Economic and Fiscal Impact Analysis of Class I Railroads

Commissioned by
Association of American Railroads

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1.0 Executive Summary

1.1 Overview

The primary purpose of this study is to examine the economic impact of Class I Railroads, a major transportation and economic contributor, in the U.S. economy. This report, commissioned by the Association of American Railroads, calculates the economic and fiscal impacts of operations and capital investments of Class I Railroads. Beyond the economic and fiscal impacts, this report briefly addresses the widespread use and benefits of Class I Railroads' transportation. In determining the national economic impacts of Class I Railroads, three types of impacts are measured: direct, indirect, and induced impacts.

- The **direct** economic effects are generated as operations and capital investment create jobs and workers are hired to support Class I Railroads' operations.
- The **indirect** economic impacts occur as goods and services are purchased from other firms.
- In either case, the increases in employment generate an increase in household income, as new job opportunities are created and income levels rise. This drives the **induced** economic impacts that result from households increasing their purchases at local businesses.

This report provides economic and fiscal impact estimates for 2014, the most recent year for which Class I Railroads' spending data are available. Class I Railroad spending data were gleaned from annual reports (Form R-1) submitted to the Surface Transportation Board.

1.2 Summary of Findings

The analysis found that Class I Railroads have a wide footprint on the economy, impacting many industries and occupations. The total impacts (including direct, indirect, and induced) are a result of industry spending on employee compensation as well as operating and capital expenses. In 2014, Class I Railroads' capital expenditures for road work and equipment reached nearly $15.1 billion, while maintenance expenditures reached an approximate $12.9 billion, totaling $28.0 billion in capital and maintenance expenditures in 2014. Meanwhile, total direct employment for Class I Railroads exceeded 166,000 in 2014, with approximately $14.3 billion in total 2014 expenses attributable directly to employee compensation. According to RESI's analysis, Class I Railroads' operations and capital investment supported approximately 1.5 million jobs (1.1 percent of all U.S. workers), $273.6 billion in output (1.6 percent of total U.S. output), and $88.4 billion in wages (1.3 percent of total U.S. wages).

Figure 1: Class I Railroads' Total Economic Impacts, 2014

Impact Type	Total	Percent of U.S. Economy
Jobs	1,478,247	1.1%
Output	$273,610,148,085	1.6%
Wages	$88,410,469,540	1.3%

Sources: IMPLAN, RESI, Bureau of Labor Statistics, Bureau of Economic Analysis

Class I Railroads' operations and capital investment generated approximately $32.8 billion in tax revenues in 2014. State and local taxes in the analysis primarily include sales and property taxes, as well as dividends and other taxes (such as motor vehicle taxes). Meanwhile, federal taxes include excise taxes and custom duties. Personal income taxes, social insurance taxes, and corporate profits are included at the state and local level, as well as at the federal level.[1]

Figure 2: Class I Railroads' Total Fiscal Impacts, 2014

Tax Type	Total
State and local	$11,883,459,781
Federal	$20,894,501,892
Total	**$32,777,961,673**

Sources: IMPLAN, RESI

Class I Railroads' activity directly employs individuals who fall primarily within the Transportation and Warehousing sector. This includes subsectors for various forms of transportation, couriers and messengers, and warehousing and storage. Total employment impacts, however, fall primarily under the Retail Trade sector, followed by the Administrative and Support and Waste Management and Remediation Services sector. The Retail Trade sector includes subsectors such as motor vehicle and parts dealers; health and personal care stores; and sporting goods, hobby, and musical instruments retailers. The Administrative and Support and Waste Management and Remediation Services sector includes subsectors such as office administrative services, landscape and horticultural services, and waste management and remediation services. Meanwhile, Other Services encompasses subsectors such as commercial and industrial machinery and equipment repair and maintenance; Manufacturing encompasses subsectors such as food product manufacturing and iron and steel forging.

Figure 3: Major Class I Railroads' Employment Impacts, 2014

Industry	Direct	Indirect	Induced	Total
Retail Trade	0	159,882	74,757	234,639
Administrative and Support and Waste Management and Remediation Services	26,426	150,382	37,372	214,180
Other Services	43,180	54,430	49,693	147,302
Manufacturing	21,301	74,507	28,887	124,695
Transportation and Warehousing	56,016	39,129	18,489	113,634

Sources: IMPLAN, RESI

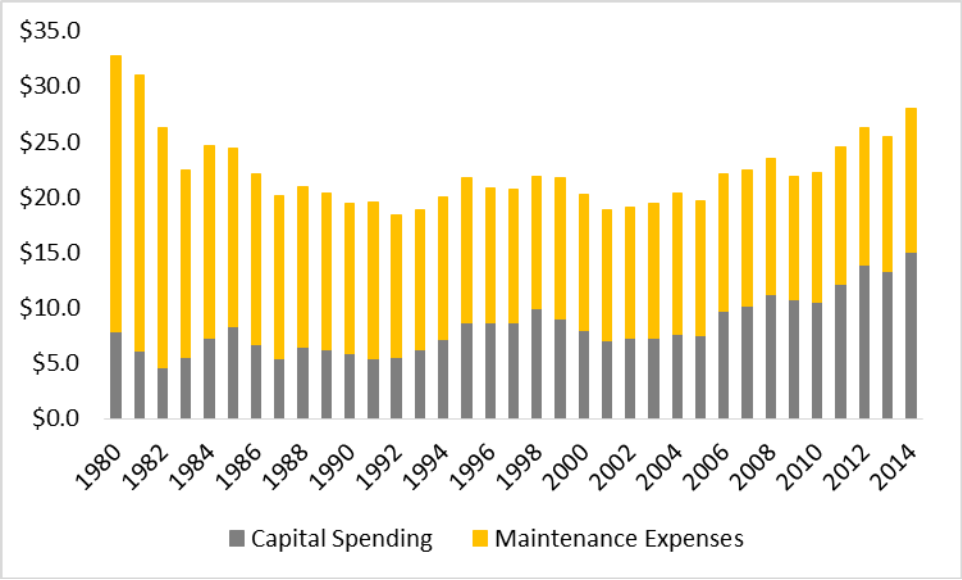
1.3 Spending Activity

Despite a slight decline in the early 1980s, total Class I Railroads' spending on infrastructure and equipment remained fairly consistent at about $20 billion between 1983 and 2011.[2] Since 2011,

[1] IMPLAN does not differentiate between state and local taxes.
[2] Spending is reported in 2014 dollars.

spending on infrastructure and equipment has increased to an average of nearly $26 billion per year.

Figure 4: Total Infrastructure and Equipment Spending, Billions of 2014 $s



Sources: Association of American Railroads, RESI

2.0 Introduction

The primary purpose of this study is to examine the economic impact of Class I Railroads, a major transportation and economic contributor, in the U.S. economy. This report, commissioned by the Association of American Railroads, calculates the economic and fiscal impacts of operations and capital investments of Class I Railroads. Beyond the economic and fiscal impacts, this report briefly addresses the widespread use and benefits of Class I Railroads' transportation.

The U.S. freight railroad industry network encompasses close to 140,000 miles of rails and is shared by several types of railroads: Class I Railroads, Short Line and Regional Railroads (including Switching and Terminal Railroads), and Passenger Railroads.[3] [4] Class I Railroads account for the majority of the industry's mileage and revenue. Despite a slight decline in the early 1980s, total Class I Railroads' spending on infrastructure and equipment remained fairly consistent, at about $20 billion annually, between 1983 and 2011.[5] Since 2011, spending on infrastructure and equipment has increased to an average of nearly $26 billion per year. In 2014, railroad capital and maintenance expenditures topped $28 billion and are estimated at $29 billion for 2015.[6] The products that railroads move include components that are vital to a number of important industries; in turn, these industries support a number of jobs and significant economic activity. Due to Class I Railroads' substantial contributions to the U.S. economy, it is important to determine a comprehensive measure of the economic and fiscal impacts of current operations and capital investments.

3.0 The Railroad Industry

In the U.S. alone, there are approximately 140,000 miles of freight line, the majority of which (95,000 miles) are operated by Class I Railroads.[7] There are seven major Class I Railroads operating in the U.S.:

- BNSF Railway Co.,
- CSX Transportation,
- Grand Trunk Corporation (the majority of Canadian National's U.S. operations),

[3] "Types of Railroads," Association of American Railroads, accessed February 24, 2016, https://www.aar.org/todays-railroads/our-network?t=typesofrailroads.
[4] The 140,000 miles refers to route-miles, which are the aggregate length of railroad right-of-way (excluding yard tracks, sidings, and spurs) over which rail service is conducted. It does not reflect the fact that a mile of right-of-way might include two, three, or more parallel tracks.
[5] Spending is reported in 2014 dollars.
[6] Association of American Railroads, "2015 Outlook," accessed March 15, 2016, https://www.aar.org/Documents/Outlook%202015/2015OutlookReport.pdf.
[7] International Union of Railways, "Benchmarking Intermodal Rail Transport in the United States and Europe," 4, accessed February 24, 2016, http://www.uic.org/diomis/IMG/pdf/DIOMIS_Benchmarking_Intermodal_Rail_Transport_in_the_US_and_Europe.pdf.

- Kansas City Southern Railway Co.,
- Norfolk Southern Corporation,
- Soo Line Railroad (all of Canadian Pacific's U.S. operations), and
- Union Pacific Railroad Co.[8]

These seven Class I Railroads account for approximately 90 percent of railroad employees, 94 percent of freight revenue, and 69 percent of freight rail mileage.[9] Other common railroad categories include Short Line/Regional (accounting for 10 percent of railroad employees and 31 percent of freight rail mileage), Switching and Terminal Railroads, and Passenger Railroads; most of the track traveled by Amtrak (70 percent of miles traveled) is freight-owned track.[10]

3.1 Cargo

The U.S. leads the world in freight rail at 1,770 billion ton-miles, followed by China and Russia with 1,373 billion ton-miles and 1,290 billion ton-miles, respectively.[11] Comparatively, Europe has just 240 billion ton-miles in freight rail.[12] On average, 5 million tons of goods are delivered using Class I Railroads each day.[13] Coal transportation, historically the most important commodity for U.S. railroads, was responsible for 39 percent of tonnage, 20 percent of carloads, and 19 percent of revenue for all U.S. Class I Railroads in 2014.[14] Comparatively, Chemicals transportation was responsible for approximately 10 percent of tonnage, 7 percent of carloads, and 14 percent of revenue for all U.S. Class I Railroads in 2014.[15]

In 2013, the top commodities (by weight and value) shipped by all modes of transportation were bulk products; these products encompassed 16 percent of the total value of goods transported and 64.6 percent of total tons of goods transported.[16] Meanwhile, the top 10 commodities by value comprised 58 percent of the total value of good transported and nearly 19 percent of total tons of goods transported.[17] Gravel was the most transported commodity by weight, while machinery was the most transported commodity by value.[18] Only two

[8] Association of American Railroads, "Railroad Facts 2015 Edition," 4, accessed April 4, 2016, report provided by Association of American Railroads.
[9] "Types of Railroads," Association of American Railroads.
[10] Ibid.
[11] U.S. Department of Transportation, "National Rail Plan Progress Report," Federal Railroad Administration: 9, accessed February 24, 2016, https://www.fra.dot.gov/eLib/Details/L02696.
[12] Ibid.
[13] "The Engine that Moves America," Association of American Railroads, accessed March 15, 2016, https://www.aar.org/Pages/Railroad-101.aspx.
[14] Association of American Railroads, "Railroads and Coal," 6, accessed April 18, 2016, https://www.aar.org/BackgroundPapers/Railroads%20and%20Coal.pdf.
[15] Association of American Railroads, "Railroads and Chemicals," 2, accessed April 18, 2016, https://www.aar.org/BackgroundPapers/Railroads%20and%20Chemicals.pdf.
[16] U.S. Department of Transportation, "Freight Facts and Figures 2015," Bureau of Transportation Statistics, 6, accessed February 29, 2016, http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/FF%26F_complete.pdf.
[17] Ibid.
[18] Ibid.

commodities (gasoline as well as natural gas, coke, asphalt) were in the top 10 commodities transported by both weight and value standards. [19]

Figure 5: Top Commodities for All Modes of Transportation, by Weight or Value, 2013

Weight	Millions of tons	Value	Billions of 2007 dollars
Gravel	2,427	Machinery	$1,877
Cereal grains	1,665	Electronics	$1,485
Non-metallic mineral products	1,514	Motorized vehicles	$1,484
Waste/scrap	1,441	Mixed freight	$1,110
Natural gas, coke, asphalt	1,403	Pharmaceuticals	$914
Coal	1,263	Gasoline	$796
Gasoline	1,029	Miscellaneous manufactured products	$740
Crude petroleum	839	Textiles/leather	$736
Fuel oils	757	Natural gas, coke, asphalt	$650
Natural sands	620	Plastics/rubber	$618

Sources: U.S. Department of Transportation (USDOT), Bureau of Transportation Statistics, and USDOT, Federal Highway Administration, Office of Freight Management and Operations, Freight Analysis Framework, version 3.5

3.2 Regulation Changes and Infrastructure Investment

The Staggers Rail Act of 1980 was enacted as a partial economic deregulation of the freight rail industry to increase the productivity and efficiency of rail systems and to provide freedom to price services at market value.[20] The Staggers Rail Act has had several effects. Railroad costs were reduced through the elimination of unprofitable rail lines, the application of technological advancements, and a reorganization of the rail network (designed to improve efficiency).[21] Since deregulation in 1980, rail track miles have decreased by approximately 40 percent, and traffic density (measured by millions of ton-miles per mile of track) has increased from 3.4 to 11.48.[22] While flat prior to the Staggers Rail Act, rail productivity has increased 139 percent since the regulation change.[23] Most of these productivity gains were passed through to rail customers—decreasing the cost of utilizing rail transportation. By 2014, rail rates charged to customers had decreased by 43 percent, according to average inflation-adjusted rail rates as measured by revenue per ton-mile; this decrease indicates vast savings for rail customers as the

[19] U.S. Department of Transportation, "Freight Facts and Figures 2015," 6.
[20] U.S Department of Transportation, "National Rail Plan Progress Report," 15.
[21] Clifford Winston, "The Success of the Staggers Rail Act of 1980," AEI-Brookings Joint Center for Regulatory Studies (October 2005): 5-5, http://www.brookings.edu/research/papers/2005/10/railact-winston.
[22] Association of American Railroads, "Railroad Facts 2015 Edition," 45-47.
[23] Association of American Railroads, "The Impact of the Staggers Rail Act of 1980," 3, accessed March 30, 2016, https://www.aar.org/BackgroundPapers/Impact%20of%20the%20Staggers%20Act.pdf.

current shipping rate allows for the transport of close to two times the amount of product as it did prior to 1980.[24]

In recent years, the railroad industry has spent significant amounts on capital improvements and maintenance to continue ensuring a safe, productive, and reliable environment. Railroad infrastructure and equipment spending totaled approximately $600 billion between 1980 and 2015; during that same period, the industry saw a 79 percent decrease in train accidents.[25] In fact, the employee injury rate in the rail industry is lower than most major industries, including trucking, water transportation, airlines, agriculture, manufacturing, and construction.[26] To improve safety and efficiency, the railroad industry consistently implements new technologies, such as defect detectors (for both rail cars as well as tracks) and sophisticated data performance collection systems.[27]

3.3 Rail Transportation and the Economy

Since the beginning of rail operations in 1829, railroads have been positively impacting the U.S. economy. The expansion of railroads in the U.S. initially generated a considerable need for goods (such as coal, steel and wood, and construction workers) and labor that later enabled increased business activity. Interstate trade benefited from increased rail transportation in the U.S.[28] Rail transportation allowed for the creation of a national market, enabling movement of goods across the country, and connecting the entirety of the U.S., allowing for increased economic activity.[29] Additionally, rail transportation increased the ease of travel for both business and pleasure, thereby enabling growth and providing the opportunity for increased communications and partnerships.[30] Today, the rail industry continues to be a significant driver of the U.S. economy through operations and capital investment and providing efficient transportation for the industries it serves.

Despite a slight decline in the early 1980s, total Class I Railroads' spending on infrastructure and equipment remained fairly consistent, at about $20 billion annually, between 1983 and 2011.[31]

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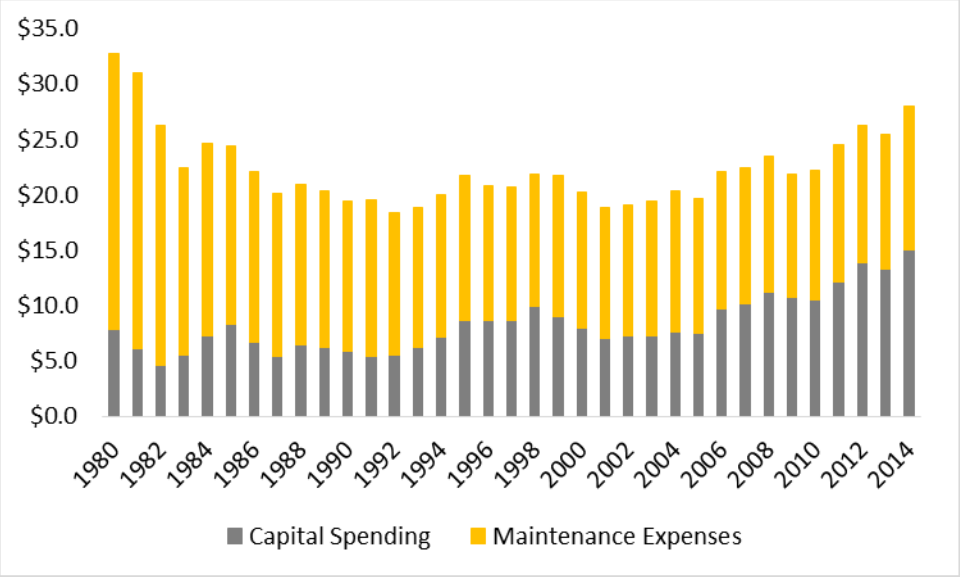
[24] Association of American Railroads, "The Impact of the Staggers Rail Act of 1980," 2.
[25] "Rail Investment Leads to Fewer Train Accidents," Association of American Railroads, accessed February 26, 2016, https://www.aar.org/Pages/Rail-Investment-Leads-to-Fewer-Train-Accidents.aspx.
[26] BNSF, "Employee Safety Programs," ES-1, accessed April 4, 2016, https://www.bnsf.com/communities/pdf/1_EmployeeSafetyPrograms.pdf.
[27] Lisa Terry, "Railroad Operations: Where Safety and Innovation Converge," Inbound Logistics (October 2013): accessed April 5, 2016, http://www.inboundlogistics.com/cms/article/railroad-operations-where-safety-and-innovation-converge/.
[28] PBS, "The Impact of the Transcontinental Railroad," accessed March 31, 2016, http://www.pbs.org/wgbh/americanexperience/features/general-article/tcrr-impact/.
[29] Ibid.
[30] Courtney Endsley, "How the Transcontinental Railroad Changes America," GTG Technology Group, December 17, 2014, accessed March 31, 2016, http://gtgtechnologygroup.com/transcontinental-railroad/.
[31] Spending is reported in 2014 dollars.

Since 2011, spending on infrastructure and equipment has increased to an average of nearly $26 billion per year.

Figure 6: Total Infrastructure and Equipment Spending, Billions of 2014 $s



Sources: Association of American Railroads, RESI

4.0 Findings

To achieve the project objective, RESI completed a national economic (jobs, output, and wages) and fiscal (state and local tax revenues) impact analysis using IMPLAN.[32] RESI estimated the economic impacts of Class I Railroads' operations as well as capital investment for 2014, the most recent year for which all data are available. This analysis depicts the impacts associated with operating Class I Railroads and capital investment in rail infrastructure in terms of employment, output, and wages.

To determine the economic and fiscal impacts of nationwide Class I Railroads' operations, RESI used 2014 operations and capital investments data that the Association of American Railroads provided. AAR compiled Class I Railroad spending data from annual reports (Form R-1) submitted to the Surface Transportation Board. In 2014, Class I Railroads' capital expenditures for road work and equipment reached nearly $15.1 billion, while maintenance expenditures reached an approximate $12.9 billion, totaling $28.0 billion in capital and maintenance expenditures in 2014. Locomotives represented the largest equipment expenditure in 2014 at more than $3.3 billion, while the expenditures related to rail and other track material encompassed the largest road work expenditure at nearly $3.0 billion. Remaining equipment expenditures were primarily related to the purchase of ties, signals and interlockers, ballast, construction work, and other equipment, as well as investments in technology and

[32] Please refer to Appendix A for a detailed description of IMPLAN.

infrastructure. Meanwhile, total direct employment for Class I Railroads exceeded 166,000 in 2014, with approximately $14.3 billion of total 2014 operating expenses attributable directly to employee compensation. Engine and train crews comprised the largest portion of employee compensation in 2014, at $2.5 billion and $2.3 billion, respectively. Moreover, former Class I Railroads' employees and their dependents received more than $7.0 billion in annual pension payments—generating increased household income for the recipients.

According to RESI's analysis, Class I Railroads' operations and capital investment supported approximately 1.5 million jobs (1.1 percent of total U.S. workers), $273.6 billion in output (1.6 percent of total U.S. output), and $88.4 billion in wages (1.3 percent of total U.S. wages). A summary of the total economic impacts of Class I Railroads' operations can be found in Figure 7.

Note that summed figures throughout the report may not add up exactly to totals due to rounding. Please refer to Appendix A for more information regarding the specific industry sectors analyzed using the IMPLAN model. For detailed impacts, please refer to Appendix B.

Figure 7: Class I Railroads' Total Economic Impacts, 2014

Impact Type	Direct	Indirect	Induced	Total
Jobs	166,209	719,203	592,834	1,478,247
Output	$49,872,935,994	$89,099,393,222	$134,637,818,868	$273,610,148,085
Wages	$15,509,974,255[33]	$31,030,407,490	$41,870,087,795	$88,410,469,540

Sources: IMPLAN, RESI

As detailed in Figure 8, Class I Railroads' activity directly employs individuals who fall primarily within the Transportation and Warehousing sector. This includes subsectors for various forms of transportation; couriers and messengers; and warehousing and storage. Total employment impacts, however, fall primarily under the Retail Trade sector, followed by the Administrative and Support and Waste Management and Remediation Services sector. The Retail Trade sector includes subsectors such as motor vehicle and parts dealers; furniture and home furnishings; and electronics and appliance stores. The Administrative and Support and Waste Management and Remediation Services sector includes subsectors such as office administrative services, facilities support services, and waste management and remediation services. Meanwhile, Other Services, with the third-highest total employment impacts, encompasses subsectors such as commercial and industrial machinery and equipment repair and maintenance; Manufacturing encompasses subsectors such as food product manufacturing and motor vehicle body manufacturing.

Figure 8: Major Class I Railroads' Employment Impacts, 2014

[33] IMPLAN Online reports wage impacts as labor income, defined as "all forms of employment income, including employee compensation (wages and benefits) and proprietor income," and therefore direct wage impacts slightly vary from direct employee compensation inputs.

Industry	Direct	Indirect	Induced	Total
Retail Trade	0	159,882	74,757	234,639
Administrative and Support and Waste Management and Remediation Services	26,426	150,382	37,372	214,180
Other Services	43,180	54,430	49,693	147,302
Manufacturing	21,301	74,507	28,887	124,695
Transportation and Warehousing	56,016	39,129	18,489	113,634

Sources: IMPLAN, RESI

Fiscal impacts were largely produced at the federal level. Impacts generated as a result of Class I Railroads' operations resulted in tax impacts of nearly $32.8 billion in 2014. For a summary of these impacts generated at both levels, see Figure 9.

Figure 9: Total Fiscal Impacts

Tax Type	Direct	Indirect	Induced	Total
State and local	$ 3,961,467,225	$ 2,860,999,425	$5,060,993,131	$11,883,459,781
Federal	$ 7,855,039,588	$ 5,371,170,090	$7,668,292,214	$20,894,501,892
Total	**$11,816,506,813**	**$8,232,169,515**	**$12,729,285,345**	**$32,777,961,673**

Sources: IMPLAN, RESI

State and local taxes in the analysis primarily include sales and property taxes, as well as dividends and other taxes (such as motor vehicle taxes). Meanwhile, federal taxes include excise taxes and custom duties. Personal income taxes, social insurance taxes, and corporate profits are included at the state and local level, as well as at the federal level.[34]

5.0 Conclusion

Rail transportation has been positively impacting the U.S. economy since its expansion in the 1800s. In addition to creating numerous jobs during the construction of the U.S. railroad network, rail transportation enabled economic growth throughout the country as cross-country shipping and travel became a reality. Today, Class I Railroads inject significant capital into the economy and support numerous jobs. According to RESI's analysis, Class I Railroads' operations supported approximately 1.5 million jobs, $273.6 billion in output, $88.4 billion in wages, and $32.8 billion in tax revenues in 2014.

[34] IMPLAN does not differentiate between state and local taxes.

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Appendix A—Methodology

A.1 IMPLAN Model Overview

To quantify the economic and fiscal impacts of Class I Railroads' operation and investment in the U.S., RESI used the IMPLAN input/output model. This model has the ability to enumerate the economic and fiscal impact of each dollar earned and spent by the following: employees of the development, other supporting vendors (business services, retail, etc.), each dollar spent by these vendors on other firms, and each dollar spent by the households of the development's employees, other vendors' employees, and other businesses' economic impacts that result from households increasing their purchases at local businesses.

Economists measure three types of economic impacts: direct, indirect, and induced impacts. The direct economic effects are generated as the event create jobs and hire workers to support the event's activities. The indirect economic impacts occur as the vendors purchase goods and services from other firms. In either case the increases in employment generate an increase in household income, as new job opportunities are created and income levels rise. This drives the induced economic impacts that result from households increasing their purchases at local businesses.

Consider the following example. A new firm opens in a region and directly employs 100 workers. The firm purchases supplies, both from outside the region as well as from local suppliers, which leads to increased business for local firms, thereby hypothetically creating jobs for another 100 workers. This is called the indirect effect. The workers at the firm and at suppliers spend their income mostly in the local area, hypothetically creating jobs for another 50 workers. This is the induced effect. The direct, indirect and induced effects add up to 250 jobs created from the original 100 jobs. Thus, in terms of employment, the total economic impact of the firm in our example is 250.[35]

A.2 Input Assumptions

RESI determined economic impacts based on spending on operations and capital investments that the Association of American Railroads provided—AAR compiled Class I Railroad spending data from annual reports (Form R-1) submitted to the Surface Transportation Board. RESI categorized the provided expenditure data by IMPLAN industry sectors. RESI's analysis includes the following modeling assumptions.

- Economic impact multipliers are developed from IMPLAN input/output software.
- IMPLAN data are based on the North American Industrial Classification System (NAICS).
- IMPLAN employment multipliers are adjusted for inflation using the Bureau of Labor Statistic's CPI-U.
- Impacts are based on 2014 IMPLAN data for the U.S., the most recent data available.
- Impacts are represented in 2014 dollars.

[35] Total economic impact is defined as the sum of direct, indirect, and induced effects.

- Employment impacts include both full- and part-time employees. IMPLAN does not differentiate between full- and part-time employments.

For the IMPLAN analysis, RESI categorized industry sectors based on the expenditure categories outlined in Section 4.0. The specific industry sectors that RESI analyzed can be found in Figure 10 below.

Figure 10: IMPLAN Industry Sectors

Industry Code	Description
58	Construction of other new nonresidential structures
134	Sawmills
145	All other miscellaneous wood product manufacturing
209	Other concrete product manufacturing
264	Construction machinery manufacturing
303	Computer terminals and other computer peripheral equipment manufacturing
306	Other communications equipment manufacturing
332	Power, distribution, and specialty transformer manufacturing
362	Railroad rolling stock manufacturing
395	Wholesale trade
402	Retail--gasoline stores
409	Rail transportation
430	Data processing, hosting, and related services
438	Insurance agencies, brokerages, and related activities
440	Real estate
447	Legal services
448	Accounting, tax preparation, bookkeeping, and payroll services
449	Architectural, engineering, and related services
456	Scientific research and development services
457	Advertising, public relations, and related services
460	Marketing research and all other miscellaneous professional, scientific, and technical services
462	Office administrative services
465	Business support services
467	Investigation and security services
468	Services to buildings
470	Other support services
507	Commercial and industrial machinery and equipment repair and maintenance
516	Labor and civic organizations
523	Other state government enterprises
526	Other local government enterprises

Source: IMPLAN

Appendix B—Detailed Economic Impacts

Figure 11: Detailed Jobs Impacts

Industry	Direct	Indirect	Induced	Total
Agriculture	0	11,206	11,447	22,653
Mining	0	5,748	2,860	8,608
Utilities	0	1,518	2,197	3,715
Construction	5,644	14,738	7,127	27,509
Manufacturing	21,301	74,507	28,887	124,695
Wholesale Trade	870	22,998	17,772	41,639
Retail Trade	0	159,882	74,757	234,639
Transportation and Warehousing	56,016	39,129	18,489	113,634
Information	1,153	10,257	10,773	22,183
Finance and Insurance	247	36,871	43,142	80,260
Real Estate and Rental and Leasing	0	33,849	29,005	62,854
Professional, Scientific and Technical Services	11,372	60,476	30,075	101,922
Management of Companies and Enterprises	0	9,912	6,544	16,457
Administrative and Support and Waste Management and Remediation Services	26,426	150,382	37,372	214,180
Educational Services	0	676	18,014	18,690
Health Care and Social Services	0	4	109,199	109,203
Arts, Entertainment and Recreation	0	7,105	18,096	25,201
Accommodation and Food Services	0	14,399	70,116	84,515
Other Services	43,180	54,430	49,693	147,302
Government	0	11,116	7,271	18,386
Total	**166,209**	**719,203**	**592,834**	**1,478,247**

Sources: IMPLAN, RESI

Figure 12: Detailed Output Impacts

Industry	Direct[36]	Indirect	Induced	Total
Agriculture	$0	$504,277,558	$2,259,659,066	$2,763,936,624
Mining	$0	$1,872,062,114	$2,323,489,105	$4,195,551,219
Utilities	$0	$779,832,127	$3,737,476,017	$4,517,308,143
Construction	$946,138,008	$1,558,811,341	$2,169,212,077	$4,674,161,425
Manufacturing	$13,811,267,891	$26,373,082,155	$27,150,469,685	$67,334,819,731
Wholesale Trade	$235,401,708	$3,519,869,703	$6,943,685,908	$10,698,957,319
Retail Trade	$0	$11,844,661,956	$6,591,585,881	$18,436,247,837
Transportation and Warehousing	$24,316,263,599	$7,895,332,979	$5,126,370,642	$37,337,967,220
Information	$397,046,990	$2,199,249,880	$8,144,011,247	$10,740,308,116
Finance and Insurance	$47,012,710	$4,533,809,750	$13,324,374,238	$17,905,196,698
Real Estate and Rental and Leasing	$0	$4,742,223,585	$16,947,145,553	$21,689,369,138
Professional, Scientific and Technical Services	$1,312,248,490	$5,327,388,913	$7,561,358,366	$14,200,995,769
Management of Companies and Enterprises	$0	$1,216,830,932	$2,850,696,374	$4,067,527,306
Administrative and Support and Waste Management and Remediation Services	$2,103,209,297	$7,416,068,553	$4,340,160,911	$13,859,438,761
Educational Services	$0	$10,602,850	$1,431,027,320	$1,441,630,170
Health Care and Social Services	$0	$197,995	$10,971,452,361	$10,971,650,356
Arts, Entertainment and Recreation	$0	$282,582,352	$1,730,195,360	$2,012,777,713
Accommodation and Food Services	$0	$444,171,264	$5,034,922,139	$5,479,093,403
Other Services	$6,704,347,303	$7,012,358,855	$3,887,422,326	$17,604,128,483
Government	$0	$1,565,978,360	$2,113,104,293	$3,679,082,652
Total	**$49,872,935,994**	**$89,099,393,222**	**$134,637,818,868**	**$273,610,148,085**

Sources: IMPLAN, RESI

[36] IMPLAN Online reports wage impacts as labor income (employee compensation and proprietor income); therefore, direct wage impacts slightly vary from direct employee compensation inputs.

Figure 13: Detailed Wage Impacts

Industry	Direct	Indirect	Induced	Total
Agriculture	$0	$238,640,154	$785,463,339	$1,024,103,493
Mining	$0	$468,889,707	$564,297,647	$1,033,187,354
Utilities	$0	$98,465,570	$450,613,913	$549,079,483
Construction	$345,325,172	$542,421,455	$707,334,799	$1,595,081,426
Manufacturing	$1,889,374,242	$4,015,147,454	$3,837,477,206	$9,741,998,901
Wholesale Trade	$81,418,988	$1,217,426,303	$2,401,630,338	$3,700,475,630
Retail Trade	$0	$5,644,521,243	$2,794,504,326	$8,439,025,570
Transportation and Warehousing	$7,333,597,937	$2,512,369,518	$1,851,466,906	$11,697,434,362
Information	$124,097,832	$594,641,077	$1,780,136,437	$2,498,875,346
Finance and Insurance	$16,153,080	$1,962,765,751	$4,664,686,502	$6,643,605,333
Real Estate and Rental and Leasing	$0	$695,383,833	$1,227,663,129	$1,923,046,962
Professional, Scientific and Technical Services	$812,751,541	$3,064,404,800	$4,281,833,687	$8,158,990,029
Management of Companies and Enterprises	$0	$640,923,850	$1,501,506,287	$2,142,430,137
Administrative and Support and Waste Management and Remediation Services	$1,670,371,522	$4,940,479,509	$2,419,879,312	$9,030,730,342
Educational Services	$0	$6,262,900	$828,918,802	$835,181,702
Health Care and Social Services	$0	$110,146	$6,305,826,837	$6,305,936,983
Arts, Entertainment and Recreation	$0	$103,246,872	$617,365,655	$720,612,527
Accommodation and Food Services	$0	$164,677,915	$1,925,862,767	$2,090,540,682
Other Services	$3,236,883,941	$3,413,272,623	$2,057,554,040	$8,707,710,604
Government	$0	$706,356,809	$866,065,865	$1,572,422,674
Total	**$15,509,974,255**	**$31,030,407,490**	**$41,870,087,795**	**$88,410,469,540**

Sources: IMPLAN, RESI

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