



TRANS MOUNTAIN PIPELINE SYSTEM

OIL SANDS PRODUCT FORUM
APRIL 16, 2013

Trans Mountain Pipeline



Current Operations

- Operating since 1953
- Capacity: 300,000 bpd
- 715 miles between Edmonton and Burnaby
- Ferndale and Anacortes
- Transports refined products, heavy and light crude oils including dilbit
- Last expanded in 2008

Proposed Expansion

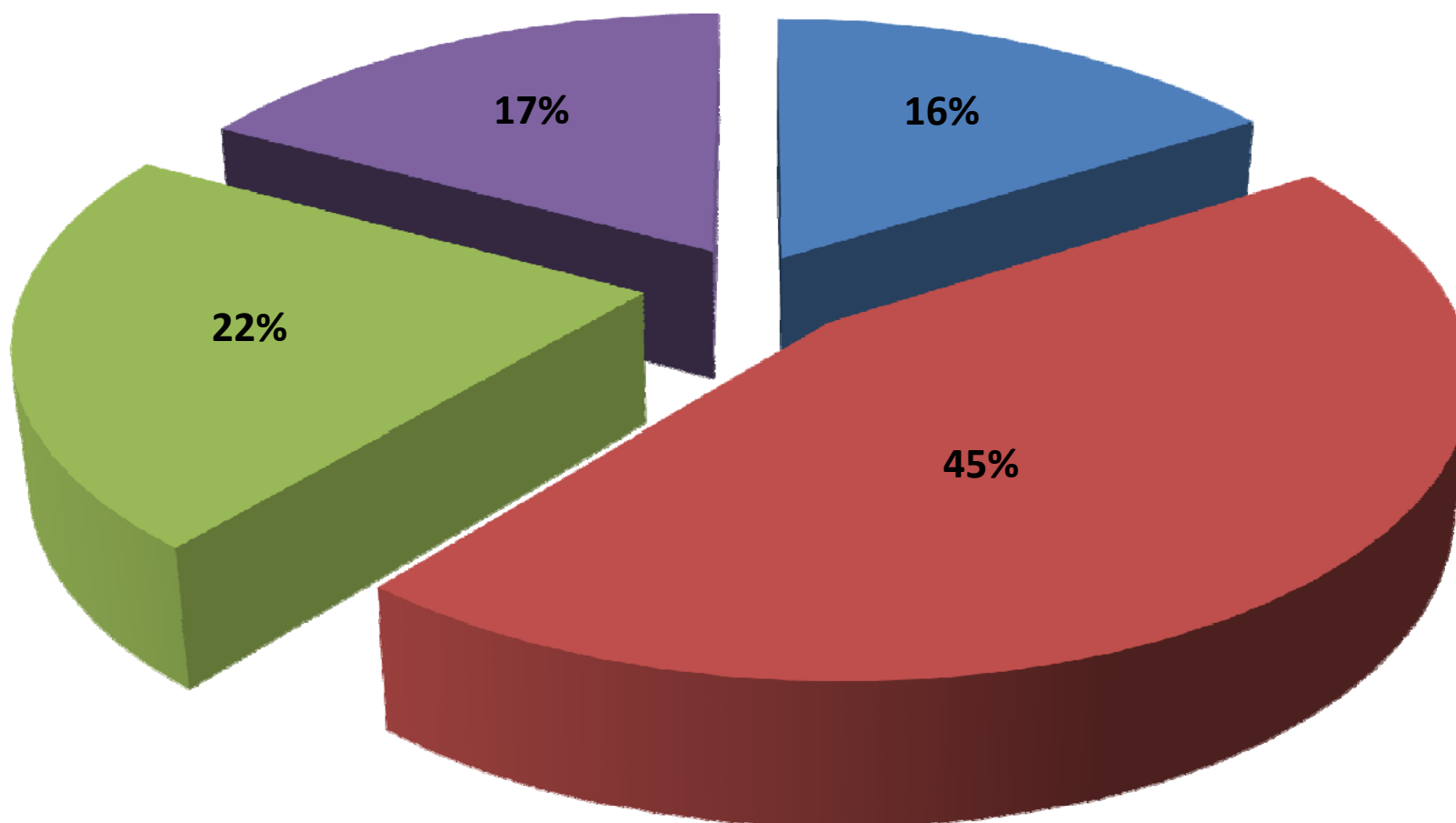
- Expand capacity to 890,000 bpd
- Customer contracts for ~ 700,000 bpd on 15 and 20 year terms
- Increased demand from U.S. west coast and Asia – drives need for additional capacity to Washington refineries and Westridge Marine Terminal
- Twin remaining 620 miles of pipeline
- Increase pumping capability
- Increase storage capacity
- Increase Puget Sound pipeline capacity
- Add 2 tanker berths
- Increase in tanker traffic - not tanker size

TMPL Throughput 2012



2012 Trans Mountain Pipeline Throughput by Product Type

■ Refined Products ■ Light Crude ■ Heavy Crude ■ Synthetic Crude

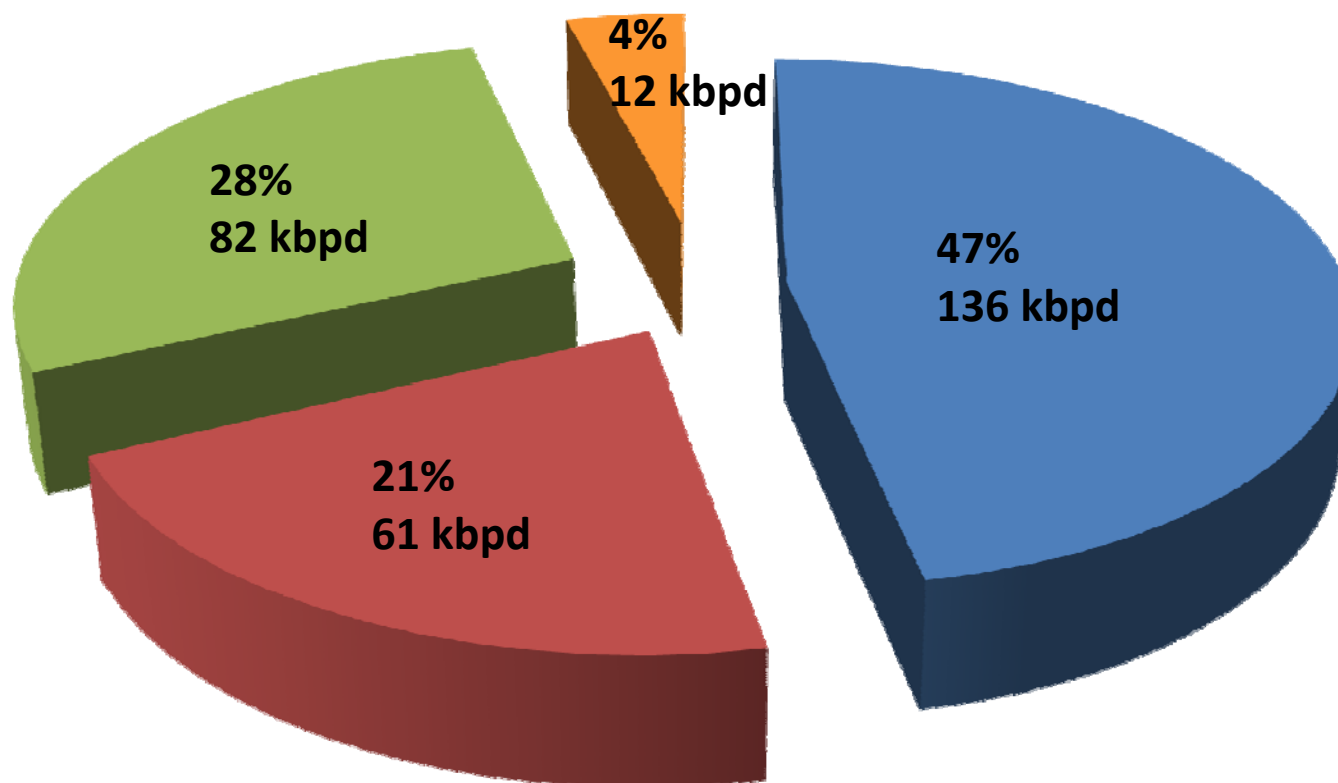


TMPL Throughput 2012

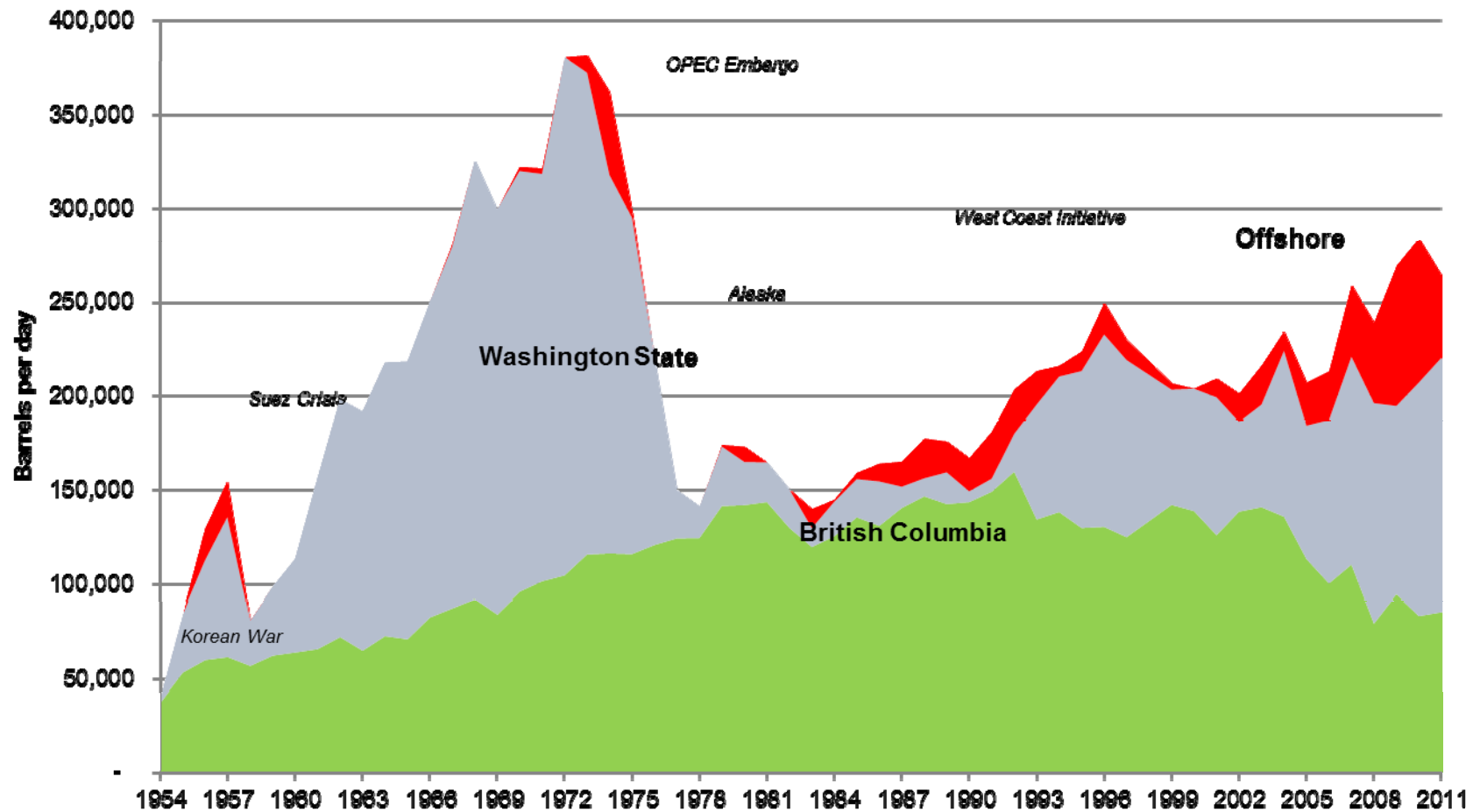


2012 Trans Mountain Pipeline Throughput by Destination

■ Puget Sound ■ Westridge ■ Burnaby ■ Kamloops



Product Destination – History to 2011



Puget Sound System

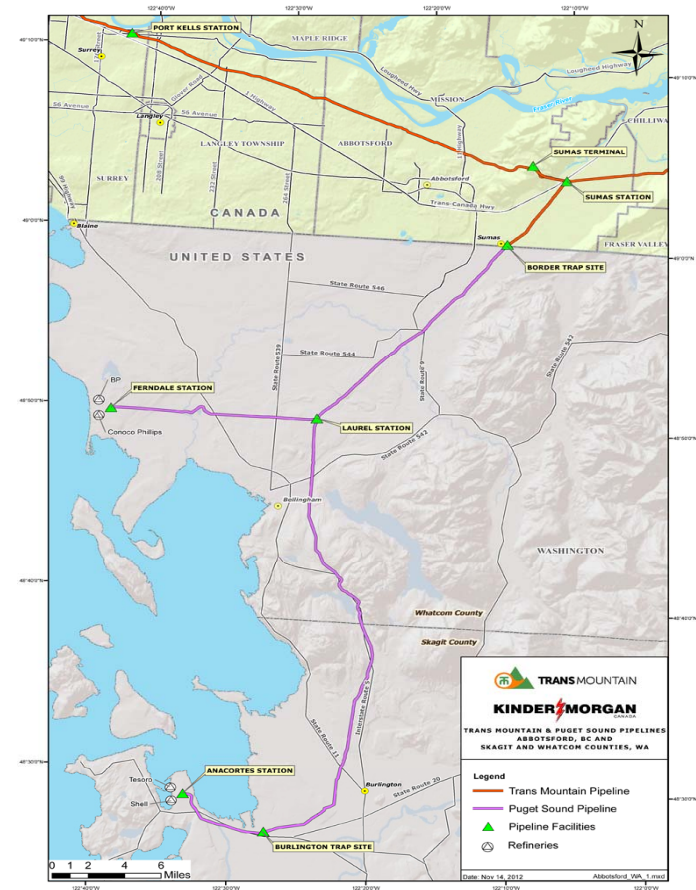


Existing System

- Serves Cherry Point and Anacortes
 - Length: 105 km (65 miles)
 - Diameter: 20" and 16"
 - Current capacity: 170,000 bpd
 - Pump stations: one at Laurel
 - Transit time ~24 hours

Proposed Upgrades

- Increase capacity to 225,000 bpd
 - New Burlington Pump Station
 - New 20" diameter pipeline (~1 mile long), deactivation of adjacent 16-inch diameter pipeline
 - Removal of existing Burlington scraper trap
 - One additional pump at Laurel Pump Station
 - One additional meter at each Ferndale and Anacortes Facilities
 - \$40 million



Emergency Response

Emergency Response Plans

- Compliant with Washington Administrative Code (WAC)
- Approved by Washington Department of Ecology (WSDOE) and Department of Transportation - Pipeline and Hazardous Materials Safety (PHMSA)
- Emergency Response Field Guides
- Control Points Manual
- Incident Command System (ICS)

Equipment

- Two recovery trailers (Laurel and Anacortes)
- Two boom boats for lake and river deployments
- ICS Trailer equipped with all of the materials to set up a command post
- Annual Training
- Annual Exercises

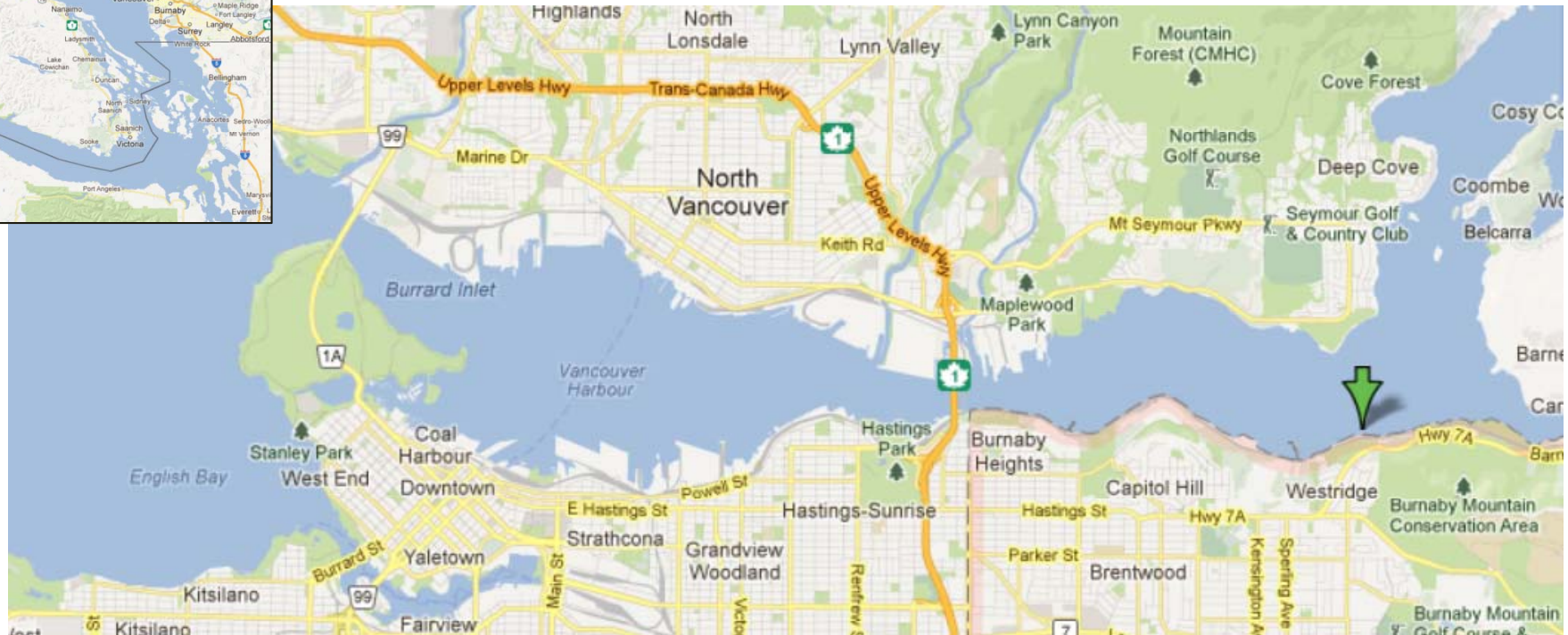
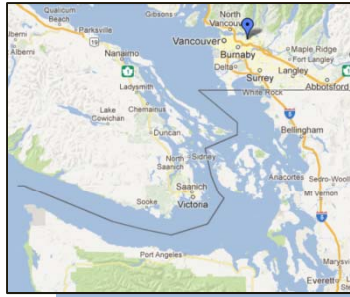
Outside Resources Available



Kinder Morgan has signed agreements with outside resources:

- Marine Spill Response Corporation (MSRC)
 - MSRC is a service provider for Kinder Morgan in the event of a water-based spill. They have the staff and equipment to respond to a large spill. MSRC can also respond to a land-based spill.
- Witt | O'Brien's
 - Witt | O'Brien's is a service provider to Kinder Morgan in the event of any emergency. They will provide support and staff to the Incident Management Team (IMT) when necessary.
- National Response Corporation (NRC)
 - Kinder Morgan is presently working on signing an agreement with NRC by the end of year.

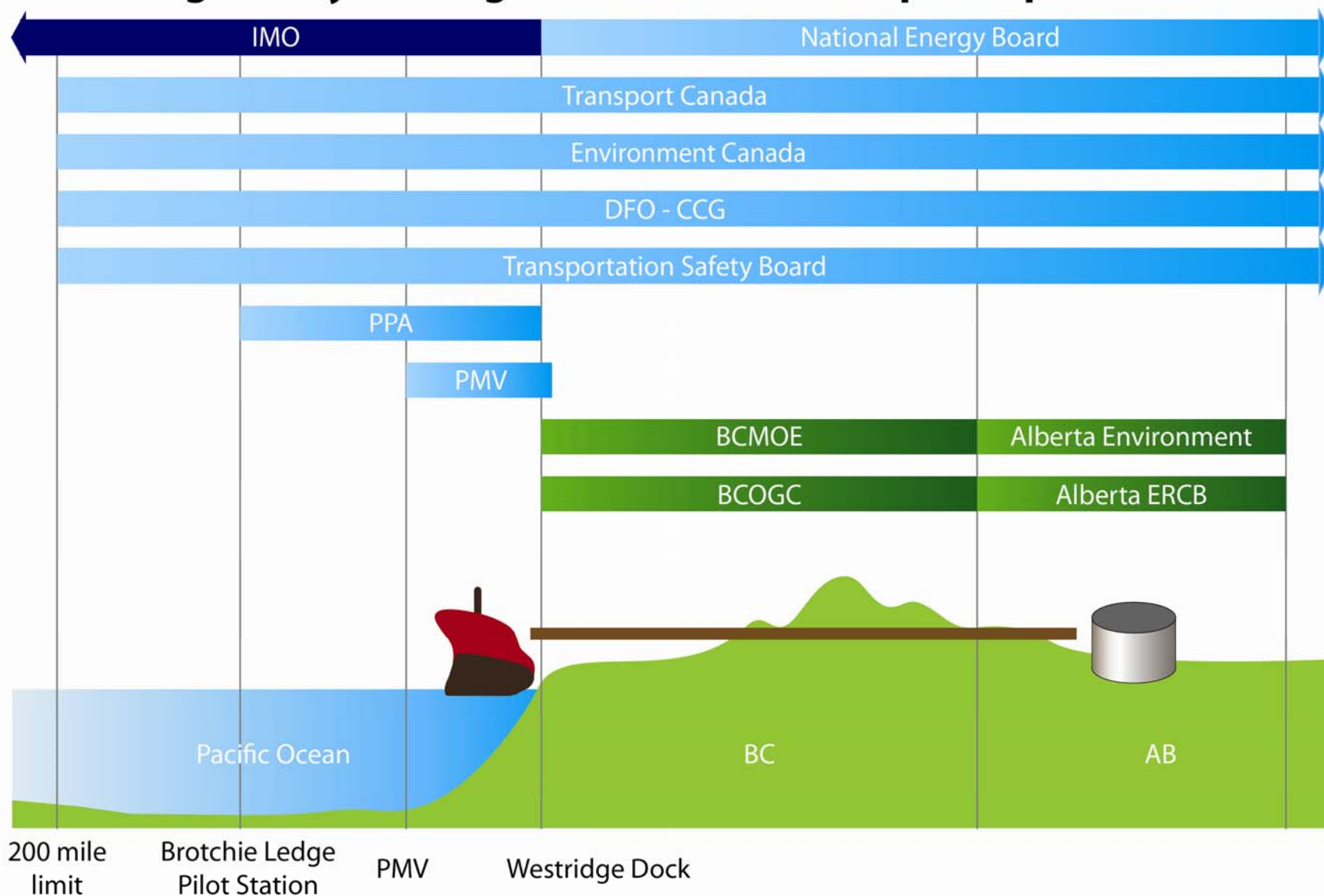
Westridge Marine Terminal



- One tanker berth face
- Partially (85%) laden Aframax
 - Typically 5 tankers/month
 - 2 crude oil barges/month
 - 1 jet fuel barge (receiving)/month
- ~3% of PMV traffic

- Three tanker berth faces
- Partially (85%) laden Aframax
 - Up to 34 tankers/month
 - 2 crude oil barges/month
 - 1 jet fuel barge (receiving)/month
- ~14% of current PMV traffic

Regulatory Oversight of Crude Oil Transport Operations



Product Quality



We transport a wide range of products and the terms and conditions for this service are defined in our [Tariff 88](#)

These conditions include product quality limits typical of major pipelines:

- (a) Reid vapour pressure: 103 kPa
- (b) Sand, dust, gums, sediment, water or other impurities (total in aggregate): 0.5%
- (c) Receipt Point a temperature: 38°C
- (d) **Density: 940 kg/m³**
- (e) Kinematic Viscosity: 350cSt
- (f) Having any organic chlorides or other compounds with physical or chemical characteristics that may render such Petroleum not readily transportable by the Carrier...

Trans Mountain has been transporting diluted bitumen since late 1980s without incident or operational problems due to dilbit properties

Fate and Behavior



KMC has engaged O'Brien's Response Management and Polaris Applied Sciences to conduct a Study of Fate and Effects of Heavy Crude Oils on Marine Waters

- | | | |
|----------|---------------------------------|----------------------|
| • Step 1 | Literature Search | Completed |
| • Step 2 | Gap Analysis and Research Plan | Completed |
| • Step 3 | Applied Research (location TBD) | Scheduled for Spring |
| • Step 4 | Final Report | Scheduled for Summer |

Applied Research is intended to include test of typical oil sands products under ambient conditions similar to those of the Salish Sea

Other tests on diluted bitumen are underway

- API
- National Academy of Science



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Westridge Marine Terminal

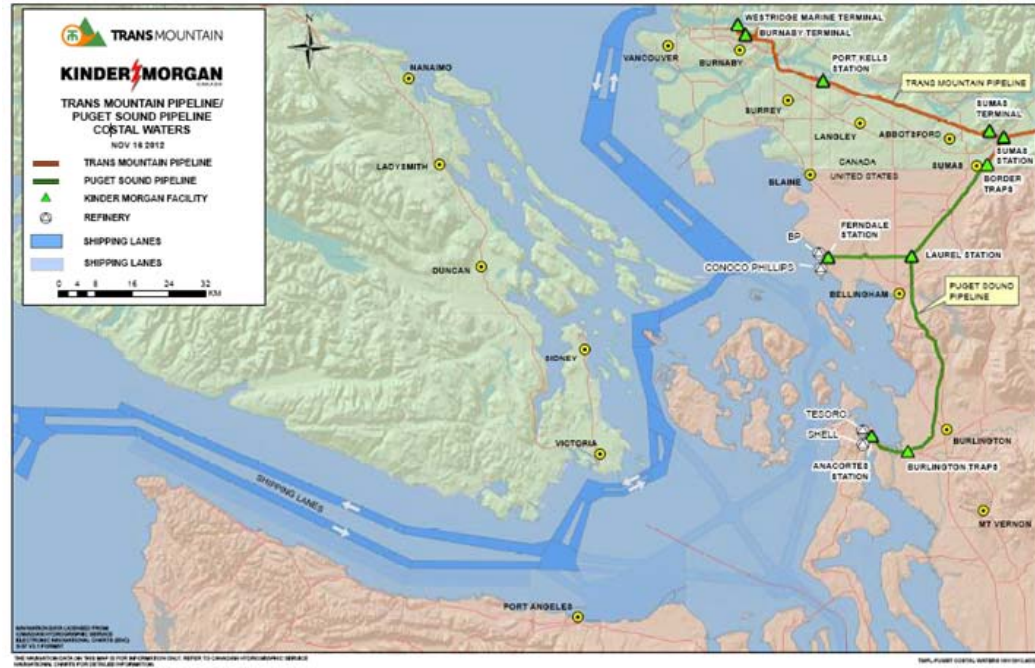


- Vessel is selected by a pipeline shipper and proposed to KMC
- Proposed vessel must meet all international and local rules and regulations
- Vessel is vetted by KMC to ensure:
 - Age, design and construction
 - Certification and insurance requirement
 - Manning
 - No adverse operating history
 - Terminal compatibility
- Terminal reserves the right to decline a vessel
- All vessels destined to a Canadian port are required under law to have a contractual arrangement in place with the certified oil spill response organization – WCMRC

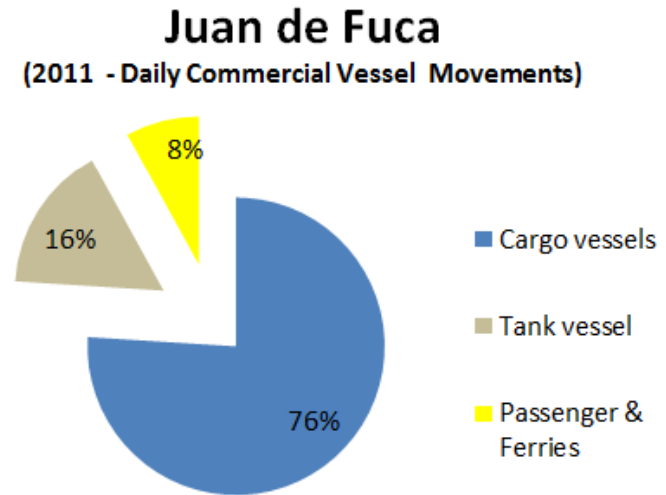
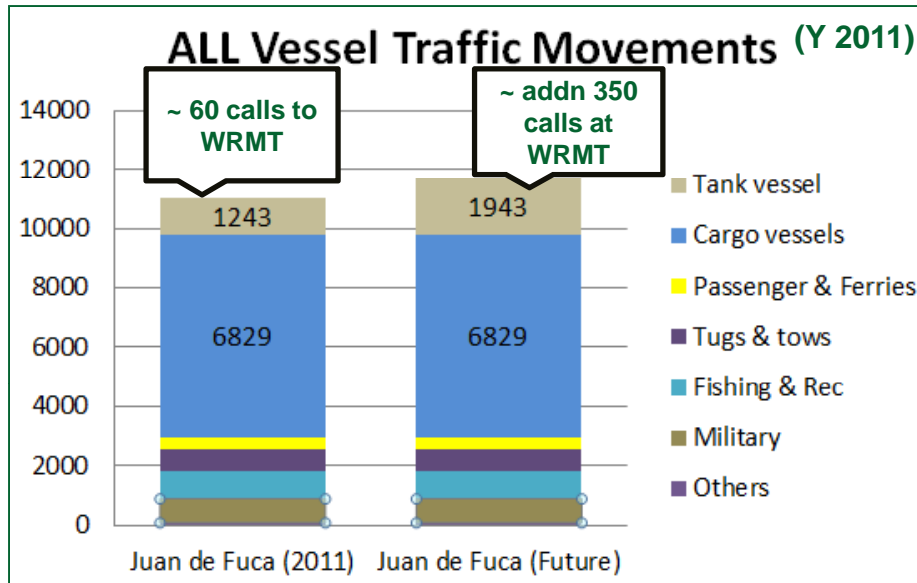
Marine Traffic



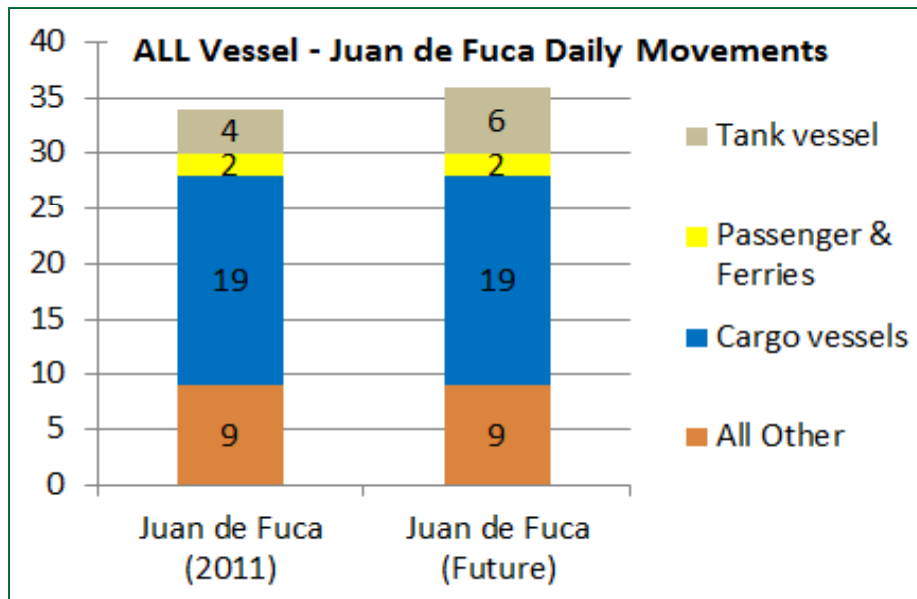
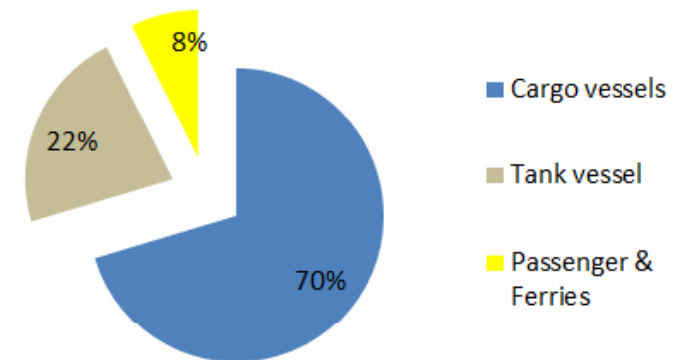
- Transit follows established traffic separation scheme (CCG and USCG)
- Traffic is monitored by vessel traffic services (CCG and USGC)
- Aids to navigation maintained by CCG and USCG
- PMV and Transport Canada rules and regulations in place
- BC Coast Pilots (certified by Pacific Pilotage Authority) onboard between Victoria and Terminal
 - 2 Pilots during loaded transit
- Tug escort arrangements using tethered tugs during harbor transit (loaded and ballast)
 - Up to 4 tugs during departure
- Tethered purpose built escort tug through Haro Straits and Boundary Pass (loaded)



Vessel Traffic Analysis



Juan de Fuca
(Future - Daily Commercial Vessel Movements)



Project Application Requirements

- Application to National Energy Board
- Application must describe “effect of the project on the environment”
- Effects include those from normal operations and from “accidents and malfunctions”
- Application will describe effect of increased tanker traffic

- Marine studies to support the application will include those required for TERMPOL review by Transport Canada
- TERMPOL review involves quantitative risk assessment
 - Moffat Nichol
 - Det Norske Veritas (DNV)
 - Witt | O’Brien’s
 - Tetra Tech

Trans Mountain Expansion Schedule

