Washington Research Council

Policy Brief

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**Part 3 in Our Series:**
***TRADE AND TRANSPORTATION***

# WASHINGTON CARGO RIDES THE RAILS

**BRIEFLY**

*Continued investment in and by the major railroads is vital for the state's future.*

For more than 100 years, Washington's economy has relied on high quality rail service. The arrival of the railroads to Western Washington in the 1890s connected the state's timber and agricultural producers to national markets in the east, greatly expanding opportunities in the state. Before then, the state was accessible only by wagon roads to the east or sailing ships to San Francisco.

Rail connections provided a major boost to the state's growing trade economy. By the time the railroads arrived, steamship technologies had made trans-Pacific voyages economical. Puget Sound, being 600 miles closer than San Francisco to Japan, quickly became the preferred port for Asian trade, adding to the brisk business coming from Alaska.

Port-driven growth, accompanied by expansion of maritime related industries like shipyards and foundries, caused Seattle's population to expand from about 50,000 in 1890 to 240,000 by 1910. The railroads had mitigated Washington's geographic disadvantage and allowed the state to capture opportunities presented by its northwestern location. Since then, rail lines have continued to provide critical transportation links to major parts of the state's economy.

The ports in the state, both on Puget Sound and on the Columbia River, are major economic drivers. Yet, they face stiff competition. The ports rely on rail connections to handle "discretionary" cargo, which makes up about 70 percent of what goes through the Puget Sound ports. It has origins and destinations outside the Northwest and could ship through other West Coast ports or the expanded Panama Canal. California's massive consumer base has made the distance advantage of Puget Sound less relevant. To the north, Canadian ports further threaten the state's maritime activity, making high quality rail service even more important to the competitiveness of the state's ports.

Rail service has been important to some high-profile industrial recruitment efforts in the state. Some recent examples underscore rail's significance:

- The SGL-BMW carbon fiber plant in Moses Lake relies on rail connections both to bring raw materials to the plant from Puget Sound ports, and to ship out the finished product to East Coast ports for final transfer to Germany. The plant will process thousands of tons of material, and rail is the ideal mode for shipping such products over long distances between ports.
- In 1995, BHP (now Steelscape) decided to locate its steel mill in the port city of Kalama. In citing the reasons for the location, company executives emphasized the site's rail and highway transportation advantages.
- The Boeing Company uses a distributed manufacturing model that demands reliable transportation of large components over large distances for final assembly. For example, the company transports 737 fuselages from Wichita to Renton over rail lines.

Below we trace railroad investment in Washington and consider a few aspects of railroad economics.

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## Railroads in Washington

Washington is currently served by two "Class I" railroads, the BNSF and the Union Pacific, and by a number of smaller short line and switching railroads. Table 1 shows the railroads that operate the nearly 3,700 miles of active track in the state, with the Class I railroads operating about 60 percent of that track. The smaller railways serve primarily as feeder lines to bring cars to and from industrial and agricultural operations off the Class I mainlines. Nationally, Class I railroads operate about 70 percent of active track but account for 94 percent of revenue. The Railroad Retirement Board reports that in 2011 railroads employed 4,950 Washington residents.

Table 1: Freight Railroads in Washington

| | Miles Operated |
|---|---|
| **Class I Railroads** | |
| BNSF Railway Company | 1,635 |
| Union Pacific Railroad Co. | 531 |
| **Regional Railroads** | |
| Montana Rail Link | 15 |
| **Local Railroads** | |
| Cascade & Columbia River Railroad | 137 |
| Central Washington Railroad Company | 60 |
| Columbia & Cowlitz Railway | 8 |
| Columbia Basin Railroad Company, Inc. | 124 |
| Eastern Washington Gateway Railroad | 108 |
| GNP Railway, Inc. | 14 |
| Great Northwest Railroad | 67 |
| Kettle Falls International Railway LLC | 142 |
| Palouse River & Coulee City Railroad | 160 |
| Pend Oreille Valley Railroad | 61 |
| Portland Vancouver Junction Railroad | 33 |
| Puget Sound & Pacific Railroad Co. | 149 |
| Tacoma Rail Mountain Division | 132 |
| Washington & Idaho Railway, Inc. | 88 |
| YCR Corp | 22 |
| **Switching & Terminal Railroads** | |
| Ballard Terminal Railroad Co. | 3 |
| Longview Switching Co. | 17 |
| Meeker Southern Railroad | 5 |
| Mount Vernon Terminal Railway | 1 |
| Tacoma Rail | 59 |
| Tri-City & Olympia Railroad Company | 125 |
| | 3,696 |

Source: Association of American Railroads, BNSF

## All on One Track

The key to success in the railroad industry is to build a portfolio of business that all fits on the same tracks. Within this portfolio, freight trains fall into two broad types.

*Unit trains, or block trains* are defined as those assemblies of rail cars that are never taken apart. The entire train typically travels from one origin to one destination and then unloads. The train likely returns empty. Unit trains are used to haul bulk commodities like grain, coal and, increasingly, petroleum.

*Wagonload trains*. These consist of many different kinds of cars that are assembled into trains in switching yards. A wagonload train may pick up additional cars on the way to its final destination, and may drop cars off as well. Wagonload trains have long felt competition from trucking. While rail transport is more fuel and labor efficient, it often involves multiple moves of cargo, as opposed to the door-to-door service that trucks can provide.

In fitting these services on their networks of track, railroads face two challenges. First, shippers have different time sensitivities. A load of coal heading to a power plant that has a four week supply on hand is less of a priority than a load of new automobiles heading to dealers or containers heading to a ship. Second, trains operate at different speeds. Bulk carriers hauling heavy minerals travel at about 40 miles per hour, whereas intermodal trains with lighter cargo travel at perhaps 60 miles per hour and passenger trains, which operate infrequently, but on the same tracks, travel in excess of 70 miles per hour.

## Constant Investment

Keeping this complex system operating and allowing it to grow both its overall capacity and its ability to absorb surges in cargo requires high levels of investment. Table 2 shows that railroads have increased capital investment significantly over the past decade. In inflation adjusted terms, annual investment has dou-

Table 2: Capital Expenditures by U.S. Freight Railroads (Billions)

| | Total | Structures | Equipment |
|---|---|---|---|
| 2002 | $6.402 | $4.965 | $1.436 |
| 2003 | $6.546 | $4.947 | $1.600 |
| 2004 | $7.189 | $5.615 | $1.574 |
| 2005 | $8.232 | $6.543 | $1.689 |
| 2006 | $9.567 | $7.581 | $1.985 |
| 2007 | $10.952 | $8.148 | $2.804 |
| 2008 | $11.521 | $8.102 | $3.418 |
| 2009 | $10.342 | $7.890 | $2.452 |
| 2010 | $11.031 | $7.783 | $3.248 |
| 2011 | $15.375 | $9.464 | $5.912 |

Source: U.S. Census Annual Capital Expenditures Survey

bled since the end of the previous recession, with the great majority of that investment going to new track, bridges, yards and rolling stock. Investment falls into several categories.

First, the tracks, signals and communications systems must be meticulously maintained. Just as a chain is only as strong as its weakest link, a rail line is only as fast as its slowest segment. As mainlines reach their operating capacity, a slowdown at any point will slow the entire line.

Second, railroads need to add sidings and double tracks in key locations in order to facilitate trains passing, and they must lengthen existing sidings to accommodate longer trains and allow stopped trains to get up to speed before joining the mainline.

Third, switching and intermodal yards must be maintained and expanded so that arriving wagonload trains can be accommodated without delay. A train may have crossed the country in good time, but if the yard is still full of the last train, it must wait.

Fourth, railroads must invest in rolling stock to keep up with changing customer needs and ever-evolving environmental and safety regulations.

BNSF, as noted previously, is Washington's largest railroad. The company's investment has grown substantially in recent years. For BNSF, system wide investment has increased from $1.9 billion in 2002 to $3.7 billion in 2012. In our state alone, BNSF's annual investment has averaged $100 million in recent years. This private sector infrastructure spending underpins the state's significant trade activity.

These investments are all made in a market environment in which the main competitors, trucking lines, are responsible only for their rigs. Trucks use public roads and handle most freight on the customers' property. And in Washington, the cost of railroad investment is compounded by the well-known penalty that Washington's physical geography imposes on infrastructure.

But constant investment is required. A 2007 study for the American Association of Railroads projected that traffic will more than double on many mainlines by 2035, including the primary routes in Washington, and that without significant improvements, those lines will become dysfunctional. The good news from the study is that the capacity on all those corridors can be expanded to accommodate that growth.

## Challenges

Railroads face some important challenges in Washington. To begin with, rail service in the state consists more heavily of wagonload trains than other areas of the country. Unit trains bring grain and other bulk commodities to the ports for export, but most trains operating in the state consist of intermodal cars and other rolling stock that must be assembled in yards. Only about 25 percent of rail cars serving the state arriving in unit trains while unit trains make up about two thirds of shipments nationally.

And to make things more difficult, much of the freight moving to and from Washington is highly variable. Consider three examples of situations faced by the rail industry in Washington:

- As housing markets turned down in the mid-2000s, demand for building materials, furnishings and other goods purchased by homeowners

fell sharply, affecting rail shipments in two ways. First, many of these materials and products are manufactured in Asia, so intermodal rail shipments fell. Second, demand fell for lumber and panels from the Northwest's building materials industries, which are shipped by rail to Eastern markets (from 2005 to 2009, Washington's timber harvest fell by nearly 40 percent). This process is now reversing itself, resulting in surges of demand for rail service as building materials producers and importers ramp up to meet the needs of a resurgent building industry.

- Dock strikes at the Ports of Los Angeles/Long Beach have resulted in the diversion of ships to other West Coast ports, including Puget Sound. The Southern California ports are so huge that even a modest diversion would result in a major increase in intermodal traffic in Washington. This requires a movement of rolling stock and personnel that, once the dock strike is over, must be reversed.
- International grain shipments depend on the vagaries of global harvests, world pricing and food politics. U.S. grain shipments are massive in some years and lower in other years. Growth in food consumption in China, in particular, has led to surges in grain demand when Chinese farmers cannot keep up. But a strong harvest or a change in political decision making can reverse the trend and slow grain shipments. The Chinese government has been aggressively pursuing diversification of its food sources, making grain shipments less certain in the future.

Because Washington, is, quite literally, at the end of the line, boom and bust cycles presents difficulties for the railroads in terms of the availability of rolling stock, employment of personnel and scheduling of service. A healthy railroad system must have both a strong base of consistent, predictable demand and capacity to accommodate surges in demand as they arise. Increasing trade activity and diversifying the product mix will provide more predictability in aggregate demand, strengthening the rail industry and benefitting the port communities that depend on it.

## The Original Network Industry

It's helpful to recognize that railroads resemble other networked services like electric power, telecommunications and the internet. As a prominent study of railroad economics observes:

> While railroads may appear to be an old technology, they are, in fact, the original network industry. . . . Railroads incur large sunk costs before any service can be provided. Once built, the railroad may provide transportation service to a variety of users, each with differing demands. The complexity of the underlying technology of multiple capital-intensive operations serving diverse markets at different locations gives rise to difficult economic issues (Dennis & Tally 2007).

Like any network business, the economics of the railroad industry is built around the problem of generating enough revenue not only to pay operating expenses but also to pay for the massive cost of building and maintaining privately-owned infrastructure. And this all takes place within an economic environment characterized by uneven levels of competition and regulation and a "derived demand" market in which sales depend on activity in the rest of the economy. After decades of regulation, the railroads benefitted from Carter-era deregulation.

## Failure of Regulation

For decades the federal government responded to the uncertainties in the freight transportation industry by heavily regulating not only railroads, but also trucking and air cargo. Regulations set rates, discouraged mergers and the abandonment of tracks, and attempted to strike a regulatory balance between rail and trucking. Ultimately, by the 1970s

the regulatory regime failed, and railroads across the country faced bankruptcy.

Recognizing the failure of heavy regulation, Congress passed the Staggers Rail Act in 1980, substantially deregulating railroads. Deregulation had two important impacts. First, by eliminating price controls railroads could better justify productivity-enhancing investments, knowing they could get a return on that investment.

Second, by allowing mergers, many of which were "end-to-end," railroads could extend their lines across larger stretches of the country and serve long-haul markets much more efficiently. For example, the merger of the Burlington Northern and the Atchison Topeka and Santa Fe railroads allowed direct shipments north and south through the Midwest that had previously required transfers between railroads.

The post-Staggers Act efficiencies had a big impact on pricing. According to the American Association of Railroads, freight rates fell, on an inflation-adjusted basis, from $0.07 per ton-mile in 1981 to just $0.028 per ton-mile in 2004. Rates started to pick up after 2004, but by 2012, freight rates were still less than 60 percent of their level under the regulated environment.

## Conclusion

Railroads have the same basic features of other networked businesses—high initial fixed investment, need for large network scale—and need to develop reliable demand patterns in order to finance construction and maintenance of their networks. This means having a diverse portfolio of services that can hedge against the variability they face as a "derived demand" business. In Washington that portfolio is less balanced than elsewhere in the country, with more of the railroads' business in wagonload trains and less in unit trains.

Continued investment in and by the major railroads is vital for the state's future. The competitiveness of the state's ports will be heavily determined by the rail connections and service they rely on, and industrial sites around the state need reliable service. Washington is a terminal stop for two of the nation's major Class I railroads, so we cannot rely on continued high quality service just because the trains happen to be passing through. The increased investment associated with coal exports will keep the trade doors open for decades to come by strengthening the rail presence in our port cities.

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