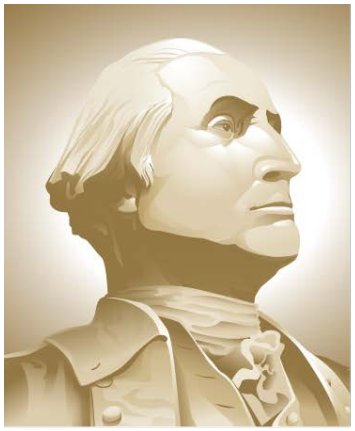
Preliminary Traffic Scenario - Definition

Presentation by: J. Rene van Dorp



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May 2, 2013

Purpose of Traffic Scenario Definitions

TO PERFORM WHAT IF ANALYSES!

COMMENTS/ OBSERVATIONS:

1. WHAT IF ANALYSES MAY OR MAY NOT HAPPEN.
2. NO JUDGMENT IS MADE WHICH SCENARIO IS MORE LIKELY TO OCCUR.
3. THEIR SOLE PURPOSE IS TO ENHANCE UNDERSTANDING OF SYSTEM BEHAVIOR.

IN THIS CONTEXT THE INCREASED UNDERSTANDING HELPS INFORM POTENTIAL RISK MANAGEMENT STATEGIES

2010 VTRA STUDY – PLANNED PROJECTS + FOCUS VESSELS

BASE CASE: VTRA UPDATED WITH VTOSS 2010

FOCUS VESSEL	VESSEL TYPE
1	Oil Tanker
2	ATB
3	Oil Barge
4	Bulk Carrier
5	Container Vessels

PROJECT	SCENARIO
1	GATEWAY
2	KINDER MORGAN
3	DELTA PHASE -1
4	DELTA PHASE - 2
5	BP (?)
6	OTHER TRAFFIC CHANGES

SUGGESTED APPROACH TOWARDS FUTURE SCENARIO DEFINITION:

- **Keep interacting vessels at VTOSS 2010 levels, limit to FV changes**
- **Each Scenario may result in Focus Vessel increases**
- **Each Scenario may result in Focus Vessel decreases**

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2010 VTRA STUDY – 14 TRAFFIC SCENARIOS THUS FAR

TRAFFIC SCENARIOS	TRAFF. ⇑ or ⇓	GW ⇑	KM ⇑	DP1 ⇑	DP2 ⇑	BP(?) ⇑
BASE: VTRA 2010	NO	NO	NO	NO	NO	NO
VTRA 2010 + TRENDS	YES	NO	NO	NO	NO	NO
GW – NT	NO	YES	NO	NO	NO	NO
GW – YT	YES	YES	NO	NO	NO	NO
KM – NT	NO	NO	YES	NO	NO	NO
KM – YT	YES	NO	YES	NO	NO	NO
DP1 – NT	NO	NO	NO	YES	NO	NO
DP1 – YT	YES	NO	NO	YES	NO	NO
DP12 – NT	NO	NO	NO	YES	YES	NO
DP12 – YT	YES	NO	NO	YES	YES	NO
BP – NT	NO	NO	NO	NO	NO	YES
BP – YT	YES	NO	NO	NO	NO	YES
MAX HIGH – NT	NO	YES	YES	YES	YES	YES
MAX HIGH – YT	YES	YES	YES	YES	YES	YES

1 BASE CASE + 13 TRAFFIC SCENARIOS

Recall: We evaluate exposure, accident frequency and oil outflow

5 Focus Vessels

14 Scenarios

3 Output Metric Profiles

Number of Geographic Profiles: 5 x 14 x 3 = ??

210 Geographic Profiles

70 Exposure, 70 Accident Frequency, 70 Oil Outflow Profiles

To help inform risk mitigation strategies

BASE CASE PROFILES : FIRST WEEK OF JUNE
WHAT-IF PROFILES : FIRST WEEK OF JULY

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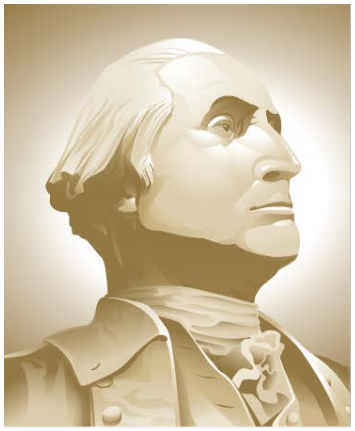
WHAT-IF CASE 1
GATEWAY

Presentation by: J. Rene van Dorp



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2010 VTRA STUDY – GATEWAY PROJECT TRAFFIC INCREASES

Focus Vessel	Call Increases	SOURCE/ ANALYSIS
1	Oil Tanker : None	
2	ATB : None	
3	Oil Barge : + 228	At current rate of bunkering: see below
4	Bulk Carrier : + 487	Gateway Project Information Document
5	Container Vessels: None	

4.5.6 Vessel Traffic

Commodities would be moved by oceangoing vessel to and from the Terminal. Approximately 221 vessels (144 Panamax vessels and 77 Capesize vessels) are expected to call at the Gateway Pacific Terminal per year during Phase 1 operations. At full operational capacity, approximately 487 vessels per year are expected to call at Gateway Pacific Terminal (Table 4–6).

http://www.whatcomcounty.us/pds/plan/current/gpt-ssa/pdf/2011-02-28-project-info-doc.pdf

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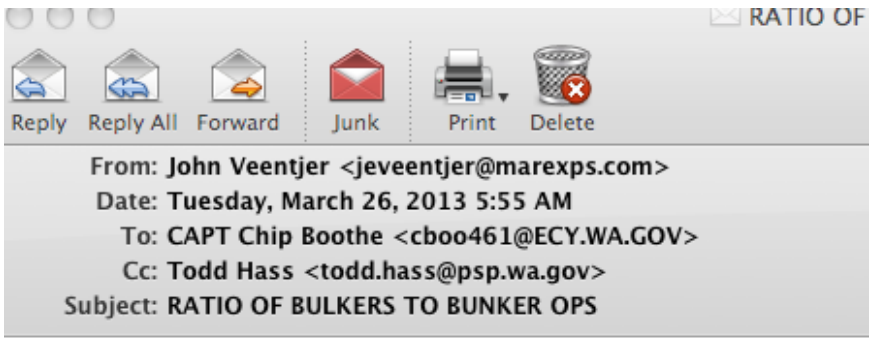
2010 VTRA STUDY – GATEWAY PROJECT TRAFFIC DECREASES



From: John Veentjer <jeveentjer@marexps.com>
Date: Tuesday, March 26, 2013 5:55 AM
To: CAPT Chip Boothe <cboo461@ECY.WA.GOV>
Cc: Todd Hass <todd.hass@psp.wa.gov>
Subject: RATIO OF BULKERS TO BUNKER OPS

Chip:

Per our records, the percentage of bulkers by year that took bunkers:

2010	183 of 393 = .466
2011	197 of 383 = .514
2012	136 of 327 = .416
2013 YTD	26 of 50 = .52

Average over three years, 2010 – 2012, is 516 of 1103 = .468

487 additional bulkers may result in about 228 additional bunker operations.

Regards,
John

WILL NEED TO WORK TOGETHER WITH STEERING COMMITTEE TO GET A GENERAL PICTURE OF BUNKERING OPERATIONS TO BE ABLE TO MODEL BUNKERING INCREASES IN GW/VCU SIM VTRA MODEL

WOULD LIKE TO SUGGEST MEETINGS IN FIRST WEEK WEEK OF MAY (1st, 2nd or 3rd)

MEETING WITH SVEN CHRISTENSEN TODAY

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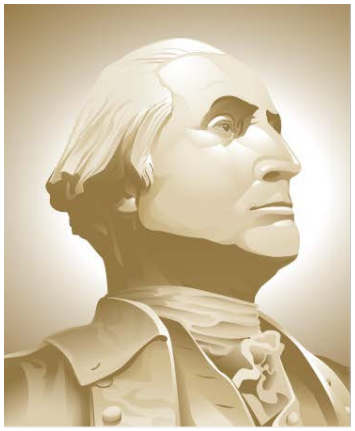
WHAT IF CASE 2
KINDER MORGAN

Presentation by: J. Rene van Dorp



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MAY 2, 2013

2010 VTRA STUDY – KINDER MORGAN TRAFFIC INCREASES

Focus Vessel	Call Increases	SOURCE/ ANALYSIS
1	Oil Tanker : 29 per month	See below
2	ATB : ???	Increase by ratio ATB to Tankers (?)
3	Oil Barge : ???	Increase by ratio Barge to Tankers (?)
4	Bulk Carrier : None	
5	Container Vessels: None	

Currently : 5 tankers per month (60 total per year)
Forecasted : 34 tankers per month (408 tankers per year)
Increases : 29 tankers per month (358 tankers per year)

Rationale: These estimates are current as of April 1 2013 and were corroborated by Kinder Morgan representatives at VTRA SC meeting in February 6 2013. The maximum estimate is based on maximum throughput capacity. Although 408 is a high figure — given the requirement for daylight high tides in order for tankers to transit 2nd Narrows it is considered possible that more than one tanker could transit during such a window (for example by leaving in tandem).

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2010 VTRA STUDY – KINDERMORGAN TRAFFIC INCREASES

TRANSMOUNTAIN

Proposed Expansion / Marine Plans / Tanker Traffic

Search

Source: http://www.transmountain.com/tanker-traffic

- Project Overview
- Benefits
- Route Plans
- Marine Plans
  - **Tanker Traffic**
  - Marine/Westridge Dock Improvements
- Environmental and Socio-Economic Studies

TANKER TRAFFIC

When looking out to the ships in English Bay, one might be surprised to learn just how few are tankers. At present, more than 250 deep draft vessels enter the port each month — about 3,000 per year. Of those 250 per month, only *eight* are presently destined for Westridge terminal, five of which are tankers. This means traffic to Westridge currently represents less than 3% of the total traffic of Port Metro Vancouver.

With the proposed expansion of the Trans Mountain Pipeline and associated dock facilities the Westridge Marine Terminal is forecast to serve 37 vessels per month, of which approximately 34 would be tankers. This increased total would then represent about 14% of today's marine traffic in Port Metro Vancouver.

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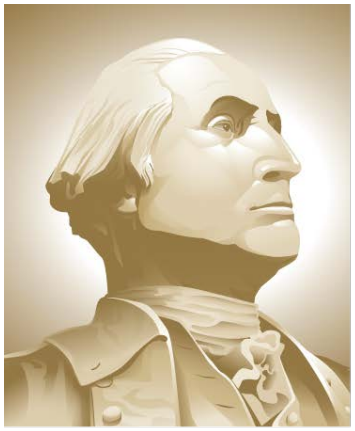
WHAT-IF CASES 3 & 4
DELTA/WESTSHORE/NEPTUNE

Presentation by: J. Rene van Dorp



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MAY 2, 2013

2010 VTRA STUDY – DELTA/WESTSHORE/NEPTUNE TRAFFIC INCREASES

Focus Vessel	Call Increases	SOURCE/ ANALYSIS
1	Oil Tanker : None	
2	ATB : 60 (DP1 or DP2)	
3	Oil Barge : ????	Bunkering increases at current rate (?)
4	Bulk Carrier : 104 (DP1 or DP2)	Environmental Assessment Report
5	Container Vessels: 15 (DP1) + 260 (DP2)	Environmental Assessment Report

Table 8-4 Actual (2010) and Projected (2014 Onwards) Annual Ship Calls

	Deltaport (including DTRRIP starting in 2014)	Roberts Bank Terminal 2	Westshore	Vancouver Airport Fuel Delivery Project
2010	245	na	246	na
2014	260	na	250	36-60
2017	312	na	280	36-60
2020	312	156	310	36-60
2025	260	260	350	36-60

+ 15 + 260 + 104 + 60

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2010 VTRA STUDY – DELTA/WESTSHORE/NEPTUNE TRAFFIC INCREASES

ENVIRONMENTAL ASSESSMENT REPORT

Deltaport Terminal

Road and Rail Improvement Project

http://www.portmetrovancouver.com/Libraries/PROJECTS_CCIP/DTRRIP_Environmental_Assessment_Report_-_Final.sflb.ashx

Roberts Bank Vessel Movements

Ship traffic to the Roberts Bank Port Terminal Complex includes ship traffic to both Deltaport (container vessels) and Westshore terminals (bulk coal vessels). In 2010, 245 ships (594 ship movements[38]) were served by Deltaport. In the same year, the coal terminal operated by Westshore Terminals served 246 ships (492 movements). For vessels calling at Deltaport the average ship capacity increased from about 2,700 TEU in 1999 to about 6,400 TEU in 2010 (**Table 6.4-3**). But overall the number of container ship calls at Deltaport has remained constant over the same period (Seaport, 2011).

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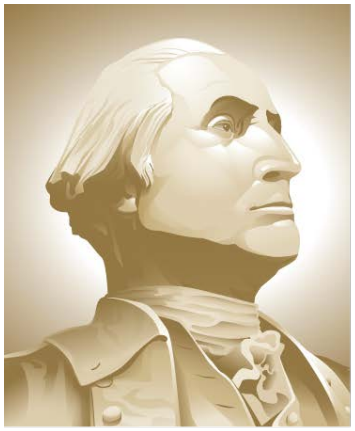
WHAT-IF CASE 5
BP CHERRY POINT TERMINAL (?)

Presentation by: J. Rene van Dorp



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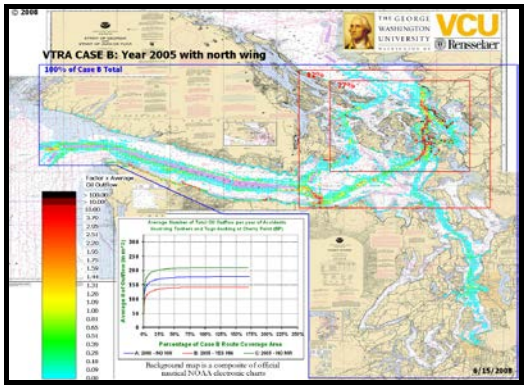
2010 VTRA STUDY – DELTA/WESTSHORE/NEPTUNE TRAFFIC INCREASES

Focus Vessel	Call Increases	SOURCE/ ANALYSIS
1	Oil Tanker : to 150 from 2010 levels	VTRA 2008 Report: Appendix F
2	ATB : to 300 from 2010 levels	VTRA 2008 Report: Appendix F
3	Oil Barge : ????	Bunkering increases at current rate (?)
4	Bulk Carrier : None	
5	Container Vessels: None	

SOURCE DOCUMENT:

TECHNICAL APPENDIX F: FUTURE SCENARIOS



Assessment of Oil Spill Risk due to Potential Increased Vessel Traffic at Cherry Point, Washington

Submitted by VTRA TEAM:

Johan Rene van Dorp (GWU), John R. Harrald (GWU), Jason R.. W. Merrick (VCU) and Martha Grabowski (RPI)

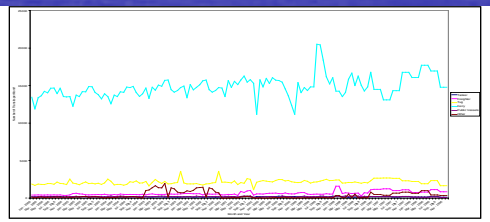


Figure F-1. US Coast Guard Transit Data

The Marine Exchange and Seattle VTS data was used to forecast traffic levels for non-BP vessels in 2025. This data was also used to find the change in traffic levels from 2000 to 2005. For BP vessels, projections were provided by BP.

F-1. BP's projection of Cherry Point Traffic

Table F-1 shows the projections provided by BP for both crude tankers and product vessels.

Table F-1. BP's projections of future traffic levels at the BP Cherry Point docks.

Vessel Traffic Scenario	Annual Total Vessel Range				Probability of Occurrence	
	crude vessels	product vessels	crude vessels	product vessels	within 10yrs	by 2025
Increased Crude Oil Delivery by Pipeline from Canada	170		to 220		very low	low
	15	155	20	200		
Current Range of Operations	320		to 400		low	medium
	150	170	180	220		
Growth Based On Historical Market Demand	340		to 370		medium	low
	170	170	185	185		
Growth Based On High Market Demand	350		to 450		very low	very low
	120	230	150	300		

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Table F-1. BP's projections of future traffic levels at the BP Cherry Point docks.

Vessel Traffic Scenario	Annual Total Vessel Range					Probability of Occurrence	
	crude vessels	product vessels		crude vessels	product vessels	within 10yrs	by 2025
Increased Crude Oil Delivery by Pipeline from Canada	170		to	220		very low	low
	15	155		20	200		
Current Range of Operations	320		to	400		low	medium
	150	170		180	220		
Growth Based On Historical Market Demand	340		to	370		medium	low
	170	170		185	185		
Growth Based On High Market Demand	350		to	450		very low	very low
	120	230		150	300		

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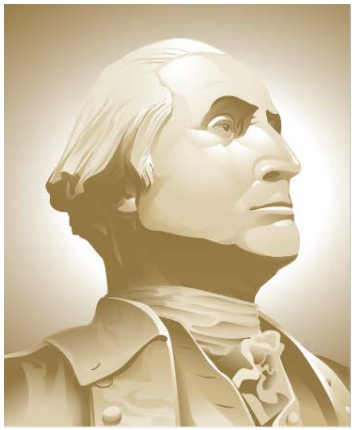
WHAT IF CASE 6
OTHER TRAFFIC UP OR DOWN

Presentation by: J. Rene van Dorp



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MAY 2, 2013

CENTRAL QUESTION :

WILL THERE BE VESSEL TRAFFIC DECREASES DUE TO PLANNED ENHANCEMENTS IN RAIL INFRASTRUCTURE?

AND!

WHAT SOURCE DOCUMENTATION IS AVAILABLE TO SUPPORT ANSWER?

IF:

IF NOT CONSIDERED NUMBER OF TRAFFIC SCENARIOS DROPS TO SEVEN!

WHICH:

OPENS POSSSIBILITY OF RUNNING TRAFFIC SCENARIOS AT HALF (?) INCREASE LEVELS!

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