

# THE ECONOMIC IMPACT OF THE LAKE SUPERIOR AND MISSISSIPPI RAILROAD

On the City of Duluth

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**BUREAU OF BUSINESS AND  
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## Executive Summary

The Lake Superior and Mississippi Railroad (LS&MR), an all-volunteer run passenger railroad, operates a historic excursion train in Western Duluth, along the St. Louis River estuary. The LS&MR runs from late June through the end of October, offering passengers the option of four train rides each weekend. During a typical season, the LS&MR serves roughly 6,000 passengers.

The Western Waterfront Trail (WWT) expansion plan, currently being developed by the city of Duluth, may impact the future operations of the LS&MR. The plan began in August 2016 to determine the recreational uses of the 10- to 12-mile corridor along the St. Louis River, which includes the rail bed used by the LS&MR. In June 2017, the city put forth the recommendation that the current WWT be developed within the rail corridor for roughly two miles past its existing location. Beyond that point, the rail bed would be removed and the trail would continue alone. This would eliminate the last 1.8 miles of the LS&MR's 6.1-mile line.

The Friends of Western Duluth Parks and Trails (FWDPT), a citizen group advocating for the best use of the area's resources, and the LS&MR would like to see both the rail and the trail continue for the entire length, contending that rail with trail (RWT) will benefit both entities. The FWDPT contacted the Bureau of Business and Economic Research (BBER) at the University of Minnesota-Duluth (UMD) to study the issue.

The BBER was tasked with estimating the economic impact that the LS&MR passengers provide to the city of Duluth by bringing new visitor spending to the city's hospitality and tourism industry. In addition, the BBER identified examples of successful rail with trail (RWT) throughout the country to learn from their experience. These findings, along with results from a passenger survey, provide information that may be useful to

the train, community members, and the city as it considers the plan for the future of the Western Waterfront Trail and the LS&MR rail line.

While still a relatively new phenomenon, RWT has become increasingly popular throughout the country. In 2002, there were fewer than 70 instances of RWT in the U.S. In 2018, the Rails-to-Trails Conservancy identified roughly 350 such combinations. The BBER identified seven RWT communities similar to LS&MR (e.g. slow-moving excursion trains, trails surfaced with crushed limestone, views of a body of water, and trains with a heavy reliance on volunteers) to learn from those communities' experiences with RWT. Feedback from the communities found many similar themes, safety and popularity being the most common. According to representatives associated with the seven communities, no major incidents had occurred; primarily due to the emphasis put on rail safety. And despite some initial concerns among the parties involved, RWT was found to be very popular in the communities identified for the study. One respondent indicated that "the two attractions together add value to the visitors' experience".

As for the LS&MR passenger experience with the train ride, feedback from the survey was overwhelmingly positive. Nearly all surveyed passengers said they would probably or definitely recommend the train ride to others. And when asked about their preferred part of the ride, roughly half selected the third part across Mud Lake. Just over 60% of riders said they would be less likely to recommend the train to others if the final stretch along Mud Lake was eliminated.

Using results from the passenger survey, the BBER estimated that more than 4,100 out-of-town visitors rode the LS&MR train in 2018. About one-third of those visitors came for the day and two-thirds stayed overnight. Day guests spent

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approximately \$40 during their visit, while overnight guests spent an average of \$130 per day (\$350 per visit). In total, the combined spending from all LS&MR visitors amounted to more than \$1.0 million in 2018.

Three scenarios were modeled to determine the economic impacts of the LS&MR on the city of Duluth. The first scenario represents the current impact of the train and its passengers on the city, based on the spending information provided in the survey. The second scenario reflects an increase in ridership by roughly 20%, due to a combined RWT for the full length of the rail line. The third scenario estimates potential economic impacts of the train if the final segment of the ride was eliminated (i.e. a decline in ridership of 40%).

The current economic impact of the LS&MR and its visiting passengers was almost \$1.3 million in output, \$430,000 in wages (i.e. labor income), and 17 jobs in 2018. The impacts of visitor spending were felt primarily by tourist related industries, such as hotels and motels, restaurants, and

recreation. However, there were a number of secondary industries (e.g. real estate, wholesale trade) that saw indirect and induced effects as a result of increased passenger spending.

The impacts from the second scenario were the largest of the three, with \$1.6 million in new spending, \$516,000 in wages, and 20 new jobs annually. The third scenario would have the smallest impacts, with roughly \$780,000 in new spending, \$258,000 in labor income, and 10 new jobs annually.

Based on the city of Duluth's construction cost estimates (City of Duluth), the payback period for Scenario II (assuming an increase in ridership of about 20%) would be 4.1 years, meaning the costs of construction for building RWT for the full length of the LS&MR rail line would be recovered after about four years through increased annual spending on the part of LS&MR visitors. And even if the train were to sustain its current level of ridership (Scenario I), the costs of construction would be recovered after nearly five years.

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# The Economic Impact of the Lake Superior and Mississippi Railroad on the City of Duluth

## I. Introduction

The Lake Superior and Mississippi Railroad (LS&MR), an all-volunteer run passenger railroad that operates a historic excursion train in West Duluth and along the St. Louis River estuary, has been in existence since 1980. The group oversees the operation of the excursion train that uses the track from the original 1870 Lake Superior & Mississippi Railroad, the first train into Duluth.

The Western Waterfront Trail (WWT) expansion plan began in August 2016 to determine the future recreational uses of the mostly city-owned 10- to 12-mile corridor along the St. Louis River estuary, which includes the historic rail bed used by the LS&MR. One of the goals of the plan is to determine whether the city should retain and/or potentially improve the remaining riverfront rail line and renew the LS&MR lease for excursion rail trips.

Throughout the WWT expansion planning process, the city has held two public meetings to collect feedback from and share their intentions with Duluth residents, conducted a phone survey of City Council District 5 residents (those who live along the route of the proposed trail expansion), and conducted an online survey of Duluth residents. In addition, a number of environmental assessments on the estuary have been conducted. However, to date, no economic analyses on the train have been conducted, and no feedback has been collected from non-Duluth residents on their experience with the train or their preferences for the corridor.

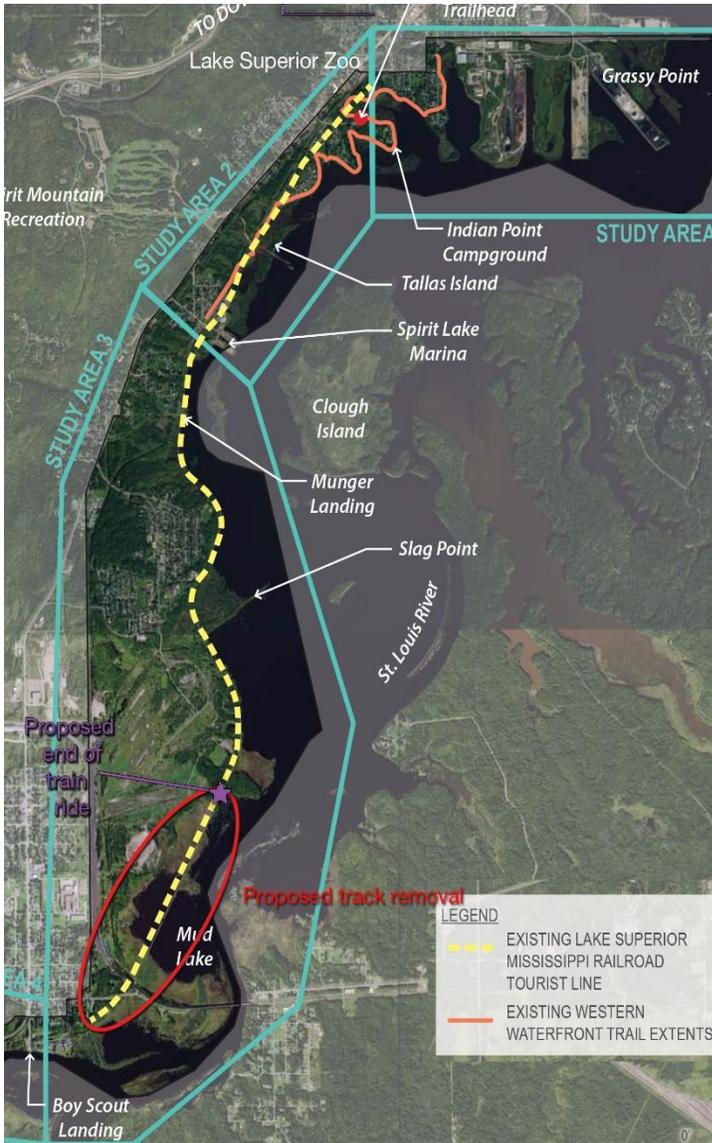
The Friends of Western Duluth Parks and Trails (FWDPT), a volunteer grassroots civic organization that has been involved in advocating for the best use of the area's resources (i.e. land, water, businesses, nonprofits) for several years, contacted the Bureau of Business and Economic Research (BBER) at the University of Minnesota Duluth's Labovitz School of Business and Economics to study the economic impacts of the LS&MR and its passengers. In addition, the BBER conducted a survey of passengers to learn more about their experience with the train ride and their visit to Duluth. Lastly, the BBER was tasked with identifying successful examples of RWT throughout the country that could serve as an example for the city of Duluth as they consider RWT for the WWT expansion.

### ***Background***

The existing LS&MR rail line runs 6.1 miles from Fremont Street (across from Lake Superior Zoo) to Boy Scout Landing, just beyond East McCuen Street. The existing Western Waterfront pedestrian trail meanders along the river from Sixty-Third Avenue West, across Kingsbury Creek and around Indian Point Campground until it meets up with the LS&MR rail line. The two then continue side-by-side for about a mile until the Spirit Lake Marina. There, the trail ends, and the rail line continues to its current turnaround point near Boy Scout Landing.

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**Figure 1. Map of Lake Superior & Mississippi Railroad Tracks and Western Waterfront Trail, current and proposed.**



SOURCE: CITY OF DULUTH AND BBER

At the most recent open house meeting regarding the WWT (June 2017), the city put forth the recommendation that the trail be developed within the rail corridor for roughly two miles past its existing location at Spring Street. Beyond that point, the rail bed would be removed at the north shore of Mud Lake, and the trail would continue alone. This would eliminate the last 1.8 miles of the LS&MR's 6.1-mile line and open up the waters of Mud Lake to the meeting, the city also provided preliminary cost estimates for the construction of the trail (City of Duluth 2017). The costs for the trail extension from Spirit Lake Marina to Boy Scout Landing in the city's recommended plan was roughly \$4.7 million. Alternatively, the BBER estimated the cost to the city for the LS&MR and FWDPT's preferred plan, with extended RWT, at \$6.3 million.<sup>1</sup>

Shown in Figure 1, the red-circled area is where the LS&MR track would be removed in the city's recommended plan, thus ending the train ride at the red star and eliminating what is considered the pinnacle of the trip. (The study area outlined in blue is for the city's purposes not for this economic impact analysis.)

As an alternative, FWDPT and the LS&MR are advocating for rail with trail (RWT) for the full length of the rail bed. They do not want to remove the historic tracks from the estuary portion of the train excursion.

The two groups (FWDPT and LS&MR) would like to see both the rail and the trail continue for the entire length, contending that RWT will benefit both entities—increasing train ridership as well as trail usage by bringing awareness to both recreational

<sup>1</sup> Cost estimates were obtained from the City of Duluth's Western Waterfront Trail & Park Master Plan Public Open House #1 and #2 presentations. Scenario III costs reflect the sum of the costs for Segments 1 – 5 as provided by the city on page 36 of the Open House #2 presentation. Scenario II costs are based on the sum of Segments 1 – 3 from the Open House #2 presentation and Segments 4 (Rail with Value Engineered Trail) and 5 (Rail with Optimum Trail) from the Open House #1 presentation.

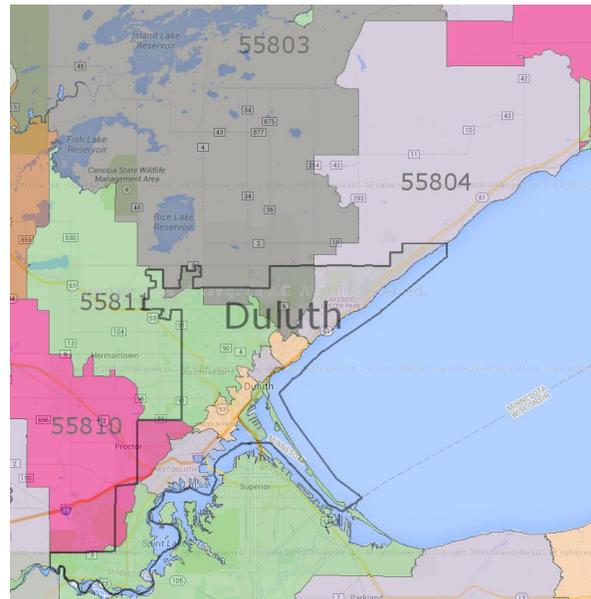
<http://www.duluthmn.gov/media/542524/final-draft-public-meeting-2-presentation-61317.pdf>

options and maintaining access to the river for those who prefer to view it from the train as opposed to a pedestrian trail. This includes those physically unable to view the river other than via train.

This report begins with some background on RWT and feedback from the RWT communities. Chapter II includes the results of the passenger survey. Chapter III describes the results of the economic impact modeling and provides a range of possible impacts based on three scenarios: the current train ride, extended trail with rail, and a shortened train ride.

The geographic scope for this economic impact analysis is the city of Duluth. Figure 2 shows the outline of the Duluth city limits and shaded regions for the included zip codes. All Duluth zip codes<sup>2</sup> were used for the study area, including those located only partially within the city limits (i.e. 55803, 55804, 55810, and 55811).

**Figure 2. City of Duluth and Surrounding Zip Codes**



SOURCE: [WWW.ZIPMAP.NET/MINNESOTA/ST.\\_LOUIS\\_](http://WWW.ZIPMAP.NET/MINNESOTA/ST._LOUIS_)

### **Rail with Trail**

Despite the fact that railway infrastructure has been present in American communities since the 1800s, the combination of RWT—trails alongside active rail lines—is relatively new. According to the Rails-to-Trails Conservancy, a national nonprofit group that advocates for the creation of trails alongside former or existing railway corridors, the first operational RWT was completed in 1966. Today there are 350 examples of active RWT programs in the United States (Pack 2018). This new interest in RWT stems largely from the desire on the part of communities to enhance local transportation systems by creating more pedestrian trails.

To learn more about the pros and cons of RWT, the BBER research team first identified more than 20 examples of RWT throughout the United States. These examples came from a variety of sources, including recommendations from the FWDPT, case studies provided in the city’s open house presentations, and reports published by the Rails to Trails Conservancy.

In total, seven case studies were selected based on their similarity to the WWT and LS&MR.<sup>3</sup> Representatives from the selected rail with trail organizations were then contacted to inquire about the success of each and what the community would do differently if it had the opportunity. Feedback from these communities found many similar themes, safety and popularity being the most common.

In establishing RWT, safety continues to be the top priority among railroads and communities. Trends show that RWT has been getting safer over time. According to a Department of Transportation (2002) study, while the number and length of rails with trails has increased, the numbers of fatalities and injuries has actually decreased. This is likely due to increases in signage, fencing, and other safety measures.

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<sup>2</sup> Duluth zip codes include 55801, 55802, 55803, 55804, 55805, 55806, 55807, 55808, 55810, 55811, 55812, 55814, 55815, and 55816.

<sup>3</sup> Detailed information on each case study is described in Appendix B.

Of the seven RWT entities surveyed, none reported having trail related injuries. According to Ken Buehler from the North Shore Scenic Railroad “The entire route is fenced for safety, and one crossing has protection with arms, bells and lights.” The RWT combination of the Duluth Lakewalk and the North Shore Scenic Railroad has seen no injuries since its completion and has been cited as a model for safety by TRAINS magazine.

Most of the RWT case studies contacted for this study, however, had no need for fencing or barriers between the rail and trail, due to slow train speeds. The LS&MR, for example, operates at speeds of less than 10 mph. Bill Atkinson from the Allegheny Trail Alliance stated, “Liability issues depend on the type of train you are sharing the right of way with; the train here only runs 20 miles an hour, so it’s slow moving and only runs on weekends once a day.”

It should be noted that while none of the case studies completed in this report include RWT entities that have experienced rail-or trail-related injuries, many indicated that safety and liability are areas that RWT managers and stakeholders are constantly improving upon.

The BBER was interested in learning whether having the combination of rail and trail would actually provide benefits to both entities—increasing train ridership as well as trail usage by bringing awareness to both recreational options. Of those entities that had provided information on this topic, all of them stated that they did feel the combination created more awareness and usage of both entities. Amanda Cordero from the Astoria Riverwalk stated, “I believe the combo of trail and track attracts more people to each. The people walking the trail, see the trolley and decide to ride. The people riding the trolley see the trail and decide to walk/run. I also believe the presence of the trolley makes the trail seem safer and less isolated.”

According to all of the representatives that responded to the inquiry, excursion trains are frequented more by visitors than by residents, while conversely, local trails are typically used more by residents than visitors. But the combination of RWT creates additional opportunities for both groups to use the corridor. According to Pete West of the Denver Trolley, “people using the trail see the Trolley parked adjacent to the trail or running on the line and come to ride it.”

In addition, the RTC noted that the benefits of having dual use can be particularly strong when the two entities cooperate to leverage each other’s strengths (Pack 2018). For example, the Allegheny Highlands Trail of Maryland uses its excursion train to provide a bicycle/train shuttle service for tourists and Bill Atkinson from the Allegheny Trail Alliance noted that “the two attractions together add value to the visitors’ experience, the train shuttle is a plus.”

The LS&MR has just begun to provide a similar service in partnership with the local marina, offering customers the opportunity to ride the train and then kayak downstream to a specified destination. While the arrangement is still very new, it highlights the train’s willingness to partner with entities to provide trail users and train riders with more opportunities to experience the St. Louis River corridor. It should also be noted that the city is currently pursuing a National Water Trail designation for the St. Louis River Estuary. The kayak shuttle service could be very popular among visitors drawn to Duluth by the new water trail designation.

To summarize, the city of Duluth is planning to extend the existing Western Waterfront Trail alongside the LS&MR rail line, increasing the length of RWT along the St. Louis River corridor. The city’s most recent recommendation would eliminate the last 1.8 miles of the LS&MR’s 6.1-mile line. The FWDPT and LS&MR would like to see both the rail and the trail continue for the entire length, contending that RWT will benefit both entities. According to feedback from other RWT communities, RWT can be safe and popular, especially when combined with a slow-moving excursion train. There is evidence, if anecdotal, that the two combined increase awareness and usage of both recreational options.

## II. Survey of LS&MR Passengers

A survey of Lake Superior and Mississippi Railroad (LS&MR) passengers was developed by the BBER in spring 2018 in partnership with both the Friends of Western Duluth Parks and Trails (FWDPT) and the LS&MR.<sup>4</sup> Surveys were distributed throughout the 2018 riding season, which runs from mid-June through the end of October. During a typical season, the LS&MR serves roughly 6,000 passengers.

The LS&MR offers its excursion train ride four times each weekend—two on Saturday and two on Sunday. The ride takes passengers along the St. Louis River estuary and includes a narrated history of the area. During each ride, as the train approached the end of the tracks, the train narrator read a statement about the purpose of the survey to encourage survey participation. The statement included the web address where riders could access the online survey.

Additionally, while the train was stopped, volunteers walked through the train's cars offering a paper copy of the survey to each group of passengers—one survey per family or party per ride.

The survey asked each group about their home residence, their experience with the train ride, their likelihood to participate in various activities along the St. Louis River, and whether they would recommend the train ride to others. In addition, the survey asked out-of-town guests about their reason for visiting Duluth, their length of stay, and their estimated spending while in Duluth.

A total of 839 groups completed the survey in either the written or online format. Surveyed passengers were split into two categories (residents and visitors) based on their zip codes (see Table 1). Roughly one-third of those surveyed indicated that they were residents of Duluth (n=222) or were categorized that way based on their response to the rest of the survey questions (n=62). The remaining 553 groups (66% of respondents) were visiting from outside the city.<sup>5</sup>

**Table 1. What is the zip code at your home residence?**

<i>Three-Digit Zip Code</i>	<i>Area</i>	<i>Surveyed Groups</i>
558	Duluth	222
557	St. Louis/Carlton County	71
553	Western Twin Cities suburbs	68
554	Minneapolis	52
550	Northern Twin Cities suburbs	44
548	Superior, WI	33
551	St. Paul	33
563	St. Cloud	22
559	Rochester	17
560	Detroit Lakes	16
565	Mankato	16
562	Willmar	12
564	Brainerd	9
556	Two Harbors	6
540	Eau Claire, WI	5
541	Somerset, WI	5
547	Green Bay, WI	5
581	Fargo, ND	5
	All other	198
	Total	839

SOURCE: LS&MR PASSENGER SURVEY

<sup>4</sup> A copy of the LS&MR passenger survey can be found in Appendix C.

<sup>5</sup> Two groups were not able to be classified as residents or visitors due to a lack of information provided by the respondents in the survey.

## Questions about Train Ride

LS&MR passengers were asked a series of questions about their experience on the train, their likelihood to participate in various activities along the St. Louis River estuary, and whether they would recommend the ride to others. In total 839 groups completed this portion of the survey. One person per group was asked to respond on behalf of the entire party. With an average number of guests per group of 3.7, it is estimated that more than 3,000 individual guests' responses are represented by this portion of the survey, roughly half of the estimated ridership for the season.

Respondents were shown three images depicting scenery that they would have seen during the LS&MR train ride (see Figure 3). Each image displays one of the most notable views or highlights from the three parts of the ride. Image A depicts the first part of the ride through the neighborhoods to the Tate & Lyle factory. Image B depicts the ride along Spirit Lake and past the U.S. Steel site. Image C depicts the portion across the Mud Lake causeway to the end of the trip. Passengers were then asked to "Consider the ride you just experienced and rank each area from 1 to 3 in order of enjoyment with 1 being the best."

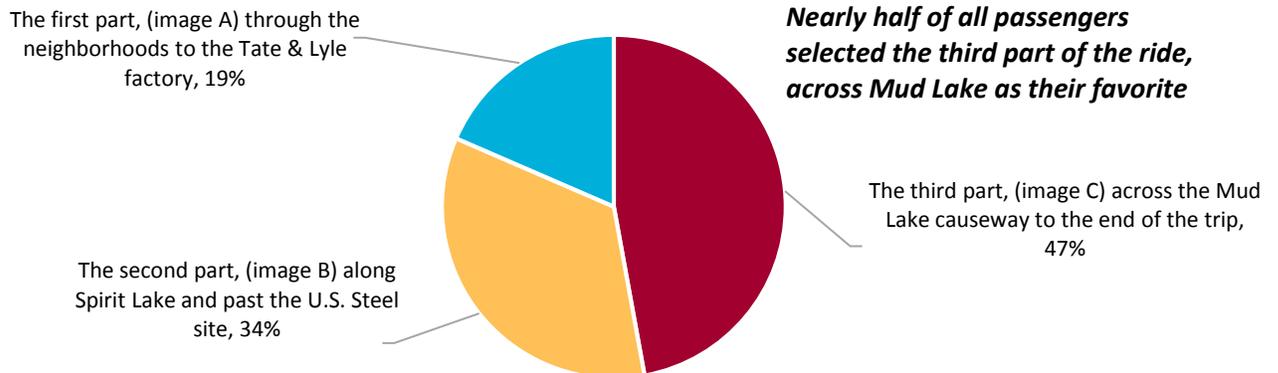
Figure 4 shows the percentage of respondents that ranked each area as the best part of the ride. The portion of the ride across the Mud Lake causeway (image C) was listed by nearly half of all surveyed groups as the most enjoyable portion of the train ride. The second part, along Spirit Lake and past the U.S. Steel site was the next most popular segment, with 34% of riders selecting it as the best part. Roughly 20% of those surveyed enjoyed the first part of the ride the best.

Figure 3. Areas of LS&MR Train Ride



SOURCE: LS&MR

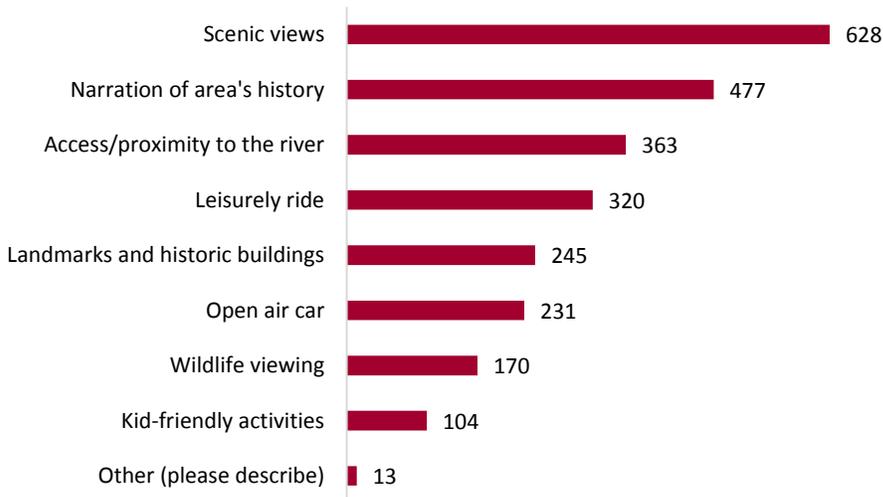
Figure 4. Best Part of LS&MR Train Ride (Portion of Passengers that Selected Area as Most Enjoyable)



**Nearly half of all passengers selected the third part of the ride, across Mud Lake as their favorite**

SOURCE: LS&MR PASSENGER SURVEY

**Figure 5. Which of the following aspects of the ride were most enjoyable?  
Select up to three.**



SOURCE: LS&MR PASSENGER SURVEY

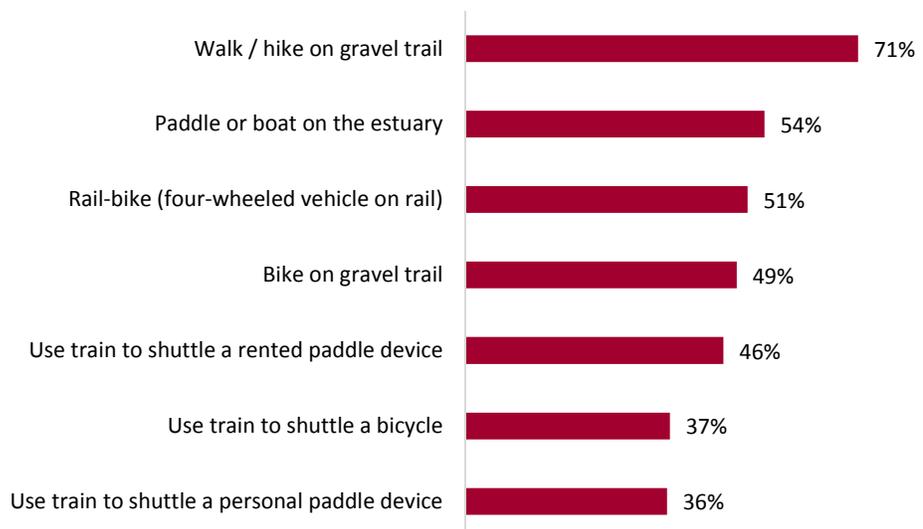
Passengers were then asked about which aspects of the ride were most enjoyable. As shown in Figure 5, respondents enjoyed the scenic views, the narration of the area's history, and access/proximity to the river the most.

Passengers were also asked about their potential likelihood to participate in various activities along the train route. This question was included in the survey as the city of Duluth is

considering replacing or combining the train route with a type of trail alternative. The question's purpose was to provide insight into what other activities people would enjoy in that particular area. Figure 6 shows passengers' interest in the activities.

The most popular activity was walking or hiking on a trail, with more than 70% of surveyed groups indicating that they would be somewhat or very likely to participate in that activity along the estuary. Paddling or boating on the estuary was another popular option, with 54% of respondents stating they were likely or very likely to participate in that activity. Less than 40% of those surveyed indicated they would be somewhat or very likely to use the train to shuttle a personal paddle device or bicycle. However, those findings are not particularly surprising, considering these activities require the individual to have access to a personal paddle device or bicycle.

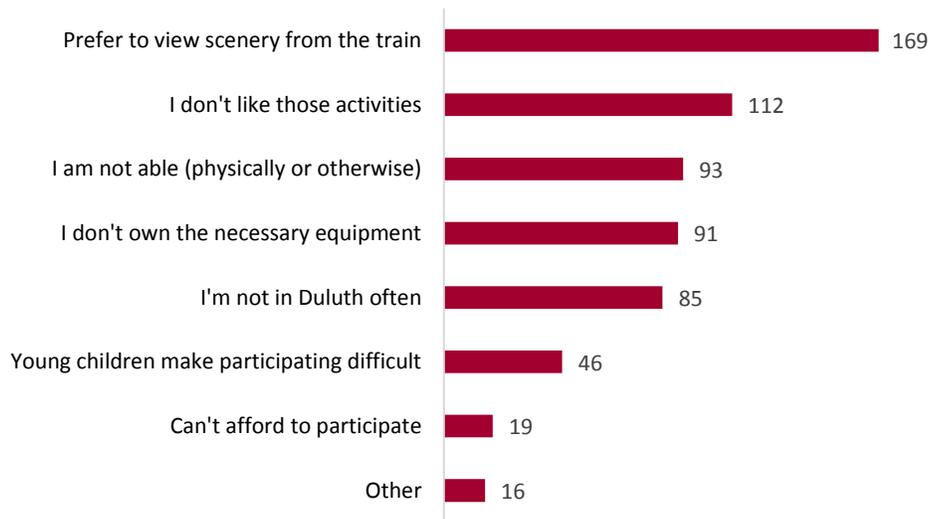
**Figure 6. Percentage "Likely" or "Very Likely" to Participate in Activities**



SOURCE: LS&MR PASSENGER SURVEY

Half of the respondents selected “very unlikely” for at least one of the activities listed. As a follow up, those individuals were asked to explain further their reasons for not wanting to participate in that chosen activity (or activities). Figure 7 shows the reasons most commonly given. Many cited a preference for the train as a way to view the trail and estuary, followed by a general disinterest in the activities, and then a lack of ability to participate in such activities due to physical or other reasons.

**Figure 7. If you responded “very unlikely” for any of the activities, why? (Select all that apply)**



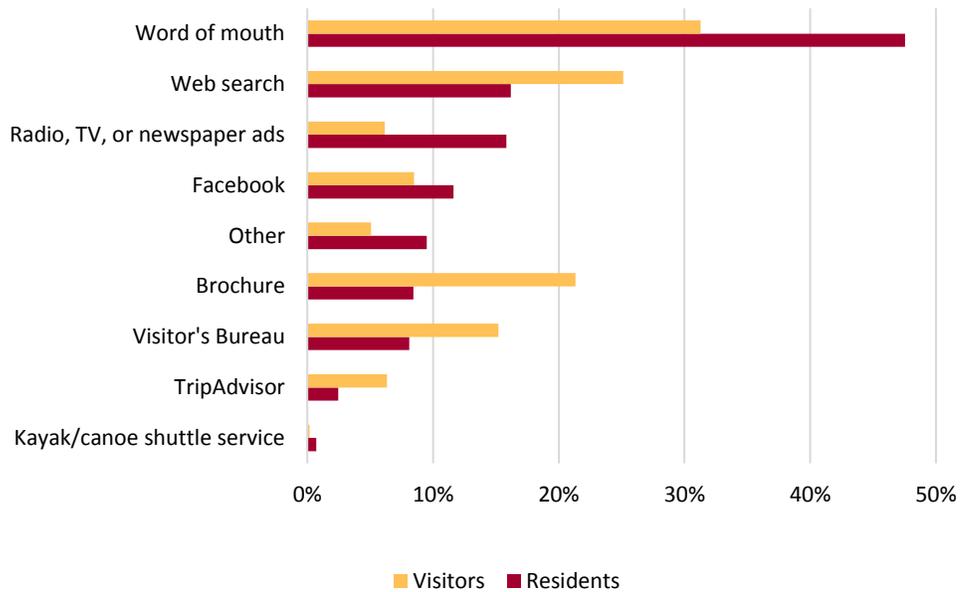
SOURCE: LS&MR PASSENGER SURVEY

Perhaps not surprising was that out-of-town visitors were less likely to want to participate in the activities listed, as compared with Duluth residents. For example, 48% of out-of-town visitors stated that they would be somewhat or very unlikely to ride a bike along the estuary, compared with 35% of Duluth residents. In fact, for all of the activities listed in that question, visitors reported being less likely to want to participate than residents.

This aligns with what we heard from the other RWT communities as well. It seems that, in most cases, the trail portion of RWT is more popular with local residents, who use it for commuting, walking, and other day-to-day activities. On the other hand, excursion trains typically are more popular among out-of-town guests.

Figure 8 shows the most common ways by which LS&MR passengers learned about the train ride. The graph is broken out by visitors and residents, allowing for a comparison between the two types of passengers. While both groups most commonly learned about the train via word of mouth, that method was much more likely among Duluth residents than visitors (48% of residents compared with 31% of visitors). In general, residents were also more likely to hear about the train through radio and TV ads and Facebook, while visitors were more likely to find the train via a web search, brochure, the visitor's bureau, or TripAdvisor.

**Figure 8. How did you hear about the Lake Superior and Mississippi Railroad? (Select all that apply)**

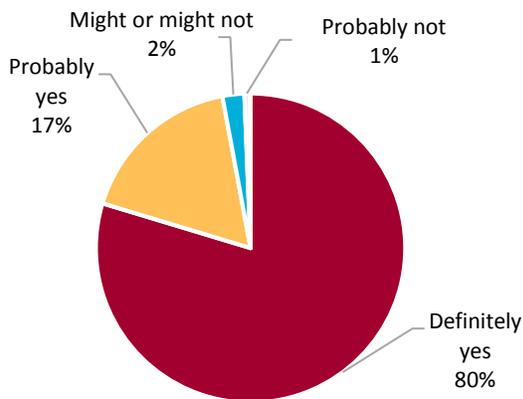


\*Totals will not sum to 100% as groups were allowed to select multiple options

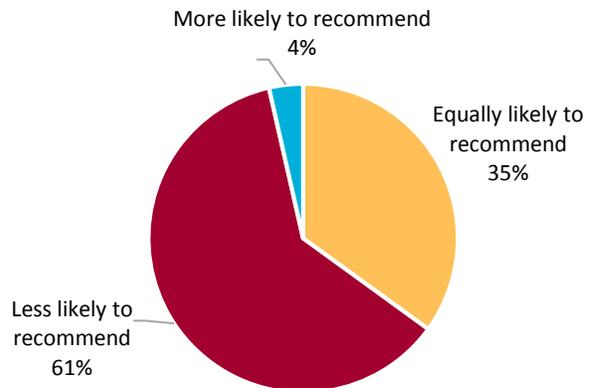
SOURCE: LS&MR PASSENGER SURVEY

All guests were asked two related questions. The first, "Would you recommend the train ride to others?" Results saw an overwhelmingly positive response with 97% of passengers responding probably or definitely yes to the question (80% said definitely yes), as shown in Figure 9. The second question asked, "Would shortening the ride by approximately 30 minutes round-trip (eliminating the final stretch across Mud Lake) make you more or less likely to recommend the train to others?" When offered that hypothetical scenario,

**Figure 9. Would you recommend the train ride to others?**



**Figure 10. Would shortening the ride by approximately 30 minutes round-trip (eliminating Mud Lake) make you more or less likely to recommend the train to to others?**



SOURCE: LS&MR PASSENGER SURVEY

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which is based upon the city’s possible change in the rail/train corridor, roughly 60% of respondents said they would be less likely to recommend the ride, 35% said they would be equally likely, and 4% said they would be more likely (see Figure 10).

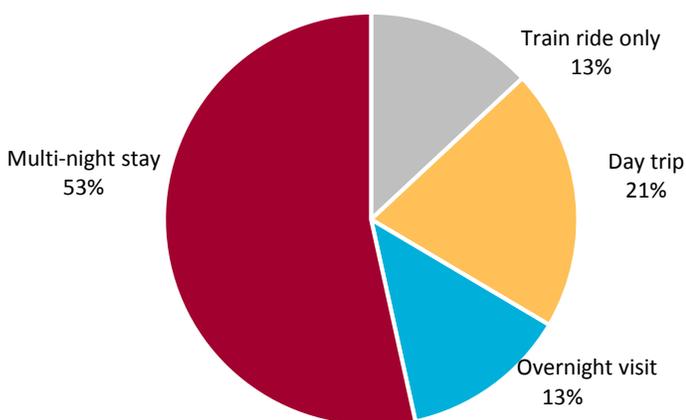
### Questions Only for Visitors

The following questions were asked only of groups that indicated that they were not from the city of Duluth. These questions were asked to gain information on each group’s reason for visiting Duluth, length of stay, and estimated spending while in town. More than 550 groups completed this portion of the survey. With an average group consisting of 3.7 individuals, it is estimated that roughly half of all of the out-of-town visitors who rode the train during the 2018 season provided feedback on their experience as a visitor to Duluth.

Visitors were asked to select one of four options that best described their visit to Duluth. Figure 11 shows the types of visits and the percentage of groups that selected each. The majority of out-of-town groups riding the train (53%) were visiting Duluth for multiple nights. The next most common option selected was “day trip (train and other attractions)” at 21%. The remaining responses were split equally between overnight visitors (those who stay a single night) and riders just visiting Duluth for the train ride (13% each). Those who indicated that they planned to stay overnight were also asked to identify how many nights that they planned to stay in Duluth; the mean response was 2.7 nights.

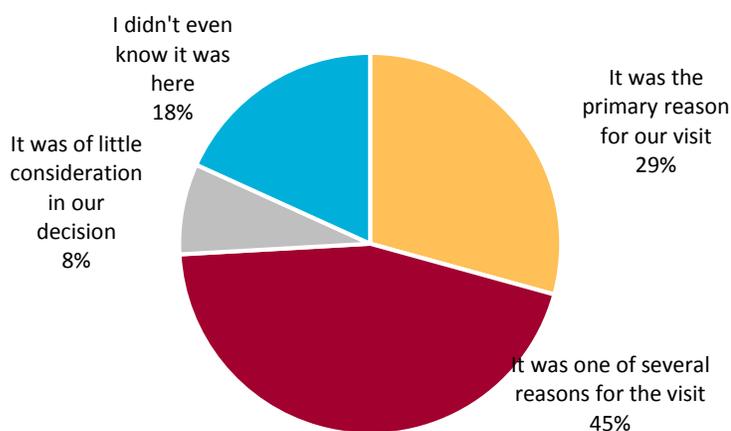
Figure 12 illustrates the importance of the LS&MR in visitors’ decisions to visit the city of Duluth. Nearly 30% of visitors indicated that the LS&MR was the primary reason for the group’s visit to Duluth. For 45% of the groups surveyed, the train was one of several reasons. For 8% of groups surveyed, the LS&MR was of little importance in their decision to visit Duluth. And about one in five groups (18%) was unaware of the train before coming to Duluth.

**Figure 11. Which of the following best describes your current visit to Duluth?**



SOURCE: LS&MR PASSENGER SURVEY

**Figure 12. How important was the LS&MR train ride in your decision to visit Duluth for this trip to the area?**



SOURCE: LS&MR PASSENGER SURVEY

Visitors were also asked whether the train influenced their group’s length of stay. The survey inquired, “Did you extend your visit because of the LS&MR train ride? If so, by how much? Approximately, 22% of the groups surveyed did extend their time in Duluth because of the train. The average number of hours that visits were extended was 14; although a small number of groups (n=5) indicated that they had stayed multiple extra days in Duluth for the opportunity to ride the LS&MR.

**Figure 13. Which other Duluth attractions do you plan to visit or have you visited during this trip? (select all that apply)**

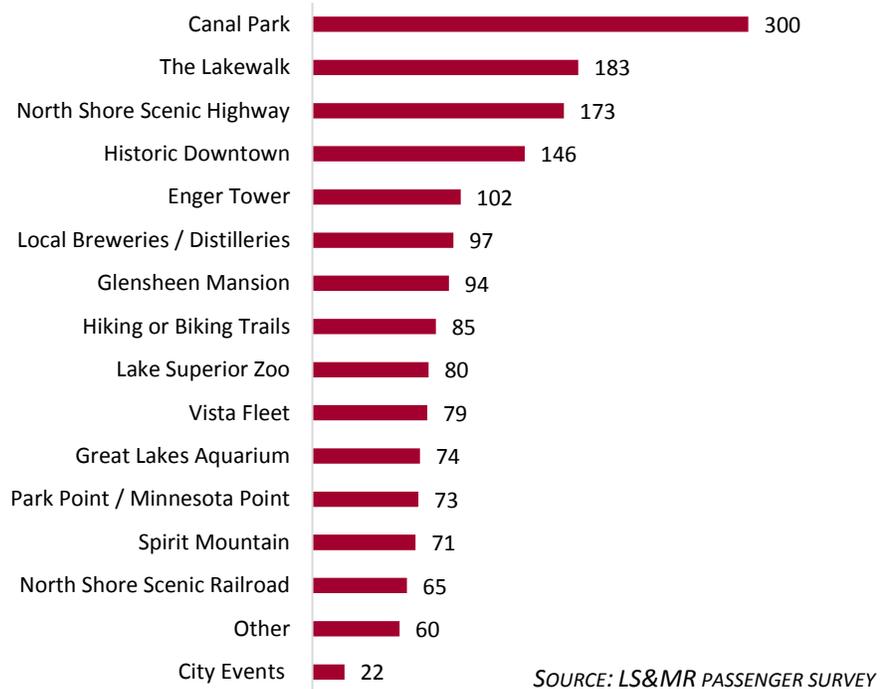


Figure 13 shows the most common Duluth attractions among non-local survey respondents. The most popular attractions include Canal Park, the Lakewalk, and the North Shore Scenic Highway. A number of visitors cited other attractions they had visited or intended to visit. Some of the most common among these other responses included state parks, casinos, the Duluth Rose Garden, and the Lake Superior Railroad Museum.

Visitors were then asked to report their group’s total spending while in Duluth. The research team used the information provided by each group (spending, number of nights, number of individuals in group) to calculate the per-person per-day spending in each of the spending categories. Spending was calculated for both overnight and day visitors.

The average overnight guest spent roughly \$130 per day during their visit to Duluth, while day guests spent just over \$40 per person during their visit. Given the estimated number of day (n=1,390) and overnight (n=2,734) visitors per season and the average length of stay for overnight visitors (2.7 nights), it is estimated that the combined spending for all LS&MR visitors would total more than \$1 million for the entire season. More details on the LS&MR visitor spending and the economic impacts resulting from that spending will be described in Chapter III.

## ***Rider Feedback and Suggestions***

The last question asked of all passengers was “Do you have any suggestions for how to improve the LS&MR train ride?” In total, 170 groups provided suggestions, roughly 20% of all survey respondents. Results showed a number of broad themes and suggestions from the respondents; the four key themes are listed below:

- The ride is currently satisfactory.
- Improvements to sound quality and narration
- Additional food, drink, and merchandise
- Overall comfort and cleanliness

The most common theme was that respondents were generally satisfied with the ride in its current form. Many passengers provided comments like “Awesome trip and a great crew,” “Great ride!”, “Love it!” Similarly, fifteen groups stated that the overall route of the train should not be changed, possibly implying that the portion of the ride across the Mud Lake causeway should not be removed. And a number of groups could not think of anything that could be done to improve the train ride and experience. A similar group of riders suggested that the train should do more marketing to increase awareness of what they felt was a great ride.

The next largest theme was related to the narration and sound quality on the LS&MR train. Many groups stated that the narration was either too quiet or hard to hear in the train’s open car. Others had suggestions relating to the narration itself. For example, some wanted the amount of narration to be consistent throughout the trip or wanted less narration, while others wanted more narration on the area’s ecology.

Many suggestions were related to the types of food, drinks, and other merchandise available on the LS&MR train. The most common suggestion in this theme was for hot drinks (coffee, cider, hot chocolate) to be available on the ride during the late summer and early fall or during colder weather. A similar number expressed the idea for additional merchandise (small gifts and souvenirs) and packaged snacks to be available. A small portion of respondents expressed a desire for another ride option that provided dinner and beverages.

The last major theme found in the survey results was related to the overall comfort and cleanliness of the train. Some commented the train was too cold in the later riding season. Additionally, there were two comments about the overall cleanliness of the enclosed car, both of which mentioned dust and allergens in the seats of the car.

One small but important group of suggestions related to the ticket area. These groups suggested providing additional seating for elderly passengers and handing out tickets as passengers arrive rather than immediately prior to boarding.

The passenger suggestions could be very useful to the LS&MR in future seasons, as they consider ways to attract new riders and improve the train ride for all of those who participate.

The findings from the passenger survey show the popularity of the train, particularly the third part of the ride across Mud Lake. In addition, the results show some of the key differences between visitors’ and residents’ experiences with the train. Visitors are much more likely to learn of the train through web searches, TripAdvisor, or brochures; while Duluth residents are more likely to learn of the train through word of mouth or local advertisements. And visitors are less likely to want to participate in other types of activities along the estuary, preferring to view the scenery from the vantage point of the train.

### III. Economic Impact

The LS&MR provides a positive economic impact to the city of Duluth by attracting visitors from outside the city who, in turn, spend money on lodging, dining, shopping, and other attractions. The increased spending from the train’s visitors creates a shock to the local economy that impacts the entirety of the local economy; the visitors’ direct spending leads to additional new spending by local businesses and consumers.

This section details the average per-person per-day visitor spending as reported by LS&MR passengers, calculates the total value of new spending throughout the city that can be attributed to the train’s riders, and estimates the economic impacts (i.e. indirect and induced spending) that occurs throughout the city as a result of the LS&MR.

Results are shown for three scenarios that represent a possible range of economic impacts. The first scenario represents the current number of LS&MR passengers based on ridership data from the 2018 season. The second scenario represents the estimated impacts of combined rail with trail (RWT) for the entire length of the corridor. The third and final scenario represents the estimated impacts of a shortened ride, ending at Mud Lake. While the three scenarios are just estimates, they provide a reasonable range of impacts that can be attributed to the LS&MR for use in future planning being considered by the city of Duluth.

The BBER used the IMPLAN software version 3.1 to estimate economic impacts.<sup>6</sup> All scenarios were modeled using the most recent data available, which was for the year 2016. All results are shown in 2018 dollars.

#### Inputs

Inputs for modeling include the average spending per visitor per day based on the results of the LS&MR passenger survey. The economic impact attributable to the LS&MR relates only to new money injected into the Duluth economy by visiting passengers. As expenditures by Duluth residents represent only a recycling of money that already exists in the local economy, the analysis is concerned only with visitor spending.

**Table 2. Per Person per Day Spending by LS&MR Visitors**

<i>Spending Category</i>	<i>Overnight Visitors</i>	<i>Day Visitors</i>
Lodging expenses	\$58.25	\$0.00
Dining / drinking out	\$32.34	\$16.25
Retail purchases	\$12.39	\$5.39
Gas stations	\$10.97	\$7.67
Arts / entertainment	\$8.42	\$2.30
Groceries	\$3.72	\$1.20
Recreation	\$1.69	\$1.54
Other spending	\$0.98	\$6.02
Other transportation	\$0.93	\$0.03
Services purchases	\$0.40	\$0.41
<b><i>Per Person Per Day Spending</i></b>	<b><i>\$130.10</i></b>	<b><i>\$40.81</i></b>

\*Totals may not sum due to rounding

SOURCE: LS&MR PASSENGER SURVEY, BBER

<sup>6</sup> For more information on data sources and assumptions relevant to economic impact modeling and the IMPLAN database, see Appendix D.

As part of the LS&MR passenger survey, visitors were asked to estimate their total spending while in Duluth, broken out into ten categories. The research team used the information provided by each group (spending, number of nights, number of individuals in group) to calculate the per-person per-day spending in each of the spending categories (see Table 2). Spending was calculated for both overnight and day visitors.

The average day visitor spent just over \$40 per visitor per day during a visit to Duluth, while the average overnight visitor spent roughly \$130 per day. The greatest expenses reported by overnight guests included \$58 on lodging, \$32 on dining and drinking, \$12 on retail purchases, and \$11 on gas. Individuals who visited for day trips spent, on average, \$16 on dining, \$8 on gas, and \$5 on retail. These spending categories were redistributed among appropriate IMPLAN industry sectors. For a complete list of sectors used in modeling, see Appendix E.

**Table 3. Visitor Spending Estimates for Three Modeling Scenarios**

<i>Scenarios</i>	<i>Type of Visitor</i>	<i>Length of Visit (Days)</i>	<i>Spending per Visitor per Day</i>	<i>Visitors</i>	<i>Visitor Days (Visitors x Length of Visit)</i>	<i>Total Visitor Spending</i>	<i>Cost to City</i>
Scenario I <i>Current Train Ride</i>	Day	1	\$40.81	1,390	1,390	\$56,726	
	Overnight	2.7	\$130.10	2,734	7,284	\$947,589	
			<b>Total</b>	<b>4,124</b>	<b>8,674</b>	<b>\$1,004,315</b>	<b>\$0</b>
Scenario II <i>Extended Rail with Trail (20% increase)</i>	Day	1	\$40.81	1,668	1,668	\$68,071	
	Overnight	2.7	\$130.10	3,280	8,740	\$1,137,074	
			<b>Total</b>	<b>4,948</b>	<b>10,408</b>	<b>\$1,205,167</b>	<b>\$6,349,685</b>
Scenario III <i>Shortened Train Ride (40% decline)</i>	Day	1	\$40.81	834	834	\$34,036	
	Overnight	2.7	\$130.10	1,640	4,370	\$568,537	
			<b>Total</b>	<b>2,474</b>	<b>5,204</b>	<b>\$602,583</b>	<b>\$4,650,876</b>

\*Totals may not sum due to rounding

SOURCE: BBER

Inputs for modeling the three economic impact scenarios are shown in Table 3. As noted previously, Scenario I represents the current number of LS&MR passengers based on ridership data from the 2018 season. This scenario uses the spending information and average length of stay provided by surveyed passengers to estimate the number of visitor days (number of visitors multiplied by length of stay) and spending for all LS&MR passengers visiting from outside the city of Duluth.<sup>7</sup> As shown in the table, roughly two-thirds of all LS&MR passengers were visitors to Duluth (n=4,124), and the average length of stay for overnight visitors was 2.7 days. This equates to roughly 8,600 visitor days and \$1 million in total visitor spending.

For Scenarios II and III, spending per visitor per day was kept constant, but the number of visitors was adjusted to reflect the hypothetical alternative. Scenario II represents a 20% increase in the number of visitors (4,948 per year). This estimate was based on feedback from other RWT communities that have noted

<sup>7</sup> For a more detailed description of the methodology and assumptions used to calculate visitor days as well as a full list of IMPLAN sectors used in modeling, see Appendix E, Detailed Inputs.

a cross-over effect from RWT when the trail is paired with an excursion train. For example, a number of RWT communities noted that the combination of RWT increases awareness of both modes. In Scenario III, the research team predicted that the number of visitors would decline by 40% (2,474 per year) due to the shortened train ride. This estimate was based on passengers' response to the survey question, "Would shortening the ride by approximately 30 minutes round-trip (eliminating the final stretch across Mud Lake) make you more or less likely to recommend the train to others?" Roughly 60% of passengers said they would be less likely to recommend the train to others if the ride was shortened. Considering that the most common way in which passengers learn about the train ride is via word of mouth (48% of residents and 31% of visitors), eliminating the most popular portion of the ride could be detrimental to the train's ability to attract new riders. While the three scenarios are just estimates, they are meant to provide a reasonable range of impacts that might be attributed to the LS&MR in the various arrangements currently being considered by the city.

In addition to the visitor spending estimates, Table 3 also includes the estimated cost to the city for the construction of the Western Waterfront Trail, based on information provided by the city at public meetings. The current scenario represents no change. Therefore, the city incurs no new costs. Scenario II, which includes rail with trail for the full length of the rail bed, is the most extensive option. Therefore, it has the highest cost (\$6.3 million). Scenario III is the plan currently being recommended by the city and costs less than Scenario II (\$4.7 million). This scenario would remove the rail line past Mud Lake.

### ***Scenario I (Current Impact)***

Economic impact analysis tracks an initial economic shock or activity (like the direct spending of LS&MR visitors) through multiple rounds of industry and consumer spending to show the multiplier or ripple effects through a local economy. The initial shock or activity is considered the direct effect, the resulting increase in industry spending is the indirect effect, and the resulting increase in consumer spending is the induced effect. This section summarizes the economic impacts for the LS&MR, based on spending from its visiting passengers. Results are measured in employment, output, labor income, and value added. All results are shown in thousands of dollars for the year 2018.

An estimated 6,000 passengers rode the LS&MR train in 2018, and roughly two-thirds of those were visitors from outside the city of Duluth. In total, those visitors spent roughly \$1 million in the city of Duluth (see Table 3, Total Visitor Spending), on lodging, dining, retail, and recreation.<sup>8</sup>

**Table 4. Economic Impacts of LS&MR Visitors, Scenario I – Current Impact (Thousands of Dollars)**

<b><i>Impact Type</i></b>	<b><i>Employment</i></b>	<b><i>Labor Income</i></b>	<b><i>Value Added</i></b>	<b><i>Output</i></b>
Direct Effect	13	\$287.4	\$467.0	\$841.0
Indirect Effect	2	\$72.2	\$119.0	\$237.4
Induced Effect	2	\$70.7	\$124.9	\$220.5
Total Effect	17	\$430.2	\$710.9	\$1,298.9

\*Totals may not sum due to rounding

SOURCE: BBER, IMPLAN

<sup>8</sup> Due to margining, the actual direct output shown in Table 4 (\$841,000) is lower than the total value spent by LS&MR visitors (\$1,004,315) shown in Table 3 under Total Visitor Spending. Retail industries have margins on their goods, and only a portion of each sale is introduced into the local economy. See the full definition of margining in Appendix A for more information.

Table 4 shows the economic impacts of those visitors on the city of Duluth. The first column of the table, labeled employment, estimates the number of jobs that the LS&MR supported, directly and through indirect and induced effects. Employment estimates are in terms of jobs, not in terms of full-time equivalent employees. According to the results of this analysis, it is estimated that spending on the part of LS&MR visitors supported 17 local jobs, 13 of which were the result of direct spending from LS&MR visitors and four of which resulted from increased spending by local businesses and consumers due to visitor spending.

The second column, labeled labor income, depicts all employee compensation, including wages, benefits, and proprietor income. In 2018, it is estimated that \$430,200 of employee wages and benefits in the study area could be attributed to spending from LS&MR passengers. The third column, value added, represents spending that goes specifically towards wages, rents, interest, and profits in the study area. It can be thought of as the difference between revenue and the cost of inputs. The value added for the study area as a result of LS&MR visitors was more than \$710,900 in 2018. Lastly, the far right column, labeled output, represents the value of all local production and was equal to nearly \$1.3 million in 2018.

**Figure 14. Industries Most Impacted by LS&MR Visitors, by Value Added Spending, in Thousands of Dollars**



SOURCE: BBER, IMPLAN

Industries impacted by the LS&MR visitor spending include hotels and motels, full-service restaurants, other accommodations, limited-service restaurants, and all other food and drinking places (see Figure 14). These

industries are mostly impacted by direct spending on the part of visitors. Some industries, however, see significant impacts from indirect and induced spending by local businesses and consumers. These include real estate, owner-occupied dwellings,<sup>9</sup> management of companies and enterprises, and wholesale trade.

### ***Scenario II (Extended Rail with Trail)***

Scenario II reflects the economic impacts of an increase in LS&MR ridership of 20% (4,948 visitors per year) due to the addition of rail with trail for the full length of the LS&MR rail line. This scenario represents roughly \$1.2 million annually in new spending throughout the city of Duluth as a result of LS&MR visitors.

**Table 5. Economic Impacts of LS&MR Visitors, Scenario II – Extended Rail with Trail (Thousands of Dollars)**

<i>Impact Type</i>	<i>Employment</i>	<i>Labor Income</i>	<i>Value Added</i>	<i>Output</i>
Direct Effect	16	\$344.8	\$560.4	\$1,009.1
Indirect Effect	2	\$86.6	\$142.7	\$284.8
Induced Effect	2	\$84.8	\$149.9	\$264.6
Total Effect	20	\$516.2	\$853.0	\$1,558.5

\*Totals may not sum due to rounding

SOURCE: BBER, IMPLAN

Table 6 shows the detailed economic impacts for Scenario II. The spending on the part of LS&MR visitors represent the direct effects. In this case, the estimated visitor spending total (\$1.0 million)<sup>10</sup> is shown as direct output. All other direct effects (wages, employment, and value added) were calculated based on the value of output, using IMPLAN's modeling software. It is estimated that 16 jobs, \$344,800 in wages, and \$560,400 in value added spending would be generated in the city of Duluth as a result of LS&MR passenger spending if rail with trail were extended for the full length of the rail line.

The second row of the table shows indirect effects resulting from LS&MR visitor spending. Indirect effects represent the additional economic activity among industries as a result of the direct effects. In this case, industries that support and do business with the retail and hospitality industries directly affected by LS&MR passenger spending would see an estimated \$284,800 in additional spending and two additional jobs because of the LS&MR visitor spending. Many of the businesses that benefit from these indirect effects may not serve tourists but still see economic benefits from visitor spending within the city of Duluth.

Induced effects measure the amount of increased spending by residential households as a result of the direct effects. Induced effects include, for example, spending on health care costs, household items, housing, and recreation. In this case, \$264,600 in new revenue, \$149,900 in value added spending, \$84,800 in wages, and two jobs can be attributed annually to LS&MR visitor spending in the city of Duluth.

<sup>9</sup> The industry, owner-occupied dwellings, includes imputed rental activity by homeowners. In this case, market rents are used to estimate the value to the property owner.

<sup>10</sup> As in Scenario I, the direct output of \$1.0 million, shown in Table 5, is lower than the total value spent by LS&MR tourists, \$1,205,167 shown in Table 3, due to margining on retail purchases.

### **Scenario III (Shortened Train Ride)**

Scenario III reflects the economic impacts of a decline in LS&MR ridership by 40% (from its current level at 4,124 visitors per year to 2,474) due to the shortening of the train ride. This scenario represents roughly \$600,000 annually in new spending throughout the city of Duluth as a result of LS&MR visitors.

**Table 6. Economic Impacts of LS&MR Visitors, Scenario III – Shortened Train Ride (Thousands of Dollars)**

<b>Impact Type</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Value Added</b>	<b>Output</b>
Direct Effect	8	\$172.4	\$280.2	\$504.6
Indirect Effect	1	\$43.3	\$71.4	\$142.4
Induced Effect	1	\$42.4	\$75.0	\$132.3
Total Effect	10	\$258.1	\$426.5	\$779.3

\*Totals may not sum due to rounding

SOURCE: BBER, IMPLAN

Compared with Scenarios I and II, economic impacts for Scenario III, as shown in Table 6, are the smallest. In this scenario, roughly \$500,000 in direct output<sup>11</sup> would be spent annually by LS&MR visitors. This spending would, in turn, create \$142,400 in indirect and \$132,300 in induced effects in supporting industries, for a total economic impact of \$779,300 annually in additional output throughout the city of Duluth.

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<sup>11</sup> As in the previous two scenarios, the direct output of \$504,600, shown in Table 6, is lower than the total value spent by LS&MR tourists, \$602,583 shown in Table 3, due to margining on retail purchases.

## IV. Conclusions

The Western Waterfront Trail expansion plan, currently being developed by the city of Duluth, includes recommendations that the Western Waterfront pedestrian trail be extended along the St. Louis River estuary to Chambers Grove in West Duluth. As part of its recommendation, the city has proposed removing the rail line across Mud Lake and shortening the length of the LS&MR excursion train ride.

Each year, the LS&MR takes more than 6,000 passengers on its scenic excursion train along the St. Louis River. Roughly two-thirds of those passengers are visitors from outside the city of Duluth, and their spending provides an economic benefit to the city.

Based on results of a survey distributed to LS&MR passengers, the BBER estimated that more than 4,100 out-of-town visitors rode the LS&MR train in 2018. About one-third of those visitors came for the day and two-thirds stayed for multiple nights. Day guests spent approximately \$40 during their visit, while overnight guests spent \$130 per day (\$350 per visit). In total, the combined spending from all LS&MR visitors amounted to more than \$1.0 million.

The survey also found that nearly three-quarters of LS&MR passengers considered the train ride when planning their visit to Duluth. For nearly 30% of passengers, it was their primary reason for coming to the city.

Other notable findings from the survey:

- Nearly half of all passengers selected the third part of the ride, across Mud Lake, as their favorite.
- Walking/hiking on a gravel trail was the most popular alternate activity listed among LS&MR passengers.
- About half of those surveyed said they preferred viewing the scenery from the train over doing other types of activities along the river.
- Nearly all surveyed passengers (97%) would probably or definitely recommend the train to others. However, 61% said they would be less likely to recommend the train if the final stretch along Mud Lake was eliminated.

The study also identified other communities throughout the U.S. that represent successful examples of Rail with Trail (RWT). Feedback from these communities highlighted some of the advantages and considerations associated with incorporating RWT. According to feedback from communities with RWT combinations similar to the one being considered by the city of Duluth, RWT can be safe and popular. Plus, there is evidence, if anecdotal, that the two combined increase awareness and usage of both recreational options.

**Table 7. Total Combined Economic Impacts for Three Modeling Scenarios, in Thousands of Dollars**

<b>Total Effects</b>	<b>Employment</b>	<b>Labor Income</b>	<b>Value Added</b>	<b>Output</b>	<b>Cost to City</b>
Scenario I – Current Impact	17	\$430.2	\$710.9	\$1,298.9	\$0
Scenario II – Extended Rail With Trail	20	\$516.2	\$853.0	\$1,558.5	\$6,349.7
Scenario III – Shortened Train Ride	10	\$258.1	\$426.5	\$779.3	\$4,650.9

SOURCE: BBER

Finally, the BBER modeled three scenarios to determine the economic impacts of the LS&MR on the city of Duluth. The first scenario represented the current impact of the train and its passengers on the city, based on spending information provided in the survey. The second scenario estimated an increase in ridership by roughly 20%, due to a combined RWT for the full length of the rail line. The third and final scenario predicted

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a potential decline in ridership by roughly 40% due to the elimination of the final portion of the train ride.

Results of the three scenarios are shown in Table 7. The current impact of the LS&MR and its visiting passengers was almost \$1.3 million in output, \$430,200 in wages (i.e. labor income), and 17 jobs in 2018. The impacts of visitor spending were felt primarily by tourist related industries, such as hotels and motels, restaurants, and recreation. However, there were a number of secondary industries (e.g. real estate, wholesale trade) that saw indirect and induced effects as a result of increased passenger spending.

The impacts from the second scenario were the largest of the three, with over \$1.5 million in output, \$516,200 in wages and 20 new jobs annually. The third scenario would have the smallest impacts, with roughly \$780,000 in new spending, \$258,100 in labor income, and 10 new jobs annually.

It is interesting to compare the economic impacts of the three scenarios with the estimated cost to the city.<sup>12</sup> For example, in our proposed Scenario II (Extended Rail with Trail), the payback period for the cost of construction would be 4.1 years, while the payback period for Scenario III (Shortened Train Ride) would be nearly six years, due to the assumed decline in ridership from the shortened train ride.

Even though Scenario II has a larger initial cost to the city, its capacity for greater returns through increases in tourist spending supports its economic viability. It should be noted that these costs will not be directly repaid to the city but will instead be introduced into the local economy through visitor spending. Due to this, money spent by the city in Scenarios II and III might be thought of as an indirect investment in Duluth's tourism industry.

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<sup>12</sup> Cost estimates obtained from the City of Duluth's Western Waterfront Trail & Park Master Plan Public Open House #1 and #2 presentations.

## Appendix A. Definitions Used in this Report

**Causeway:** A raised road or track across low or wet ground.

**Corridor:** A (generally linear) tract of land in which at least one main line for some mode of transport has been built

**Direct effect:** Initial new spending in the study area resulting from the project.

**Economic impact:** The effect of an event on the economy in a specified area, ranging from a single neighborhood to the entire globe. It usually measures changes in business revenue, business profits, personal wages, and/or jobs.

**Employment:** Estimates (from U.S. Department of Commerce secondary data) are in terms of jobs, not in terms of full-time equivalent employees. Therefore, these jobs may be temporary, part-time, or short-term.

**Estuary:** Bodies of water usually found where rivers meet the sea. There are also several types of entirely freshwater ecosystems that have many similar characteristics to the traditional brackish estuaries. For example, along the Great Lakes, river water with very different chemical and physical characteristics mixes with lake water in coastal wetlands that are affected by tides and storms just like estuaries along the oceanic coasts.

**Excursion train:** Trains taken for short pleasure trips.

**Freight Train:** Trains that carry goods (freight) rather than passengers.

**Friends of Western Duluth Parks and Trail (FWDPT):** A citizen group incorporated with the State of Minnesota for the purpose of enabling more effective citizen participation with the city of Duluth in planning for the best possible parks and trails.

**Indirect effect:** The additional inter-industry spending from the direct impact. For example, increased sales in linen supply firms resulting from more motel sales would be an indirect effect of visitor spending.

**Induced effect:** The impact of additional household expenditures resulting from the direct and indirect impact. For example, motel employees spend the income they earn from increased tourism on housing, utilities, groceries and other consumer goods.

**Labor income:** All forms of employment income, including employee compensation (wages and benefits) and proprietor income.

**Lake Superior and Mississippi Railroad (LS&MR):** A nonprofit, volunteer-run passenger railroad dedicated to the preservation of railroad history and the restoration of railroad artifacts. The current LS&MR operates a 6.1-mile excursion train along the St. Louis River corridor in West Duluth.

**Margins:** The value of wholesale and retail trade services provided in delivering commodities from producers' establishments to purchasers. Margin is calculated as sales receipts less the cost of the goods sold. It consists of the trade margin plus sales taxes and excise taxes that are collected by the trade establishment. (BEA)

**Output:** The value of local production required to sustain activities.

**Owner-occupied dwellings:** An IMPLAN industry that represents imputed rental activity by homeowners. In this case, market rents are used to estimate the value to the property owner.

**Rail bed:** The roadbed of a railroad track.

**Rails-to-Trails Conservancy (RTC):** A nonprofit organization dedicated to creating a nationwide network of

trails from former rail lines and connecting corridors to build healthier places for healthier people.

**Rails with Trails (RWT):** Trails adjacent to or within an active railroad corridor. The rail-with-trail concept provides more opportunities for the creation of trail systems that enhance local transportation systems.

**Trolley:** A vehicle that runs on track laid in the streets, operated usually in single units and usually driven by electric motor also called a street car or tram.

**Trolleybus,** also called **Trackless Trolley:** vehicle operated on the streets on rubber tires and powered by electricity drawn from two overhead wires by trolley poles. It is distinct from a trolley car, which runs on rails rather than on tires and is thus a form of streetcar.

**Value added:** A measure of the impacting industry's contribution to the local community; it includes wages, rents, interest, and profits.

**Visitor days:** The number of visitors multiplied by their average length of stay. Intended to represent the total number of days spent in Duluth by out-of-town guests in a given year.

**Western Waterfront Trail (WWT):** A 3.3-mile trail along the St. Louis River in West Duluth, linking the Riverside neighborhood to the Lake Superior Zoo. The city of Duluth is considering extending the WWT to Chambers Grove.

## Appendix B. Case Studies

To identify rail with trail (RWT) communities most similar to the Western Waterfront Trail (WWT) and the Lake Superior and Mississippi Railroad (LS&MR) the Bureau of Business and Economic Research (BBER) first identified more than 20 examples of RWT throughout the United States using recommendations from the Friends of Western Duluth Parks and Trails (FWDPT), case studies provided in the city's open house presentations, and RWT reports published by the Rails-to-Trails Conservancy (RTC), a national nonprofit group that advocates for the creation of trails alongside former or existing railway corridors.

Once an initial list of RWT entities had been compiled, a ranking system was implemented to give each RWT a score, from 0 to 50, to measure its similarity with the WWT. A perfect match received a score of 50, while a score of 0 meant there was little similarity on the key characteristics. The scoring system used is as follows:

**Train type:** 10 points for excursion train/trolley, 5 points for commuter train, and 2 points for freight train

**Train speed:** 10 points if it is less than 20 mph, 5 points if it is between 21-40 mph, and 2 points if it is over 40 mph

**Proximity to water:** 10 points if the route is along a body of water

**Implementation of volunteers:** 10 points if train operations are staffed by volunteers

**Trail surface:** 5 points if the path is crushed limestone

**Rail and trail barrier:** 5 points if there is no barrier between the railroad track and trail

A brief description of each RWT, including length of rail and trail, average number of riders per year, number of years in existence, and other important characteristics are described below, beginning with the WWT and continuing with the seven case studies, ranked from most similar to the WWT to least similar.

### ***Western Waterfront Trail***

The existing LS&MR rail line shares the St. Louis River rail corridor with the 3.3-mile, crushed limestone Western Waterfront Trail pedestrian trail (WWT) for about a mile. No barrier exists between the two. The city of Duluth is currently considering extending the WWT beyond the length of the LS&MR rail line and eliminating the last 1.8 miles of the train ride. LS&MR is an all-volunteer run excursion train that operates in Western Duluth along the St. Louis River estuary. The current train ride takes an hour and forty-five minutes to finish its 12.2-mile round trip. The LS&MR, in its current form, has been operational since 1980; however the tracks and corridor that the LS&MR operates on, have been in existence since 1870. The train has approximately 6,000 riders per season, which runs from late June to mid-October.

**Train type:** Excursion Train

**Train speed:** Averaging under 10 mph

**Proximity to water:** Yes, travels along St. Louis River estuary

**Volunteers:** Completely staffed and run by volunteers

**Trail surface:** Crushed limestone

**Rail and trail barrier:** No barrier

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### ***Heritage Rail Trail (50)***

The Heritage Rail Trail is a nearly 25-mile RWT located in York County, Pennsylvania. It features an ADA compliant trail that is 10 feet wide with a crushed stone surface designed for hiking, bicycling, running, horseback riding, cross-country skiing, and snowshoeing. The trail reportedly sees 175,000 users per year (Rails-to-Trails Conservancy 2000). Alongside the trail, Northern Central Railway operates a Civil War-themed excursion train called Steam Into History, which was established in 2013. The replica 1860s steam locomotive with diesel engine travels about 10 miles per hour and is governed by the York County Rail Trail Authority; while the trail is maintained by York County Parks. Volunteers are utilized for the bulk of the oversight and work on the train. There is currently no barrier that separates the trail from the active rail (Google Maps 2018).

**Train type:** Excursion train/trolley – 10

**Train speed:** Less than 20 mph – 10

**Proximity to water:** Yes – 10

**Implementation of volunteers:** Yes – 10

**Trail surface:** Crushed stone – 5

**Rail and trail barrier:** None – 5

### ***Astoria Riverwalk (45)***

The Astoria Riverwalk is a 6-mile RWT, developed in 2000, that runs along the shore of the Columbia River in Astoria, Oregon. The majority of the trail is paved asphalt however there are portions constructed as a boardwalk as well. The Astoria Riverwalk Trolley runs parallel to the trail for 3 miles and offers rides to the public from March through December; with annual ridership of 65,000 in 2017 (Stratton 2017). Both the rail and trail are managed by the City of Astoria but volunteers from the non-profit Astoria Riverfront Trolley Association operate the trolley service and maintain the equipment (Rails to Trails Conservancy n.d.). There is no barrier between the trail and trolley tracks.

**Train type:** Excursion train/trolley – 10

**Train speed:** Less than 20 mph – 10

**Proximity to water:** Yes – 10

**Implementation of volunteers:** Yes – 10

**Trail surface:** Not crushed limestone (asphalt and boardwalk) – 0

**Rail and trail barrier:** None – 5

### ***Eastern Promenade Trail (45)***

The Eastern Promenade Trail is a 2.1 mile-long RWT located in Portland, Maine along Casco Bay and the Portland Harbor. The trail, which was developed in the late 1990s, is paved asphalt and sees roughly 40,000 visitors each year (Rails-to-Trails Conservancy 2000). Alongside the trail, the Maine Narrow Gauge Railway Company and Museum operates a leisure/excursion train, which, in addition to regular trips, puts on several different events year round. The train runs a one-mile (2 mile round trip) route at very low speeds while volunteers provide narration. Volunteers also assist in train operation, restoration, and in any special events put on by the Museum. The trail is maintained by the City of Portland and there is currently no barrier separating the rail and the trail (Portland Trails 2017).

**Train type:** Excursion train/trolley – 10

**Train speed:** Less than 20 mph – 10

**Proximity to water:** Yes – 10

**Implementation of volunteers:** Yes – 10

**Trail surface:** Not crushed limestone (asphalt) – 0

**Rail and trail barrier:** None – 5

### ***South Platte River Trail (45)***

The South Platte River Trail is located in Denver, Colorado and extends for 28.5 miles. The surface of the trail varies but includes portions that are paved asphalt, cinder, and concrete. Running parallel to the South Platte River Greenway, the Denver Trolley offers rides for 3.3-miles. Trolley rides lasts 25-minutes and are provided 5 days a week, beginning shortly after Memorial Day and concluding around Labor Day. Volunteers provide help with a range of activities including train operation, equipment and infrastructure repair, and community outreach. According to the Denver Tramway Heritage Society-- who oversees the trolley—ridership stays consistent around 20,000 passengers per year. As for the trail, its central location and proximity to community attractions contribute to substantial use (West 2018). The trail is managed by the City of Denver's Parks and Recreation department and there is no barrier between the trolley rail and the trail (Google Maps 2018).

**Train type:** Excursion train/trolley – 10

**Train speed:** Less than 20 mph – 10

**Proximity to water:** Yes – 10

**Implementation of volunteers:** Yes –10

**Trail surface:** Not crushed limestone (asphalt, cinder, concrete) – 0

**Rail and trail barrier:** None – 5

### ***Duluth Lakewalk (37)***

The Duluth Lakewalk is a 7.5-mile multi-use trail along Lake Superior that is paved with asphalt and a boardwalk. The trail, which runs from Duluth's popular tourist district, Canal Park, to 26<sup>th</sup> Ave East, is overseen by the city of Duluth Parks and Recreation department. However, a volunteer group, Friends of the Lakewalk, support the trail through advocacy and cleanup. The North Shore Scenic Railroad operates a 28-mile route that runs parallel to the Lakewalk for approximately six miles. The railroad was laid in 1886 and today has a variety of excursion trains, which are managed by the Lake Superior Railroad Museum. The trains travel around 20 mph but can reach a top speed of 30 mph on the mainline. A short metal fence separates the rail and trail and arms, bells, and lights are placed at the point where the rail and trail intersect. As a result of the safety measures taken, the North Shore Scenic Railroad has been recognized by TRAINS Magazine for its safety implementations. In a typical year, the North Shore Scenic Railroad reports about 105,000 passengers. The Duluth Lakewalk, according to a 2000 study from the Rails-to-Trails conservancy, has approximately 700,000 trail users annually. The train reaches speeds of 20-30 mph. The trail attracts equal amounts of tourists and residents. (Miller, Josh; Station Manager North Shore Scenic Railroad 2018)

**Train type:** Excursion train/trolley – 10

**Train speed:** Trains travel around 20 mph, but can reach a top speed of 30 on mainline – 7

**Proximity to water:** Yes – 10

**Volunteers:** Yes – 10

**Trail surface:** Not crushed limestone (asphalt and boardwalk) – 0

**Rail and trail barrier:** Fencing – 0

### ***Allegheny Highlands Trail of Maryland (30)***

The Allegheny Highlands Trail of Maryland is a 22 mile trail that runs from Cumberland, Maryland, to the Mason-Dixon Line (where it then turns into the Allegheny Trail of Pennsylvania). The trail, which opened in 2007, is comprised mostly of crushed limestone with some intermittent stretches of pavement (Rails to Trails n.d.). Since 1988, the Western Maryland Scenic Railroad company has operated an excursion train that runs parallel to the trail for a 15-mile stretch from Cumberland to its turnaround point in Frostburg. The train, which is powered by steam locomotive, serves mostly as a shuttle for trail riders and only completes one ride per day on the weekends. Besides a short section with a minimal fence, there is little to no barrier between the trail users and the steam engine (AllTrails n.d.). According to Bill Atkinson, Vice President of the Allegheny Trail Alliance, the trail sees over 100,000 users per year while the rail sees roughly 35,000 riders per year. Also, it was reported that the train is typically used more frequently by tourists, while the trail typically has more residents and locals.

**Train type:** Excursion train/trolley – 10

**Train speed:** Under 20 mph – 10

**Proximity to water:** No – 0

**Volunteers:** Staffed by employees – 0

**Trail surface:** Mostly crushed limestone with some asphalt – 5

**Rail and trail barrier:** None – 5

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## ***Springwater Corridor (25)***

The Springwater Corridor, located in Portland, Oregon, is a 21-mile long trail that uses a former rail line as its route. In 1990, the Springwater Division rail line was obtained by the “40-Mile Loop Trust” to encourage the development of trails around Portland and connect the city’s many parks. Freight trains, run by the Oregon Pacific Railroad (OPR), operate a three-mile portion of track that runs along the Willamette River between downtown Portland and the Sellwood Bridge (Portland Parks & Recreation 2018). The OPR also has provides some occasional excursions for passengers—typically one per weekend and during the holiday season. The entirety of the trail is paved and includes fencing where the rail is being currently utilized.

**Train type:** Mostly freight with some excursion train rides – 5

**Train speed:** Less than 20 mph – 10

**Proximity to water:** Yes – 10

**Volunteers:** No – 0

**Trail surface:** Asphalt – 0

**Rail and trail barrier:** Fencing – 0

# Appendix C. LS&MR Passenger Survey

## Part 1: Residency

**Q1. What is the zip code at your home residence?** \_\_\_\_\_  
 (Duluth residents, please skip to **Part 3: Train Ride.**)

## Part 2: Visit to Duluth (Complete this section only if you are a visitor to Duluth.)

**Q2. How many people, including you, are in your travel party for this visit to Duluth?**  
 (Include even those not riding the train today) \_\_\_\_\_

**Q3. Which of the following best describes your current visit to Duluth?**  
 Train ride only (no other attractions)     Day trip (train and other attractions)  
 Overnight visit (one night)                       Multi-night stay (more than one night)

**Q4. How many nights, in total, do you plan to stay in Duluth during this visit?** \_\_\_\_\_

**Q5. How important was the LS&MR train ride in your decision to visit Duluth for THIS TRIP to the area?**  
 It was the primary reason for our visit                       It was one of several reasons for the visit  
 It was of little consideration in our decision                       I didn't even know it was here

**Q6. Did you extend your visit to Duluth because of the LS&MR train ride?** Yes\_\_\_ No\_\_\_  
 If Yes, by how much? Days\_\_\_\_\_ Hours \_\_\_\_\_

**Q7. Which other Duluth attraction do you plan to visit or have visited during THIS trip?** (mark all that apply)  
 Canal Park     Great Lakes Aquarium     Lake Superior Zoo     Local Breweries/Distilleries     Park Point/Minnesota Point  
 The Lakewalk     Hiking or Biking Trails     Spirit Mountain     North Shore Scenic Highway     North Shore Scenic Railroad  
 Enger Tower     Glensheen Mansion     Vista Fleet     Historic Downtown     City Events (Blues Fest, etc.)  
 Other (please indicate) \_\_\_\_\_

**Q8. Please estimate the breakdown of your total spending while in Duluth. Include spending by all members of your travel party.**

Lodging Expenses \$	Dining & Drinking Out \$	Retail Purchases \$	Gas Stations \$	Transportation (rental & repairs) \$
Arts & Entertainment \$	Recreation (sporting & permits) \$	Services (spa & guides) \$	Groceries \$	Other (indicate below) \$

Please define "other" spending here \_\_\_\_\_

## Part 3: Train Ride (This section is to be completed by all passengers: visitors and Duluth residents.)

For the following questions, please respond on behalf of your entire party

**Q9. Consider the ride you just experienced. Please rank each area from 1-3 in order of enjoyment with 1 being the best.**

- A.  The first part, through the neighborhoods to the Tate & Lyle factory.
- B.  The second part, along Spirit Lake and past the U.S. Steel site.
- C.  The third part, across the Mud Lake causeway to the end of the trip.



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**Q10. Which aspects of the ride were most enjoyable?** (mark up to 3 choices)

- Access/proximity to river   
  Scenic views   
  Landmarks and historic buildings   
  Wildlife viewing   
  Leisurely ride  
 Narration of area's history   
  Open-air car   
  Kid friendly activities (pennies, conductor hat, etc.)  
 Other (please describe) \_\_\_\_\_

**Q11. How likely would you be to participate in the following activities along the St. Louis River estuary (i.e. the train route) if they were available, either now or in the future?**

	Very Unlikely	Somewhat Unlikely	Somewhat Likely	Very Likely
Walk / hike on gravel trail				
Bike on gravel trail				
Paddle or boat on the estuary				
Use train to shuttle a bicycle				
Use train to shuttle a personal paddle device (kayak / canoe)				
Rent a paddle device and use train for start or return trip				
Rail-bike (four-wheeled, pedal-driven vehicles that ride on the rails)				

**Q12. If you responded "very unlikely" for any of the activities in Q11, why?** (mark all that apply)

- I prefer to view the river and scenery from the train   
  I don't like that activity/those activities  
 I am not able (physically or otherwise) to participate in that activity/those activities  
 I have young children, so participating in that activity/those activities is difficult  
 I can't afford to participate in that activity/those activities   
  I don't own the necessary equipment   
  I'm not in Duluth often  
 Other (please indicate) \_\_\_\_\_

**Q13. How did you hear about the Lake Superior and Mississippi Railroad?** (mark all that apply)

- Visitor's bureau / Visit Duluth   
  Trip Advisor   
  Facebook   
  Brochure   
  Word of mouth  
 Kayak/canoe shuttle service   
  Web search   
  Radio, TV, or newspaper ads   
  Other (please specify) \_\_\_\_\_

**Q14. Would you recommend the train ride to others?**

- Definitely not   
  Probably not   
  Might or might not   
  Probably yes   
  Definitely yes

If you chose "probably not" or "definitely not," why not? \_\_\_\_\_

**Q15. Would shortening the ride by approximately 30 minutes round-trip (eliminating the final stretch across Mud Lake) make you more or less likely to recommend the train to others?**

- Less likely to recommend  
 Equally likely to recommend  
 More likely to recommend

**Q16. Do you have any suggestions for how to improve the LS&MR train ride?** \_\_\_\_\_

**Part 4: Prize and contact information**

Thank you for participating in the survey. Please provide your name and contact information below to be entered into a drawing to win a family adventure package that includes four all-day passes to Spirit Mountain Adventure Park and Lake Superior Zoo. Drawing will be held October 2018. Passes are redeemable through October 2019.

Name \_\_\_\_\_

Email \_\_\_\_\_

Phone Number \_\_\_\_\_

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## Appendix D. Input-Output Modeling

### *Data Sources*

This study uses the IMPLAN Group's input-output modeling data and software (IMPLAN version 3.1). The IMPLAN database contains county, state, zip code, and federal economic statistics, which are specialized by region, not estimated from national averages. Using classic input-output analysis in combination with region-specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. IMPLAN data files use the following federal government data sources:

- U.S. Bureau of Economic Analysis Benchmark Input-Output Accounts of the U.S.
- U.S. Bureau of Economic Analysis Output Estimates
- U.S. Bureau of Economic Analysis Regional Economic Information Systems (REIS) Program
- U.S. Bureau of Labor Statistics Covered Employment and Wages (CEW) Program
- U.S. Bureau of Labor Statistics Consumer Expenditure Survey
- U.S. Census Bureau County Business Patterns
- U.S. Census Bureau Decennial Census and Population Surveys
- U.S. Census Bureau Economic Censuses and Surveys
- U.S. Department of Agriculture Census

IMPLAN data files consist of the following components: employment, industry output, value added, institutional demands, national structural matrices, and inter-institutional transfers. Economic impacts are made up of direct, indirect, and induced impacts. The data used was the most recent IMPLAN data available, which is for the year 2017. All data are reported in 2018 dollars.

Economic impacts are made up of direct, indirect, and induced impacts. The following are suggested assumptions for accepting the impact model: IMPLAN input/output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

Regional data for the impact models for value added, employment, and output are supplied by IMPLAN for this impact. Employment assumptions were provided to the model to enable construction of the impact model. From these data, social accounts, production, absorption, and byproducts information were generated from the national level data and was incorporated into the model. All region study definitions and impact model assumptions were agreed on before work with the models began.

## ***Modeling Assumptions***

The following are suggested assumptions for accepting the impact model:<sup>13</sup>

**Backward-Linkages:** IMPLAN is a backward-linkage model, meaning that it measures the increased demand on industries that produce intermediate inputs as a result of increases in production. However, if an industry increases production, there will also be an increased supply of output for other industries to use in their production. Models that measure this type of relationship are called forward-linkage models. To highlight this concept, consider the example of a new sawmill beginning its operations in a state. The increased production as a result of the sawmill's operations will increase the demand for lumber, creating an increase in activity in the logging industry, as well as other supporting industries such as electric transmission and distribution. IMPLAN's results will include those impacts, but will exclude effects on any wood product manufacturers located nearby that might be impacted by the newly available supply of lumber.

**Employment:** IMPLAN input-output is a production-based model, and employment numbers (from U.S. Department of Commerce secondary data) treat both full- and part-time individuals as being employed.

**Fixed prices and no supply constraints:** IMPLAN is a fixed-price model. This means that the modeling software assumes no price adjustment in response to supply constraints or other factors. In other words, the model assumes that firms can increase their production as needed and are not limited by availability of labor or inputs and that firms in the local economy are not operating at full capacity.

**Fixed production patterns:** Input-output (I-O) models assume inputs are used in fixed proportion, without any substitution of inputs, across a wide range of production levels. This assumption assumes that an industry must double its inputs (including both purchases and employment) to double its output. In many instances, an industry will increase output by offering overtime, improving productivity, or improvements in technology.

**Industry homogeneity:** I-O models typically assume that all firms within an industry have similar production processes. Any industries that fall outside the typical spending pattern for an industry should be adjusted using IMPLAN's Analysis-by-Parts technique.

**Leakages:** A small area can have a high level of leakage. Leakages are any payments made to imports or value added sectors, which do not in turn re-spend the dollars within the region. What's more, a study area that is actually part of a larger functional economic region will likely miss some important linkages. For example, workers who live and spend outside the study area may actually hold local jobs.

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<sup>13</sup> Bureau of Economic Analysis [https://www.bea.gov/papers/pdf/WP\\_IOMIA\\_RIMSII\\_020612.pdf](https://www.bea.gov/papers/pdf/WP_IOMIA_RIMSII_020612.pdf)

## Appendix E. Detailed Inputs

The detailed inputs provided in this section include a complete list of sectors used in economic impact modeling and the method used in determining total visitor spending for all LS&MR passengers for the 2018 season.

**Table 8. IMPLAN Sectors Used in Modeling**

<i>IMPLAN Sector</i>	<i>Description</i>
400	Retail - Food and beverage stores
402	Retail - Gasoline stores
403	Retail - Clothing and clothing accessories stores
405	Retail - General merchandise stores
406	Retail - Miscellaneous store retailers
406	Retail - Miscellaneous store retailers
407	Retail - Nonstore retailers
488	Performing arts companies
492	Independent artists, writers, and performers
493	Museums, historical sites, zoos, and parks
494	Amusement parks and arcades
495	Gambling industries (except casino hotels)
496	Other amusement and recreation industries
496	Other amusement and recreation industries
499	Hotels and motels, including casino hotels
500	Other accommodations
501	Full-service restaurants
502	Limited-service restaurants
503	All other food and drinking places
504	Automotive repair and maintenance, except car washes
505	Car washes
509	Personal care services

*SOURCE: IMPLAN*

Table 8 shows the IMPLAN sectors used in modeling. These sectors were based on the LS&MR passenger survey, where non-local riders were asked to list their spending in ten categories. Spending in each of the ten categories was then distributed into the appropriate IMPLAN industry sector.

**Table 9. Estimated Spending for 2018 LS&MR Visitors**

	(A) Visiting Groups Surveyed	(B) People per Group	(C) Visitors Surveyed	(D) Total Visitors	(E) Length of Stay	(F) Visitor Days	(G) Spending per Visitor per day	(H) Total Spending by LS&MR Visitors (F*G)
			(A*B)			(D*E)		
Day Guests	169	4.1	695	1,390	1	1,390	\$40.81	\$56,726
Overnight Guests	384	3.6	1,367	2,734	2.7	7,284	\$130.10	\$947,580
<b>Total</b>	<b>553</b>	<b>3.73</b> <i>(average)</i>	<b>2,062</b>	<b>4,124</b>	--	<b>8,674</b>	--	<b>\$1,004,306</b>

SOURCE: BBER

Table 10 shows the process for calculating combined total spending for all LS&MR guests for the 2018 season. Just over 550 surveyed groups indicated that they were visiting from outside of Duluth (column A). These groups were divided into day guests and overnight guests. By multiplying the number of groups with the number of people per group (column B), it is estimated that the survey received spending information for just over 2,000 out-of-town visitors during the 2018 season (column C). This number was doubled<sup>14</sup> to estimate the total number of out-of-town visitors that ride the train each year—roughly 4,100 people (column D). Multiplying the number of people with the average length of stay (2.7 days for overnight guests) gives us the number of “people days”— the number of combined days (8,674) LS&MR visitors spent in Duluth in 2018. Column f shows the average spending per person per day (\$130 for overnight guests and \$40 for day guests). These spending values were then multiplied by the number of people days to get an estimated \$1 million in new spending throughout the city of Duluth as a result of out-of-town guests riding the LS&MR.

<sup>14</sup> According to LS&MR records, roughly 6,000 people ride the train each year. With 839 survey responses and an average number of individuals in each group of 3.7, it is estimated that more than 3,000 individuals were accounted for in the survey process, or roughly half (52%) of the LS&MR ridership for the season.

## Bibliography

- All Trails. Great Allegheny Passage: Frostburg to Cumberland. Accessed December 12, 2018.  
<https://www.alltrails.com/trail/us/maryland/great-allegheny-passage-frostburg-to-cumberland>.
- Atkinson, Bill; Vice President, Allegheny Trail Alliance. Email (November 21, 2018).
- Beshore, Debi Dwyer; Marketing and Development Director, Steam into History. Email via Friends of Western Duluth's Parks and Trails.
- Buehler, Ken; General Manager, North Shore Scenic Railroad. Email (November 16, 2018).
- Cordero, Amanda; Chair of Operations, Astoria Riverfront Trolley. Email (December 14, 2018).
- Casey, Mike. Friends of Western Duluth Parks & Trails.
- Department of Transportation. <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/RailsWithTrails.pdf>  
Accessed December 17, 2018
- Duluth, City of. Western Waterfront Trail, Parks and Recreation Master Plan, Accessed December 3, 2018.  
<http://www.duluthmn.gov/st-louis-river-corridor/western-waterfront-planning/>
- Encyclopedia Britannica. October 29, 2018. Accessed December 13, 2018.  
<https://www.britannica.com/technology/streetcar>
- Google Maps. Accessed December 13, 2018.
- IMPLAN Group LLC.IMPLAN System (data and software). [www.implan.com](http://www.implan.com)
- Lake Superior & Mississippi Railroad
- Miller, Josh; Station Manager North Shore Scenic Railroad. Email (November 12, 2018).
- National Oceanic and Atmospheric Administration, U.S. Department of Commerce, Accessed December 12, 2018. <https://oceanservice.noaa.gov/facts/estuary.html>.
- Pack, Kelly; Director of Trail Development. Rails to Trails Conservancy. Telephone interview by Monica Haynes. (November 20, 2018).
- Portland Parks & Recreation. Springwater Corridor. Accessed December 12, 2018.  
<https://www.portlandoregon.gov/parks/finder/index.cfm?&action=ViewPark&propertyid=679>
- Portland Trails. Eastern Promenade Trail. Accessed November 21, 2018. <http://trails.org/our-trails/eastern-prom-trail/>
- Rails to Trails. Allegheny Highlands Trail of Maryland. Accessed December 12, 2018.  
[https://www.railstotrails.us/md\\_allegheny\\_highlands\\_trail\\_of\\_maryland.htm](https://www.railstotrails.us/md_allegheny_highlands_trail_of_maryland.htm).
- Rails to Trails. <https://www.railstotrails.org/build-trails/trail-building-toolbox/basics/rail-with-trail>. Accessed December 14, 2018.
- Rails to Trails Conservancy. Astoria Riverwalk. Accessed November 21, 2018.  
<https://www.trailink.com/trail/astoria-riverwalk>
- Samuels, Dick. Oregon Pacific Railroad Company. Telephone interview December 17, 2018.
- Stratton, Edward. The Daily Astorian. Accessed December 19, 2018.  
[https://www.dailyastorian.com/news/local/off-track/article\\_9250ec10-e499-5570-81ab-](https://www.dailyastorian.com/news/local/off-track/article_9250ec10-e499-5570-81ab-)

3de24b872590.html

Visit Duluth. The Lakewalk. Accessed November 21, 2018. <http://www.visitduluth.com/attractions/parks-and-trails/lakewalk>

Walk Ride Colorado. South Platte River Trail - Denver, Colorado . Accessed November 21, 2018. <http://www.walkridecolorado.com/individual-trails/denver-metro/south-platte-river-trail-colorado>.

West, Pete; Board Member, Denver Trolley. Email November 30, 2018.

Woodrick, Kara; Executive Director, Portland Trails. Email December 18, 2018