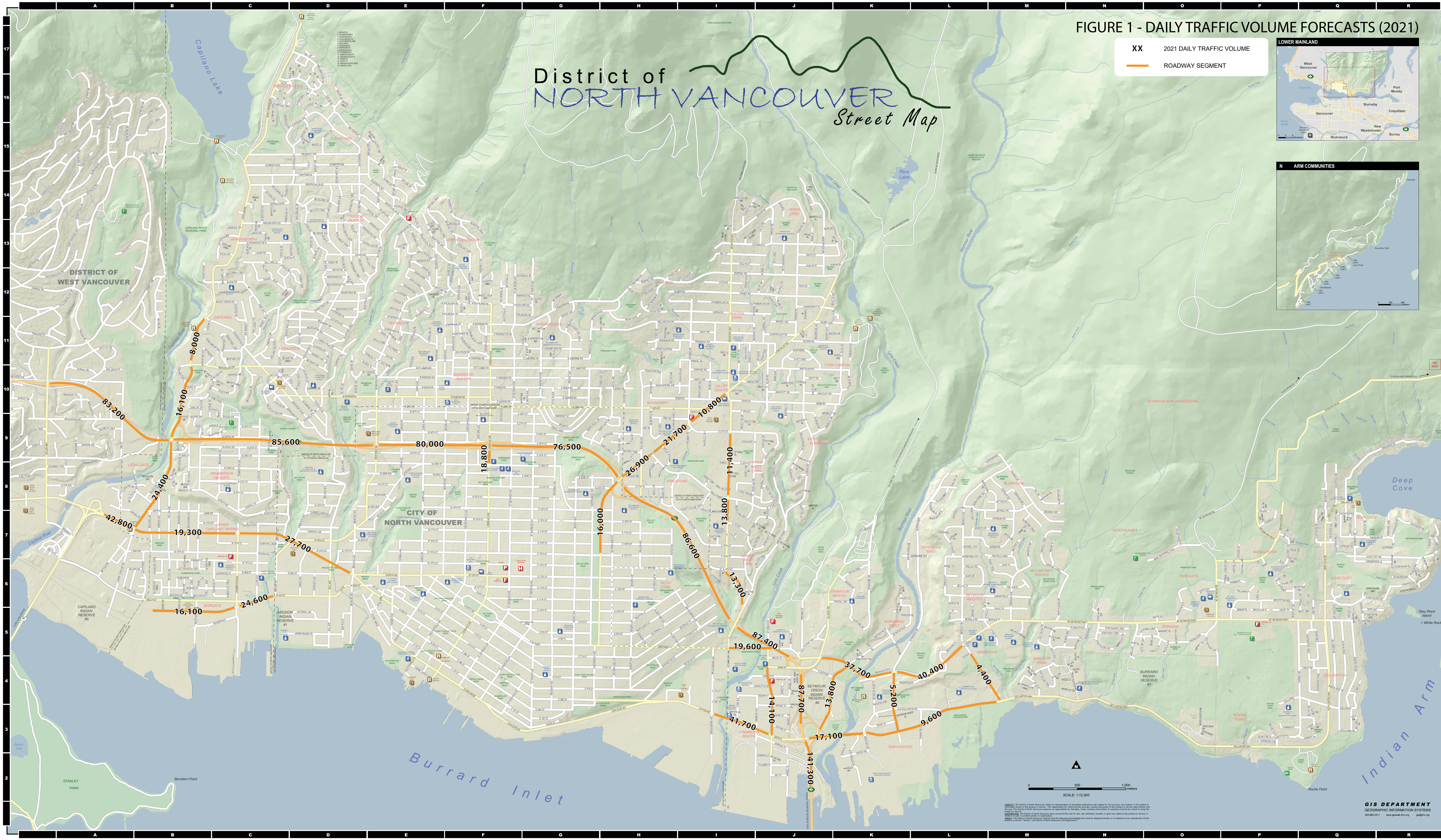


FIGURE 1 - DAILY TRAFFIC VOLUME FORECASTS (2021)
XX 2021 DAILY TRAFFIC VOLUME
ROADWAY SEGMENT
District of
NORTH VANCOUVER
Street Map
LOWER MAINLAND
ARM COMMUNITIES
DISTRICT OF WEST VANCOUVER
CITY OF NORTH VANCOUVER
Capilano Lake
Rice Lake
Deep Cove
Burrard Inlet
Indian Arm
Stanley Park
8,000
16,100
83,200
85,600
80,000
18,800
76,500
26,900
21,700
10,800
11,400
13,800
16,000
86,600
13,300
24,400
42,800
19,300
27,700
24,600
16,100
87,400
19,600
37,700
40,400
4,400
5,200
87,700
13,800
14,100
41,700
17,100
9,600
141,300
GIS DEPARTMENT

TABLE 2 – ROAD PROJECTS				
ID	**Project**	**Description**	**Project Type**	**Benefits**
Public Roadways				
	Highway 1 Lower Lynn Interchanges	Modify interchange ramps at Fern Street and Dollarton Highway. Build new half interchange at Brooksbank Avenue. Accommodates Mt. Seymour Road/Keith Road connection and/or Northern Service Road (Project 4)	Capacity	Improve Highway 1 access and safety and provide improved District roadway circulation.
1	Mt. Seymour Road	Re-allocate the road space between Indian River Drive and Mount Seymour Parkway	Reconfiguration	Reconfigure roadway by using excess width to reduce vehicle speeds, reduce pedestrian crossing distance, and alter roadway character to reflect role of Parkgate village centre
2	Maplewood Industrial Area Redevelopment Connection	Provide additional connection to industrial area to supplement West Riverside Drive, with the alignment to be determined (may extend Amherst Drive)	Connection	Provide alternate connection for Metro Vancouver and port operations
3	Barrow Street / Spicer Road	Barrow Street to Spicer Road inter-port connector	Connection	Improve access for goods movement and create Spirit Trail crossing of Seymour River, while also providing emergency alternate route to Main Street/Dollarton Highway
4	Northern Service Road	Provide a new connection across Lynn Creek north of Highway 1, expected to use the Keith Road alignment	Connection	Provide redundancy in the network for emergency access and separate local and regional traffic
5	Crown Street	Provide a new crossing of Lynn Creek to serve bicyclists and pedestrians that is accessible to emergency vehicles; may extend over Highway 1 subject to	Connection	Provide redundancy in the network for emergency access and pedestrian/bicycle access

TABLE 2 – ROAD PROJECTS

ID	Project	Description	Project Type	Benefits
		agreement by the Squamish Nation		
6	Pemberton Avenue	Re-allocate the road space	Reconfiguration	Minimize excess roadway capacity to reduce speeds and improve conditions for bicycling and walking
7	Marine Drive circulator	General changes to rear lanes and local roads to facilitate circulation and access to Marine Drive commercial business (avoiding residential area).	Reconfiguration	To support development of the Marine Drive commercial and residential centre and to separate through and circulating traffic
8	Capilano Road (Marine Drive to Fullerton Ave)	Improve Capilano Road and provide bike and transit lanes from Marine Drive to Fullerton Avenue	Roadway Capacity	Support the Lower Capilano village centre, provide priority for transit, and improve conditions for bicycling and walking
9	Capilano Road/Nancy Greene Way (Highway 1 to Grouse Mountain)	Narrowing lanes and provide bikeways from Highway 1 north to Grouse Mountain.	Reconfiguration	Minimize excess roadway capacity to reduce speeds and improve conditions for bicycling and walking
10	Highlands Boulevard	Reconfigure from 3 lanes to 2 lanes, add bike lanes	Reconfiguration	Minimize excess roadway capacity to reduce speeds and improve conditions for bicycling and walking
11	Riverside Drive	Rebuild with bicycle lanes and parking from Old Dollarton Road to Mt Seymour Parkway	Reconfiguration	Improve conditions for bicycling and walking
12	Seymour Boulevard (Squamish Nation)	Extend Seymour Boulevard to the Dollarton Road interchange	Connection	Provide a connection between Dollarton Road and Mt. Seymour Parkway to facilitate local area access within the Squamish Nation Reserve.

TABLE 2 – ROAD PROJECTS

ID	Project	Description	Project Type	Benefits
Roadways Tied to Development				
13	Parkgate Avenue	Create a new connection to Mount Seymour Road	Connection	Provide access to secondary school site if developed and provide alternate circulating route in the Parkgate village centre
14	Northlands Drive	New connection north to Hyannis Drive	Connection	Provide service to Northland area (aka CMHC land) if developed and provide alternate access to/from Blueridge neighbourhood
15	Berkley Road	Extend Berkley Road as a four-lane arterial road from Mount Seymour Parkway to Dollarton Highway	Connection	Service Port Metro Vancouver lands if developed and provide additional connection between Mount Seymour Parkway and Dollarton Highway
16	Old Lillooet Road	Extend Old Lillooet Road from Lillooet Road to Capilano University	Connection	Provide appropriate and direct route to Capilano University, to be provided when student population increases significantly and/or adjacent lands developed
17	Lower Level Road Western Extension (District of West Vancouver and Squamish Nation jurisdiction)	Lower Level Road Western Extension from Taylor Way to 1st Street	Connection	Complete connections to provide direct paths for all travelers and avoid circuitous routing, subject to development of Squamish Nation lands
18	Pemberton Overpass	Provide overcrossing of the CNR tracks in vicinity of Philip Avenue	Connection	Reduce freight delays due to railroad crossing. Noise reduction and safety improvements.

Source: Fehr & Peers, 2011.

FIGURE 2 - ROAD NETWORK PROJECTS

District of NORTH VANCOUVER Street Map

- PUBLIC ROADWAYS (1 - 12)
- ROADWAYS TIED TO DEVELOPMENT (13 - 18)
- NORTH SHORE INTERCHANGES PLAN
- RECONFIGURE RAMPS (see Appendix)

LOWER MAINLAND

INDIAN ARM COMMUNITIES

DISTRICT OF WEST VANCOUVER

CITY OF NORTH VANCOUVER

Capilano Lake

Capilano River

Lynn Creek

Rice Lake

Seymour River

Burrard Inlet

Indian Arm

Deep Cove

Grey Rock Island

White Rock

Brockton Point

Roche Point

STANLEY PARK

CAPILANO INDIAN RESERVE #5

MISSION INDIAN RESERVE #1

SEYMOUR CREEK INDIAN RESERVE #2

BURRARD INDIAN RESERVE #3

CAPILANO RIVER REGIONAL PARK

LYNN VALLEY

LYNN CANYON

SEYMOUR NON-RESIDENTIAL

See Appendix B for details of Highway 1 Interchanges

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

PUBLISHED: JUNE 26, 2009

0 500 1,000 meters

SCALE: 1:12,500

DISCLAIMER AND TERMS OF USE

GIS DEPARTMENT
GEOGRAPHIC INFORMATION SYSTEMS
604.990.2311 www.geoweb.dnv.org gis@dnv.org

Roadway Capacity Needs

Overall, traffic on the District roadways is forecast to grow at rates below 1 percent annually. This relatively low traffic growth revealed few locations where new roadway travel lanes are necessary. The following facilities listed in Table 2 would provide new roadway capacity needs:

- **Highway 1 Interchange Revisions**-The Ministry has proposed several changes to the lower Lynn interchanges to improve Highway 1 access and safety. These projects might be phased. The **Lower Lynn Interchanges** are located along the Highway 1 corridor between the north bridgehead of the Ironworkers Memorial Bridge and south of the Lynn Valley Interchange. The interchange revisions, shown in detail in **Appendix B**, would include a rebuilding of the Fern Street interchange, modifications to the Dollarton ramp movements, and the construction of a new half-interchange at Brooksbank Avenue for eastbound movements to/from Highway 1. In addition, the project would include a new connection between Mt. Seymour Parkway and Keith Road crossing over Highway 1 (Project 4). An option to this roadway link would be a new northern service road constructed to the north of Highway 1 across Lynn Creek. This roadway link could be implemented as a separate project from the Highway 1 interchange revisions.

- **Capilano Road**-(Project 8)-New transit and bicycle lanes would be added from Marine Drive to Fullerton Avenue

Roadway Connectivity Needs

The following projects shown in Figure 1 would provide new roadway connections within the District. Several of these projects would be tied to new development proposals. The primary benefits of these projects would be to provide increased connectivity between neighbourhoods and businesses within the District.

- **Maplewood Industrial Area Redevelopment Connection** (Project 2)
- **Barrow Street/Spicer Road Connector** (Project 3)
- **Northern Service Road** (Project 4- see Highway 1 discussion above)
- **Crown Street Connector** (Project 5)
- **Seymour Boulevard** (Project 12)
- **Marine Drive Circulator** (Project 7)
- **New Connections tied to Development**
  - Parkgate Avenue (Project 13)
  - Northlands Drive (Project 14)
  - Berkley Road (Project 15)
  - Old Lillooet Road (Project 16)
  - Lower Level Road Western Extension (Project 17)
  - Pemberton Overpass (Project 18)

Roadway Reconfiguration Opportunities

The relatively low growth rates on district roads provide opportunities to reconfigure existing roadway space to accommodate alternative modes. These projects include the following:

- Mt. Seymour Road (Project 1)
- Pemberton Avenue (Project 6)
- Capilano Road/Nancy Greene Way (north of Highway 1) (Project 9)
- Highlands Boulevard (Project 10)
- Riverside Drive (Project 11)

PROJECT PRIORITIZATION

The roadway projects were prioritized using several evaluation criteria, as shown in Table 3. These criteria reflect the District's transportation goals that emphasize multi-modal connections and providing improvements that have good opportunities for partnering with other agencies for available funding. The criteria include three rating levels: low, medium and high, with definitions of each rating shown in Table 3. For simplicity of evaluation, there were no weights given to the criteria. Each is considered important, with the overall ratings being illustrative of importance.

TABLE 3 – EVALUATION CRITERIA

Criteria	Rating			Notes
	High ●	Medium ◒	Low ○	
Encourage Alternative Transportation Modes	Emphasizes non-auto modes	Accommodates non-auto modes	Auto-mode focused	
Increase Person Moving Capacity	Substantial addition to roadway capacity for moving people	Some addition to roadway person capacity	Limited or no addition to roadway person capacity	Includes all modes: auto (SOV,HOV), transit, pedestrian, bicycle
Improve Safety	Addresses known safety issue	Potential to improve safety	Not related to safety	
Increase Roadway Connectivity	Adds major roadway connection	Adds minor roadway connection	No change in roadway connectivity	
Improve Freight Mobility	Directly addresses freight mobility	Potential to improve freight mobility	Not related to freight mobility	
Ease of Implementation	Easy to implement; minimal change in roadway cross-section or right of way	Straight-forward project with few community concerns	Requires new property/right of way and/or likely community concerns	
Funding Opportunities	Low Cost and/or excellent partner funding opportunities	Low to Medium Cost; and/or some partnering opportunities	High cost with limited or no partner funding opportunities	Partner opportunities include: Major Road Network; Insurance partners; pedestrian/ bicycle grants

Source: Fehr & Peers, 2011.

The ratings were applied to each of the roadway projects, as shown in Table 4. The overall rating for each project was based on professional judgment by reviewing the individual rating results for each criterion. The rating score is the sum of the circle ratings for each criterion.

TABLE 4 – PROJECT PRIORITIZATION

ID	Project (Refer to Table 2 for description)	Criteria							
		Encourage Alternative Modes	Increase Person-Moving and Vehicle-Moving Capacity	Improve Safety	Increase Roadway Connectivity	Improve Freight Mobility	Ease of Implementation	Funding Opportunities	OVERALL RATING
Public Roadways									
	Highway 1 Lower Lynn Interchanges	◒	●	●	●	◒	○	◒	**4.5**
1	Mt. Seymour Road	●	○	◒	○	○	●	◒	**3.0**
2	Maplewood Industrial Area Redevelopment Connection	○	◒	○	◒	●	◒	◒	**3.0**
3	Barrow Street / Spicer Road	●	◒	○	●	●	◒	◒	**4.5**
4	Northern Service Road	◒	◒	○	●	○	◒	◒	**3.0**
5	Crown Street	●	◒	◒	◒	○	◒	●	**4.0**
6	Pemberton Avenue	●	○	◒	○	○	●	●	**3.5**
7	Marine Drive circulator	○	◒	◒	◒	○	◒	●	**3.0**
8	Capilano Road (Marine Drive to Fullerton Ave)	●	●	◒	○	○	○	●	**3.5**
9	Capilano Road (Highway 1 to Prospect Ave)	●	◒	◒	○	○	●	●	**4.0**
10	Highlands Boulevard	●	◒	◒	○	○	●	◒	**3.5**
11	Riverside Drive	●	◒	◒	○	○	◒	●	**3.5**
12	Seymour Boulevard	◒	●	◒	●	◒	○	◒	**4.0**

TABLE 4 – PROJECT PRIORITIZATION

ID	Project (Refer to Table 2 for description)	Criteria							
		Encourage Alternative Modes	Increase Person-Moving and Vehicle-Moving Capacity	Improve Safety	Increase Roadway Connectivity	Improve Freight Mobility	Ease of Implementation	Funding Opportunities	OVERALL RATING
Roadways Tied to Development									
13	Parkgate Avenue	◒	◒	○	●	○	◒	●	**3.5**
14	Northlands Drive	◒	◒	○	●	○	○	●	**3.0**
15	Berkley Road	◒	●	◒	●	◒	○	●	**4.5**
16	Old Lillooet Road	◒	○	○	◒	○	◒	●	**2.5**
17	Lower Level Road Western Extension (District of West Vancouver and Squamish Nation jurisdiction)	◒	●	○	●	◒	○	◒	**3.5**
18	Pemberton Overpass	This project was not prioritized as it is already under development and is almost fully funded.							

High: ● Medium: ◒ Low: ○

Source: Fehr & Peers, 2011.

KEY PROJECT COST ESTIMATES

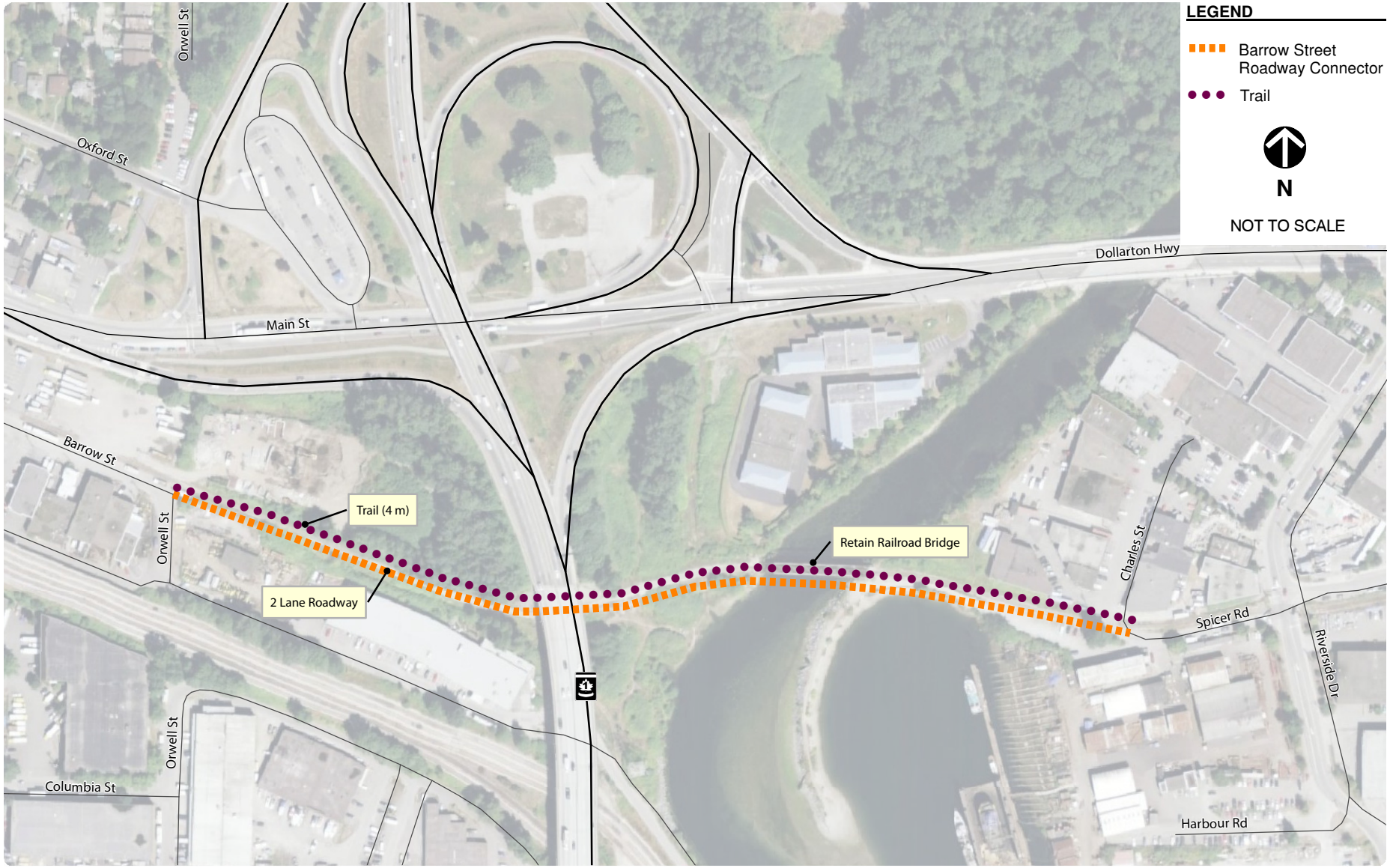
While many of the projects rated very well, three projects were selected as being high priority for short-term District implementation. These projects are the following:

- Barrow Street/Spicer Road freight connection (Project 3)- See **Figure 3**
- Crown Street pedestrian/bicycle and emergency vehicle crossing of Lynn Creek (Project 5)- See **Figure 4**
- Capilano Road reconfiguration for bicycle lanes (Project 9)- See **Figure 5**

Cost estimates were prepared for these projects, summarized in **Table 5**.

TABLE 5 – PROJECT COST ESTIMATES

Project	Design Assumptions	Capital Cost Range ($2011)	
	•	Low	High
3. Barrow Street/Spicer Road connection	• Two-lane roadway connecting Barrow Street and Spicer Road • Adjacent nonmotorized trail • Bridge across Seymour River located north of existing railroad bridge	$4.4 Million	$6.0 Million
6.Crown Street Bridge	• Bicycle/pedestrian and emergency vehicle access bridge across Lynn Creek connecting Crown Street and E. 4th Street • High visibility crosswalk across Brooksbank Avenue • Pedestrian and bicycle signing and marking along Crown Street east to Mountain Highway • Retain vehicular ramp access from Crown Street to Creek	$1.2 Million	$1.6 Million
9. Capilano Road reconfiguration for bicycle lanes	• Add bicycle lane marking and signing • Reconfigure existing lanes to accommodate bicycles • Refer to Figure 5 for cross sections	$120,000	$150,000



FEHR PEERS

N:\Projects\SE09-0165_North Vancouver Roadway Network Study\Graphics\Draft\GIS\fig03_newProj.mxd

BARROW STREET / SPICER ROAD CONNECTOR

FIGURE 3

FEHR PEERS

CROWN STREET EXTENSION
PEDESTRIAN BRIDGE AND HIGH VISIBILITY CROSSWALK

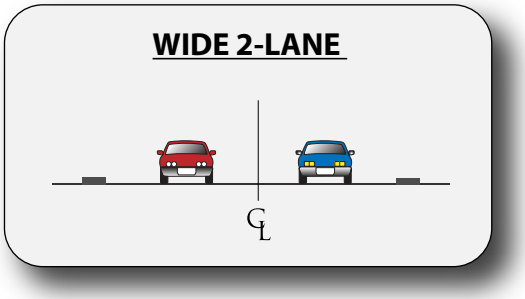
FIGURE 4

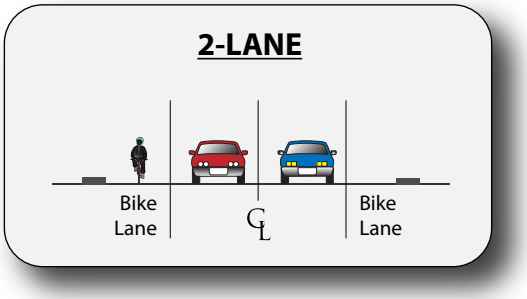
May 12, 2010 JM
N:\Seattle Projects\SE09-0152\Fern_Alignment_Concepts.dwg

BEFORE

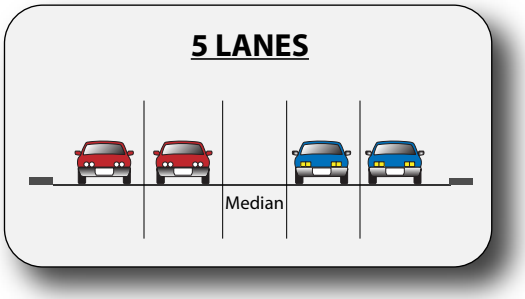
AFTER

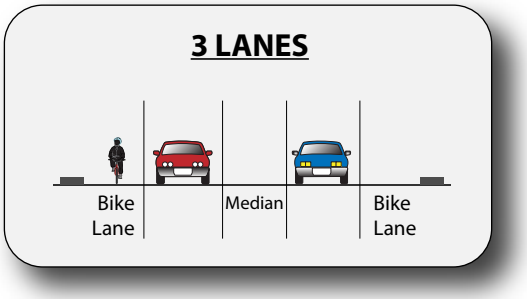
North of Ridgewood Drive





Highway 1 to Ridgewood Drive





FEHR PEERS

CAPILANO ROAD NARROWING AND BICYCLE LANES

N:\Projects\SE09-0165_North Vancouver Roadway Network Study\Graphics\Draft\AI\xSections.ai

FIGURE 5

Appendix A- Traffic Volume Forecasts

Roadway	Section	PM Peak Hour Volumes				Daily Volumes		Growth		Comments
		2006		2021		2006	2021	Percent Growth	Annual Percent Growth	
		EB	WB	EB	WB					
Marine Dr	Route 99 to Capilano Rd	2,610	1,120	2,360	1,040	47,000	42,842	-9%	-0.6%	
	Capilano Rd to Pemberton Ave	1,070	710	930	560	23,000	19,253	-16%	-1.2%	Reductions due to traffic
	Pemberton Ave to Bewicke Ave	1,300	910	1,320	825	28,556	27,716	*	*	shifts to Lower Level Road
		EB	WB	EB	WB					
W 1st St.	Taylor Way Way To Pemberton /	NA	NA	640	760	NA	16,051	NA	NA	New road
	Pemberton Ave to Mackay Ave	990	580	1,180	970	18,000	24,650	37%	2.1%	
		SB	NB	SB	NB					
Capilano Rd	Marine Dr to Highway 1	640	1,360	800	1,420	22,000	24,420	11%	0.7%	
	Highway 1 to Ridgewood Dr	630	890	680	850	16,000	16,105	*	*	
	Ridgewood Dr to Edgemont Blvd	310	430	340	400	8,000	8,000	*	*	
		EB	WB	EB	WB					
Highway 1	Taylor Way to Capilano Rd	2,610	2,750	2,470	2,730	71,725	83,200	*	*	
	Capilano Rd to Westview Dr	2,950	2,580	2,820	2,590	74,000	86,560	*	*	
	Westview Dr to Lonsdale Ave	2,630	2,300	2,590	2,410	65,971	80,000	*	*	
	Lonsdale Ave to Lynn Valley Rd	2,300	2,360	2,260	2,520	62,358	76,480	*	*	
	Lynn Valley Rd to Mountain Hwy	2,580	2,460	2,420	2,990	68,000	86,560	*	*	
	Mountain Hwy to Mt Seymour P	2,580	3,150	2,470	2,990	76,676	87,360	*	*	
	Mt Seymour to Dollarton	2,300	2,530	3,000	2,480	64,633	87,680	13%	0.8%	Changes due to interchange reconfigurations
	Dollarton to Iron Workers Bridge	5,020	4,790	5,260	4,830	131,273	141,260	*	*	
		EB	WB	EB	WB					
Dollarton	Highway 1 to Amherst	1,790	1,200	1,460	670	24,000	17,097	-29%	-2.2%	
	Amherst to Forester	1,060	480	860	200	14,000	9,636	-31%	-2.5%	
		EB	WB	EB	WB					
Mt Seymour Prkwy	Lillooet Rd to Riverside Dr	1,240	870	1,600	1,540	27,430	37,680	49%	2.7%	
	Riverside Dr to Berkley Rd	1,550	1,190	1,800	1,570	35,620	40,440	23%	1.4%	
		EB	WB	EB	WB					
Main St	Brooksbank Ave to Mountain Hv	1,656	1,561	2,030	1,410	39,000	41,703	*	*	
		SB	NB	SB	NB					
Mountain Hwy	Arborlyn Dr to E 14th	260	530	330	480	13,000	13,329	*	*	
	E 18th to Kirkstone Rd	310	540	360	480	13,987	13,823	*	*	
	Kirkstone Rd to E 27th	230	470	300	390	11,519	11,354	*	*	
		SB	NB	SB	NB					
Lynn Valley Rd	Highway 1 to Kirkstone Rd	1,230	1,100	1,650	1,200	22,000	26,910	22%	1.4%	
	Kirkstone Rd to Fromme Rd	890	940	1,070	1,230	17,279	21,717	26%	1.5%	
	Fromme Rd to Mountain Hwy	400	540	470	670	8,876	10,764	21%	1.3%	
		SB	NB	SB	NB					
Grand Blvd	E 15th to Highway 1	510	1,050	590	1,010	15,600	16,000	*	*	
		SB	NB	SB	NB					
Lonsdale Ave	W 23Rd to Highway 1	900	840	980	900	17,400	18,800	8%	0.5%	
		SB	NB	SB	NB					
Seymour Boulevard	Dollarton to Mt. Seymour Pkwy	NA	NA	880	500	NA	13,800	NA	NA	NEW road
		SB	NB	SB	NB					
Berkley Road	Mt. Seymour Pkwy to Dollarton	NA	NA	200	240	NA	4,400	NA	NA	NEW road
		SB	NB	SB	NB					
Lower Mountain H	Main Street to Fern Street	526	374	850	555	9,000	14,050	56%	3.0%	
		EB	WB	EB	WB					
Keith Road	Mountain Hwy to Lower Mounta	945	450	1,340	620	13,950	19,600	41%	2.3%	
		SB	NB	SB	NB					
Riverside Drive	Old Dollarton to Mount Seymou	550	640	120	400	11,900	5,200	-56%	-5.4%	Shifts to Seymour Blvd

Notes: * Volume changes are considered insignificant in comparison to travel model range of sensitivity
Sources: District of North Vancouver Traffic Counts; regional travel model

Appendix B- Highway 1 Interchange Concept

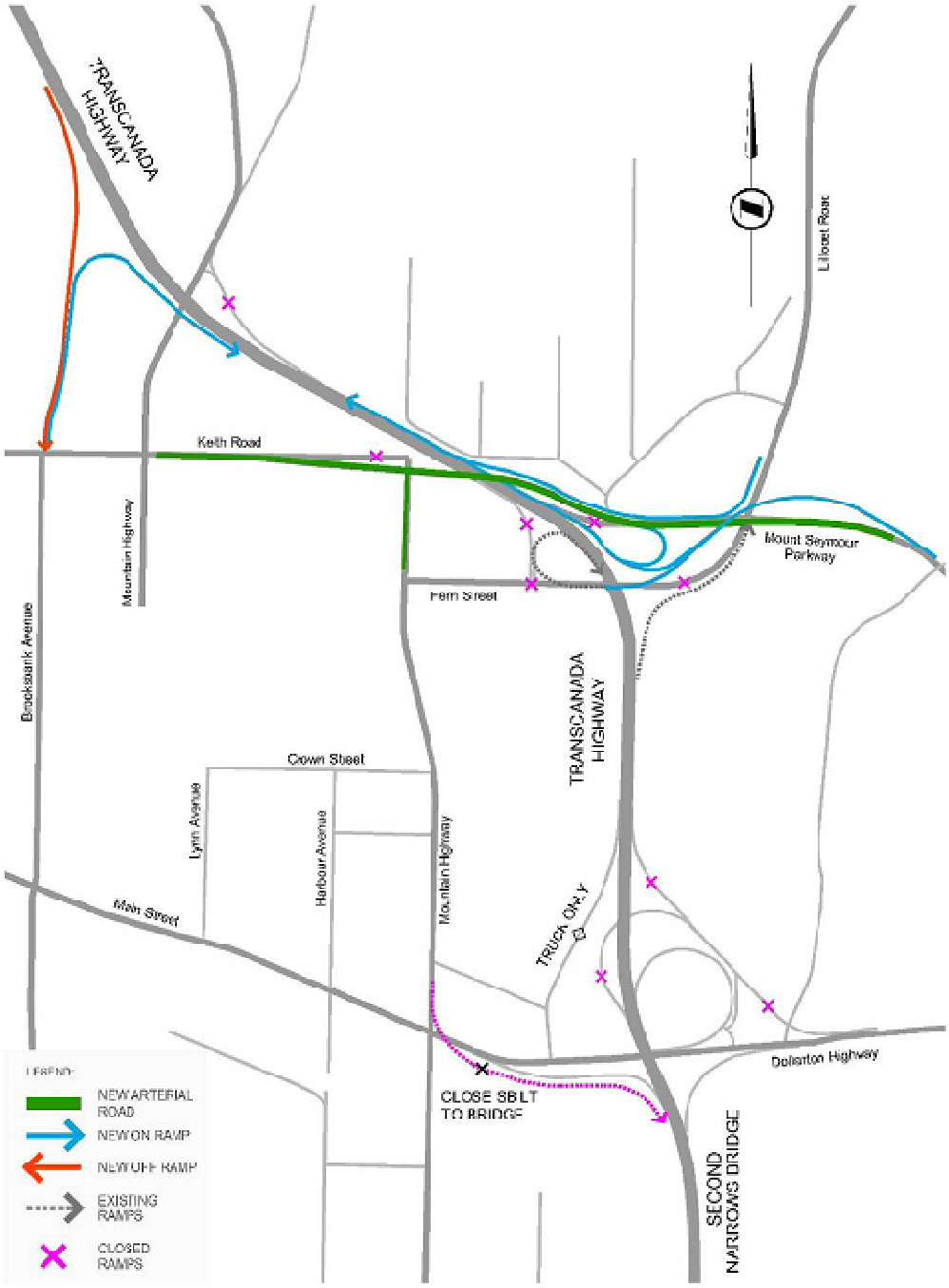


Figure B-1
North Shore Interchanges Functional Planning Study
Preferred Concept