

## Executive Summary

### **Full Report:** Measuring the Economic Benefits of Rural and Small Urban Transit Services in Greater Minnesota

Rural and small urban transit agencies provide a vital service to their users, connecting them to health care, education, employment, shopping, social activities, and other important activities. As transit systems compete for funding at the local, state, and federal levels, it is important to identify and quantify, where possible, the impacts that these services have within local communities. Transit agencies need data regarding the benefits of investments in transit to inform local investment decisions because local share is required by state law for funding transit in Greater Minnesota. Further, the evidence could also be used to inform statewide investment levels.

While there is research showing the positive benefits of rural and small urban transit, the number of previous studies that focused on rural areas and small communities is limited, and the transferability of previous findings to specific agencies in Minnesota is not certain. Results may differ based on the types of trips provided, the geographic and demographic characteristics of the service area, and characteristics of the service provided. While rural Minnesota has some similarities to areas studied in previous research, there may be important differences that could yield different results.

The objective of this research is to document and measure the economic benefit of rural and small urban transit services in Greater Minnesota. To accomplish this objective, the study first conducted a review of previous research on the benefits of rural and small urban transit. Then a survey was conducted of transit stakeholders across the state to obtain feedback on the perceived benefits of rural and small urban transit in Greater Minnesota. Based on the literature review and input from the stakeholder survey, a method was developed for estimating benefits of transit in Greater Minnesota. This framework was applied in a series of six case studies across the state. The case studies included a survey of transit riders for each of the six transit agencies and an estimation of the different types of benefits provided by each transit agency. Statewide benefits were then estimated for rural transit and small urban systems in Greater Minnesota. Total benefits as well as benefit-cost ratios were estimated. To address uncertainty in the results, a range of estimated results given different input assumptions was also presented. Further, the study developed a tool that transit agencies, stakeholders, and others can use to assess the value of services provided. The tool is the practical application of the project that individual providers may use to provide evidence regarding the value of their service.

## Stakeholder Survey

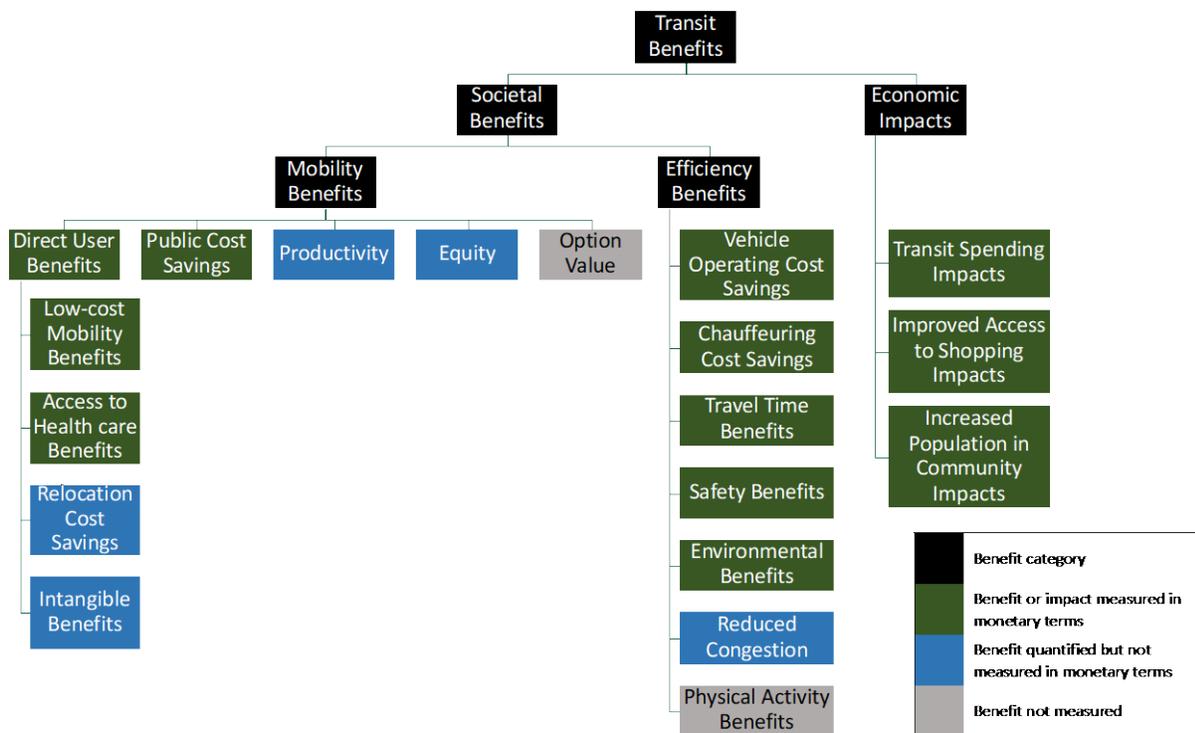
A survey of transit stakeholders was conducted across the state to obtain feedback on the perceived benefits of rural and small urban transit in Greater Minnesota. Responses were received from 493 individuals from human service agencies, county or city governments, public health departments, community organizations, health care providers, educational institutions, transportation providers, and others.

Respondents largely agreed that transit provides a wide range of benefits within their communities. The benefits they identified as most important stem from the provision of transportation to people who otherwise would not be able to make trips, including older adults, people with disabilities, low-income individuals who cannot afford a vehicle, and others. They especially focused on how transit provides access to jobs and health care, supports independent living, allows seniors to age in place, and keeps people living in the community. Positive impacts for local employers, local businesses, and the community at large were also widely acknowledged.

## Study Methods

The potential benefits of transit in Greater Minnesota were conceptualized through a transit benefits assessment tree (Figure 1). Two main types of benefits were identified: societal benefits and economic impacts. Societal benefits included mobility benefits and efficiency benefits. If transit service was not available, transit users would either make the trip in some other way or forgo the trip. Mobility benefits were those of providing trips that otherwise would have been forgone, and efficiency benefits were those that originate from making trips with transit instead of by automobile or some other mode. Below are definitions of all the types of benefits and impacts.

**Figure 1. Transit Benefits Assessment Tree**



## Definitions of Benefits

<b>Term</b>	<b>Definition</b>
<i>Access to health care benefit</i>	Reduced health care costs and improved quality of life resulting from providing transportation to someone who otherwise would have missed a health care trip.
<i>Chauffeur cost savings</i>	Savings from riding transit instead of getting a ride from someone, which includes vehicle operating costs and the value of time for the driver.
<i>Economic impact</i>	Any effect of a policy or project on the economy of a designated project area.
<i>Efficiency benefits</i>	The benefits from making trips with transit instead of the automobile or some other mode.
<i>Environmental benefits</i>	The difference between the environmental costs of how transit trips would have been made in the absence of transit and the environmental costs of transit, including costs of air pollution and greenhouse gas emissions.
<i>Improved access to shopping impacts</i>	Economic impacts resulting from transit providing trips to local businesses that otherwise would not have been made.
<i>Increased population in community impacts</i>	Economic impacts resulting from transit keeping people living in the community and, therefore, spending money in the local economy.
<i>Low-cost mobility benefits</i>	Value to the user for having transit as a low-cost mobility option.
<i>Mobility benefits</i>	The benefits of providing trips that otherwise would have been forgone.
<i>Option value</i>	The value of having an option for future transit use.
<i>Public assistance cost savings</i>	Reduction in spending on public assistance programs resulting from transit providing increased access to work.
<i>Relocation cost savings</i>	Cost savings by allowing transit users to remain at their current residence.
<i>Safety benefits</i>	The value of the safety difference between transit and the alternative with no transit.
<i>Societal benefits</i>	Positive outcomes to society, including mobility benefits and efficiency benefits.
<i>Transit spending impacts</i>	Economic impacts resulting from the existence of transit operations, including jobs created by the transit agency, businesses that benefit from selling to the transit agency, and induced economic activity.
<i>Travel time benefits</i>	The value of the travel time difference between transit and an alternative mode.
<i>Vehicle operating cost savings</i>	Savings from riding transit instead of driving.

Rider surveys collected data needed to estimate societal benefits. This included information about the percentage of transit trips that would be forgone and the breakdown of those trips by trip purpose, as well as the number of trips that would have been made in other ways. Some of the societal benefits were measured in monetary terms and others were quantified in other ways.

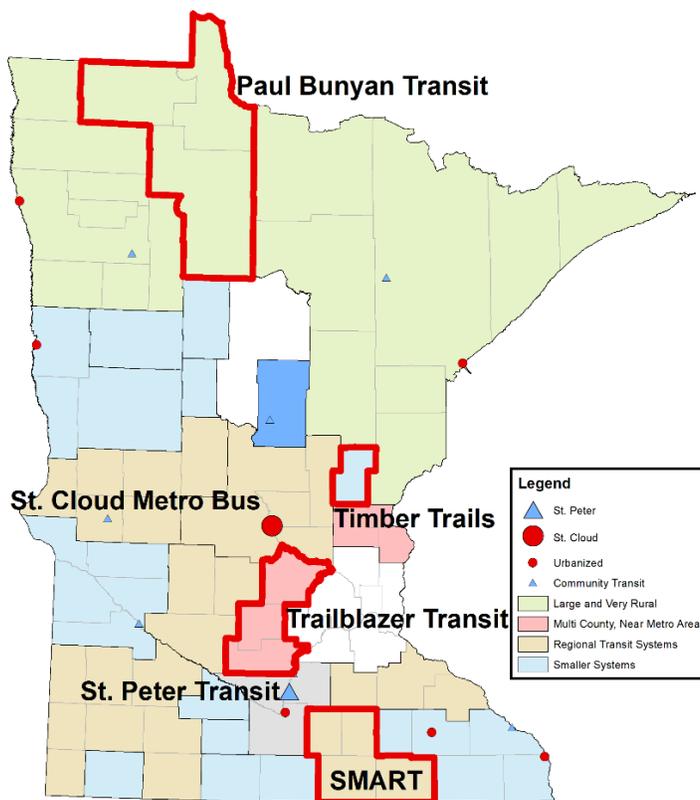
Economic impacts included those from transit spending, improved access to shopping, and increased population in the community. Economic impacts were estimated using an input-output model, a quantitative economic model that traced the path of spending throughout the local economy. The societal benefits and economic

impacts were estimated and reported separately. They could not be added because they represented different forms of analysis.

## Case Studies

Transit agencies in Greater Minnesota were categorized into six peer groups. These included urbanized systems, community transit systems, large and very rural systems, multi-county systems near the metro area, regional transit systems, and small systems. One case study was selected for each peer group (Figure 2). The case studies included a survey of transit riders and an estimation of the different types of benefits provided by each transit agency. The six case studies were Paul Bunyan Transit, Southern Minnesota Area Rural Transit (SMART), St. Cloud Metro Bus, St. Peter Transit, Timber Trails, and Trailblazer Transit.

**Figure 2. Selected Case Studies**



## Transit Users

Survey results showed that transit in Greater Minnesota serves many riders with limited transportation options. Among riders surveyed for five rural systems, nearly three-quarters did not have a driver's license, two-thirds did not have a vehicle in their household, 63% considered themselves as having a disability, and three-quarters had household income below \$25,000. Respondents in St. Cloud, the urban system studied, were also predominately low-income and a majority did not have a driver's license or access to a vehicle. Most transit riders in Greater Minnesota were frequent riders, using the service multiple days per week. Many relied on it as a primary means of transportation. This was notably the case for those who rode transit to work.

Because many riders have limited transportation options, they would be severely affected if transit services were not available. Very few can drive themselves, and most would need to rely on someone else to provide transportation, pay a higher cost for taxi or Uber or Lyft services where available, or simply not make the trip. About 35% of riders surveyed would not have made their current trip if transit had not been available. This response was fairly similar across the six agencies studied (Table 1).

**Table 1. How Respondents Would Have Made the Trip If Transit Was Not Available**

	<b>Paul Bunyan Transit (n=112)</b>	<b>SMART (n=93)</b>	<b>St. Cloud Metro Bus (n=370)</b>	<b>St. Peter Transit (n=23)</b>	<b>Timber Trails (n=30)</b>	<b>Trailblazer Transit (n=135)</b>
	-----Percentage of respondents-----					
<i>I would not have made this trip</i>	32	32	30	35	23	41
<i>Family member or friend</i>	23	27	20	35	10	16
<i>Used a taxi, Uber, or Lyft</i>	5	16	23	9	0	3
<i>Walked</i>	9	14	14	13	10	8
<i>Volunteer driver</i>	5	2	3	4	3	5
<i>Driven myself</i>	3	2	4	0	0	4
<i>Bicycled</i>	2	3	3	0	3	3
<i>Other, such as ride from staff</i>	21	3	3	4	50	20

## Estimated Monetary Benefits

Table 2 provides a summary of the estimated monetary benefits for each agency. To compare these benefits to the total costs of providing the service, Table 3 shows the total benefits and total costs per trip and the benefit-to-cost ratio. For all six transit agencies studied, estimated benefits were found to exceed the costs of providing service. Benefit-cost ratios were found to range from 1.5 to 4.2.

Sensitivity analysis was conducted to show how results would change with changes in assumptions and input parameters. Estimated benefit-cost ratios were found to range from 1.5 to 3.4 for Paul Bunyan Transit, 0.9 to 3.7 for SMART, 1.6 to 3.0 for St. Cloud Metro Bus, 1.1 to 8.1 for St. Peter Transit, 0.9 to 4.3 for Timber Trails, and 0.6 to 2.3 for Trailblazer Transit. There is only a 5% chance the benefit-cost ratios would be below these ranges. For each transit agency, the three most important variables are the percentage of health care trips that they provide, the percentage of trips that would be forgone if transit was not available, and the cost assigned to a forgone health care trip. Changes in these variables have significant effects on total estimated benefits.

**Table 2. Summary of Estimated Monetary Benefits**

	Paul Bunyan Transit	SMART	St. Cloud Metro Bus	St. Peter Transit	Timber Trails	Trailblazer Transit
<i>Mobility Benefits</i>						
Low-cost mobility benefit (\$)	114,532	110,108	985,722	14,124	34,752	389,096
Access to health care benefit (\$)	3,520,587	5,514,718	29,466,106	980,629	2,180,975	4,623,828
Public assistance cost savings (\$)	282,661	295,324	2,203,861	25,902	109,474	1,144,721
<i>Efficiency Benefits</i>						
Vehicle operating cost savings (\$)	1,738	-1,944	-2,660	0	0	12,427
Chauffeuring cost savings (\$)	379,660	265,241	1,818,205	38,454	232,596	1,014,388
Travel time benefits (\$)	-93,121	-10,037	316,290	3,572	-32,568	-80,562
Safety benefits (\$)	6,255	6,578	65,750	470	6,651	838
Environmental benefits (\$)	-58,880	-109,169	-233,741	-7,429	-34,329	-215,350
<b>Total (\$)</b>	<b>4,153,434</b>	<b>6,070,819</b>	<b>34,619,532</b>	<b>1,055,723</b>	<b>2,497,552</b>	<b>6,889,385</b>

**Table 3. Comparison of Benefits to Costs, Per Trip**

	Paul Bunyan Transit	SMART	St. Cloud Metro Bus	St. Peter Transit	Timber Trails	Trailblazer Transit
<i>Benefits (\$)</i>	34.76	25.14	18.31	36.05	47.58	27.49
<i>Costs (\$)</i>	13.31	11.87	8.21	8.59	19.38	17.74
<b><i>Benefit-cost ratio</i></b>	<b>2.6</b>	<b>2.1</b>	<b>2.2</b>	<b>4.2</b>	<b>2.5</b>	<b>1.5</b>

Total annual benefits of transit were estimated at \$128 million for the rural systems statewide, \$143 million for urban providers in Greater Minnesota, and \$271 million overall (Table 4). Access to health care benefits comprises a large share of these benefits. These benefits result from providing trips to health care service for individuals who otherwise would not be able to make those trips. It results in reduced health care costs and improved quality of life. Public assistance cost savings, chauffeuring cost savings, and low-cost mobility benefits comprise most of the remainder of the benefits. Public assistance cost savings result when transit provides access to work for individuals who otherwise would not be able to travel to work. Transit allows more people to go to work and maintain a job, which reduces the need for government spending on assistance programs. Chauffeuring cost savings are benefits to family members and friends who would need to provide transportation to transit riders if transit was not available. These savings include the cost of operating the vehicle as well as the value of their time for providing the trip. Low-cost mobility benefits are benefits to transit riders who would not be able to afford to make the trip any other way if transit was not available.

**Table 4. Summary of Estimated Greater Minnesota Monetary Benefits**

	Rural	Urban	Total
<i>Mobility Benefits</i>			
Low-cost mobility benefit (\$)	3,750,469	3,857,064	7,607,533
Access to health care benefit (\$)	107,041,780	121,451,153	228,492,933
Public assistance cost savings (\$)	10,072,423	9,083,705	19,156,128
<i>Efficiency Benefits</i>			
Vehicle operating cost savings (\$)	27,821	-65,125	-37,305
Chauffeuring cost savings (\$)	11,144,524	7,151,127	18,295,650
Travel time benefits (\$)	-1,619,399	2,058,385	438,986
Safety benefits (\$)	152,708	271,003	423,711
Environmental benefits (\$)	-2,632,430	-708,102	-3,340,532
<b>Total (\$)</b>	<b>127,937,896</b>	<b>143,099,209</b>	<b>271,037,104</b>

A comparison of the benefits to total costs shows a benefit-to-cost ratio of 2.2 for rural transit, 2.9 for urban systems, and 2.5 overall (Table 5). This result means that every dollar invested in transit in Greater Minnesota provides \$2.50 in benefits. These estimates are based on 2017 data. Benefit-cost ratios were estimated to range from 1.5 to 3.0 for rural transit and from 2.1 to 4.0 for urban transit in Greater Minnesota.

**Table 5. Comparison of Greater Minnesota Benefits to Costs, Per Trip**

	Rural	Urban	Total
<i>Benefits (\$)</i>	31.63	18.36	22.89
<i>Costs (\$)</i>	14.28	6.43	9.11
<b><i>Benefit-cost ratio</i></b>	<b>2.2</b>	<b>2.9</b>	<b>2.5</b>

## Non-Monetary Benefits

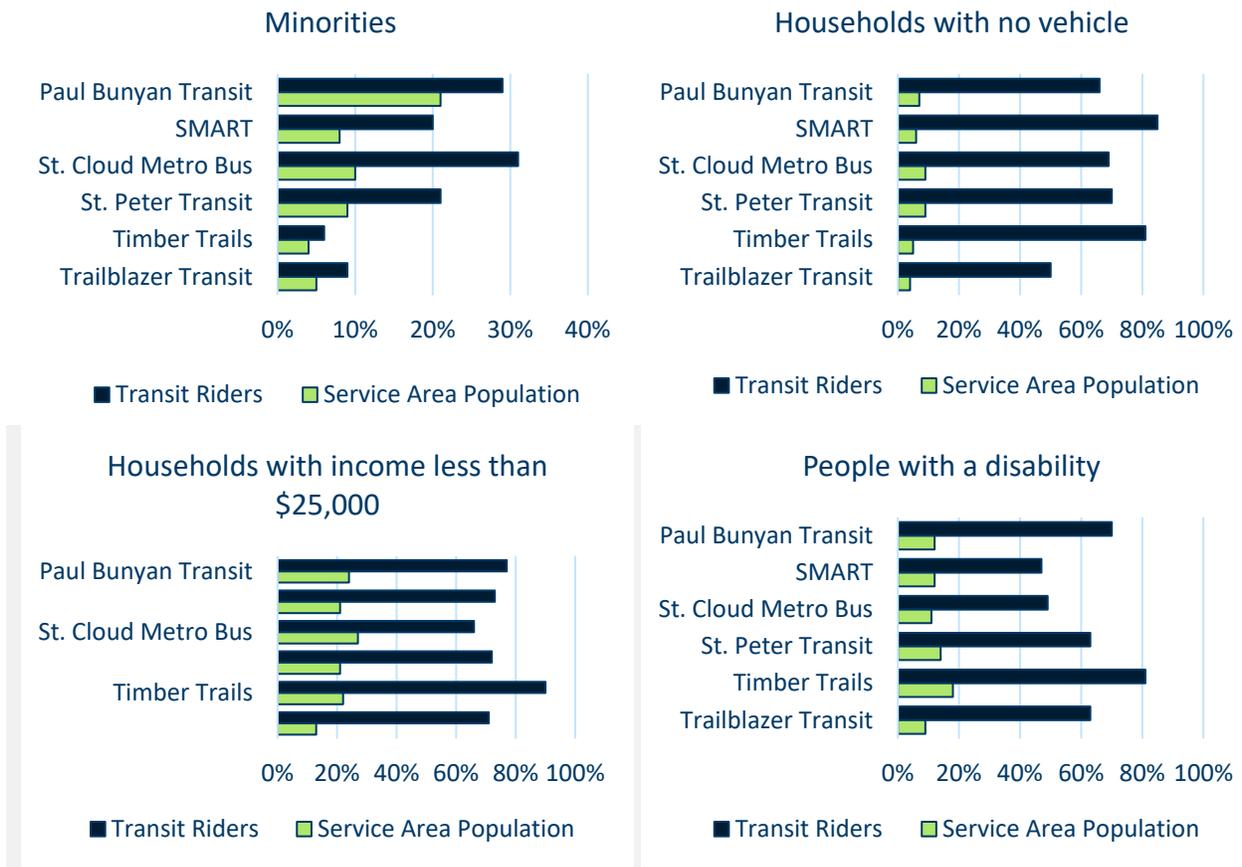
Transit provides other benefits that were not quantified in dollar terms. These include relocation avoidance, intangible user benefits, increased productivity, and equity. It is estimated that 23% of rural transit riders and 45% of urban riders in Greater Minnesota would relocate if transit was not available, including many who would move to a different town or city and some who would need to move to an assisted living facility. The intangible benefits listed in Table 6 demonstrate the positive effect transit has by improving social connectedness, reducing stress, allowing for independent living, and improving overall quality of life. Increased productivity is a result of the improved access to work and education, which is demonstrated by the high percentage of riders that rely on transit for those purposes.

**Table 6. Intangible Benefits for Rural Passengers**

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
-----Percentage of rider survey respondents-----					
<i>Allows me to make more trips</i>	53	32	10	3	2
<i>Increases my social interaction with other people</i>	45	28	22	3	2
<i>Reduces my stress level</i>	40	32	23	3	2
<i>Allows me to live independently</i>	51	30	14	3	2
<i>Improves my overall quality of life</i>	51	31	15	1	1

Another important benefit of transit is that it promotes equity by serving populations not well served by other transportation options. Transit serves a disproportionately higher percentage of low-income individuals, those without access to a vehicle, people with disabilities, minorities, and older adults. For example, among the Greater Minnesota population, 20% have household incomes below \$25,000, 6% do not have any vehicles in the household, and 12% have a disability. Among transit riders, however, 75% of rural riders and 66% of urban riders have household incomes below \$25,000, about two-thirds do not have a vehicle, and 63% of rural riders and 49% of urban riders have a disability. Figure 3 compares demographics of transit riders to the general population for the six case study agencies.

**Figure 3. Comparison of Demographics Between Transit Riders and General Population**



## Economic Impacts

Economic impacts were estimated separate from societal benefits. Transit impacts local economies in several ways. Economic impacts include those from transit spending, improved access to shopping, and increased population in the community.

### Economic Impacts from Transit Spending

The impacts from transit spending are those that result from the existence of transit operations, including direct effects, indirect effects, and induced economic activity. The direct effect includes jobs created directly by the transit system – drivers, dispatchers, mechanics, bookkeepers, program directors, etc. The indirect effect results from jobs and income spent in industries that supply inputs or services to public transit such as fuel, repairs, insurance, etc. Induced economic activity results from the income generated through both the direct and indirect effects. These induced effects occur when the people who work for the transit system or the businesses indirectly affected by transit spend their new income in the community. This spending supports additional jobs in the local economy. The analysis estimated total jobs supported, labor income, value added, and output. Value added includes labor income, taxes, and other income or profit. Output is the total change in local sales. The TREDTransit Calculator, an online software tool produced by TREDIS, was used to estimate economic impacts from transit spending.

Rural transit directly supports 1,758 jobs throughout the state, and 169 additional jobs are supported through the indirect and induced effects. For rural systems, direct labor income is \$37.8 million, plus an additional \$5.6 million through indirect and induced effects. The direct value added is \$37.9 million, and indirect and induced value added provide an additional \$7.4 million. The estimated output effects include \$51.8 million in direct effects, plus an additional \$19.7 million through indirect and induced effects. Total impacts are 1,928 jobs supported, \$43.4 million in labor income, \$45.2 million in value added, and \$71.5 million in output.

Across Greater Minnesota, urban transit directly supports 916 jobs, and 271 additional jobs are supported through the indirect and induced effects. Direct labor income is \$25.3 million, plus an additional \$10.0 million through indirect and induced effects. The direct value added is \$25.8 million, and indirect and induced value added provide an additional \$12.8 million. The estimated output effects include \$45.1 million in direct effects plus an additional \$27.6 million through indirect and induced effects. Total impacts are 1,187 jobs supported, \$35.3 million in labor income, \$38.7 million in value added, and \$72.7 million in output.

While government investment in other activities could also generate jobs, income, and economic activity, investment in transit is particularly effective in generating economic impacts because labor costs represent a large majority of transit costs, and transit employees typically live within the communities they serve. Therefore, dollars spent on transit are likely to stay within the local community.

### Economic Impacts from Improved Access to Shopping

Transit also impacts the local economy by improving access to local businesses for those who cannot or do not drive. To estimate these impacts, rider surveys from six case study agencies in Greater Minnesota collected information about the number of transit trips that support local businesses, such as for shopping and restaurants, that otherwise would not have been made had transit not been available. Based on survey responses, estimates were made for the average amount of spending made on these trips to estimate total new spending in the community. Then, economic multipliers were used estimate the overall impacts of this increased spending.

Table 7 shows the estimated economic impacts of total shopping trips made by transit riders in Greater Minnesota. Some of these shopping trips would still occur if transit was not available, but some would be lost to out-of-state online shopping. Table 8 estimates the economic impacts of shopping supported by transit that would have occurred online if there were no transit.

**Table 7. Economic Impacts of Total Shopping Trips Made by Transit Riders in Greater Minnesota**

	Rural	Urban	Total
<i>Earnings (\$)</i>	1,227,824	1,527,483	2,755,307
<i>Jobs</i>	48	60	108
<i>Value Added (\$)</i>	2,566,598	3,190,431	5,757,029

**Table 8. Economic Impacts in Greater Minnesota of Shopping That Would Have Occurred Online**

	Rural	Urban	Total
<i>Earnings (\$)</i>	178,034	290,222	468,256
<i>Jobs</i>	7	11	18
<i>Value Added (\$)</i>	372,157	606,182	978,339

### Economic Impacts from Keeping People Living in the Community

Transit can further impact the local economy by allowing residents to continue living in the community. Without transit, some may need to move to another city with improved access to amenities. Transit, therefore, supports population, which then supports the local economy. Based on survey responses, 7% to 21% of transit riders, depending on the transit agency, said they would move to another town or city if the bus service was not available in their community. Table 9 details the economic impacts of keeping these individuals in the local community for six case study agencies.

**Table 9. Economic Impacts of Keeping People in the Community**

	Paul Bunyan Transit	SMART	St. Cloud Metro Bus	St. Peter Transit	Timber Trails	Trailblazer Transit
<i>Earnings (\$)</i>	118,662	418,243	3,294,278	67,728	83,720	293,509
<i>Jobs</i>	3	11	93	2	2	8
<i>Value Added (\$)</i>	235,814	781,552	6,414,782	128,370	163,024	571,535

## Summary and Conclusions

For all six transit agencies studied, estimated benefits were found to exceed the costs of providing service. Benefit-cost ratios were found to range from 1.5 to 4.2, indicating that the benefits of transit ranged from \$1.50 to \$4.20 for every \$1 spent on transit. Across Greater Minnesota, benefit-cost ratios were found to equal 2.2 for rural transit and 2.9 for urban transit. Among the different peer groups, these ratios ranged from 1.4 to 5.1.

A large share of the transit benefits was driven by the benefits of providing access to health care. These benefits resulted from providing health care trips to riders who otherwise would not make these trips. Other benefits were also demonstrated. Work trips were the most common type of transit trip. Most riders traveling to work relied on transit as their primary means of transportation, and a majority reported they would not be able to keep their jobs without transit. Therefore, by improving access to work, transit reduced spending on public assistance that would be needed to support those who are unemployed. Shopping trips were another common type of transit trip. Shopping trips helped support local businesses and contributed to the local economy. Transit also allowed people to live where they preferred to live; and by keeping people living in small communities there were positive impacts to local economies. Spending on transit also provided jobs and stimulated local economic activity. There were also intangible benefits that were difficult to quantify. Transit was shown to support independent living and improve social connectedness. It was also shown to promote equity and quality of life by increasing access to a range of activities for transportation-disadvantaged populations.

This research provides information to objectively assess the benefits of public spending on transit services in Greater Minnesota. The spreadsheet-based user tool can be used by individual operators to provide evidence regarding the value of their service.