



## The Northwest's Pipeline on Rails

Crude oil shipments planned for Puget Sound, the Washington Coast, and the Columbia River

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### Summary

Since 2012, nearly a dozen plans have emerged to ship crude oil by train to Northwest refineries and port terminals. Moving large quantities of oil by rail would be a major change for the Northwest's energy economy, but so far the proposals have largely escaped notice.

Most media accounts to date have presented only a fragmented view of the developments, and government regulators are evaluating the projects largely in isolation from one another. This memo presents the first comprehensive, region-wide review of all the oil-by-rail projects planned or currently operating in the Pacific Northwest. It finds that:

- ◆ In Oregon and Washington, 11 refineries and port terminals are planning, building, or already operating oil-by-rail shipments.
- ◆ If all of the projects were built and operated at full capacity, they would put an estimated 20 mile-long trains per day on the Northwest's railway system. Many worry about the risk of oil spills from thousands of loaded oil trains that may soon traverse the region each year.
- ◆ Taken together, the oil-by-rail projects planned for the Northwest would be capable of delivering enough fuel to exceed the region's oil refining capacity. Ironically, two of the facilities that would handle oil by rail were originally built to supply renewable fuels.
- ◆ The projects are designed to transport fuel from the Bakken oil formation in North Dakota, but the infrastructure could also be used to export Canadian tar sands oil. In fact, if all of the oil-by-rail projects were built, they would be capable of moving 720,000 barrels per day—that's more oil capacity than either of the controversial pipelines planned in British Columbia.
- ◆ On Puget Sound, two of the region's five refineries already receive oil-by-rail shipments, and the other three are planning new facilities. Three proposals for Grays Harbor would move oil along the Washington coast. And on the Columbia River, one port terminal is already receiving oil-by-rail shipments, while officials at Vancouver are planning by far the region's largest facility.

## Analysis

It was clear and sunny on September 4, 2012 when locomotives pulling a hundred uniformly black tanker cars rolled to the shores of Puget Sound. It was the first train bearing crude oil from North Dakota to reach the Northwest coast, and its arrival heralded a new era for the region's place in the global energy economy—one in which the Northwest could become a major oil supplier to Asian markets.<sup>1</sup>

The oil had come from beneath the rangeland of western North Dakota, long a quiet and empty place sitting atop a huge oil field known as the Bakken formation. Until recently, the extensive shale oil deposits there were largely untapped because the oil was simply too difficult to extract. But new fracking and drilling techniques allowed oil companies in the Bakken to unleash a gusher of petroleum that is widely considered the most consequential American oil play in decades.

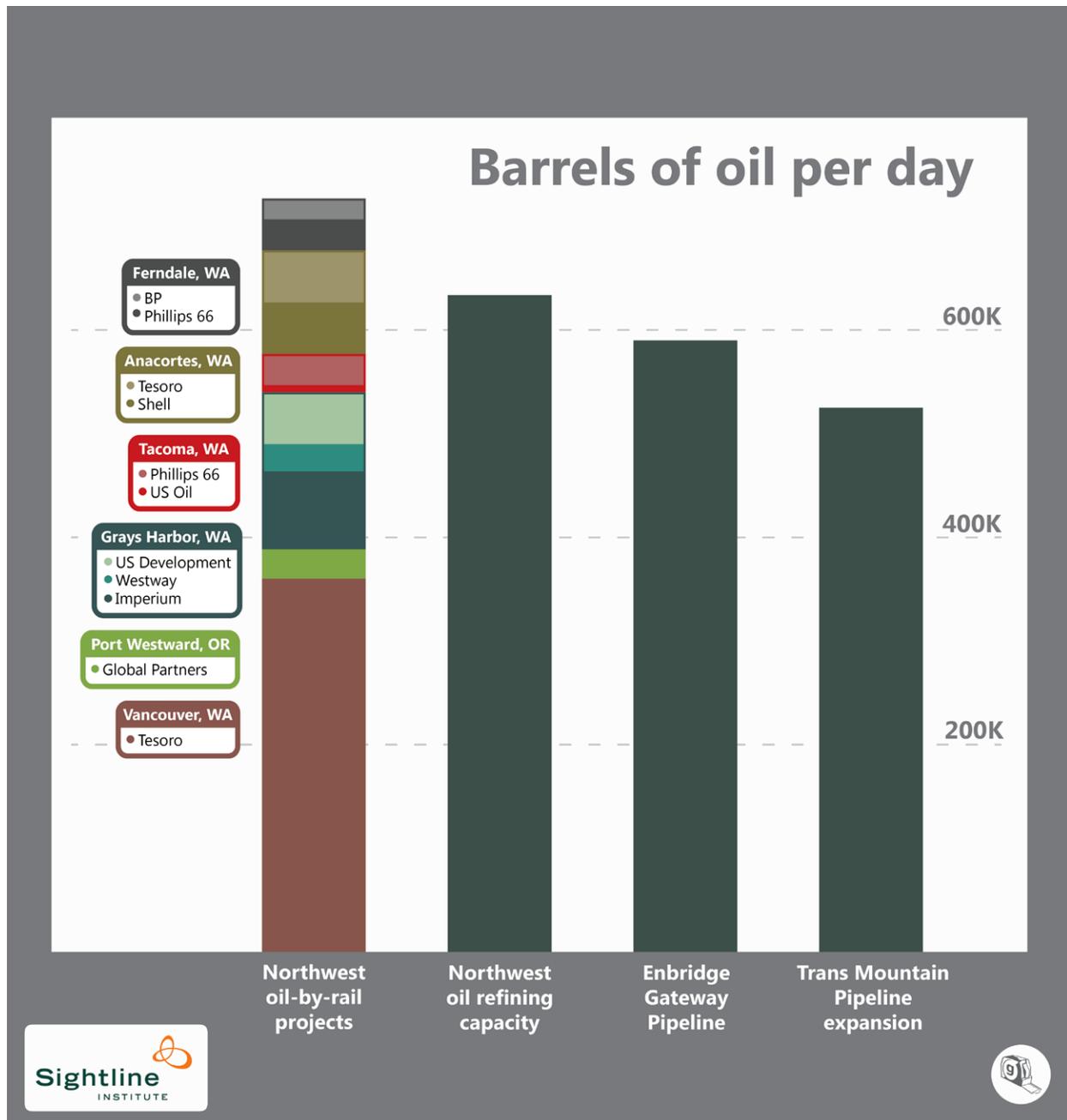
So sudden was the region's oil boom that companies found themselves with scant infrastructure to move the crude to market. Railways seized the opportunity to play a role traditionally reserved for pipelines: moving large volumes of crude oil. The rail industry embarked on a breakneck campaign of building tanker cars as refineries and ports began hatching plans to receive the product from trains.<sup>2</sup>

Today, oil companies are planning, building, or already operating 11 crude oil-by-rail projects in Oregon and Washington. The destinations include all five Northwest refineries as well as six port terminals. If all of them are built, they would be capable of delivering more than 720,000 barrels of oil per day, a figure that exceeds the region's total oil refining capacity. Taken together, Northwest oil-by-rail projects would have a larger capacity than either of the controversial pipeline expansions in British Columbia—the Enbridge Northern Gateway Pipeline proposal and Kinder Morgan's planned expansion of its Trans Mountain Pipeline.<sup>3</sup>

Ironically, two of the facilities that would handle oil by rail were originally built to supply renewable fuels. Imperium Renewables at the Port of Grays Harbor, Washington, was promoted to handle biodiesel, but the firm is now planning to expand its facilities to become the region's second largest player in shipping crude oil by rail.<sup>4</sup> And at Port Westward, near the town of Clatskanie, Oregon, a troubled ethanol facility that was supported by state renewable energy subsidies is already transferring crude oil from trains to vessels on the Columbia River.<sup>5</sup>

The scale of these projects raises concerns about increased freight train traffic on the region's railways. If built and operated at full capacity, the oil-by-rail projects could add more than 20 mile long petroleum-hauling trains per day. The Northwest railway system is already overburdened in many locations and is at risk of considerably more congestion if coal export terminals planned for Puget Sound and the Columbia River are developed.<sup>6</sup>





Widespread oil-by-rail shipments also raise concerns about the increased risk of oil spills. In Washington, the state's oil spill response program is funded through a tax on crude oil coming into the state by vessel but not rail. If the state transitions from vessel shipments of Alaskan oil to rail shipments of oil from North Dakota or Canada, it is possible that the program may find itself underfunded.<sup>7</sup> Industry officials debate the relative safety of shipping oil by rail rather than pipeline, noting that railcar spills tend to be smaller but more frequent.<sup>8</sup>

Crude oil-by-rail infrastructure is by no means restricted to serving the Bakken oil fields; it could also act as a vehicle for transporting bitumen from the Canadian oil sands.<sup>9</sup> Wider use of tar sands oil is currently impeded by serious transport bottlenecks. In Canada, pipelines planned to the Pacific

Ocean are facing delay and staunch opposition, while US activists have questioned the wisdom of constructing the Keystone XL Pipeline, which would deliver Canadian oil to the Gulf Coast. Large-scale build-out of oil-by-rail projects in the Northwest could, in effect, serve as a pipeline on wheels for Canadian tar sands.

Regardless of the origin of the crude oil to be shipped by rail, it is not clear where the product is destined. In some cases, oil delivered to West Coast refineries may displace existing supplies of crude such as those from Alaska's North Slope oil fields that currently arrive in tanker vessels. In other cases, the oil may be destined for export to Asia. Under current law, US crude oil cannot be exported overseas, but many in the oil industry are calling for Congress to lift the ban, enabling oil producers to sell American crude oil to China and other countries.<sup>10</sup> Oil from Canada, however, is not subject to the ban, so it is conceivable that Oregon and Washington could become a transshipment hub for tar sands oil headed to Asia.

Although oil-by-rail plans represent a potential transformation of the Northwest's energy economy, most media accounts have presented only a fragmented view of the developments. Moreover, government regulators are evaluating the projects largely in isolation from one another. Until now, no one has conducted a comprehensive project-by-project assessment of oil-by-rail facilities in the Pacific Northwest.

## Findings

	Handling capacity (barrels per day)	Estimated trains per week (full & empty)
BP Refinery (Ferndale, WA)	20,000	4
Phillips 66 Refinery (Ferndale, WA)	30,000	6
Tesoro Refinery (Anacortes, WA)	50,000	10
Shell Refinery (Anacortes, WA)	50,000	10
Phillips 66 / Targa Terminal (Tacoma, WA )	30,000	6
US Oil & Refining (Tacoma, WA)	6,900	1.4
US Development (Hoquiam, WA)	50,000	10
Westway Terminals (Hoquiam, WA)	26,300	5.3
Imperium Terminals (Hoquiam, WA)	75,000	15
Global Partners (Clatskanie, OR)	28,600	5.7
Tesoro / Savage (Vancouver, WA)	360,000	72
<b>Total</b>	<b>726,800</b>	<b>145</b>

### **BP Refinery (Ferndale, WA)**

By far the largest refinery in the Northwest, BP's Cherry Point Refinery is located on Puget Sound. It can refine 230,000 barrels of oil per day. Plant managers are undertaking a \$60 million dollar project to build railcar receiving and unloading facilities that will enable the refinery to accept 20,000 barrels of oil per day by the end of 2014.<sup>11</sup>

### **Phillips 66 Refinery (Ferndale, WA)**

Capable of processing 100,000 barrels of oil per day, the Phillips 66 Ferndale refinery is located on Puget Sound just south of Cherry Point. It is set to build a rail car receiving facility that will allow the plant to take 30,000 barrels of oil per day. Refinery officials hope to complete work by December 2014.<sup>12</sup>

### **Tesoro Refinery (Anacortes, WA)**

Tesoro's Anacortes Refinery sits on Puget Sound at March Point near Anacortes. Capable of refining 120,000 barrels per day, the company completed a \$60 million rail improvement project in 2012 that allows it to receive 50,000 barrels of oil per day by railcar.<sup>13</sup>

### **Shell Refinery (Anacortes, WA)**

The second largest refinery in the Northwest, with a capacity of 145,000 barrels per day, Shell's Puget Sound Refinery is located just south of the Tesoro Refinery at Anacortes. Officials there are planning a new rail loop and offloading facility that will enable it to handle 50,000 barrels per day of crude oil delivered by train.<sup>14</sup>

### **Phillips 66 / Targa Sound Terminal (Tacoma, WA)**

Located on the Hylebos Waterway at the Port of Tacoma, Targa Sound Terminal is building a new storage and unloading facility estimated to cost between \$80 and \$150 million. Targa has partnered with Phillips 66 to provide rail-unloading and barge-loading services to move 30,000 barrels per day to the Phillips 66 refineries in Ferndale or San Francisco.<sup>15</sup>

### **US Oil Refinery (Tacoma, WA)**

Located at the Port of Tacoma, US Oil and Refining Company operates the smallest of the Northwest refineries, with a rated capacity of 39,000 barrels per day. In 2012, the plant spent \$8 million building a new rail yard. Based on statements from a refinery official, Sightline estimates that the facility currently accepts 6,900 barrels of crude oil per day brought in on trains.<sup>16</sup>

### **US Development Group (Hoquiam, WA)**

The US Development Group is planning to spend \$80 million constructing a facility at the Port of Grays Harbor's Terminal 3. Plans call for receiving 50,000 barrels of crude oil per day by rail, storing it on site in tanks, and transferring it to barge or vessel.<sup>17</sup>

### **Westway Terminals (Hoquiam, WA)**

Westway's Grays Harbor Terminal is located at the Port of Grays Harbor where it currently operates a methanol handling facility. Westway is planning to spend \$50 million building four additional storage tanks, each big enough to store 200,000 barrels of oil, which will enable the company to handle 26,300 barrels of oil per day received by trains, store it on site, and load it onto barges or vessels. The company hopes that the site will be operational by January 2014, but legal appeals of the permits will likely delay operations.<sup>18</sup>

### **Imperium Terminals (Hoquiam, WA)**

Imperium, a renewable fuels producer, is exploring a crude oil handling facility at the Port of Grays Harbor at the firm's existing site at Terminal 1. The company is proposing to spend \$45 million constructing nine 80,000 gallon storage tanks and other facilities by 2014. Based on rail and vessel traffic estimates reported in news accounts, Sightline estimates that the site is likely to have a capacity of at least 75,000 barrels per day if it is completed.<sup>19</sup>

### **Global Partners (Clatskanie, OR)**

Global Partners purchased a former ethanol plant at Port Westward on the Columbia River. Operators are currently receiving trainloads of crude oil, storing it on site in two 3.8 million gallon tanks, and loading it onto vessels or barges. Based on information provided by the Oregon state agency charged with emergency oil spill response, Sightline estimates that the facility receives more than 28,000 barrels per day.<sup>20</sup>

### **Tesoro / Savage (Vancouver, WA)**

The most ambitious crude oil transshipment scheme in the Northwest is Tesoro's plan to partner with Savage Companies to develop a \$75 to \$100 million rail complex at the Port of Vancouver. The facility would be capable of handling as much as 360,000 barrels per day. Company officials expect the site to be operational by 2014.<sup>21</sup>

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**Sightline Institute** is a not-for-profit research and communications center—a think tank—based in Seattle. Sightline's mission is to make the Northwest a global model of sustainability—strong communities, a green economy, and a healthy environment.

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## Methods and Sources

Capacity handling figures are rounded to the nearest one hundred barrels per day.

Train volumes are generic estimates by Sightline, not figures derived from specific project documents. Consistent with reports in popular media and industry publications, Sightline assumes that a single railcar carries 700 barrels of oil and that an oil train consists of 100 railcars, which means that each train carries 70,000 barrels of oil.<sup>22</sup>

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