Port Mann/Highway 1 Improvement Project

Project lead: Keith Holmes
Client: Kiewit/Flatiron General Partnership
Location: Vancouver to Langley, BC
Project value: $2.8B

Project overview
The Port Mann/Highway 1 design-build project was a five-year upgrade to the transportation infrastructure in Metro Vancouver that included the construction of a replacement 10-lane cable-stayed toll-bridge across the Fraser River. The onshore element of the project included widening of 37 km of freeway, which involved laying 1,500,000 m² of new pavement and 800,000 m² of overlay, upgrading 11 major freeway interchanges, replacing 34 freeway bridges and rehabilitating a further eight bridges, construction of over 20 lightweight fill embankments and more than 80 retaining walls together with construction of over 200 culverts and 750,000 m² of ground improvements. There were also environmental compensation works, hundreds of utility relocations and protections, and signage and lighting works. All of this project activity occurred between the McGill Interchange in Vancouver and 216 Street in Langley, which is the most congested element of Highway 1 in British Columbia.

WSP’s role on the project
WSP, in joint venture with Hatch Mott MacDonald and supported by over a dozen sub-consultants, was responsible for the onshore design of the project, which included the whole gamut of transportation design and management services including construction review and certification.

Challenges and innovation
The project required a complete redesign of the complex Cape Horn Interchange at the west end of the Port Mann Bridge to simplify the interchange and improve safety and efficiency for all traffic movements. Key criteria successfully addressed include: soft soils where settlement and seismic induced liquefaction were mitigated; the design of the whole alignment within a three dimensional digital model; and the completion of the design within budget and ahead of the construction schedule.