

Capital Project Plan: Sea-to-Sky Highway Improvement Project January 10, 2004

1. Background: Current Highway Conditions

The Sea-to-Sky Highway corridor provides access to communities and resources along Howe Sound, including Lions Bay, Furry Creek, Squamish, Whistler, Pemberton, Mount Currie, and ultimately to the interior of British Columbia and beyond along the Duffy Lake Road.

The current predominantly two-lane highway has safety, reliability, mobility and maintenance problems and is facing growing congestion.

- 1. Safety** – High accident rates and severity that significantly exceed provincial averages (between 1996 and 2000, 27 fatalities, 552 injuries and 600 property damage only accidents).
- 2. Reliability** – Recurring delays due to normal construction activities, rock scaling, development, special events, rock falls, debris torrents and other natural events (an average of 405 full and partial closures annually)
- 3. Mobility** – Poor average travel speeds between Vancouver and Whistler, resulting from congestion in urban sections and narrow, winding rural sections (average speed is 55 km/h from Horseshoe Bay to Whistler)
- 4. Maintenance** – High annual operation and maintenance cost for highway (operation and maintenance cost exceeds \$6 million annually)
- 5. Capacity** – Traffic studies indicate that traffic volume will increase by 62% by year 2025 resulting in growing congestion, higher accident levels and longer trip times, if improvements are not made

2. Project Objectives

Extensive improvements to the highway are required between Horseshoe Bay and Whistler to improve safety, reliability, and mobility making travel along the corridor safer for residents, commuters, tourists, and businesses moving goods. Highway improvements will serve population growth, economic development in corridor communities and increasing demand for resident travel, visitor travel and goods movement.

The hosting of the 2010 Olympics has accelerated the need for some improvements in order to accommodate projected traffic levels during the games. Construction of these improvements must be completed prior 2010 Olympics. These improvements would have been needed in any event by 2012, based on projected traffic volume increases.

Improvements will include safety and reliability upgrades such as highway widening, flattening of curves, improved sightlines, passing lanes, wider ditches and shoulders and other measures to reduce hazards. These improvements will employ context sensitive design so as to encourage safe driving practices. For example, motorists will be encouraged to drive at a consistent and safe speed by providing a curvilinear roadway that eliminates or avoids instances where higher speed long straight sections transition abruptly into lower speed short tight curves. It is projected that the number of accidents on the highway will be reduced by 30% from the level that would otherwise occur.

The improvements will also shorten travel times and increase capacity of the Sea-to-Sky Highway. It is estimated that the travel time between West Vancouver and Whistler will be reduced by 15 minutes.

The extent and nature of the improvements will be also based on consultations with corridor residents and communities. These consultations are continuing. The project team has worked with corridor residents, business groups and community leaders to develop a strategy for sequencing construction to minimize disruption, and maximize predictability of travel delays and road closures.

The Sea-to-Sky Highway will be configured as follows upon project completion:

- The section from Horseshoe Bay to Lions Bay (12 kilometers in length) will be four lanes. The project team is engaged in consultations with the District of West Vancouver to finalize the alignment and features of the highway through the community.
- The section through Lions Bay (4 kilometers in length) will be four lanes during the Olympics, with the potential to convert to three (two northbound) or two lanes after the Olympics, pending the outcome of community consultations currently underway.
- The section from Brunswick Beach north of Lions Bay to Furry Creek (15 kilometers in length) will be predominantly two lanes, plus a 3rd lane on the adjacent rail bed during the Olympics. Permanent improvements in this section will include rock slope stabilization, some alignment straightening and expanded passing areas.
- The section from Furry Creek to just south of Darrel Bay (14 kilometers in length) will be three lanes, with some four lane zones.
- The section from Darrel Bay to Depot Road in Squamish (13 kilometers in length) will be four lanes. The project team is engaged in discussions with the Squamish First Nation to finalize highway features through IR 24 and with the District of Squamish to finalize features of the highway through the community, including connections to the municipal road network.

- The section from Depot Road in Squamish to Function Junction in Whistler (41 kilometers in length) will be three lanes, with some four lane zones. No changes will be made to the highway from Depot Road to Culliton Creek (13 kilometers). This section has been recently upgraded to a minimum of three lanes. The section from Culliton Creek to the north end of Cheakamus Canyon (7 kilometers) is currently being widened to three lanes, with some alignment straightening. This work is a separate project that pre-dates the Sea-to-Sky Highway Improvement Project.

3. Project Status

Development of the Project has proceeded along a number of fronts. In addition to undertaking planning and engineering studies, the project team has engaged in consultations with the public, community and business groups, First Nations, municipal officials and regulatory agencies. Some of these consultations have occurred under the auspices of the Environmental Assessment Process applicable to the Project.

The project team has participated in almost 300 meetings over the last two years with groups along the corridor. In addition, the Ministry has commissioned studies regarding transportation alternatives, alternative routes, and socio-economic and environmental impacts, as well as engineering and costing studies, in response to issues and concerns that have been expressed.

The Project submitted an application for an Environmental Approval Certificate on August 13, 2003 and anticipates receiving the certificate by March or April, 2004. Completion of preliminary design is anticipated within the same timeframe.

The preliminary stages of procurement have commenced, including starting construction on a test section south of Lions Bay to gain specific knowledge of geotechnical, constructability and traffic management issues associated with the project, and issuing a Request for Qualifications for construction of the remainder of the section between Ansell Place and Lions Bay. Procurement for the remainder of the project is to be initiated shortly. The award of major construction contracts will occur subsequent to receipt of an Environmental Approval Certificate.

4. Project Costs

The estimated capital cost of the Project is \$600 million, comprised of the following components:

	<u>(\$millions)</u>
Project Management, Consultations/Communications and Procurement	21
Planning, Preliminary Engineering and Quality Assurance (including environmental and First Nations impact studies)	24
Property Acquisition	20
Detailed Design and Construction (including contingencies)	535
Total	<u>600</u>

Preparations for Project procurement have included extensive costing analyses:

- Development of preliminary cost estimates by design teams;
- Review and adjustment of the cost estimates by the Owner's Engineer;
- Development of cost estimates by an independent cost estimating specialist and comparison and reconciliation of these cost estimates with those of the Owner's Engineer;
- Inclusion of substantial contingencies in the cost estimates; and
- Probabilistic risk analysis to determine an expected range of project costs.

A review by the Auditor General concluded that thorough costing methodology and procedures was used to develop the cost estimate for the Project.

5. Project Benefits

Following completion of construction, the improved highway is expected to generate significant benefits. Over the period 2010 to 2025, highway users are expected to realize benefits in the order of \$873 million.

Travel Time Savings	\$276 million
Vehicle Operating Cost Savings	\$80 million
Accident Cost Savings	<u>\$517 million</u>
Total Road User Benefits	\$873 million

The improvements will also stimulate tourism throughout the corridor, benefit the forest and agricultural sectors and facilitate new developments. The estimates of incremental economic benefits include \$297 million in GDP and 6,000 new jobs.

6. Project Risks

The Project is complex and challenging because of:

- The tough terrain it traverses;
- The need to keep a large volume of traffic flowing (currently an average of 14,000 cars per day, with peaks of 16,000 cars per day) while working in a constricted environment;
- The need to address a number of municipal, First Nation and environmental issues; and
- The unalterable schedule for completing the job.

These factors largely coincide with the main risk areas that may impact the budget. The Ministry of Transportation is confident that these risks can be successfully managed.

1. **Geotechnical Risk:** This risk arises from the possibility of encountering unforeseen ground or rock conditions. As such, it is a source of budget risk. Measures to mitigate this risk include:
 - Undertaking substantial geotechnical investigations, including undertaking construction on a test section,
 - Adopting contracting practices that will transfer geotechnical risk to contractors.
 - Developing cost estimates that take this risk transfer as well as the results of the geotechnical investigations into account.
2. **Traffic Management Risk:** The project team, based on advice from experts (including experienced contractors), and in consultation with

stakeholders in the Sea-to-Sky Highway corridor, has developed a traffic management regime that contractors will need to adhere to. This regime stipulates available time periods for closing the highway to undertake required construction activities. The traffic management regime will be a major factor that contractors will take into account in preparing their bids. As such, it is a source of budget risk. Measures to mitigate this risk include:

- Obtaining independent expert advice.
 - Developing cost estimates that take into account the traffic management regime and commissioning independent costing analyses as described above.
 - Gaining specific knowledge of constructability and traffic management issues during construction of the test section.
 - Requiring contractors to provide full traffic management plans consistent with the stipulated traffic management regime, and review of these plans by experts.
 - Incorporating appropriate incentive structures in contracts to encourage effective traffic management.
3. **Schedule Risk:** The project team will incorporate terms within contracts to ensure the Project is completed by the Fall of 2009. These terms will be a major factor that contractors will take into account in preparing their bids. As such, they are a source of budget risk. Measures to mitigate this risk include:
- Obtaining independent expert advice.
 - Obtaining input from short-listed contractors during procurement.
 - Requiring contractors to provide full schedules, with milestone dates for completion of work components, and review of these by experts.
 - Extensive progress monitoring by the project team to allow early identification of any schedule issues and provide the opportunity for discussions with contractors to identify methods of rectifying schedule problems, before they become unrecoverable.

**Further information on the Project can be found at:
www.seatoskyimprovements.ca**