Into (and Out of?) the Valley
Rail Traffic Trends in the 2010s

Michael W. Blaszak
Gross Domestic Product – U.S.

Source: https://fred.stlouisfed.org/series/GDP#0
Annual U.S. Class I Rail Tons
Total Traffic

Tons (in millions)

- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012
- 2013
- 2014
- 2015

Data are originations and include the U.S. operations of CN and CP.
Overall Trends - Canada
Gross Domestic Product - Canada

Source: https://tradingeconomics.com/canada/gdp
Coal
U.S. Coal Production

Source: https://www.eia.gov/coal/production/quarterly/pdf/t1p01p1.pdf
Coal Production by Region

The diagram shows the U.S. coal production by region from 2000 to 2016. The Western region has consistently produced the most coal, followed by the Appalachian region. The Interior region has produced the least coal. The forecast indicates a continued decline in production for the Western and Appalachian regions.
Powder River Coal Production

Source: https://www.eia.gov/opendata/embed.php?type=chart&series_id=COAL.PRODUCTION.TOT-PRB-TOT.A
U.S. Electricity End Use

U.S. Electricity Generation by Fuel Source

Source: https://www.eia.gov/totalenergy/data/monthly/pdf/sec7_4.pdf
Reasons for Change

• Natural Gas Glut
  • Gas Now #1 Fuel Source for Electricity

• Falling cost of renewables
  • Renewables produce 16.9% of U.S. electricity (2016)
  • Government subsidies and mandates

• Cost of pollution reduction

• Aging coal plants
  • 5% of coal fired capacity retired in 2015 alone
  • Median coal plant in service date: 1972 (EIA)

Source: https://www.brookings.edu/blog/the-avenue/2016/12/19/coal-plant-retirements-will-continue-despite-trumps-epa-pick/
U.S. Coal Fired Power Plants

Source: https://www.eia.gov/electricity/annual/html/epa_04_01.html
U.S. Coal Transportation by Modal Share

Source: https://www.eia.gov/todayinenergy/detail.php?id=31472
Canadian Coal Production

Source: https://www.neb-one.gc.ca/nrg/ntgrtd/mrkt/snpsht/2017/03-05cndnclprdctn-eng.html
Canada’s Coal Phaseout

• Ontario ceased burning coal for power generation in 2014
• Alberta (biggest coal producer/user) plans to phase out coal for power by 2030
• Quebec and British Columbia do not generate power from coal
• About half of Canadian coal production is metallurgical coal for export

Crude Oil
World Crude Oil Production

Source: https://www.indexmundi.com/energy/?product=oil&graph=production
U.S. Crude Oil Production to 2015

Source: Energy Information Administration
North Dakota Crude Oil Production

Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCRFPND1&f=M
U.S. Crude Oil Pipeline Map (2013)

Source: American Energy Mapping (AEM) 2013
Crude by Rail Shipments through August 2015

Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=ESM_EPC0_RAIL_ZAMN-ZAMN_MBBL&f=M
Crude Oil Price

Source: http://www.macrotrends.net/1369/crude-oil-price-history-chart
Reasons for the Collapse

• Slowing demand from China
• Anticipated re-entry of Libyan and Iranian oil to world markets
• Saudi Arabia protecting market share
• Delayed pullback in U.S. investment

U.S. Crude Oil Production 2015-17

Source: https://www.eia.gov/outlooks/steo/report/us_oil.cfm
Oil Train Derailments

- Lac Megantic, QC: 47 killed, 1.6 million gallons spilled, MM&A bankrupted
- Mosier, OR: UP blamed for failing to detect broken bolts
- Casselton, ND: BNSF collision and fire forces 2,000 to be evacuated
- DOT and Transport Canada impose stricter car standards and speed limits in 2015, and require ECP brakes by 2021

Source: https://apnews.com/84b1e8273d854697b34af57bc60badc2/timeline-recent-oil-train-crashes-us-and-canada
Crude by Rail Shipments through 2017

Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=ESM_EPC0_RAIL_ZAMN-ZAMN_MBBL&f=M
Dakota Access Pipeline
Dakota Access Pipeline

• Began commercial service on June 1, 2017

• Capacity equal to six oil trains a day (nearly half of ND production)

• Shippers can save $3 a barrel over rail on shipping costs to Gulf points

• But no crude oil pipeline to East Coast (yet)

Source: https://daplpipelinefacts.com
Ethanol Production

Source:
https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=W_EPOOXE_YOP_NUS_MBBLD&f=W
Fracking Sand
Numbers above columns represent the average number of active horizontal rotary drilling rigs per week in a particular year.

Intermodal
U.S. Intermodal Shipments

Source: https://www.aar.org/Pages/Freight-Rail-Traffic-Data.aspx
Canada Intermodal Shipments

Source:
U.S. West Coast Port Container Volume
U.S. East Coast Port Container Volume

New York/New Jersey

Savannah

Source: American Association of Port Authorities, March 2015.
New Panama Canal

Existing locks
Vessel capacity: 5,000 standard containers

New post-Panamax locks
Vessel capacity: 13,000 standard containers

Source: Panama Canal Authority

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Canada West Coast Port Container Volume

Vancouver

Prince Rupert

Source: http://2015.rupertport.com/
Fuel represents about one-third the cost of operating a tractor-trailer over the road

Source: https://www.eia.gov/dnav/pet/hist/LeafHandler.ashx？n=PET&s=EMD_EPD2D_PTE_NUS_DPG&f=A
Intermodal Challenges

- Shift from West Coast to East Coast ports increases truck market share and decreases rail haul
- Reduced diesel fuel prices make over the road movement cheaper
- Poor service during 2014-15 traffic peak drove shippers away
- Truck size and weight
- Automated trucks on the horizon
Average Length of U.S. Rail Haul

Source:
Current Rail Traffic

Source: https://www.aar.org/Pages/Freight-Rail-Traffic-Data.aspx
Current Coal Traffic

Source: https://www.aar.org/Pages/Freight-Rail-Traffic-Data.aspx
Current Intermodal Traffic

Source: https://www.aar.org/Pages/Freight-Rail-Traffic-Data.aspx
Conclusions

• Coal won’t come back in the foreseeable future
• Crude oil may have flattened out
• Intermodal keeps up despite serious challenges
• Uptick in grain traffic
• Conventional carload traffic continues decline
Questions?