

NORTH DELTA TUNNEL COST ESTIMATE – SFPR NORTH DELTA COST ESTIMATE

The Sunbury Neighbourhood Association’s Annacis Island tunnel concept was analyzed and determined not to be feasible for the following reasons:

- Potential interference with the foundations of the Alex Fraser Bridge;
- Potential interference with the ship berths at the Fraser Surrey Docks
- Major construction challenges to ensure that the tunnel does not impede existing and future shipping channels on the Fraser River;
- Major construction challenges for the tunnel portals and decline sections of the tunnels due to poor ground conditions;
- Major soil liquefaction risks under earthquake conditions due to the existing sandy soils;
- Major differential movement and buoyancy risks in the tunnel sections under earthquake conditions;
- Significant environmental mitigation due to impacts to the Fraser River foreshore;

The Gateway program conducted a high level feasibility study of other North Delta Tunnel options including the approximately 5 kilometre tunnel concept proposed by Mr. Greg Hoover and Mr. Olav Naas as well as a 4 kilometre tunnel option developed by the Gateway Program. Both options were determined to be technically feasible, but at significant cost.

The cost table below includes the estimated capital cost to construct a road tunnel, either the Hoover and Naas option or the Gateway option, and is estimated to cost between \$450 million and \$560 million depending on the option.

Please Note: These costs do not include; design engineering, property acquisition, project management, contractor costs, environmental mitigation, or operations and maintenance costs. These other cost elements would likely increase tunnel costs up to 40% over the \$450 to \$560 quoted above. In addition it must be noted that operations and maintenance costs for a tunnel of this length would require significantly higher operation and maintenance costs than a comparable section of open roadway.

The following table summarizes the construction cost estimates for the two North Delta Tunnel concepts:

Cost Element (Bored Tunnel)	Hoover and Naas Tunnel Option	Gateway Tunnel Option
Mobilization and Demobilization	\$3,000,000	\$3,000,000
Tunnel portals	\$500,000	\$500,000
Tunnel boring, excavation & disposal of material	\$190,000,000	\$152,000,000
Pre-cast concrete tunnel liner segments	\$206,000,000	\$165,000,000
Road deck, concrete edge barrier, utility duct	\$27,000,000	\$22,000,000
Drainage and drainage retention sump	\$400,000	\$300,000
Incident management control centre	\$2,000,000	\$2,000,000
Ventilation ducts and equipment	\$1,900,000	\$1,500,000
Lighting, signals and communication	\$3,000,000	\$2,200,000
Electricity and emergency power	\$2,400,000	\$1,900,000
Fire detection, monitoring and fire suppression	\$1,900,000	\$1,500,000
Sub total	\$438,100,000	351,900,000
20% Contingency	\$88,000,000	\$70,400,000
Total	\$526,000,000	\$422, 300,000

Following is the cost estimate for the comparable section of the South Fraser Perimeter Road. This figure includes all other costs not included in the above tunnel estimate. These other costs include; property acquisition, environmental mitigation, engineering and design, project management and construction management and contingencies.

Cost Element South Fraser Perimeter Road – N. Delta section	North Delta Section
Roadways	\$21,300,000
Structures	\$56,000,000
Utilities	\$4,700,000
Operational Construction	\$2,100,000
Property	\$38,600,000
Design, Project & Construction Management (including preliminary and detailed design)	\$21,600,000
Project Management Services (Project management office, pre-design services)	\$11,000,000
Other costs including contingencies	\$31,300,000
Total	\$186,600,000