



Transportation Highways and Bridges

Client

British Columbia Ministry of
Transportation and Infrastructure

Location

Vancouver, British Columbia,
Canada

Pitt River Bridge and Port Mann Bridge

Project Highlights

- Technical support for design and construction of two new bridge structures near Vancouver, British Columbia
- Design-build project delivery

CH2M HILL is assisting the British Columbia Ministry of Transportation as the prime contractor in the design and construction of two new bridge structures that replace existing, outdated bridges. CH2M HILL is also a subcontractor to Delcan Corporation for program engineering services for one of the bridge contracts.

Pitt River Bridge

The Pitt River Bridge and Mary Hill Bypass Interchange Project is a new bridge to replace two existing swing bridges and an interchange to replace the Lougheed Highway and Mary Hill Bypass intersection. The new bridge will eliminate the current counter-flow system, and allow the bridge's seven lanes to be allocated as general-purpose lanes or as a combination of general-purpose and high occupancy vehicle (HOV) lanes. The design also allows for one lane to be added in the future. This additional lane could meet future demand for vehicle use (HOV, buses, and/or other vehicles) or light rail rapid transit.

CH2M HILL provided technical support for project justification, funding application, business case development, reference concept development, procurement documentation, and procurement management, and led contractor negotiations leading to successful contract execution for this \$198-million design-build project. This effort included design leadership and project management for the road, bridge, and deep foundation reference designs; CH2M HILL also prepared contract conditions, assembled geotechnical baseline data, coordinated environmental compliance requirements, and provided ongoing design review and field support for the owner's staff during construction.

The initial concept design involved a multi-span, steel box girder bridge as the likely economic structure type, with five piers. As the team moved from concept development to developing project technical schedules, senior reviewers identified that, while a cable-stayed or "extradosed" bridge design was technically feasible for this span, conventional thinking suggested it would not be cost-effective compared with the steel box girder design. In addition, the flight path for the nearby Pitt Meadows Airport was potentially in conflict with the cable-stayed design, and clarifying this issue would require Transport Canada application and review.

Application was made to Transport Canada for the flight path implications of the cable-stayed, extradosed bridge towers. Transport Canada permitted the design, which had a further advantage by reducing the number of river piers

from five down to two, a major ecosystem benefit. Working together, the CH2M HILL team facilitated considerable innovation, cost-effectiveness, and environmental benefit to the project.

Port Mann Bridge

CH2M HILL provided procurement, technical advisor, and program engineering for the Port Mann Bridge/Highway 1 project, which includes widening Highway 1, replacing the existing five-lane Port Mann Bridge across the Fraser River with a 10-lane structure, upgrading 17 interchanges, and improving municipal streets crossing the corridor.

CH2M HILL provided a variety of services for this project through collocating key staff with the British Columbia Ministry of Transportation and Infrastructure's executive team. Specific services included:

- Risk identification, assessment, mitigation, and allocation
- Business case development, economic analysis, and cost-benefit value evaluation of the initial public-private partnership
- Management of cost estimate preparation
- Development of reference concepts
- Support for the environmental assessment (EA) and commercial and risk-allocation aspects of the Concession Agreement
- Development of Project Agreement technical schedules and output specifications
- Development of performance-based procurement documentation to support the multidisciplinary teams developing the overall Request for Proposals (RFP)
- Provision of contract administration during the construction phase

The \$2.5-billion, design-build project included a 10-lane bridge design, plus removal of the 40-year-old existing bridge structure, effectively providing the Province with a newer, safer bridge structure. CH2M HILL is serving as the Province's representative through project implementation, is part of the implementation team, and is currently advising the Province on a tolling and operations strategy. CH2M HILL personnel are also working with constructors and overseeing safety issues, work schedule, and traffic management during implementation.

The project challenges include extensive traffic issues, property acquisition requirements, stakeholder and community relations, and accommodations for businesses, other highway infrastructure, and rail lines. CH2M HILL helped the Province in issuing an RFP and technical requirements, and negotiated operations and maintenance contract amendments and arrangement for the ongoing maintenance on this active corridor.