Summary
Rail intermodal — the movement of shipping containers and truck trailers on railroad flat cars — has been growing rapidly for years. U.S. rail intermodal volume in 2017 was a record 13.7 million containers and trailers. Today, intermodal is the largest single source of U.S. freight rail revenue. Intermodal represents a competitively priced, environmentally friendly alternative to excessive reliance on highways to transport freight. It has grown in large part because railroads have invested billions of dollars on new intermodal terminals, track upgrades, and other infrastructure projects that have made rail intermodal more reliable and cost effective.

What is Rail Intermodal?
Rail intermodal is the long-haul movement of shipping containers and truck trailers by rail, combined with a truck or water movement at one or both ends. Intermodal allows railroads, ocean carriers, trucking companies, and intermodal customers to take advantage of the best attributes of various transportation modes to yield an efficient and cost-effective overall freight movement.

- U.S. rail intermodal volume has grown sharply over the years, rising from 5.6 million containers and trailers in 1990 to 9.0 million in 2000 to 11.1 million in 2010. In 2017, U.S. rail intermodal volume was a record 13.7 million units.

- In 2017, intermodal accounted for approximately 24 percent of revenue for major U.S. railroads, more than any other single commodity group and well ahead of coal, which in the past was usually the largest single source of rail revenue.

- Intermodal is used to transport a huge variety of goods that Americans use every day — from greeting cards and furniture to frozen chickens and computers. In fact, just about...
everything found on a retailer’s shelves might have traveled on an intermodal train. Intermodal is also widely used to transport industrial and agricultural products like auto parts and grain.

- Today, exports and imports account for around half of U.S. rail intermodal traffic. The domestic share of intermodal traffic has been rising in recent years, with much of the increase consisting of freight that used to move solely by truck but which has been converted to rail intermodal.

- Containers accounted for 47 percent of intermodal volume in 1990, 69 percent in 2000, and a record 92 percent in 2017. Unlike trailers, containers can be “double stacked,” sharply increasing productivity and helping to ensure that there is sufficient traffic density to keep rail intermodal cost competitive with all-truck movements. Containers can also be easily transferred to and from ships and trucks, further enhancing productivity.

- Chicago and Los Angeles/Long Beach are by far the top U.S. metropolitan areas for intermodal volume. Major intermodal markets have large populations and extensive highway feeder systems, both of which are crucial elements for intermodal success.

### The Development of the U.S. Rail Intermodal Network

Successful intermodal corridors need sufficient line haul and terminal capacity to keep trains moving and to avoid congestion or delay. With this in mind, U.S. railroads have created the most advanced intermodal network in the world by more fully utilizing existing capacity and through tens of billions of dollars in spending on new infrastructure and equipment directly connected to intermodal operations, such as:

- New or expanded inland intermodal terminals to facilitate the transfer of containers and trailers between rail and truck;
- New near-dock intermodal terminals to facilitate the transfer of containers between ship and rail;
- Raising clearances along rail routes to accommodate the additional height required for doublestack trains;

#### Top 15 Markets for Intermodal Traffic Handled in the United States in 2016*

<table>
<thead>
<tr>
<th>Market</th>
<th>Containers and Trailers</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Chicago / Elwood / Joliet, IL</td>
<td>5,925,000</td>
</tr>
<tr>
<td>2. Long Beach / San Pedro / San Bernardino / City of Industry, CA</td>
<td>5,014,000</td>
</tr>
<tr>
<td>3. Atlanta, GA</td>
<td>1,397,000</td>
</tr>
<tr>
<td>4. Dallas / Ft. Worth / Saginaw, TX</td>
<td>1,244,000</td>
</tr>
<tr>
<td>5. Little Ferry / North Bergen / South Kearny / Jersey City / Newark / Elizabeth, NJ / Staten Island, NY</td>
<td>1,083,000</td>
</tr>
<tr>
<td>6. Seattle / Bremerton / Tacoma / Everett, WA</td>
<td>970,000</td>
</tr>
<tr>
<td>7. Memphis, TN / West Memphis, AR</td>
<td>799,000</td>
</tr>
<tr>
<td>8. Norfolk / Portsmouth, VA</td>
<td>641,000</td>
</tr>
<tr>
<td>9. Stockton, CA</td>
<td>609,000</td>
</tr>
<tr>
<td>10. Harrisburg, PA</td>
<td>599,000</td>
</tr>
<tr>
<td>11. Detroit / Pontiac, MI / Toledo, OH</td>
<td>522,000</td>
</tr>
<tr>
<td>12. Jacksonville, FL</td>
<td>497,000</td>
</tr>
<tr>
<td>13. Columbus / Marion / Marysville, OH</td>
<td>448,000</td>
</tr>
<tr>
<td>14. Savannah, GA</td>
<td>441,000</td>
</tr>
<tr>
<td>15. Houston, TX</td>
<td>378,000</td>
</tr>
</tbody>
</table>

*Originated and terminated  Source: AAR analysis of 2016 STB Waybill Sample
• Adding track capacity and advanced signaling systems to accommodate faster, more frequent trains on the rail network;
• Introducing a variety of new intermodal car types and modernizing the locomotive fleet to enhance reliability for rail customers.

The intermodal-specific spending is part of a much broader set of more than $660 billion in rail spending from 1980 through 2017 — paid for with railroads’ own funds, not taxpayer funds — on capital expenditures and maintenance expenses related to locomotives, freight cars, tracks, bridges, tunnels, and other infrastructure and equipment. That’s more than 40 cents out of every rail revenue dollar over that period.

Why Has Rail Intermodal Been Growing?

Rail intermodal has been growing for a number of reasons:

• Better service. Railroads know that reliability is crucial to successful intermodal operations. That’s why they’ve put enormous effort into improving their intermodal service. Today, rail intermodal is far more efficient and productive than it used to be.

• Massive Spending. The rail spending described above is now paying off in terms of more productive and more reliable intermodal operations. The map above shows major intermodal terminals on the U.S. rail network. Many of these terminals did not exist five or ten years ago. Their breadth and scope are a testament to the seriousness with which railroads treat their customers’ capacity and service needs.

• Fuel costs. On average, railroads are four times more fuel efficient than trucks, meaning that higher fuel prices put trucks at a relative disadvantage vis-à-vis railroads.
• **Truck driver shortages.** Finding enough people who are willing and able to be long-haul truck drivers is a constant challenge for trucking companies — annual driver turnover at trucking firms often approaches 100 percent. When rail intermodal is used, truck driver shortages are much less of a problem.

• **International trade.** About half of U.S. rail intermodal volume consists of imports and exports. International trade has been growing, and experts predict continued growth into the future.

• **Conversion of boxcar traffic.** Some rail traffic that used to move in boxcars now moves in containers. In 1994, boxcars accounted for 11 percent of rail traffic. Today, it’s well under 3 percent. Part of this decline is due to lost traffic — newsprint, for example, typically moves in boxcars, and because fewer people are reading printed newspapers, railroads have fewer newsprint moves. But some of the decline is conversion. Auto parts, for example, now often move by container.

**Rail Intermodal Yields Huge Public Benefits**

Trucks are, and will remain, critical to freight transportation and to America’s economy. However, **railroads are more cost effective, more fuel efficient, and more environmentally desirable than an over-reliance on highways for freight transport.** Consider:

• In 2016, railroads moved a ton of freight an average of **468 miles** per gallon of fuel. As noted above, on average railroads are four times more fuel efficient than trucks. Because greenhouse gas emissions are directly related to fuel consumption, moving freight by rail instead of truck reduces greenhouse gas emissions by 75 percent.

• According to the Texas Transportation Institute’s 2015 Urban Mobility Scorecard, **highway congestion in 2014 cost Americans $160 billion** in wasted time (6.9 billion hours) and wasted fuel (3.1 billion gallons). Lost productivity, cargo delays, and other costs add tens of billions of dollars to this tab. **One freight train, though, can carry the freight of several hundred trucks.**

• **Shifting freight from trucks to rail reduces the pressure to build costly new roads** and helps **cut the costs of maintaining the roads we already have.** Roads are incredibly expensive and time consuming to build. It can easily cost $15 million (and often much more) and well over a decade just to add a lane to a mile of highway.

• Moving freight by intermodal rather than by truck alone means cleaner air. Emissions of particulate matter and nitrogen oxides are significantly lower for railroads than for trucks.
Future Growth in Intermodal

- The United States has the world’s most highly developed highway network, built and maintained at enormous public expense over the years. According to the Federal Highway Administration (FHWA), states disbursed more than $105 billion in 2015 alone on capital outlays and maintenance for highways. Adding in other expenses such as administration and planning, law enforcement, interest, and grants to local governments brings total state disbursements for highways to $168 billion in 2015. Even this huge level of spending, however, is widely considered to be inadequate to meet present-day, much less future, needs.

- That’s important, because in the future the need to move more people and goods will grow. Recent forecasts from the FHWA say that total U.S. freight shipments will rise from an estimated 18.1 billion tons in 2015 to 25.5 billion tons in 2040 — a 41 percent increase.

- Fortunately, freight rail in general, and intermodal rail specifically, represents a viable and socially beneficial way to help meet this growing demand. Today, rail intermodal service takes millions of trucks off our highways each year, and its potential to play a much larger role in the future is enormous, both in traditional transcontinental markets and in new short- and middle-distance lanes.

- This does not mean we should stop investing in highways or that we should no longer recognize the importance of trucks, but it does mean that policymakers should be doubly aware of the tremendous role railroads are playing — and can play in the future — in meeting our nation’s present and future freight transportation needs.