



# Economic Contribution of Proposed South St. Paul Union Pacific Rail Yard Improvements

A REPORT OF THE ECONOMIC IMPACT ANALYSIS PROGRAM

Brigid Tuck, Owusua Yamoah, and Neil Linscheid



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## Economic Contribution of Proposed South St. Paul Rail Yard Improvements: Executive Summary

- *Background:* Railroads are a critical component of Minnesota's transportation infrastructure. Recent economic and industrial trends have increased demand for transportation by rail in Minnesota. As demand for rail transportation increases, railroad companies are investing in improvements to enhance efficiency to move freight throughout the system. Union Pacific is one railroad looking to improve its efficiency in Minnesota, specifically in its South St. Paul rail yard. Progress Plus, an economic development foundation of the River Heights Chamber of Commerce, commissioned University of Minnesota Extension to explore the rail yard's economic contribution.
- *Direct Spending and Employment:* Union Pacific spent \$36.1 million in Dakota and Ramsey counties in 2013 to operate the South St. Paul yard. The railway employs 118 residents in the two counties, paying \$7.4 million in compensation annually to those employees. Union Pacific has over 300 employees based from the rail yard.
- *Economic Contribution of Operations in Dakota and Ramsey Counties:* Union Pacific's current operations of the South St. Paul rail yard contribute an estimated \$63.0 million in economic activity to the economy of Dakota and Ramsey counties. This includes an estimated \$17.0 million of labor income for residents of the counties in 2013. The operations support an estimated 310 full and part-time jobs in the counties.
- *Economic Contribution of Operations in Minnesota:* Union Pacific's operation of the South St. Paul rail yard generates an estimated \$211.8 million of economic activity in Minnesota each year. This includes an estimated \$52.0 million of labor income paid. The rail yard supports an estimated 915 jobs in Minnesota.
- *Top Industries Affected:* Expenditures for goods and services by Union Pacific have high impacts on the engineering and architectural services industry and on the real estate industry in Ramsey and Dakota counties. Expenditures by employees of Union Pacific have high impacts on health care and real estate in the counties.
- *Economic Contribution of Increased Freight Capacity:* Increased efficiency in the rail yard has the potential to increase the level of throughput in the yard. If Union Pacific increases its expenditures by 5 percent (projected short-term growth level), then the economic contribution of the South St. Paul rail yard in Dakota and Ramsey counties would increase to an estimated \$66.6 million each year, including 330 jobs and \$17.8 million in labor income. If Union Pacific increases its expenditures by 25 percent (projected long-term growth level), then the economic contribution of the South St. Paul rail yard would increase to an estimated \$79.3 million, including 395 jobs and \$21.2 million in labor income in Dakota and Ramsey counties.



## BACKGROUND AND HISTORY OF THE PROJECT

Railroads are a critical component of Minnesota's transportation infrastructure. In 2007, rail transportation carried 38 percent of the volume of goods transported in Minnesota. Furthermore, 90 percent of rail volume was between states, as opposed to 50 percent of truck tonnage, underlying the importance of rail in moving goods in and out of Minnesota.<sup>1</sup>

Recent economic and industrial trends have increased demand for transportation by rail across the United States. IHS-Global Insight forecasted a 25 percent increase in rail tonnage between 2010 and 2030.<sup>2</sup> Minnesota's rail industry has been affected by this growth as well.

As demand for rail transportation increases, railways are making investments and improvements to enhance efficiency of freight movement throughout the system. Union Pacific is one railroad looking to improve its efficiency in Minnesota, specifically in its South St. Paul rail yard. As currently configured, Union Pacific has a limited footprint in the yard, making movement through the Minneapolis-St. Paul metropolitan area difficult.

Improvement plans call for supplementing current capacity, by adding a second track that will allow trains to pass each other, as well as extending the track into the currently empty northern section of the yard. These improvements are expected to provide a variety of benefits. Benefits include increasing the fluidity, velocity, and throughput of the yard; lowering emissions and noise; decreasing the number of train starts; and increasing shipping performance.

Progress Plus, an economic development foundation of the River Heights Chamber of Commerce, works with businesses in South St. Paul and Inver Grove Heights. Progress Plus is interested in understanding the economic role of Union Pacific in the surrounding communities and region. The organization is also interested in determining how the proposed improvements by Union Pacific would affect the local economy. Therefore, Progress Plus contracted with University of Minnesota Extension to analyze the economic contribution of proposed improvements to the South St. Paul rail yard.

In this analysis, quantifying the economic contribution of the rail yard improvements is done in two steps. First, the current economic contribution of the rail yard is calculated. This becomes the baseline for measuring how changes in freight volume will affect the economic contribution of the rail yard. Second, the economic contribution of the rail yard with increased freight capacity is estimated.

The South St. Paul rail yard is located in Dakota County. It is in near proximity to Ramsey County. Given its location, the analysis focuses on the economic contribution of the rail yard in the two counties. Union Pacific has a statewide presence, and makes significant purchases from Minnesota-based companies, making the contribution to Minnesota also of interest. Therefore, this analysis has two study areas. The primary study area is Dakota and Ramsey counties, but results for Minnesota are also reported.

The input-output model IMPLAN (MIG, Inc) is the basis of the analysis in this study. IMPLAN version 3.0 with the SAM multipliers was implemented. For more on the model and the methodology, please read appendix one.

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<sup>1</sup> Minnesota Comprehensive Statewide Freight and Passenger Rail Plan (February 2010). Retrieved from: <http://www.dot.state.mn.us/planning/railplan/>.

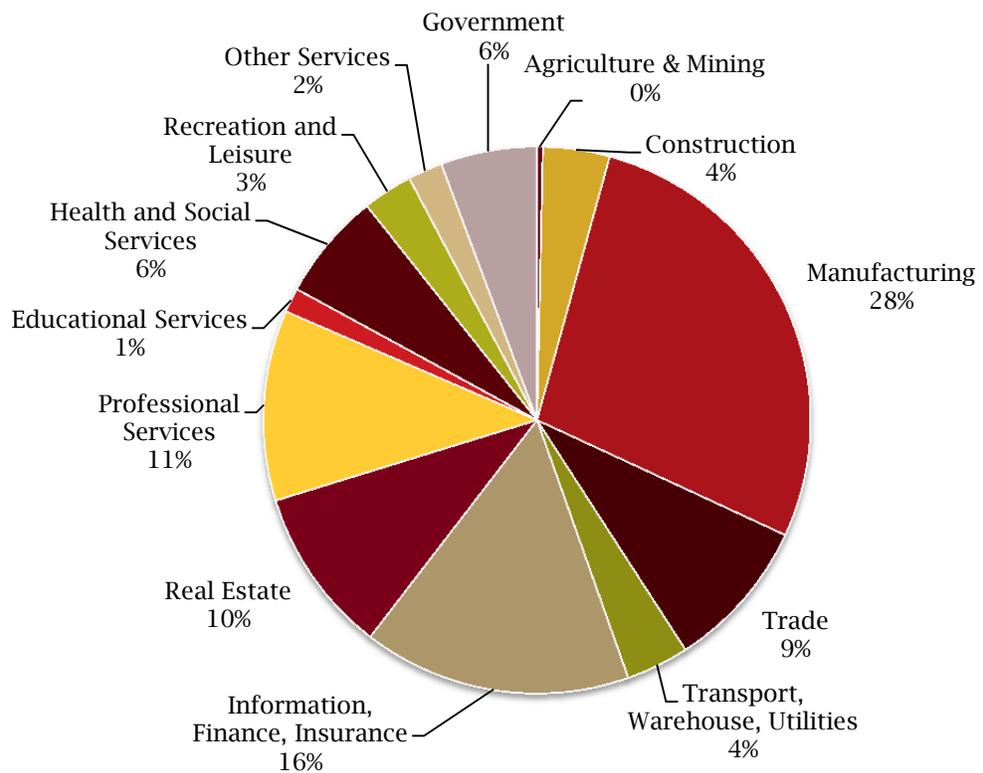
<sup>2</sup> Also in Minnesota Comprehensive Statewide Freight and Passenger Rail Plan. See previous footnote.

## PROFILE OF THE STUDY AREA ECONOMY

The primary focus of this study is to examine the economic contribution of the South St. Paul Union Pacific rail yard to the economy of Dakota and Ramsey counties. This is the functional economy in which the rail yard operates.

In 2012, industries in Dakota and Ramsey counties produced \$107.0 billion in sales (output)<sup>3</sup>. The two counties produced 18 percent of total output in Minnesota. In Dakota and Ramsey counties, manufacturing companies produced 28 percent of total output, making it the largest industry in terms of sales (chart 1). Railways, the focus of this report, are categorized in the transportation, warehousing, and utilities sector. Transport by rail produced \$494.9 million in economic activity in 2012 in the two counties. This is less than 1 percent of total output.

**Chart 1: Output by Industry:  
Dakota and Ramsey Counties**



<sup>3</sup> Data in this section of the report is from the IMPLAN database (MIG, Inc). Data from 2012 is the most current data available.



In 2012, industries in Dakota and Ramsey counties employed 627,500 people. Sixteen percent of those jobs were in professional services, making it the largest industry in terms of employment (chart 2). Thirteen percent of those jobs were in the government sector and twelve percent in the health and social services industry, ranking them the second and third largest industries in terms of employment. Railways are the focus of this report and are included in the transportation, warehousing, and utilities industry. Rail transportation, specifically, employed 1,030 people in 2012 in the two counties. Rail employment, therefore, accounted for less than 1 percent of all employment in the counties. More detail on transportation employment is shown in chart 3.

Manufacturing accounts for a higher percent of total output as compared to employment. This is likely due to two factors. One, output per employee in the manufacturing sector is higher than many other industries. Each manufacturing worker can produce more output, as measured in dollars, than in other sectors. Two, in the dataset used in this analysis, one job is one job. A job is counted as one job regardless of whether it is full-time, part-time, or seasonal. Manufacturing jobs tend to be full-time, while jobs in other industries, such as restaurants, tend to be more part-time.

**Chart 2: Employment by Industry:  
Dakota and Ramsey Counties**

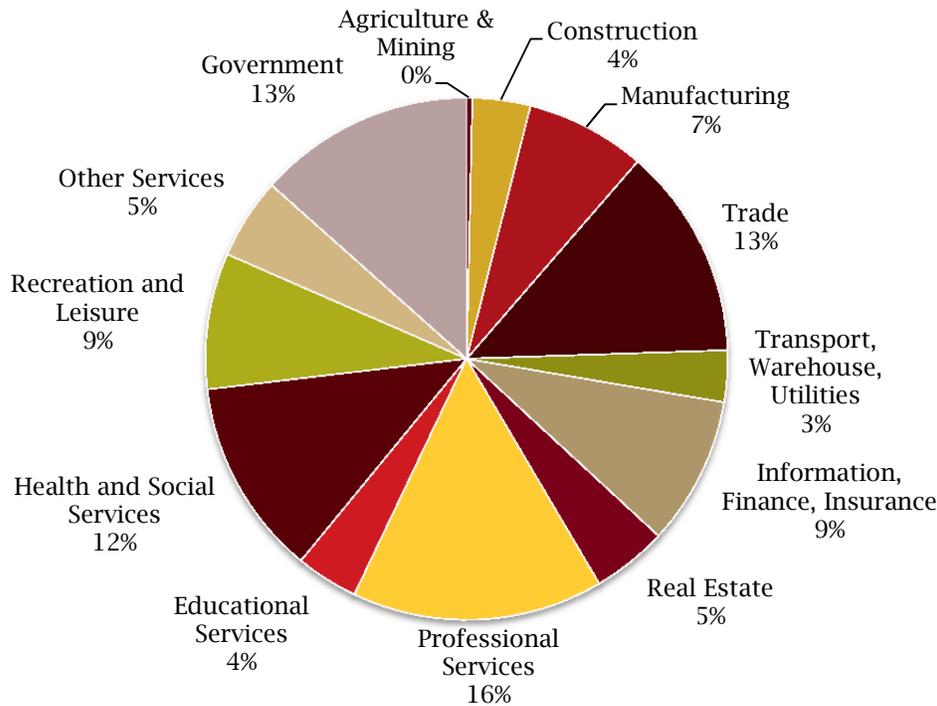
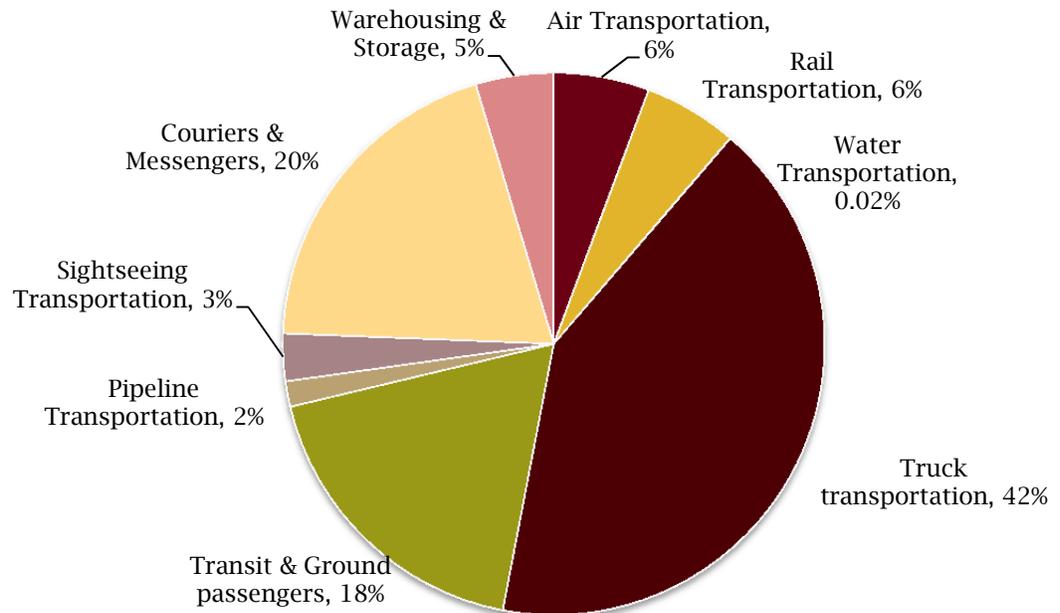


Chart 3 shows total employment in the transportation and warehousing industry in Dakota and Ramsey counties. Truck transportation accounts for 42 percent of the 18,500 jobs in the sector. Rail transportation accounts for 6 percent.

**Chart 3: Employment in Transportation and Warehouse:  
Dakota and Ramsey Counties**



## CURRENT ECONOMIC CONTRIBUTION OF THE SOUTH ST. PAUL UNION PACIFIC RAIL YARD

Total economic contribution is comprised of three parts - direct, indirect, and induced effects. This section of the report explains each of these components and how they were calculated for this study.

### Direct Effect of Current Operations

The direct effect of current operations of the South St. Paul Union Pacific rail yard is driven by expenditures for day-to-day operations. Union Pacific makes local expenditures for goods and services in order to operate the rail yard. Union Pacific also makes expenditures to its employees, many of whom live in local communities. These local expenditures and payments for labor create the direct effect of the South St. Paul Union Pacific rail yard.

In order to quantify the direct effect the Union Pacific rail yard, Union Pacific provided University of Minnesota Extension with 2013 data about operating expenditures, including total salaries, wages, and benefits paid. Extension was then able to estimate expenditures in two study areas. The first study area is Ramsey and Dakota counties. The second study area is Minnesota.

In 2013, Union Pacific spent \$118.7 million in Minnesota to operate the South St. Paul rail yard (table 1). The \$118.7 million of operating expenditures included payments of \$19.4 million to the company's employees living in Minnesota.

The \$118.7 million also included \$99.3 million in expenditures for goods and services. Goods and services purchased are consistent with operating a railroad and include expenditures for engineering services, rolling railroad stock, track maintenance (such as lawn care), computing, and telecommunications. Union Pacific made purchases from companies in 32 of Minnesota's 87 counties in 2013.

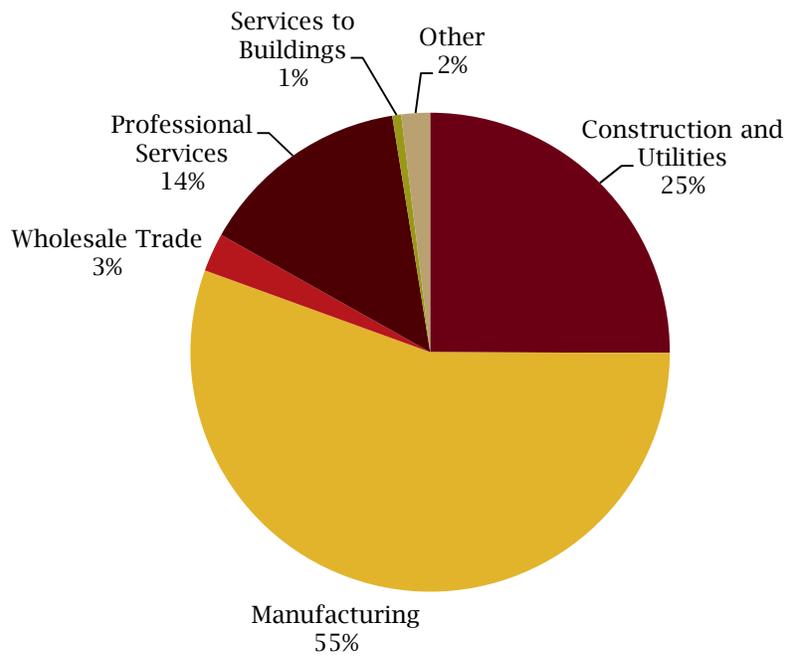
**Table 1: Direct Operating Expenditures and Wages of South St. Paul Union Pacific Rail Yard, 2013 (millions)**

	Ramsey and Dakota Counties	Minnesota
Goods and Services	\$28.7	\$99.3
Salaries, Wages, and Benefits	\$7.4	\$19.4
Total Expenditures	\$36.1	\$118.7

Data supplied by Union Pacific and compiled by University of Minnesota Extension

Union Pacific's expenditures by industry in Minnesota are shown in chart 4. The majority (55 percent) of Union Pacific's purchases are from manufacturing companies. Not surprisingly, a significant portion of those purchases are for railroad stock - manufacturing of locomotives, railroad cars, railroad locomotive and car parts, and railway track maintenance equipment. Construction purchases accounted for one-quarter of all expenditures in 2013.

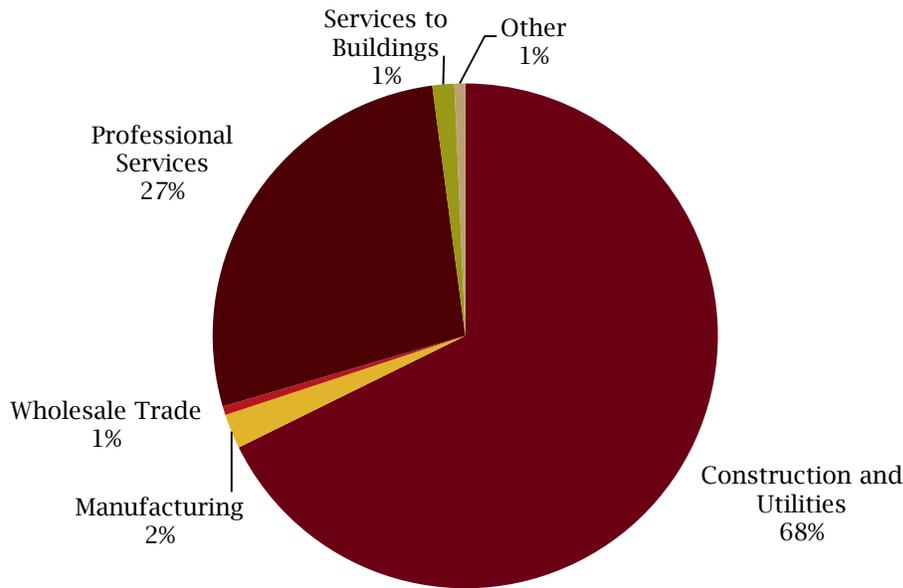
**Chart 4: Union Pacific Expenditures in Minnesota by Industry 2013**



Union Pacific spent \$36.1 million in Dakota and Ramsey counties in 2013 (table 1). The company purchased \$28.7 million of goods and services from businesses based in the two counties. Union Pacific purchased a broad range of items, including environmental management services, pest control, construction, train engines, relay controls, and computer services. Union Pacific also directly paid \$7.4 million in salaries, wages, and benefits to employees residing in Ramsey and Dakota counties in 2013.

Chart 5 details Union Pacific's expenditures for goods and services by industry. The majority (68 percent) of expenditures were construction-related. These were contracts with construction firms located in Ramsey and Dakota counties. Twenty-seven percent of expenditures were with professional consulting firms located in the counties.

**Chart 5: Union Pacific Expenditures by Industry in Dakota and Ramsey Counties 2013**



Union Pacific employs 118 people who live in either Dakota or Ramsey county (table 2). There are over 300 Minnesotans based at the South St. Paul rail yard. There are additional employees based at the rail yard who live outside Minnesota.

**Table 2: Employment by Union Pacific in Minnesota, 2013**

	Ramsey and Dakota Counties	Minnesota
Total	118	305

**Indirect and Induced Effects**

Using estimated direct effects, the data was entered into an input-output model. Input-output models trace the flow of dollars throughout a local economy and can capture the indirect and induced, or ripple, effects of an economic activity. The input-output model IMPLAN was used in this analysis.

Indirect effects are those associated with a change in economic activity due to spending for goods and services directly tied to the industry. In this case, these are the changes in the local economy occurring because Union Pacific purchases goods (rail equipment and relay controls, for example) and related services (engineering and track maintenance, for example). As the railroad makes purchases, this creates an increase in purchases across the supply chain. Indirect effects are the summary of these changes across an economy.

Induced effects are those associated with a change in economic activity due to spending by the employees of businesses (labor) and by households. Primarily, in this study, these are economic changes related to spending by Union Pacific employees. It also includes household spending related to indirect effects. As employees of the railway make purchases locally, this triggers increases in purchases on that supply chain.<sup>4</sup>

The indirect and induced effects of the operation of the Union Pacific South St. Paul rail yard are shown in table 3, along with a discussion of the total impact.

### **Economic Contribution of Current Operations**

In 2013, Union Pacific contributed an estimated \$63.0 million dollars in economic activity to Ramsey and Dakota counties (table 3). The railway’s presence in Ramsey and Dakota counties supports an estimated 310 jobs. These employees receive an estimated \$17.0 million in wages, salaries, and benefits.

Union Pacific itself spends \$36.1 million annually in Dakota and Ramsey counties to operate the rail yard, as detailed above. The railway employs 118 residents of the counties and spends \$7.4 million in compensation for those workers.

When Union Pacific makes purchases from businesses in the two counties, this generates additional economic activity (indirect effects). Union Pacific generates \$19.9 million in activity each year at local businesses and supports jobs for 145 individuals in those businesses.

When Union Pacific’s employees spend their wages and salaries in Dakota and Ramsey counties, this creates economic activity at businesses in the county (induced effects). Employee spending generated \$7.0 million in economic activity in 2013 in the two counties and supported employment for 50 workers.

**Table 3: Total Economic Contribution of Union Pacific’s Current Operations on Dakota and Ramsey Counties, 2013**

	<b>Output (Millions)</b>	<b>Employment</b>	<b>Labor Income (Millions)</b>
Direct	\$36.1	118	\$7.4
Indirect	\$19.9	145	\$7.2
Induced	\$7.0	50	\$2.4
<b>Total</b>	<b>\$63.0</b>	<b>313</b>	<b>\$17.0</b>

Estimates by University of Minnesota Extension

In 2013, Union Pacific spent \$118.7 million in Minnesota to operate its South St. Paul rail yard. Of this, \$19.4 million was paid in labor income to its 305 employees who reside in Minnesota (table 4).

<sup>4</sup> For further definitions of direct, indirect, and induced effects please see appendix one.

Union Pacific’s operation of the South St. Paul rail yard generates an estimated \$211.8 million of economic activity in Minnesota each year. This includes an estimated \$52.0 million of labor income paid to residents of Minnesota. The rail yard supports an estimated 915 jobs in Minnesota.

**Table 4: Total Economic Contribution of Union Pacific’s Operations on Minnesota, 2013**

	<b>Output (Millions)</b>	<b>Employment</b>	<b>Labor Income (Millions)</b>
Direct	\$118.7	305	\$19.4
Indirect	\$70.1	450	\$24.8
Induced	\$23.0	160	\$7.8
<b>Total</b>	<b>\$211.8</b>	<b>915</b>	<b>\$52.0</b>

Estimates by University of Minnesota Extension

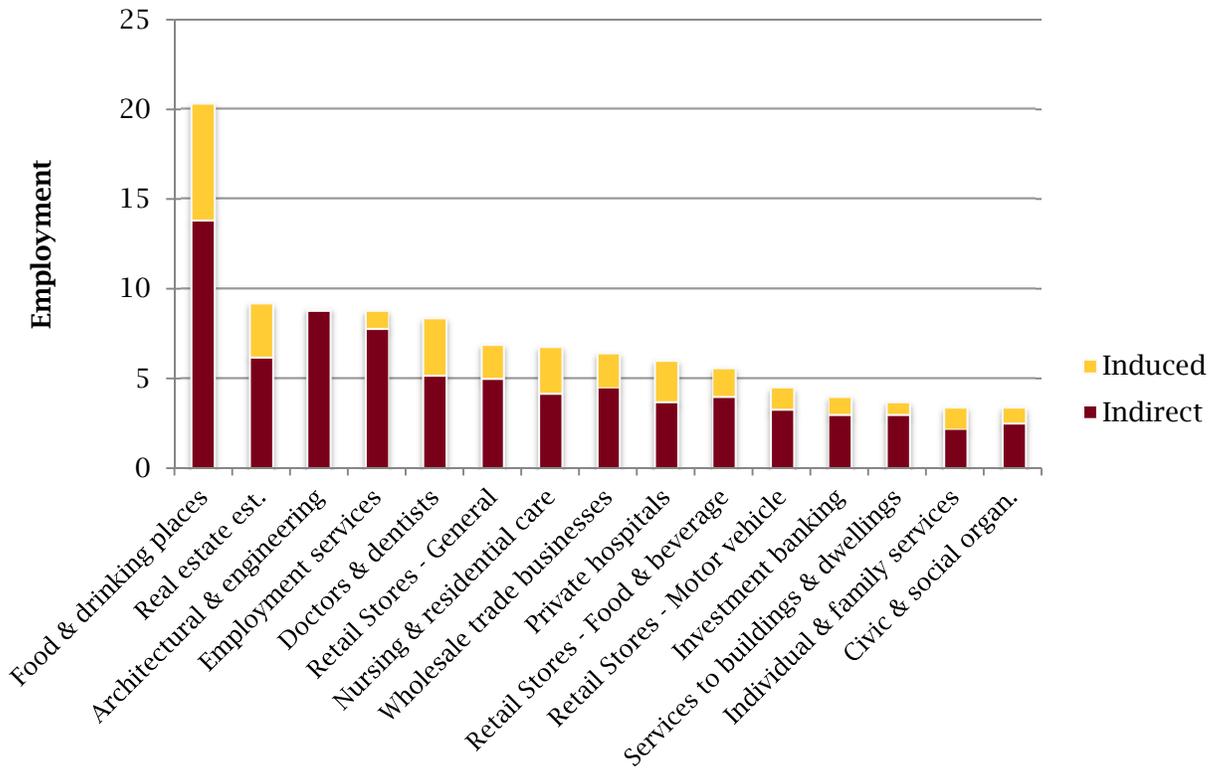
### Top Industries Impacted

Union Pacific’s operation of the South St. Paul rail yard supports employment for 313 residents of Ramsey and Dakota counties. Of these, 118 jobs are with Union Pacific itself. Thus, Union Pacific supports 195 jobs in other businesses in the two counties. Chart 6 illustrates the top fifteen industries with jobs supported by Union Pacific. These impacts are driven by the local expenditures and vary depending on the types of local purchases. Indirect effects are those created through the railway’s expenditures for goods and services. Union Pacific’s local expenditures highly influence the engineering and architectural services industry, employment services, and real estate. Induced effects are generated because Union Pacific’s employees spend wages and salaries in the local economy. Health care is a major expenditure for most households; therefore, it is not surprising to see high induced impacts in those industries.

Many economic impact studies show relatively high employment impacts on the food services and drinking places industry. Expenditures here include restaurants and catering services. Since employment in this industry is often part-time, and in the model, one job is one job (regardless of full- or part-time status), employment impacts tend to be higher in this particular industry.



**Chart 6: Top Industries Effected: Sorted by Employment**



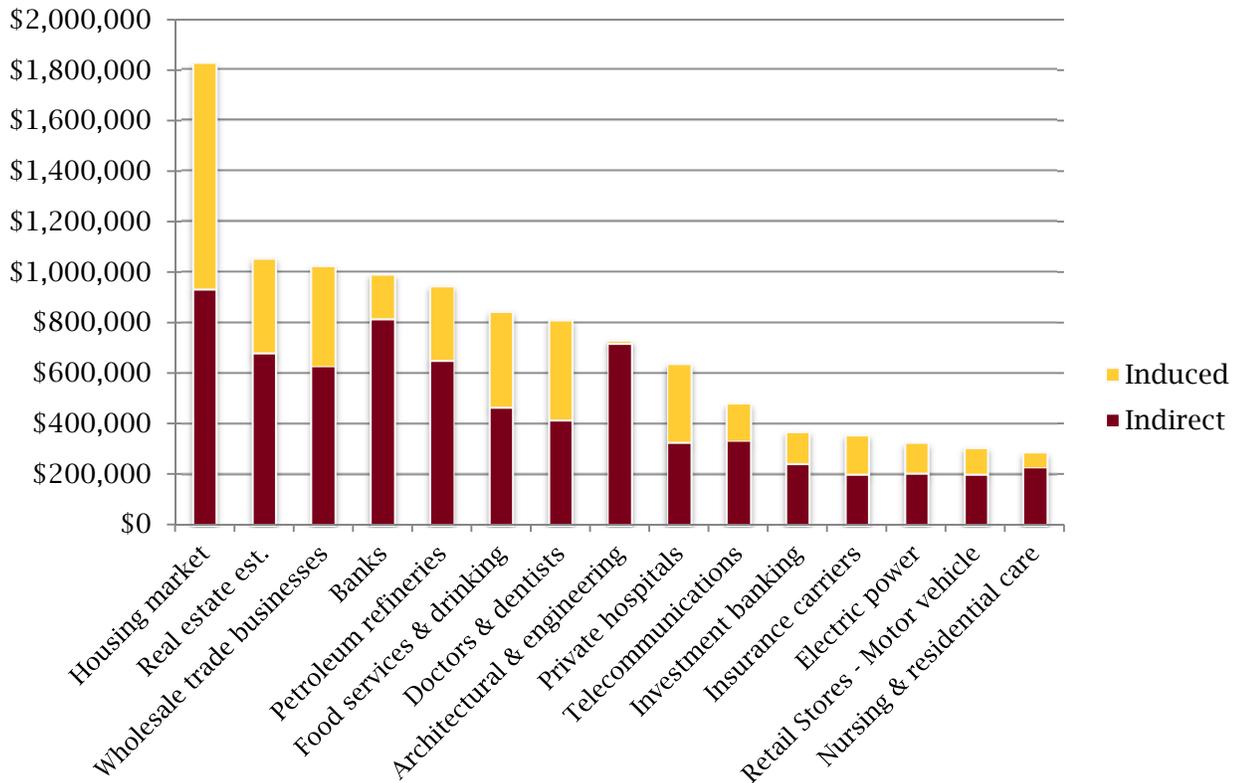
Examining the industries most affected in terms of employment is one lens through which to examine economic contribution. As mentioned, one job is one job in the model, therefore employment effects are often weighted towards industries that employ more part-time workers and have lower levels of output per worker. Therefore it is also instructive to view the industries with the highest output impacts. Reviewing results both by employment and output gives a fuller picture of how the rail yard impacts the economy.

Chart 7 shows the top industries affected, but sorted by output. The South St. Paul rail yard’s operations contribute \$63.0 million in economic activity to Dakota and Ramsey counties each year. Union Pacific itself spends \$36.1 million in the counties. The remainder, \$26.9 million, is activity at other businesses in the county. Union Pacific’s rail yard activities contribute most strongly to the housing and real estate market in Dakota and Ramsey counties. Wholesale trade and banks are also strongly influenced.

The housing market measures the value of housing where the owner is the occupant. Real estate establishments measure the value of rental housing. Indirect effects reflect activity created by land and housing owned directly by Union Pacific (housing market) and any leased property (real estate establishments). For example, if Union Pacific leased land through a property manager, then the property manager would have increased business activity.



**Chart 7: Top Industries Effected, Sorted by Output**



**Transportation Services for Businesses in Ramsey and Dakota Counties**

In addition to creating economic activity by making purchases from businesses in Dakota and Ramsey counties, the Union Pacific rail yard also provides critical transportation services for businesses located in the counties. Union Pacific ships goods for 88 businesses located in the two counties.

Union Pacific ships a wide range of product including coal, sand, industrial products, agricultural products, chemicals, and automobiles. As an example of local businesses using rail services, Alter Metal Recycling uses Union Pacific to transport recycled materials.

**Charitable Contributions and Donations**

In addition to the direct relationships with local businesses, Union Pacific also contributes to the local economy through charitable contributions and donations. Union Pacific Foundation, through its community-based grant program and other methods, has donated \$177,000 to Neighbors Inc. Union Pacific Foundation has also provided \$15,000 in funding to the South St. Paul Mayor’s Youth Task Force. Learn more about Union Pacific Foundation here:

<http://www.up.com/aboutup/community/foundation/index.htm>.

## ECONOMIC CONTRIBUTION OF INCREASED FREIGHT CAPACITY OF THE YARD

Union Pacific’s proposed South St. Paul rail yard improvements are designed to increase the efficiency of the yard, allowing for additional freight to move through the yard. In the ten year period between 2003 and 2014, the number of carloads originating and terminating in Minnesota and Wisconsin increased by 35 percent. Union Pacific anticipates, based on historical averages, the number of carloads originating and terminating in South St. Paul to increase by 2 percent between 2014 and 2017. IHS-Global Insight calls for a 25 percent increase in freight traffic in the United States between 2010 and 2030.<sup>5</sup>

Increased capacity and efficiency in the yard will allow for additional freight volume to move through, increasing the economic contribution of the rail yard. This section models two likely scenarios based on projections for freight growth in the region. The first scenario looks at the economic contribution if spending and employment by Union Pacific grows by 5 percent. This is consistent with short-term growth projections by the railroad. The second scenario looks at the economic contribution if spending and employment by Union Pacific grows by 25 percent. This is consistent with long-term growth rates in the United States predicted by IHS-Global Insight. The study area is Dakota and Ramsey counties.

The two scenarios below assume that expenditures and employment would increase in relative proportion as freight volume increases. Freight volume may be able to increase (especially at smaller levels) without increasing employment or expenditures, at least in the short-term.

If Union Pacific were to increase its expenditures in the South St. Paul rail yard by 5 percent, the total economic contribution of the rail yard would increase to an estimated \$66.6 million per year (table 5). This includes an estimated \$17.8 million in labor income paid to 329 residents of the two counties. This represents an increase in output contribution impacts of \$3.6 million, in employment of 15, and labor income of \$0.8 million.

**Table 5: Total Economic Contribution in Dakota and Ramsey Counties of a 5 Percent Increase in Freight Volume in Union Pacific’s South St. Paul Yard**

	<b>Output (Millions)</b>	<b>Employment</b>	<b>Labor Income (Millions)</b>
Direct	\$38.4	124	\$7.8
Indirect	\$20.9	150	\$7.5
Induced	\$7.3	55	\$2.5
Total	\$66.6	329	\$17.8

University of Minnesota Extension

<sup>5</sup> These figures do not represent system wide growth expectations for the entire Union Pacific system. These percentages are provided as local business estimates that are used purely as assumptions for the purposes of this study, and are also based upon the historical averages for the South St. Paul area.

If Union Pacific were to increase its expenditures in the South St. Paul rail yard by 25 percent, the total economic contribution of the rail yard would increase to an estimated \$79.3 million per year (table 6). Under this scenario, Union Pacific’s operations would support an estimated 393 jobs in Ramsey and Dakota counties resulting in \$21.2 million of income to residents. This represents an increase in output contribution impacts of \$16.4 million, in employment of 80, and labor income of \$4.2 million.

**Table 6: Total Annual Economic Contribution in Dakota and Ramsey Counties of a 25 Percent Increase in Freight Volume in Union Pacific’s South St. Paul Yard**

	<b>Output (Millions)</b>	<b>Employment</b>	<b>Labor Income (Millions)</b>
Direct	\$45.7	148	\$9.2
Indirect	\$24.9	180	\$9.0
Induced	\$8.7	65	\$3.0
<b>Total</b>	<b>\$79.3</b>	<b>393</b>	<b>\$21.2</b>

University of Minnesota Extension

Of note here, is the source of the increased freight demand. If increased transportation by rail results from decreased transportation by truck, then there will be a corresponding decrease in economic activity from the trucking industry. Currently, increased demand for rail appears to primarily be driven by increased production of goods rather than substitution from truck transportation. Therefore, this is not a major concern in this analysis, but should be considered if the source of demand should shift in the future.



## NOTES ON THE ANALYSIS

This analysis focuses on the operational and construction economic contribution of Union Pacific's South St. Paul rail yard. The analysis is based on data provided to University of Minnesota Extension by Union Pacific. The focus is on Union Pacific and not on other railways operating in the area.

As an economic analysis, this study focuses on economic considerations. Therefore, other considerations, such as environmental concerns, are not addressed. This study also does not address the changes that these improvements might make to the competitive environment for freight. In other words, this report doesn't take into account substitution effects or the impact relative price changes might have on the industry.

The greatest economic contribution of a railway may be the production that it enables or encourages. The costs of alternative shipping options, if the railway did not service the area, may cause businesses that ship by rail to lose profits, contract, or close. Previous research has proven this point has merit. A 2009 University of Minnesota Extension economic contribution study interviewed private businesses that ship via a railroad in southern Minnesota. All twelve shippers interviewed reported profits would decline if they were forced to ship via truck. One business indicated an important market would become inaccessible. A second business indicated their business would cease completely.<sup>6</sup>

The input-output model used in this analysis measures backward linkages for industries (suppliers and employee spending), however forward linkages and critical services (rail) to get products to market and sell them require more extended estimation. Interviews with manufacturers and shippers can provide a projection of the importance of rail service to their businesses and therefore a basis for those estimates, yet that analysis is beyond the scope of this study.

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<sup>6</sup> The Economic Contribution of the Minnesota Valley Regional Rail Authority Rail Line (December 2009). Retrieved from <http://www.extension.umn.edu/community/economic-impact-analysis/reports/docs/2009-EIA-MVRRRA-Rail.pdf>.

## CONCLUSIONS

Railroads are a critical component of Minnesota's transportation infrastructure. Recent economic and industrial trends have increased demand for transportation by rail in Minnesota. As demand for rail transportation increases, railways are making investments and improvements to enhance efficiency to move freight throughout the system. Union Pacific is one railroad looking to improve its efficiency in Minnesota, specifically in its South St. Paul rail yard. Progress Plus, an economic development foundation of the River Heights Chamber of Commerce that works with businesses in South St. Paul and Inver Grove Heights, commissioned University of Minnesota Extension to explore the rail yard's economic contribution.

In the analysis, two study areas are considered - Dakota and Ramsey counties as one study area and Minnesota as a second study area. Ramsey and Dakota counties are the functional economy in which the rail yard operates. The railway makes significant expenditures in Minnesota, making this an interesting study area to include.

Union Pacific spent \$36.1 million in Dakota and Ramsey counties in 2013 to operate the South St. Paul yard. The railway employs 118 residents in the two counties, paying \$7.4 million in compensation to those employees each year. Over 300 employees are based out of the rail yard. The additional employees live in counties other than Ramsey or Dakota.

Union Pacific's current operations of the South St. Paul rail yard contribute an estimated \$63.0 million in economic activity to the economy of Dakota and Ramsey counties on an annual basis. This includes \$17.0 million of labor income for residents of the counties. The operations support jobs for 310 residents in the counties.

Union Pacific's operation of the South St. Paul rail yard generates \$211.8 million of economic activity in Minnesota per year. This includes \$52.0 million of labor income paid to residents of Minnesota. The rail yard's activities support jobs for 915 Minnesotans.

Expenditures for goods and services by Union Pacific have high impacts on the engineering and architectural services industry and on the real estate industry in Ramsey and Dakota counties. Expenditures by employees of Union Pacific have high impacts on health care and real estate in the counties.

Increased efficiency in the rail yard has the potential to increase the volume of freight moving through the yard. If Union Pacific increases its expenditures by 5 percent (projected short-term growth level), then the economic contribution of the South St. Paul rail yard would increase to \$66.6 million annually, including 330 jobs and \$17.8 million in labor income. If Union Pacific increases its expenditures by 25 percent (projected long-term growth level), then the economic contribution of the South St. Paul rail yard would increase to \$79.3 million each year, including 395 jobs and \$21.2 million in labor income.

## APPENDIX ONE: METHODOLOGY

Special models, called input-output models, exist to conduct economic impact analysis. There are several input-output models available. IMPLAN (Impact Analysis for PLANning, Minnesota IMPLAN Group)<sup>7</sup> is one such model. Many economists use IMPLAN for economic contribution analysis because it can measure output and employment impacts, is available on a county-by-county basis, and is flexible for the user. IMPLAN has some limitations and qualifications, but it is one of the best tools available to economists for input-output modeling. Understanding the IMPLAN tool, its capabilities, and its limitations will help ensure the best results from the model.

One of the most critical aspects of understanding economic impact analysis is the distinction between the “local” and “non-local” economy. The local economy is identified as part of the model-building process. Either the group requesting the study or the analyst defines the local area. Typically, the study area (the local economy) is a county or a group of counties that share economic linkages. In this analysis, two study areas were considered – Dakota and Ramsey counties and Minnesota.

A few definitions are essential in order to properly read the results of an IMPLAN analysis. The terms and their definitions are provided below.

### Output

Output is measured in dollars and is equivalent to total sales. The output measure can include significant “double counting.” Think of corn, for example. The value of the corn is counted when it is sold to the mill, again when it is sold to the dairy farmer, again as part of the price of fluid milk, and yet again when it is sold as cheese. The value of the corn is built into the price of each of these items and then the sales of each of these items are added up to get total sales (or output).

### Employment

Employment includes full- and part-time workers and is measured in annual average jobs, not full-time equivalents (FTE’s). IMPLAN includes total wage and salaried employees, as well as the self-employed, in employment estimates. Because employment is measured in jobs and not in dollar values, it tends to be a very stable metric.

### Labor Income

Labor income measures the value added to the product by the labor component. So, in the corn example when the corn is sold to the mill, a certain percentage of the sale goes to the farmer for his/her labor. Then when the mill sells the corn as feed to dairy farmers, it includes some markup for its labor costs in the price. When dairy farmers sell the milk to the cheese manufacturer, they include a value for their labor. These individual value increments for labor can be measured, which amounts to labor income. Labor income does *not* include double counting.

### Direct Impact

Direct impact is equivalent to the initial activity in the economy. In this study, it is spending by Union Pacific on operating expenses – goods and services for the rail yard and salaries, wages and benefits.

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<sup>7</sup> IMPLAN Version 3.0 was used in this analysis. The trade flows model with SAM multipliers was implemented.

### **Indirect Impact**

The indirect impact is the summation of changes in the local economy that occur due to **spending for inputs** (goods and services) by the industry or industries directly impacted. For instance, if employment in a manufacturing plant increases by 100 jobs, this implies a corresponding increase in output by the plant. As the plant increases output, it must also purchase more inputs, such as electricity, steel, and equipment. As the plant increases purchases of these items, its suppliers must also increase production, and so forth. As these ripples move through the economy, they can be captured and measured. Ripples related to the purchase of goods and services are indirect impacts. In this study, indirect impacts are those associated with spending by Union Pacific for operating items and for capital outlays.

### **Induced Impact**

The induced impact is the summation of changes in the local economy that occur due to **spending by labor**. For instance, if employment in a manufacturing plant increases by 100 jobs, the new employees will have more money to spend to purchase housing, buy groceries, and go out to dinner. As they spend their new income, more activity occurs in the local economy. Induced impacts also include spending by labor generated by indirect impacts. So, if the railway purchases services from a local tax preparer, spending of the tax preparer's wages would also create induced impacts. Primarily, in this study, the induced impacts are those economic changes related to spending by Union Pacific employees.

### **Total Impact**

The total impact is the summation of the direct, indirect, and induced impacts.

### **Input-Output, Supply and Demand, and Size of Market**

Care must be taken when using regional input-output models to ensure they are being used in the appropriate type of analysis. If input-output models are used to examine the impact or the contribution of an industry that is so large that its expansion or contraction results in such major shifts in supply and demand that prices of inputs and labor change, input-output can overstate the impacts or contributions. While Union Pacific is a major component of the Minnesota economy, it is not likely that its existence has an impact on national prices. Hence, the model should estimate the contributions reliably.