



Crude by Rail and the Pacific Northwest: An Overview

April 2016



Overview of Crude By Rail (CBR) Movements – United States

▪ Facts:

- Per U.S. EIA, in 2014 the **U.S. became the No. 1 producer of oil** in the world and with that continuing into 2015 – bigger than Saudi Arabia or Russia
- Per the American Association of Railroads, 2014 carloads carrying oil **rose by more than 5,000 percent** when compared with the numbers in 2008 – approximately 350,000,000 barrels in 2014.
- Key U.S. production regions: **Texas, Gulf of Mexico offshore** and **North Dakota**, which combined account for more than one-half of U.S. production

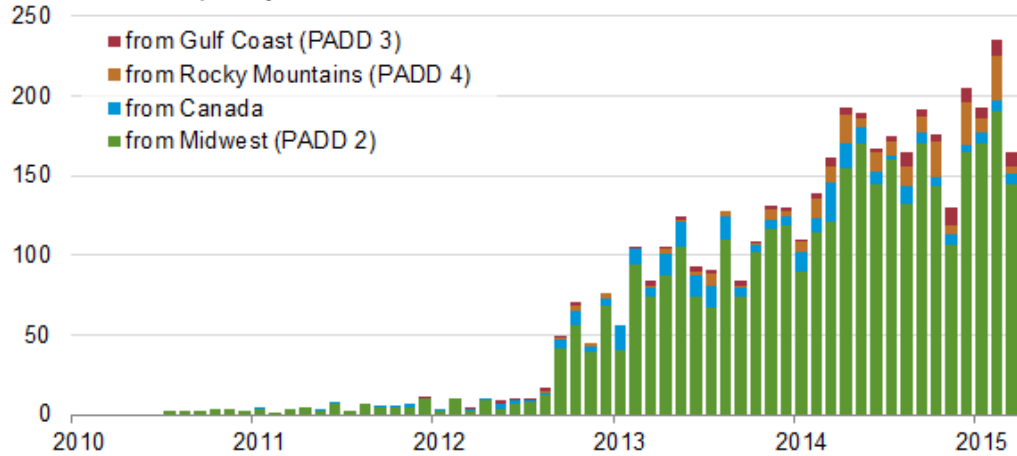
Crude By Rail: Why It Grew

- **Within the past 10 years:**
 - Rapid expansion of crude oil production in inland U.S.
 - Very limited pipeline capacity – North Dakota in particular
 - Lack of pipeline network to coastal regions supplied in recent decades by imported or Alaskan crude oil
 - Domestic crude less expensive than imported
 - Quick capability of railroads to expand crude oil capacity
 - A positive economic equation for producers, refiners, and railroads

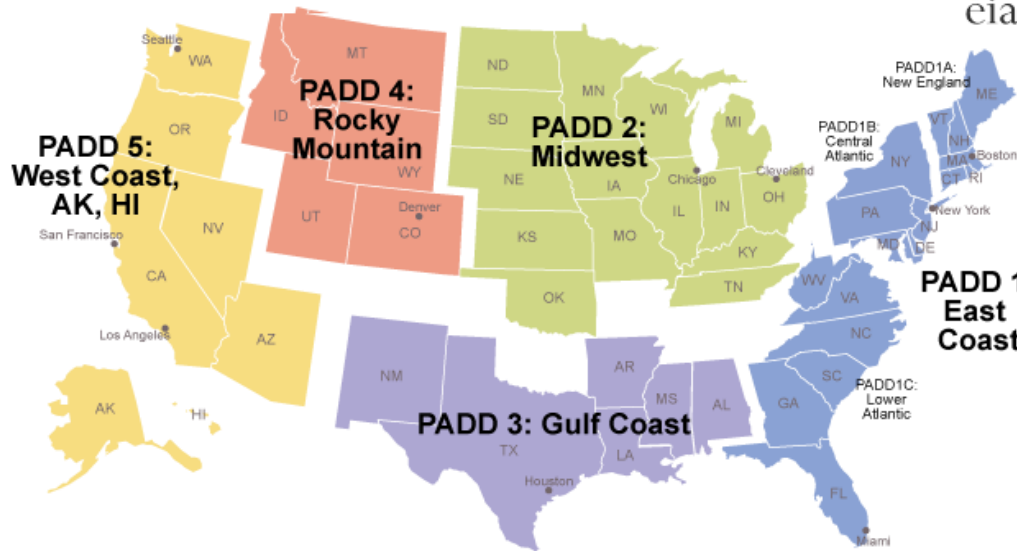
West Coast Sources of Crude By Rail

- Five Petroleum Administration for Defense Districts (PADD) in the U.S.
 - The West Coast, Alaska, and Hawaii are located in **PADD 5**
- Largest movement is originating from **PADD 2**, with sources from North Dakota oil fields

Crude oil supplied by rail to West Coast (PADD 5)
thousand barrels per day

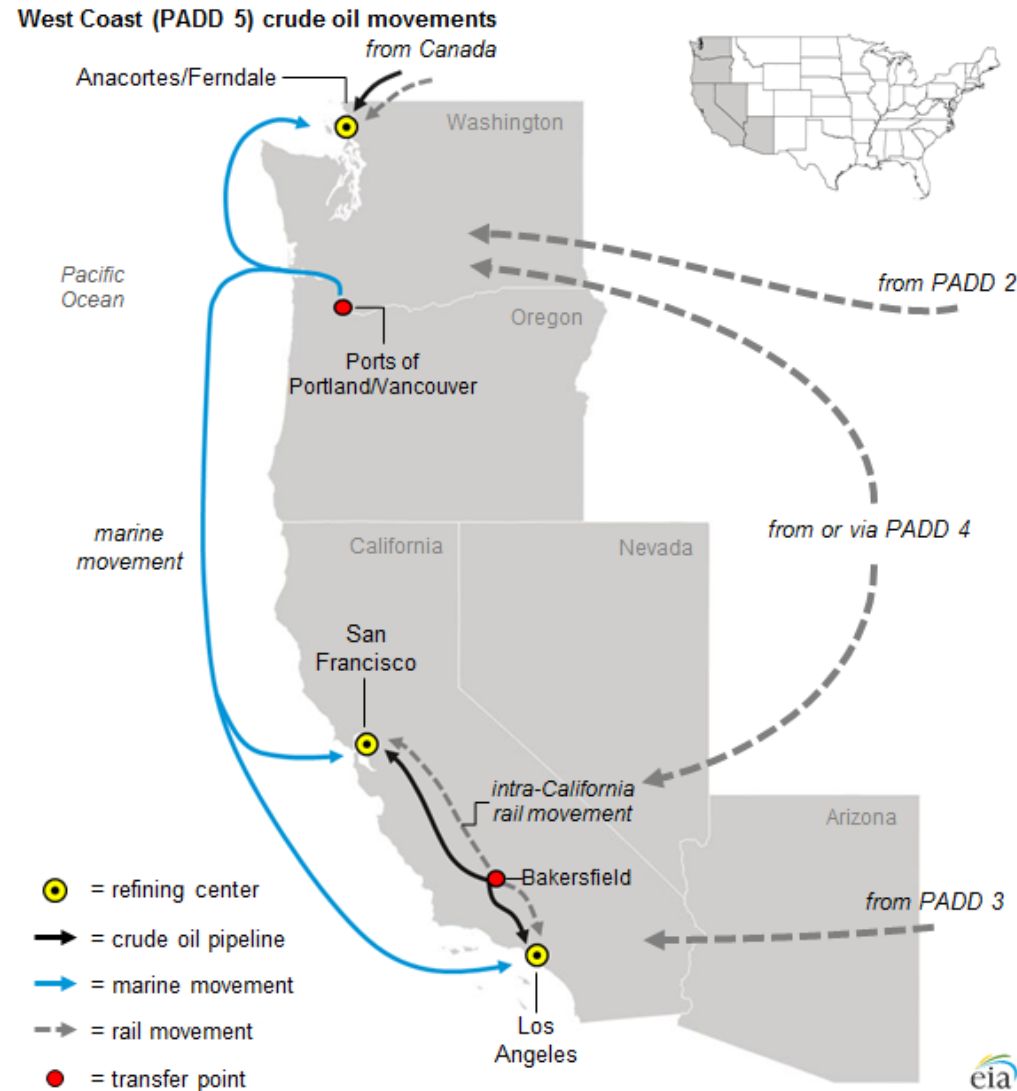


Petroleum Administration for Defense Districts



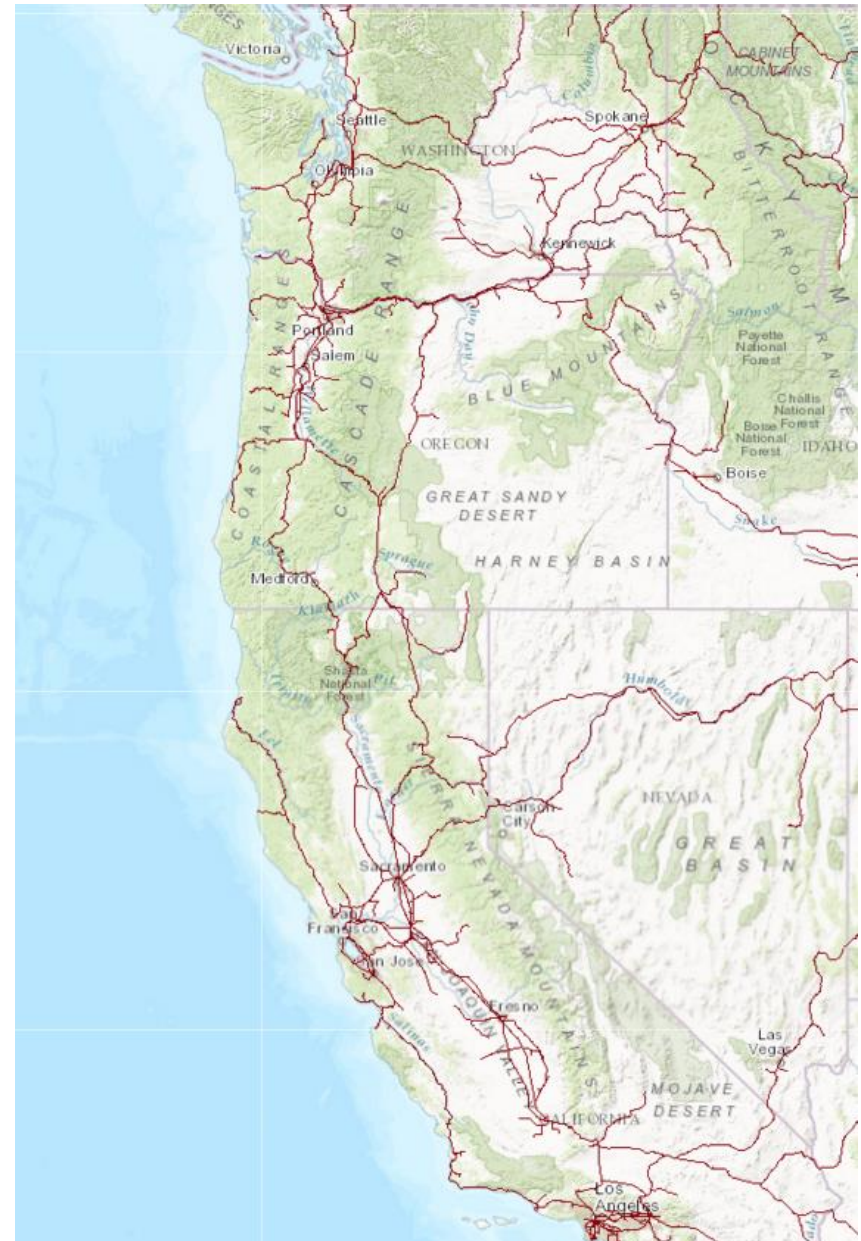
West Coast Crude Oil Movements in Detail

- **Crude by Rail transported to:**
 - Unloading facilities at refineries in Washington and California
 - Terminals in California, Washington, and Oregon.
- **CBR Importance of West Coast:**
 - Supply serves needs of key population centers
 - Bakken accounts for 90% of West Coast receipts delivered by rail



The Pacific Northwest Rail Network

- **Seven principal rail routes to refineries and ports in British Columbia, Washington, and Oregon:**
 - UP Columbia River Gorge
 - BNSF Columbia River Gorge
 - BNSF Stampede Pass (Pasco-Auburn)
 - CP-BNSF via Bellingham, Washington
 - CP-UP via Eastport, Idaho
 - CP to Vancouver, B.C.
 - CN to Vancouver, B.C.



Safety Regulations Enhanced

- High-profile accidents have introduced the need to improve public safety, while also reducing the potential for rail spills
- In 2015, USDOT strengthened safety standards for rail transportation of flammable liquids:
 - Improved tank car standards
 - Phase-out of older tank cars
 - Improved train operation requirements
 - New testing and sampling requirements to determine crude oil volatility
 - Revising current operational protocols



HDR