

EXPANDING THE REALM OF POSSIBILITY

Sea to Sky Highway 2010 Winter Olympics




David Hein, P.Eng.
Principal Engineer
Vice-President, Transportation



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Vancouver to Whistler

- Sea-to-Sky Highway 
- 115 km (72 miles) in length
- 5th most beautiful highway in the World – UK's *The Guardian*
- AADT Squamish - Vancouver
13,000 vpd - 2005
22,000 vpd - 2025
- AADT Squamish – Whistler
8,000 vpd - 2005
12,000 vpd - 2025

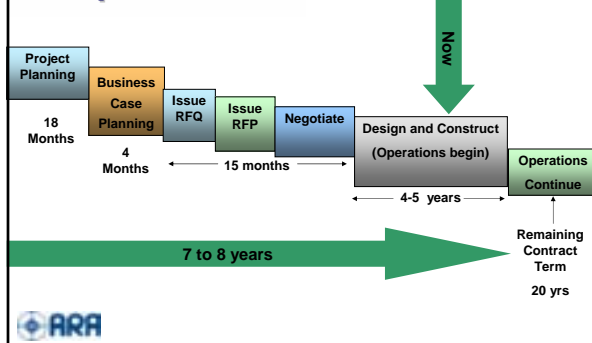



Background

- Undivided highway is built on a steep cliff on the coastal mountains overlooking Howe Sound
- Many motorists have died due to inclement weather, poor visibility or drunk driving
- Local media label the roadway as the “Drive-to-Die Highway”
- As part of the 2010 Winter Olympics bid, Public/Private/Partnership used to upgrade the roadway to increase safety, reliability and capacity



Project Development & Completion Timeline



Project Bid Structure

Available Funding - \$600 M

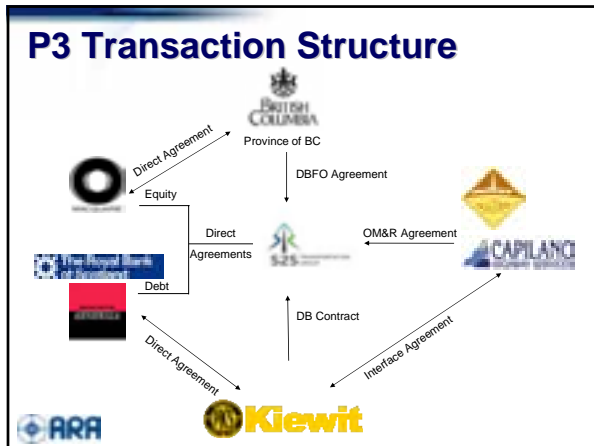
- Proposal evaluation based on improvements over minimum project requirements and below Province Objectives –
- Points
 - Safety Improvements 350 pts
 - Mobility Improvements 250 pts
 - Construction Traffic Management 100 pts
 - Handback Value 100 pts
 - Environment 100 pts
 - Commercial & Financial 100 pts
- Maximum Points Available 1,000 pts



P3: Design-Build-Finance-Operate

- Primary Team:
 - Macquarie (Concessionaire)
 - Kiewit (DB Contractor)
 - Hatch Mott MacDonald (Design)
 - Miller-Capilano (OM&R)
- Design/Construction:
 - 4 years
 - 65 of 100 km (40 of 62 miles)
- Operate/Maintain/Rehabilitation:
 - 25 years
 - +100 km (+62 miles), ramps sideroads, etc.







P3 Investment Highlights

Well Structured

- Stable and Predictable Revenues
 - Limited traffic risk
 - Payments
 - 80-85% availability
 - 10-15% traffic usage
 - 2.5% bonus
 - end of term payment
- Provincial land
- Direct agreement between Province and Lenders




P3 Investment Highlights

Appropriate Risk Allocation

- Protection against loss of revenue:
 - Traffic revenue risk
 - Small proportion of overall payment
 - No competing roads
 - Shadow toll means no driver disincentive to use road
 - 80-90% derived from existing traffic levels
 - Modest growth assumptions



Design Build Scope - \$500M

- 41 Bridges
- 105 MSE Retaining Walls
- Earthworks (2,500,000 m³ - includes over 1,200,000 m³ of rock)
- Asphalt Paving (420,000 tonnes)
- Over 370 major pieces of equipment
- Simultaneous construction at up to 15 locations



Project Constraints

Coastal Mountains

Existing Highway

Existing Railway

Ocean

































Weather Issues

- Vancouver (relatively mild)
 - Temperature Range -18 to +33°C (0 to 92°F)
 - Snow up to 40 cm/year (16 inches)
 - Rain up to 90 mm/day (3.5 inches)
 - Annual rainfall typically 1,155 mm (23 inches)
- Whistler (alpine)
 - Temperature Range -30 to +40°C (-22 to 104°F)
 - Snow up to 175 cm/year (6 feet) – upper elevations typically more than 3 m (30 feet)
 - Rain up to 80 mm/day (3.2 inches)
 - Annual rainfall typically 725 mm (28.5 inches)



High Winds



Weather Issues – Debris Flow



High Rains - Rock Slide – 2007



Drill and Blast On Road









Shannon Falls looking South

Darryl Bay - Rock Cut








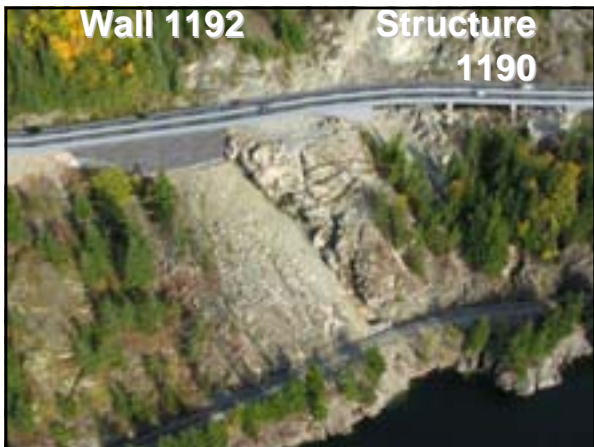




 **1190 Structure**







1193 Structure

Step 1 – Survey & Clear




Step 2 – Develop Wall Footing Profile



Step 3 – Concrete Footing & Retaining Wall



Step 4 – Install and Connect Soil/Rock Anchors



Step 5 – Install MSE Wire Walls



Step 6 – Concrete Coping Wall & Pavement Structure









 **1208 Structure**



 **1208 Structure**



 **1208 Structure**



1208 Structure



1208 Structure







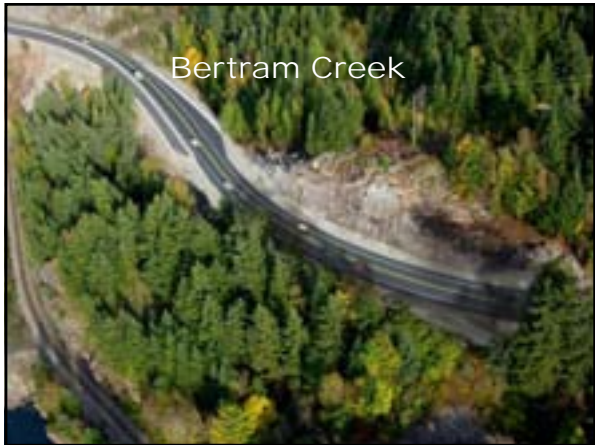












Bertram Creek



Windy Point

Sea-to-Sky Highway End Result

- Enhanced Safety
- Increased Capacity & Reliability
- Excellent Construction Traffic Management