Written Testimony of Mr. Chuck Baker
President, American Short Line and Regional Railroad Association (ASLRRA)

House Committee on Transportation and Infrastructure
Joint Hearing: Subcommittee on Railroads, Pipelines, and Hazardous Materials; and
Subcommittee on Highways and Transit
Where's My Stuff?: Examining the Economic, Environmental,
and Societal Impacts of Freight Transportation
2167 Rayburn House Office Building
Thursday, December 5, 2019, 10:00am

Thank you Chairman DeFazio, Ranking Member Graves, Chairs Lipinski and Norton and Ranking Members Crawford and Davis, and Members of the Subcommittees for inviting me to testify as part of this important hearing. My name is Chuck Baker and I am President of the American Short Line and Regional Railroad Association (ASLRRA), the national trade association representing the nation's 603 Class II and Class III railroads (referred to here collectively as "short lines").

This hearing will explore the economic, environmental and societal impacts of freight transportation and you have asked me to tell you "where's my stuff" as it relates to the short line railroad industry. Well, I am happy to report that short line railroads have **lots of stuff**, it's the **right stuff,** and we are here to transport **America's stuff** in a safe, efficient, and environmentally friendly manner.

Together, short line railroads operate nearly 50,000 miles of track, or approximately 30% of the national railroad network and employ more than 17,000 hard-working Americans. We operate in 49 states and in 36 of those states we operate at least one quarter of the state's total rail network. In five states, short lines operate 100% of the state's rail network. In the states represented by the Members of the two Subcommittees holding this hearing, there are 450 short lines operating over 38,000 track miles. Short lines are often called the first mile/last mile of the nation's railroad system and handle in origination or destination one out of every five rail cars moving on the national system.

Although short lines are most often associated with small town and rural America, we also serve large urban areas and many of the nation's busiest ports, including Miami, Los Angeles and Long Beach, Hampton Roads, and New York/New Jersey. Likewise various short line railroads operate as neutral terminal switch carriers for multiple Class I railroads in Chicago, New Orleans and St. Louis. The nation's short lines are much more than a quaint name on the Monopoly Board.

The name "short line" can create the mistaken impression that all of these railroads are very short in length. The fact is we come in all sizes. The Peru Industrial Railroad in Congressmen Lipinski's and

Davis's state of Illinois is three miles long. The Portland and Western in Congressman DeFazio's state of Oregon is 516 miles long. Pan Am Railways, headquartered in Massachusetts, is the nation's longest short line, operating approximately 1,700 route miles and providing the majority of rail service in New England. Our common denominators are that we operate track that was not viable under the structure of the larger national Class 1 railroads, that we run lean and mean, that we stay very close to our customers, that we are dedicated to safety, and that we hustle, fight, scratch and claw for every last carload of stuff we can help move.

Short Lines Have the Right **Economic** Stuff

Short line railroads preserve service and jobs over track that was headed for abandonment under previous Class I ownership. These were low density branch lines that could not generate enough profit under the cost structure of the big national carriers. Because these were marginal or money losing lines, they received little investment prior to their sale, resulting in significant deferred maintenance. To be successful, short line owners have worked hard to not only bring their tracks and bridges up to a state of good repair but to upgrade them to handle the heavier, longer trains that are becoming the national standard. To do that, short lines invest on average from 25 to 33% of their annual revenues in rehabilitating their infrastructure and this makes short line railroading one of the most capital-intensive industries in the country. To provide some dollar perspective, to upgrade one mile of typical 90-pound track up to the 115-pound rail needed to handle today's modern railcars costs more than $500,000 per mile and while short lines have been working hard to update their lines, we still need to do that across a large percentage of the 50,000-mile network.

The economic importance of this investment cannot be overstated. For large areas of the country, especially in small town and rural America, short line railroad service is the only connection to the larger national railroad network. For the businesses and farmers in those areas, our ability to take a 25-car train 75 miles to the nearest Class I interchange is just as important as the Class I's ability to attach that block of traffic to a 100-car train and move it across the country. While these shippers cannot complete the journey to their markets across the country without Class I railroad service, they cannot start or end the journey without short line service. This is especially true for much of the "merchandise" or "carload" traffic that comes from manufacturing, paper and agricultural shippers that does not typically move in unit train quantities. We are crucial in providing those shippers access to the economic benefits of shipping by rail.

Short lines serve over 10,000 shippers in thousands of communities nationwide and we find those shippers quite willing to testify to the importance of this first mile/last mile service. I have **attached** at the end of my testimony a list of quotes from short line customers. We have selected a wide variety from across the country to give you a sense of the important relationship between shippers and their short lines. In general, they sound like this: *"Our serving short line railroad is truly a partner for our paper mill. The services provided, including freight haul in and out, daily switches, and rail car maintenance help us keep our mill running successfully day in and day out. It is critical to the 400 plus people employed here that our short line railroad be able to continue to operate successfully."*

The money invested by short lines also results in economic benefits beyond preserving local rail service.

Investing in better track leverages significant **additional investment by railroad customers**. For example, in South Dakota the improvements made by the 670-mile Rapid City, Pierre & Eastern Railroad since it began operations in 2014 have already attracted over $311 million in new facility investments by

six South Dakota companies. Those facilities employ 260 workers. This result is being duplicated in the 49 states that are served by short line railroads.

Railroads are an **all-American** proposition. We can not take our operations or jobs overseas. Virtually everything we buy for infrastructure improvement – the ties, the steel rail, the ballast, the locomotives and the freight cars – is made in America, so every dollar we spend is spent in America.

Railroad rehabilitation is a **labor-intensive** effort. As small businesses, most short lines do not have the necessary in-house labor force or specialized equipment to complete major rehabilitation projects so we staff up or hire contractors and lease heavy machinery for new projects, so that new investment typically results immediately in new jobs. The FRA estimates that half of every dollar spent on short line track rehabilitation goes to pay workers.

As those of you who represent rural areas know, it is difficult to **create jobs in rural America**. According to the US Department of Agriculture, from its post-recession low in 2010 through 2017, rural employment grew at an average annual rate of only 0.5%, compared to 1.8% in urban areas. In urban areas, the prime-age labor participation rate was just 0.8 percentage points below its 2008 level while in rural counties the prime-age participation rate in 2017 was 2.7 percentage points below its 2008 level. Short lines and the shippers we serve are a significant source of good paying jobs in rural America. In the case of short lines themselves, these jobs also include health care benefits and a generous Railroad Retirement program.

Short line railroads **lower transportation costs** for their local shippers. The economics stem from the fact that one rail car holds the equivalent of three to four truckloads worth of stuff and also that railroads use fuel much more efficiently than trucks. In testimony we recently submitted to the House Ways & Means Committee in support of the short line rehabilitation 45G tax credit, we cited an example from an Oklahoma short line, Farmrail. The cost of moving a ton of freight 95 miles from Clinton to Enid, Oklahoma is $2.24 per mile on the railroad versus $3.75 per mile for comparable truck service. That level of savings can be cited with most short lines across the country and is a very meaningful number for the businesses we serve, which lets them compete effectively in both the domestic and global markets. Without a viable rail service option, some of these businesses would just disappear.

Last year the ASLRRA engaged Pricewaterhouse Coopers (PwC) to take an independent look at the 45G tax credit and the economic contributions of the short line industry. I have **attached** a copy of that report. Among the study's findings:

- The short line industry directly provides 17,000 jobs annually, paying labor income of $1.1 billion and adding $2.2 billion to the nation's GDP;
- Operational spending by the industry supported 33,730 indirect and induced jobs and capital spending supported another 10,240 jobs;
- Across the US economy .51% of business inputs rely on transportation services provided by short lines, amounting to 478,820 jobs, $26.1 billion in labor income and $56.2 billion in value added.

I will not pretend that the numbers I am talking about are a huge deal in an economy measured in the trillions of dollars. However, for those shippers we keep connected, for those communities where we create economic activity, for the employees we hire, these **are** meaningful numbers. It is not the biggest stuff but it is important stuff.

Short Lines Have the Right **Environmental** Stuff

As my colleague at the AAR has said, railroads are the most fuel-efficient way to move freight over land – three to four times more fuel efficient than trucks. Today, a freight train can move one ton of freight an average of more than 470 miles on one gallon of diesel fuel, double the average in 1980. The EPA has measured the sources of transportation-related greenhouse gas emissions and rail is a big success story. Of the greenhouse gas emissions from transportation, cars/light trucks/motorcycles account for 60.5%, trucking is 23.1%, aircraft 9.1%, and freight rail is only 2%.

Highway congestion, in addition to being soul-crushing and quality-of-life-destroying, is a significant contributor to harmful emissions. Motor vehicles idle for hours on overcrowded roads – in total there were more than 8.8 billion hours wasted in traffic in the last year measured - that's the equivalent of a full working year from 4.4 million Americans! The average railcar holds the equivalent of three to four truckloads and removing those trucks from the highway helps reduce that congestion. The short line industry handles over 12 million carloads annually which equals about 40 million truckloads not on the highway.

Short lines are often custodians of expensive infrastructure, such as bridges and tunnels that were originally built by the much larger railroads and are reaching the end of their useful life. Rehabilitation or replacement of this legacy infrastructure can be very challenging for small companies, but the benefits are substantial. These benefits are documented through the cost benefit analysis required by the BUILD (formerly TIGER) program. As an example, a federal grant award made through the TIGER program in 2014 enabled replacement of a failing strategic short line bridge in southwestern Indiana. This investment prevented over 45 million truck miles from being added to the regional road network over a 20-year period. This saved the public over $11 million in truck traffic costs through avoided emissions, accidents, congestion and local road damage. Some 3.2 million gallons of diesel fuel consumption were also avoided.

While advances in fuel efficient locomotives do not garner the headline grabbing attention of Tesla's electric cars, the railroad industry is making steady progress in that regard. Tier 4 locomotives maximize locomotive performance and reduce emissions. As you know, Tier 4 diesel engine standards are the strictest EPA emissions requirements for off-highway diesel engines and the railroad industry is increasingly incorporating Tier 4 locomotive into its fleet. I am pleased to report that one of our short line members, Knoxville Locomotive Works, has earned EPA's Tier 4 certification for its SE series four and six axle locomotive designs and is providing these locomotives to short lines for switching operations. These locomotives reduce existing emission levels by more than 90%. The Chairman of Knoxville Locomotive Works is Pete Claussen who is also the Chairman of short line company Gulf and Ohio Railways and his son Doc is President of that railroad and is currently serving as Chairman of our Short Line Association.

Short Lines Have the Right **Societal** Stuff

Rail is the safest option for moving freight by land in America. Using USDOT data and measuring on a comparable ton-miles basis, rail is approximately 3-5 times safer than trucking.

Short lines are proud of our safety culture and work diligently to reduce and eliminate injuries. In 2018, 265 short lines reported zero accidents to the FRA. The average accident rate that year was a near record low of 1.84 per million train miles. We are also proud of the Short Line Safety Institute, which

exists to provide voluntary intense safety culture assessments on short lines all over the country as we continually strive for zero accidents, injuries, and fatalities.

Because rail is the safest option for moving freight by land, any policies that Congress enacts that affect the balance between rail and trucking also affect public safety and have major societal impacts.

The Right **Legislative** Stuff

As evidenced by the discussion above, short line railroads have the right stuff when it comes to moving America's stuff, and we would like to share with the Committee several legislative recommendations that we believe will help our industry provide more of that stuff in the future.

As you likely know, our number one legislative priority is the extension of the Short Line Rehabilitation Tax Credit known as **45G**. I will mention this only briefly for three reasons. First, it is not in the jurisdiction of this committee. Second, you are no doubt as tired of hearing us talk about it as I am of talking about it. Third, 49 of the 62 Members of these two Sub-Committees are co-sponsors of this legislation so I'd only be preaching to the choir. Suffice it to say that this credit allows short lines to maximize infrastructure investment that is critical to producing the kind of economic, environmental, and societal results described above, and to the extent that any of the members of this committee are able to work with your colleagues on Ways & Means and in leadership to ensure that an end-of-the-year tax package advances that includes 45G, that would be a big win for the thousands of communities and shippers that count on short lines. The credit has been expired since December 31, 2017 and we respectfully call on Congress to address this before the end of this year. The negative consequences of the credit being lapsed are becoming more apparent by the day.

We strongly support the **Consolidated Rail Infrastructure and Safety Improvements (CRISI)** grant program as it specifically provides for short line eligibility and puts a focus on benefit-cost analysis. We have seen that with this level playing field, short line projects fare well. Further, it includes a special focus on the deployment of railroad safety technology, which can potentially help our work implementing positive train control (PTC) in compliance with the federal mandate. The yearly authorized level for the program should be increased – we suggest to **$592 million,** which was the high-water mark appropriated in fiscal year (FY) 2018. We also recommend that program eligibility be tweaked to include non-profit associations representing short line railroads. These types of associations have previously been eligible for similar grant programs and successfully received grants that provided safety support to many short line railroads. The current FY20 House THUD Appropriations bill includes language to this effect. We believe CRISI is an important and effective program that should be continued in the next surface transportation authorization bill.

We are also supportive of the **INFRA** grant program. There is value in a merit-based discretionary grant program open to multiple modes of transportation, especially one that is focused on freight and goods movement, but we do recommend two changes to this program:

1) Allow the program to support the most efficient and effective freight projects by fully removing or at least significantly increasing the $500 million cap on non-highway portions of the multimodal freight projects. Such a cap is particularly anachronistic now that the highway trust fund has been subsidized by more than $140 **billion(!)** in general funds since 2008.

2) Ensure that the program is able to fund all efficient and effective projects by increasing the "small projects" set aside. Currently, the 10% cap on small projects, defined as projects that do not meet the $100 million project minimum, does not provide enough opportunity for INFRA grants to be used to help with most short line infrastructure projects. The 10% set aside should be increased to 25% to more accurately represent the many needs in small town and rural America and the small but effective projects that are possible everywhere.

Similar to the INFRA grant program, the **state freight formula program** is also a beneficial program that could be improved by increasing the percentage of the grants that can go to the non-highway portions of multimodal freight projects. Again, artificially limiting the types of projects that can be funded results in less than optimal projects being selected, and it also makes no sense in a world where road user fees are not funding anywhere near the full cost of the highway trust fund.

We also support the **BUILD** program. While BUILD has traditionally not been an authorized program, if this committee is inclined to authorize the program going forward, we would suggest including language that encourages the USDOT to select projects that are multi-modal in nature and not just projects that could just as easily be done within the normal state highway allocation. And the committee could also strengthen language around prioritizing the environmental and societal benefits of projects.

The **RRIF** loan authorization of $35 billion is viewed by many as a potential solution to railroad rehabilitation. That has unfortunately not been the case so far. Since its inception in 1998, the program has provided miniscule support for short line rehabilitation. Notwithstanding its relatively limited utility, we wake up optimistic every day and believe there are ways to improve the program and thus offer the following suggestions.

- Provide subsidies for RRIF loan credit risk premiums, along the same lines as TIFIA;
- Provide assistance for advisory fees associated with RRIF loan applications;
- Extend RRIF loan terms from the present 35 years to 50 years to more accurately match loan terms with the economic life of railroad assets;
- Facilitate earlier identification of credit risk premium ranges so that an applicant knows if it's worth engaging in the process;
- Implement an express framework for RRIF applications meeting certain criteria;
- Ensure that RRIF loans are considered local matching funds for other federal programs provided that they are repaid with local funds, as is the rule under TIFIA; and
- Allow short line holding companies to be applicants.

I know that Members of this Committee have been vocal advocates for a comprehensive infrastructure program that addresses well-documented and critical needs. We share your frustration with the political gridlock that has halted progress on this important subject. In the hope that good sense will eventually prevail, we offer up five general principals that will help short lines better utilize any grant programs funded within a surface transportation reauthorization bill or larger infrastructure package, whether those are the existing programs noted above or new programs:

1. Short lines should be **directly eligible** applicants for project grants, similar to CRISI. Too often in the past, federal programs have been only open for application to local units of government, which in turn requires short lines to create unnecessarily complex and burdensome applicant

structures and which sometimes favors politically popular projects over economically beneficial projects.

2. The application process needs to be as **simple and transparent** as possible. Short lines are small businesses and generally the individuals writing these applications are employees with other duties on the railroad. We do not have full time grant writers or the resources to hire expensive consulting firms.

3. The analysis used to judge a project should **not be a rigid one-size-fits-all** process. For example, the process to apply, the public planning and the engineering required, and the appropriate benefit-cost analysis format for incrementally upgrading a ten-mile segment of existing track serving five small grain elevators should not be the same as building a new subway line or adding lanes to an interstate highway.

4. If there is to be an associated **environmental approval** process, it must be completed in a reasonable period of time. Approval processes that last for years are a deal-killer to those running a business.

5. Imposing limits on a **state DOT's number of grant submissions** allowed in a round of a program forces pre-application competition between smaller short line projects and other larger projects, often putting the smaller short line project at a disadvantage.

Finally, I will wrap up with three policy issues to keep in mind as the Committee looks towards a surface transportation reauthorization bill and considers how to increase the economic, environmental, and societal benefits of freight movement:

1) Infrastructure legislation that this committee advances will be a target vehicle for those who want to increase **truck size and weight**. Short lines are part of a broad coalition of interests, including safety advocates, law enforcement officials, rail labor, truck labor, independent truckers, Class I railroads, and even some truckload carriers, who oppose bigger and heavier trucks. Bigger trucks mean diversion from rail to truck and thus more trucks, more expensive damage to our highways and bridges, more highway congestion, more environmental damage, and more danger for the motoring public. Of all the aspects of my job, this is the only thing that all the relatives at the Thanksgiving dinner table care about and agree on – **NOBODY** wants bigger trucks! The biggest hurdle to enacting new infrastructure funding legislation is finding the funding, so including a provision that guarantees higher infrastructure repair costs makes the hurdle all the more difficult to overcome and that just would not make sense.

2) Mandating **crew sizes** on trains would be counter-productive in that it would just make trains less competitive with other transportation modes and would do so for no good reason as there is no evidence of a safety benefit generated by a second crew member. It is ironic that as the government is working to facilitate the move to driverless vehicles on the complex open architecture of the highway system, Congress is considering making the railroads do just the opposite on the simpler closed architecture of the railroad system. Short lines operate safely all over the country with a variety of business models and crew sizes, and we need the ability to be flexible and to adapt to an ever-changing competitive marketplace or else we will simply vanish in the face of competition.

3) As has been said thousands of times by most of you all on this Committee and most of us in the transportation community, it is essential that the **highway trust fund return to a largely user-funded system**. There are many important reasons for this, but from our short line perspective the current system amounts to a $10b+ per year government subsidy to our biggest competitors, which artificially shifts traffic from the freight rail system to the highway system and thus loses the economic, environmental, and societal benefits that can be provided by freight rail.

In summary, Short Line railroads have the **right stuff**, and with your continued support in the areas I have identified, we will provide even **more of the stuff that matters** - jobs, economic opportunity, environmental sustainability, and business growth, particularly in small town and rural America.

I appreciate the opportunity to appear before you today and am pleased to answer any questions you might have.

Short Line Railroad Customers Talk about Service and the Short Line Rehabilitation 45G Tax Credit

Dana Shellberg, of Allweather Wood LLC, in Loveland, CO
A customer of the Great Western Railway of Colorado

"Without the Great Western Railway of Colorado we would have to truck all our lumber in from Oregon, Washington, Alabama, and Arkansas. This would not allow us to stay competitive in the lumber market."

Robert Glezen, of Mont Eagle Mills, Inc., in Oblong and Palestine, IL
A customer of the Indiana Rail Road

"Short line railroads are an increasingly important piece of our nation's infrastructure. Our business depends upon the Indiana Rail Road to serve the agricultural base of southeastern Illinois."

David Doti, of Jadcore, LLC, in Terra Haute, IN
A customer of the Indiana Rail Road

"The Indiana Rail Road is our only connection to the main line. All of the other carriers have either merged or are out of business. The plastics industry relies on the railroad for its delivery of finished products all over the country."

Daniel Semsak, of Pacific Woodtech Corporation, in Saginaw, MI
A customer of the Lake State Railway

"We depend on short lines to get into our customers' facilities. Rail access is essential for our company and our customers to be able to grow. As the Class 1 railroads have focused more and more on unit trains for inefficiencies, small business has relied on short lines for survival. We need the short lines for the "last mile"."

Brian Arnhalt, of Minn-Kota Ag Products, in Breckenridge, MN
A customer of the Red River Valley & Western Railroad

"Our rail service from the Red River Valley & Western Railroad is outstanding. The personalized attention to our customer needs is a big help in the success of our business."

Curt Warfel, of Akzo Nobel, Inc., in Columbus, MS
A customer of the Alabama and Gulf Coast Railway

"Akzo Nobel has long been supportive of the short line railroad tax credit. We see this as an excellent way in which short line railroads may "stretch" a dollar to upgrade their railroads and improve service to rail shippers."

Chuck Hunter, of PSC Metals, Inc., in St. Louis, MO
A customer of the Terminal Railroad Association of St. Louis

"The six short lines that serve our facilities have and will play a vital role in the growth of our company. They have worked with us to add rail service to several of our facilities, issued rates to incent rail service -vs- truck. Their local presence and willingness to partnership in problem solving has been a blessing. These service providers are an essential part of our continued success in the North American marketplace."

Levi Ross, of Dead River Company, in North Walpole, NH
A customer of the Green Mountain Railroad

"Our retail petroleum business is dependent on the service of short lines for a dependable regional supply chain."

Jason Tininenko, of Freeport McMoRan, in Hurley, NM
A customer of the Southwestern Railway

"There are several short line railroads that are integral to our business. They provide a consistent, cost effective option for us to move large volumes of freight both to and from our mining locations."

Mike Sawyer, of Western Producers Cooperative, in Dill City, Rocky, and Sentinel, OK
A customer of Farmrail

"Our livelihood depends on railroads shipping our grain. Farmrail does a great job in taking care of our needs. We need their services!"

Steve Stivala, of MacMillan-Piper, in Tacoma, WA
A customer of Tacoma Rail

"Tacoma Rail is an integral part of our business and overall operation in Tacoma. The short line railroad provides us with consistent and reliable service on a daily basis. By meeting our needs and requirements, we are better able to service our customers. This would not be possible without the assist from Tacoma Rail."

Maurice Bohrer, of Michels Materials, in Janesville and Waterloo, WI
A customer of the Wisconsin & Southern Railroad

"Our short line and regional railroad, the Wisconsin & Southern Railroad, is the only railroad that provides service to our black granite quarry and without them we would not be able to sell our granite to many of our customers and the other railroads that use our ballast!"

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The Section 45G Tax Credit and the Economic Contribution of the Short Line Railroad Industry

July 2018

Prepared for:

American Short Line and Regional Railroad Association

The Section 45G Tax Credit and the Economic Contribution of the Short Line Railroad Industry

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The Section 45G Tax Credit and the Economic Contribution of the Short Line Railroad Industry

Executive Summary

Industry Overview

The US short line and regional railroad industry ("short line industry") consists of the nation's smallest freight railroads by revenue, defined according to the US Surface Transportation Board as Class II or III railroads with freight revenue of less than $475.75 million in 2016. There are an estimated 603 short line railroads as of 2016. The average short line railroad employs fewer than 30 people and operates less than 79 route miles. Combined, short lines operate 47,500 route miles, or 29 percent of the nation's rail network, extending the reach of the rail network to rural communities, farmers, manufacturers, and other industries.[1] Short lines together with the seven Class I railroads (those with freight revenue of at least $475.75 million) constitute the US freight railroad industry.

Economic Contribution of the Industry

PwC estimates the short line industry directly provided 17,100 jobs in the United States in 2016, paying labor income of $1.1 billion, and adding $2.2 billion to the nation's GDP (see Table E-1). The short line industry's economic impact goes beyond its own employees and direct payroll and value added. Including the indirect effects resulting from suppliers to the industry and induced effects resulting from expenditures of labor income, the industry supported 61,070 jobs in 2016. Operational spending by the industry supported 33,730 indirect and induced jobs in 2016, while capital spending by the industry of $755 million supported 10,240 jobs. This indicates that each job in the short line industry supports an average of 2.6 additional indirect and induced jobs across the rest of the US economy (combined jobs to direct jobs multiplier of 3.6). Combined labor income amounted to $3.8 billion (labor income multiplier of 3.3) and value added amounted to $6.5 billion (value added multiplier of 2.9).

Table E-1. Direct, Indirect, and Induced Economic Impacts of the US Short Line Industry, 2016

Item	Direct Impacts	Indirect and Induced Impacts		Combined Impacts
		Operational Impacts	Capital Investment Impacts	
Employment*	17,100	33,730	10,240	61,070
Labor Income ($ millions)**	$1,129	$2,035	$616	$3,780
Value Added ($ millions)	$2,228	$3,373	$948	$6,549

Source: PwC calculations using the IMPLAN modeling system (2016 database).
Note: Details may not add to totals due to rounding.
* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.
** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

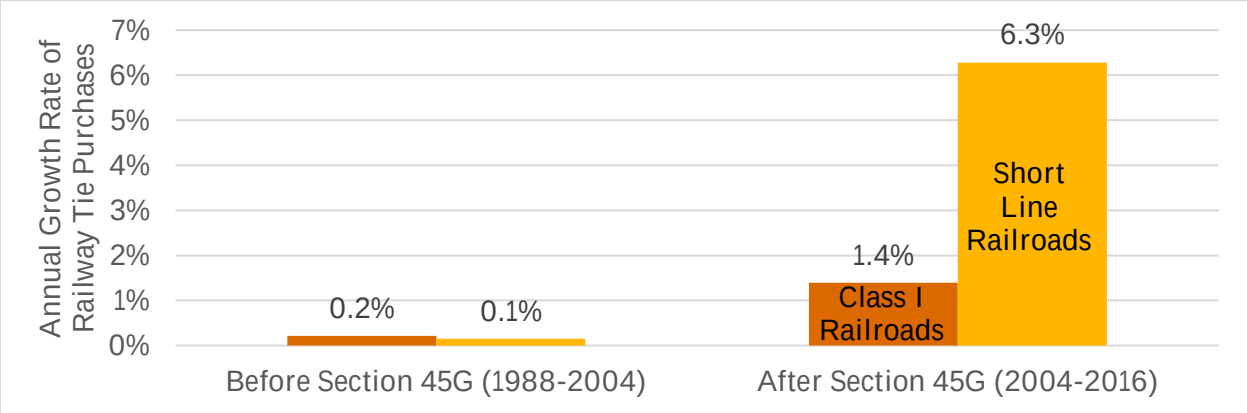
[1] American Short Line and Regional Railroad Association (ASLRRA), "Short Line and Regional Railroad Facts and Figures," 2017; Association of American Railroads (AAR) to ASLRRA, February 17, 2017, 2015 Short Line Railroad Industry Estimates.

In addition to the direct, indirect, and induced economic impacts, the short line industry impacts the US economy to the degree that other industries rely on the short line industry for transportation services. The three customer sectors most reliant on the short line industry are (1) mining, (2) manufacturing, and (3) agriculture. In total across the US economy, 0.51 percent of business inputs rely on transportation services provided by the short line industry, amounting to 478,820 jobs, $26.1 billion in labor income, and $56.2 billion in value added.

The Section 45G Tax Credit

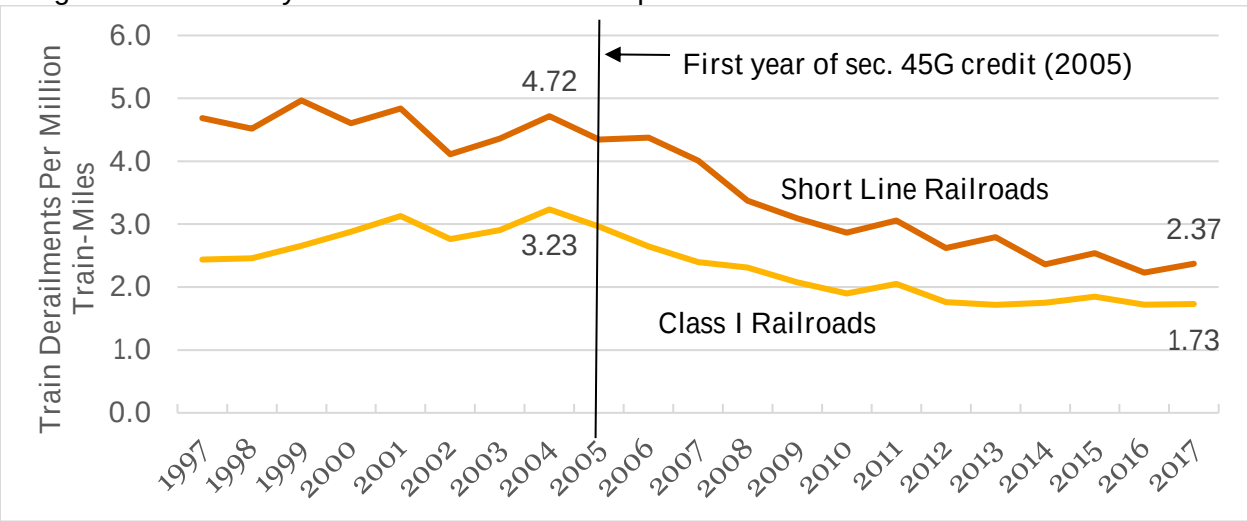
Since its enactment in 2004, the railroad track maintenance tax credit (Internal Revenue Code section 45G) has provided an important financial incentive to maintain and improve short line infrastructure. The result has been a marked increase in industry investment, as evidenced, for example, by industry purchases of railway ties, which have grown at an annual rate of 6.3 percent since enactment of the credit, compared to 0.1 percent before the credit (see Figure E-1). In addition, safety on short line railroads has improved since enactment of the credit. For example, train derailments on short line railroads have declined by 50 percent, from a rate of 4.72 per million train miles in 2004 to 2.37 in 2017 (see Figure E-2).

Figure E-1. Railway Tie Purchases have Increased since Enactment of Section 45G



Source: Railway Tie Association.

Figure E-2. Safety on Short Lines has Improved since Enactment of Section 45G



Source: Federal Railroad Administration.
Note: Class I data exclude Amtrak.

Standard cost of capital analysis indicates the section 45G credit provides strong incentives to invest in short line infrastructure.[2] For instance, for a corporate taxpayer making a break-even, or marginal, investment in short line track maintenance that is below the section 45G per mile cap, relative to current law in which the section 45G credit is expired, extending the section 45G credit reduces the user cost of capital by 63 percent. Empirical estimates of the responsiveness of investment to changes in the user cost of capital indicate that such a reduction in the user cost of capital is associated with a 47.3 percent increase in investment (see Table E-2).[3]

The same type of analysis indicates that for short line infrastructure investors the section 45G credit is a much more powerful incentive at the margin than the two main investment incentives provided in the Tax Cuts and Jobs Act (TCJA), i.e., the lower corporate tax rate and full expensing for equipment. Relative to 2017 law, the combination of the TCJA's two main incentives reduces the user cost of capital by 1.2 percent, which is associated with a 0.9 percent increase in investment.[4]

Table E-2. Impact of Section 45G Tax Credit and the Tax Cuts and Jobs Act (TCJA) on Cost of Capital and Investment for a Short Line Infrastructure Project

Tax Change	Change in Cost of Capital	Change in Investment
Section 45G Tax Credit	-63.0%	47.3%
TCJA (reduced corporate tax rate and expensing)	-1.2%	0.9%

[2] The user cost of capital is the real before-tax rate of return that a marginal (i.e., break-even) investment must earn to recover the cost of investment, pay taxes on business income, and pay an expected after-tax rate of return to investors that covers their opportunity cost.

[3] Kevin A. Hassett and R. Glenn Hubbard, "Tax Policy and Business Investment," in Handbook of Public Economics, Vol. 3, edited by Alan J. Auerbach and Martin Feldstein, pp. 1293–1343, 2002.

[4] Expensing under TCJA has relatively little effect on short line investment incentives because short line investors previously were permitted to expense 75 percent of track maintenance expenditures under a safe harbor provided by IRS Revenue Procedure 2002-65.

The Section 45G Tax Credit and the Economic Contribution of the Short Line Railroad Industry

I. Overview of the Industry

Number of Railroads, Revenue, and Employment

The US short line and regional railroad industry ("short line industry") consists of the nation's smallest freight railroads by revenue, defined according to the US Surface Transportation Board as Class II or III railroads with freight revenue of less than $475.75 million in 2016. There are an estimated 603 short line railroads as of 2016. The average short line railroad employs fewer than 30 people and operates less than 79 route miles.[5]

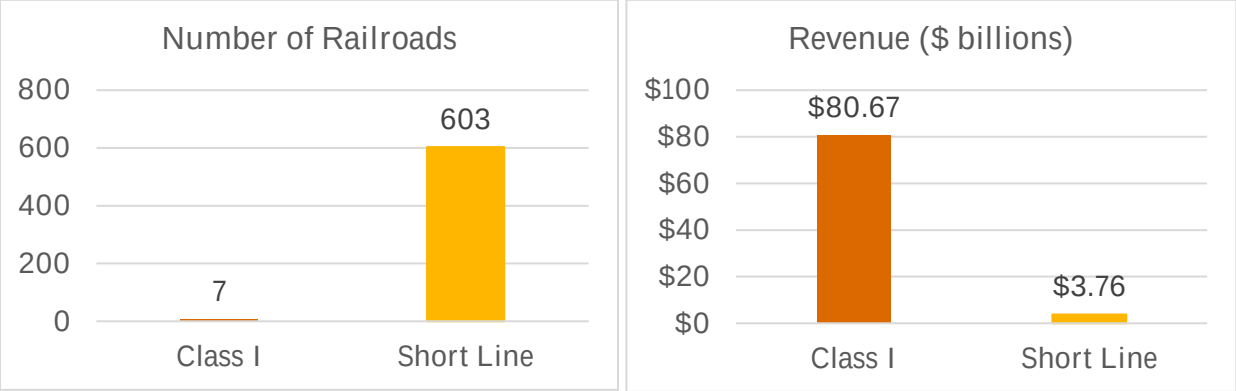
Short lines together with the seven Class I railroads (those with freight revenue of at least $475.75 million) constitute the US freight railroad industry. While short line railroads far outnumber Class I railroads, the vast majority of total railroad industry revenue is earned by Class 1 railroads (see Figure 1). Based on annual surveys by the Association of American Railroads (AAR), we estimate that total revenue earned by the short line industry was $3.76 billion in 2016 – an average of $6.24 million per railroad.[6] We estimate that total employment in the short line industry was 17,100 in 2016 – an average of 28 employees per railroad.[7]

[5] American Short Line and Regional Railroad Association (ASLRRA), "Short Line and Regional Railroad Facts and Figures," 2017; Association of American Railroads (AAR) to ASLRRA, February 17, 2017, 2015 Short Line Railroad Industry Estimates.

[6] Association of American Railroads, "Railroad Facts 2017 Edition," 2017. We used the AAR's last published estimate of revenue earned by the short line industry in 2012 and projected it forward using the AAR's estimated percent change in revenue for the Class I railroad industry. The revenues of Class I and short line railroads are highly correlated since they carry similar types of commodities. Short line industry revenues dropped approximately 8 percent in both 2015 and 2016, based on the revenue declines reported by Class I railroads, which are primarily attributable to declines in coal shipments. To the extent coal shipments on short line railroads have rebounded since 2016, short line industry revenue may have rebounded as well.

[7] Association of American Railroads, "Railroad Facts 2017 Edition," 2017. We used the AAR's last published estimate of employment in the short line industry in 2012 and projected it forward using the AAR's estimated percent change in employment for the overall railroad industry. This reflects an estimated drop in short line employment of approximately 9 percent in 2016, based on estimated employment declines for the entire railroad industry, which are primarily attributable to declines in coal shipments. Industry employment may have rebounded since 2016 to the extent coal shipments have rebounded.

Figure 1. Comparison of Short Line and Class I Railroads



Source: ASLRRA, AAR, and PwC calculations using the IMPLAN modeling system (2016 database).

Rail Network and Relationship to Class I's

Short lines operate a total of 47,500 route miles, or 29 percent of the nation's rail network, extending the reach of the rail network to rural communities, farmers, manufacturers, and other industries (see Figure 2). In five states (Alaska, Maine, New Hampshire, Rhode Island, and Vermont), short lines provide the only freight rail service.[8]

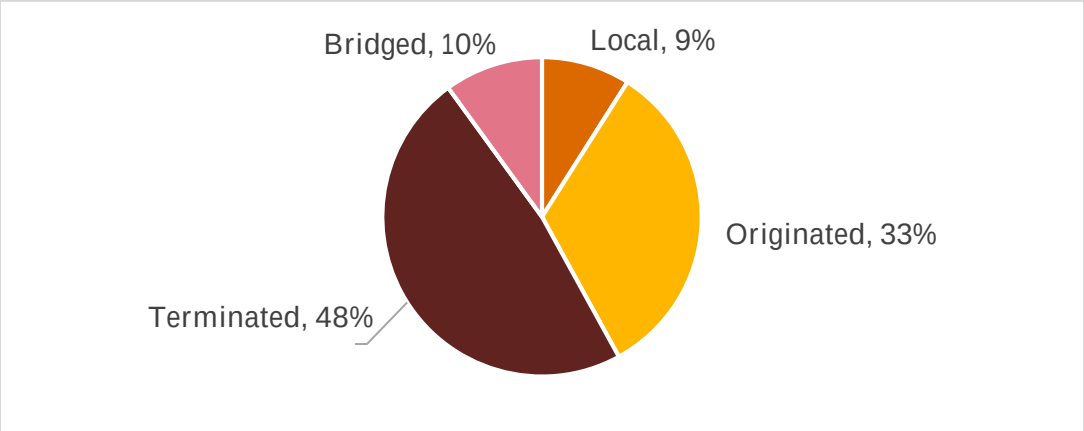
Figure 2. Short Line and Regional Railroads of the United States

The vast majority of traffic on short lines (81 percent) either originates or terminates on short lines as part of a longer journey on Class I railroads or other modes of traffic (see Figure 3). A smaller share of traffic (10 percent) is transferred (bridged) from one Class I railroad to another

[8] Ibid. AAR estimates that total miles of track owned by short line railroads exceeds 47,500, including multiple main tracks, passing tracks, sidings, crossovers, turn-outs and switching tracks.

via short line, and the remainder (9 percent) is local traffic that is moved entirely by short line railroads. The average length of haul for short line railroads is 37.5 miles.[9]

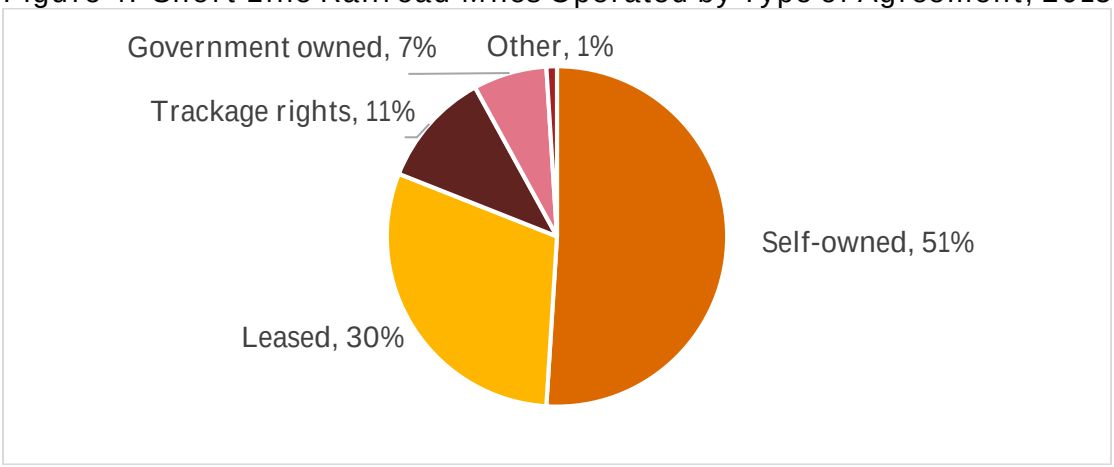
Figure 3. Carloads Moved on Short Line Railroads by Traffic Type, 2015



Source: 2016 ASLRRA Data Survey.

Short line railroads provide service under many types of agreements (see Figure 4). The majority (51 percent) of short line track miles are wholly-owned by short line railroads, while the remainder are either leased from Class I railroads and other entities (31 percent), owned by the government (7 percent), or made available via trackage rights or other interchange agreements (12 percent).

Figure 4. Short Line Railroad Miles Operated by Type of Agreement, 2015



Source: 2016 ASLRRA Data Survey.

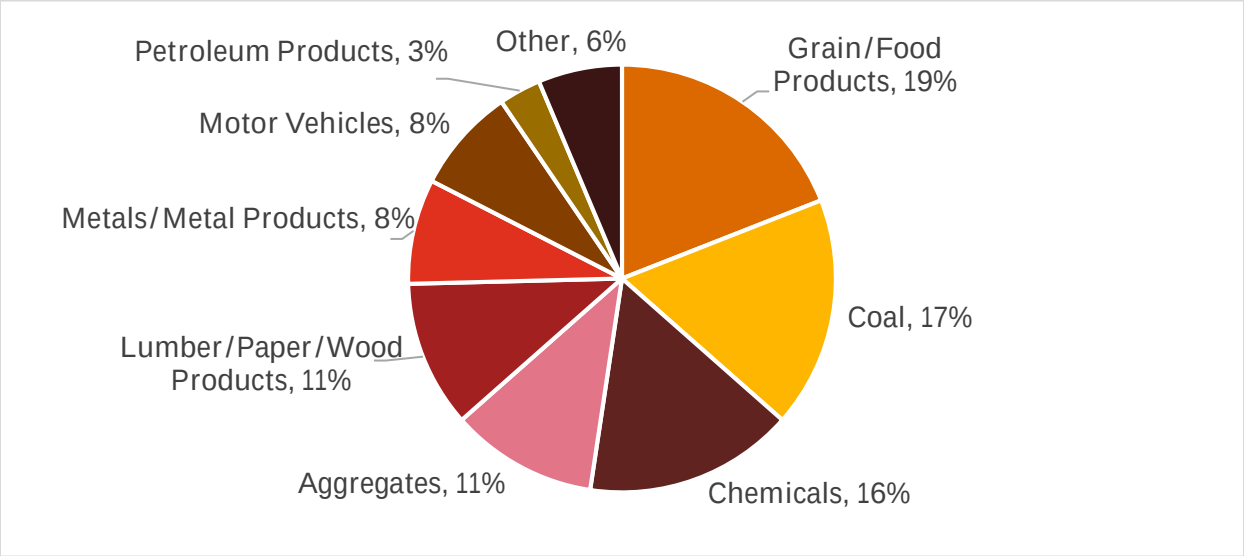
Commodities

Short line railroads move many types of commodities, and are typically more efficient than trucks for moving extremely heavy or bulky goods. Coal has historically been a major commodity shipped by rail, but as US coal production has declined precipitously in recent years so have shipments by rail, forcing short line railroads to diversify more into other

[9] ASLRRA, "Short Line and Regional Railroad Facts and Figures," 2017.

commodities.[10] As of 2015, grain and food products comprise the largest share of identified carloads moved by short lines (19 percent), followed by coal (17 percent), chemicals (16 percent), aggregates (11 percent), and lumber, paper and wood products (11 percent).[11] Class I railroads have a broadly similar distribution of carloads by commodity as compared to short line railroads, but with a heavier concentration in coal.[12]

Figure 5. Short Line Carloads by Commodity (where identified), 2015



Source: 2016 ASLRRA Data Survey.
Note: The unidentified category (not shown) consists of trailers/containers with miscellaneous goods.

[10] US coal production dropped 38 percent from 2008 to 2016, but is estimated to have increased 6 percent in 2017, according to the U.S. Energy Information Administration, available at https://www.eia.gov/todayinenergy/detail.php?id=34992#; ASLRRA, "Short Line and Regional Railroad Facts and Figures," 2017.
[11] Unidentified commodities consist of trailers/containers with miscellaneous goods.
[12] AAR, "Railroad Ten-Year Trends, 2006-2015," 2017.

II. Economic Contributions

Direct, Indirect, and Induced Impacts

The economic activity of the short line industry can be measured using three separate metrics: employment, labor income, and value added, as defined below.

- Employment: The number of payroll and self-employed jobs (including part-time jobs), averaged over the year.
- Labor income: The wages, salaries and benefits paid to employees and proprietors' income for the self-employed.
- Value added: The total output of each sector less the associated value of intermediate inputs. The sum of the value added across all sectors in the economy is GDP.[13] An industry's value added represents its contribution to GDP.

The short line industry's economic impact goes beyond its own employees and direct payroll and value added. The industry uses goods and services supplied by other industries to produce its own services, generating upstream employment, payroll, and value added. The employees of the short line industry and its supply chain spend their wages and salaries on goods and services generating additional (induced) economic activity. The combined economic impact of the short line industry includes direct, supply chain (indirect), and induced impacts:

- *Direct effects* include activities directly attributable to short line companies, such as the employees and value added of short line companies.
- *Indirect effects* include activities of the upstream supply chain to short line companies, including contractors and other companies providing inputs to short line companies and their immediate suppliers.
- *Induced effects* reflect spending by employees of short line companies and their suppliers. Employees throughout the short line industry's supply chain receive incomes associated with the direct and indirect activities, a portion of which will be consumed. This consumption causes additional economic activity attributable to the short line industry.

To quantify these linkages, we rely on the IMPLAN model, an input-output (I-O) model based on federal government data (see Appendix). The indirect and induced effects are determined separately for purchases of operating inputs (operational impact) and plant and equipment (investment impact).

As presented in Table 1, below, we estimate the short line industry directly provided 17,100 jobs in the United States in 2016, paying labor income of $1.1 billion, and adding $2.2 billion to the nation's GDP.

Combined, including the indirect and induced effects, the industry supported 61,070 jobs in 2016. Operational spending by the industry supported 33,730 indirect and induced jobs in 2016, while capital spending by the industry of $755 million supported 10,240 jobs. This indicates that each job in the short line industry supports an average of 2.6 additional indirect

[13] Value added differs from gross output (or sales) because it excludes the value of intermediate goods that are embedded in the final sales of each industry. The value of intermediate inputs could be counted multiple times if output of one segment of the short line industry serves as an input for another segment.

and induced jobs across the rest of the US economy (combined jobs to direct jobs multiplier of 3.6).

Combined labor income amounted to $3.8 billion and value added to $6.5 billion. Labor income and value added multipliers for the industry are 3.3 and 2.9, respectively.

Table 1. Direct, Indirect, and Induced Economic Impacts of the US Short Line Industry, 2016

Item	Direct Impacts	Indirect and Induced Impacts		Combined Impacts
		Operational Impacts	Capital Investment Impacts	
Employment*	17,100	33,730	10,240	61,070
Labor Income ($ millions)**	$1,129	$2,035	$616	$3,780
Value Added ($ millions)	$2,228	$3,373	$948	$6,549

Source: PwC calculations using the IMPLAN modeling system (2016 database).
Note: Details may not add to totals due to rounding.
* Employment is defined as the number of payroll and self-employed jobs, including part-time jobs.
** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

Customer Impacts

In addition to the direct, indirect, and induced economic impacts, the short line industry impacts the US economy to the degree that other industries rely on the short line industry for transportation services. To quantify the degree of customer reliance on the short line industry, we estimate two alternative measures – inbound reliance and outbound reliance – representing two perspectives on the goods that are transported by short line railroads. Inbound reliance refers to the degree to which sectors rely on the short line industry for transportation of business inputs. Outbound reliance refers to the degree to which certain commodities are transported by short line railroads. More specifically:

- *Inbound reliance* includes the portion of a sector's economic activity reliant on the short line industry as measured by the sector's expenditures on short line rail transportation as a share of the sector's expenditures on all transportation.
- *Outbound reliance* includes the portion of US-produced commodities transported by short line railroads (measured by a combination of volume and value) as a share of all modes of transportation.

We use the IMPLAN model to estimate inbound customer reliance for all sectors (see Appendix). As shown in Table 2, the three sectors with the greatest inbound reliance on the short line industry are (1) mining, (2) manufacturing (including iron and steel manufacturing), and (3) agriculture.

In the mining sector, 1.63 percent of business inputs rely on transportation services provided by the short industry, amounting to 9,500 jobs, $895 million in labor income, and $2.2 billion in value added. In manufacturing, 1.11 percent of business inputs rely on transportation services provided by the short line industry, amounting to 106,650 jobs, $8.2 billion in labor income, and $16.9 billion in value added. In agriculture, 0.85 percent of business inputs rely on

transportation services provided by the short line industry, amounting to 26,760 jobs, $1.2 billion in labor income, and $1.6 billion in value added. In total across the US economy, 0.51 percent of business inputs rely on transportation services provided by the short line industry, amounting to 478,820 jobs, $26.1 billion in labor income, and $56.2 billion in value added.

Table 2. Inbound Customer Reliance on the US Short Line Industry, 2016

Sector	Short Line Share of Trans-portation Cost	Reliant Employ-ment*	Reliant Labor Income ($millions)**	Reliant Value Added ($millions)
Agriculture	0.85%	26,760	$1,192	$1,638
Mining	1.63%	9,500	$895	$2,249
Utilities	0.60%	3,400	$479	$1,581
Construction	0.40%	41,890	$2,330	$3,179
Manufacturing	1.11%	106,650	$8,238	$16,874
Wholesale and retail trade	0.02%	5,710	$270	$466
Transportation and warehousing	0.20%	11,950	$768	$1,050
Information	0.09%	5,410	$529	$1,607
Finance, insurance, real estate, rental and leasing	0.20%	64,980	$2,276	$16,866
Services	0.17%	195,090	$8,403	$9,932
Other	0.07%	7,470	$682	$736
Total	**0.51%**	**478,820**	**$26,062**	**$56,177**

Source: PwC calculations using the IMPLAN modeling system (2016 database).
Note: Details may not add to totals due to rounding.
* Employment is defined as the number of payroll and self-employed jobs, including part time jobs.
** Labor income is defined as wages and salaries and benefits as well as proprietors' income.

To estimate the outbound customer reliance on the short line industry, we use data published by the US Bureau of Transportation Statistics and US Census Bureau for 2012 and the AAR for 2016 indicating the share (by volume and value) of US-produced commodities that are shipped by rail. To determine the short line industry share, we then allocate the rail industry share between the short line industry and Class I railroads by revenue.[14]

Table 3 and Table 4 show the results of this analysis for select commodities. As shown in Table 3, products reliant on rail transportation include: (1) coal, with 67.5 percent of the volume of all US-produced coal shipped by rail in 2016; (2) chemicals, with 26.2 percent of the volume of all US-produced chemicals shipped by rail in 2012; and (3) grain, with 22.9 percent of the volume of all US-produced grain shipped by rail in 2016. Across all US-produced commodities, in 2012, 5.1 percent of the value and 16.8 percent of the volume was shipped by rail.[15]

[14] While the revenue (and train miles) associated with rail transportation of many commodities may be largely attributable to Class I railroads, short line railroads often provide the first or last mile of service, or a bridge between Class I railroads (see Figure 3). In this sense, commodities shipped by rail are more dependent on short lines than indicated by the short line revenue share.
[15] The most recent Economic Census data published by the US Census Bureau is for 2012.

Table 3. Outbound Customer Reliance on the US Railroad Industry

Commodity Shipped by Rail	Year	Value of Shipments by Rail ($ millions)	Share of US production by value	Volume of Shipments (thousands of tons, unless otherwise noted)	Share of US production by volume
All commodities	2012	705,879	5.1%	1,897,921	16.8%
Coal	2012	29,028	63.2%	748,788	71.5%
Coal	2016	N/A	N/A	492,000	67.5%
Chemicals	2012	60,758	19.2%	90,087	26.2%
Grain	2016	N/A	N/A	5,300	22.9%

Source for 2012: US Bureau of Transportation Statistics and US Census Bureau, 2012 Economic Census, "Transportation - Commodity Flow Survey".
Source for 2016: AAR, "Railroad 10-Year Trends 2006-2015," June 2017.
Note: 2012 data includes a small portion that is transported by a combination of rail and other modes. Grain volume is in millions of bushels.

Based on the short line industry's share of freight rail revenue, 4.9 percent of all freight rail transportation costs were incurred on short-line rail transportation. Multiplying rail volume of each commodity by the short line industry's share of rail transportation costs provides an indication of the degree to which the short line industry is relied upon for transportation of these commodities: 3.3 percent of the volume of all US-produced coal in 2016, 1.3 percent of the volume of all US-produced chemicals in 2012, and 1.1 percent of the volume of all US-produced grain in 2016 (see Table 4).

Table 4. Outbound Customer Reliance on the US Short Line Industry

Commodity Shipped by Short Line Rail	Year	Value of Shipments by Short Line Rail ($ millions)	Share of US production by value	Volume of Shipments (thousands of tons, unless otherwise noted)	Share of US production by volume
All commodities	2012	34,306	0.2%	92,239	0.8%
Coal	2012	1,411	3.1%	36,391	3.5%
Coal	2016	N/A	N/A	23,911	3.3%
Chemicals	2012	2,953	0.9%	4,378	1.3%
Grain	2016	N/A	N/A	258	1.1%

Source for 2012: US Bureau of Transportation Statistics and US Census Bureau, 2012 Economic Census, "Transportation - Commodity Flow Survey"; PwC calculations.
Source for 2016: AAR, "Railroad 10-Year Trends 2006-2015," June 2017; PwC calculations.
Note: 2012 data includes a small portion that is transported by a combination of rail and other modes. Grain volume is in millions of bushels.

III. Section 45G Tax Credit

Since its enactment in 2004, the railroad track maintenance tax credit (IRC section 45G) has been an important factor for the industry, providing incentives to taxpayers to maintain and improve short line infrastructure.

Legislative History and Policy Rationale

The section 45G credit was initially introduced in October 2003 as a permanent tax credit by Sen. Gordon Smith (R-OR) in the Local Railroad Rehabilitation and Investment Act of 2003 (S. 1703). The bill was co-sponsored by Sen. Ron Wyden (D-OR) and 17 other Senators,[16] before being incorporated in a modified form in the Jumpstart Our Business Strength (JOBS) Act (S. 1637), passed by the Senate on May, 11, 2004. Following a House/Senate Conference, the legislation was included in the American Jobs Creation Act of 2004 (Public Law 108–357, enacted October 22, 2004), and effective for three years – taxable years beginning after December 31, 2004 and before January 1, 2008.

The provision has been extended six times, most recently by the Bipartisan Budget Act of 2018, which extended it retroactively through 2017. As indicated in Table 5, after the section 45G credit's initial enactment period of three years, the credit has been extended 10 additional years. Of those 10 years of extensions, approximately 5-1/2 years have represented periods the credit was extended retroactively; only 4-1/2 years represent periods the credit was extended prospectively. As a result, taxpayers have not always been able to count on the availability of the section 45G credit when making investment plans.

The original rationale for the provision upon introduction of S. 1703 by Sen. Smith and co-sponsors was threefold.[17] First, the bill's sponsors noted the critical role played by short lines in the nation's infrastructure, particularly in connecting farmers and small businesses in rural America to the larger rail network and providing an alternative to increasing truck traffic on local roads. Second, the bill's sponsors believed there was a need to create incentives for taxpayers to maintain short lines, many of which had been abandoned or poorly maintained as branch lines of Class I's before being spun-off to short line companies. Third, the bill's sponsors recognized the need for short lines to upgrade to accommodate the new Class I industry standard maximum car weight of 286,000 lbs. (up from 263,000 lbs.), which was estimated to require $7 billion in new investment. A number of studies at the time documented the large infrastructure needs of small railroads.[18]

[16] Co-sponsors of S. 1703 were Sen. Ron Wyden (D-OR), Sen. Sam Brownback (R-KS), Sen. Arlen Specter (R-PA), Sen. Conrad Burns (R-MT), Sen. Pat Roberts (R-KS), Sen. Richard Lugar (R-IN), Sen. Larry Craig (R-ID), Sen. Olympia Snowe (R-ME), Sen. Mark Pryor (D-AR), Sen. Thad Cochran (R-MS), Sen. Blanche Lincoln (D-AR), Sen. Evan Bayh (D-IN), Sen. Thomas Daschle (D-SD), Sen. Bill Nelson (D-FL), Sen. Charles Schumer (D-NY), Sen. Susan Collins (R-ME), Sen. Tim Johnson (D-SD), and Sen. Jim Talent (R-MO).

[17] Congressional Record, available at https://www.congress.gov/congressional-record/2003/10/02/senate-section/article/S12377-1.

[18] American Association of State Highway and Transportation Officials, "Freight-Rail Bottom Line Report," 2002; Upper Great Plains Transportation Institute, North Dakota State University, "Small Railroads – Investment Needs, Financial Options, and Public Benefits," 2002; ZETA-TECH Associates, Inc., "An Estimation of the Investment in Track and Structures Needed to Handle 286,000 lb. Rail Cars," 2000.

Table 5. Legislative History of the Railroad Track Maintenance Credit

Legislation	Effective Dates: Taxable Years beginning after and before	Total Years Covered	Retroactive Period	Prospective Period
Bipartisan Budget Act of 2018 (Public Law 115-123, enacted February 9, 2018)	12/31/2016-1/1/2018	1 year	12 months	None
Protecting Americans from Tax Hikes Act of 2015 (Public Law 114-113, enacted December 18, 2015)	12/31/2014-1/1/2017	2 years	11.5 months	12.5 months
Tax Increase Prevention Act of 2014 (Public Law 113-295, enacted December 19, 2014)	12/31/2013-1/1/2015	1 year	11.5 months	0.5 months
American Taxpayer Relief Act of 2012 (Public Law 112–240, enacted January 2, 2013)	12/31/2011-1/1/2014	2 years	12 months	12 months
Tax Relief, Unemployment Insurance Reauthorization, and Job Creation Act of 2010 (Public Law 111–312, enacted December 17, 2010)	12/31/2009-1/1/2012	2 years	11.5 months	12.5 months
Emergency Economic Stabilization Act of 2008 (Public Law 110-343, enacted October 3, 2008)	12/31/2007-1/1/2010	2 years	9 months	15 months
American Jobs Creation Act of 2004 (Public Law 108–357, enacted October 22, 2004)	12/31/04-1/1/2008	3 years	None	36 months

Capital Needs of the Industry

A more recent capital needs assessment by the Federal Railroad Administration (FRA) in 2014 finds that while short lines have made substantial progress in upgrading track (e.g., 57 percent of route-miles could handle the heavier cars as of 2010, up from 39 percent in 2002) substantial capital needs remain.[19] Based on industry surveys and interviews with bankers and other experts, the FRA estimated that as of 2013 the short line industry required $5.3 billion in investment to meet capital needs over the next 5 years, mainly due to infrastructure needs of $4.2 billion. The FRA estimated that only 69 percent of these needs would be met with available funding, primarily cash flow (73 percent of funding), as it is difficult for short line companies to access private market financing, particularly infrastructure loans.

How the Credit Works

The section 45G credit is a business tax credit allowed for 50 percent of qualified railroad track maintenance expenditures paid or incurred in a taxable year by an eligible taxpayer. Qualified railroad track maintenance expenditures are gross expenditures for maintaining railroad track

[19] Federal Railroad Administration, "Summary of Class II and Class III Railroad Capital Needs and Funding Sources," October 2014.

(including rail, ties, bridges, signals, crossings, tunnels, roadbed, etc.) owned or leased as of January 1, 2015 by a Class II or Class III railroad.

The credit is limited to the product of $3,500 times the number of miles of railroad track owned, leased, or assigned to the eligible taxpayer as of the close of its taxable year. The credit is assignable to any eligible taxpayer who makes qualified expenditures. An eligible taxpayer is (1) any Class II or Class III railroad and (2) any person that transports property using the rail facilities of a Class II or Class III railroad or that furnishes railroad-related property or services to such person.

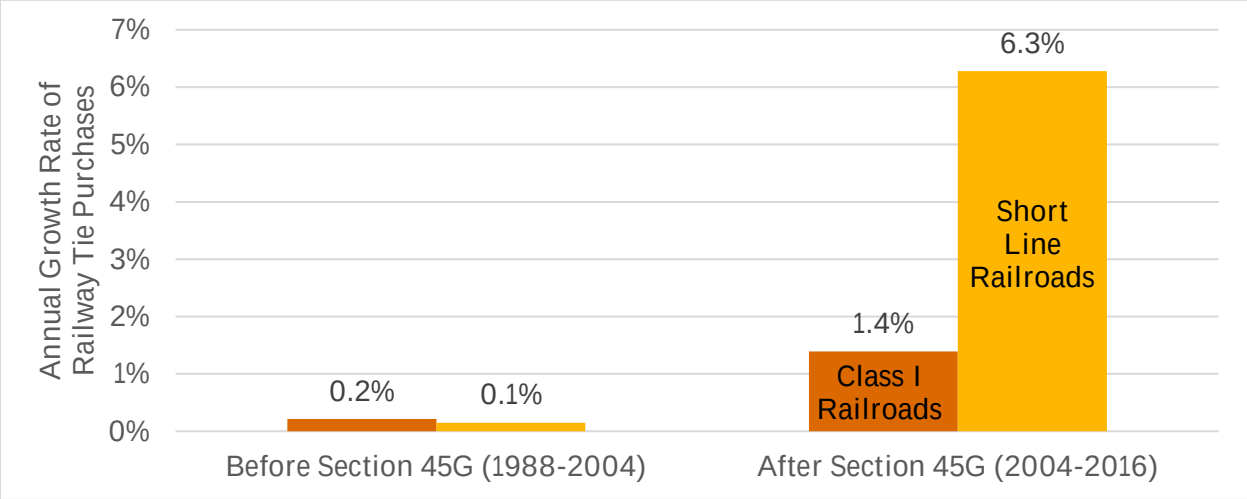
Effectiveness

The most recent IRS Statistics of Income (SOI) data indicate that $241 million in section 45G tax credits were tentatively claimed in 2013, $171 million of which was by C corporations and the remainder by individuals.[20] This indicates that the section 45G tax credit supported approximately $482 million of short line infrastructure investment in 2013, or roughly half the industry's estimated $1 billion of expenditures for capital and track maintenance in that year.[21]

A major portion of short line infrastructure expense is the purchase and installation of railway ties.[22] According to data provided by the Railway Tie Association (RTA), since enactment of the section 45G credit in 2004, railway tie purchases by the short line industry have grown at an annual rate of 6.3 percent over the period 2004-2016, compared to an annual rate of growth of 0.1 percent over the period 1988-2004 (see Figure 6). Purchases of ties by Class I railroads also increased, but by a much smaller amount, from an annual rate of 0.2 percent before the credit to 1.4 percent after the credit. After controlling through statistical analysis for various factors that normally predict railway tie purchases, RTA finds that approximately 1 million railway tie purchases annually by the short line industry are attributable to the section 45G tax credit – a 23 percent increase over the average of annual purchases for the period 1988-2016.[23] Given the $50 average cost of treated ties, this amounts to an annual increase in purchases of $50 million.[24]

[20] Due to limitations on general business tax credits, which include the section 45G credit, approximately one-third of tentative credits are claimed in a typical tax year.
[21] Surveys by the ASLRRA and AAR indicate that the short line industry's revenue in 2013 was approximately $4.2 billion, and expenditures for capital and maintenance of way are approximately 24 percent of revenue. See, ASLRRA, "Short Line and Regional Railroad Facts and Figures," 2017.
[22] Based on data provided by the Railway Tie Association on the number of ties purchased by the short line industry and the average cost of treated ties (approximately $50), the short line industry spent approximately $366 million on treated ties in 2013, and $404 million in 2016. Installation costs incurred by the industry are in addition to these expenditures.
[23] Fred Norrell, "An Inquiry into the Effect of Tax Credits on Crosstie Purchases," Railway Tie Association, March 28, 2018.
[24] Data provided by the Railway Tie Association. Excludes the cost of installation.

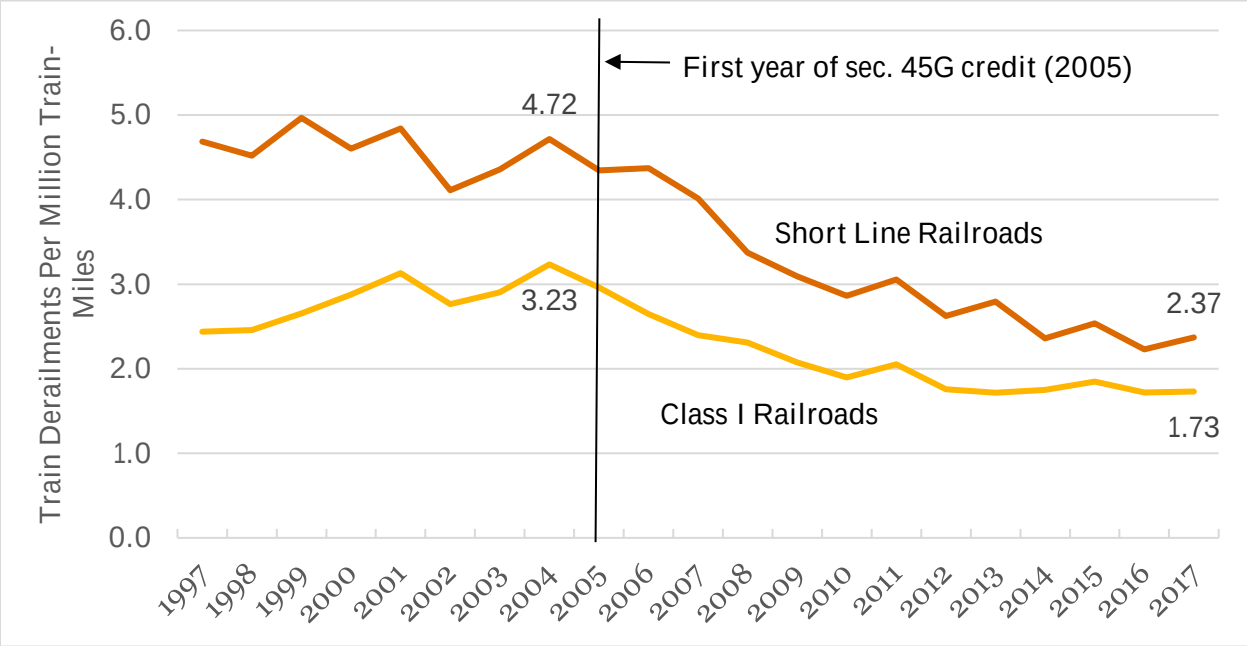
Figure 6. Railway Tie Purchases have Increased since Enactment of Section 45G



Source: Railway Tie Association.

One indicator of the quality of short line infrastructure investment is the industry's improved safety record. Since enactment of the 45G credit in 2004, train derailments on short line rails have declined by 50 percent, from a rate of 4.72 per million train miles in 2004 to 2.37 in 2017 (see Figure 7). Short line railroad safety performance is now approaching that of the longer haul Class I railroads and has improved at a faster rate than Class I railroads over the period the 45G credit has been in existence.

Figure 7. Safety on Short Lines has Improved since Enactment of Section 45G



Source: Federal Railroad Administration.
Note: Class I data exclude Amtrak.

Investment Incentives

Standard cost of capital analysis also indicates the section 45G credit provides strong incentives to invest in short line infrastructure.[25] For instance, consider the case of a break-even, or marginal, investment in short line track maintenance that is below the section 45G per mile cap (i.e., an investment of less than $7,000 per track mile), such that the credit has maximum effect on investment incentives (i.e., the credit is fully utilized, either directly or through assignment to another taxpayer).[26] In this case, the section 45G credit reduces the user cost of capital by 63 percent.[27] Empirical estimates of the responsiveness of investment to changes in the user cost of capital indicate that such a reduction in the user cost of capital is associated with a 47.3 percent increase in investment (see Table 6).[28]

The same type of analysis indicates that for short line infrastructure investors the section 45G credit is a much more powerful incentive at the margin than the two major incentives contained in the Tax Cuts and Jobs Act (TCJA), namely:

1. The lower federal corporate income tax rate (21 percent in 2018, down from 35 percent in 2017).
2. 100-percent expensing for equipment in 2018 (up from 50-percent expensing, a.k.a. bonus depreciation, in 2017).

For instance, for a corporate taxpayer making a marginal investment in short line track maintenance, relative to 2017 law, the combination of the TCJA's lower corporate tax rate and expensing for equipment reduces the user cost of capital by 1.2 percent, which is associated with a 0.9 percent increase in investment. Expensing has relatively little effect on short line investment incentives because short line investors previously were permitted to expense 75 percent of track maintenance expenditures under a safe harbor provided by IRS Revenue Procedure 2002-65.

Table 6. Impact of Section 45G Tax Credit and the Tax Cuts and Jobs Act (TCJA) on Cost of Capital and Investment for a Short Line Infrastructure Project

Tax Change	Change in Cost of Capital	Change in Investment
Section 45G Tax Credit	-63.0%	47.3%
TCJA (reduced corporate tax rate and expensing)	-1.2%	0.9%

[25] The user cost of capital is the real before-tax rate of return that a marginal (i.e., break-even) investment must earn to recover the cost of investment, pay taxes on business income, and pay an expected after-tax rate of return to investors that covers their opportunity cost. Further details on the calculations are provided in the appendix.

[26] There is zero effect on marginal incentives for taxpayers above the section 45G cap. It is not known what percentage of taxpayers have expenditures in excess of the cap.

[27] The section 45G credit may reduce the user cost of capital at the time an investment is made by a lesser amount under certain circumstances, including (1) for investments of more than $7,000 per track mile, (2) investments made in periods in which the credit was not yet extended (even if extended retroactively), and (3) investments by taxpayers who have difficulties in utilizing or assigning the credit.

[28] We used a consensus of empirical estimates of the elasticity of investment with respect to the cost of capital (-0.75), which is for all business investment, not just railroad infrastructure investment. See, Kevin A. Hassett and R. Glenn Hubbard, "Tax Policy and Business Investment," in Handbook of Public Economics, Vol. 3, edited by Alan J. Auerbach and Martin Feldstein, pp. 1293–1343, 2002.

Current Legislation

The section 45G credit expired on December 31, 2017. Bills have been introduced in both the House and Senate to extend the credit on a permanent basis. The House bill (H.R. 721 - Building Rail Access for Customers and the Economy Act) was introduced on January 30, 2017 by Rep. Lynn Jenkins (R-KS) and originally co-sponsored by Rep. Earl Blumenauer (D-OR), Rep. Rodney Davis (R-IL), and Rep. Daniel Lipinski (D-IL). As of June 29, 2018, the House bill had 261 co-sponsors. The Senate bill (S. 407) was introduced on February 16, 2017 by Sen. Mike Crapo (R-ID) and originally co-sponsored by Sen. Debbie Stabenow (D-MI), Sen. James Inhofe (R-OK), Sen. Ron Wyden (D-OR), Sen. Jerry Moran (R-KS), Sen. Charles Schumer (D-NY), Sen. Roger Wicker (R-MS), Sen. Robert Casey (D-PA), Sen. Pat Roberts (R-KS), Sen. Richard Blumenthal (D-CT), Sen. Johnny Isakson (R-GA), Sen. Dean Heller (R-NV), and Sen. John Thune (R-SD). As of June 29, 2018, the Senate bill had 56 co-sponsors.

Appendix: Methodology

Economic Impact Modeling

We used estimated short line industry revenues and the IMPLAN model to calculate the economic impacts of the US short line industry.[29] IMPLAN is a modeling system developed for estimating economic impacts and is similar to the Regional Input-Output Modeling System developed by the US Department of Commerce. The model is primarily based on government data sources.

IMPLAN is built around an "input-output" table that relates the purchases that each industry has made from other industries to the value of the output of each industry. To meet the demand for goods and services from an industry, purchases are made in other industries according to the patterns recorded in the input-output table. These purchases in turn spark still more purchases by the industry's suppliers, and so on. Additionally, employees and business owners make personal purchases out of the additional income that is generated by this process, further increasing demand that ripples through the economy. Multipliers describe these iterations.

Economic multipliers are often used to measure the overall change in production that would result from a marginal increase in a particular industry. For example, a value added multiplier converts a $1 million increase in output of the short line industry into the total change in value added throughout the supply chain. Because some suppliers of US short line companies might use short line rail service, a marginal change in the short line industry could lead to an additional change in short line activity attributable to the services it provides its suppliers throughout the economy.

While this impact is appropriate to include when modeling a marginal change, when evaluating the overall impact of the industry these indirect, own-industry impacts should be excluded to prevent double-counting. Therefore, we have adjusted the IMPLAN model results to exclude any indirect or induced effects taking place within the short line industry.

Economic impacts are reported at 2016 levels.

Inbound Customer Reliance

To illustrate our methodology for estimating inbound customer reliance, Table A-1 provides a detailed calculation for the iron and steel manufacturing industry (a subset of the manufacturing industry shown in Table 2). The iron and steel manufacturing industry had 90,940 employees in 2016. Each job in this sector can be viewed as reliant on transportation services of coal and other inputs purchased by iron and steel manufacturers. These manufacturers spent $8.4 billion on transportation services of inputs (shipments in the final stage of transport), of which $5.0 billion was for rail transportation. Based on the short line industry's share of the entire rail industry's revenue (4.9 percent), we estimate that iron and steel manufacturers spent $241 million on short line transportation in 2016, or 2.9 percent of the transportation costs of iron and steel manufacturers. As such, we estimate that 2.9 percent of iron and steel manufacturing employment relies on transportation services provided by the short line industry, amounting to 2,620 jobs.

[29] IMPLAN is a product of IMPLAN Group, Inc.

Table A-1. Methodology for Estimating Inbound Customer Reliance on the US Short Line Industry, Iron and Steel Manufacturing Industry as Customer, 2016

Employment*	Total Transportation Cost ($millions)	Railroad Cost ($millions)	Short Line Cost ($millions)	Short Line Share of Transportation Cost	Jobs Reliant on the Short Line Industry
90,940	$8,371	$4,963	$241	2.9%	2,620

Source: PwC calculations using the IMPLAN modeling system (2016 database).
Note: Details may not add to totals due to rounding.
* Employment is defined as the number of payroll and self-employed jobs, including part time jobs.

Cost of Capital Analysis

The user cost of capital is the real before-tax rate of return that a marginal investment must earn to recover the cost of investment, pay taxes on business income, and pay an expected after-tax rate of return to investors that covers their opportunity cost. We calculated the user cost of capital for a marginal, equity-financed investment in short line infrastructure by a corporate investor, following the standard methodology used, for example, by the US Treasury Department and the European Commission.[30] We accounted for the US corporate tax rate (inclusive of the average state corporate income tax), bonus depreciation for equipment, and the section 45G tax credit, assuming that the taxpayer is not subject to the section 45G per mile cap.[31] We excluded all other taxes, such as shareholder taxes and property taxes.

Data for US corporate income tax rates come from the OECD database.[32] The US combined statutory tax rate for 2017, assuming an average state corporate income tax rate of 6.01 percent, is calculated to be 37.58 percent. Under 2018 law, we held the average state corporate income tax rate constant at its 2017 value, and compute the US combined statutory tax rate to be 25.75 percent.

Following IRS Revenue Procedure 2002-65, we assumed that 75 percent of the infrastructure investment is expensed (under both 2017 and 2018 law). The remaining 25 percent we assumed is railroad track with a 7-year MACRS recovery period (double declining balance with a switch to straight line); we account for the half-year convention for the year placed in service as well as 50 percent bonus depreciation in 2017 and expensing in 2018.

We assumed a real interest rate of 5 percent and inflation of 2 percent.

[30] See, for example, US Treasury Department, "Effective Tax Rate Model," July 2014, available at https://www.treasury.gov/resource-center/tax-policy/tax-analysis/Documents/New-Investment-Rates-Methodology.pdf; James B. Mackie III, "Unfinished Business of the 1986 Tax Reform," *National Tax Journal*, June 2002; Christoph Spengel, Frank Schmidt, Jost Heckemeyer, and Katharina Nicolay, "Effective Tax Levels using the Devereux/Griffith Methodology: Final Report 2016," Project for the EU Commission TAXUD/2013/CC/120, Centre for Economic Research (ZEW), October 2016, available at http://www.zew.de/en/publikationen/effective-tax-levels-using-the-devereuxgriffith-methodology-final-report-2016/?cHash=cd1beff16840b2d302fd63720247e358.
[31] Because a majority of the section 45G credits are claimed by C corporations, we modeled the corporate income tax rather than the individual income tax that applies to pass-through business entity income.
[32] The OECD database is available at http://www.oecd.org/tax/tax-policy/tax-database.htm.

Based on these parameters we computed the percentage change in the cost of capital under the assumed change in tax law.[33] Lastly, we translated the estimated change in the user cost of capital into an estimated change in investment using a consensus of empirical estimates of the elasticity of investment with respect to the cost of capital (-0.75).[34] This elasticity implies that a 10 percent reduction in the cost of capital will increase investment by 7.5 percent.

[33] The percentage change in the cost of capital reported in Section III is independent of the asset's economic depreciation rate.

[34] Kevin A. Hassett and R. Glenn Hubbard, "Tax Policy and Business Investment," in Handbook of Public Economics, Vol. 3, edited by Alan J. Auerbach and Martin Feldstein, pp. 1293–1343, 2002.