

Lower Mainland Highway Improvement Outlook

October 1997

1.0 INTRODUCTION

In 1993, the Province of British Columbia, in conjunction with the Greater Vancouver Regional District (GVRD), BC Transit and other agencies, published *Transport 2021* - a document establishing an overall direction for the regional transportation system into the next century. The two volume document contained strategies that include a range of proposed system improvements for a medium term (2006) and a long term (2021) scenario. This work was used to develop the Livable Region Strategic Plan (LRSP) which was adopted by the Board of the Greater Vancouver Regional District in 1996.

In 1995, the Province published an integrated, multi-modal transportation plan entitled *Going Places: Transportation for British Columbians*. *Going Places* is a province-wide transportation plan, with the Greater Vancouver portion of the document being consistent with *Transport 2021* and the GVRD's Livable Region Strategic Plan. The document outlines the new approaches to transportation infrastructure that the Province is taking, and establishes general priorities for new transportation investments, with the primary focus being on highway, transit and ferry improvements.

In 1995, the Province also published a ten year development plan for BC Transit entitled *In Transit: People Moving People*. *In Transit* was developed in the context of *Going Places*, and commits to the following goals:

- To increase the number and proportion of people using public transit;
- To shape urban development and help reduce urban sprawl; and,
- To ensure people are well-served by transit.

To achieve these goals, *In Transit* proposed development of an LRT system on the Burrard Peninsula, linking Vancouver, Coquitlam and New Westminster, and bus service expansions throughout the Province.

Over the last few years, the Province (British Columbia Transportation Finance Authority, MoTH, BC Transit, and BC Ferries) in partnership with the GVRD have worked on the Lower Mainland Highway System Report (LMHSR) as a continuation of the LRSP and *Going Places*. Several priorities for future highway initiatives in the Lower Mainland over the next 10 years were recommended by the report. They include:

- Development of an HOV network.
- Development of a Traffic Management Program.
- Highway 1 corridor improvements, including the possible expansion of the Port Mann Bridge at the end of the 10 year period.
- Highway 99 corridor improvements.
- Development of the South Fraser Perimeter Road (Highway 1 to Highway 91 section).
- Various other projects already in the BCTFA's Capital Plan.

The LMHSR also recommended a long term strategy to the year 2021. Specific proposals included:

- Further improvements to the Trans Canada corridor in the Lower Mainland, including addition of HOV lanes between the Cape Horn Interchange and 152nd Street in Surrey, construction of a North Fraser Connector at either Barnston, 200th Street or Cottonwood to link Surrey with communities north of the Fraser River, and construction of the Stormont-McBride connector.
- Further improvements to east-west connectors, including the continued development of the South Fraser Perimeter Road, as well as limited road upgrade and intersection improvements on Highway 10.
- Further improvements to the north-south corridor (Highways 99, 91 and 17), including the addition of

HOV lanes on Highway 99 from 8th Avenue in White Rock to the Oak Street Bridge in Vancouver, interchange modifications, and improved connections along Highway 91 corridor between Tree Island and Marine Way, such as a new four lane bridge.

The LMHSR indicated that the timing of the Port Mann Bridge expansion required further investigation, because of the significant costs and potential impacts on the overall growth strategy and LRT development in the Lower Mainland. Furthermore, the LMHSR did not identify any supporting municipal street improvements that would be required nor did it address the issues of funding/financing. Municipal street improvement requirements were to be addressed through subsequent planning and evaluation initiatives, while the issue of funding was to be dealt with in government-to-government negotiations.

2.0 IMPROVEMENT PLAN OVERVIEW

Since the initiation of the LMHSR, however, two other initiatives have been launched that have significantly influenced where and how the Province will proceed with highway improvements in the Lower Mainland. These initiatives are:

1. The Capital Expenditure Review completed earlier this year, which significantly reduced the capital expenditure targets over the next four years for highway expansion or improvement; and
2. The Transportation Governance and Funding Negotiations initiated with the GVRD earlier this year, which could have significant implications for how highway improvements are planned and funded.

In light of these initiatives, as well as the objectives of the LRSP and *Going Places*, and the work undertaken for the LMHSR and Transport 2021, the Province proposes to proceed with a series of integrated and phased programs to expand or improve the performance of major roads in the Lower Mainland. Four programs are to be established for the purpose of supporting or undertaking the implementation of:

1. An HOV/Transit Priority Network;
2. A Regional Trip Reduction Service;
3. A Traffic Management System; and
4. Major Road Improvements.

Integration of these programs will entail their coordinated application on an area or highway corridor basis. Phasing of the programs will entail working with municipalities and the GVRD to plan and confirm specific expansions or improvements, and then proceeding with implementation on a corridor-by-corridor or area-by-area basis. The development of plans for specific projects will be undertaken, in light of the funding and governance negotiations, without prejudice as to who pays for subsequent implementation of the projects. The strategy to proceed with implementation on a corridor-by-corridor or area-by-area basis is the result of capital expenditure limitations.

The initial priorities for implementation will be:

1. The Highway 1 corridor in the Growth Concentration Area of the GVRD (i.e. North Surrey, North Delta, Coquitlam, Burnaby and New Westminster), including improvements in connections between Highway 1 and Highway 91; and
2. Road improvements throughout the GVRD to support transit service improvements or expansions.

Subsequently, implementation would focus on improvements to Highway 1 on the North Shore and to the Highway 99, 91 and 17 corridors. It should be noted, however, that when a corridor or area is identified as a priority, this does not preclude implementation of some measures in other corridors or areas where the measures will ameliorate a particularly bad situation and produce relatively high benefits per dollar of expenditure.

The priority afforded the Highway 1 corridor in the Growth Concentration Area reflects the view that: this area currently suffers from the worst congestion in the GVRD; there is a need to build on recently completed or initiated

projects, such as the Barnet-Hastings and Highway 1 HOV lanes, the Pitt River Bridge counterflow facility and the new interchanges on Highway 91, to fully capture the benefits they can produce; and mobility within the Growth Concentration Area is needed to achieve the growth patterns called for by the LRSP. The government's near-term planning activities will reflect this priority, and are expected to result in the implementation of a number of major initiatives in the corridor over the next 7-10 years, along the lines described later in this document.

These initiatives will be aimed at improving the performance of Highway 1 through improving:

1. Traffic flow through the Cape Horn Interchange;
2. Connectivity between Highways 1 and 91 to take advantage of available capacity on Highway 91;
3. Connectivity between local major roads to reduce the number of short trips on Highway 1;
4. The movement of HOV's between Cape Horn Interchange and Grandview Highway; and
5. Incident management and traveler information between Lynn Valley Road and 160th Street in Surrey.

Major initiatives in other corridors will likely be initiated in 5-10 years, with detailed planning for these commencing in about 3 years.

Within the next 10 years, however, no increase is contemplated in general purpose road capacity across the Fraser River. This not only reflects the desire to be supportive of the development of a more compact metropolitan area, and of LRT lines on the Burrard Peninsula, but also the reality that the addition of general purpose river crossing capacity has to be preceded by improvements to relieve current congestion on the peninsula. Without such improvements, additional river crossing capacity would make congestion on the peninsula worse. After 10 years, additional river crossing capacity is contemplated to the George Massey Tunnel, Port Mann Bridge and/or Annacis Bridge.

The remainder of this document outlines in more detail the four program areas noted above.

3.0 HOV/TRANSIT PRIORITY NETWORK

The HOV/Transit Priority Network is to consist of two basic elements:

1. Transit lanes and queue jumpers primarily in Vancouver, on the North Shore, along Highway 99 and in Surrey; and,
2. High occupancy vehicle lanes (shared by transit and other passenger carrying vehicles) primarily in the eastern half of the Burrard Peninsula, and along access routes thereto, and possibly in east Richmond, Surrey and Langley.

The objectives of the program are to assist BC Transit in reaching its ridership objectives of 13.1% and to have HOV's account for 1% of all trips in the GVRD by 2006.

A draft report recommending a network has been prepared for the BC Transportation Financing Authority with advice at the staff level from BC Transit, the Ministry of Transportation and Highways, the GVRD, the BC Automobile Association and some Lower Mainland municipalities. Within a few weeks, the draft report is to be reviewed by the steering committee and detailed discussions are to be initiated with municipalities, the GVRD and BC Transit to confirm elements of the network and implementation arrangements. The recommended network covers local as well as provincial roads.

It is expected that discussions with municipalities, the GVRD and BC Transit will result in a final plan to be announced early next year. It is anticipated that over the next 5-7 years priority will be given to transit lanes and queue jumpers throughout the GVRD, to support planned transit service improvements and expansion, and to HOV lanes in the eastern half of the Burrard Peninsula, to provide continuity and connectivity vis-a-vis the Barnet-Hastings and Highway 1 HOV lanes.

4.0 REGIONAL TRIP REDUCTION SERVICE

The Regional Trip Reduction Service is in essence the "software" needed to make effective use of the HOV/Transit Priority Network. The service has three basic elements:

1. Promotion of van/carpooling and transit as alternative means of travel;
2. Provision of ride matching services for users of van/car pools; and
3. Provision of assistance to employers and schools to set up van/carpools.

The GVRD is responsible for administration of the service and has assembled a budget of \$570,000 for service implementation in 1997/98. Provincial agencies have committed \$166,000 to the GVRD in 1997/98 for provision of the services. Future funding arrangements are to be confirmed pending the outcome of the governance and funding negotiations between the GVRD and the Province.

5.0 TRAFFIC MANAGEMENT PROGRAM

Traffic management is seen by many transportation agencies as the means to maintain or enhance service levels under fiscal constraints. Traffic management is directed at optimizing the use of existing infrastructure by the application of intelligent transportation system (ITS) technologies and advanced operations management techniques. Travel time savings, travel speed increases, accident rate reductions, fuel consumption reductions and reduced air emissions can be achieved through four strategies:

1. Incident Management: where cameras and detectors are used to detect, verify, and manage the response to remove impediments to smooth traffic flow.
2. Traveler Information: where motorists are provided real time travel information before leaving on their trip, or en route, so they can divert to another route, change mode of travel or reschedule their trip.
3. Fleet Management: where administrators of fleets are provided traffic information so they can better manage their operations.
4. Traffic Signal Control: where signals along a highway corridor, or within a road network, are integrated and coordinated to optimize performance. This could include ramp-metering (spacing vehicles ramping on to highways) and transit activated controls.

Implementation of the Traffic Management Program (TMP) is to proceed in two phases:

1. A pilot project to implement advanced incident management and traveler information systems on Highway 1 between Lynn Valley Road and 160th Street in Surrey, over the next 4-5 years; and
2. Subsequent expansion of the program to the major roads network in the GVRD.

The expansion could take the form of additional services (i.e. ramp metering, route diversion, signal integration) as well as extension of the services on Highway 1 to the other elements of the major roads network.

Successful implementation of the TMP could defer the need for more than \$1.0 billion in additional investment in roadways in the GVRD. The Highway 1 pilot has performance targets of reducing peak period travel times by 10% and increasing peak period vehicle/person throughput by 5%. Furthermore the incident management and traveler information systems of the TMP are viewed as vital to the long term success of the HOV network.

Implementation of the pilot project is to be coordinated with the Highway 1 HOV lane project, with activation of the pilot to occur shortly after the completion of the HOV lanes. The details for implementation of the pilot are expected to be finalized in the next few months.

Expansion beyond the Highway 1 corridor is contingent on successful negotiations with local governments vis-a-vis application of intelligent transportation system technologies to local roads, and their integration with the systems on provincial highways, as well as success of the pilot project. Discussions with local governments on TMP expansion are to proceed pending the outcome of the governance and funding negotiations.

6.0 MAJOR ROAD IMPROVEMENTS

This program is to provide for phased major expansions or improvements to the road network within the GVRD. The first phase, covering the next 7-10 years, will concentrate, for the reasons noted above, on the Highway 1 corridor in the Growth Concentration Area of the GVRD. The first step will be to plan a series of improvements in consultation with municipalities in the area and the GVRD. The details pertaining to funding and implementation are to be addressed pending the outcome of the governance and funding negotiations. Nonetheless, construction of the first improvement under this program is expected to start within 24 months.

The initiatives to be considered for the Highway 1 corridor are:

1. Improvements to the Cape Horn Interchange to process more traffic and to provide continuity of and/or connectivity with the Highway 1 HOV lanes.
2. A North Fraser Perimeter Road, possibly with HOV capacity, involving improvements in Coquitlam and New Westminster to facilitate the movement of traffic from or to Coquitlam and Port Coquitlam, through New Westminster and on to or from Highway 91 or Marine Way and to provide connectivity to enhance TMP effectiveness.
3. A Stormont-McBride connector, possibly with HOV capacity, involving improvements to facilitate the movement of traffic between Highway 1 in Burnaby and Highway 91 or Marine Way and to provide connectivity to enhance TMP effectiveness.
4. Changes to Highway 7 to accommodate the planned LRT lines.
5. A South Fraser Perimeter Road to connect Highways 1 and 15 with Highway 91 (relieving pressure on the Port Mann Bridge and on roads in New Westminster carrying traffic to Highway 1) and to provide connectivity to enhance TMP effectiveness. Extension of the SFPR to Highway 99 is not contemplated.
6. Completion of the Nordel Extension to connect with 88th Avenue.
7. Improvements to Highway 10 between Highways 1 and 91.

An outline of the work plan for developing and evaluating these initiatives is contained in Appendix C.

After 5-7 years it is expected that the second phase will begin to concentrate on improvements to and between interchanges on Highway 1 on the North Shore. The list of interchanges include Capilano Road, Lynn Valley Road, Fern Street and Mountain Highway. Some of the interchange improvements may be advanced, however, as preliminary analysis suggests they offer significant benefits at relatively low costs.

Subsequent phases will consider improvements to Highways 17, 91 and 99, additional general purpose road capacity across the Fraser River and upgrading of the SFPR. The exact natures of these initiatives will be significantly affected by the growth pattern that will emerge in the next 5-7 years pursuant to implementation of the Livable Regions Strategic Plan.

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APPENDIX A

SUMMARY OF BACKGROUND STUDIES

Going Places: Transportation for British Columbians

Going Places is a comprehensive, integrated and multimodal provincial transportation action plan, released in September 1995. It was developed by the BCTFA in conjunction with MoTH, the Ministry of Employment and Investment, BC Transit, BC Ferries and BC Rail. *Going Places* represents a new approach to transportation, with a focus on four main elements.

- Managing demand to make maximum use of existing facilities before further investing in new infrastructure.
- Giving priority to strategic investments which facilitate the movement of people and goods as opposed to the movement of single-occupant vehicles.
- Developing new partnerships with other governments, the private sector and users in order to more efficiently and cost-effectively implement new investments.
- Increasing cost recovery from the beneficiaries of transportation facilities and services.

A clear commitment toward relieving congestion in the Lower Mainland was made in *Going Places*. In addition to the provision of specific transit, HOV and bicycle system enhancements, several highway projects were identified to relieve congestion including:

- Adding two HOV lanes to Highway 1, from the Port Mann Bridge to Vancouver, and developing additional crossing capacity on or near the Port Mann Bridge to reduce congestion and accommodate extension of HOV lanes. Options for additional capacity on or near the Port Mann Bridge identified in *Going Places* included twinning the existing bridge or constructing a separate north-south connection between Surrey and Coquitlam.
- Undertaking seismic improvements and adding HOV capacity to Highway 99, from Ladner to Vancouver.
- Completing highway improvements such as the Mary Hill Bypass, Johnson-Marine Connector, Barnet-Hastings Highway and Pitt River Counterflow.

These and other transportation initiatives must be considered as part of the strategy for Congestion Management in the Growth Concentration Area.

In Transit, People Moving People

In Transit is BC Transit's 10 year development plan, released in 1995. It commits to the following goals:

- To increase the number and proportion of people using public transit
- To shape urban development and help reduce urban sprawl
- To ensure people are well served by transit.

In the Vancouver region, *In Transit* proposed major expansion of transit service to reverse the decline in the proportion of people using transit and to support the LRSP. There are five key components which *In Transit* focuses upon for the Vancouver region.

- Improved customer service, through more frequent bus service in medium and higher density areas, improved route and scheduling information, improved safety and security measures and increased accessibility (such as the introduction of low floor buses).
- Expanded bus service, including an increase in crosstown and crossregional routes, expanded express bus services, new premium commuter bus services and expanded community oriented minibus services and other alternatives.
- Innovative transit priority measures, such as increased use of HOV lanes, increased use of queue jumpers at congested bridges and intersections, use of smart signaling and other traffic control measures and legislative changes to give buses priority when leaving stops.
- Commuter rail, express bus and rapid bus services in the short to medium term. These include the West Coast Express commuter rail service from Mission to downtown Vancouver, the introduction of rapid bus service between Richmond and downtown Vancouver and the development of express bus services in the Broadway-Lougheed and Coquitlam-New Westminister corridors.
- Implementation of light rail transit (LRT) over the medium to long term, including medium term introduction of LRT in the Broadway-Lougheed and Coquitlam-Lougheed corridors and longer term introduction of an LRT extension from Lougheed to New Westminister.

In Transit calls for an increase in the Vancouver bus fleet by 250 vehicles and an expansion of the SkyTrain fleet from

150 to 190 cars by 2006. In addition, the introduction of rapid bus, LRT and a major expansion of regional bus services focusing on town centres, will support the vision of a more compact region with complete communities.

In addition to *In Transit*, BC Transit is completing a 5 year transit plan and funding strategy. The 5 year plan proposes to set market share targets for a number of key activity centres and major travel corridors. The objectives of the 5 year plan include: improved service quality, including frequency to reduce crowding on major routes; expanded regional connectors to meet the growing regional market; improved services within the metropolitan core to reflect the changes in land use; implementation of a transit priority measures program to improve the competitiveness of transit; and development of innovative pilot projects to test alternative transit service concepts.

The Livable Region Strategic Plan (LRSP)

Creating Our Future, established by the GVRD in 1990 and updated in 1993, provides the policy framework for the LRSP. The LRSP developed by the GVRD and approved by their Board in October 1995, provides a plan to manage regional growth over the coming decades. The LRSP establishes a vision for the Greater Vancouver region that combines economic vitality with the highest standards of livability and environmental quality.

Specifically, the LRSP, which grew out of 4 years of public and intergovernmental discussions, proposed four fundamental strategies:

- Protecting the green zone, including parks, watersheds, ecologically important areas and farmland.
- Building complete communities that incorporate town centres, resulting in a better balance between work and home and more efficient transportation system.
- Achieving a compact metropolitan region so that residential and employment growth is concentrated in the Burrard Peninsula, the Northeast Sector, North Surrey and North Delta. People can thus live closer to their jobs, and make better use of transit and community services.
- Increasing transportation choice by encouraging public transit use and discouraging reliance on SOV travel.

The LRSP also recognizes the vital need to serve the movement of goods and people in the Lower Mainland - "the regional transportation system must also provide for goods movement and interregional travel". To address the very fundamental relationships between transportation and economic development of the Lower Mainland, commitment toward strategies that support truck traffic to bypass congested roadways and interregional traffic between Greater Vancouver and other parts of the province is clearly indicated. This commitment is directly linked toward the provincial initiative for congestion relief in the growth concentration area.

Transport 2021

Transport 2021, released in September 1993, developed medium and long-range strategic transportation plans for the GVRD. Prepared jointly by the GVRD and the Province, *Transport 2021* outlined transportation policies based on the major levers available to steer the transportation system:

- Control land use (zoning regulations)
- Apply transportation demand management (to change travelers behavior)
- Supply transportation infrastructure (adjust service levels, build new facilities).

As part of *Transport 2021*, several long-range transportation system improvements were identified that contribute toward managing congestion in the growth concentration area. These projects included transit capacity improvements, bus lanes and other priority treatments, HOV lanes as well as other key roadway network enhancements. The roadway network improvements identified within the growth concentration area included:

- Improve north-south connections from Patullo Bridge and Marine Way to TransCanada and Lougheed Highways
- Improve access from Highway 91 at Nordel Way to the Surrey City Centre
- Provide a new river crossing over the main Arm of the Fraser River from Fraser North to Fraser South

- Provision of an improved connection from Highway 17/99 to Highway 15/Highway 1 via the South Fraser Perimeter Road
- Improve east-west connection between Mary Hill Bypass/Highway 1 to Queensborough Bridge/Marine Way North Fraser Perimeter Road
- Provide new arterial and widen existing arterials to serve developments.

These recommendations contributed toward the work undertaken as part of the Lower Mainland Highway Improvement Outlook and remain a central part of the provincial transportation strategy along with supporting alternative modes.

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APPENDIX B

LOWER MAINLAND HIGHWAY SYSTEM REPORT

Lower Mainland Highway System Report

The Lower Mainland Highway System Report (LMHSR) is an integrated transportation development strategy designed to support and further the regional growth objectives found in the LRSP. The report represents the culmination of several constituent transportation studies, the results of which have been integrated and further evaluated to form a broad level transportation strategy for Greater Vancouver. It provides for coordinated development of public transit services, the regional highway network and major municipal streets in the Greater Vancouver area. The LMHSR is summarized in two separate reports as follows:

The Lower Mainland Highway System Report - A Draft Strategy for Integrated Provincial Highway Investments in the Lower Mainland Region (March 1997).

This document provides the context in which the LMHSR was prepared and gives an overview of the strategy. It is an independent evaluation based on the conclusions drawn from the four constituent studies and six technical studies that were carried out as part of the report preparation. As the goal of the LMHSR was to produce a long term vision for the highway network in the Greater Vancouver area, the recommendations of the constituent studies provided the background for an integrated evaluation of transportation strategies. It defined recommended investment strategy for highways needed in the 10 year (2006) and 25 year (2021) horizons. This was done on a corridor by corridor basis with priority indication where possible.

The Lower Mainland Highway System Report - Assessing the Options - A Draft Strategy for Integrated Provincial Highway Investments in the Lower Mainland Region (March 1997)

This document summarizes the approach, methodology, findings and recommendations of the four constituent studies which served as the background to the System Report. It presents the recommended components of the LMHSR in a 10 year investment strategy consistent with the long term direction.

With respect to the TCH corridor itself, the report underlines the importance of the corridor and identified several areas of deficiency - some of which are presently in the process of being addressed. For the Port Mann area of the TCH, the report acknowledged the apparent need for increased effective capacity, but raised two major issues that require further consideration. The first issue is the impact of the timing of the Port Mann Bridge expansion on regional growth targets and travel behaviour (i.e., would widening of the Port Mann Bridge and TCH with general purpose lanes encourage growth east of the river crossing and into the Valley area? Does this improvement foster increased SOV travel and detract from initiatives to encourage greater transit usage?). The second issue relates to the cost of bridge replacement and related works along corridors serving the TCH in light of ongoing Provincial Debt Management policies (i.e., can other transportation solutions be used to defer investment at the bridge site?).

Lower Mainland Highway System Report Constituent Studies

During the preparation of the LMHSR, a series of four constituent studies were undertaken. A detailed list of those reports and other background studies is provided in Appendix B. An outline of the contents of the most recent works and how this relates to the Central Fraser River Crossing Study follows below:

Trans Canada Highway Corridor

Two technical studies were prepared as part of the LMHSR for areas to the east and the west of the Cassiar Tunnel site respectively:

a) Cassiar to Abbotsford Section (Delcan, December 1995)

The study of the eastern portion of the TCH is directly relevant to the Port Mann Bridge. As part of this review, several transportation options that could potentially serve critical travel demands across the Fraser River were identified and evaluated using the Multiple Accounts Evaluation (MAE). The conclusions drawn from this constituent study and supported in the LMHSR was to widen the TCH from the Grandview Highway to 152nd Street in Surrey to eight lanes - three general purpose lanes and one HOV lane in each direction. The ultimate configuration was recommended as a 10 to 15 year improvement.

An additional feature of this corridor study was a review of the need and general alignment of new crossings of the Fraser River, east of the Port Mann Bridge. The Barnston Island Crossing was recommended as the appropriate alignment for the long term improvement. It was indicated, however, that further investigation of the other alternatives was required before finally selecting a preferred alternative.

b) Horseshoe Bay to Cassiar Section (NDLC/Hull, November 1995)

The western portion of the TCH technical studies identified a preferred program of interchange upgrades and ultimately, an additional structure at the Second Narrows crossing. Other than as representing competition for funding, the recommendations have minimal impact on the Port Mann area of the TCH. The timing of those particular improvements, while a long term need, would have some impact on the overall corridor travel demands and therefore, the widening of the TCH to the east of the Cassiar Tunnel.

South West Sector and Fraser River Crossings (RCPL, July 1995)

The constituent studies indicated that additional capacity across both the North Arm of the Fraser River near Queensborough and the South Arm at the George Massey Tunnel was required to encourage and serve HOV travel. As part of the 10 year investment strategy, HOV lanes were identified along Highway 99 between the George Massey Tunnel to the Oak Street Bridge and on Highway 91 from Nordel Way and Highway 99 (Richmond). These conclusions were supported in the overall evaluation for the LMHSR, and incorporated within the 10 year Highway Investment Strategy. The longer term strategy included several key improvements which were identified as follows:

- HOV lanes on Highway 99, from 8 Avenue in White Rock to the Oak Street Bridge, including a new facility across the South Arm of the Fraser River
- Modifications to the interchange of Highways 99/17
- Construction of a four lane crossing of the North Arm of the Fraser River to connect Highway 91 Extension and Marine Way, or the Tree Island Crossing

East-West Sector Corridor (1995-96)

The South Fraser Perimeter Road (SFPR) was identified as the preferred option serving major east-west interregional trips as well as the movement of goods for long distance transport through and to the local area between Highway 1 and Highway 99. As part of the 10 year investment strategy, it was recommended that the SFPR be constructed to a two lane arterial standard between Highway 91 and Highway 1. Outstanding issues related to the cost sharing agreement and other environmental and land use impacts were identified as key features for the next stages of planning in order to confirm commitment toward this transportation solution.

As part of the longer term strategy (beyond 15 years), it was indicated in LMHSR that continued development of the two lane arterial standard between Highway 1 and Highway 99 was a priority. Upgrading the facility to a four lane expressway was identified within the ultimate horizon year connecting the key corridors of Highway 1 and Highway 99. To complement this improvement, upgrades to intersections along Highway 10 and the eventual widening to a four lane arterial standard was also identified as part of the long term strategy.

It was also concluded that the improvements to the SFPR were required, independent of the Port Mann Bridge/TCH direction. It was recognized, however, that this corridor, along with Highway 91 and the Tree Island Crossing, could be an alternative strategy serving travel demands for an interim period.

The HOV Network (PBQD, IBI, Pacific Rim, July 1995)

The HOV Network Study was developed as a strategy to increase transportation choice for commuters in Greater Vancouver and to manage congestion by providing incentives for carpooling and vanpooling.

This technical study identified potential candidate corridors for HOV lane construction and/or conversion, and evaluated the benefits and costs in the context of the overall regional plan. Of the many corridors segments reviewed, a list of suggested short, medium and long term improvements was prepared together with an estimation of costs. The work was coordinated with the other constituent studies underway at the time. Some of the short term recommendations made have already been initiated, including those for parts of the TCH corridor.

The Province is currently evaluating plans for an HOV network in the Lower Mainland as a follow up to this constituent study. This subsequent work has been focused on evaluating the role of the HOV network within the overall planning in the Lower Mainland, the market emphasis in terms of project priorities and integration of the HOV network with the provincial investment strategy. The results produced from this review will ultimately lead toward the development of a network strategy that will serve as input toward the overall strategy for managing congestion in the growth concentration area.

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APPENDIX C

MAJOR ROAD IMPROVEMENT PROGRAM: TRANS CANADA HIGHWAY CORRIDOR IN GVRD GROWTH CONCENTRATION AREA

This initiative is essentially focused on developing a program of network improvements to manage congestion in the GVRD's Growth Concentration Area — namely the Burrard Peninsula as well as the northern parts of Delta and Surrey. The LMHSR identified potential major road improvements throughout this area that have formed the basis for proceeding with this initiative.

The focus of the initiative is to support and build upon the principles outlined by the LRSP, Going Places, Transport 2021 and the LMHSR, and investment priorities for the future. Although it is indicated as a separate program from the HOV/Transit Priority Network, Regional Trip Reduction and Traffic Management Strategy, all improvement options developed as part of the Major Road Improvement Program will be developed with elements of these other programs taken into consideration.

The focus of program development for the next few years will be to determine the potential effectiveness of improvement options to relieve congestion and divert traffic away from Highway 1 in the short to medium term, thereby deferring the need for major capacity improvements and capital investments on the highway. However, short to mid term improvements will also be assessed in terms of their compatibility with the long term options so as to

maximise their useful life.

1.0 PROGRAM SCOPE & STUDY AREA

Program development will entail examining system level and corridor improvement alternatives that:

- improve traffic flow through the Cape Horn Interchange
- improve connectivity between the TCH and Highway 91 by developing regional roads that will provide an alternative for TCH traffic, (i.e; South Fraser Perimeter Road, Nordel Extension, Hwy 10 improvements)
- improve connectivity between local roads to reduce the number of short trips on the TCH, (i.e; North Fraser Perimeter Road, Stormont McBride Connector, Tree Island Crossing and/or Queensborough Bridge Interchange improvements).

The study area for the project approximately extends from Highway 91 and Burnaby to the west, Pitt River and Langley to the east, Highway 7 to the north and Highway 10 to the south.

The proposed process for program development is separated into four phases:

PHASE A - Existing & Base Conditions

PHASE B

Corridor Studies

New Westminster Corridors

Highway 7 Corridor

Highway 10 Corridor

South Fraser Perimeter Road and Nordel Extension

Cape Horn Area Network

PHASE C - Project Development

PHASE D - Program Development

2.0 PHASE - A EXISTING & BASE CONDITIONS

The first phase of program development will be a technical analysis using the GVRD's EMME/2 Transportation Model to define the existing and projected base transportation conditions in the study area for the years 1996, 2006 and 2021. The base projections will include only committed transportation improvements identified by the Province and municipalities. This base projections will enable problem definition and represent the scenario against which all candidate improvements will be compared. It will provide a consistent basis for assessing the impacts/benefits of transportation improvements and will serve as the benchmark against which congestion relief in the Growth Concentration Area will be measured.

3.0 PHASE - B CORRIDOR STUDIES

Phase B, will consist of a series of technical corridor planning studies that will define potential improvements along specific corridors and examine the system level service impacts that various configurations of corridor improvements will have in relieving congestion, their costs and other impacts in the Growth Concentration Area. Five corridor feasibility studies will be conducted to:

- examine the functional requirements of each corridor
- identify potential improvements in each corridor in terms of possible alignments and performance standards
- evaluate the technical feasibility of each alternative
- evaluate the desirability of each alternative in terms of benefits versus costs (i.e. financial, service, environmental and social impacts)
- select preferred alternatives

- provide Class C cost estimates for preferred alternatives

This will be done in consultation with affected municipalities.

3.1 New Westminster Corridors Study

This study will address potential new roads and upgrading of existing roads to provide improved connectivity between Highways 1 and 91 on the north side of the Fraser River. The object of the exercise is not only to divert traffic from Highway 1 and the Port Mann Bridge to the Highway 91 corridor, but also to facilitate the removal of regional and provincial traffic from the congested local street system of New Westminster. The New Westminster corridors study will be comprised of two components.

3.1.1 East / West Route - North Fraser Perimeter Road (NFPR)

This component would look at the development of a continuous route along the northern perimeter of the Fraser River, from Marine Way (Burnaby) in the west to the Mary Hill Bypass in the east. The route will principally serve as a high standard east-west corridor for truck traffic as indicated in Transport 2021 and the LMHSR. The study will examine alternative alignments for the corridor, such as the Braid Street connector, and identify a preferred solution based on projected benefits versus costs.

3.1.2 North / South Route - Highway 91 Extension and Stormont-McBride Connector

This component would look at the development of a continuous route between Marine Way (Burnaby) or Highway 91 (Richmond) and the Stormont Interchange on Highway 1 (Burnaby) that would complement the east-west route to be developed in the other component of this study. This will involve consideration of extension or improvement of Highway 91 from the Westminster Interchange in New Westminster (via a possible Tree Island Crossing or upgrading of the existing Queensborough Bridge across the North Arm of the Fraser River) to connect to Highway 1 at the Stormont Interchange in Burnaby via 10th Avenue and the Stormont-McBride Connector as put forward by both Transport 2021 and the LMHSR. This study will also examine the possibility of connecting the Stormont-McBride Connector to Patullo Bridge instead of, or, in addition to Marine Way or Highway 91.

3.2 Highway 7, Boundary Road to Pitt River, Corridor Study

The section of the Lougheed Highway (Highway 7) between Boundary Road and North Road has been identified to accommodate future LRT development between Vancouver, Coquitlam and New Westminster. Immediately to the east, the Lougheed Highway between North Road and the Pitt River has been identified to accommodate HOV lanes. The primary purpose of this study is to consider options for accommodating LRT development and HOV lanes. The component pertaining to LRT development will proceed in conjunction with the planning of the LRT project.

3.3 Highway 10 Corridor Management Study

The LMHSR identified that the main east - west demand for traffic movement between Highways 1 and 91 south of the Fraser River would be best served by the development of a South Fraser Perimeter Road (SFPR). However, the report also recommended that Highway 10 should be upgraded to provide a supporting east - west corridor role. This study will consider various upgrades for the corridor, including four laning, signal optimization, rail grade-separation and access management. These improvements could potentially reduce vehicle travel demands on Highway 1 by providing residents with reasonable access to alternative north-south routes that cross the Fraser River.

3.4 South Fraser Perimeter Road and Nordel Way Study

As noted previously, the SFPR was the recommended option from the LMHSR to serve the regional east - west demand between Highways 1 and 91 south of the Fraser River. This link will also provide alternative routing for Highway 1 traffic across the Fraser River. In this regard, it is anticipated that the SFPR will contribute toward congestion relief of the Growth Concentration Area.

The study proposed here will take the next step in defining the SFPR and give consideration to completion of the Nordel Way Extension as an initial step to improve east-west traffic flows south of the Fraser River.

Significant planning work has already been undertaken with regard to the SFPR and Nordel Way Extension. The proposed study will undertake further preliminary design work to identify and evaluate alternative alignments of the

SFPR at its ends (i.e. connections to Highways 1 and 91), examine outstanding issues associated with the SFPR pertaining to environmental, social, cultural, financial and heritage impacts and mitigation measures, and consider alternative alignments for connecting Nordel Way to 88th Avenue.

3.5 Cape Horn Area Network Study

The Cape Horn Interchange is a critical congestion point within the Growth Concentration Area. Given its proximity to the Port Mann Bridge and its role in connecting Highway 7 to Highway 1, it serves as a focal point for regional and provincial travel north of the Fraser River. The Cape Horn Interchange is now one of the most congested areas in the Lower Mainland. Furthermore, recent infrastructure improvements along the Mary Hill Bypass and at the Pitt River have improved traffic flow along Highway 7 but could result in more concentrated traffic flows reaching the Cape Horn Interchange, exacerbating congestion at the Interchange.

This study will consider potential improvements to the Cape Horn Interchange and its linkages to Highways 1 and 7, and examine the feasibility and cost of providing additional lanes on the existing Port Mann Bridge structure for the purpose of extending the Highway 1 HOV lanes across the Fraser River. The analysis of the existing Port Mann Bridge will require a detailed review of the structure, foundations, deck capability and expansion limitations, as well as an evaluation of the geometric requirements and functional review. To maximize use of improvement expenditures for the long term, the results of this bridge review will provide input into the identification of potential improvements to the Cape Horn Interchange as the ramp configuration may be impacted by the feasibility of expanding the Bridge. The confirmation of the long term need to construct a parallel or twin bridge structure will be needed as part of this study in order to develop the most effective strategy for the Port Mann Bridge and Cape Horn Interchange area.

In order to effectively develop improvements to the Cape Horn Interchange, a longer term view of the crossing requirements of the Port Mann Bridge is needed. Therefore, this study will also examine a limited number of options for the long term requirements related to the construction of a new bridge structure parallel to the existing Port Mann bridge. Central to the study will be to determine the implications of the options for the Cape Horn Interchange.

4.0 PHASE - C PROJECT DEVELOPMENT

This phase will concentrate on the development of project packages that will form the input for Phase D - Program Development. This will primarily entail the consolidation of candidate improvements into project packages that will provide integrated solutions on a corridor and area basis. This will require a detailed assessment of alternative project packages using a multiple accounts evaluation of service, environmental, financial and community impacts.

In order to assess the financial impacts of project packages, this phase will also give consideration to the direct revenue generating capacity of each project package, and the potential to secure contributions from benefiting property owners and other indirect beneficiaries.

4.1 Public Consultation

As part of the project development phase, public consultation will take place. The processes for doing this will be developed prior to this phase in conjunction with impacted municipalities.

5.0 Phase - D PROGRAM DEVELOPMENT

The final phase will be to develop a program for implementation of project packages over the next 7-10 years. This will primarily entail project scheduling taking into account the availability of BCTFA financing/funding and of contributions from other beneficiaries, regulatory approval requirements, and project desirability as assessed during the project development phase.

6.0 PROJECT TIMING

Work is already underway on the preparation of the existing conditions and base projections by Ministry of Transportation and Highways staff that will serve as input to the individual corridor studies.

Due to the number of studies involved in the project, as well as the dynamics of specific study results establishing scope and timing for other studies, project timing will be a complex issue. All of the phases will require 18 to 24 months to complete. The work on the SFPR and Nordel Way Extension may proceed more rapidly due to recent planning work undertaken for these projects.

7.0 PROJECT ADMINISTRATION

Phases A through C will be overseen by a Project Director – South Coast Region Planning Manager – who will provide direction and advice to study teams in terms of issue resolution, scope, schedule and costs. The Director will have spending authority for the contracts approved by the BCTFA and report to a committee of BCTFA and MoTH executives. This Committee will meet with corresponding representatives of municipalities, the GVRD, BC Transit and possibly other agencies to address concerns or issues that have been raised and cannot be addressed at a technical level. It will also provide approval at key stages to the Project Director to ensure that project goals and objectives are maintained, and that the work is coordinated with the HOV/Transit Priority Network and TMP programs. Technical Liaison/Advisory Committees including representatives of municipalities, the GVRD and BC Transit will be established to provide expert advice and direction to consultants and the project teams.

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