The
Return on Investment
of the
Regional Transit System

By
East Metro Strong
Minneapolis Regional Chamber

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CONTENTS

ACKNOWLEDGEMENTS ........................................................................................................................................... 1

1 EXECUTIVE SUMMARY .................................................................................................................................. 2

2 INTRODUCTION ................................................................................................................................................. 3

3 RETURN ON INVESTMENT FROM CONTINUING TO BUILD OUT THE REGIONAL TRANSIT SYSTEM .... 4

3.1 Costs ............................................................................................................................................................... 5

3.2 Impacts (costs and benefits) .......................................................................................................................... 6

3.3 Wider Economic Impacts ................................................................................................................................ 8

3.4 Access to jobs .................................................................................................................................................. 9

4 RE-EVALUATING THE 2012 “RETURN ON INVESTMENT FROM TRANSIT” STUDY ....................... 10

4.1 Transit Ridership .............................................................................................................................................. 10

4.2 Other inputs to costs and benefits ................................................................................................................ 11

4.3 Re-evaluating the 2012 study: Conclusion ..................................................................................................... 11

5 BUSINESS PERSPECTIVE ON TRANSIT ..................................................................................................... 12

6 TRANSIT BENEFITS MINNESOTANS ACROSS THE STATE ........................................................................ 15

6.1 Transit helps connect Greater Minnesotans to employment opportunities ............................................... 15

6.2 Transit creates healthier communities across Minnesota ............................................................................. 17

6.3 Transit serves Minnesota’s most vulnerable ................................................................................................. 17

6.4 Transit helps Minnesotans age in place ........................................................................................................ 17

7 HOW WILL EMERGING TECHNOLOGIES AND MOBILITY OPTIONS AFFECT THE RETURN ON INVESTMENT OF TRANSIT? ...................................................................................................... 19

7.1 New Mobility creates substantial new options .............................................................................................. 19

7.2 Autonomous Vehicles and the need for transit ........................................................................................... 20

7.3 What can the Twin Cities do now? .................................................................................................................. 21

8 CONCLUSION .................................................................................................................................................... 24
Acknowledgements

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1 Executive Summary

In 2012, the Itasca Project quantified and monetized the expected return from building out the region’s proposed transit system. This report

- updates that analysis based on the region’s experience with transit in the years since,
- analyzes benefits of building the rest of the system, and
- outlines the benefits transit provides to Greater Minnesota.

Building out the region’s transit system would produce substantial vehicle cost savings, travel time savings, safety improvements, and emissions reductions, among other benefits. In total, the region will see $9 billion in benefits on a $3.1 billion investment. The savings in private vehicle operating costs alone exceed the cost of building and operating the additional transit lines.

In addition, these transit investments will bring 8,000 new jobs, connect 42,000 additional residents to employment, and boost tax revenue by hundreds of millions of dollars.

The benefits of transit investment are not limited to the Twin Cities region. Across Minnesota, transit provides essential connections that allow all residents to meet their day-to-day needs. Transit not only connects households in Greater Minnesota to employment, education, and opportunity, it also allows older adults to stay in their hometowns and be connected to the health care and services they need.

Some policymakers wonder if autonomous vehicles will reduce the need for, and thus the return on, transit investment. Because autonomous vehicles still take up scare road space, the answer is that cities will always need quality transit. In fact, new mobility options can improve the economics of transit in at least two ways:

- by more efficiently serving people who require expensive service now
- by linking transit lines to harder-to-serve areas.

This report finds that transit benefits everyone—both those that use it and those that don’t. A patient might drive to the hospital, and her nurse may rely on transit to get there. While a college professor might drive to work, their students likely came some other way. A farmer sending product through the Twin Cities benefits when people take the bus to work rather than putting 40 cars in front of his truck.

Transit takes cars off the road, saves money in household transportation costs, reduces emissions, improves roadway safety, extends pavement life, and connects people to jobs and businesses to talent and customers.

For every one dollar we invest in building out and operating the currently planned transit routes, our region will get $2.90 in return. A clear accounting of costs and benefits supports investing in a transportation system that benefits everyone—people who use transit, people who drive, businesses, and employees alike.

In sum, the analysis in this report concludes that when Minnesota invests in transit, we build a stronger and healthier state: one where all people can participate in the economy, one that attracts the best talent from across the country, and one where businesses want to locate and grow.
2 Introduction

In 2012, the Itasca Project quantified the expected return from building out the region’s proposed transit system. Working with regional experts and national experts Cambridge Systematics, the project team quantified how the regional transit build-out would affect

- travel times,
- travel time reliability,
- vehicle operating cost,
- safety,
- emissions,
- shippers and logistics costs, and
- road pavement condition.

These impacts were broken out by benefits to transit and road users. The team monetized those impacts and forecast between $6.6 and $10.1 billion in total direct benefits, on a $4.4 billion investment (2030 - 2045). In sum, the 2012 analysis found that investment in a built-out regional transit system would create substantial value for the region and benefit users across the region – from commuters to students to truck drivers and logistics companies.

Since then, the region has

- built the Green Line Light Rail Transit and A Line Bus Rapid Transit (BRT), both of which have shown substantially higher-than-projected ridership;
- committed funding to build a variety of new transitways; and
- developed plans for a substantial number of additional transitways, including BRT lines.

To help inform discussions about transportation funding, we:

- Engaged Cambridge Systematics to evaluate costs and impacts of the incremental project plan.
- Re-evaluated the 2012 analysis, using data about what has actually happened since 2012.
- Looked at how businesses in particular view transit.

The landscape of mobility has changed since 2012, with the introduction of ridesharing apps, increasing adoption of electric vehicles, and work on developing autonomous and connected vehicles. These trends have raised questions about whether the positive ROI found in 2012 will continue in future years. For example, some people argue that “autonomous vehicles will reduce or eliminate the need for new transit investments.” To understand the possible impacts of autonomous vehicles, we worked with national experts Nelson\Nygaard Consulting Associates to evaluate the impact of autonomous vehicles on likely demand for transit.

We also looked beyond the Twin Cities, to the role that transit investments play in Greater Minnesota.

This report describes the approach to, and results of, all of this work.
3 Return on Investment from continuing to build out the regional transit system

This analysis begins with similar methodology used in the 2012 study and estimates the economic benefits to be generated by the transit investments being considered for the Twin Cities region as defined by the Metropolitan Council’s Thrive MSP 2040 transportation policy plan (TPP). The analyzed plan is based on current expected revenue, and is thus constrained to those projects for which funding is expected given the current revenue mechanisms. For instance, it does not include the proposed build-out of the arterial Bus Rapid Transit lines.

Cambridge Systematics used the Metropolitan Council’s TPP, regional travel model, and forecasts to answer the question “What are the costs and impacts of expanding the regional transit system?”

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1 [https://metrocouncil.org/tpp-update.aspx](https://metrocouncil.org/tpp-update.aspx)
3.1 Costs

We analyzed the costs and benefits of the Metropolitan Council’s Thrive MSP 2040 transportation policy plan. The Metropolitan Council provided us with total costs to build out that plan, shown here:
Costs were developed as follows:

1. Begin with capital and operating costs in Year of Expenditure (YOE), from the Metropolitan Council.
   
   - Capital costs from 2025 to 2031
   - Operating costs from 2025 to 2045

2. Convert all YOE dollar costs to 2017 dollars, to remove the effects of inflation.

3. Discount all future costs by the “time value of money”, a discount rate of 2.8%.

4. Sum these to produce a cumulative Total Cost to build and operate.

The total of cost of building and operating this system through 2045 is:

<table>
<thead>
<tr>
<th>2025 - 2045 Current Revenue Scenario</th>
<th>Billions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Cost</td>
<td>$1.671</td>
</tr>
<tr>
<td>Operating Cost</td>
<td>$1.471</td>
</tr>
<tr>
<td><strong>Total Cost =</strong></td>
<td><strong>$3.142</strong></td>
</tr>
</tbody>
</table>

Source: Metropolitan Council, Cambridge Systematics

### 3.2 Impacts (costs and benefits)

Making the investment of $3.142 billion would produce a wide variety of impacts. To analyze and understand these impacts:

- We began with the Metropolitan Council’s forecast of regional trip-making choices with and without the new transit investments (vehicle trips; vehicle hours traveled; transit trips; transit trip times, etc.)

- Cambridge Systematics used that forecast to generate impacts in six categories;

- Cambridge Systematics used generally accepted monetary values of those impacts to generate a monetary value of those impacts, so they could be compared to total costs.

We describe these as “impacts” rather than “benefits” because transit investments can have costs beyond the cost of construction and operation; users may choose transit even if the trip takes longer than by car, and the analysis accounts for increases as well as decreases in travel time. Similarly, transit vehicles emit pollution even as they reduce emissions from private vehicles. Again, the analysis accounts for both.

The monetary values of these impacts were then converted into total benefits in the same way as total costs:

1. Begin with impacts in Year of Impact (YOI).

2. Convert all YOI dollar costs to 2017 dollars.
3. Discount all future impacts by the “time value of money”, a discount rate of 2.8%.

4. Sum these to produce a Total Cost to build and operate.

After accounting for both positive and negative impacts, the net impacts are substantially positive:

<table>
<thead>
<tr>
<th>Impact</th>
<th>Impact detail</th>
<th>Highway user impact &amp; transit user impact, $ million</th>
<th>Impact, total $ million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel time savings</td>
<td>Highway Users (HU): Travel Time Cost Savings</td>
<td>$2,313</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transit Users (TU): Travel Time Cost Savings</td>
<td>612</td>
<td>$2,925</td>
</tr>
<tr>
<td>Vehicle operating cost savings</td>
<td>HU Vehicle Operating Cost Savings</td>
<td>3,885</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Change in Transportation Costs for Transit-dependent Users</td>
<td>818</td>
<td>4,703</td>
</tr>
<tr>
<td>Reliability Improvements</td>
<td>HU Travel Time Reliability Improvements, including Shipper Logistics Cost Savings</td>
<td>728</td>
<td>728</td>
</tr>
<tr>
<td>Emissions reduction</td>
<td>HU Emission Damage Reductions*</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TU Emission Damage Reductions*</td>
<td>3</td>
<td>30</td>
</tr>
<tr>
<td>Safety benefits</td>
<td>HU Traffic Crash Cost Reductions</td>
<td>364</td>
<td></td>
</tr>
<tr>
<td></td>
<td>TU Traffic Crash Cost Reductions</td>
<td>263</td>
<td>627</td>
</tr>
<tr>
<td>Pavement maintenance savings</td>
<td>Highway Repair Savings</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transit Repair Savings</td>
<td>34</td>
<td>44</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$9,057 billion</td>
<td>$9,057 billion</td>
</tr>
</tbody>
</table>

* Note that although emissions reductions originate with highway and transit operations, they benefit everyone.

The major factors in each impact category are:

- **Travel time savings**: As the saying goes, time is money. These savings place a value on the time saved by both transit uses, who have shorter, more direct trips with a built-out system, and the
time saved by drivers, who face less growth of congestion on roads due to transit users, and by businesses, who can ship goods and services more efficiently.

- **Vehicle operating expense savings:** These savings are driven by fuel expense avoided by both transit users and drivers, whose fuel use decreases with less congestion. Savings are net of transit fares.

- **Reliability improvements:** Opportunity cost of the “time buffer” travelers build in during congested peaks to arrive on time, and the cost to businesses of missing on-time deliveries.

- **Emissions reductions:** Emissions from transportation are reduced both by slowing the growth in congestion and by shifting trips to more efficient modes, such as transit.

- **Safety benefits:** Value of fewer crashes and associated injuries and mortalities, produced by shifting travel to safer modes and by reducing growth in congestion, which increases tendency to crash.

- **Pavement maintenance savings:** Reduced cost of pavement repair due to slower growth in congestion and shifting trips to transit.

These results can be broken down in a variety of ways. For example:

- 81% ($7.327 billion) of the benefits are enjoyed by people and businesses using the region’s street and highway system.

- 19% ($1.730 billion) of the benefits are enjoyed by people using the transit system.

- Savings in “vehicle operating costs” alone ($3.885 billion) exceed the cost of building and operating the additional transit lines ($3.142 billion).

With costs and impacts in hand, we can calculate:

<table>
<thead>
<tr>
<th>2025 - 2045 Current Revenue Scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net Present Value of Costs (Capital and Operating)</td>
</tr>
<tr>
<td>Net Present Value of Benefits</td>
</tr>
<tr>
<td><strong>Net benefits</strong></td>
</tr>
</tbody>
</table>

Sources: Cambridge Systematics analysis based on Metropolitan Council Transportation Model output

The Minneapolis-Saint Paul region has available to it $5.915 billion dollars in net benefits from building out and operating the currently planned transit routes.

Put another way, for every $1 spent, the region would see $2.90 in benefits.

### 3.3 Wider Economic Impacts

These direct user benefits will give rise to long-term economic impacts in terms of business attraction and retention, leading to economic and employment expansion. (The 2012 report did not quantify these impacts.)
Cambridge Systematics used the IMPLAN model of the regional and national economy to estimate regional economic impacts.

<table>
<thead>
<tr>
<th>Average Annual Economic Impacts of the Transit System investment in the Current Revenue Scenario, 2025-2045 (2017$)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gross Regional Product (GRP)</strong></td>
</tr>
<tr>
<td><strong>Employment (jobs)</strong></td>
</tr>
<tr>
<td><strong>Income</strong></td>
</tr>
<tr>
<td><strong>Local and State Tax Revenue</strong></td>
</tr>
<tr>
<td><strong>Total increase in Local and State Tax Revenue ($143 million/yr * 20 years)</strong></td>
</tr>
</tbody>
</table>

Source: Cambridge Systematics analysis using IMPLAN; note that these estimates are not discounted at 2.8% as the impacts are long-term impacts – i.e., these jobs would be created on a sustained basis, and would generate income and tax revenue over the entire time period.

In the short run, the construction activity associated with the current revenue transit scenario is projected to give rise to nearly 27,000 full-time equivalent jobs and $1.8 billion in income over the course of the construction period.

### 3.4 Access to jobs

Planned transit improvements will provide greater transportation options for all regional residents. For residents with limited transportation options, transit often provides the only affordable commute option. Expanding the transit network increases work opportunities available to residents and the labor shed available to employers.

Analysis finds that an average of about 42,000 additional residents could gain employment as a result of having an affordable transportation option.

Using the lowest annual mean wage for “All Occupations” in Minneapolis-St. Paul-Bloomington, MN-WI (May 2017), the income benefit from affordable mobility provided by transit is estimated to be $25 billion between 2025 and 2045, or $1.25 billion per year.
4 Re-evaluating the 2012 “Return on Investment from Transit” Study

In 2012, the Itasca Project quantified the expected return from building out the region’s proposed transit system. In the same way as described in Section 3, impacts were broken out by benefits to transit and road users. The 2012 team monetized those impacts, and found (all results were in 2010 dollars):

- **A built-out regional transit system would produce a substantial return on investment:**
  
  Between $6.6 and $10.1 billion in total direct benefits, on a $4.4 billion investment (2030 - 2045)

- **Accelerating the build-out would increase the return on investment:**
  
  The total direct benefits would increase to between $10.8 – 16.5 billion, on a $5.3 billion investment (benefits accrued 2023 – 2045).

- **More community growth near transit stations would increase net benefits**
  
  By another $2 – 4 billion (2030 - 2045).

In addition to quantified and monetized benefits, the analysis quantified but did not monetize other regional impacts, such as regional accessibility to jobs. The analysis found that a regional transit system would enable local employers to access an additional 500,000 employees.

The seven years since the 2012 study by the Itasca Project and Cambridge Systematics (CS) have produced substantial amounts of data that can be used to evaluate the forecasts made in 2012. In this section we look back at the 2012 study.

4.1 **Transit Ridership**

Most important, the region has seven years of transit ridership data that can be used to evaluate the ridership forecasts from 2012. Cambridge Systematics reviewed the ridership forecasts used in the 2012 study, and compared them to current year ridership and trends.

Overall, transit system ridership across all modes is running 5.6% ahead of the amounts forecast in 2012.

Increased transit ridership is the basis for all of the benefits forecast in the 2012 study (that is, benefits to both people using the transit system, and those using the highway system). Since the 2012 ridership forecasts were low, then, so were the benefits forecasts.

Speaking broadly then, by building out the system the region would be enjoying benefits 5.6% higher than those forecast in the 2012 study (again, results are in 2010 dollars):

<table>
<thead>
<tr>
<th>2012 forecast, millions</th>
<th>Adjustment based on 7 years of data</th>
<th>Additional benefits, millions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low benefit</td>
<td>High benefit</td>
<td>Midpoint</td>
</tr>
<tr>
<td>$6,571</td>
<td>$10,083</td>
<td>$8,327</td>
</tr>
</tbody>
</table>
4.2 Other inputs to costs and benefits

In 2012 the Itasca Project and Cambridge Systematics used input from a steering committee to choose high and low values for several key inputs to the cost and benefit analysis, including vehicle operating costs per mile and the cost per hour of operating a truck.

Comparison of those values to current values suggests that the inputs to the “High” benefit forecast more accurately captured the trends in vehicle operating costs per mile and the cost per hour of operating a truck.

For example:

Vehicle operating costs
- 2012 analysis “low”: $0.32/mile
- 2012 analysis “high”: $0.585/mile
- 2018 actual: $0.5899/mile (AAA)

The costs of transit construction have also increased. It was beyond the scope of this project to separate out the various drivers in construction costs—overall inflation versus costs that are genuinely higher than forecast in 2012.

The 2012 analysis also modeled the costs and benefits of an accelerated build-out of the regional transit system, and found that the higher costs of accelerated construction were more than offset by the longer period of benefits.

To be conservative, one might assume that both the cost inputs and benefit inputs are higher than forecast in 2012.

4.3 Re-evaluating the 2012 study: Conclusion

If we ignore increases on both sides of the cost/benefit calculation, or assume that they are a wash, the main “adjustment” that one should make to the 2012 analysis is to increase the benefits produced by a given system by the 5.6% greater than forecast ridership.

Put more simply, the available data since 2012 suggest that the 2012 analysis was correct in forecasting billions of dollars in net benefits to the region; and in fact the analysis underestimated those benefits.
5 Business perspective on transit

Transit is important to employers across the U.S. to attract and retain top talent. A recent study by Smart Growth America and Cushman & Wakefield evaluated the relocation choices of 500 companies who moved to a walkable downtown (not necessarily a central business district). The study found that the main drivers of their decisions are:

- access to greater transportation options,
- vibrant pedestrian friendly environments, and
- proximity to customers and business partners.

Businesses that relocated chose areas that were significantly more walkable, had significantly more transit options, and allowed for biking. The average Walk Score increased from 51 in previous locations to 88 in new locations, Transit Scores increase from 52 to 79, and Bike Scores went from 66 to 78.

“Before” and “After” accessibility scores for 500 companies that relocated

The survey included eleven companies in the Twin Cities who relocated headquarters into downtown Minneapolis or Saint Paul:

- 2010 Three Deep Marketing (marketing consulting services) – moved from North St. Paul to 180 E. Fifth St, Saint Paul
- 2013 Morsekode (advertising agency) – moved from Bloomington to 333 S 7th St, Minneapolis
- 2013 West Academic (information services) – moved from Eagan to 444 Cedar St, Saint Paul
- 2014 Redpath and Co. (accounting services) – moved from White Bear Lake to 55 E. Fifth St, Saint Paul
2014 Be the Match (support services) – moved from 3001 Broadway St NE Minneapolis to 524 N. 5th St, Minneapolis

2015 Aimia (public relations agency) – moved from Plymouth to 100 N 6th St, Minneapolis

2016 Weber Shandwick (public relations agency) – moved from Bloomington to 510 S. Marquette Ave, Minneapolis

2016 Wells Fargo (commercial banking) – moved to corner of Portland Ave S & S 4th St., Minneapolis

2016 Arctic Cat (headquarters) – moved to North Loop (acquired by Textron and vacated in 2017)

2016 ECMC Group (headquarters) – moved from Oakdale to 111 Washington, Minneapolis

2017 Select Comfort (headquarters) – moved from Plymouth to 1001 3rd Ave S, Minneapolis

Overall, data from CoStar tells us that about half of the office space in downtown Minneapolis that has been newly occupied over the last four years has been a result of a desire to be in the downtown core and business relocation from the MSP suburbs. Why?

Companies explained their decisions in terms of access to workers and, thus, transit:

- Dr. Jeff Chell, CEO, Be the Match:
  
  “We considered 65 different locations for our new headquarters. In making the final decision, we asked ourselves, ‘Five to ten years from now, what’s going to allow us to attract and retain a really mission-driven workforce?’ We knew the answer to that was a neighborhood with lots of restaurants and other amenities, and better public transportation. Eventually we decided on a location right on the edge of downtown Minneapolis in a neighborhood called The North Loop. That location already has a lot of what we’re looking for and more of those amenities are in the works. We’re excited to grow our company as the neighborhood grows, too.

  “The biggest objection our employees have had to the new location was that there won’t be free parking. When we began considering new locations a few years ago, that was the number one reason complaint people had, the number one reason why people said, ‘Well, maybe I won’t make the transition.’ But now people are seeing the inexpensive alternatives to parking downtown and all the ways they can get to work that don’t involve parking downtown, we’re hearing nothing but good things.”

- Eric Pehle, Executive Vice President, Weber Shandwick:
  
  “We have great options on public transportation, options that we simply did not have before. The real growth of bus rapid transit from the suburbs into downtown Minneapolis, the emergence of light rail transit, better bike routes, and more of our employee base living closer to downtown made it a really easy decision.”
Millennials now make up the largest generation in the workforce, and as a generation, are choosing to forgo drivers’ licenses:

- in 1983, 92% of people aged 16-44 held a driver’s license;
- in 2014, that percentage had dropped to 77%.

As we see above, data show that companies are adapting to this generation’s preference for walkable, urban neighborhoods that feature a variety of transportation options.

The Minneapolis-Saint Paul regional business community similarly responds to better transit.
Investments in light-rail transit have generated at least $8.4 billion in new investments along existing and planned lines.

For example, the business community supports the Southwest Light Rail (METRO Green Line Extension) because it will connect downtown Minneapolis to Hopkins, St. Louis Park, Minnetonka and Eden Prairie, allowing workers to easily connect with major employers on each end; including United Healthcare’s campus and employers in downtown Minneapolis. Similarly, the business community supports the Riverview Modern Streetcar because it will connect a wide variety of workers, residents, and visitors to the Mall of America, MSP International Airport, downtown Saint Paul, and through connections, the rest of the region.

The regional business community similarly supports the rapid build-out of the regional bus rapid transit (BRT) network for more reliable, comfortable, and faster service.

Key perspectives on the importance of public transit to the business community are:

**Transit helps access and retain employees.**

Convenient, reliable transit options allow employers to recruit talent from larger geographic areas, providing high quality and diverse applicant pools. Transit options are becoming more important as the car-dependent suburbs see higher rates of job growth, leading to populations without access to cars to lose out on employment opportunities and employers to lose out on potential talent.

**Transit enables smarter development and customer access.**

Employers have found that areas with greater density promote collaboration and creativity by allowing employees to interact and network with other departments, companies and industries. High density areas also allow companies to centralize operations and be closer to customers, partners and service providers.

**Transit must make connections.**

Most people are willing to walk up to a quarter mile to access public transit. Distances greater than a quarter mile are beyond a “comfortable distance” for most commuters. Effective transit planning must consider the first and last mile of a rider’s commute and provide access to transit connections and alternative modes such as bikes, scooters and ride sharing services. (Autonomous vehicles may be able to help make some of these connections, as discussed later in this report.)

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2 Source: [http://www.umich.edu/~umtriswt/PDF/UMTRI-2016-4_Abstract_English.pdf](http://www.umich.edu/~umtriswt/PDF/UMTRI-2016-4_Abstract_English.pdf)

6 Transit benefits Minnesotans across the state

Public transportation is essential to Minnesota’s prosperity as it provides connections that allow all residents to meet their day-to-day needs. In a prosperous Minnesota, employers have access to the workers they need, and people of all ages and incomes can get around – for work, school, the doctor, or to see family—regardless of whether they live in Saint Paul, Saint Cloud, or Saint Hilaire.

This section describes the benefits of transit across Minnesota.

(Left) Bus driver for SMART. (Right) SMART bus filled with passengers in Waseca, MN. Photos provided by SMART.

6.1 Transit helps connect Greater Minnesotans to employment opportunities

Because the previous sections concentrate on transit ridership and its benefits to the Minneapolis-Saint Paul region, we begin this section with a focus on Greater Minnesota. Transit systems in Greater Minnesota provide more than 12 million trips a year, providing connections of all kinds; to school, to work, to medical appointments. The need and demand for this service is growing quickly.

The Minnesota Department of Transportation noted both record use…

“Greater Minnesota transit systems reached record highs for ridership and service hours in 2015, with 12.1 million boardings.”

…and substantial unmet needs and demand:

“Increasing public transit ridership is a goal in Minnesota Statutes § 174.24, subd 1a, the Olmstead Plan and Heading Home: Minnesota’s Plan to Prevent and End Homelessness. The transit ridership performance target is that by 2025 public transit will serve 90 percent of transit need.”

To meet these unmet needs by 2025, says MnDOT, “an additional 4.8 million rides are needed” to be provided by Greater Minnesota transit.

“To meet this goal, Greater Minnesota public transit must add more service.” [Emphasis added.]

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Transit systems in Greater Minnesota connect people to jobs, providing a critical link for some to jobs they otherwise wouldn’t be able to reach. In some communities, it also helps reduce both congestion and the need to provide parking in downtown areas.

Many communities in Greater Minnesota experience strong ridership among commuters on their transit services.

- Duluth’s popular transit system boarded more than 37,000 riders on the average weekday in 2017, including 10,000 to 12,000 riders in West Duluth, mostly heading to and from downtown. Due to this demand among commuters, local leaders have been exploring bus rapid transit (BRT) along that corridor. This added service would help provide a faster and more reliable ride for commuters needing to reach jobs downtown, encouraging even more to switch from driving.\(^7\),\(^8\)

- Communities in Greater Minnesota and major employers like the Mayo Clinic have worked together to provide better transit for those heading to work because it offers economic benefits to both the employer and the city.\(^9\) In Rochester, where the Mayo Clinic is the largest employer, 10 percent of trips to downtown by commuters are via transit. The Mayo Clinic has partnered with the City of Rochester to provide an extensive commuter bus system from outlying areas, as well as two new planned BRT circulator routes connecting the outskirts of downtown to the Mayo Clinic, its Discovery Square innovation district and other businesses, hotels, and shopping areas. The program also subsidizes transit passes for commuters and is reducing parking demand downtown.

Transit also provides employees with critical connections to work in smaller Minnesota cities, benefiting both residents and major employers. For example:

- The Southern Minnesota Area Rural Transit (SMART) operates a route in Austin specifically designed to meet the needs of area commuters. Although anyone can ride the route, the primary purpose is for employment transportation, with Hormel Foods and Quality Pork Processors (QPP), major area employers, being key destinations. The commuter line schedule serves Hormel and QPP’s three shifts, with many employees each workday taking advantage of the bus.\(^10\)

- SMART service is an important tool for Owatonna to attract these millennials and retirees. Both population groups are seeing a growth spurt in downtown Owatonna. This boom is thanks in part to this transit service that gets them to the places they need to go, whether home to their apartment or to the grocery store. And new residents living in downtown mean new businesses opening to employ them and serve their daily needs.

People in Greater Minnesota are just as aware as people in the Twin Cities that a lack of transit is a serious barrier to growth and prosperity.

Transit plays an important role in helping revitalize downtowns and attracting new residents, particularly millennials and retirees who are seeking to live in connected and walkable places.

\(^7\) [http://www.duluthtransit.com/content/pdf/misc/tdp_report.pdf](http://www.duluthtransit.com/content/pdf/misc/tdp_report.pdf)  
\(^9\) [https://www.rochestermn.gov/home/showdocument?id=21067](https://www.rochestermn.gov/home/showdocument?id=21067)  
\(^10\) [http://smartbusmn.org/maps-schedule-fares.html](http://smartbusmn.org/maps-schedule-fares.html)
6.2 **Transit creates healthier communities across Minnesota**

Studies show that transit increases physical activity,\(^{11}\) decreases obesity,\(^{12}\) and improves traffic safety.\(^{13}\)

- The Minnesota Department of Health and Minnesota Department of Transportation work together to support public transit options across the state because they know that there is significant value in providing high-quality transit services.\(^{14}\) High-quality transit services, like urban rail or bus rapid transit, are able to produce per capita annual health benefits of $355.\(^{15}\)

Transit can also help communities improve air quality, save energy, and reduce emissions.\(^{16}\)

- Transportation is the largest source of greenhouse gases (GHG) emissions in Minnesota. According to the Minnesota Pollution Control Agency, more than 70% of the transportation sector’s emissions come from driving light-duty trucks, passenger vehicles, and medium to heavy-duty trucks.\(^{17}\) Providing high-quality transit across is an important way Minnesota can reduce GHG emissions.

6.3 **Transit serves Minnesota’s most vulnerable**

Transit is especially important for Minnesotans who, due to age (both young and old), disability, or income are unable to drive or lack access to a car. For these residents, in particular, affordable and reliable public transit is crucial to their independence. Relying on family and friends, expensive local taxi services, or even ride-hailing companies (like Uber or Lyft) is not always an option. Many Minnesotans depend on public transportation to more effectively participate in, contribute to, and access their local communities and economies.

Owing a car is costly and not possible for everyone. AAA estimates that in 2018 the average cost to own and operate a vehicle was $8,849. About 7% of households in Minnesota do not have access to a car.\(^{18}\)

6.4 **Transit helps Minnesotans age in place**

According to the Minnesota State Demographic Center, by 2020, “Minnesota’s 65+ population is expected to eclipse the K-12 population, for the first time in history.”\(^{19}\) This trend is illustrated in the map below. Research also shows that nearly 80 percent of older adults (50+) indicate that they want to remain in their communities and homes as they age.\(^{20}\) To remain in their communities, older adults in Minnesota

\(^{11}\)https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3407915/
\(^{14}\)https://www.cdc.gov/policy/hst/hi5/docs/18_290916_A_Heaps_Hi5_Minnesota_508wh.pdf
\(^{15}\)https://www.apta.com/resources/reportsandpublications/Documents/APTA_Health_Benefits_Litman.pdf
\(^{17}\)https://www.pca.state.mn.us/sites/default/files/iraq-2sy19.pdf
\(^{19}\)https://mn.gov/admin/demography/data-by-topic/aging/
need affordable, safe, convenient alternatives to driving. Without transportation options like public transit, older adults will find themselves more isolated and at risk for loneliness\(^\text{21}\) and poor health.\(^\text{22}\)


\[\text{22} \text{https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2756979/}\]
7 How will emerging technologies and mobility options affect the Return on Investment of transit?

7.1 New Mobility creates substantial new options

Recent private investment in transportation has substantially increased the number of mobility options in the marketplace. In the future, autonomous technology will present even more options. This new world of choice only heightens the importance and relevance of transit if regions wish to sustain growth.

Because transit provides access for the most people in the smallest amount of space, there will always be value in bus and rail transit.

Moving More People in the Same Space

Transit in Mixed Traffic
When transit vehicles have to share lanes with cars, they travel much slower and move fewer people. Merging in and out of traffic to pick up and drop off passengers means a longer bus ride and delays for car drivers. Fewer people choose to ride a bus if it has to sit in traffic, which creates a negative feedback cycle that makes it harder for everyone to get around.

This roadway is carrying 126 people
using six auto lanes with two local buses. Traffic is very congested and moving slowly, even though the road is carrying 100 fewer people than the road with transit-only lanes.

Transit-Only Lanes
Throughput capacity is the number of people that can use a roadway in a given period of time. Creating a dedicated transit lane greatly increases the throughput capacity of a road, because a dedicated transit lane can move many more people than an auto lane where each car has an average of 1.2 people per vehicle.

This roadway is carrying 235 people
using two transit-only BRT lanes and four auto lanes. Even with all those people, traffic is moving freely thanks to the throughput capacity of the transit-only lanes.

Source: Capital Metro / Nelson\Nygaard

This is especially true in a world with autonomous vehicles competing for scarce street space.

New options and autonomous technology have potential to make transit even more valuable by expanding its reach and increasing its cost effectiveness.

The availability of ride-hailing (transportation network companies, or TNCs), whether autonomous or not, provides a great mobility option for door-to-door or last-mile trips, but could be hurting cities’ economies on the aggregate. TNCs contribute to costly network congestion. En route to pick up
passengers, or “deadheading”, ride-hailing vehicles add to vehicle miles travelled (VMT),\textsuperscript{23} the primary metric to measure network volume on an aggregate level, without providing any benefit. And, for the first time in U.S. history, cities are facing a dire reality that with AVs, their average occupancy per vehicle may actually amount to less than one person—a costly use of space. The resulting congestion has potentially catastrophic economic impacts.

Nonetheless, personal vehicles and ride-hailing services provide faster door-to-door travel times than buses, making them competitive mobility choices. And, the field of mobility options is growing, with microtransit, micromobility, and others providing new options, some of which are complementary to transit, some of which compete, and many of which do both. When used as a first- or last-mile connection, and when the existence of these options allows an individual to sell or forego the usage of a car, shared mobility modes like ride-hailing, microtransit, and micromobility complement transit and enhance its benefits by extending its reach farther into communities.

However, when transit alternatives are cost-competitive, new mobility options compete with transit and pose a threat to its benefits. Further, there is no evidence that ride-hailing, microtransit, dockless mobility, or autonomous vehicles (AVs) will bring the land development and private investment that high quality transit attracts to a corridor.

The extent to which new mobility options and AVs compete or complement transit today and in the future is largely a matter of policy, which is squarely in the hands of regional decision-makers. Transit is not only still relevant, it is even more relevant in a world with AVs if regions wish to attract and sustain growth.

Without providing people with a high-quality transit choice, the region risks widespread adoption of low- or even zero-occupancy autonomous vehicles, which will further congest streets and prevent the kind of economic activity that fuels regional growth. The region will lose the vibrancy, attraction, and investment that transit brings.

\subsection*{7.2 Autonomous Vehicles and the need for transit}

Congestion costs each driver in Minneapolis an estimated $1,000 annually.\textsuperscript{24} Other impacts on the local economy—such as employers who choose to locate in other cities due to congestion and lack of transit options—are harder to quantify.

As the Twin Cities look to improve regional mobility, it must do so in the context of the impending changes automation brings to transportation. Transportation innovations that increase the speed at which people travel have not resulted in people spending less time traveling but rather in traveling farther distances.

Unsurprisingly then, it is likely that AVs will increase VMT and congestion in the network. Any gains in efficiency from technology, such as vehicle-to-vehicle communication and route optimization, risk being cancelled out by these increases in VMT and congestion.


\textsuperscript{24} http://inrix.com/scorecard-city/?city=Minneapolis%2C%20MN&index=132
Further, because they will not generate land value the way transit does, AVs are not likely to bring the positive impacts of talent and customer attraction, increased development investment, and increased sales in the corridor.

To prevent the negative economic impact of increased urban congestion and to attempt to produce new economic returns, policies and investment decisions must be coordinated between municipalities, transit agencies, and regional authorities. High-quality transit, supported by new mobility options, unlocks yet-untapped regional growth potential by increasing access and making the most use of limited space. The costs, and the benefits, accrue both to individuals and to the region as a whole.

As driverless technology progresses in the automotive industry, these advancements hold huge promise for transit automation and increased efficiencies. China is experimenting with autonomous rapid transit (ART) that leverages BRT technology with rail-like guideway infrastructure without tracks. Portland, Oregon is testing new transit signal prioritization that relies on vehicle-to-infrastructure advancements made possible through emerging technology, and several transit agencies around the country are rapidly evolving their fleets to anticipate the increased, phased automation of operations.

### 7.3 What can the Twin Cities do now?

While its population grew over the last decade, Minneapolis is one of just two cities nationally to have observed fewer people choosing to drive, and this is due in large part to the coordination of major public transit investments with land use policy whose effects will benefit the region as a whole. These investments will sustain development that reinforces the importance of transit and increases the region’s potential investment return. Continued action in pricing, policy, and transit infrastructure leads to a virtuous cycle of transit investment and return.

Five actions cities and transit agencies can take today to create a prosperous future are:

1. **Dedicate road space to transit.**
   
   AVs, whether shared or privately owned, will not change the simple fact that public transit can serve more people in the same amount of space as a car. The upcoming Hennepin Avenue project is an early win, and demonstrates the region’s continued progress to protect transit efficiency and investment.

2. **Develop and brand a high-frequency, congestion-free transit network.**
   
   Developing and branding these high frequency transit networks, and using their high frequency and capacity to justify transit priority improvements, makes transit better today, while providing the framework for an expanded autonomous high-frequency, congestion free network in the future.

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25 [https://usa.streetsblog.org/2019/02/08/minneapolis-and-seattle-have-achieved-the-holy-grail-for-sustainable-transportation/](https://usa.streetsblog.org/2019/02/08/minneapolis-and-seattle-have-achieved-the-holy-grail-for-sustainable-transportation/)
3. **Make multimodal travel seamless.**

Build on the region’s integrated fare products with:
- mobility hubs,
- options like electric HourCar, and
- multimodal trip planners.

Together, these strategies constitute a physical and virtual mobility-as-a-service (MaaS) platform. The public sector can put the building blocks in place today to remain central in the region’s mobility management and ensure equitable access to opportunities.

4. **Increase collaboration between City Departments of Transportation and transit agencies.**

To make transit work, especially in the autonomous age, transit and cities need to break down silos of control over public assets and work together to prioritize transit on city streets. Collaboration between transit agencies and cities can take many forms – ranging from the development of a transit priority toolkit that empowers cities to implement transit-friendly street designs to an integrated team of planning staff making sure transit priority in transportation decision-making processes.

5. **Regulate to give access to the most people.**

Movement in cities is the indicator of economic prosperity. Rather than waiting to see how autonomous technology will reshape travel behavior, cities should act now by protecting street space for rapid transit, increasing involvement with state- and federal-level policymaking, and collaborating with political leaders to highlight the economic opportunity costs of inaction. Regionally, the Minneapolis 2040 Plan is prioritizing people over vehicles, and setting a City policy bedrock on which its future can grow.
Virtuous cycle of transit investment

Increase frequency in corridor

Attract more riders

Reduce cost to increase frequency

FREQUENCY & SPEED WORK TOGETHER

Reduce travel time for riders and vehicles

Implement transit priority treatments

Enhance justification for transit priority treatments

Source: Nelson\Nygaard


8 Conclusion

In the past 20 years, the Twin Cities have made significant investments in transit, committed to funding new transitways, and developed plans to build a substantial number of additional transitways. That transit investment has allowed the region to continue to grow and improve quality of life, instead of growth increasing congestion and reducing quality of life.

Our 2019 analysis finds that building out the remaining lines in the Metropolitan Council’s Thrive MSP 2040 Transportation Policy Plan will continue to bring more prosperity and opportunity to the region.

- Considering impacts of travel time savings, vehicle operating cost savings, reliability improvements, emissions reductions, safety benefits, and pavement maintenance savings, the region will see over $9 billion in benefits on a $3.1 billion investment.

- In terms of business attraction and retention, the current revenue transit scenario is projected to give rise to nearly 8,000 new permanent jobs, and the economic growth that comes with those, including $2.86 billion in new tax revenue.

- We have a great deal of confidence in these projections, since similar analysis in 2012 have proven conservative. The transit system ridership is outperforming projections, running 5.6% ahead of forecasts used in 2012.

A connected, easily accessible transportation network not only allows businesses to access and retain employees, but also enables smarter development and customer access. Across Minnesota, transit is helping to create stronger, healthier communities. In Greater Minnesota, transit connects people to jobs and education. It allows older adults to remain in their hometowns and still be connected to the health care and services they need.

Recent advancements in technology, like self-driving cars and new mobility, are changing the future of transportation while also introducing new challenges. However, because bus and rail transit provide access for the most people in the smallest amount of space, there will always be value in public transportation.

We can be confident that investments in transit will remain both necessary, and will return substantial benefits to the Minneapolis-Saint Paul region and the whole state of Minnesota.