SUPPLY CHAINS RESILIENCE: COMPETITIVENESS OF OUR TRANSPORT SYSTEM

Transportation System in a Policy Setting

Goals

Increase the **reliability** of transportation infrastructure

Increase the **efficiency** of Canada's supply chains

Support Canada's Economic **Competitiveness**

Objectives

Identify the **risks** facing Canada's supply chains

Identify **vulnerabilities** in Canada's supply chains linked to multi-modal transportation and infrastructure

Develop a framework to **assess** economic and competitiveness **impacts** linked to resilience

Investigate the role of **technologies** and other measures to assist in this initiative

Identify **policies, tools** and mitigating factors to address **resilience** issues

Outcomes

Improve **information sharing** between industry and government and between governments
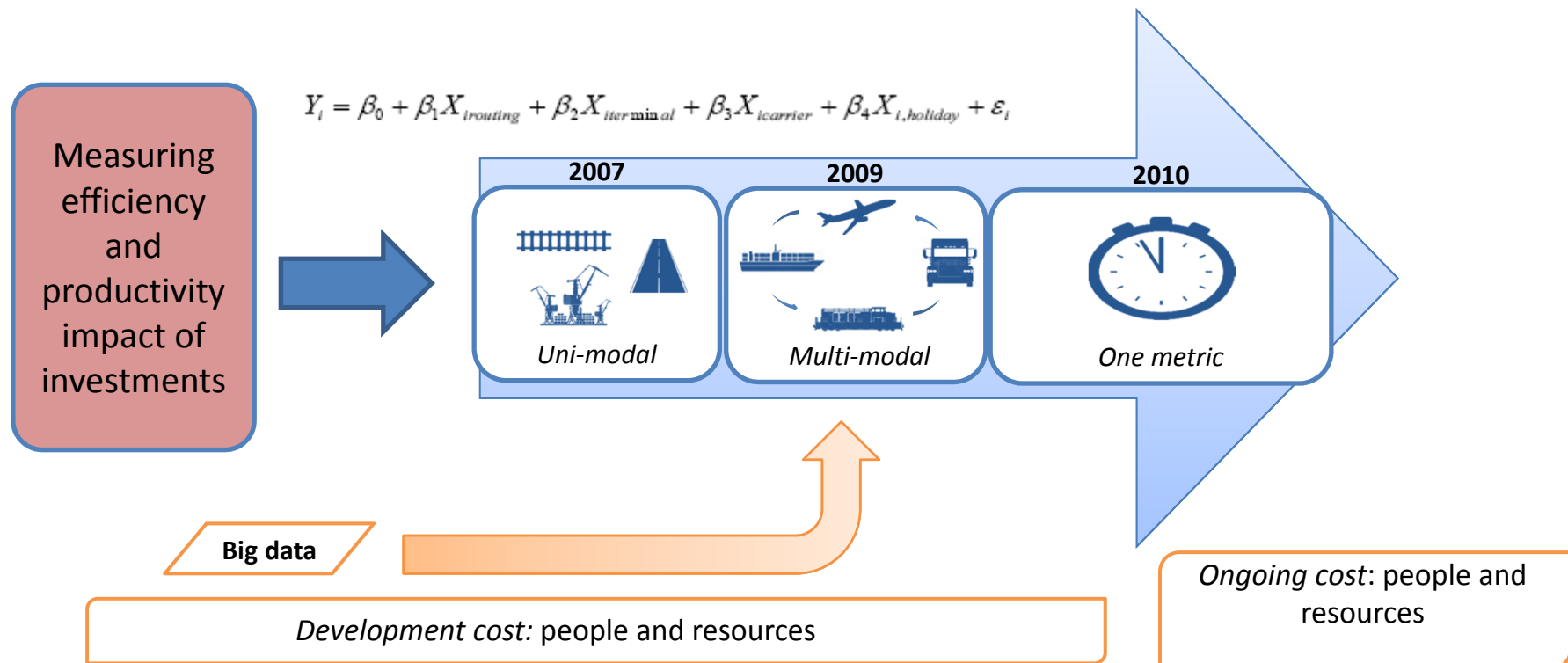
Develop **expertise** and **predictive** tools using an archive of supply chain disruptions and their impact on resiliency

Define when resilience becomes a **system issue** requiring government involvement
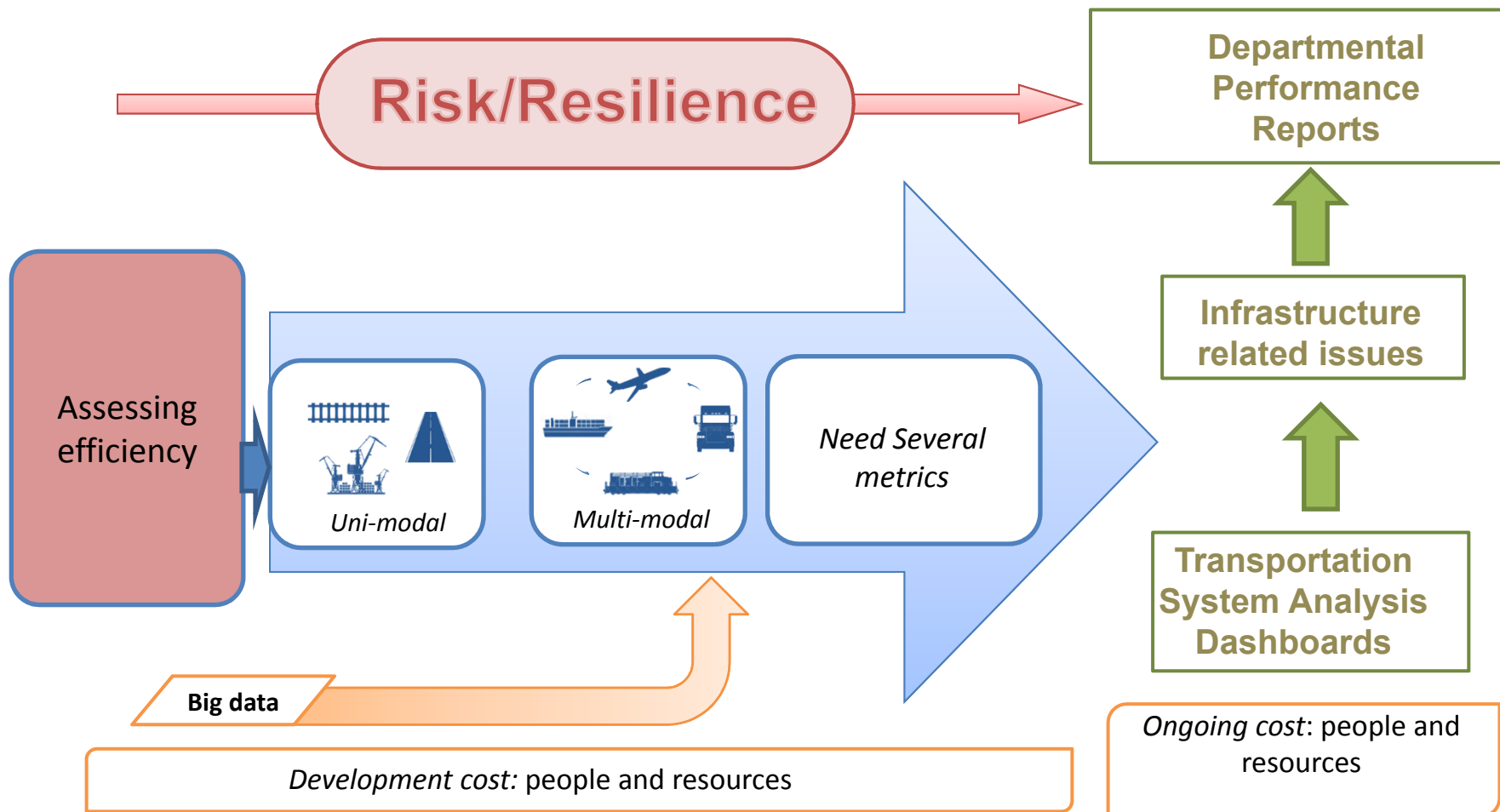
Build **supply chain efficiency, visibility** and **resilience** and improve Canada's economic **competitiveness**

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Transportation System Monitoring

Gradually Evolved Towards Supply Chains' Approach

$$Y_i = \beta_0 + \beta_1 X_{i\,routing} + \beta_2 X_{i\,terminal} + \beta_3 X_{i\,carrier} + \beta_4 X_{i,holiday} + \varepsilon_i$$

Measuring efficiency and productivity impact of investments

2007

Uni-modal

2009

Multi-modal

2010

One metric

Big data

Development cost: people and resources

Ongoing cost: people and resources

Transportation System

Risk/Resilience → **Departmental Performance Reports**

Assessing efficiency →

Uni-modal

Multi-modal

Need Several metrics

Infrastructure related issues

Transportation System Analysis Dashboards

Big data

Development cost: people and resources

Ongoing cost: people and resources

Framework: Development of Supply Chains Work at TC

Research $\longrightarrow$ Development $\longrightarrow$ Delivery

Partnership $\longrightarrow$ Working Group/Data/Trust $\longrightarrow$ Trial & Error/Win-Win

TC role is based on a few Axioms

- Work that Supports Government Objectives (the Why)
  - Speech from the Throne, Budget, Departmental Mission, Departmental Performance, Minister's mandate letter, Minister's Statement, Legislation, Regulations, etc...
- Issues involved more than one mode or is international in scope
- Objectivity
  - Neutral Party - Public good
  - Neutral Metric (point to an issue not an organization)
- Evidence-based – beware of anecdotal stories but listen
- Transparent and yet Protect Sensitive Commercial Data
- Challenges for Governments
  - Timely release of results
  - Value-Added (Long-term involvement)

Transportation System **Resilience**

Inherent (steady-state) resilience:

- Built into the system to respond to stress and geared towards infrastructure
- Attempts to prevent a disruption from occurring, or barring prevention, reduces its effect; Ashcroft case

Figure 1. Map of major landslides within the Thompson River valley.
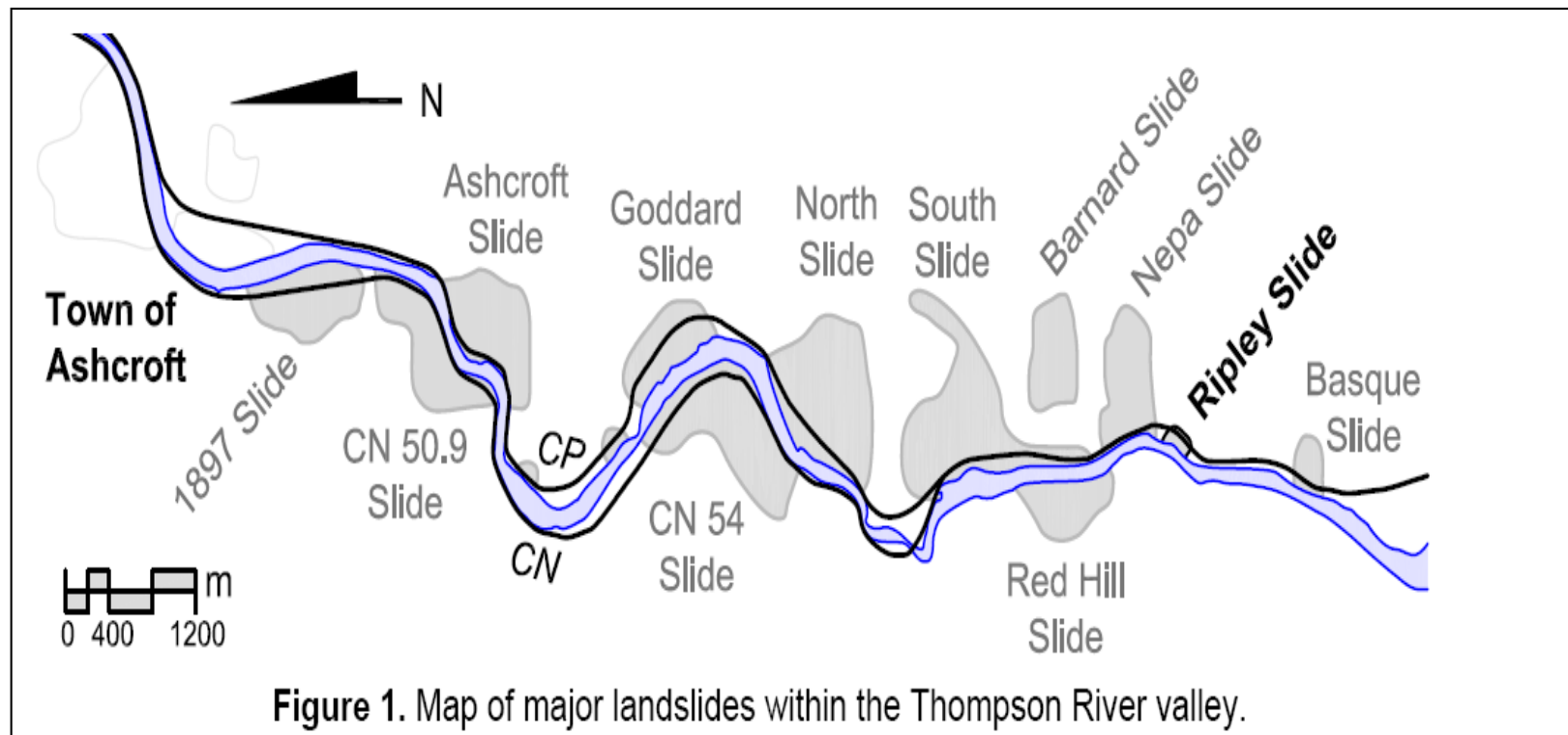
Transportation System **Resilience**

Adaptive (dynamic) resilience: Focusing on information gathering and predictive analytics - Embryonic Internet of Things (IoT)

Southbound Wait Times 2017 YTD September (minutes)				
Border Crossing	95th Percentile	3-Year Average	Median	3-Year Average
Ambassador Bridge	39.5	44.4	14.1	15.0
Sarnia	38.6	35.7	16.1	15.5
Peace Bridge	32.8	38.6	9.3	12.3
Pacific Highway	42.4	45.7	14.9	15.8
Queenston	41.0	41.1	13.1	13.3
Lacolle	28.9	31.8	12.1	12.5
Emerson	26.6	29.0	13.7	15.1
Lansdowne	31.0	33.0	15.9	16.7
Coutts	28.1	29.2	12.0	12.1
North Portal	26.6	27.8	11.0	13.0
Huntingdon	32.1	33.5	13.8	14.3
Rock Island	36.1	32.0	10.5	11.7
Woodstock	21.8	21.3	9.3	8.7
St. Stephen	18.1	18.2	6.2	6.8
Sault Ste. Marie	30.6	30.6	13.4	13.5

Northbound Wait Times 2017 YTD September (minutes)				
Border Crossing	95th Percentile	3-Year Average	Median	3-Year Average
Ambassador Bridge	33.7	35.2	16.5	16.1
Sarnia	39.0	34.3	15.1	14.2
Peace Bridge	37.0	36.4	15.8	15.6
Pacific Highway	24.4	25.4	11.4	12.3
Queenston	22.5	21.9	9.7	9.9
Lacolle	22.5	22.0	10.1	9.8
Emerson	21.5	23.1	8.9	9.5
Lansdowne	26.7	25.7	12.1	11.2
Coutts	41.3	42.3	13.0	13.4
North Portal	32.4	34.0	12.3	13.3
Huntingdon	24.4	21.4	12.2	11.4
Rock Island	34.5	35.9	11.6	11.3
Woodstock	12.2	14.9	5.1	6.7
St. Stephen	14.0	13.8	7.1	7.6
Sault Ste. Marie	40.9	33.5	12.6	12.9

Some Examples of Measurements

Transportation System Information Sharing

Transportation System Analysis: Example

| Port	Indicators	2017 - Jun	3-Year avg. - Jun	2017 - YTD	3-Year avg. - 2016 YTD
	Container volumes – TEUs	361,910	289,998[1]	1,975,200	1,788,706[1]
	% of imports	52	52	54	54
	Import container dwell time - days	3.2	3.1	3.4	3.9
	Vessel on-time performance - %	50.1	81.6	45.0	46.6
B.C. Ports	Berth Productivity – TEUs per berth hour	108	106	101	104
	End-to-end transit time – Shanghai to Chicago - days	23.0	23.5	24.1	25.0
	U.S. comparison – Shanghai to Chicago via Seattle/Tacoma – days	24.5	25.7	27.3	26.1

Sources: Transport Canada Port Authorities, INNAV, Lloyd's List ; 1 – container volumes are compared to previous year, not 3-year average

⬤ Warning of potential congestion/bottlenecks/competiveness issues
⬤ Alert of likely congestion/bottlenecks/competiveness issues

- Container volumes at B.C. ports dropped increased in the first half of 2017 compared to 2016
- Vessel on time performance is low for this time of the year, but with changes in Shipping Alliances as well as high volumes of containers for June, it is not alarming, but should be monitored
- Import container dwell times have been negatively impacted by intermodal rail yard construction at Deltaport through 2017, but has been decreasing back to normal levels as construction is being finished.
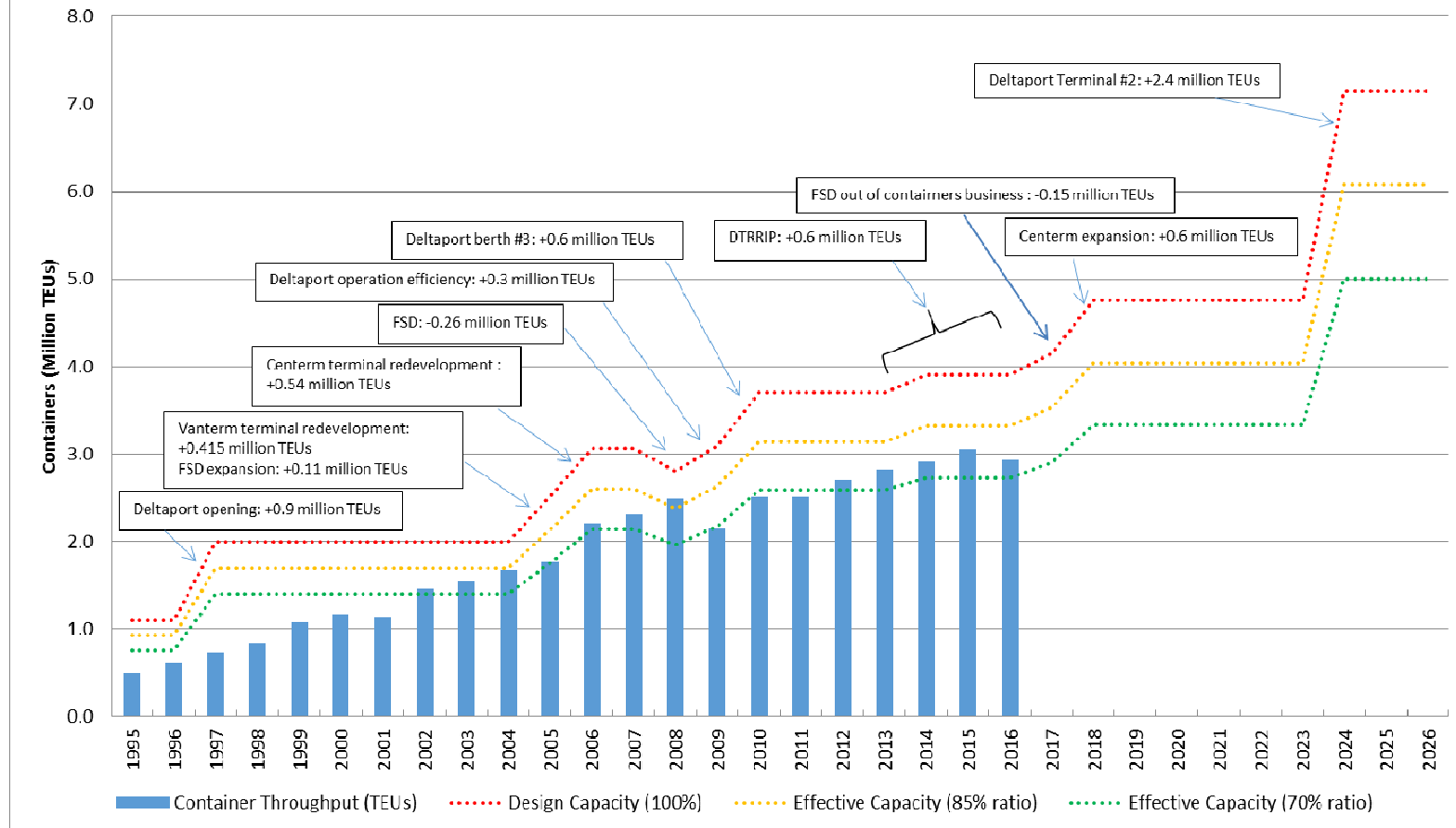
Transportation System Monitoring: Visibility

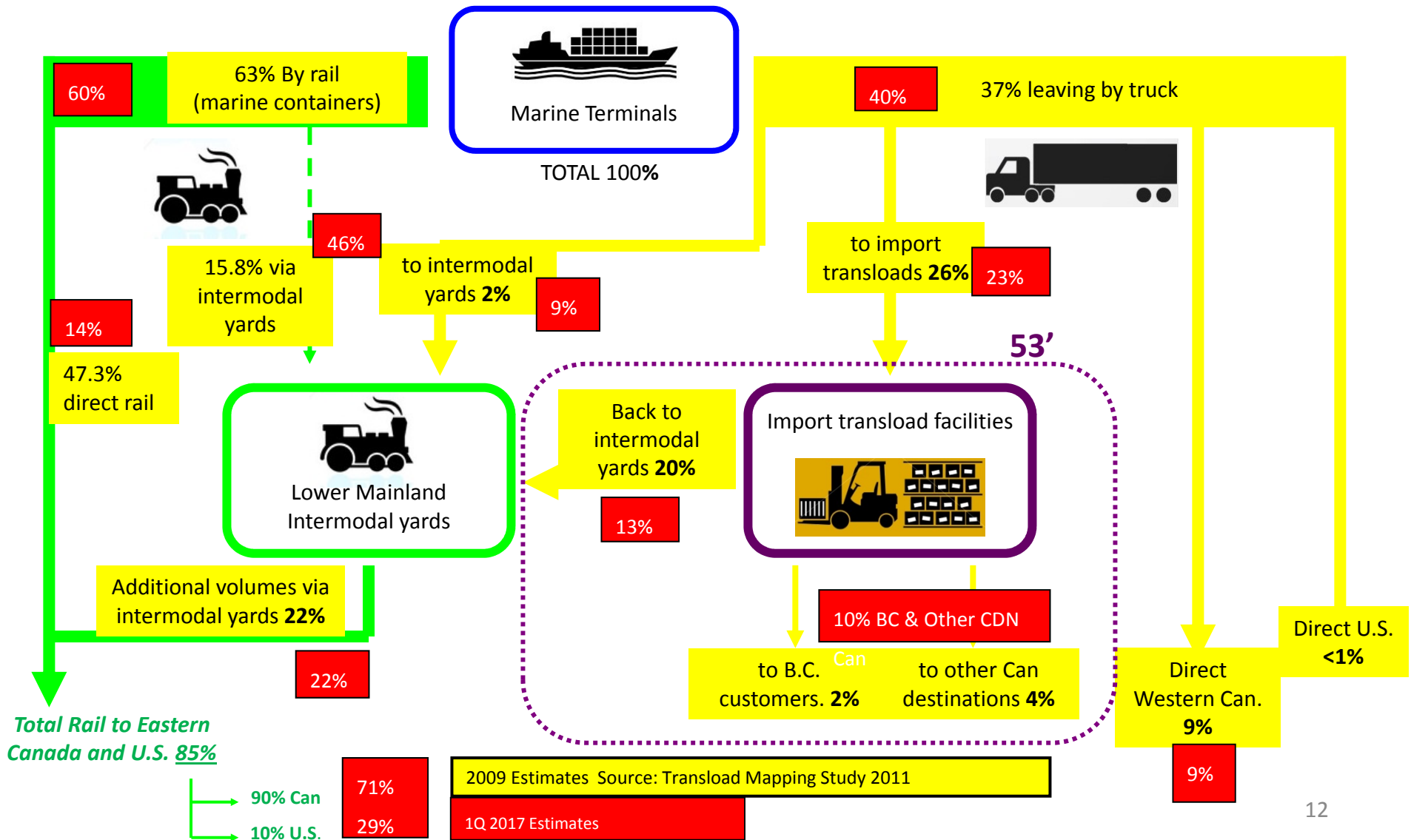Transportation System Analysis: Example Port of Vancouver – Pressure Points Identification
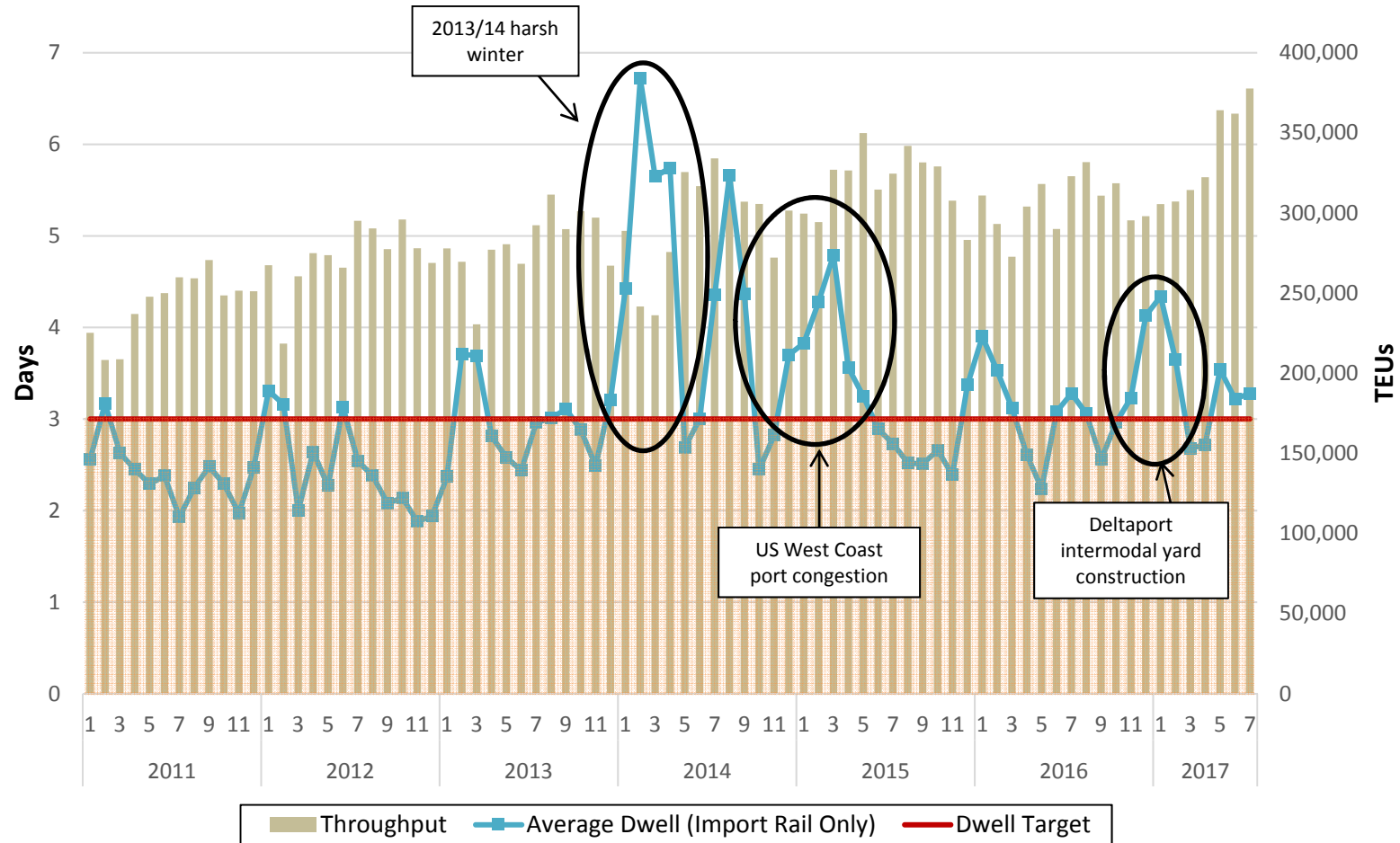
RESILIENCE: CONTAINER TERMINAL CAPACITY

Source: Transport Canada and Port Metro Vancouver

SYSTEM ISSUES: VANCOUVER LOWER MAINLAND 2009 & 2017

Marine Terminals
TOTAL 100%

60%

63% By rail
(marine containers)

40%

37% leaving by truck

46%

15.8% via intermodal yards

to intermodal yards 2%

9%

to import transloads 26%

23%

14%

47.3% direct rail

53'

Back to intermodal yards 20%

Import transload facilities

Lower Mainland Intermodal yards

13%

Additional volumes via intermodal yards 22%

10% BC & Other CDN

22%

to B.C. customers. 2%

Can

to other Can destinations 4%

Direct U.S. <1%

Direct Western Can. 9%

9%

Total Rail to Eastern Canada and U.S. 85%

90% Can

71%

10% U.S.

29%

2009 Estimates Source: Transload Mapping Study 2011

1Q 2017 Estimates

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TRADE CORRIDOR – CONGESTION VISIBILITY

Legend
Canada HERE Road Network
Travel Time Index - TTI
- < 1.25 (green)
- 1.25 - 1.75 (yellow)
- 1.75 - 2.50 (orange)
- > 2.50 (red)

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Vancouver

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Calgary

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
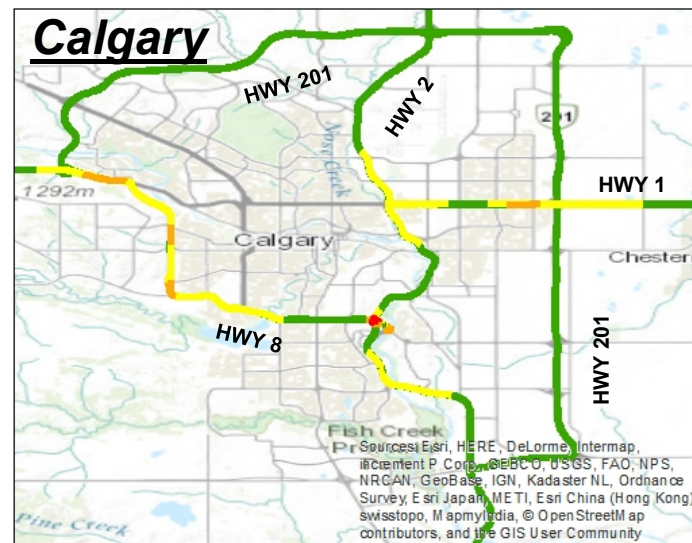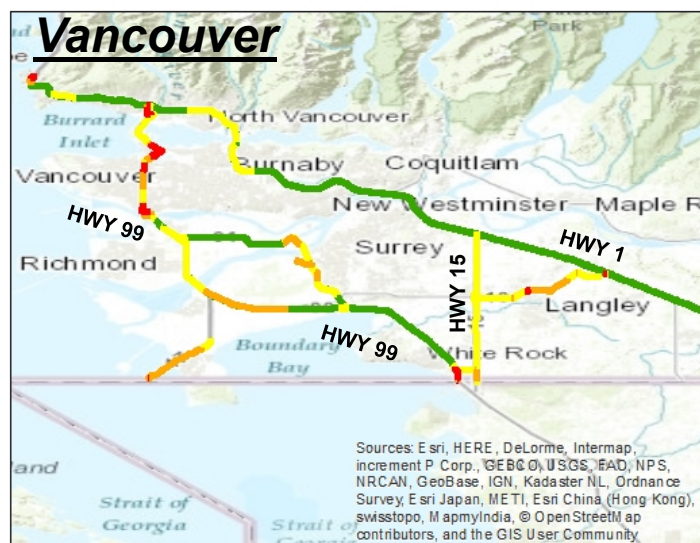
Travel Time Index :
Travel Time Index (TTI) is a comparison between peak period and free flow speeds to indicate additional travel time required during peak periods.

For example, a TTI of 3.0 indicates that a motorist's trip will take three times longer during peak periods than during off peak
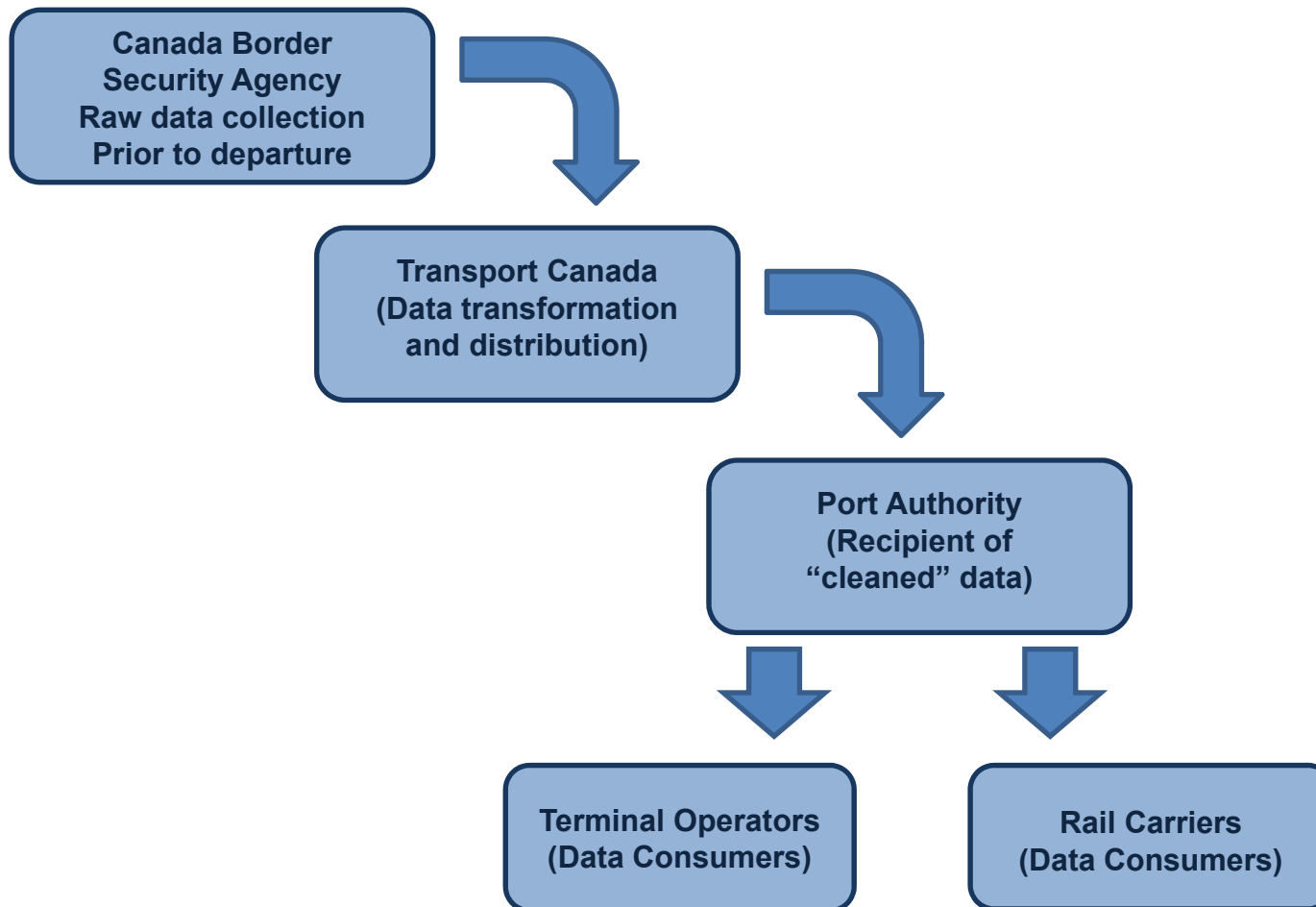
- *Travel Time Index = (Free Flow Speed / Average Speed)*

Data Source : 13
HERE GPS Data [2016]

Using Customs data for better planning for inbound containers

```
Canada Border
Security Agency
Raw data collection
Prior to departure
        ↓
Transport Canada
(Data transformation
and distribution)
        ↓
Port Authority
(Recipient of
"cleaned" data)
    ↓           ↓
Terminal Operators   Rail Carriers
(Data Consumers)     (Data Consumers)
```

North American Market Share for U.S. Midwest Traffic Inbound Laden Container

2016

Pacific = 65%
Atlantic = 33%
Gulf = 2%

Canada Atlantic 5%

U.S. Pacific 44%

U.S. Atlantic 28%

Canada Pacific 21%

U.S. Gulf 2%

Total TEU = 3.0 Million

2013

Pacific = 68%
Atlantic = 30%
Gulf = 2%

Canada Atlantic 5%

U.S. Pacific 51%

U.S. Atlantic 26%

Canada Pacific 16%

U.S. Gulf 2%

Total TEU = 2.8 Million

2004

Pacific = 60%
Atlantic = 37%
Gulf = 3%

Canada Atlantic 12%

U.S. Pacific 55%

U.S. Atlantic 27%

U.S. Gulf 3%

Canada Pacific 3%

Total TEU = 2.3 Million
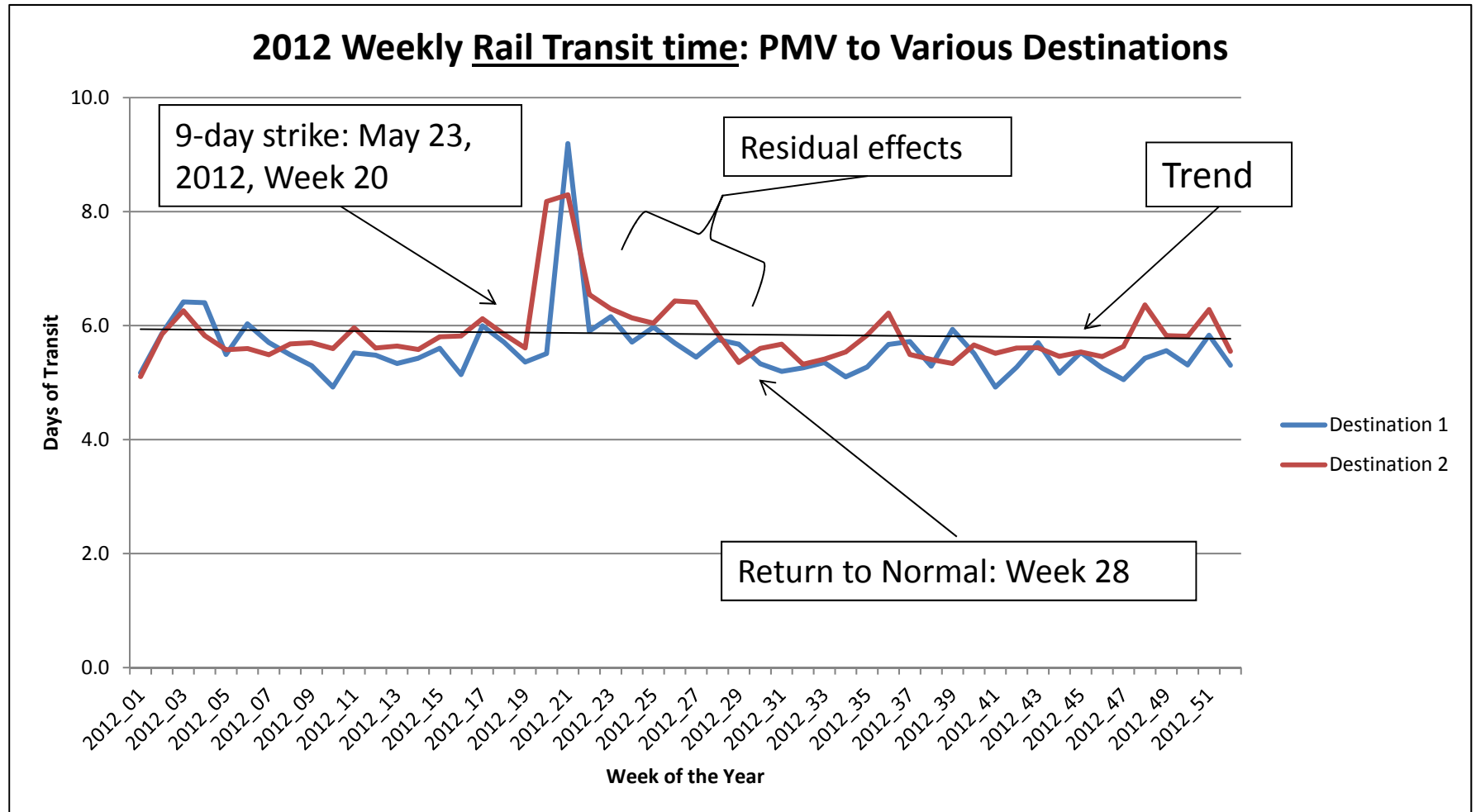
Source: U.S. customs data from Panjiva; Canadian customs data from CBSA

Transportation System Monitoring: Competitiveness and Resilience

Transportation System Analysis: Shanghai to Chicago

Source: Transport Canada; Canada Port Authorities; Canadian Class 1 Railways

Lessons From Events.

2012 Weekly <u>Rail Transit time</u>: PMV to Various Destinations

9-day strike: May 23, 2012, Week 20

Residual effects

Trend

Return to Normal: Week 28

Days of Transit

Week of the Year

Destination 1
Destination 2
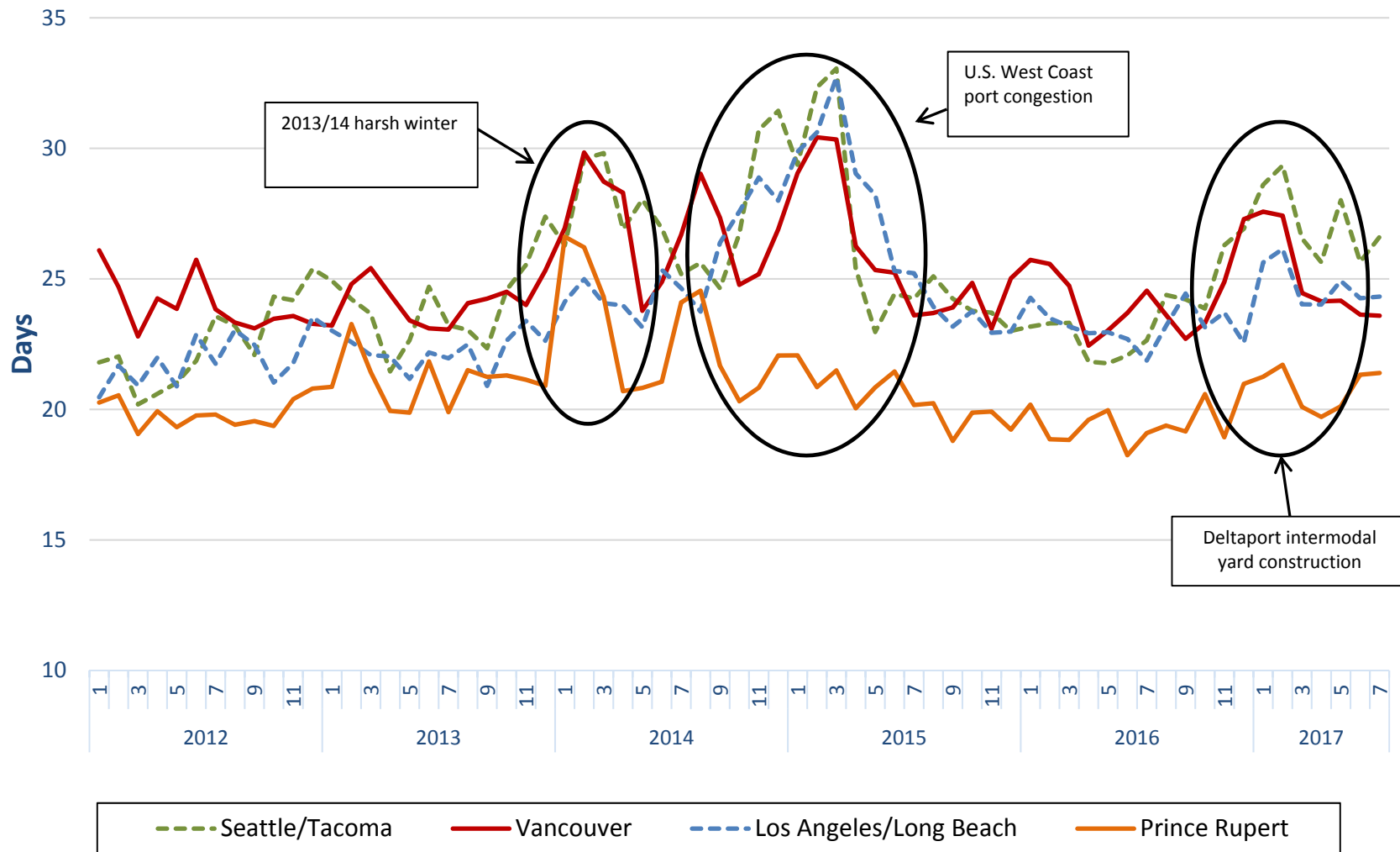
Commodity Flow Indicator - Vancouver

Port/ Commodity/ Year			Month											
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Port of Vancouver	Containers	2012	1	1	1	1	1	1	1	1	1	1	1	1
		2013	1.01	1.18	0.90	1.02	1.05	1.04	1.01	1.07	1.09	1.05	1.05	1.04
		2014	1.08	1.10	0.89	0.99	1.20	1.22	1.10	1.08	1.16	1.06	0.93	**1.10**
		2015	1.07	**1.27**	**1.19**	**1.14**	1.21	1.15	1.08	1.10	**1.19**	**1.06**	**1.07**	1.03
		2016	**1.13**	1.23	1.02	1.03	1.10	1.07	1.00	1.10	1.12	1.05	1.05	1.09
		2017	1.07	1.34	1.15	1.12	**1.27**	**1.25**	**1.19**	**1.15**				
	Grain	2012	1	1	1	1	1	1	1	1	1	1	1	1
		2013	1.32	0.92	1.18	1.05	1.15	0.88	0.70	0.82	1.08	1.23	1.09	1.18
		2014	1.06	1.01	0.98	1.36	1.32	1.48	1.45	1.46	1.19	1.12	1.20	**1.50**
		2015	1.34	1.17	1.21	1.23	1.59	**1.91**	1.52	**1.49**	**1.34**	1.24	1.47	1.48
		2016	1.63	**1.58**	**1.37**	1.55	1.26	1.48	**1.61**	1.42	1.16	**1.33**	**1.73**	1.38
		2017	**2.23**	1.50	1.27	**1.85**	**1.67**	1.73						
	Coal	2012	1	1	1	1	1	1	1	1	1	1	1	1
		2013	1.06	0.95	1.39	1.51	0.81	1.05	0.95	**1.82**	1.14	1.03	1.11	**1.72**
		2014	1.16	1.05	1.33	1.35	**0.99**	**1.20**	0.94	1.54	**1.24**	**1.10**	0.98	1.46
		2015	**1.38**	**1.14**	1.36	1.30	0.83	0.87	0.96	1.29	0.92	0.83	0.92	1.43
		2016	1.29	0.83	1.41	1.04	0.72	0.81	**1.04**	1.26	0.85	0.85	**1.11**	1.40
		2017	1.13	0.61	**1.27**	**1.54**	0.82	1.05						
	Potash	2012	1	1	1	1	1	1	1	1	1	1	1	1
		2013	1.37	1.30	**3.16**	**1.06**	1.10	0.82	1.11	0.65	0.91	1.21	1.81	1.21
		2014	1.57	0.92	2.39	0.92	**1.10**	0.87	1.12	1.18	1.86	2.42	2.50	**2.31**
		2015	1.93	**1.46**	2.23	0.99	1.06	**1.42**	**1.36**	2.03	2.16	**2.60**	2.85	1.51
		2016	1.24	1.14	1.83	0.75	0.87	1.12	1.30	**2.25**	**3.03**	2.49	**2.99**	1.87
		2017	**1.94**	1.14	2.35	0.75	0.69	0.60						

Cells marked in **red** represent the year with the maximum commodity flow for that month.

Example: In August 2017, Vancouver had the largest commodity flow for containers compared to every August since 2012, with 15% more TEUs handled than August 2012

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Transportation System Monitoring: Grain (Crop Year 2016/2017)

- The Western grain transportation system has performed well throughout the 2016-17 crop year. Crop-year-to-date (CYTD) grain volumes at Vancouver are above the 3 year average.

- 7 Vessels anchored off Nanaimo & the Gulf Islands, indicating some congestion at the port. CYTD twice as many vessels have used anchors outside of Vancouver's waters, but time spent in Canadian waters is 1 day below the 3 year average at just below 14 days.

  - CYTD Vessel loading tonnes per berth hour and overall port productivity are up from the 3 year average – This along with the large amount of vessel anchoring in the Gulf indicates that the port is able to handle the large amount of vessels due to loading efficiencies and coordination.

- Both CN and CP rail provided fluid Western grain transport to port positions

  - Average car cycles from the Prairies to the 3 major western ports is 1/2 day below the 3 year average

Vancouver Marine Metrics

	Indicators	2016 - Jun	3 year avg.	2016-17 CYTD Jun	3 year avg.
1	Vessels Anchoring off Nanaimo & Gulf Islands	7	3	124	62
2	Average Time in Canadian Waters	13.3	12.5	13.7	14.9

Vancouver Terminal Metrics

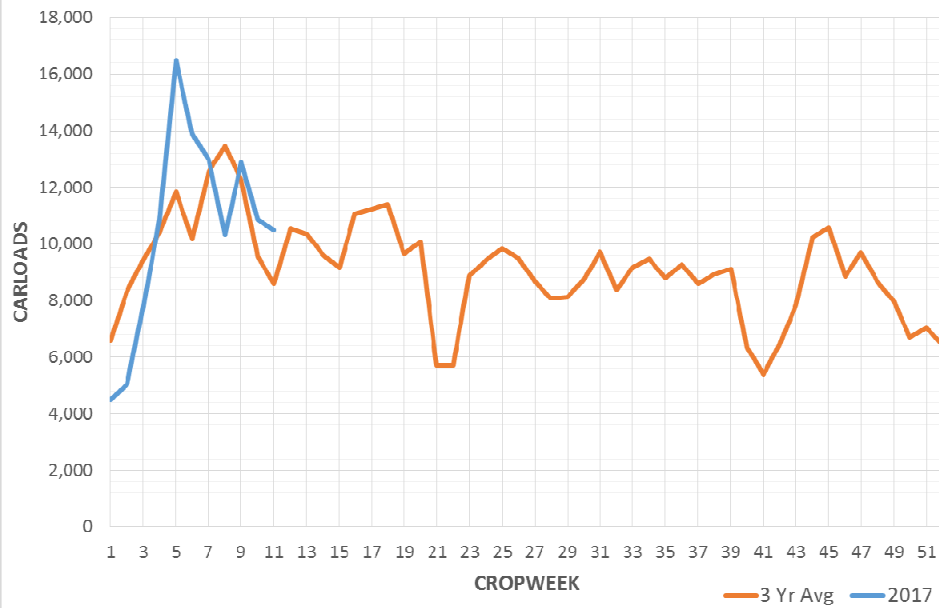|	Indicators	2016 - Jun	3 year avg.	2016-17 CYTD Jun	3 year avg.
1	Average Berth Productivity – tonnes per hour at berth	639	896	720	707
2	Average Port Productivity – tonnes per hour	2,444	2,350	2,732	2,318

Rail Metrics

	Indicators	2016 - Jun	3 year avg.	2016-17 CYTD Jun	3 year avg.
1	Rail Unloads at Vancouver Terminals – MMT	1.6	1.7	20.0	17.9
2	Car Cycle – Prairies to Western Ports – Days	13.3	13.9*	13.0	12.9*

Prairie Elevator Metrics

	Indicators	2016 - Jun	3 year avg.	2016-17 CYTD Jun	3 year avg.
1	Total to Move - MMT	4.3	4.3	48.1	44.3
2	Total Shipments	3.6	3.6	42.3	38.3

*Note: CYTD = Crop Year to Date, *- 5 year average*

Deliveries to Prairie Elevators

CARLOADS vs CROPWEEK

Legend: — 3 Yr Avg — 2017

Shipments from Prairie Elevators

CARLOADS vs CROPWEEK

Legend: — 3 Yr Avg — 2017
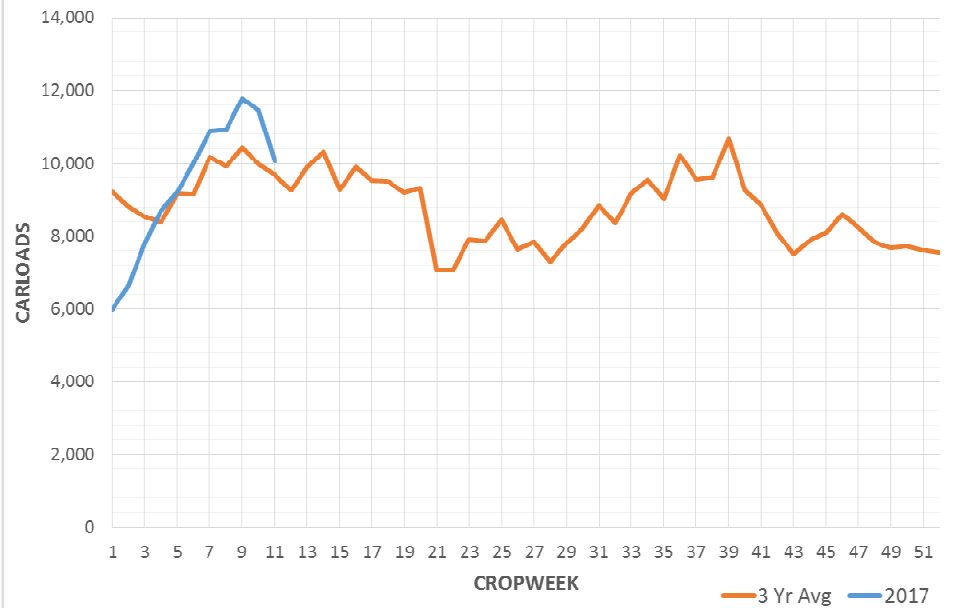
Western Port Terminal Unloads

CARLOADS vs CROPWEEK

Legend: — 3 Yr Avg — 2017 - - Sustainable Capacity — Maximum Capacity

Western Unloads By Port

Port Terminal Receipts (Tonnes/90) vs cropweek

Prince Rupert | Thunder Bay | Vancouver

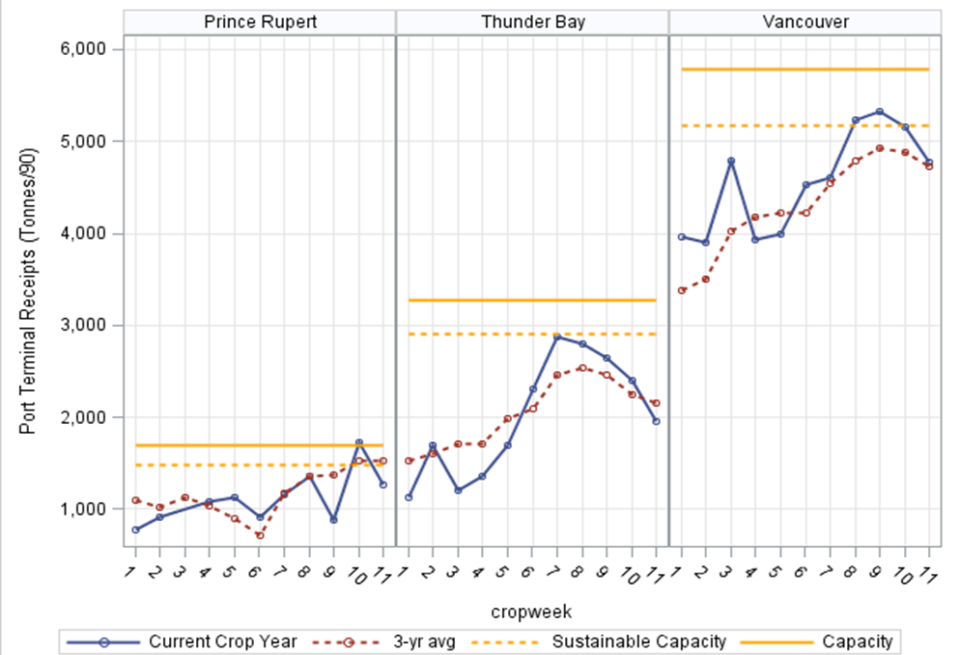Legend: — Current Crop Year - - 3-yr avg - - Sustainable Capacity — Capacity
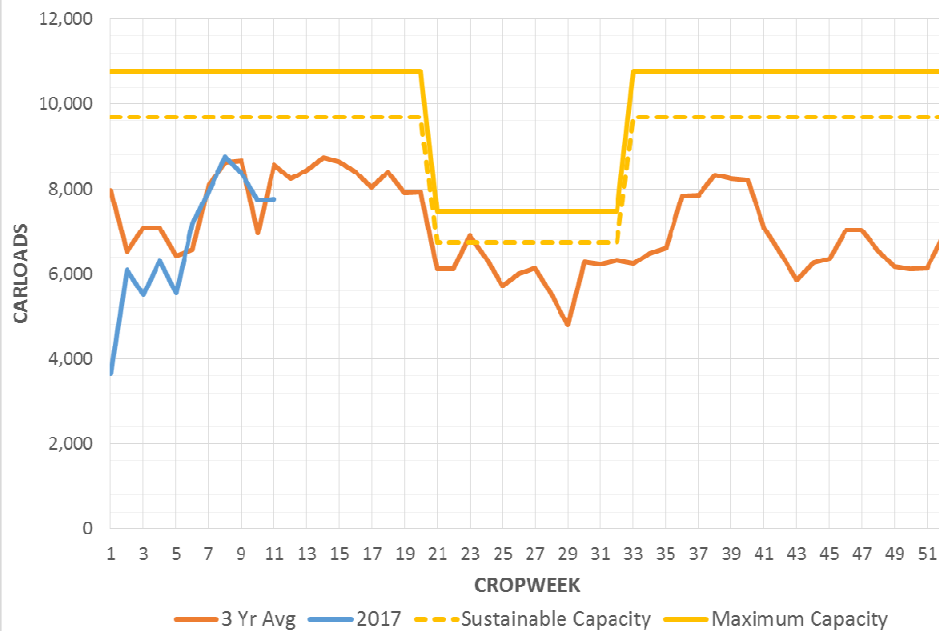
Table 1: Grain Supply Chain Volume and Performance Metrics - Crop Weeks 10 - 11 Ending Oct-15

Estimates Updated at the Beginning of the Crop Year — 1. Western Crop Supply

Crop Year	Total Supply[1]	Export Amount Total[2]	Export Amount Marine[3]	Harvest Progress[4]
	Cars	Cars	Cars	%
2017/2018	833,059	406,928	366,494	86%
3 Yr. Avg.	850,035	415,338	373,886	87%
% Change	-2.0%	-2.0%	-2.0%	-1.0%
2016/2017	884,006	444,642	394,823	77%
2015/2016	815,519	401,447	367,117	89%
2014/2015	850,580	399,926	359,718	-

Values and Estimates Updated Each Week of the Crop Year

Period	2. Prairie			3. Western Ports	4. Port of Vancouver					5. Western Ports
	Prairie Elevator Receipts[5]	Prairie Elevator Shipments[6]	Marine Export Shipment Progress[7]	Unloads at Terminal[8]	Unloads at Terminal[9]	Terminal Throughput Utilization[10]	Grain Vessels in CDN Waters[11]	Grain Vessels at Nanaimo / Gulf Is.[12]	Vessel Loads[13]	Western Port Exports[14]
	Cars	Cars	%	Cars	Cars	%	Vessels	Vessels	Tonnes	Tonnes
Week 11	10,492	10,079	2.1%	7,762	4,768	82.5%	21	0	432,611	604,000
3 Yr. Avg.	8,601	9,677	2.2%	8,562	4,884	84.5%	19	1	409,382	511,600
Week 10	10,861	11,462	2.6%	7,724	4,092	70.8%	17	1	491,764	616,300
3 Yr. Avg.	9,556	9,975	2.2%	6,957	4,869	84.2%	19	1	388,868	415,133
Change from 3 Yr. Avg.	22.0%	4.1%	0.0%	-9.3%	-2.4%	-2.0%	2	-1	5.7%	18.1%
Change from Week 10	-3.4%	-12.1%	-0.5%	0.5%	16.5%	11.7%	4	-1	-12.0%	-2.0%
CYTD - Week 11	118,698	108,850	23.0%	81,556	49,027	-	-	-	4,531,973	5,942,300
CYTD - 3 Yr. Avg.	118,419	104,217	23.1%	83,733	48,826	-	-	-	4,239,604	5,959,733
Change from 3 Yr. Avg.	0.2%	4.4%	-0.1%	-2.6%	0.4%	-	-	-	6.9%	-0.3%

Note: Harvest Progress percentage as of week 10

Definitions

1: Represents the annual tonnage of total supply of Western grain divided by 90 tonnes per car. source: StatsCan, CGC

2: Total supply multiplied by the historical proportion of exports, 49%.

3: Total supply multiplied by the historical proportion of exports, via marine terminals, 90% of the expected export amount.

4: Combined progress of harvest for Alberta & Saskatchewan; source: Provinces websites

5: Tonnage received at Prairie elevators divided by 90 tones per car; source: CGC

6: Tonnage shipped by Prairie elevators divided by 90 tones per car; source: CGC

7: Percentage of estimated marine exports that have been shipped to Western Ports; source: TC, CGC

8: Tonnage received at Western Ports divided by 90 tones per car; source: CGC

9: Tonnage received at Port of Vancouver divided by 90 tones per car; source: CGC

10: Derived unloads from column 9 divided by 5,780 car per week upper limit; source CGC, WGEA

11. Number of vessels in Canadian waters at Vancouver; source: INNAV, BC Chamber of Shipping

12. Number of vessels at Nanaimo and Gulf Islands; source: INNAV, BC Chamber of Shipping

13. Tonnage exported from Marine terminals at Vancouver; source: CGC

14. Tonnage exported from Marine terminals at Western Ports; source: CGC

Transportation System Analysis: Air Cargo

"The forgotten child" Air Cargo Capacity Utilization

YYZ – (LHR+LGW)
Toronto Pearson International - London/Heathrow & Gatwick

Time Period	Enplaned Cargo		Deplaned Cargo		Revenue Passengers	
	Utilization	Utilization 3yr Avg	Utilization	Utilization 3yr Avg	Utilization	Utilization 3yr Avg
Jan-15	43%	37%	52%	42%	80%	79%
Feb-15	56%	45%	63%	51%	72%	70%
Mar-15	52%	42%	64%	50%	79%	81%
Apr-15	31%	34%	45%	37%	80%	81%
May-15	34%	33%	37%	38%	86%	87%
Jun-15	28%	29%	33%	35%	89%	91%
Jul-15	24%	28%	30%	33%	86%	88%
Aug-15	24%	27%	27%	32%	94%	93%
Sep-15	27%	30%	29%	35%	90%	92%
Oct-15	33%	36%	39%	41%	84%	84%
Nov-15	51%	46%	55%	55%	77%	77%
Dec-15	44%	40%	48%	46%	83%	87%
Jan-16	44%	39%	50%	45%	79%	81%
Feb-16	51%	47%	53%	55%	75%	72%
Mar-16	41%	44%	47%	55%	80%	80%
Apr-16	40%	31%	43%	39%	82%	80%
May-16	24%	31%	28%	37%	79%	87%
Jun-16	27%	27%	27%	32%	83%	90%
Jul-16	26%	26%	26%	30%	88%	88%
Aug-16	27%	25%	28%	29%	93%	94%
Sep-16	27%	26%	27%	31%	85%	91%
Oct-16	35%	33%	35%	38%	81%	83%
Nov-16	45%	48%	48%	52%	77%	75%
Dec-16	39%	41%	44%	44%	84%	85%
Totals	**36%**	**34%**	**40%**	**40%**	**83%**	**84%**

YUL – CDG
Montréal-Pierre Elliott Trudeau International - Paris/Charles De Gaulle

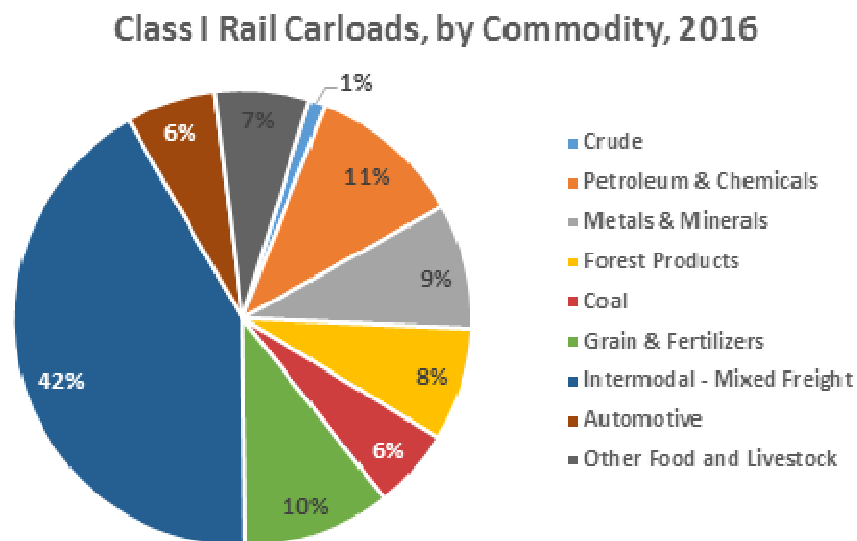| Time Period	Enplaned Cargo		Deplaned Cargo		Revenue Passengers	
	Utilization	Utilization 3yr Avg	Utilization	Utilization 3yr Avg	Utilization	Utilization 3yr Avg
Jan-15	41%	41%	40%	40%	82%	86%
Feb-15	47%	47%	52%	56%	82%	82%
Mar-15	45%	43%	50%	53%	89%	89%
Apr-15	35%	36%	42%	42%	93%	91%
May-15	30%	31%	31%	34%	89%	89%
Jun-15	19%	23%	22%	28%	89%	90%
Jul-15	15%	16%	21%	33%	89%	91%
Aug-15	11%	15%	21%	29%	93%	93%
Sep-15	14%	17%	23%	32%	90%	91%
Oct-15	21%	27%	27%	42%	95%	93%
Nov-15	32%	38%	57%	63%	78%	79%
Dec-15	30%	38%	49%	48%	86%	88%
Jan-16	31%	38%	48%	41%	86%	85%
Feb-16	31%	47%	51%	55%	82%	82%
Mar-16	35%	40%	43%	49%	87%	89%
Apr-16	35%	32%	41%	41%	91%	91%
May-16	35%	29%	31%	33%	92%	90%
Jun-16	17%	22%	18%	24%	85%	90%
Jul-16	12%	16%	22%	28%	86%	91%
Aug-16	10%	14%	24%	25%	88%	94%
Sep-16	19%	15%	27%	27%	84%	90%
Oct-16	31%	26%	38%	50%	94%	94%
Nov-16	40%	37%	52%	54%	77%	78%
Dec-16	46%	35%	45%	43%	86%	87%
Totals	**28%**	**30%**	**37%**	**40%**	**87%**	**88%**

Sources: ECATS, IATA, Transport Canada

GREEN > 5% increase in Utilization compared to 3-year average
RED > 5% decrease in Utilization compared to 3-year average

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Existing Supply Chains with time series:

- Containers imported from Asia and Europe entering four major ports: Vancouver, Prince Rupert, Montreal and Halifax
- Grain exported by rail through the ports of Vancouver, Prince Rupert and Thunder Bay
- Dedicated Supply Chains for the export of: coal, potash, sulphur

Class I Rail Carloads, by Commodity, 2016

- Crude — 1%
- Petroleum & Chemicals — 11%
- Metals & Minerals — 9%
- Forest Products — 8%
- Coal — 6%
- Grain & Fertilizers — 10%
- Intermodal - Mixed Freight — 42%
- Automotive — 6%
- Other Food and Livestock — 7%

Supply Chains at the Developmental Stage

- Commodities moved under a Manifest Train: commodities exported by rail using mixed trains configuration (e.g. forest and chemical products)

- Automotive supply chains
    - Assembled vehicles
    - Automotive parts

- Seaway, St-Lawrence and Great Lakes Supply Chains: focusing on grain, coal, iron ore and special cargo

- East Coast: Cold Supply Chain

- E-Commerce

Road Transport is a big part of the Transport System:

- Develop four specific measurements in partnership with Provinces and Territories aimed at bringing a Provincial/Territorial lens into the System and with a focus on passenger mobility and freight corridors
  - Urban Travel Time Index of major urban corridors but as minimum the portion of the Trans Canada Highway crossing major centers
  - Truck Travel Intercity Indicator of major intercity corridors and again as a minimum the main trade corridors using the Trans Canada Highway
  - Winter/Ice Roads in Canada (NWT, Alberta, Saskatchewan, Manitoba, and Ontario)
  - Infrastructure Readiness for Alternative Fuel

- Those Results and Information will be provided to the Canadian Center on Transportation Data monthly and annually

Trade and Transportation Information Initiative

- Budget 2017 provided **$50 million over 11 years** toward Trade and Transportation Corridors Initiative

- **Scope**: Multimodal freight-passenger transportation information system

- **Deliverable:** Creation of a joint initiative Statistics Canada and Transport Canada – Canadian Center for Transportation Data

Canada's Transportation System

Working quickly and cost effectively to support Canadian jobs and our standard of living

Today's economy depends on long supply chains that reach around the globe. Many types of transportation have to work together well, to move people and freight smoothly across air, land and sea. The Canadian Centre on Transportation Data presents **Performance Indicators** that measure how quickly and efficiently our transportation system is operating. Innovation allows greater productivity by improving performance. That means lower costs and less traffic!

Air Cargo Utilization tells you how much available cargo space is used in air transportation.

Port Dwell Times and **Commodity Flow Rates** measure port activity and how quickly they move freight on to its destination.

Average Train Speeds and **Revenue Ton Miles** tell you how much freight Canada's railroads carry, and how quickly they move **exports** to international markets and **imports** to your door.

Border Crossing Wait Times tell you how quickly Canada's trucking industry gets goods to and from international markets.

(X) If something goes wrong, Canadians need a transportation **system that can adapt quickly** to keep people and goods moving.

(✓) **End to End Transit Times** tell you how well Canada's transportation modes work together to move freight quickly and efficiently.

(✓) **Activity Indicators** tell you what moved where and how. More transportation activity means that more people and more freight need to avoid congestion and delay.

International merchandise **trade statistics**, air and rail **passenger counts**, commercial truck **border traffic** and **travelers** by automobile and plane are all examples of activity indicators you can find via the Canadian Centre on Transportation Data.

The Canadian Centre for Transportation Data (CCTD)

- Coordinate the development and implementation of the multimodal freight-passenger information system

- The CCTD aims to:

    ➢ **Better informed** decisions

    ➢ Enhance **partnerships and collaboration**

    ➢ Improved **accessibility**, **transparency** and **visibility** of data/information

    ➢ Develop a public web access

Thank You

Louis-Paul Tardif

Transport Canada

Louis-paul.tardif@tc.gc.ca