



## 2008 GLOBAL EXCELLENCE AWARDS

### Location

Vancouver,  
British Columbia,  
Canada

### Client

Ministry of  
Transportation,  
Province of British  
Columbia

### Project Manager

Geof Stock

### Delcan Staff

130

### Managed Firms

55

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## VANCOUVER GATEWAY PROGRAM HIGHWAY AND BRIDGE NETWORK

The Gateway Program represents a bold and ambitious leap forward for the Vancouver region's highway network. Program scope comprises new highways along the north and south sides of the Fraser River to provide easy access to numerous port and handling facilities, improvements to the Trans-Canada Highway, and twinning of the Port Mann Bridge crossing the mighty Fraser.

British Columbia's Lower Mainland lies in the Fraser River delta, a verdant ribbon of mostly flat terrain. It is rich farmland, has an abundance of wildlife, and is historically complex with a variety of native peoples having roots there. One can just imagine the challenges that this presents. In many areas, road rights-of-way must be preloaded with fill for a year or more before the real construction begins, to force the deep compaction of silts and peat that could otherwise turn a new road surface into a roller coaster. Bridges must be founded on friction piles hundreds of feet in length. If this were not enough, the Lower Mainland has more than its share of environmental challenges.



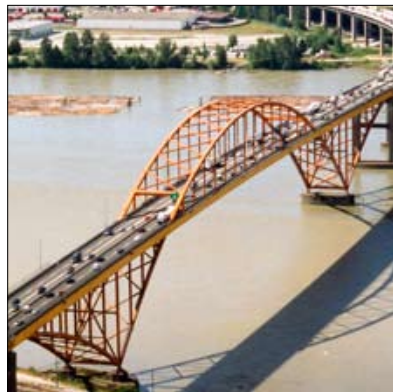
### The Gateway Program is comprised of three projects:

The **South Fraser Perimeter Road (SFPR)** project, approximately 40 kilometers long, is a proposed new four-lane, 80 kilometer per hour route along the south side of the Fraser. With connections to the Trans-Canada Highway, the major north-south links to the US and the future Golden Ears Bridge, the new route will benefit the trucking industry, commuters and tourists accessing borders, port facilities, rail yards, and the BC Interior. Construction value is likely to exceed \$1 billion and consideration is being given to delivering the project through some form of Public Private Partnership (PPP). This project has encountered the greatest environmental hurdles in the program. These



include Burns Bog, which is the largest domed peat bog on the West Coast of North America, covering an area of about 40 square kilometers. This unique, protected ecosystem sustains a wide variety of flora and fauna, including 150 bird species and 24 species of mammal, including the endangered pacific water shrew. Among other environmental concerns were cranberry farms, a sensitive water table, and alignment constraints where existing facilities along the river's edge leave little room for a new highway without affecting heritage sites and salmon spawning creeks.

The **North Fraser Perimeter Road (NFPR)** is a set of proposed improvements to existing roads along the north shore of the Fraser River, to provide an efficient, continuous route between the Queensborough Bridge in New Westminster and TransLink's new Golden Ears Bridge in Maple Ridge/Pitt Meadows. The **Pitt River Bridge** will connect the north shore of the Fraser with the Maple Ridge area. The new \$200 million cable-stayed bridge will have 3 lanes of westbound traffic and 4 lanes of eastbound traffic on opening day. It will also provide up to 16 metres of vertical marine clearance, as well as providing facilities for cyclists and pedestrians.



The **Port Mann / Highway 1 (PMH1)** project is the crown jewel of the Gateway Program, mainly because it will twin the Port Mann Bridge. Built in 1964, this is a steel tied arch bridge that consists of three spans with an orthotropic deck carrying five lanes of Trans-Canada Highway traffic, with approach spans of three steel plate girders and concrete deck. The total length of the Port Mann is 2093 m (6867 ft.), including approach spans. The Port Mann Bridge carries more traffic daily than any other in the Vancouver area, and is now congested for 13 hours a day. In addition to twinning the bridge, this project will add lanes

and improve intersections along a 37 kilometer stretch of the Trans-Canada Highway. The pre-design concept for the project is based on predicted population and economic growth and associated transportation demands through 2031. It includes demand management and congestion-reduction measures such as HOV lanes, transit and commercial vehicle priority access to highway on-ramps, improvements to the cycling network and electronic tolling on the Port Mann Bridge. The proposed new Port Mann Bridge will be built to accommodate light rail transit in the future. Construction value is estimated at \$1.5 billion and the project is currently being tendered as a Design-Build-Finance-Operate (DBFO) to be paid for through toll revenue.



### **Client Impact/Value**

The Gateway Program is the largest infrastructure program undertaken by the BC Government to date. The use of a DBFO delivery model for PMH1 also makes a bold statement that the government is committed to finding solutions without holding taxpayers to ransom.

### **Industry Impact/Value**

The magnitude of the Gateway Program will be good for business in BC, notably in the engineering services and road and Bridge construction sectors. Gateway will help the construction industry to maintain its momentum for many years to come.

### **Community Impact/Value**

There has been tremendous debate since the Gateway Program was announced, some enthusiastically supportive and some condemning. Public consultation programs are proving effective at communicating the goals of the Gateway Program and understanding and addressing stakeholder and community issues and needs. The Program will certainly make it easier for residents and commuters to navigate the highway network, and for trucks to move between coastal port facilities and inland highways. An improved highway network is a necessity if gridlock is to be avoided. Gridlock increases fuel consumption and air pollution, it forces highway traffic onto neighbourhood streets, and it leads to lost time at home and frayed nerves. Overall, the Gateway Program will benefit the cost of living and quality of life throughout the region.

### **Areas of Innovation**

The Gateway Program allowed Delcan to demonstrate its ability to innovate. We can take credit for such things as:

- Drilling programs and test piles – to understand and reduce subsurface risk to bidders
- EMME2 project model – a necessary region-wide update.
- Micro-simulation –to understand the operational characteristics and develop requirements for the Trans-Canada highway.
- Major bridge concepts – extradosed, cable-stayed, suspension
- Cost Manager – a cost analysis tool for manipulating MS Excel capital cost estimate data in MS Access.
- Task Manager – a timekeeping and invoicing database application for an integrated team.



- Resource-based work planning – a fundamental planning tool for programs.
- Tolling systems – assistance in tolling policy development, and development of state-of-the art tolling infrastructure and operations requirements.
- Requirements development - assistance in the development of operations and maintenance and hand-back standards that allow flexibility to PPP partners to develop and implement effective solutions.