

Final Report

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



ENGINEERS
PLANNERS
DESIGNERS



September 2017

SRF No. 10113

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Introduction

The Duluth Transit Authority (DTA) completed a year-long effort to update the Transit Development Plan (TDP). The TDP evaluated the connectivity, performance, and efficiency of DTA's existing transit system. The TDP also identified several service recommendations based on in-depth community input during the TDP process. This report summarizes the different tasks completed during the project (the detailed technical memorandums for each task are attached as appendices).

Goals and Objectives

At the beginning of the TDP process, a thorough review of existing plans, relevant planning and policy documents was conducted to provide a framework for the TDP (see Appendix 1). This review helped identify key items of focus for the TDP as well as to inform the goals and objectives for the DTA. As part of this TDP update, the mission, goals and objectives were revised to better match input received during the initial outreach efforts (see Appendix 2).

The Mission of the DTA shall be to provide public transit service that is safe, convenient, efficient and affordable. The following goals set standards towards accomplishing this mission:

Goal 1. Increase transit use in the Duluth area by providing high quality transit service.

Goal 2: Provide safe, clean and reliable transit service and infrastructure to all current and potential DTA riders.

Goal 3: Provide efficient and sustainable transit service.

Goal 4: Improve customer information and marketing strategies to increase ridership and customer satisfaction.

Specific objectives to help make progress towards accomplishing these goals were defined.

Existing Conditions

DTA is the public transit provider in Duluth providing fixed route service for the general public and curb-to-curb STRIDE (Special Transit Ride) service to disabled riders in Duluth, Proctor and Superior, WI. The Port town trolley seasonal circulator service operates in the summer, mainly for tourists. DTA has a basic frequency of at least 60 minutes on fixed-routes. Overall service hours vary by route, but generally start as early as 4:00 AM and operate as late as 1:25 AM on weekdays. On Saturdays, routes begin as early as 6:09 AM and operate until 11:50 PM, and on Sundays, routes operate from 7:00 AM until 10:40 PM.

DTA began in 1883 when the first mule-drawn rail car was inaugurated as the area's first public transit system. In 1900, the Duluth and Superior transit operations consolidated. Together they operated street cars with over 100 miles of track. During 1930s, all streetcars were replaced by rubber tire buses and in 1969 the DTA was legislatively created.

The Existing Conditions Report (see Appendix 3) examines community demographics, key destinations in the Duluth Metropolitan Statistical Area (MSA), and existing transit services. Additionally, the report provides a summary of DTA goals, objectives, and performance measures, a trend analysis of performance measures related to agency objectives, and a performance evaluation of the efficiency and effectiveness of DTA's transit service.

Demographic Analysis

In Duluth, the household density is higher for areas close to the lake (highest along downtown waterfront) and adjacent to the highways and in Superior, the household density is highest along Highway 35 with medium density along the lake and Highway 53. The existing DTA fixed routes serve all the higher household density areas (more than 4 households per acre). Moreover, majority of the census block groups with more than 0.5 households per acre is served by at least one transit route.

Geographic analysis of transit dependent population is imperative to truly assess the transit need in the Duluth area. The socioeconomic factors suggesting transit-dependency and transit usage include Population size, distribution, and density, age of population, automobile ownership, household income, and population with limited English proficiency. The density and distribution of low income and no vehicle population were assessed as follows (see Appendix 3 for assessment of other socio-economic factors):

- Low rates of **vehicle ownership** is one of several indicators that suggests a population may greatly benefit from transit service. Overall 8.9 percent of households in the Duluth-WI MSA do not own a vehicle. This percentage is higher than the overall percentage of households in Minnesota with no vehicle ownership (7.2 percent). The highest concentrations of households with no vehicles are located along the waterfront area, Saint Louis Bay and western Duluth. Based on the current

transit service routes and quarter mile comfortable walking distance to the bus stops, all of the no vehicle household areas are served by

- Due to the relatively high costs associated with owning and maintaining personal vehicles, many people with **lower income** are likely to use transit when it is available. According to the ACS 2015 –5 year estimates the median household income for the DuluthMSA was \$48,905. That is over \$12,000 or 20 percent lower than median income (\$61,492) for the state of Minnesota. Much of the Duluth metropolitan region's lower income population (population above 31 percent poverty level) is concentrated along the major highways and along the waterfront. All of the lower income areas are currently well-served by the DTA's fixed route service.

Existing Transit Services

Appendix 3 also provides a summary of the transit operations performed by DTA. It includes a fleet inventory, fare analysis, transit technology, fixed-route analysis, and a Demand Response overview.

- DTA fixed-route service is designed to operate in radial and crosstown patterns with the Duluth Central Business District (CBD) as a focus. Route branches converge downtown and feed into destination streets. However, some routes make small loop patterns around major transit nodes such as University of Minnesota at Duluth (UMD), Miller Hill Mall area, and areas of Superior, WI. The existing service has 17 existing fixed-routes that operate in Duluth, and two fixed-routes that operate in Superior. Nineteen fixed-routes operate on weekdays, 15 operate on Saturday, and 11 operate on Sunday.
 - The three routes with the most weekday ridership are Route 1 (Grand Avenue Zoo), Route 10 (Duluth Heights Mall), and Route 11 (East 8th UMD). The routes with the highest Saturday and Sunday ridership are Route 2 (New Duluth), Route 10H (Duluth Heights Mall via 6AE), Route 3 (Proctor), and Route 16 (Duluth Superior).
 - On-time performance is an important factor for reliability and attractiveness of the service. Overall, the three lowest performing routes are Route 2X, Route 7X, and Route 10H. Comparatively, the top three performing routes are Route 18, Route 21, and Route 4.
 - The operating pattern and ridership performance for DTA's fixed-route service was also analyzed by providing a route overview, key ridership areas, interlined routes and boardings per hour.
- Demand response transit services are delivered by STRIDE, an independent contractor who supplies schedulers and vehicle operators. STRIDE is owned by DTA and operated by Transit Special Service Incorporated. STRIDE services are available to residents within the city limits of Duluth and Proctor, as well as clients located $\frac{3}{4}$ of a mile from DTA's regular fixed routes in the City of Superior. STRIDE is a demand response transit service operating in accordance with the

Americans with Disabilities Act (ADA) for qualified individuals. On-time performance for STRIDE service is over 90 percent.

- In October 2016, STRIDE completed over 2,500 trips with an average trip length of 35 minutes and average trip distance of over 6 miles. Data shows very few attendants are required by eligible riders, and very few trips include more than one passenger. However, even though it may seem like STRIDE trips are not efficiently scheduled, there are a number of different circumstances that prohibit passenger trips from being combined. For instance, Duluth's major population centers are spread out along a 26-mile central corridor that makes up the bulk of Duluth's population, along with a secondary major corridor to the Miller Hill Mall area.
 - Over 3,000 reservations were requested in October 2016. Of these requests, 15 percent cancelled, 0.5 percent were no shows, and 0.7 percent were unscheduled. The majority of cancellations were completed following the correct procedures; however, 11 percent of those who cancel did not provide sufficient notice to STRIDE staff.
- DTA has a total of 77 vehicles in their fleet. Of the 77 vehicles, 9 are STRIDE vehicles and 2 are seasonal vehicles. Most of the vehicles in the DTA fleet have a useful life of 12 years. However, 9 vehicles which are used in the STRIDE service have a useful life of 5 years. Moreover, primary DTA facilities include the Duluth Transportation Center (DTC), the DTA Operating Center, and the Transit Center East, which links downtown Duluth to DTC via a skywalk. DTA also maintains two Park and Ride lots – Piedmont and Woodland.
- DTA offers daily, weekly, monthly, and multi-monthly fares. Daily fares range from \$.75 for off-peak hours, which applies to all passengers, to \$1.50 for peak hours. Weekly fares cost 17dollars. Two monthly passes are available, \$40 for adults and \$37.50 for teenagers. Multi-month passes include a 90-day pass, a 180-day pass, and a 360-day pass. Rates begin at \$108 for a teenage 90-day pass/\$115 for an adult 90-day pass. Multi-month passes are only available at the DTC or the DTA Operating Center, while 31-day passes are available at a variety of locations in the service area. Also, transfers between bus routes are free and valid for one hour from the time of purchase or the next connecting trip. Riders must request a transfer when boarding the bus.
- DTA uses a variety of technological tools to monitor system performance and to interact with and serve its customers. System performance data is captured through the Trapeze software system. Trapeze utilizes an automated passenger counter (APC) system to assist in reporting data needed to satisfy federal requirements. DTA can also utilize data captured by the software to monitor operations and performance. Additionally, a Computer Aided Dispatch / Automated Vehicle Location (CAD/AVL) system allows dispatchers and supervisors to monitor the location of vehicles in real-time. For customers, DTA uses a variety of technology and web based tools to reach out to the community. Moreover, system maps with basic rider

information, along with paper schedules with maps, are available on vehicles and at 106 different locations throughout the DTA service area. DTA's website (www.duluthtransit.com) also provides information for customers, as well as additional service details and forms. DTA also utilizes Google Transit to power a Plan & Ride Tool.

Appendix 3 also includes performance evaluation providing an analysis of the efficiency and effectiveness of DTA services. The indicators reviewed include productivity, revenue recovery, route design and scheduling, and operating procedures to determine how these factors impact service efficiency and service quality. The analysis includes how services are performing based on agency objectives and performance measures, public perceptions of service quality, and if services will meet projected future needs.

Community Engagement

A Community Engagement Plan was developed to help facilitate stakeholder and community engagement throughout the study (see Appendix 4). The Community Engagement Plan provided a framework for the outreach strategies, activities, and interactions with local stakeholders and the public by identifying the outreach purpose, targeted audience, timeline, and the intended outcome.

The DTA TDP Community Engagement Plan was focused on getting input on transit needs. It identified engagement strategies that facilitate both in-person and online options for stakeholders and the community to be involved and provide feedback early and often throughout the study. The Plan also identified committees to inform the TDP. Some of the engagement strategies are described below.

Policy Advisory Committee (PAC) meetings

The consultant team met with the PAC throughout the duration of the project to seek their input on the TDP. The PAC consists of key DTA staff, DTA Board Members, MnDOT representative and members of the consultant team. The PAC is made up of members of the DTA Board. The first of five PAC meetings was held on January 25, 2017 and was used as an introduction to the Transit Development Plan (TDP) and to receive their input on critical needs in the region regarding transit. Four key themes emerged during the discussion: technology, transit service, innovation and land-use.

The remaining four PAC meetings were used to present TDP updates and receive comments. The fifth and final PAC meeting included a recommendation to approve the TDP Update and pass it on to the DTA Board for final approval.

Technical Advisory Committee (TAC) meetings

The consultant team met with the TAC throughout the duration of the project to seek their input on the TDP. Members of the TAC include representatives from MnDOT, County, Cities of Duluth, Superior, Hermantown, Proctor, Metropolitan Interstate Council (MIC), and the University of Minnesota – Duluth. The first of four TAC meetings was held on February 6, 2017 and consisted of introducing the TAC to the study and receiving input on needs to be addressed by the project. There were similar themed responses as were heard at the first PAC meeting, but reflecting the variety of members, there were also more specific needs mentioned about technology, transit service, facilities and marketing.

The remaining three TAC meetings were used to present TDP updates and receive comments.

Stakeholder Workshops

The first of two Stakeholder Workshops was held on February 21, 2017. The stakeholders include staff from public agencies and the general public, including area residents, community members, and underrepresented populations. After an introduction to the study, the stakeholders participated in a Strengths Weakness Opportunities Threats (SWOT) analysis of the current DTA transit system.

The second stakeholder meeting, held on July 19, 2017, was used to present TDP findings and receive comments.

Public Input Meetings

An Open House was held on February 21, 2017 at the Duluth Transportation Center. People who attended the open house had the opportunity to comment on the reasons they do, or do not, ride DTA transit. They were also provided with the opportunity to select what they would prioritize for DTA transit service improvements. The most selected priority for improvements to DTA transit service was “span” running buses earlier and later, followed by “frequency” more buses per hour, and then “coverage” more convenient destinations. A second Open House was held on July 19, 2017 to present findings and recommendations of the TDP Update. People who attended the open house had the opportunity to comment on the findings and recommendations.

Pop Up Meetings

Two pop up meetings were held on February 21, 2017 (DTC Skyway) and February 22, 2017 (UMD campus). The pop up meetings were an informal conversation with community members and provided the opportunity to introduce the study, its purpose, how they can participate and an opportunity to take a survey (paper or online).

General Community Survey

The General Community survey was performed to understand the needs and opportunities for transit service from current and potential DTA customers. The survey has both paper and online (Survey Monkey) versions with 20 questions primarily asking about perceptions about current DTA service and recommendations for improvement. The survey asked the respondents to indicate their trip purpose, frequency of riding DTA, barriers to riding DTA and suggestions for improvement. The results of this survey create a clear picture of who benefits from transit service in Duluth, what the service is most frequently used for, and how to improve the service to meet the needs of riders. Specific inferences include:

- People with incomes below \$20,000 a year are the most frequent users of the transit system across reasons for trips, but also represented a significant portion of respondents that did not know how to use the bus service.

- Young people under the age of 25 largely responded that they didn't know how to use the bus service, this provides an opportunity for targeted education. General education campaigns could also benefit ridership.
- More than half of people who responded that their most common destination while using transit was the City of Superior made more than \$50,000 a year, which was the highest ridership for earners over that value of any destination. There was an even balance of incomes that most frequently use the service to reach downtown Duluth. London Road was chosen the most among options for expansions of service locations.
- Riders chose higher frequency of routes as the one improvement they would most like to see. Bus shelters and more convenient destination locations followed as the next most popular choices for improvements.

STRIDE Survey

The purpose of the STRIDE survey was to understand the STRIDE rider's perception of the STRIDE service, willingness to use other transportation services (including public transit) and service improvement suggestions. After discussing with DTA, the consultant team designed a 7-question survey. DTA staff conducted phone interviews from March 23 to April 17, 2017 and 180 responses were sought. To ease the process of notes taking and data entry during phone interviews, consultant staff designed the survey on Survey Monkey and provided manual data-entry (data-entry kiosk) link to the phone interviewers. The analysis of STRIDE survey data is not included in this summary since the analysis is being conducted in-house by DTA.

Employer Survey

The purpose of the employer survey was to get a better understanding of the role transit service plays in increasing the labor shed, lower absenteeism, and general benefit to businesses. The survey consisted of 20 questions and helped in assessing the employee strength at each of the respondent employer locations. Working with DTA, MIC and City of Duluth staff, a list of employers was created. The employers were contacted by phone to garner their interest in participating in the survey. Ten responses were received for the survey and the following inferences were drawn:

Only 2 employers provided their employees information about commuter options (e.g. bus schedules). Four employers have flexible work hours for their employees. Moreover, 2 of these employers also have telecommuting options for their employees while the other two have compressed work schedule (e.g., 4-10, 9-80, 3-36) availability. Only Edgewater Hotel and Waterpark offers guaranteed/emergency ride home program to their employees (offers employees who did not drive alone a taxi ride home in case of an emergency). Edgewater also indicated that 45 percent of their employees commute by public transit.

Service Recommendations

Appendix 5 presents the service and operations plan as part of the five-year TDP. The basis of the recommendations is to provide a higher level of service to improve the overall efficiency and productivity of the service. These service recommendations are intended to complement the proposed DTA Pilot Program service package that will be implemented between June and December 2017. The consultant team has outlined areas that can further improve the DTA system and begin to focus on simplification of routing and adding more frequency to the system to help improve the overall ridership and productivity. The service plan will be implemented in three phases over the five-year TDP planning horizon.

Phase 1: Years 1 and 2 – Implementation of 2-Year Pilot Program of Routes

Phase 2: Years 3 and 4 – Frequency and Efficiency

Phase 3: Year 5 – High Capacity Options and Regional Connectivity

Key components of the service plan include:

- Introduction of new routes through the 2-Year Pilot Program.
- Simplification of route interlining and route variations.
- Improvement to weekday and weekend frequencies on some routes.
- Introduction of new service delivery options.
- Introduction of new routing structures for some services to the mall.

The following longer-term strategies focus on continuing to improve service through higher frequencies where there is demand:

- Continuation of coordination with other regional transit providers.
- Development of a high capacity service along the West Mainline or the highest ridership corridor.

As part of the Pilot Program, DTA will introduce new strategies that include:

- Five new routes
- A trolley extension
- Additional service hours on Saturdays
- One additional bus dedicated to STRIDE paratransit services
- Development of a new agency mobile device app

The proposed Pilot Program will build on DTA's existing robust system. DTA has a strong system including several high frequency routes, a limited timed transfer system at the Downtown Center, and extended service hours from 4:00 am to 1:00 am on some routes. The proposed Pilot Program would increase annual revenue hours by 23,858 and put 12 additional daily buses into service. Through these

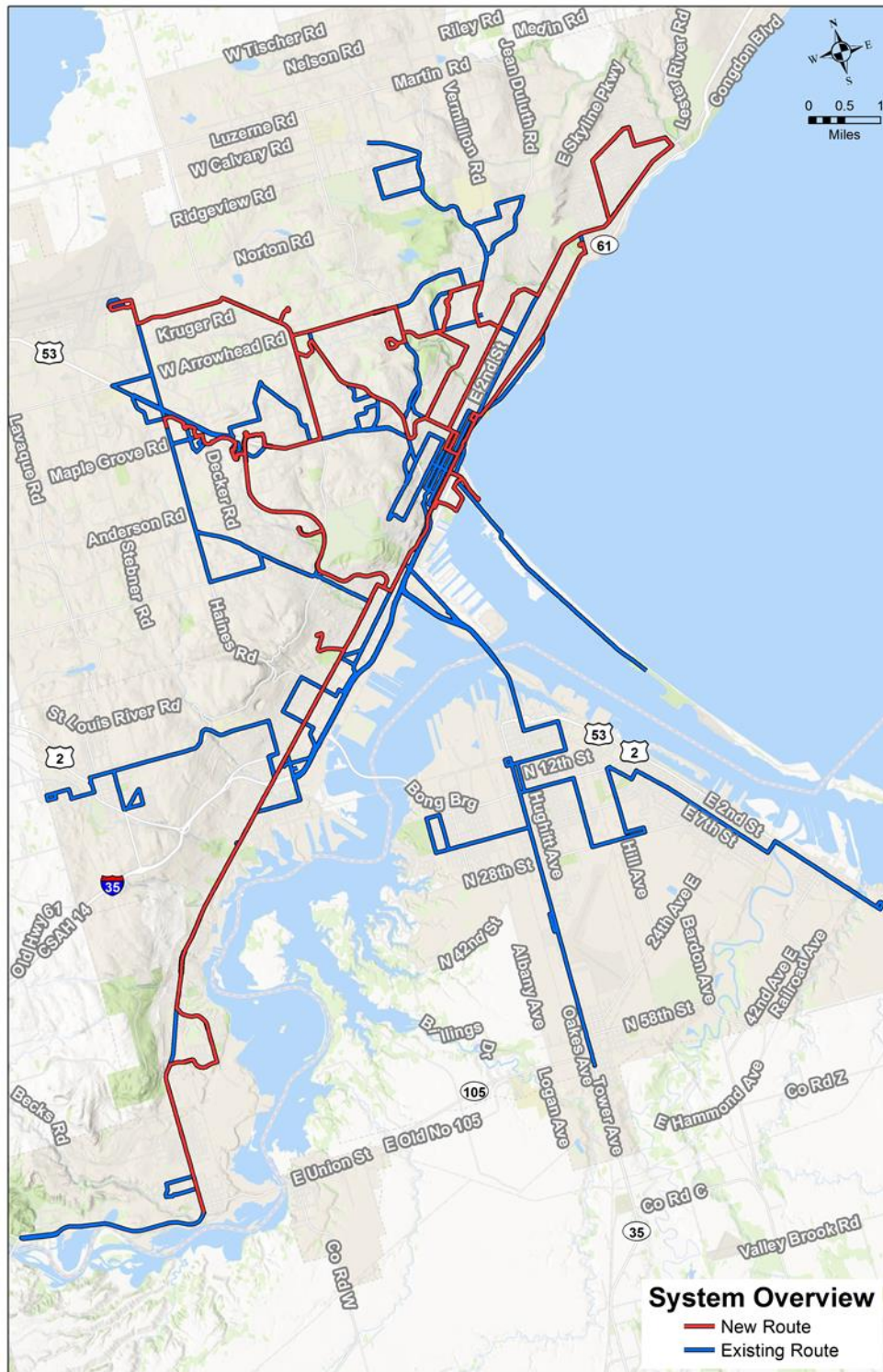
measures the proposed Pilot Program intends to provide additional coverage extended throughout the service area. Table 1 provides an overview of the proposed Pilot Program, and Figure 1 displays proposed routes.

Table 1. DTA 2 Year Pilot Program Overview

Route/ Update	Overview	Additional Daily Rev Hours	Span of Service/ Frequency	Implementation Date
Route 5 New Duluth – Miller Hill Mall	- Extend Route 5 west to New Duluth - Provide one seat ride from New Duluth to Mall	23	7:15am – 8:00pm/ 60 mins	August 27, 2017
Route 19 Port Town Trolley	- Extends existing Trolley west on Superior to Fitgers - Extends Trolley service hours from 7:30pm to 11:00pm	11.6	11:30am – 11:00pm/ 20 mins	June 5, 2017
Route 20 Downtown – Airport via United Health Care	- Introduces new service to employment centers on Arrowhead Road and Rice Lake Road including the Airpark and United Healthcare - Provides additional service between downtown and the airport	6.6	6:00am – 5:30pm/ 60 mins	December 3, 2017
Route 21 Lakeside to UMD/Miller Hill Mall	- Introduces new service with direct connections between two major activity centers – UMD and Miller Hill Mall - Improves connections between Lakeside and UMD	31.4	7:18am – 8:35pm/ 60 mins	August 27, 2017
Route 22 Lincoln Park Middle School – London Road	- Introduces new direct service to Lincoln Park Middle School - Provides additional service on the West Mainline - Introduces new service on London Road	14	7:00am – 7:00pm/ 60 mins	August 27, 2017
Route 23 UMD Circulator	- Two-way loop operating on E. 4th Street and E. 9th Street and through the UMD campus - Helps to relieve overloads on Routes 11 and 13 - Improves frequencies to UMD	11	7:30am – 5:30pm weekdays only during UMD session/60 mins	August 27, 2017
Additional STRIDE bus	Provides additional STRIDE bus in service to improve paratransit availability	8	Extend service Monday - Saturday	August 27, 2017
Additional Saturday Service	Extend late night Saturday service on Routes 2, 6 and 10	10.2	Extending service hours past 10:30pm	June 2017
Technology Improvements	- Develop a DTA app for real time information - Update the agency website	N/A	N/A	2017 - 2018

Source: AECOM, 2017

Figure 1. Phase 1 Pilot Program Route Map



Source: AECOM, 2017

Capital and Facility Plan

As part of the TDP, a Capital and Financial Plan was developed (see Appendix 6). The Capital and Financial Plan identifies capital needs including vehicles, facilities, and enhancements to support DTA operations through 2021. The DTA provided a list of projects, including funding source, grant program and total project amount, for years 2017 through 2024. The elements of the Capital and Financial Plan are a result of the findings from the TDP along with a list of projects (2017-2024) supplied by DTA staff. The line items listed under the Financial Plan in this document are funded through a combination of federal, state and local funding sources.

Appendix 1. Review of Previous Plans

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



January 2017

SRF No. 10113

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Introduction

The purpose of the Duluth TDP update is to review and evaluate the existing performance of the Duluth Transit Authority (DTA) system, as well as to make recommendations to enhance the system as needed. The Duluth TDP will rely on a firm understanding of not only current conditions, but also past conditions, attempts, and accomplishments documented in similar studies preceding it. The following is a review of the existing plans and its recommendations, as well as a review of relevant planning and policy documents which serve to frame transit development in the region.

Previous Plan and Studies

- Minnesota Department of Transportation (MnDOT) Greater Minnesota Transit Investment Plan
- Duluth-Superior Metropolitan Interstate Council (MIC) Connections 2040: The Duluth – Superior Long Range Transportation Plan (2014)
- Northwest Wisconsin Regional Planning Commission (NWRPC) Superior Transit Comprehensive Operations Analysis
- Arrowhead Regional Development Commission (ARDC) Local Human Service Transit Coordination Plan (2011)
- DTA Transit Vision Report (2009)
- DTA Multi-Modal Transportation Terminal Analysis (2009)

Consistent Themes across Previous Plans and Studies

The purpose of this section is to identify the goals that were consistent across the several reviewed plans and studies. The following bullet point summarize the consistencies:

- Partner with area communities, businesses, major employers and public agencies for coordination of services to meet short-term and long-term transportation needs.
- Promote diversification of modes encouraging a closer connection between pedestrian, bicycle and transit travel.
- Encourage and promote efficient transit routing and aim for achieving better sustainability in transit services.
- Create a stronger Duluth Transit Authority (DTA) presence and image by developing innovative marketing strategies for all segments of the population.
- Improve public information and outreach to better understand customer needs and maximize transit use by residents.

- Ensure a safe and comfortable environment to riders by providing safe and reliable infrastructure and customer amenities (e.g. security cameras, police patrol, etc.).
- Adopt technology and service innovations to improve transit effectiveness and customer satisfaction.
- Invest in technology (e.g. mobile travel applications, automated vehicle location (AVL) system) to make transit travel easier, smoother and reliable.
- Focus on livable community goals of providing access and mobility to all residents and a transportation network that stimulates economic activity.
- Use performance measures to continually evaluate route productivity, transit operations and transportation effectiveness.
- Maintain and strive to increase funding opportunities for local and regional transit operations and projects.

Review of the Relevant Plans and Studies

MnDOT Greater Minnesota Transit Investment Plan (2016)

In 2011, the Greater Minnesota Transit Investment Plan (GMTIP) was developed to provide a connection between the goals, visions and strategies included in the 2009 Greater Minnesota 20-year Transit Plan and the funding apportionment for each public transit system. In 2016, the transit investment plan was updated to devise a policy direction for transit in Greater Minnesota over the next 20 years and calculate the investments needed to meet 90 percent of transit demand by 2025.

The plan's objective is to improve mobility for the general public with emphasis on seniors, youth, low income populations, homeless populations, individuals with disabilities, veterans, new Americans and commuters.

The GMTIP 2016 outlines the wider benefits of having public transit in Greater Minnesota: economic, health, and air quality benefits and transportation connections. It also clearly defines the objectives of the plan and explains Greater Minnesota's existing transit services, costs and funding. Moreover, the plan quantifies the need for transit which in turn informs the need for transit service, routes, service levels and fares based on population density, demographic characteristics, employment and vulnerable populations. Overall, each GMTIP requires MnDOT to assess ridership, total transit needs in Greater Minnesota (two models were used) and a plan to meet the identified needs. In addition, the GMTIP also identified passenger levels, levels of service and costs necessary to address:

- Ninety percent of total transit service demand in Greater Minnesota by 2025
- Costs of meeting 100 percent of total transit service demand every five years from 2015 to 2030.

The 2016 GMTIP uses four performance measures: ridership, fleet condition, span of service and on-time performance. MnDOT annually reports progress performance on each measure. Also, as part of the plan, MnDOT analyzed the gap between funding forecast and finding requirements for operating cost from 2016-2025. Using this information, investment strategies were developed and each strategy was rated on its estimated feasibility, cost and ease of implementation, sustainability and its fulfillment of one or more of MnDOT's goals for transit system. In the end, the GMTIP describes the vision for Greater Minnesota's transit for the next 20 years.

The plan predicts that the baseline span of service with suggested urban and rural improvements is likely to meet 90 percent of the calculated public transit demand in Greater Minnesota. Unlike federal funding for Greater Minnesota transit, the state funding sources are unpredictable which makes it necessary for MnDOT to communicate the need for transit and transit funding to the public and policy makers.

Lastly, the plan identifies the following noteworthy facts involving Duluth Transit:

- Early and late service operations by Duluth Transit (as early as 4:30 a.m. and as late as 12:30 a.m.)
- Considerable nodes of employment density in Rochester, Duluth, St. Cloud and Mankato that necessitate the need for regional commuter options.
- Duluth Transit is one of the three urban service providers that meet or exceed the baseline service span (service that spans more than 20 hours on weekdays, more than 12 hours Saturday and more than nine hours Sunday).
- Duluth Transit has at least 60 minutes headways, weekend service, evening (after 7:00 p.m.) service and has schedules online.
- St. Louis County has 9.5 percent zero vehicle households which is higher than 6.2 percent share in Greater Minnesota and 7.1 percent share in the state.

Duluth-Superior MIC Connections 2040: The Duluth – Superior Long Range Transportation Plan (2014)

Connection 2040, the most recent update of the Long Range Transportation Plan (LRTP) for the Duluth – Superior urbanized area, includes the strategy for the effective investment of public funds in multi-modal transportation infrastructure throughout the Duluth-Superior area. Moreover, Connections 2040 also forms the basis of the Duluth and Superior Transportation Improvement Programs (TIPs), short-range capital improvement programs and MIC’s annual work program activities.

Connections 2040 addresses all modes of transportation within the Duluth-Superior metropolitan planning area. However, this summary focusses on the public transit system and its long range plans. The plan is based on nine planning goals with each goal including one or more objectives and several strategies to achieve those objectives. Table 1 shows Minnesota GO guiding principles as represented in Connections 2040 goals. Table 2 lists the goals, objectives and strategies that pertain to public transit.

Table 1. Minnesota GO Guiding Principles as represented in the Connections 2040 Goals

Connections 2040 GOALS →	SYSTEM PRESERVATION & OPTIMIZATION	NETWORK INTEGRATION	ACCESS & MOBILITY	ECONOMIC VITALITY	ENVIRONMENTAL PROTECTION	OPERATIONS and MAINTENANCE	PUBLIC PARTICIPATION	SAFETY	SECURITY
Minnesota GO Guiding Principles ↓									
Leverage public investments to achieve multiple purposes				●	●			●	●
Ensure accessibility		●	●				●		
Build to a maintainable scale	●				●			●	●
Ensure regional connections	●	●		●					●
Integrate safety						●		●	
Emphasize reliable and predictable options		●	●	●		●	●		
Strategically fix the system	●	●		●		●			
Use partnerships		●		●	●	●	●	●	●

Table 2. Connection 2040 Goals, Objectives and Strategies that Pertain to Public Transit

Goal	Objective	Strategy
Access and Mobility	Increase transportation choices and year-round access for the movement of people	• Ensure ADA compliance, particularly in high-use and key pedestrian corridors • Increase transit options, including on-demand transportation options • Improve sidewalk connections to major pedestrian generators • Expand bicycle infrastructure • Improve connections between modes for people of all ages ("8 to 80" Cities) • Promote events such as free DTA ride days, Bike to Work and Walk to School days, etc.
	Shift investment strategies toward providing a diversification of modes (rather than solely increasing roadway capacity)	• Lead education and dialogue about the importance of a multi-modal transportation network • Review and continually update the active transportation plans for the region, including trails, sidewalks and bikeways plans • Promote events such as free DTA ride days, etc.
Economic Vitality	Encourage transportation investments that stimulate economic activity	• Encourage infrastructure investments that integrate, coordinate and modernize multi-modal infrastructure
	Improve transportation to and within key population, activity and employment centers	• Increase transit to employment centers • Continue to support and improve existing transit service • Make strategic infrastructure investments that integrate, coordinate and modernize multi-modal infrastructure
	Promote transportation decisions that support regional and neighborhood vitality	• Increase flexibility of the transportation system to respond to changing demographic trends and economic and market conditions • Implement complete streets improvements at key activity centers • Present information about transportation options to city council and county boards • Continue to include all modes in planning • Develop metrics for measuring economic benefits of roadway improvements that benefit active transportation modes (bicycle, pedestrian and transit)
Operations and Maintenance	Ensure sufficient funding for operations and maintenance needs	• Conduct corridor studies of priority roadways; develop recommendations aimed at improving multimodal operations • Assist local transit providers with the procurement of funding for converting more of their fleet to more fuel efficient vehicles
	Optimize efficiencies of area transportation operations for all modes	• Adopt technological innovations aimed at enhancing transportation services and traffic operations • Explore the opportunities for more park-and-ride lots that serve commutes between the region and the urban core • Conduct corridor studies of priority roadways; develop recommendations aimed at improving multimodal operations • Advocate for signal-prioritization in key activity centers

Public Participation	Ensure the public has a variety of opportunities for information and involvement	• Coordinate planning and outreach efforts with local jurisdictions and transportation partners
	Ensure efforts to inform and engage disenfranchised groups impacted by transportation decisions	• Broaden contact base and invite participation from churches, community clubs, group homes, and special needs facilities
	Improve strategies and methods to get the word out, receive feedback and increase public interest	• Increase use of real-time consumer technologies
Environmental Protection	Avoid, minimize and/or mitigate the negative environmental impacts of local and regional transportation	• Encourage the use of active modes such as transit, bike and walking
	Reduce negative social or cultural impacts of local and regional transportation	• Promote transportation choices that reduce negative impacts • Encourage the use of active modes such as transit, bike and walking • Increase opportunities and locations for seamless transfer between modes • Ensure that the facilities for vehicles also provide for alternative modes
	Improve energy conservation	• Encourage the use of active modes such as transit, bike and walking • Increase education/dialogue about the importance of a multimodal transportation network • Extend tax benefits for use of public transit
	Ensure that adequate transportation facilities are in place and functioning at the time development occurs	• Ensure concurrency between transportation facilities and planned commercial, industrial and residential development
Network Integration	Improve connectivity between modes of transportation for people	• Recognize multimodal needs when designing facilities • Coordinate transit schedule and routes with major destinations including large employers, colleges and schools. • Integrate the transportation system to create efficient travel for all users of the corridor, including recognizing the different needs for each mode of transportation • Further establish key transit corridors, by including transit-oriented zoning and infrastructure which supports these corridors.
	Improve coordination of transportation facilities and services between agencies and municipalities	• Increase local coordination to ensure that transportation projects and services integrate different modes. • Prior to development, coordinate cross-agency communications and/or meetings when new projects or services may benefit other groups. • Promote inter-agency successes as they occur in order to foster a culture of working together across agencies

Safety	Improve bike and pedestrian safety	• Increase the use of techniques and technologies to improve bike and pedestrian safety. • Promote and invest in roadway projects that support the safe movement of pedestrians and cyclists. • Monitor and evaluate crash data and other information to identify and prioritize locations of concern regarding bike and pedestrian safety. • Seek Safe Routes to School (SRTS) and other funding sources to help promote bike and pedestrian safety around schools. • Coordinate the input and efforts of the 4 "E's" (Education, Enforcement, Engineering, and Emergency Response) and other stakeholders that impact bike and pedestrian safety. • Seek planning and funding resources to develop area-wide bike and pedestrian safety action plans. • Establish performance measures to support bike and pedestrian safety.
System Preservation and Optimization	Increase longevity of local transportation facilities for all modes	• Increase coordinated use of technologies for multimodal operations and asset management • Consider Transportation Demand Management to provide or expand alternatives to single-occupancy vehicle travel, such as transit, bicycling, and walking. • Replace sidewalks, include bicycle accommodations and optimize placement of bus stops as a component of roadway reconstruction.
	Increase funding for local and regional transportation projects	• Identify and pursue new funding opportunities. • Work with local governments to include funding of transportation projects in comprehensive plans • Emphasize funding requirements in conducting public meetings on transportation projects and needs • Research federal and state grant availability and determine funding eligibility for projects • Provide guidance and support of grant applications for transportation projects • Plan for multimodal and innovative projects (even without funding available at the time) that may be eligible for future funding (shovel ready plans).
	Ensure appropriately scaled transportation network	• Determine the transportation mode(s) that will grow with future demand. • Develop a system/process to prioritize infrastructure needs. • Make sure provisions for mass transit and alternative modes are included during planning for new and redeveloped areas that may generate demand.

Security	Ensure the security of all transportation facilities	• Seek opportunities for redundancy and resiliency in the transportation system. • Develop a security check list for all transportation facilities that outlines issues for review. • Conduct security audit of all transportation facilities to identify areas of vulnerability. • Establish a system of priorities for upgrading security measures at transportation facilities where weaknesses are identified. • Establish Safety and Security workgroup with representatives from all transportation modes.
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NWRPC Superior Transit Comprehensive Operations Analysis (2014)

The NWRPC with assistance from DTA and MIC contracted with SRF Consulting and Bourne Transit Consulting to perform a comprehensive operations analysis of transit services in Superior, WI. The study included an assessment of the City of Superior's existing community and transit service conditions, review of the DTA transit's performance in Superior, and recommendations to adjust schedules, running times, geographic coverage, fares, etc.

The City of Superior contracts with DTA to provide public transit service through an intergovernmental agreement. DTA operates two fixed routes in Superior, along with paratransit operated by DTA's STRIDE service as per the requirements of the Americans with Disabilities Act.

The objective of the study was to develop recommendations focusing on service concepts that could be enacted using existing financial resources, or that provide the opportunity to reinvest the existing resources. A five-year transit vision summary was prepared that listed the issues that need to be resolved, implementation plan assumptions, time frame and several aspects of implementation. Both transit routes were analyzed in detail for existing advantages and disadvantages and if modification of any type affects the current and potential riders.

Recommendations in the report addressed the following identified needs:

- Lack of midday frequency
- On-time performance
- Improvement to Intra-city Market

Objectives listed in the document focused on the service concept recommendations based on the needs and existing financial resources. Some of the service concept recommendations included identified issues, such as route reliability, service operations and expansion for Route 16 and Route 17. The recommendations included several minor and easy changes to improve operations of Route 16 and 17 that were also likely to improve the ridership. Route 16 and 17 recommendations also include the possibility of coordination with Northern Lights Express (NLX) by traffic engineering modifications or by adding mileage to the route and compensating the time at other locations.

Since the study was completed, Route 16 was shortened (now terminating at 50th Street in the Itasca Neighborhood instead of 53rd Street). This has eliminated a low ridership segment of the route and improved on-time performance. Also, very minor changes were made to the bus routing through Mariner Mall, and route maps were updated to reflect that. Additionally, deviations into several parking lots and frontage roads were eliminated on Route 17 to improve run time and on-time performance. This was made possible by improving crossings

and signalized intersections so that passengers could safely board buses on Tower Avenue. Additional deviations will be phased out over time.

The report outlines a 5 year vision for transit with 3 key issues to resolve: midday service frequency, on-time performance, connection with Duluth and convenience for riders in Superior, and lack of transit awareness. The vision for first year focused on reliability issues, second year on service improvements, third year on service frequency improvements, fourth year on service area expansion and fifth year on reduced headways and expansion of service hours. The top priority for vision planning and issue resolution was to address issues in a cost neutral manner.

The policy and administrative recommendations included in the analysis to stabilize the declines in ridership when the cost neutral service improvements are initially implemented. These include:

- Marketing and outreach to the underserved population (for example, travel training to senior and new riders)
- Additional Funding opportunities (for example, funding from educational institutions and specialized transportation assistance for counties)

ARDC Local Human Service Transit Coordination Plan (2011)

The Human Service Transportation Coordination Plan by ARDC emphasizes on transit dependent populations (primarily elderly, persons with disabilities and low income population) in the Arrowhead region of Minnesota. The Arrowhead Region includes the seven county region of Northeast Minnesota including the counties of Carlton, Aitkin, Itasca, Koochiching, St. Louis, Lake and Cook. Transit dependent populations were identified and Duluth was recognized as the key destination within the Arrowhead region.

The plan identifies Arrowhead Transit and Duluth Transit Authority as the region's largest transportation providers with a majority of riders using transit for commuting to work, medical appointments and visiting regional shopping centers. In the region, Duluth has the largest population concentration, population concentrated around the University of Minnesota Duluth campus, in the downtown area and around the Miller Hill area. Also, the largest concentration of households in poverty and of minority populations lie in Duluth making transit important for residents. These low income households are located in downtown hillside and Lincoln Park area.

Overall the needs assessment findings demonstrate the need of transit in the Duluth metropolitan area due to several reasons including presence of transit rider generators, low income and student populations, etc. Several projects were prioritized in the plan which included Duluth:

1. Mobility manager in the Twin Ports (communication, training and organizational support)
2. Ride contracting (sharing resources to coordinate and consolidate transportation services)
3. Transit shelter (improving access to transit stops).
4. Regional coordination body (for communication, training and organizational support in the arrowhead region)
5. Call center (coordinating dispatch services in the arrowhead region)

DTA Transit Vision Report (2009)

DTA with assistance from the Metropolitan Interstate Council (MIC) and Transportation Division of ARDC developed a comprehensive five-year transit plan for the Duluth-Superior metropolitan area that was initiated in 2008 and completed in 2009

The key areas discussed in the Transit Vision Report were:

- Existing bus service and performance measures review
- Current and future trends affecting transit
- Change in commuting patterns
- Current and future major travel destinations
- Future capital needs
- Suburban transit options and needs
- Performance standards for different service types
- Marketing plan
- Financial plan
- Connection between transit and community planning
- Technological innovations
- Security and service quality issues and needs
- Service improvements
- Priorities for transit service delivery

The plan includes nine goals which drive the specific objectives and standards for DTA service delivery, performance and customer satisfaction:

1. Maximize public transit use by residents by better understanding and meeting customer needs and travel patterns.
2. Provide a safe environment to riders that includes operationally safe equipment and facilities as well as personal security and property protection.
3. Provide reliable transit service to the transit dependent and disabled population.
4. Develop and maintain transit service marketing strategies for all segments of the community that will have a positive impact for the DTA.
5. Promote and support an environment of mutual respect and courtesy ensuring all employees are treated fairly and strive to maintain and upgrade the professional /technical knowledge and competence of employees.
6. Work closely with area communities, businesses and public agencies toward short and long range transit solutions.
7. Promote the development of transit facilities and services that meet the needs of the community that are linked to land use planning and design that encourages pedestrian/ bicycle access.
8. Increase and improve public transportation effectiveness through research and adoption of technology, management practices and service innovation.
9. Strive for sustainability both in the use and production of services.

The plan development team developed or updated DTA goals, objectives and standards for better system evaluation and operating effectiveness. The key findings were:

- Transit service needs to be based on people's travel patterns. A hub and spoke system enhances the access to destinations other than downtown.
- Bus fleet should provide service flexibility. For example, there may be areas where lighter duty vehicles can provide economical service. However, since DTA's major operating costs are labor costs, this idea had limited success. The difference in fuel use between heavy duty buses and smaller buses is not significant when compared to labor costs.
- Transit route productivity needs to be consistently evaluated. The process of adjusting demand and funding with route modifications should be regular and consistent for efficient working.
- Marketing the transit service is essential. Increased marketing resources for both research and promotions need to be made a priority.
- Efforts need to be made to make transit user-friendly.

The study also provided recommendations to address transit changes needed within the Duluth-Superior metropolitan area. A socioeconomic/demographic and land-use characteristics review analysis was performed as part of the study. Several recommendations were implemented and/or modified as needed and considerable public input (passenger surveys and public meetings) was also sought to make transit useful and effective. The different recommendations in policy, service, marketing and technology were based on the key areas the report focused on. For example, the policy recommendations were as follows:

- Focus on "livable community" as a more economically viable model for the city. Promote and educate the public and city government about this concept.
- Promote transit-friendly developments.
- Consider transit needs during reconstruction of transit roadways.
- Promote mixed-used developments near transit infrastructure.
- Encourage policies that improve bicycling and pedestrian activities.
- Promote planning policies that improve transportation choices.

Moreover, the plan also included service proposals within three separate plans: Fixed Route Service Enhancement Plan, Miller Hill Mall Area Service Plan and the Duluth Night Service Plan. The fixed route service enhancement plan analyzed the adequacy of current fixed route service using service guidelines. Several recommendations were made to address efficiency specific routes. The future work discussed in the plan include: City of Superior Service, Arrival and Departure Time Analysis, and 15c Routing and Timing Analysis.

The recommendations and their status is as shown in Table 3.

Table 3. Transit Vision Report Recommendations and Implementation Status

Recommendations		Initiated/ Status
Customer Service Improvements		
1	Expand U-Pass concept to businesses	Yes
2	Expand use of proximity cards and magnetic strip cards	Yes
3	Expand Transit 101 offerings to more groups of people	No
4	Enhance current customer complaints system focused on ensuring "customer satisfaction"	Yes
Operational Recommendations		
1	Enhance bus stop signs and shelter	Yes
2	Assist regular route usage among persons with disabilities	Yes
Route Recommendations		
1	Improve Route 6 and Route 7 interface	Yes
2	Develop mall shuttle and solidify Route 10 scheduling	Yes
3	Bus running time analysis	Yes
4	Create downtown circulator (technology to be decided)	No
5	Work with the city of Superior to further evaluate route options	Yes
6	Extra-urban services (Park & Rides in the short run)	Yes
7	Multi-modal terminal and rail integration	Yes
Marketing Recommendations		
1	Increase marketing resources	Yes
2	Develop green marketing	Yes
3	Increase CBD commuter marketing effort	Yes
4	Increase youth marketing effort	Yes
5	Maintain comprehensive marketing research program	Yes
6	Produce and distribute senior transit packet	No
7	Enhance distribution of schedule and other DTA information	Yes
Organizational Recommendations		
1	Maintain DTA's strong customer service	Yes
2	Educate, promote and lobby the public and city government toward "livable community" policies	Yes
Short range		
3	Develop transit criteria for new developments	No
4	Build relationships with developers before designs are complete	No
5	Review TDP route criteria to focus more on ridership and ridership densities	Yes
6	Evaluate regionalization - both in Minnesota and Wisconsin (new state laws in WI allow for tax base expansions)	No
Long range		
7	Evaluate streetcar systems	No

DTA Multi-Modal Transportation Terminal Analysis (2009)

DTA conducted this study to determine the location and type of transit facility that meets the goals of DTA as well as the region. The study report includes an initial screening process for several transportation terminal sites based on availability, size and location. The screened sites were then evaluated based on an evaluation criteria developed using the goal, vision and program elements. The final step in the process was to produce massing models, circulation and connectivity concepts for each of the potential sites based on site program and current conditions. Such concepts helped the stakeholder committee to visually see the potential of each site, along with the constraints.

The overall vision of the project was to improve modal connectivity. However, several specific vision statements were included in the report:

- Create a stronger DTA presence and image
- Improve downtown circulation
- Provide opportunities for new/additional transit service
- Accommodate efficient transit routing options
- Concentrate effective multi-modal opportunities
- Create economic development opportunities along the waterfront and within the downtown area
- Improve connectivity (vehicular and pedestrian) between downtown and the waterfront – resolve the “great divide” of I-35.
- Intercept traffic and provide passengers with multimodal choices to enhance connections to and reduce traffic in Canal Park and downtown.

This study led to the examination of potential sites for the downtown transportation center. A final site was selected and after receipt of \$16 million in federal funds, NEPA approvals and entitlements, the DTA Transportation Center was opened on February 4, 2016. The new center accommodates eight bus bays and motor coaches for both passenger transfers and layover needs. It also provides connectivity with the downtown, Canal Park, and existing bus routes as well as multimodal opportunities – transit, inner city, taxi, bikes, pedestrian, and parking.

Appendix 2. Goals and Objectives

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



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April 2017

SRF No. 10113

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Introduction

The purpose of the Duluth TDP update is to review and evaluate the existing performance of the Duluth Transit Authority (DTA) system, as well as to make recommendations to enhance the system as needed. The Duluth TDP will rely on a firm understanding of not only current conditions, but also past conditions, attempts, and accomplishments documented in similar studies preceding it. The following memorandum identifies a set of proposed goals and objectives for the DTA system.

Mission, Goals and Objectives

The Mission of the DTA shall be to provide public transit service that is safe, convenient, efficient and affordable. The following goals and objectives set standards towards accomplishing this mission:

Goal 1. Increase transit use in the Duluth area by providing high quality transit service.

	Objective	Standard
1.1	Customer Satisfaction: The DTA will improve customer satisfaction each year and will strive to minimize unsatisfied customers by monitoring customer complaints and offering corrective action when possible/appropriate.	• 75 percent of on-board survey respondents satisfied with service (survey fielded every two years). • Investigating and classifying the customer dissatisfaction complaints on a semi-annual basis.
1.2	Fixed Route Headways: The DTA will determine headways based on time of day, passenger loads and service area characteristics (such as population density, job density, income and auto ownership).	• Peak hours and/or transit supportive areas: Not more than 30 minutes. • Peak hours (mainline and University of Minnesota at Duluth (UMD) Routes): 15 minutes. • Off-peak hours and/or non-transit supportive areas: Not more than 60 minutes.
1.3	Transit Service Availability: The DTA will maximize transit service availability (based on demand) to neighborhoods and/or housing facilities with high concentrations of senior, low income and disabled populations, as well as to major employers, higher education institutions and major destinations within the service area.	• Assure equitable delivery of transit services to population sections traditionally underserved such as people with disabilities, low income population and population with limited English proficiency. • Provide access to major employers, higher education institutions, and other major destinations for all transit users.
1.4	Passenger Loading: The DTA will adopt maximum loading standards based on operating costs, revenues produced, passenger comfort and quality of service for different types of operations.	Maximum load: • System-wide: 150 percent. • Peak hours and/or transit supportive areas: 105 percent (DTA will adhere to this standard in 95 percent of all scheduled trips). • Off-peak hours and/or non-transit supportive areas: 85 percent (DTA will adhere to this standard in 95 percent of all scheduled trips). • Freeway operation: 100 percent.

	Objective	Standard
1.5	Service Expansion: The DTA will evaluate opportunities of service expansion based on regional community and municipality support (financial and/or marketing) and current and future growth of the area, or other conditions that are deemed warranted by the DTA	• Provide service when the municipality, area business or institution served provides the local share of the operating subsidy for the service and guarantees the fare-box revenue. • Expand service on a minimum one-year trial basis when publicity campaigns are supported by local community or municipality and before and after route data collections are enforced. • Evaluate routes and the possibility of service expansion in the event of newly developed “major destinations”, population shifts, opportunities for route efficiencies or in other conditions in which the DTA decides route evaluation or service expansion is necessary.
1.6	STRIDE Service Availability: The DTA will strive to meet the existing demand for STRIDE service and meet minimum ADA requirements.	• Meet existing ADA demand based on FTA requirements.

Goal 2: Provide safe, clean and reliable transit service and infrastructure to all current and potential DTA riders.

	Objective	Standard
2.1	On-time Performance: The DTA will maintain on-time performance at all destination points and maintain scheduled trip service reliability.	• Schedule adherence: 95 percent on-time service (based on destination station) during peak periods and 95 percent during off-peak periods. - On-time operation: Zero minutes ahead of schedule and no more than 5 minutes behind schedule. • Service reliability: 99 percent scheduled trips operated and at least 4500 vehicle miles between road calls.
2.2	On-time Performance for STRIDE services: The DTA will strive to maintain on-time performance for STRIDE services.	±15 minutes of scheduled time for 90 percent of the operations during peak hours and 80 percent operations during off-peak hours (evenings and weekends).
2.3	Safety and Security: The DTA will ensure maximum safety and security for all patrons and parties affected by the system by maintaining video monitored transit buses/facilities and a safe transit system perception among the patrons.	• Passenger safety: Zero passenger accidents per 100,000 passengers Zero vehicle collisions per 100,000 miles. • Passenger security: At least 75 percent of riders should indicate themselves as safe in the security perception question asked in the passenger survey (survey fielded every two years).

	Objective	Standard
2.4	Transit Facilities and Rolling Stock: The DTA will ensure that all transit facilities and equipment are well-maintained and enhance the overall transit experience of DTA customers.	• Fleet size: Total number of vehicles needed to service an area shall be related to the changing demand consistent with operating and replacement standards. • Fleet Condition: 1. Large, heavy-duty transit buses including over the road buses (approximately 35'–40', and articulated buses): at least 12 years of service or an accumulation of at least 500,000 miles. 2. Light Duty Vehicles (regular and specialized vans and light-duty buses): At least 4 years or an accumulation of at least 100,000 miles. • Shelters: Shelters must have seating, lighting, schedule and route information and should provide clear visibility in all directions. • Shelter location and amenities: Any stop where 25 or more people board on an average weekday (with seniors and disabled counted as two) must have a shelter. At least one shelter on each bus route. The number of shelters located on a route or neighborhood should not result in a disparate impact on the basis of race, color or national origin of the local riders (as per FTA's Title VI). Every shelter should have up-to-date DTA schedule and route information meeting ADA requirements. <i>Standard is based on State of Good Repair guidelines by Minnesota DOT and Federal Transit Administration.</i>
2.5	Bus Stop Spacing: The DTA will evaluate the number of transit stops on a transit route by maintaining a balance between speed (riding time) and passenger access convenience (walking distance to bus stop).	• Residential areas: Bus stop spacing between 660-1320 feet (4-8 stops per mile). Exceptions: Route operating on steep hill (greater than 6 percent slope) or two major transit trip generators located less than a block apart. • Commercial areas: The distance between stops determined based on safe pedestrian accessibility and proximity to major transit trip generators. <i>Safe Pedestrian Accessibility: People should be able to reach the transit vehicle from their origin point or reach their destination from the transit vehicle with minimal risk.</i>

Goal 3: Provide efficient and sustainable transit service.

	Objective	Standard
3.1	Transit Effectiveness: The DTA will strive to increase transit ridership each year.	Transit ridership measurement: Total revenue passengers increase by at least 3 percent.
3.2	Economic Efficiency: The DTA will strive to increase transit service efficiency each year.	Performance measures used – total cost per passenger, revenue per passenger, subsidy per passenger.
3.3	Route Efficiency and Effectiveness: The DTA will analyze route level performance to determine where corrective actions are warranted.	• Performance measures used – trip capacity, ridership per trip, ridership growth, senior ridership, transit dependent ridership and revenue efficiency. • One example of using ridership criteria for corrective actions: - 20-35 percent subsidy per passenger above the system average and/or 20-35 percent passenger per revenue hour below the system average: considered for extra marketing efforts and/or minor modifications. - 36-50 percent subsidy per passenger above the system average and/or 36-50 percent passenger per revenue hour below the system average: Significant route change. - Greater than 50 percent subsidy per passenger above the system average and/or greater than 50 percent passenger per revenue hour below system average: Major restructuring or possible elimination. • These standards are guidelines to help inform when route modifications might be considered; however, DTA will have final discretion to maintain any route due to other circumstances.
3.4	Transit Planning Coordination: The DTA will continue to promote transit planning consideration during the development of short and long range plans and policies in the Duluth metropolitan area.	Continued participation in the Metropolitan Interstate Council (MIC) Transportation Advisory Committee (TAC), Duluth city planning issues and City of Duluth reviews.

	Objective	Standard
3.5	Multimodal Coordination: The DTA will continue to promote transit in coordination with the design and development of roadways, pedestrian and bicycle infrastructure and with transportation network companies (TNCs) like Uber, Lyft, etc.	Bus routes and stop locations coordinated with pedestrian and bicycle trails, Park and Rides and regional transfer stations (for example: Downtown Terminal)
3.6	Recycling and Carbon Footprint: The DTA will continue to maximize on-site recycling and minimize its carbon footprint of vehicles and facility operation.	DTA shall adopt a policy to evaluate its current greenhouse gas emissions and commit to a reduction in accordance with MN Statute 216H.02.

Goal 4: Improve customer information and marketing strategies to increase ridership and customer satisfaction.

	Objective	Standard
4.1	Schedule and Routing: Provide integrated, useful, and easy to understand schedule and routing information (including information on website and other social media).	• 75 percent of on-board survey and passenger survey respondents indicating schedule and routing information useful and easy to understand. • Seek feedback from riders and non-riders via on-board and passenger survey for best practices of providing scheduling and routing information.
4.2	Transit Education and Marketing Activities: The DTA will promote the use of transit by educating Duluth and surrounding community residents and businesses about the benefits of public transit using social media, Chamber of Commerce, Greater Downtown Council, Duluth Visitors and Convention Bureau for public outreach.	• Minimum of 3 transit awareness and education events organized per month. • Provide regular travel training to DTA patrons. • At least one percent of the total operating cost will be spent on marketing activities.
4.3	Service Operations and Customer Service: The DTA will actively study and indulge in more proficient user interface software and technological methods of improving service delivery, ridership, effectiveness and customer service.	• The DTA will provide an updated website that is also mobile friendly and able to provide real time bus location information, fare information and trip planning features, as well as links to the Duluth Transportation Center's intercity providers and in addition to the information the DTA website currently provides. • The DTA will employ more technology solutions to track service requests, bus stop locations, Title VI compliance, and continue to remain open to all public comments and concerns.
4.4	Commuter Pass Program: The DTA will continue to work with employers to promote participation in commuter pass program.	• Monitor ridership by group in the commuter pass program • Maintain 3-4 new businesses' increase to the commuter pass program

Appendix 3. Existing Conditions Report

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



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May 2017

SRF No. 10113

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Introduction

Duluth, Minnesota is located in the southwest part of Saint Louis County at the western point of Lake Superior and serves as a major port for the U.S. Adjacent cities include the City of Hermantown, the City of Proctor, and the City of Rice Lake. The City of Superior is within the DTA service area, but is located southeast, across the St. Louis Bay, in Wisconsin.

Named after the Frenchman Daniel Greysolon, Sieur du Lhut in 1856, Duluth was established through the trade industry, and its natural resources. In its early days, Duluth faced challenges economically and with disease. In 1857, an economic crash, and in 1859, a scarlet fever epidemic threatened the future of the city. Duluth's favorable geography, natural resources, and spirit helped pull the city through its rough start. However, in modern times as well, the city has faced many challenges.

In the 1970s, many of Duluth's key industrial companies suffered layoffs and closures. The U.S. Steel Plant closed in 1971 greatly increasing unemployment rates. As the economy began to recover, the city diversified its industries by investing in tourism through city beautification. Old and vacant warehouses that once housed machines and labor have now been converted into historic shopping districts.

In 2017, Duluth's key economic generators continue to capitalize on its inherent strengths, the city's geographic location, and natural resources. The addition of tourism has helped to bring resurgence to the City and provide stability during economic downturns. The Duluth-Superior harbor is the biggest inland harbor in the world, and it continues to stay busy with regular shipments of grains, coal and taconite. For tourism, Duluth invested into waterfront development inspired by San Francisco, Boston, and Toronto. The Lakewalk renovation began in 1988 and now stretches from Bayfront Festival Park to Brighton Beach. Other tourist attractions include the Great Lakes aquarium, the only all-freshwater aquarium in the U.S., and the historic Aerial Lift Bridge.

The Existing Conditions Report examines community demographics, key destinations in the Duluth Metropolitan Statistical Area (MSA), and existing transit services. Additionally, the report provides a summary of Duluth Transit Authority's (DTA) goals, objectives, and performance measures, a trend analysis of performance measures related to agency objectives, and a performance evaluation of the efficiency and effectiveness of DTA's transit service.

Community Demographics

Duluth is the fifth largest city in Minnesota. According to the 2010 Census, the City of Duluth has a population of 86,265 while the Duluth-Superior Metropolitan Statistical Area has a population of 235,612. The metropolitan statistical area has a median age of 40.8 years¹ and a median income of \$24,631².

Based on the American Community Survey (ACS), the population of Duluth, MN-WI metropolitan area increased by 6.8 percent to a total population of 279,748 between 2005 and 2015. In 2015, the median household income for the metro area was \$48,905 which was 20 percent higher than the median household income in 2005. Moreover, the average household density was 2.28 in 2010³ and the employment density was estimated to be 1.86 jobs per acre⁴.

Figure 1 shows the residential population density of Duluth and its neighboring communities. In Duluth, the household density is higher for areas close to the lake (highest along downtown waterfront) and adjacent to the highways and in Superior, the household density is highest along Highway 35 with medium density along the lake and Highway 53. The existing DTA fixed routes serve all the higher household density areas (more than 4 households per acre). The majority of the census block groups with more than 0.5 households per acre is served by at least one transit route.

Development Density and Transit Supportive Areas

Figure 2 expands on the residential density depicted in **Figure 1** and displays locations where a basic level of transit service could be supported by residents or jobs. These locations are referred to as transit-supportive areas (TSAs) in this study. TSAs designated orange in **Figure 2** indicate areas where residential density is at least three housing units per acre, or locations where there are a minimum of four jobs per acre. Areas shown in brown are locations where both criteria are met. The current DTA fixed route service serves both TSAs and mixed-use TSAs.

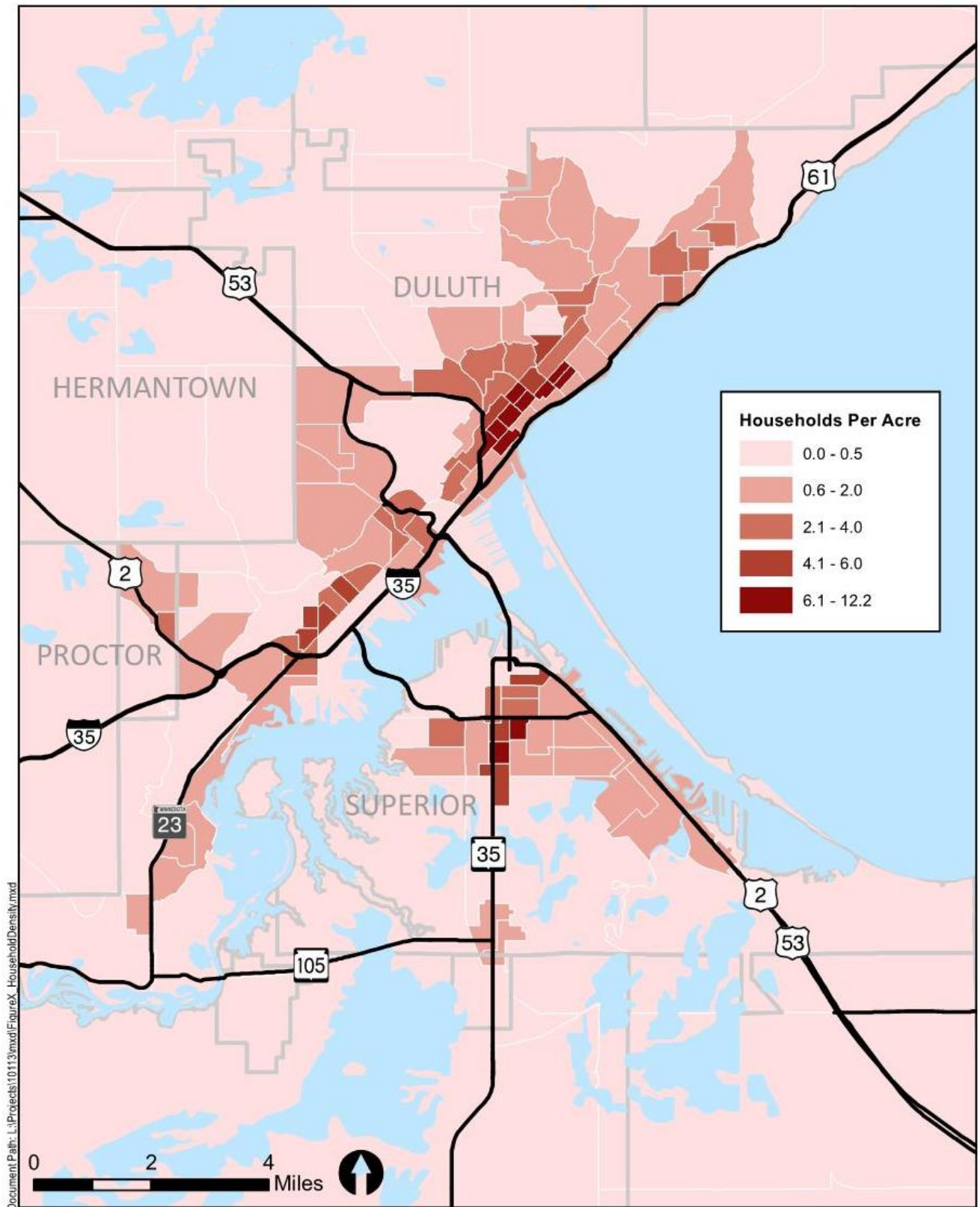
¹ U.S. Census 2010

² 2015 ACS 5 year estimate

³ U.S. Census 2010

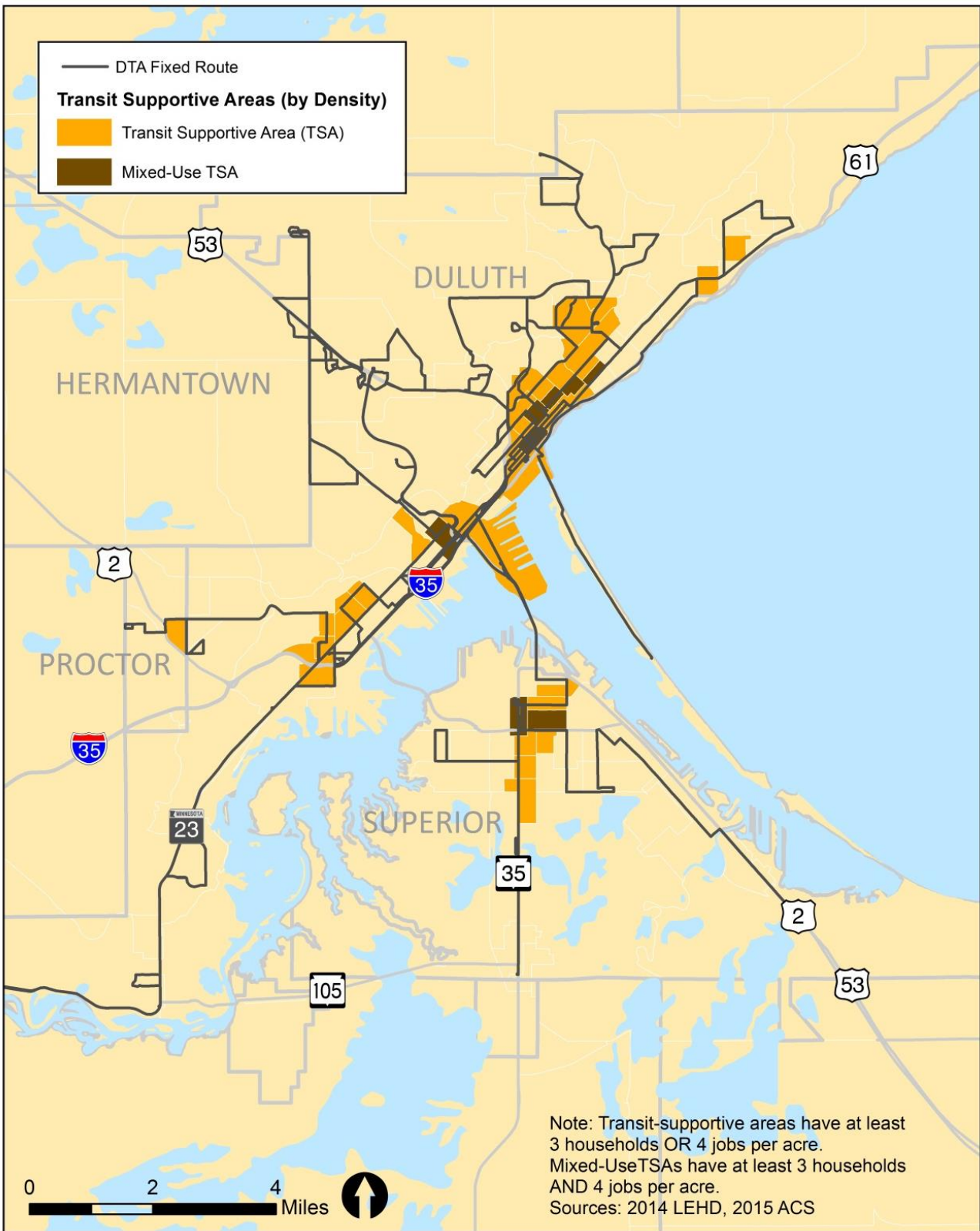
⁴ U.S. Environmental Protection Agency (EPA) Smart Database (2013 version)
url: <https://www.epa.gov/smartgrowth/smart-location-mapping>

Figure 1: Household Density



Source: SRF, 2017.

Figure 2: Transit Supportive Areas



Transit Dependent Population

Key factors when analyzed together can serve as indicators of transit dependent populations. There is no defined formula to determine transit dependent areas. However, the Federal Transit Administration (FTA) defines transit dependent persons as those 1) without private transportation, 2) elderly (over age 65), 3) youths (under age 18), and 4) persons below poverty or median income levels defined by the U.S. Census Bureau. Characteristics analyzed in this report are the following:

- Population size, distribution, and density
- Age of Population
- Automobile ownership
- Household income
- Population with limited English proficiency

Elderly Population

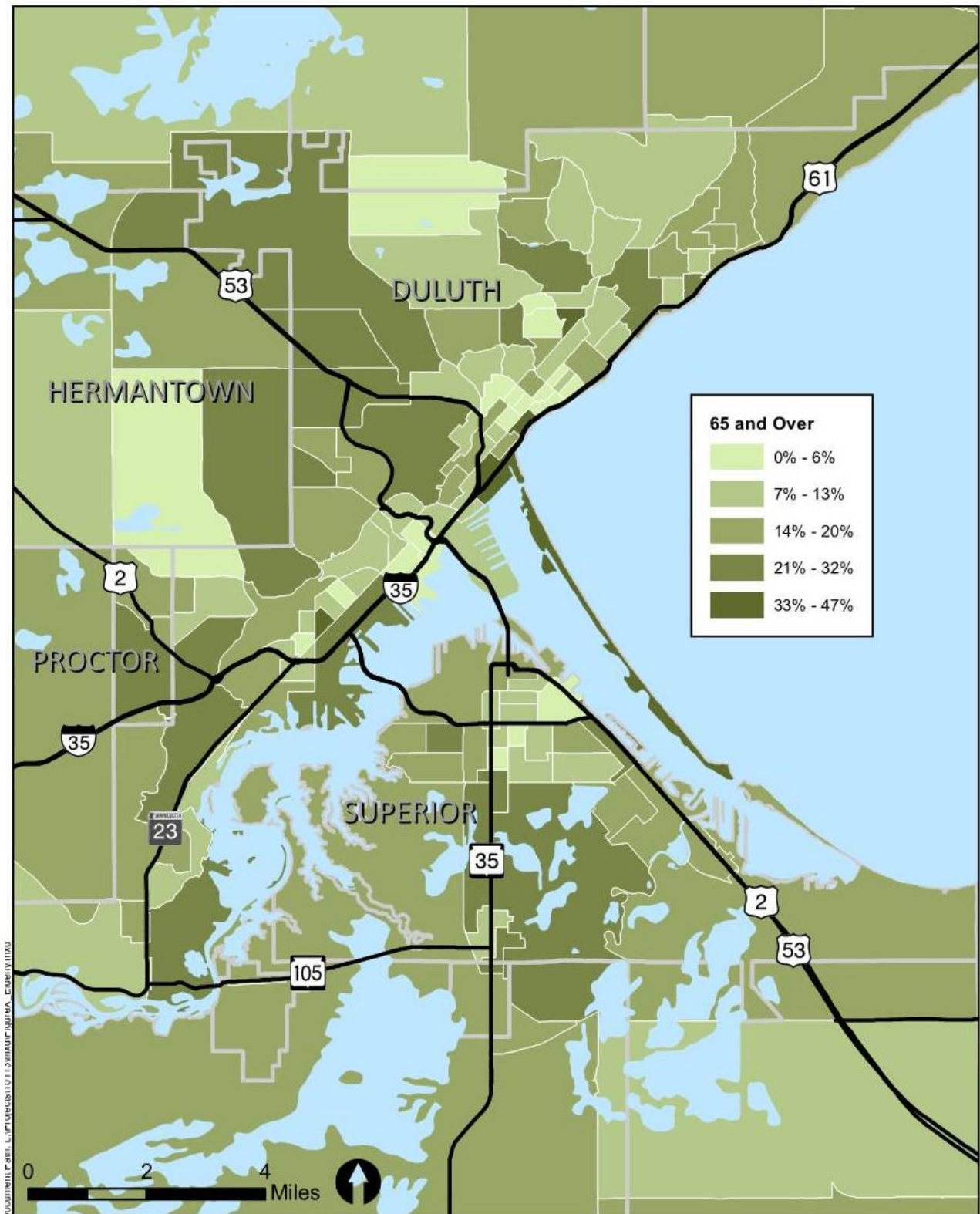
The elderly population of a community is a core component of a transit market due to decreased mobility. Elderly individuals may not have the capacity to safely operate a vehicle and many may depend on transit services to complete daily chores such as, grocery shopping, or medical appointments. Fixed route or demand response transit service can greatly enhance the independence and lives of elderly populations.

Elderly populations are defined by the U.S. Census Bureau as people who are 65 years or older. In 2015, the Duluth, MN-WI MSA's elderly population was 16.5 percent⁵, up 8.1 percent from 2010. Additionally, in 2015, Minnesota's elderly population comprised 13.9 percent of the population 2.6 percent lower than the city of Duluth. **Figure 3** shows the distribution of elderly population for the Duluth MSA.

The highest concentrations of elderly population are in the downtown waterfront area, northwest Duluth, areas bordering Hermantown and in Proctor. In Superior, the elderly population is distributed throughout the city with most census block groups having more than 6 percent elderly population. It should be noted that DTA's paratransit serves the majority of areas with a high concentration of elderly populations.

⁵ Based on ACS 5 year estimates

Figure 3: Population 65 Years of Age and Older



Source: SRF, 2017.

Youth Population

Youth populations serve another important component of a potential transit market. Youth populations are defined as people under the age of 18. Youth populations may not be legally able to operate a vehicle, or they may not have access to a vehicle. These populations may also need transit to accomplish daily tasks such as, shopping or traveling to work or school.

According to ACS 2015 – 5 year estimates, 23.6 percent of the Duluth MSA's population was under 18 years of age. This percentage is on par with the State's population estimates. **Figure 4** shows the distribution of youth population in the region.

High concentrations of youth population are in the northern parts of Duluth, around the intersection of US Highway 53 and State Route 194, along the Saint Louis Bay (in Duluth and Superior). High percentages of youth populations are also located along State Route 35 and US Highway 53, in Superior.

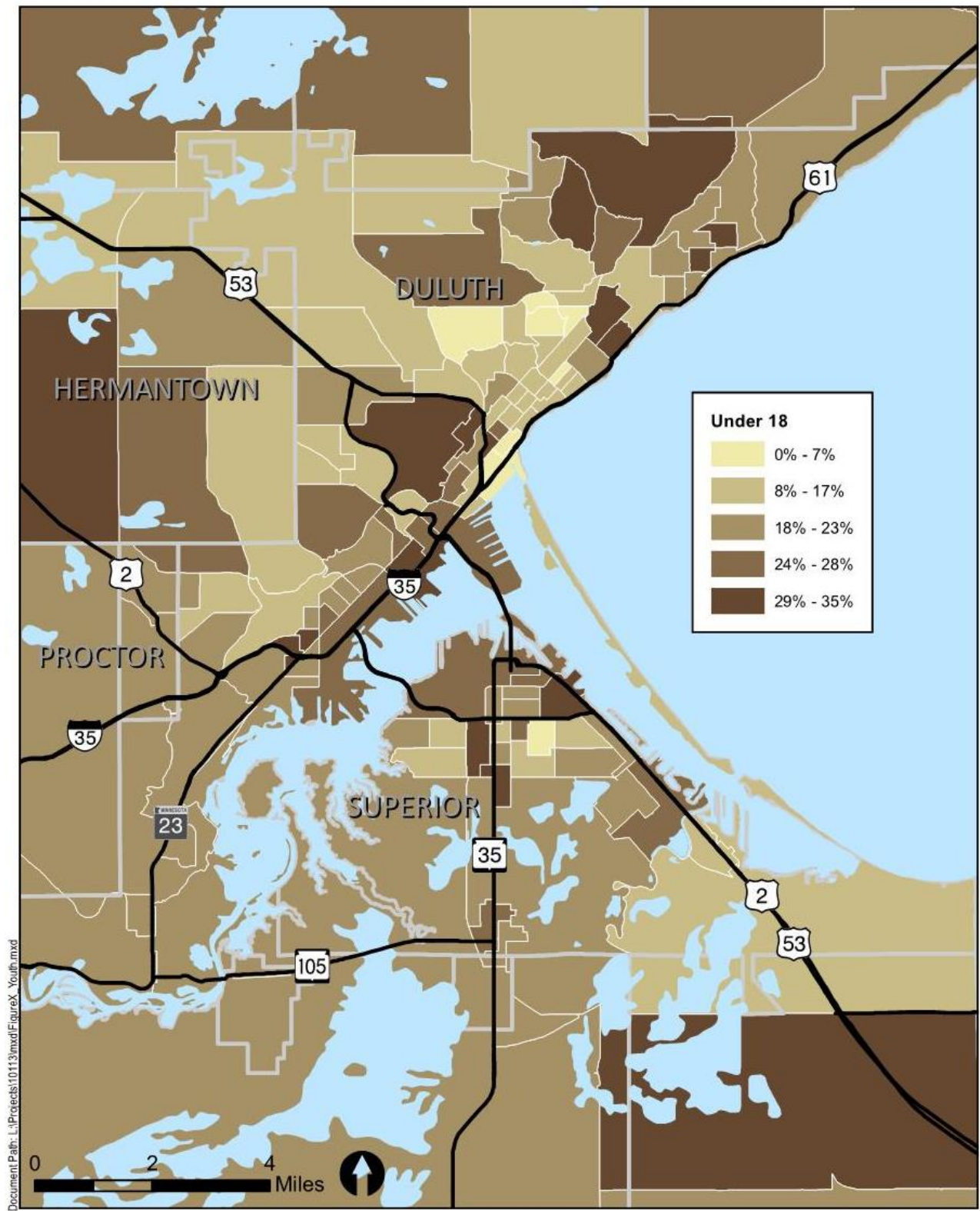
Large portions of Duluth's youth populations are located near a current transit routes. However, Hawk Ridge, Woodland, and Duluth Heights areas require over a quarter mile walk to bus stations.

Population with No Vehicle in the Household

Low rates of vehicle ownership is one of several indicators that suggests a population may greatly benefit from transit service. Overall 8.9 percent of households in the Duluth-WI MSA do not own a vehicle. This percentage is higher than the overall percentage of households in Minnesota with no vehicle ownership (7.2 percent). **Figure 5** displays the distribution of households throughout the Duluth metropolitan area that do not own a vehicle.

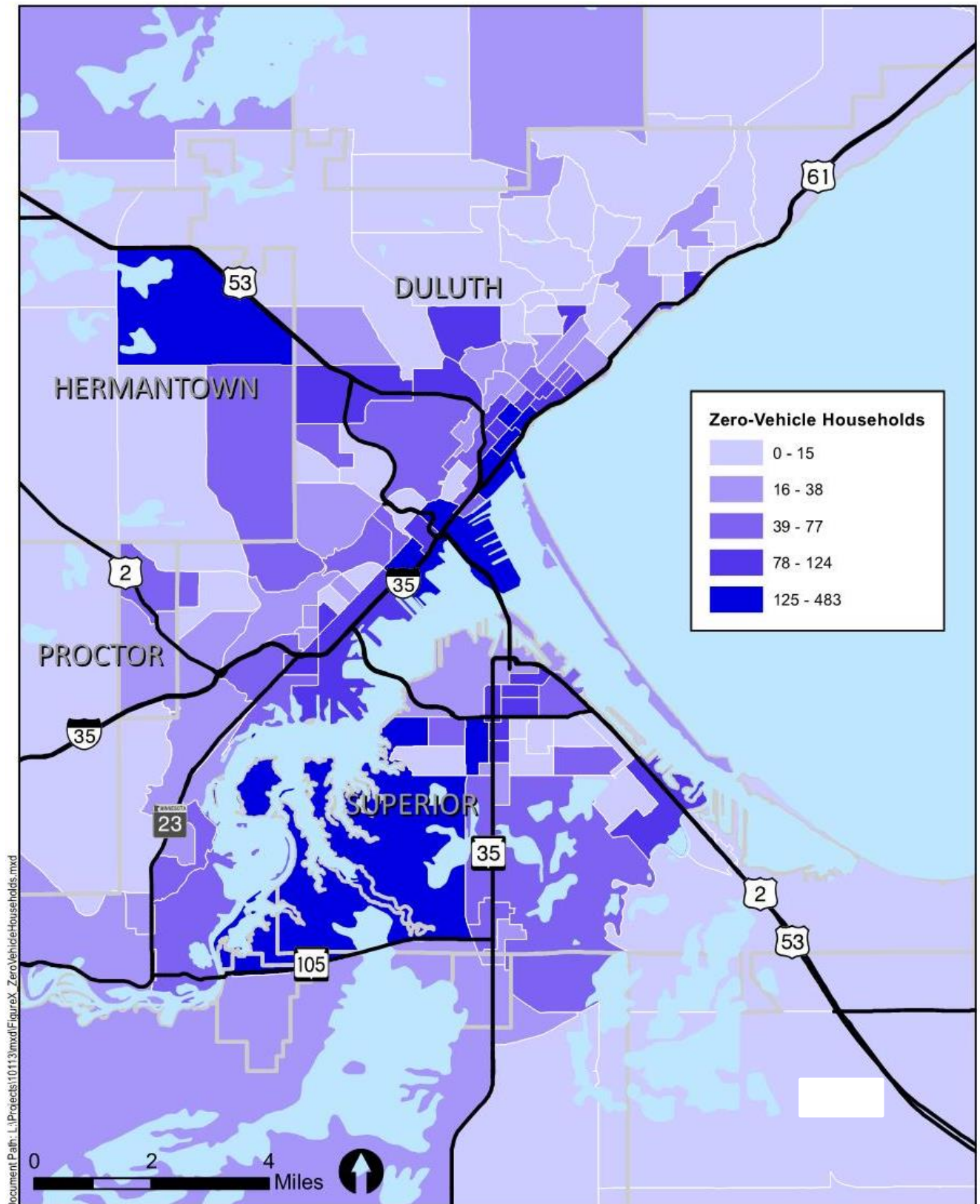
The highest concentrations of households with no vehicles are located along the waterfront area, Saint Louis Bay and western Duluth. Based on the current transit service routes and quarter mile comfortable walking distance to the bus stops, all of the no vehicle household areas are served by the current DTA service except one census block group in the western region in Hermantown.

Figure 4: Population Under 18 Years of Age



Source: SRF, 2017.

Figure 5: Zero Vehicle Households



Source: SRF, 2017.

Low Income Population

Due to the relatively high costs associated with owning and maintaining personal vehicles, many people with lower income are likely to use transit when it is available. According to the ACS 2015 – 5 year estimates the median household income for the Duluth MSA was \$48,905. That is over \$12,000 or 20 percent lower than median income (\$61,492) for the state of Minnesota.

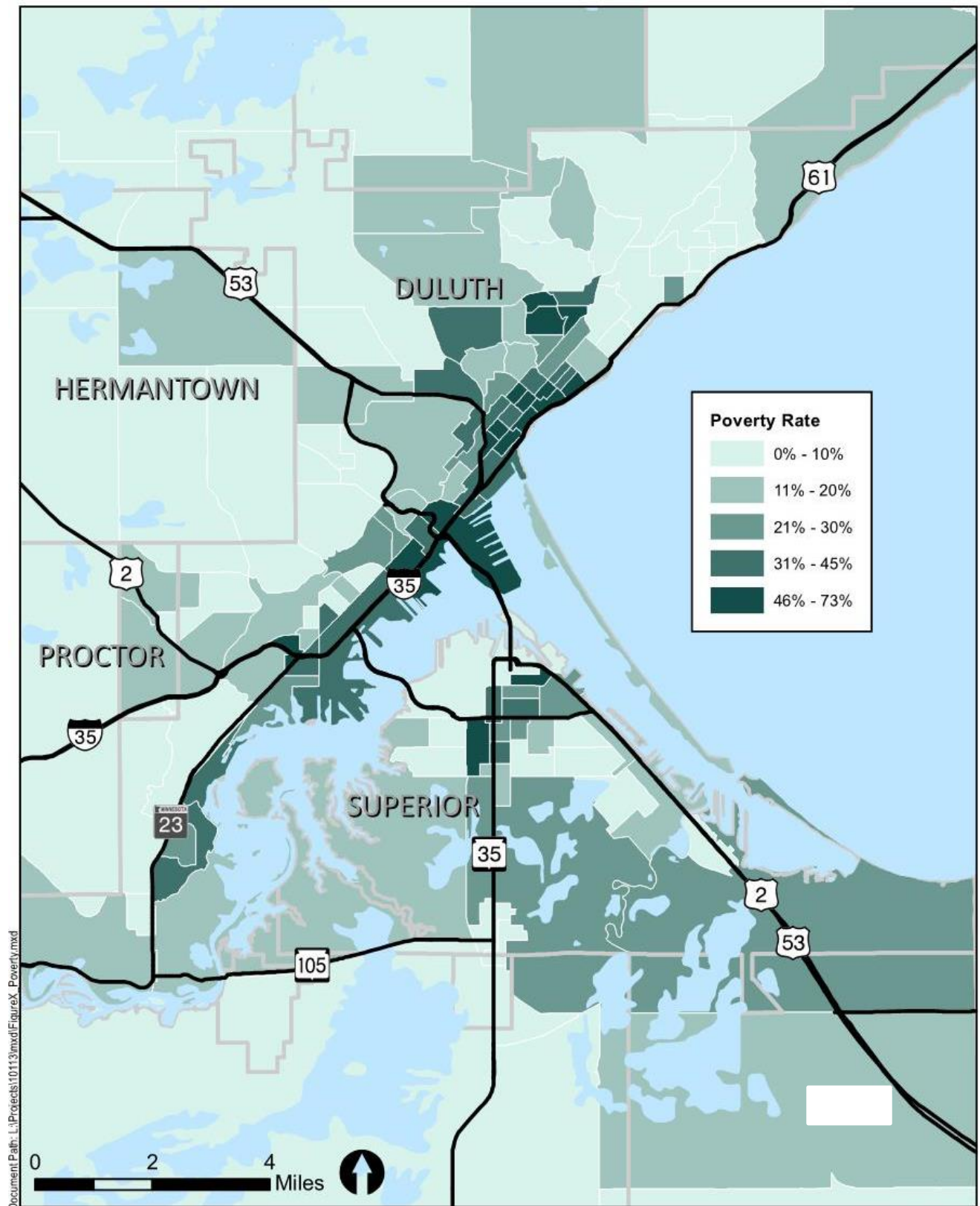
As displayed in **Figure 6**, much of the Duluth metropolitan region's lower income population (population above 31 percent poverty level) is concentrated along the major highways and along the waterfront. All of the lower income areas are currently well-served by the DTA's fixed route service.

Population with Limited English Proficiency

Individuals with limited ability to read, write, speak, or understand English are considered limited English proficient (LEP). This language barrier may prevent individuals from accessing public services and income opportunities. Hence, the population group needs easy access to public transportation services to be able to open up more opportunities of employment and to encourage the overall mobility of individuals.

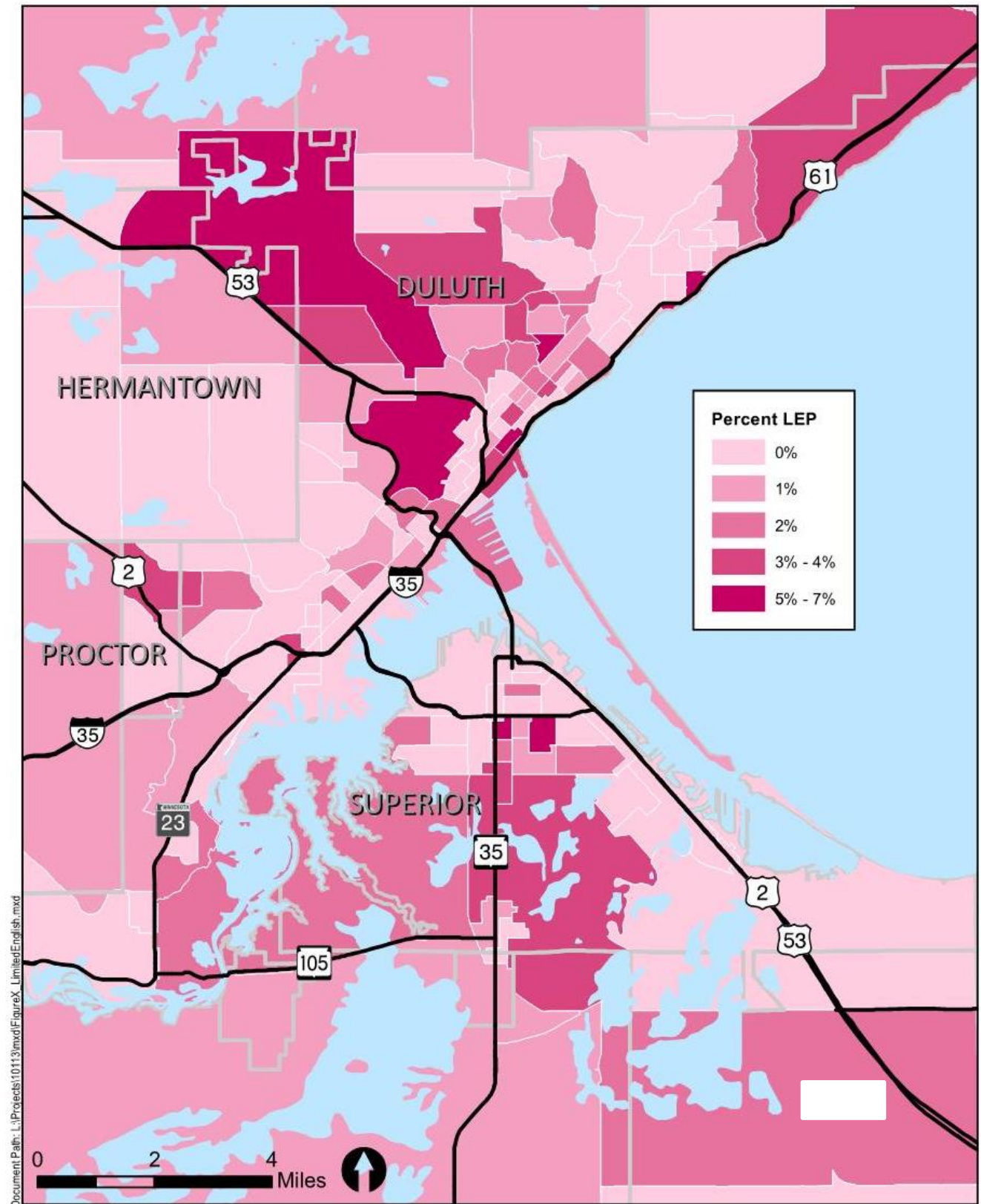
As shown in **Figure 7**, the LEP (5 percent or higher) population is distributed along the major highways as in the case of low income population. The existing fixed route service by DTA serves these areas quite well except a few areas in the north (along Highway 61) and in the northwest (north of US Highway 53).

Figure 6: Poverty Rate



Source: SRF, 2017.

Figure 7: Limited English Proficiency



Source: SRF, 2017.

Key Travel Generators

Table 1 shows key trip generators served by the existing DTA fixed route service. Trip generators are places that consistently have traffic, from both vehicles and transit.

Table 1: Travel Generators in Duluth Area

Downtown Duluth
Education
University of Minnesota – Duluth
College of St. Scholastica
Lake Superior College
East High School
Denfeld High School
Lincoln Park Middle School
Ordean Middle School
North Star Academy
Community
Duluth Area Family YMCA
Duluth Public Library
Lakeside-Lester Park Community Center
Portman Community Center
Lafayette Community Center
Harrison Community Center
Good Fellowship Community Center
Shopping/Retail
Miller Hill Mall
Burning Tree Plaza
Stone Ridge Shopping Center
Super One Foods
Wal-Mart
Target
Whole Foods Co-Op
Woodland Marketplace Foods
Housing
Lakeside Manor Assisted Living
Ecumen Lakeshore -The Crest Senior Apartments
Chateau Apartment
Primrose Retirement Community of Duluth

Keystone Bluffs Assisted Living
BeeHive Homes of Duluth (Assisted Living)
Realife Cooperative of Duluth (Retirement Home)
Mount Royal Pines - Assisted Living
Medical
Essentia Health Medical Center
St. Luke's Hospital
SMDC Medical Center
Mount Royal Medical Center
St Mary's Duluth Clinic
Lake Superior Community Health Center
Lakewalk Clinic and Surgery Center
Viewcrest Health Center
Employer
United Healthcare
Duluth Air National Guard Base/Airport
Minnesota Power
Cirrus Design
City of Duluth/St. Louis County
US Postal Service
Tourism/Entertainment
Canal Park
Superior Street Arts District
Duluth Entertainment and Convention Center
Lake Superior Zoo
Fitger's Shops
Bayfront Festival Park
Spirit Mountain

Source: DTA, 2017

Transit Service Overview and Existing Conditions

The existing conditions section for DTA is intended to provide a clear understanding of how the system performs today and to lay out a roadmap for the future. This report evaluates current services, defines service standards and performance measures for fixed-route and demand response, and it provides an overview of the passenger ridecheck statistics collected between October 2nd, 2016 and October 8th, 2016.

This report includes three sections to provide the baseline for which recommendations will be made for the proposed transit plan:

- 1) Transit service overview and existing conditions,
- 2) Performance and service standards, and
- 3) A performance evaluation.

DTA Background and Organizational Structure

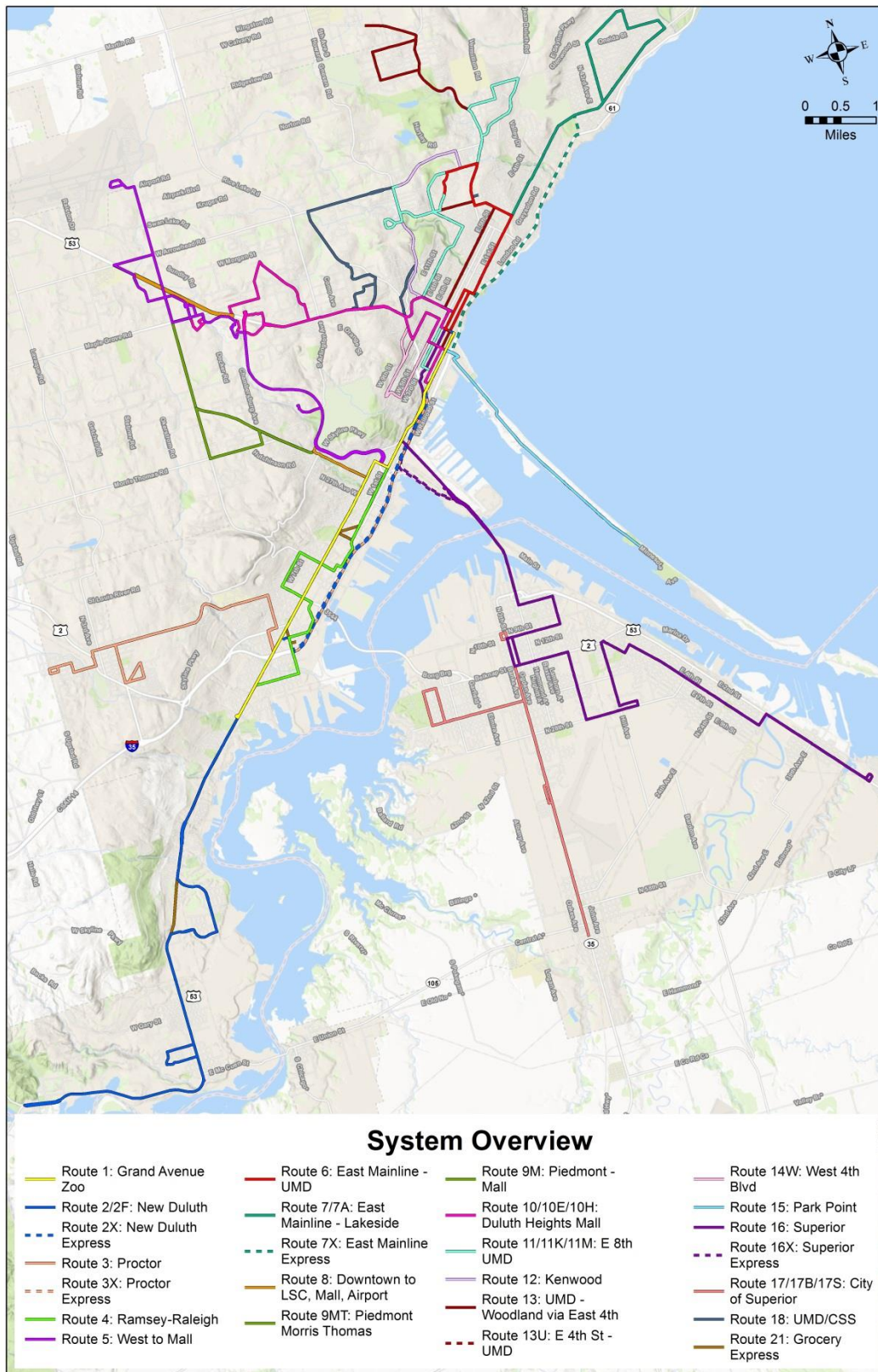
DTA is the public transit provider in Duluth providing fixed route service (**Figure 8**) for the general public. DTA also provides Special Transit Rides (STRIDE) service to disabled riders in Duluth, Proctor and Superior, WI⁶. The Port Town Trolley seasonal circulator service operates in the summer, mainly for tourists.

DTA began in 1883 when the first mule-drawn rail car was inaugurated as the area's first public transit system. In 1900, the Duluth and Superior transit operations consolidated. Together they operated street cars with over 100 miles of track. During 1930s, all streetcars were replaced by rubber tire buses and in 1969 the DTA was legislatively created.

DTA is led by a General Manager and a Board of Trustees. Operations faculty, such as the Director of Finance, Director of Planning and Grants, and Director of Operations all report directly to the General Manager. Policy is established by a nine member Board of Trustees. Meetings are conducted at the DTA Operating Facility on the last Wednesday of every month at 4:00 PM. **Figure 9** displays DTA's organizational structure.

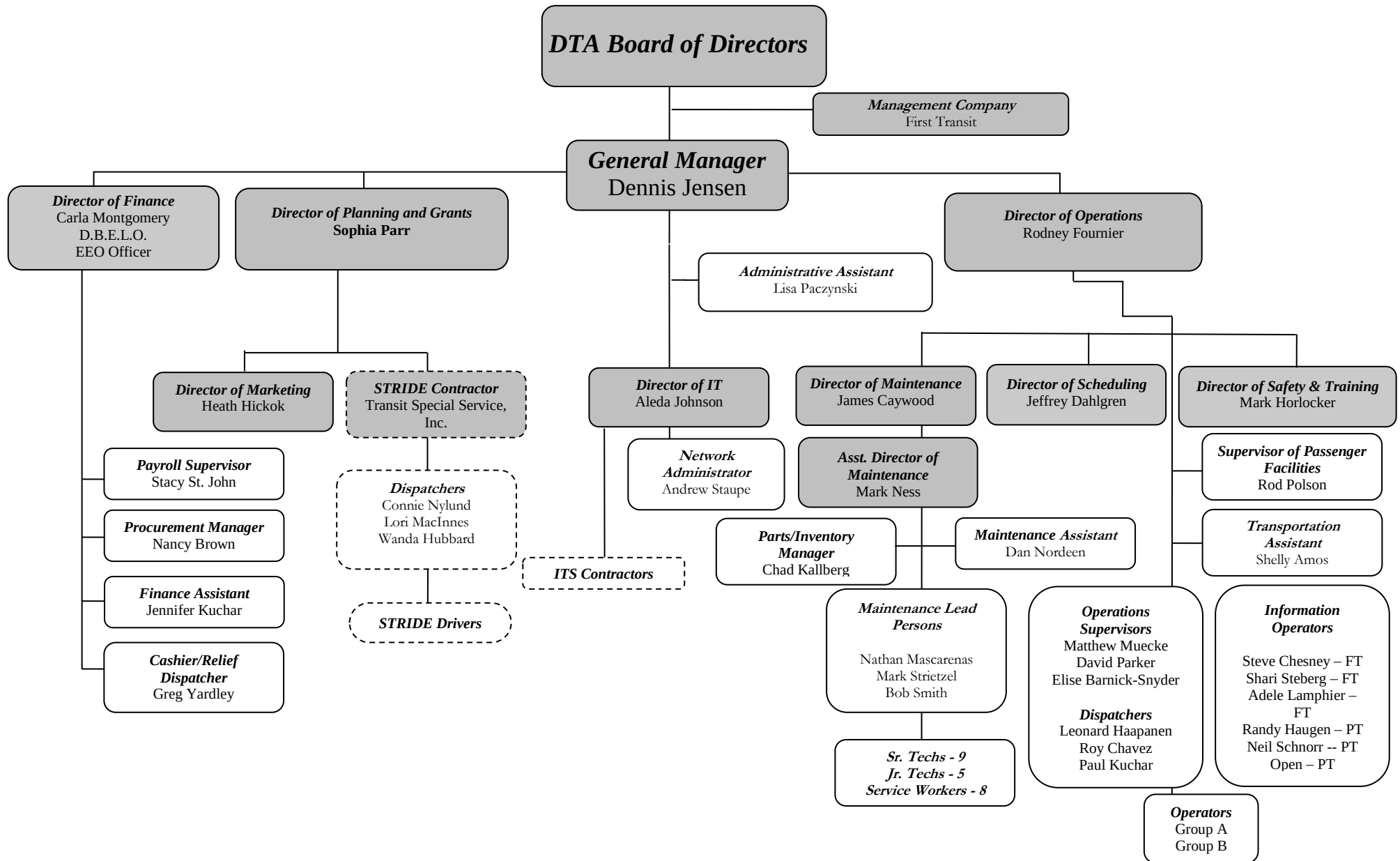
⁶ The city of Superior contracts with DTA to provide public transit service through an intergovernmental agreement.

Figure 8: DTA Fixed-Route Overview (2016)



Source: AECOM 2017

Figure 9: DTA Organizational Chart



DTA Existing Conditions

This section provides a summary of the transit operations performed by DTA. It includes fleet inventory, fare analysis, transit technology, fixed-route analysis, and a Demand Response overview.

Fleet Inventory

DTA has a total of 77 vehicles in their fleet. Of the 77 vehicles, 9 are STRIDE vehicles and 2 are seasonal vehicles. Most of the vehicles in the DTA fleet have a useful life of 12 years. However, 9 vehicles which are used in the STRIDE service have a useful life of 5 years. **Table 2** includes DTA's current vehicle inventory.

Table 2: DTA Vehicle Inventory

Year	Model	# of Vehicles in Inventory	Length (ft)	# of Wheel Chair Positions	Seating Capacity	Useful Life (years)
2002	Chance TYL	2	27	2	28	12
2004	Gillig LF	1	35	2	38	12
2006	Gillig LF	10	40	2	38	12
2007	Gillig LF (Hybrid)	10	35	2	32	12
2008	Gillig LF	2	35	2	32	12
2009	Gillig LF (Hybrid)	8	40	2	38	12
2010	Gillig LF	10	40	2	38	12
2012	Ford MV-1	3	N/A	3	5	5
2013	Gillig LF	9	40	2	38	12
2014	Gillig LF	10	40	3	38	12
2014	Chevrolet Arboc	6	N/A	2	12	5
2016	Gillig LF	6	40	3	38	12

Source: DTA, 2017

Facilities Inventory

Primary DTA facilities include the Duluth Transportation Center (DTC), the DTA Operating Center, and the Transit Center East, which links downtown Duluth to DTC via a skywalk. Transit Center East was previously the downtown transit hub prior to DTC's opening. The Center is now a mixed-use facility that supports retail tenants, office space, and serves as an alternate connection and drop off location in downtown for regional transit providers such as: LCS Coaches, Jefferson Lines, Arrowhead Transit, and Indian Trails.

The DTC opened in February of 2016 as the primary downtown Duluth transfer and transportation hub. This facility provides a large indoor waiting and reception area, a staffed ticket booth, a small

meeting space, and a 400-stall parking garage. The DTC has indoor secure bicycle storage available for rent; bike riders can connect to bike paths throughout the region via a skywalk connection to Canal Park and the Lakewalk.

The DTA Operating Center provides office space for administrative staff, and it houses the operations and maintenance facilities. The facility also provides a reception area which sells passes and provides service information.

DTA maintains two Park and Ride lots – Piedmont and Woodland. The Piedmont Park and Ride lot is located west of downtown at the corner of Haines Road and Piedmont Avenue and has bike racks and a 15 vehicle capacity. The lot is served by Route 9 (Piedmont) with service to Downtown Duluth every half-hour during weekday peak hours and hourly during off-peak hours and weekends. The Woodland Park and Ride lot, which includes twenty (20) parking spaces, is located north of Duluth on Calvary Road and Chicago Avenue and is served by Route 13 (UMD - Woodland via East 4th Street) with service to Downtown Duluth every half-hour during weekday peak hours and hourly during off-peak hours and weekends.

In addition to the DTC, three major transit hubs provide indoor waiting areas for customers, the Third Avenue East hub, the Miller Hill Mall Door Eight hub, and the University of Minnesota-Duluth (UMD) Kirby Plaza hub. The Third Avenue East hub is located below First Street on 3rd Avenue as part of the SMDC parking ramp and is open from 6:00 AM to 7:17 PM weekdays and weekends. The Miller Hill Mall Door Eight hub is located inside the Miller Hill Mall on the east entrance near Trinity road and the UMD Kirby Plaza hub is located inside UMD campus adjacent to Kirby Plaza.

Fare Analysis

DTA offers daily, weekly, monthly, and multi-monthly fares. Daily fares range from \$.75 for off-peak hours, which applies to all passengers, to \$1.50 for peak hours. Weekly fares cost 17 dollars. Two monthly passes are available, \$40 for adults and \$37.50 for teenagers. Multi-month passes include a 90-day pass, a 180-day pass, and a 360-day pass. Rates begin at \$108 for a teenage 90-day pass/\$115 for an adult 90-day pass. Multi-month passes are only available at the DTC or the DTA Operating Center, while 31-day passes are available at a variety of locations in the service area. Detailed fare information is shown in **Table 3** and **Table 4**.

Transfers between bus routes are free and valid for one hour from the time of purchase or the next connecting trip. Riders must request a transfer when boarding the bus. A maximum of three children age 4 and under may ride free when accompanied by an attending passenger. Additionally, disabled veterans receive free transportation on DTA buses when displaying a Department of Veteran Affairs Service Connected Disability identification card or SC card.

DTA passes provide unlimited travel on fixed route buses and trolleys. Additionally, Stored Value Cards can be used by more than one fare-paying rider at a time.

Table 3: DTA Fare Media

Fare Type	Price
Peak Fare ¹	\$1.50
Youth Peak Fare (18 and under)	\$1.50
Off-Peak Fare ²	\$0.75
Port Town Trolley	\$0.50
Day Pass Ticket	\$4.00
7-Day Pass	\$17.00
31-Day Pass(Adult)	\$40.00
31-Day Pass (Teen)	\$37.50
Summer Teen Pass	\$55.00
Stored Value Card	\$5.00 - \$25.00
EZ-Card	Initial \$2 fee (minimum \$5 purchase)

Notes: ¹ *Peak Hours: Defined as buses arriving or departing downtown Duluth or Superior weekdays between 7:00 am to 9:00 am and 2:30 pm to 6:00 pm*

² *Off-peak DTA fares are in compliance with the Federal Transit Administration's Senior and Disabled Off-peak Fare Policy.*

Source: DTA, 2017.

Table 4: DTA Multi-Month Fare Passes

Fare Type	Price
360 Day Adult Pass	\$450.00
360 Day Teen Pass	\$430.00
180 Day Adult Pass	\$230.00
180 Day Teen Pass	\$215.00
90 Day Adult Pass	\$115.00
90 Day Teen Pass	\$108.00

Source: DTA, 2017.

The 31-day adult pass, issued in Minnesota, is the most frequently used pass generating nearly 40 percent of fare revenue. The Minnesota U Pass Program generates 20 percent of fare revenue. The regular full adult fare provides approximately 1.2 percent of total fare revenue. **Table 5** displays the rankings of the fare types.

Table 5: Fare Type by Usage

Fare Type	Price	Percent
MN 31-Adult Pass	\$734,267.50	39.6%
Passenger Revenue-Control	\$435,854.13	23.5%
MN U-PASS PGM	\$377,581.00	20.4%
MN Value Cards Sold	\$91,720.00	4.9%
Superior WI-Farebox Rev-Reg	\$46,852.72	2.5%
Harbor City Intl School	\$23,209.96	1.3%
Full Adult Fare	\$22,852.50	1.2%
90-180 and Adult Annual Pass	\$20,560.00	1.1%
Adult Passes - WI	\$19,760.00	1.1%
16 fare types below 1%	\$82,204.91	4.4%

Source: DTA, 2017.

Transit Technology

DTA uses a variety of technological tools to monitor system performance and to interact with and serve its customers.

System performance data is captured through the Trapeze software system. Trapeze utilizes an automated passenger counter (APC) system to assist in reporting data needed to satisfy federal requirements. DTA can also utilize data captured by the software to monitor operations and performance.

The APC system automatically collects data on boardings and alightings at particular times and locations, allowing for more detailed analysis of ridership when compared to traditional manual counts. APC systems include sensors at each bus doorway that count how many passengers board and alight a bus at a given time. When integrated with AVL, they also link location to boarding and alighting activity. This automated system can provide consistent, reliable boarding information that can be used in service development along with required hand counts of ridership. APC's have two weaknesses, in addition to drivers boarding and alighting, large groups are often undercounted, particularly students with backpacks.

Additionally, a Computer Aided Dispatch / Automated Vehicle Location (CAD/AVL) system allows dispatchers and supervisors to monitor the location of vehicles in real-time. Buses in the system are equipped with Mobile Data Terminals (MDT) that allow central dispatchers to communicate with staff and to monitor where the buses are along the routes. This technology allows DTA staff to maximize on-time performance and reliability and to be proactive in addressing operational issues.

For customers, DTA uses a variety of technology and web based tools to reach out to the community. System maps with basic rider information, along with paper schedules with maps, are

available on vehicles and at 106 different locations throughout the DTA service area. These locations include, but are not limited to, retail stores, offices, hotels, medical facilities, and schools and universities. The website (duluthtransit.com) also provides information for customers, as well as additional service details and forms. DTA also utilizes Google Transit to power a Plan & Ride Tool that allows individuals to map paths from point A to point B.

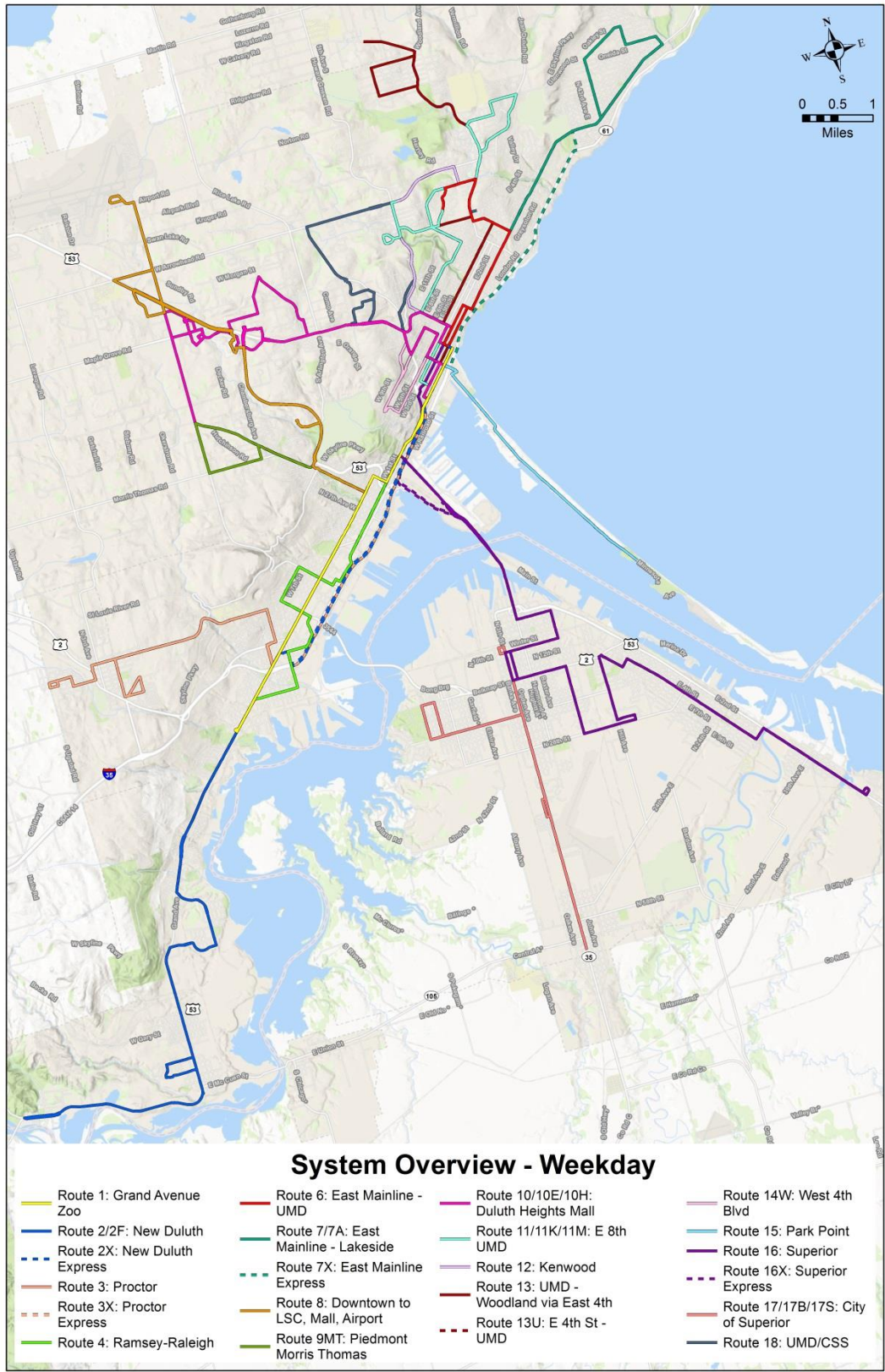
Fixed-Route Analysis

DTA fixed-route service is designed to operate in radial and crosstown patterns with the Duluth CBD as a focus. Route branches converge downtown and feed into destination streets. However, some routes make small loop patterns around major transit nodes such as UMD, Miller Hill Mall area, and areas of Superior, WI.

The existing service has 17 existing fixed-routes that operate in Duluth, and two fixed-routes that operate in Superior. Nineteen fixed-routes operate on weekdays, 15 operate on Saturday, and 11 operate on Sunday. **Figure 10** through **Figure 12** show weekday, Saturday, and Sunday routes.

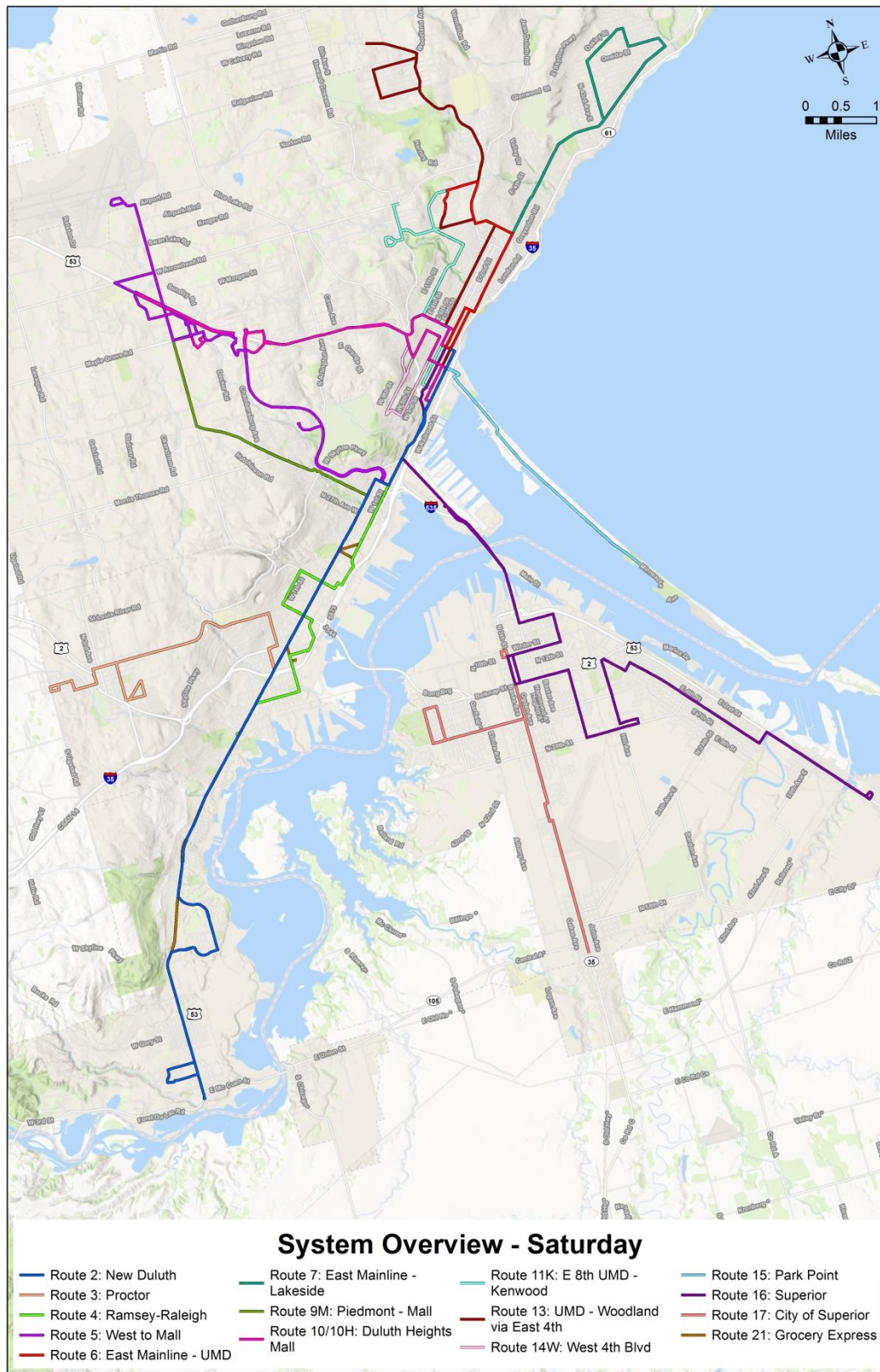
DTA has a basic frequency of at least 60 minutes on fixed-routes. Overall service hours vary by route, but generally start as early as 4:00 AM and operate as late as 1:25 AM on weekdays. On Saturdays, routes begin as early as 6:09 AM and operate until 11:50 PM, and on Sundays, routes operate from 7:00 AM until 10:40 PM. Spans of service and frequencies are further discussed in this section.

Figure 10: DTA Routes (2017) - Weekday



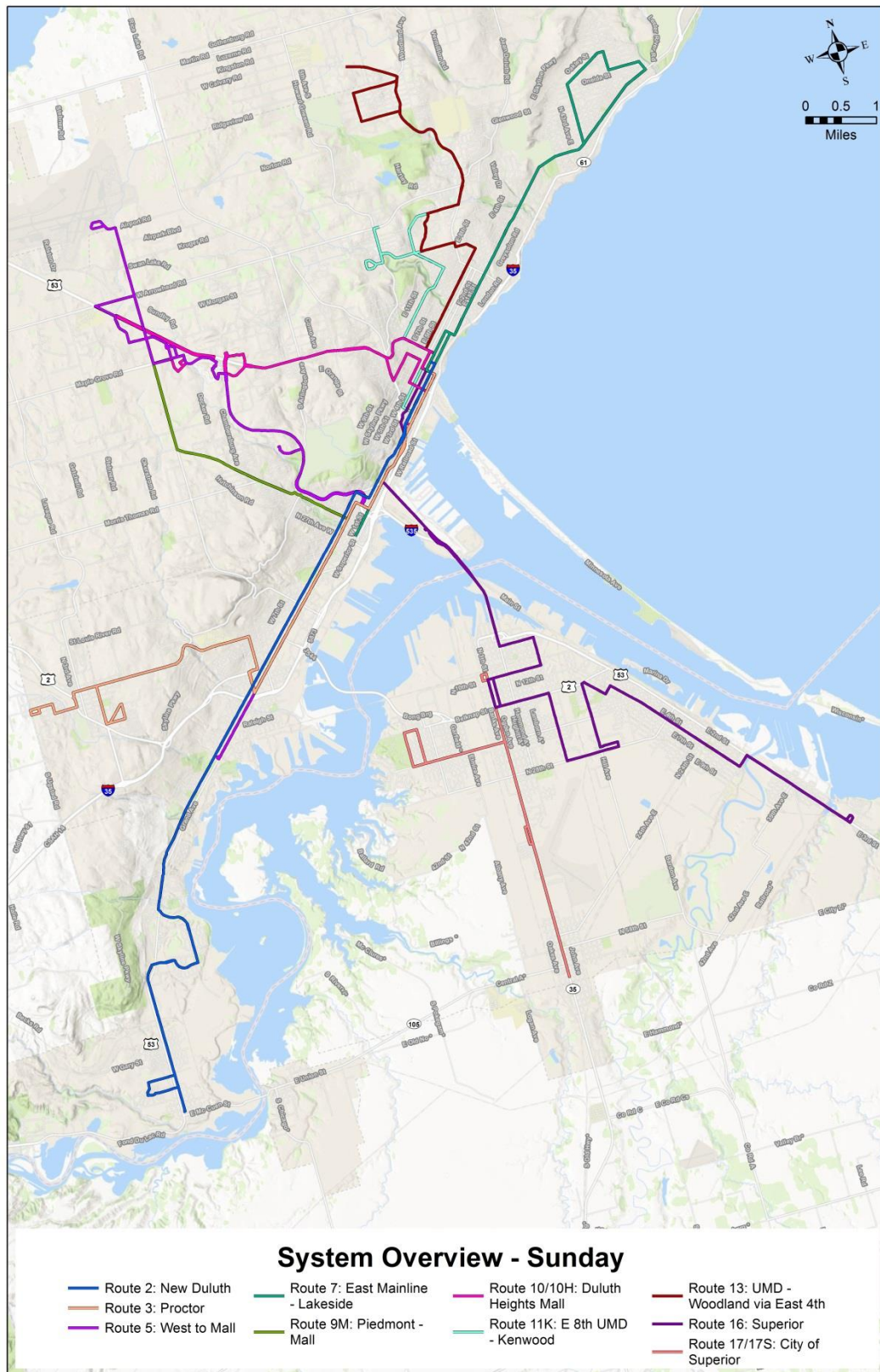
Source: AECOM, 2017

Figure 11: DTA Routes (2017) - Saturday



Source: AECOM, 2017

Figure 12: DTA Routes (2017) - Sunday



Source: AECOM, 2017

Operating Profile

DTA's fixed-route service operates 19 routes. **Table 6** lists the time and day each route operates. **Table 7** identifies the frequency of each route provided by DTA, and **Table 8** provides the average monthly and yearly ridership for each route. Notably, Route 2 had the highest average monthly ridership for 2016, as well as the highest average yearly ridership from 2011 to 2016.

Table 6: Fixed-Route Hours of Operation by Route

Route	Weekday	Saturday	Sunday
Route 1 Grand Avenue Zoo	5:00 AM – 10:00 PM	N/A	N/A
Route 2 New Duluth	4:00 AM – 2:00 AM	6:00 AM – 1:00 AM	6:00 AM – 11:00 PM
Route 2F New Duluth – Fond du Lac	4:00 AM – 8:00 AM; 4:00 PM – 7:00 PM	N/A	N/A
Route 2X New Duluth Express	6:00 AM – 8:00 AM; 4:00 PM – 6:00 PM	N/A	N/A
Route 3Proctor	5:00 AM – 10:00 PM	6:00 AM – 8:00 PM	9:00 AM – 7:00 PM
Route 3X Proctor Express	7:00 AM – 8:00 AM; 4:00 PM – 6:00 PM	N/A	N/A
Route 4 Ramsey-Raleigh	5:00 AM – 7:00 PM	8:00 AM – 6:00 PM	N/A
Route 5 West to the Mall Area	N/A	9:00 AM – 7:00 PM	12:00 PM – 7:00 PM
Route 6 East Mainline UMD	5:00 AM – 12:00 AM	8:00 AM – 10:00 PM	N/A
Route 7 East Mainline Lakeside	4:00 AM – 11:00 PM	7:00 AM – 10:00 PM	8:00 AM – 9:00 PM
Route 7A East Mainline 24AE	3:00 PM – 5:00 PM; 9:00 PM – 11:00 PM	N/A	N/A
Route 7X East Mainline Express	4:00 PM – 6:00 PM	N/A	N/A
Route 8 LSC – WM-AP	7:00 AM – 8:00 PM	N/A	N/A
Route 9MT Piedmont Morris Thomas	5:00 AM – 10:00 PM	N/A	N/A
Route 9M Piedmont Mall Weekend	N/A	8:00 AM – 7:00 PM	9:00 AM – 7:00 PM
Route 10 Duluth Heights Mall	6:00 AM – 1:00 AM	7:00 AM – 11:00 PM	9:00 AM – 9:00 PM
Route 10H Duluth Heights Mall via 6AE	8:00 AM – 6:00 PM	7:00 AM – 7:00 PM	9:00 AM – 8:00PM
Route 10E Duluth Heights - Eklund	5:00 AM – 8:00 AM; 3:00 PM – 7:00 PM	N/A	N/A
Route 11 East 8 th UMD	7:00 AM – 8:00 PM	N/A	N/A
Route 11K East 8 th UMD Kenwood	7:00 PM – 2:00 AM	7:00 AM – 12:00 AM	9:00 AM – 10:00 PM
Route 11M East 8 th UMD Morley Heights	5:00 AM – 9:00 AM; 3:00 PM – 7:00 PM	N/A	N/A
Route 12 Kenwood	5:00 AM – 7:00 PM	N/A	N/A

Route	Weekday	Saturday	Sunday
Route 13 E4th-UMD-Woodland	4:00 AM – 12:00 AM	6:00 AM – 9:00 PM	8:00 AM – 9:00 PM
Route 13U E4th - UMD	7:00 AM – 4:00 PM	N/A	N/A
Route 14W W4th Blvd	6:00 AM – 7:00 PM	9:00 AM – 5:00 PM	N/A
Route 15 Park Point	6:00 AM – 7:00 PM	9:00 AM – 6:00 PM	N/A
Route 16 Duluth Superior	5:00 AM – 8:00 PM	6:00 AM – 7:00 PM	10:00 AM – 8:00 PM
Route 16X Superior Express	4:00 PM – 6:00 PM	N/A	N/A
Route 17 City of Superior	5:00 AM – 7:00 AM; 9:00 AM – 3:00 PM	8:00 AM – 8:00 PM	10:00 AM – 7:00 PM
Route 17B City of Superior	6:00 AM – 9:00 AM; 4:00 PM – 7:00 PM	N/A	N/A
Route 17S City of Superior	6:00 AM – 9:00 AM; 3:00 PM – 7:00 PM	N/A	1:00 PM – 3:00 PM
Route 18 CSS/UMD	7:00 AM – 11:00 PM	N/A	N/A
Route 21 Grocery Route	N/A	10:00 AM – 2:00 PM	N/A

Source: DTA, 2017

Table 7: Fixed-Route Frequency by Route

Route	Peak Period			Off-Peak Period		
	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
Route 1 Grand Avenue Zoo	15	N/A	N/A	20	N/A	N/A
Route 2 New Duluth	30	60	60	60	60	60
Route 2F New Duluth – Fond du Lac	77	N/A	N/A	N/A	N/A	N/A
Route 2X New Duluth Express	N/A	N/A	N/A	N/A	N/A	N/A
Route 3 Proctor	60	60	60	60	60	60
Route 3X Proctor Express	N/A	N/A	N/A	60	N/A	N/A
Route 4 Ramsey-Raleigh	32	47	N/A	60	47	N/A
Route 5 West to the Mall Area	N/A	60	60	N/A	60	60
Route 6 East Mainline UMD	15	60	N/A	15	60	N/A
Route 7 East Mainline Lakeside	30	60	60	60	60	60
Route 7A East Mainline 24AE	56	N/A	N/A	56	N/A	N/A
Route 7X East Mainline Express	N/A	N/A	N/A	56	N/A	N/A
Route 8 LSC – WM-AP	60	N/A	N/A	60	N/A	N/A
Route 9MT Piedmont Morris Thomas	N/A	60	60	60	N/A	N/A
Route 9M Piedmont Mall Weekend	30	N/A	N/A	N/A	60	60
Route 10 Duluth Heights Mall	25	45	60	60	60	60
Route 10H Duluth Heights Mall via 6AE	60	N/A	N/A	60	30	30
Route 10E Duluth Heights - Eklund	60	30	30	60	N/A	N/A
Route 11 East 8 th UMD	15	N/A	N/A	30	N/A	N/A

Route	Peak Period			Off-Peak Period		
	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
Route 11K East 8 th UMD Kenwood	60	60	60	60	60	60
Route 11M East 8 th UMD Morley Heights	27	N/A	N/A	35	N/A	N/A
Route 12 Kenwood	30	N/A	N/A	60	N/A	N/A
Route 13 E4th-UMD-Woodland	30	60	60	60	60	60
Route 13U E4th – UMD	60	N/A	N/A	60	N/A	N/A
Route 14W W4th Blvd	60	120	N/A	60	120	N/A
Route 15 Park Point	60	120	N/A	60	120	N/A
Route 16 Duluth Superior	30	60	60	60	60	60
Route 16X Superior Express	30	N/A	N/A	N/A	N/A	N/A
Route 17 City of Superior	60	60	60	60	60	60
Route 17B City of Superior	25	N/A	N/A	30	N/A	N/A
Route 17S City of Superior	20	N/A	55	60	N/A	55
Route 18 CSS/UMD	60	N/A	N/A	60	N/A	N/A
Route 21 Grocery Route	N/A	70	N/A	N/A	70	N/A

Source: DTA, 2017

Table 8: Fixed-Route Average Monthly/Yearly Ridership by Route

Route	Average Monthly Ridership (2016)	Average Yearly Ridership (2011-2016)
Route 1 Grand Avenue Zoo	16,979	178,603
Route 2 New Duluth	25,558	316,108
Route 2F New Duluth – Fond du Lac	2,125	26,324
Route 2X New Duluth Express	926	8,650
Route 3 Proctor	19,001	200,769
Route 3X Proctor Express	544	6,565
Route 4 Ramsey-Raleigh	4,570	54,268
Route 5 West to the Mall Area	2,059	89,484
Route 6 East Mainline UMD	19,095	238,619
Route 7 East Mainline Lakeside	18,253	214,901
Route 7A East Mainline 24AE	567	4,649
Route 7X East Mainline Express	255	4,037
Route 8 LSC – WM-AP	5,559	61,144
Route 9MT Piedmont Morris Thomas	6,715	68,280
Route 9M Piedmont Mall Weekend	1,246	13,431
Route 10 Duluth Heights Mall	18,107	198,573
Route 10H Duluth Heights Mall via 6AE	13,038	148,406
Route 10E Duluth Heights - Eklund	1,401	15,435

Route	Average Monthly Ridership (2016)	Average Yearly Ridership (2011-2016)
Route 11 East 8 th UMD	10,750	137,052
Route 11K East 8 th UMD Kenwood	4,412	56,972
Route 11M East 8 th UMD Morley Heights	3,242	35,224
Route 12 Kenwood	7,376	91,954
Route 13 E4th-UMD-Woodland	19,714	251,161
Route 13U E4th - UMD	5,416	69,607
Route 14W W4th Blvd	1,575	12,043
Route 15 Park Point	1,578	20,032
Route 16 Duluth Superior	19,155	224,951
Route 16X Superior Express	316	3,406
Route 17 City of Superior	3,926	29,319
Route 17B City of Superior	859	6,512
Route 17S City of Superior	1,380	10,990
Route 18 CSS/UMD	4,408	54,404
Route 21 Grocery Route	368	2,887

Source: DTA, 2017

Fixed-Route Ridership

The project team collected APC ridership data from October 2nd, 2016 through October 8th, 2016. **Table 9** shows weekday and weekend ridership for each fixed-route, as well as overall system averages. The three routes with the most weekday ridership are Route 1 (Grand Avenue Zoo), Route 10 (Duluth Heights Mall), and Route 11 (East 8th UMD). The routes with the highest Saturday and Sunday ridership are Route 2 (New Duluth), Route 10H (Duluth Heights Mall via 6AE), Route 3 (Proctor), and Route 16 (Duluth Superior).

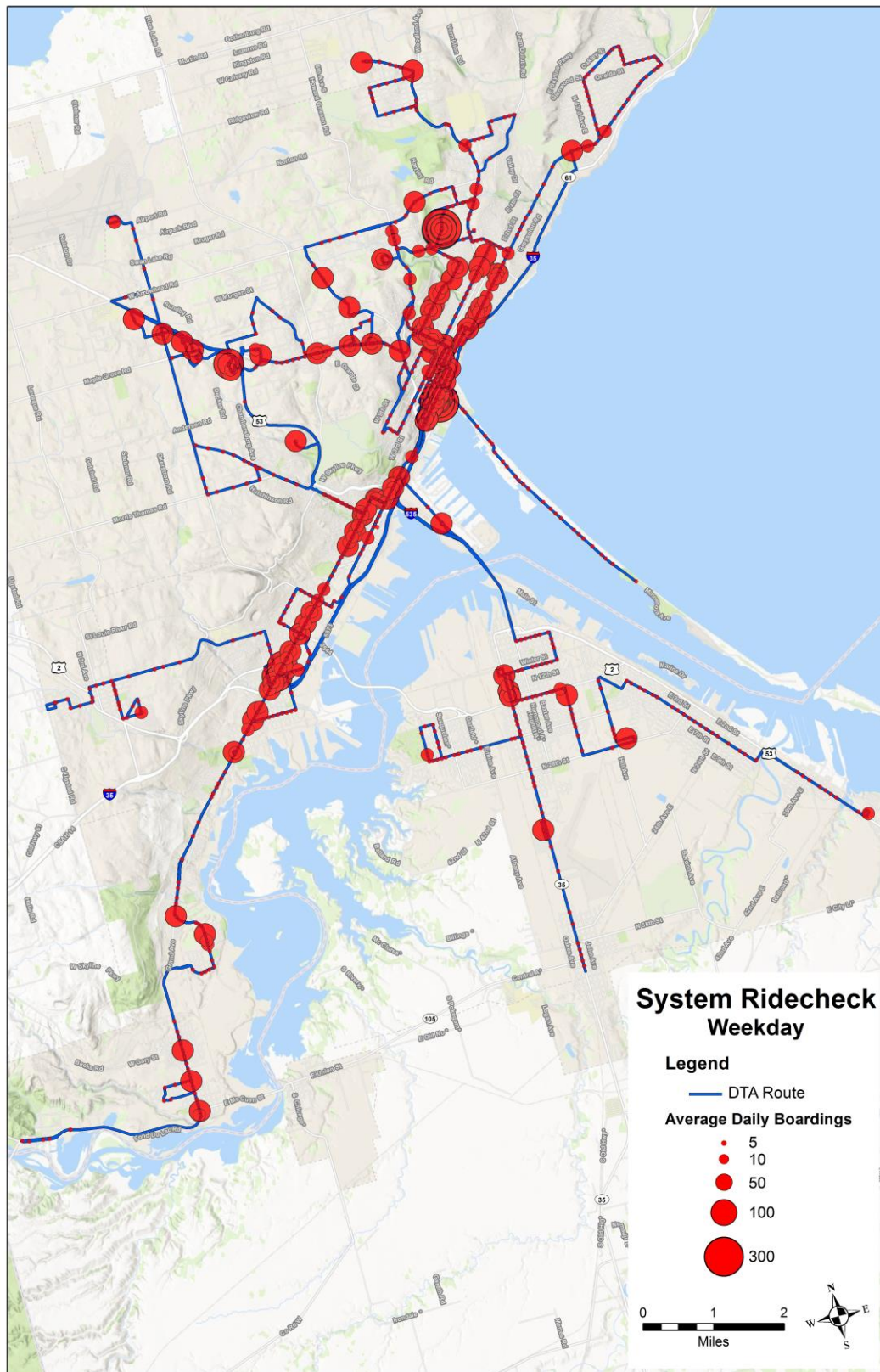
Figure 13 shows average weekday system-wide daily boardings based off an average of the 5-day collection period from October 3rd, 2016 through October 7th, 2016. The highest ridership on weekdays is located near downtown Duluth and UMD, as well as along Grand Avenue near Spirit Valley Mall, Burning Tree Plaza and the Miller Hill Mall area. Lower weekday ridership occurs in Fond-Du-Lac, New Duluth, and the East End and South portions of Superior, WI. On weekends, the greatest number of boardings occur in downtown Duluth, the Miller Hill Mall area, and downtown Superior. Low ridership areas on weekends are located south of Spirit Valley Mall, Piedmont, and north Duluth near Lakeside and Morley Heights. **Figure 14** and **Figure 15** show daily boardings by route for Saturday and Sunday. Additionally, **Figures 16** through **Figure 18** show the total boardings by route.

Table 9: Average Daily Boardings by Route – Fixed-Route

Route	Weekday	Saturday	Sunday
Route 1 Grand Avenue Zoo	4,538	N/A	N/A
Route 2 New Duluth	2,584	1,047	938
Route 2F New Duluth – Fond du Lac	347	N/A	N/A
Route 2X New Duluth Express	136	N/A	N/A
Route 3 Proctor	2,294	570	365
Route 3X Proctor Express	78	N/A	N/A
Route 4 Ramsey-Raleigh	638	67	N/A
Route 5 West to the Mall Area	N/A	242	55
Route 6 East Mainline UMD	2,797	299	N/A
Route 7 East Mainline Lakeside	2,248	466	329
Route 7A East Mainline 24AE	89	N/A	N/A
Route 7X East Mainline Express	37	N/A	N/A
Route 8 LSC – WM-AP	825	N/A	N/A
Route 9MT Piedmont Morris Thomas	563	N/A	N/A
Route 9M Piedmont Mall Weekend	N/A	211	142
Route 10 Duluth Heights Mall	3,700	478	245
Route 10H Duluth Heights Mall via 6AE	1,611	829	614
Route 10E Duluth Heights - Eklund	315	N/A	N/A
Route 11 East 8 th UMD	3,652	N/A	N/A
Route 11K East 8 th UMD Kenwood	572	408	227
Route 11M East 8 th UMD Morley Heights	956	N/A	N/A
Route 12 Kenwood	2,048	N/A	N/A
Route 13 E4th-UMD-Woodland	2,784	448	308
Route 13U E4th - UMD	1,042	N/A	N/A
Route 14W W4th Blvd	227	35	N/A
Route 15 Park Point	158	39	N/A
Route 16 Duluth Superior	2,250	378	376
Route 16X Superior Express	55	N/A	N/A
Route 17 City of Superior	404	174	99
Route 17B City of Superior	103	N/A	N/A
Route 17S City of Superior	164	N/A	13
Route 18 CSS/UMD	768	N/A	N/A
Route 21 Grocery Route	N/A	25	N/A

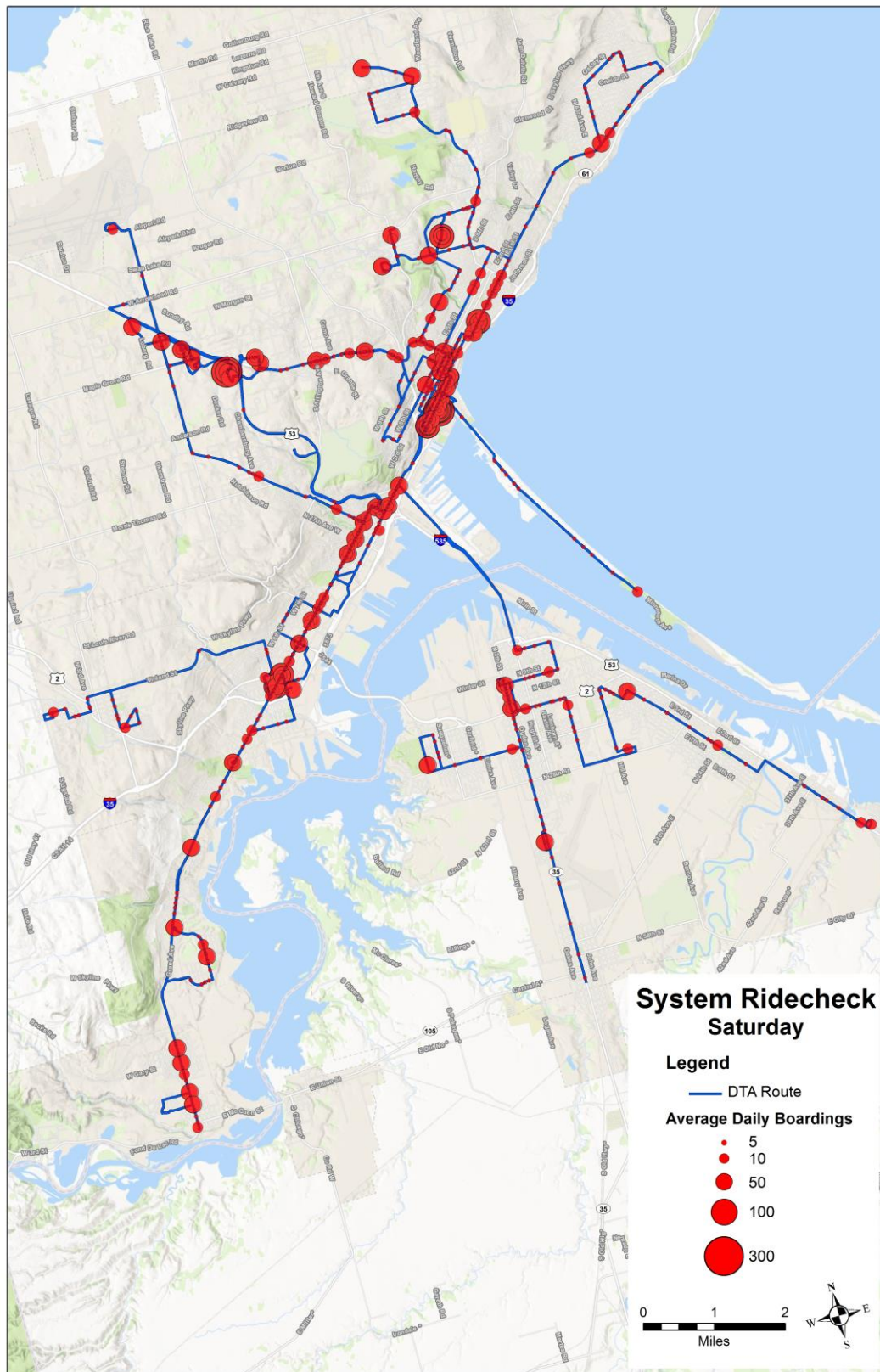
Source: DTA, 2017

Figure 13: Weekday System-wide Ridership Overview



Source: AECOM, 2017

Figure 14: Saturday System-wide Ridership Overview



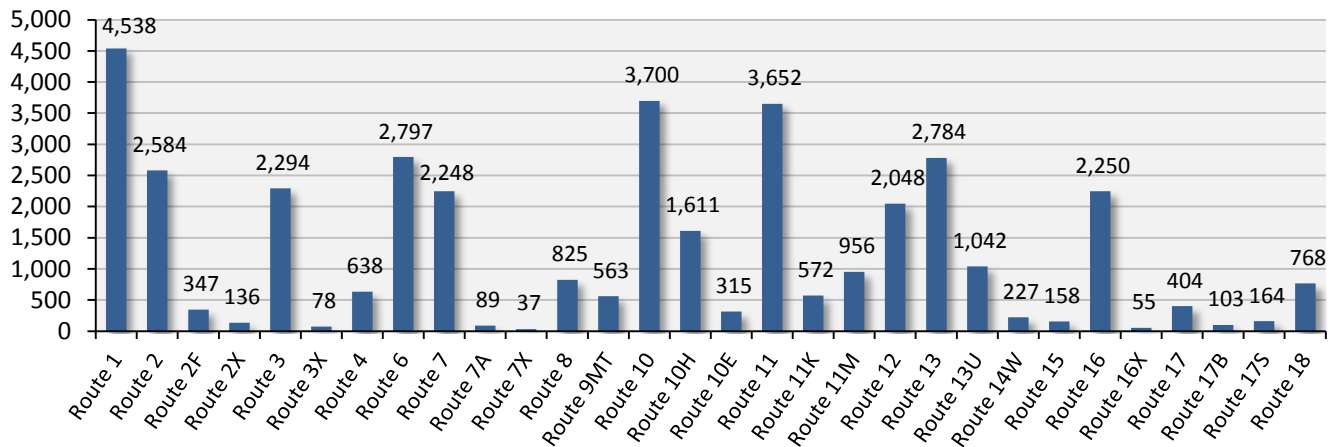
Source: AECOM, 2017

Figure 15: Sunday System-wide Ridership Overview



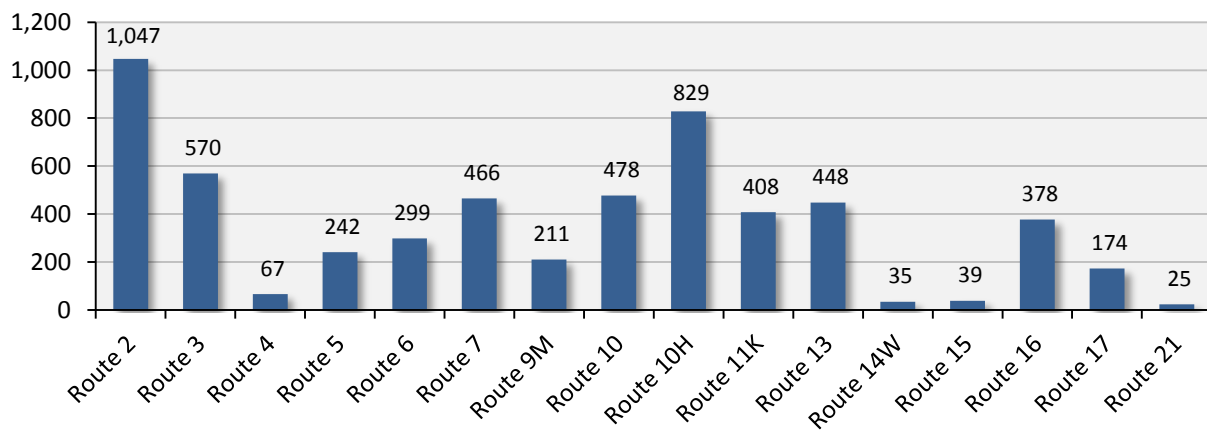
Source: AECOM, 2017

Figure 16: Weekday Ridership per Route – Daily Boardings



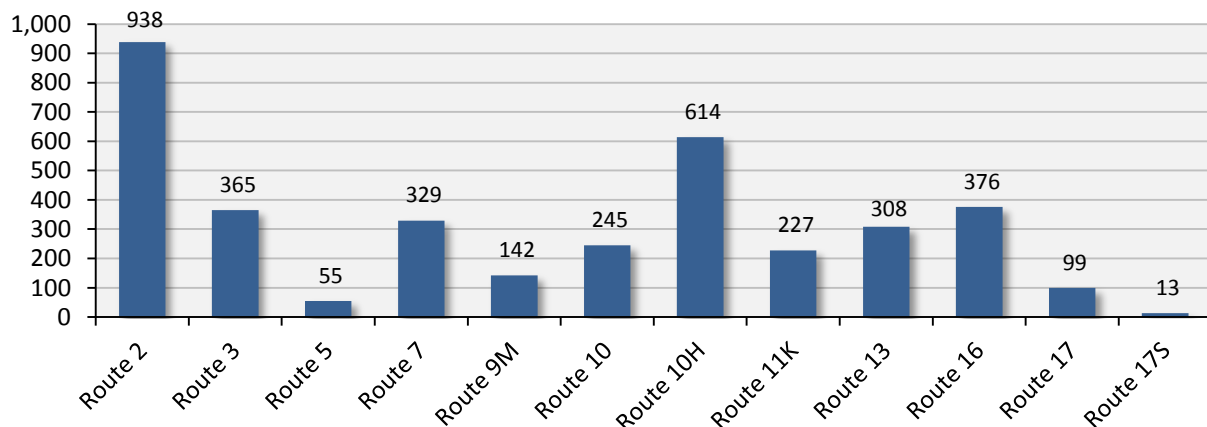
Source: AECOM, 2017

Figure 17: Saturday Ridership per Route – Daily Boardings



Source: AECOM, 2017

Figure 18: Sunday Ridership per Route – Daily Boardings



Source: AECOM, 2017

On-Time Performance

On-time performance is an important factor for reliability and attractiveness of the service. **Table 10** shows DTA's fixed-route on-time performance by route. Overall, the three lowest performing routes are Route 2X, Route 7X, and Route 10H. Comparatively, the top three performing routes are Route 18, Route 21, and Route 4. Numerous circumstances can affect on-time performance of routes causing poor ratings or inconsistent data.

Tourism and construction, from May to October, can cause major traffic constraints in downtown and around the city that adversely affect on-time performance scores. Particularly, the West Mainlines, as well as East 4th Street are impacted. The effects can be seen on all routes that travel west of 59th Street along Grand Avenue. As there are limited alternate routes buses are forced to sit in traffic delays daily.

Table 10: Fixed-Route On-Time Performance (OTP)

Route	Early	On-Time	Late	Missing	Total	OTP (%)
Route 1 Grand Avenue Zoo	500	17,218	3,402	97	21,120	81.5%
Route 2 New Duluth	561	20,730	3,599	159	24,890	83.3%
Route 2F New Duluth – Fond du Lac	83	2,374	360	39	2,817	84.3%
Route 2X New Duluth Express	13	356	297	48	666	53.5%
Route 3 Proctor	597	18,243	3,504	227	22,344	81.6%
Route 3X Proctor Express	13	502	104	11	619	81.1%
Route 4 Ramsey-Raleigh	285	10,612	734	704	11,631	91.2%
Route 5 West to the Mall Area	81	1,981	354	149	2,416	82.0%
Route 6 East Mainline UMD	208	12,700	2,335	144	15,243	83.3%
Route 7 East Mainline Lakeside	292	11,603	1,838	70	13,733	84.5%
Route 7A East Mainline 24AE	5	413	78	8	496	83.3%
Route 7X East Mainline Express	17	161	31	1	209	77.0%
Route 8 LSC – WM-AP	141	7,522	930	161	8,593	87.5%
Route 9MT Piedmont Morris Thomas	718	14,046	1,303	145	16,067	87.4%
Route 9M Piedmont Mall Weekend	90	2,951	363	33	3,404	86.7%
Route 10 Duluth Heights Mall	659	18,723	2,892	1,423	22,274	84.1%
Route 10H Duluth Heights Mall via 6AE	883	10,081	2,216	672	13,180	76.5%
Route 10E Duluth Heights - Eklund	100	2,282	270	224	2,652	86.0%
Route 11 East 8 th UMD	68	6,798	1,545	73	8,411	80.8%
Route 11K East 8 th UMD Kenwood	377	5,285	536	833	6,198	85.3%
Route 11M East 8 th UMD Morley Heights	119	5,039	757	49	5,915	85.2%
Route 12 Kenwood	409	7,116	968	291	8,493	83.8%
Route 13 E4th-UMD-Woodland	1,266	18,521	1,977	969	21,764	85.1%
Route 13U E4th - UMD	113	2,261	157	230	2,531	89.3%
Route 14W W4th Blvd	138	3,822	238	374	4,198	91.0%
Route 15 Park Point	33	4,760	544	47	5,337	89.2%
Route 16 Duluth Superior	1,053	12,253	1,964	807	15,270	80.2%
Route 16X Superior Express	2	200	49	1	251	79.7%
Route 17 City of Superior	218	5,269	517	305	6,004	87.8%
Route 17B City of Superior	454	2,872	159	253	3,485	82.4%
Route 17S City of Superior	74	2,435	239	240	2,748	88.6%
Route 18 CSS/UMD	206	8,590	177	507	8,973	95.7%
Route 21 Grocery Route	24	744	15	25	783	95.0%

Source: DTA, 2017

Route Profiles

The following section describes the operating pattern and ridership performance for DTA's fixed-route service. For the purposes of the fixed-route profiles, ranking information does not include peak-only services since the routes do not operate the full span of service. In addition, the average daily boarding weekday maps presented in this section are an average of the 5-days from when the ridecheck analysis was conducted, which was from October 3rd, 2016 through October 7th, 2016. This section presents information on key ridership areas in Duluth, span of service, and peak hours of operation. Morning peak hours are from 6:00 AM to 9:59 AM, while afternoon and evening peak hours are from 3:00 PM to 5:59 PM.

Route 1 – Grand Avenue Zoo

Route Overview

Route 1 Grand Avenue begins service at the Transportation Center in downtown Duluth at the intersection of Michigan Street and 3rd Avenue. The route travels southwest on Superior Street and 3rd Street/Grand Avenue where the route completes the one-way trip at the Lake Superior Zoo. In addition, Route 1 operates Monday through Friday from 5:00 AM to 10:00 PM. There is no service provided on Saturday or Sunday.

Figure 19 and **Figure 20** illustrate average weekday passenger boarding's for Route 1.

- Compared to other fixed-routes, Route 1 has the most boardings on weekdays.
- Trips occur at every major stop along Route 1.
- The lowest numbers of boardings occur from 6th Avenue to Piedmont Avenue.
- The peak ridership period is from 3:00 PM to 4:00 PM on weekdays.

At a Glance		Grand Avenue Zoo (1)
Weekday Boardings (rank)		4,538 (1/17)
Weekday Revenue Hours		37.13
AM Peak Hour (weekday boardings)		8a - 9am (397)
PM Peak Hour (weekday boardings)		3pm - 4pm (523)
Span of Service	Mon-Fri	5am – 10pm
Peak Frequency (minutes)	Mon-Fri	15
Off-Peak Frequency (minutes)	Mon-Fri	20

Key Ridership Areas

- East downtown Duluth
- North of Lincoln Park
- Spirit Valley Mall
- Co-Op
- Denfeld High School

Interlined Routes

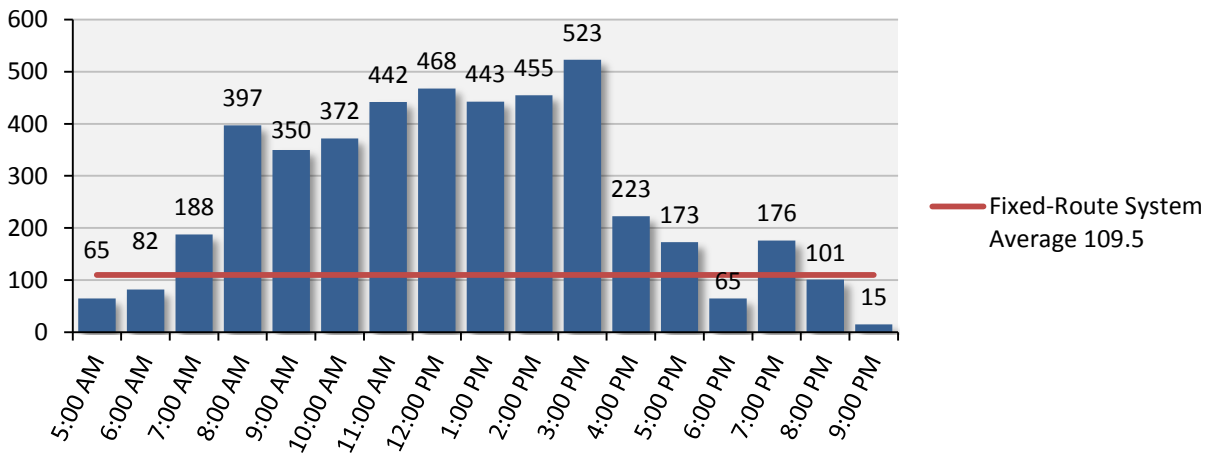
- Route 13
- Route 10H
- Route 7A

Figure 19: Weekday Boardings – Route 1 Grand Avenue Zoo



Source: AECOM, 2017

Figure 20: Weekday Boardings – Route 1 Grand Avenue Zoo



Source: AECOM, 2017

Route 2 – New Duluth

Route Overview

Route 2 New Duluth begins service at the Transportation Center in downtown Duluth at the intersection of Michigan Street and 3rd Avenue. The route travels southwest on Superior Street and 3rd Street/Grand Avenue where the route completes the one-way trip at the intersection of Commonwealth and McCuen Street. Route 2 operates weekdays from 4:00 AM to 2:00 PM, Saturday from 6:00 AM to 1:00 PM, and Sunday from 6:00 AM to 11:00 PM. **Figure 21** through **Figure 26** illustrate average weekday, Saturday, and Sunday passenger boarding's for Route 2.

- Route 2 has the highest ridership on Saturday and Sunday.
- Most of the weekday boardings occur at the Transportation Center in downtown Duluth.
- The most boardings occur on weekdays from 6:00 PM to 7:00 PM, Saturday from 3:00 PM to 4:00 PM, and Sunday from 9:00 AM to 10:00 PM.

Key Ridership Areas

- Downtown Duluth
- Denfeld High School
- Gary
- New Duluth
- Vintage Acres

Interlined Routes

- Route 7
- Route 7A
- Route 10H
- Route 11K
- Route 13
- Downtown Trolley

At a Glance		New Duluth (2)
Weekday Boardings (rank)		2,584 (6/17)
Weekday Revenue Hours		39.35
Saturday Boardings (rank)		1,047 (1/15)
Saturday Revenue Hours		27.50
Sunday Boardings (rank)		938 (1/12)
Sunday Revenue Hours		24.62
AM Peak Hour (weekday boardings)		9am -10am (114)
PM Peak Hour (weekday boardings)		3pm – 4pm (178)
AM Peak Hour (Saturday boardings)		8am - 9am (66)
PM Peak Hour (Saturday boardings)		3pm – 4pm (99)
AM Peak Hour (Sunday boardings)		9am - 10am (76)
PM Peak Hour (Sunday boardings)		3pm – 4pm (66)
Span of Service	Mon-Fri	4am – 2am
	Sat	6am – 1am
	Sun	6am – 11pm
Peak Frequency (minutes)	Mon-Fri	30
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 21: Weekday Boardings – Route 2 New Duluth



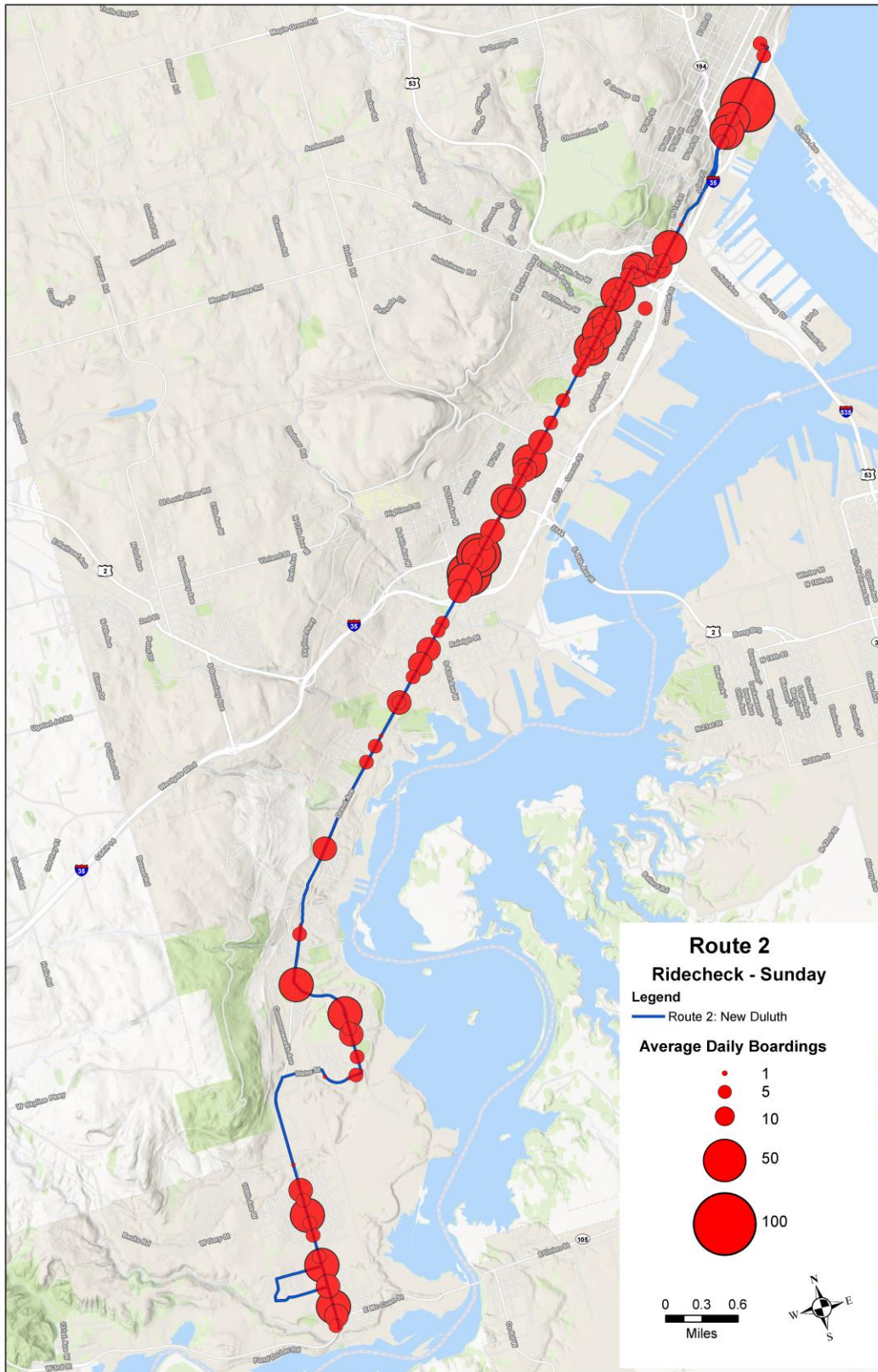
Source: AECOM, 2017

Figure 22: Saturday Boardings – Route 2 New Duluth



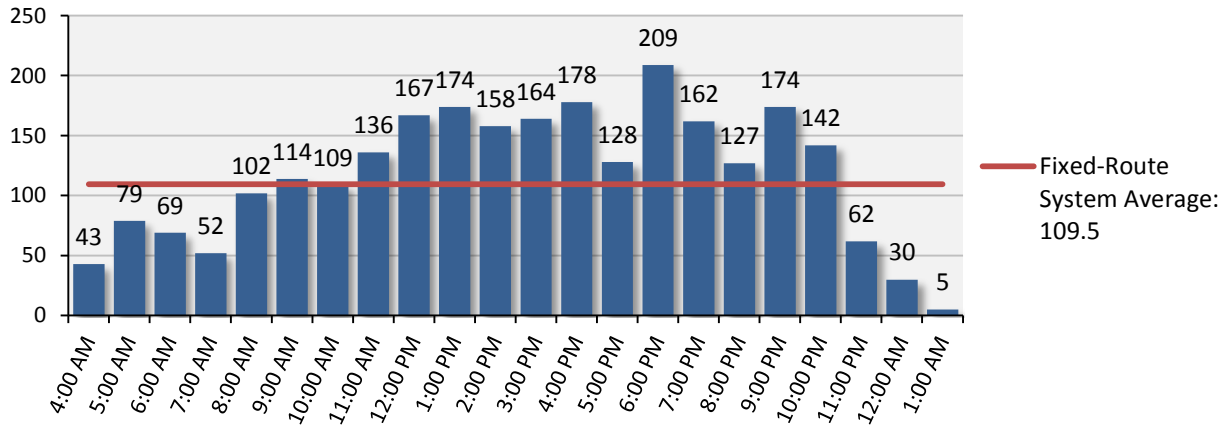
Source: AECOM, 2017

Figure 23: Sunday Boardings – Route 2 New Duluth



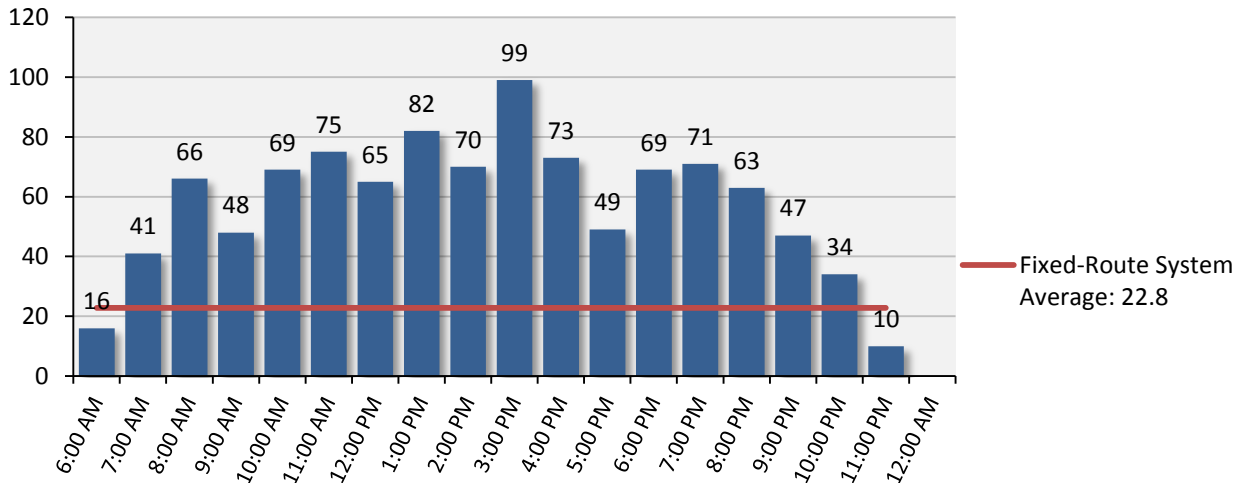
Source: AECOM, 2017

Figure 24: Weekday Boardings per Hour – Route 2 New Duluth



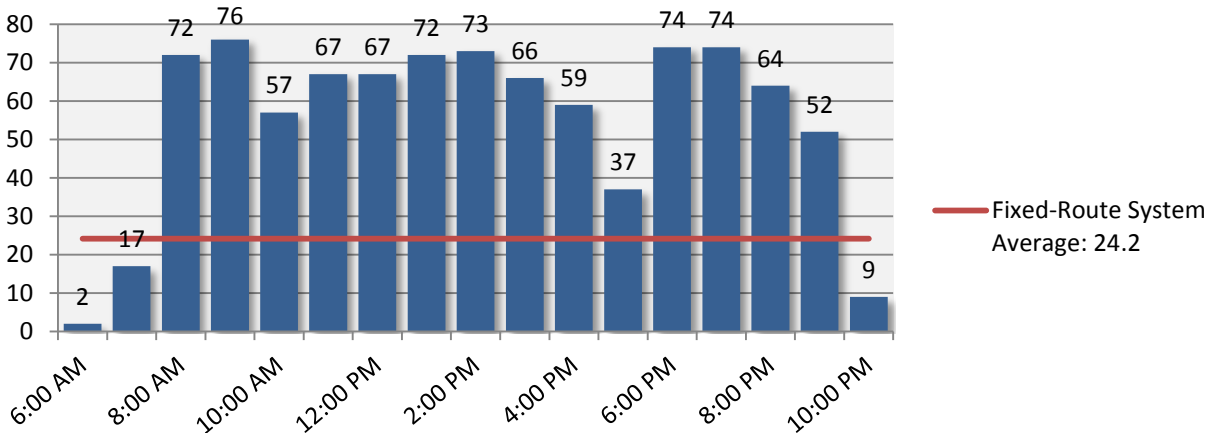
Source: AECOM, 2017

Figure 25: Saturday Boardings per Hour – Route 2 New Duluth



Source: AECOM, 2017

Figure 26: Sunday Boardings per Hour – Route 2 New Duluth



Source: AECOM, 2017

Route 2F – New Duluth – Fond du Lac

Route Overview

Route 2 New Duluth – Fond du Lac is a peak service provided by DTA which operates on weekdays from 4:00 AM to 8:00 AM and 4:00 PM to 7:00 PM. The route begins service at the Transportation Center in downtown Duluth at the intersection of Michigan Street and 3rd Avenue. The route travels southwest on Superior Street and 3rd Street/Grand Avenue where the route completes the one-way trip at Highway 23 and Highway 210. In addition, the route makes seven (7) trips a day and operates for seven hours per day on peak periods. **Figure 27** and **Figure 28** illustrate average weekday passenger boarding's for Route 2F.

- The greatest numbers of boardings occur from 7:00 AM to 8:00 AM and 5:00 PM to 6:00 PM on weekdays.
- All three trips from downtown Duluth board passengers east (or north) of the Transportation Center.

Key Ridership Areas

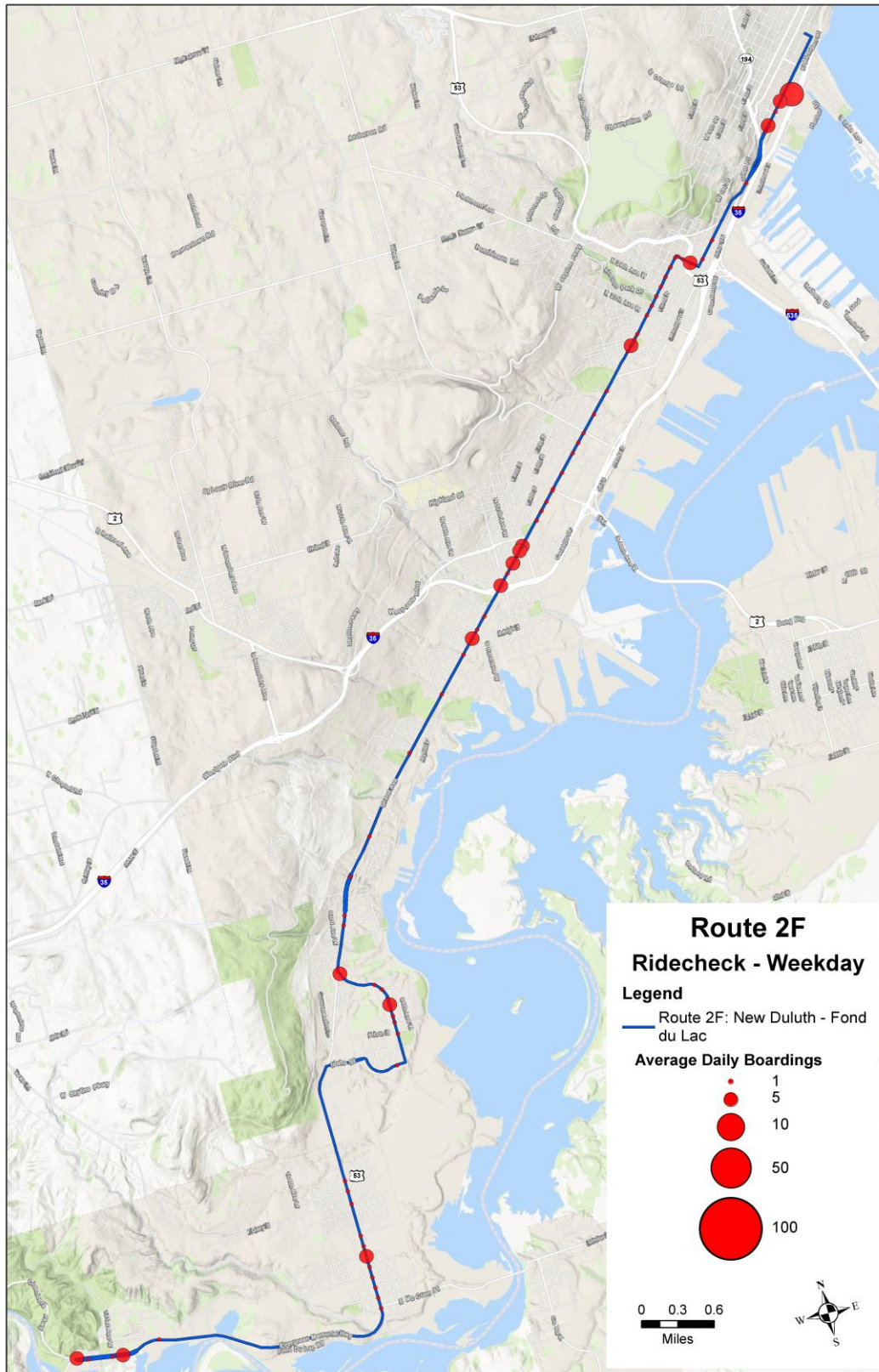
- Duluth Public Library
- Mission Creek Park
- Fond-Du-Lac
- Memorial Park
- Spirit Valley Mall

Interlined Routes

- Route 7
- Route 12

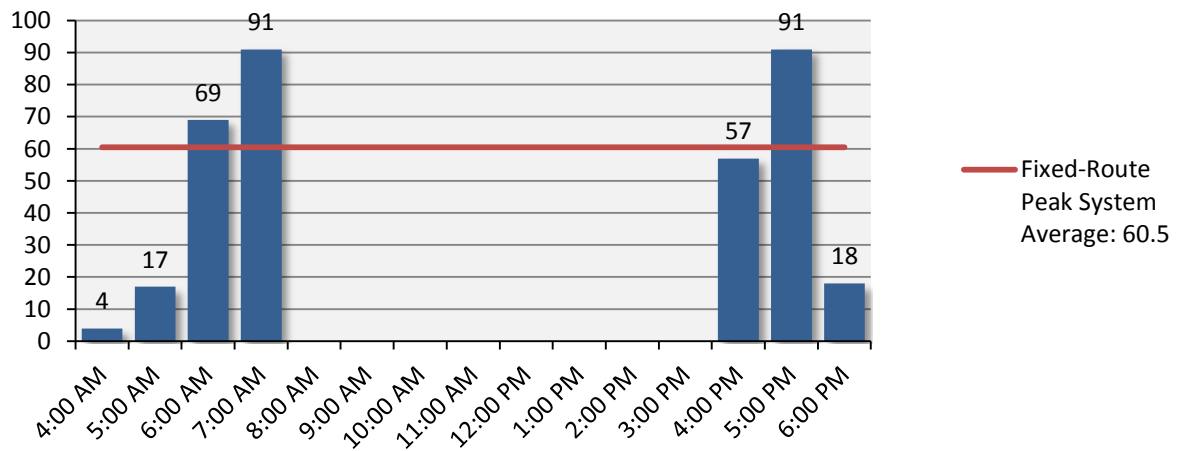
At a Glance		New Duluth – Fond du Lac (2F)
Weekday Boardings (rank)		347
Weekday Revenue Hours		5.85
AM Peak Hour (weekday boardings)		7am – 8am (91)
PM Peak Hour (weekday boardings)		5pm – 6pm (91)
Span of Service	Mon-Fri	4am – 8am 4pm – 7pm
Peak Frequency (minutes)	Mon-Fri	N/A
Off-Peak Frequency (minutes)	Mon-Fri	N/A

Figure 27: Weekday Boardings – Route 2F New Duluth – Fond du Lac



Source: AECOM, 2017

Figure 28: Weekday Boardings per Hour – Route 2F New Duluth – Fond du Lac



Source: AECOM, 2017

Route 2X – New Duluth Express

Route Overview

Route 2 New Duluth Express is a peak service provided by DTA which operates on weekdays from 6:00 AM to 8:00 AM and 4:00 PM to 6:00 PM. The express route begins service in the mornings at Commonwealth and McCuen Street and completes the one-way trip at the Transportation Center in downtown Duluth. During the late afternoon peak hours, the route begins service at the Transportation Center and travels to Commonwealth and McCuen Street where it completes the one-way trip. The express route only makes two trips a day, once in the mornings and once in the evening, which operate only on weekdays. In addition, the express route has an average daily ridership of 136 boardings. The most boarding activity occurs from 7:00 AM to 8:00 AM and 4:00 PM to 5:00 PM. **Figure 29** and **Figure 30** illustrate average weekday passenger boarding's for Route 2X.

At a Glance		New Duluth Express (2X)
Weekday Boardings (rank)		136
Weekday Revenue Hours		1.50
AM Peak Hour (weekday boardings)		7am - 8am (69)
PM Peak Hour (weekday boardings)		4pm - 5pm (55)
Span of Service	Mon-Fri	6am - 8am 4pm - 6pm
Peak Frequency (minutes)	Mon-Fri	N/A
Off-Peak Frequency (minutes)	Mon-Fri	N/A

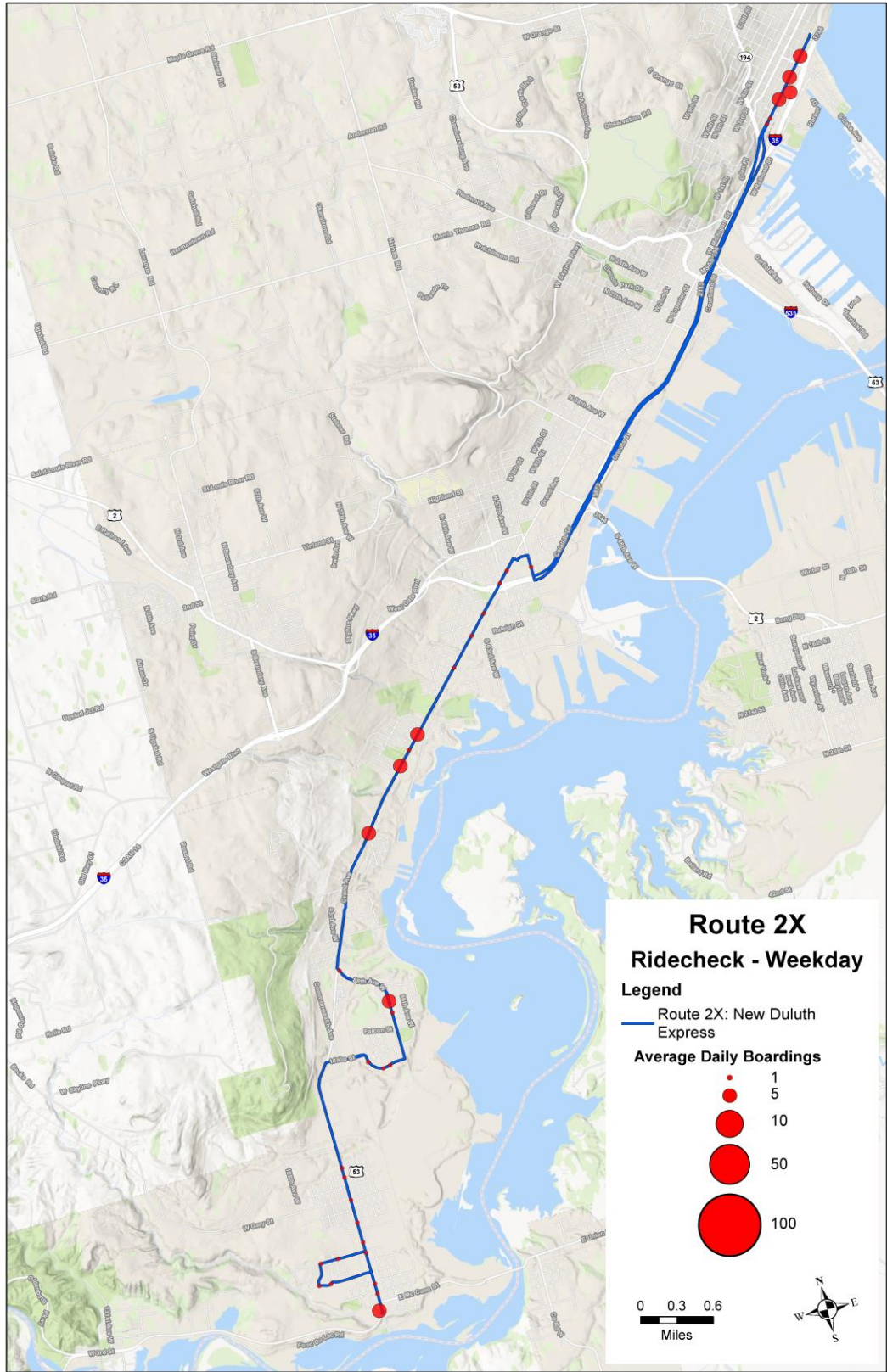
Key Ridership Areas

- Vintage Acres
- East downtown Duluth
- Superamerica in Morgan Park
- Norton Park

Interlined Routes

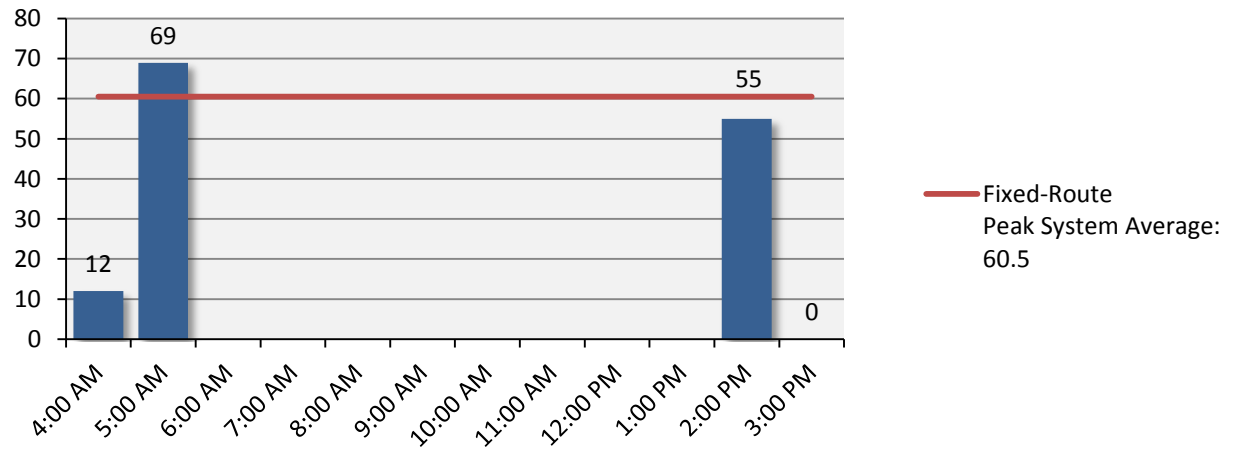
- Route 13

Figure 29: Weekday Boardings – Route 2X New Duluth Express



Source: AECOM, 2017

Figure 30: Weekday Boardings per Hour – Route 2X New Duluth Express



Source: AECOM, 2017

Route 3 – Proctor

Route Overview

Route 3 Proctor begins service at the Transportation Center in downtown Duluth at the intersection of Michigan Street and 3rd Avenue. The route travels southwest on Superior Street and 3rd Street/Grand Avenue where the route begins traveling north on 59th Avenue, east on Cody Street, and north of 57th Avenue. The route then continues west on Highland Street where route completes the one-way trip in Proctor at 4th Street and 9th Avenue. Route 3 operates with 60 minute frequency weekdays, Saturday, and Sunday. In addition, Route 3 operates weekdays from 5:00 AM to 10:00 PM, Saturday from 6:00 AM to 8:00 PM, and Sunday from 9:00 AM to 11:00 PM. **Figure 31** through **Figure 36** illustrate average weekday, Saturday, and Sunday passenger boarding's for Route 3.

- The lowest number of boardings on weekdays, Saturday, and Sunday occur as the route travels west to Bayview Heights.

Key Ridership Areas

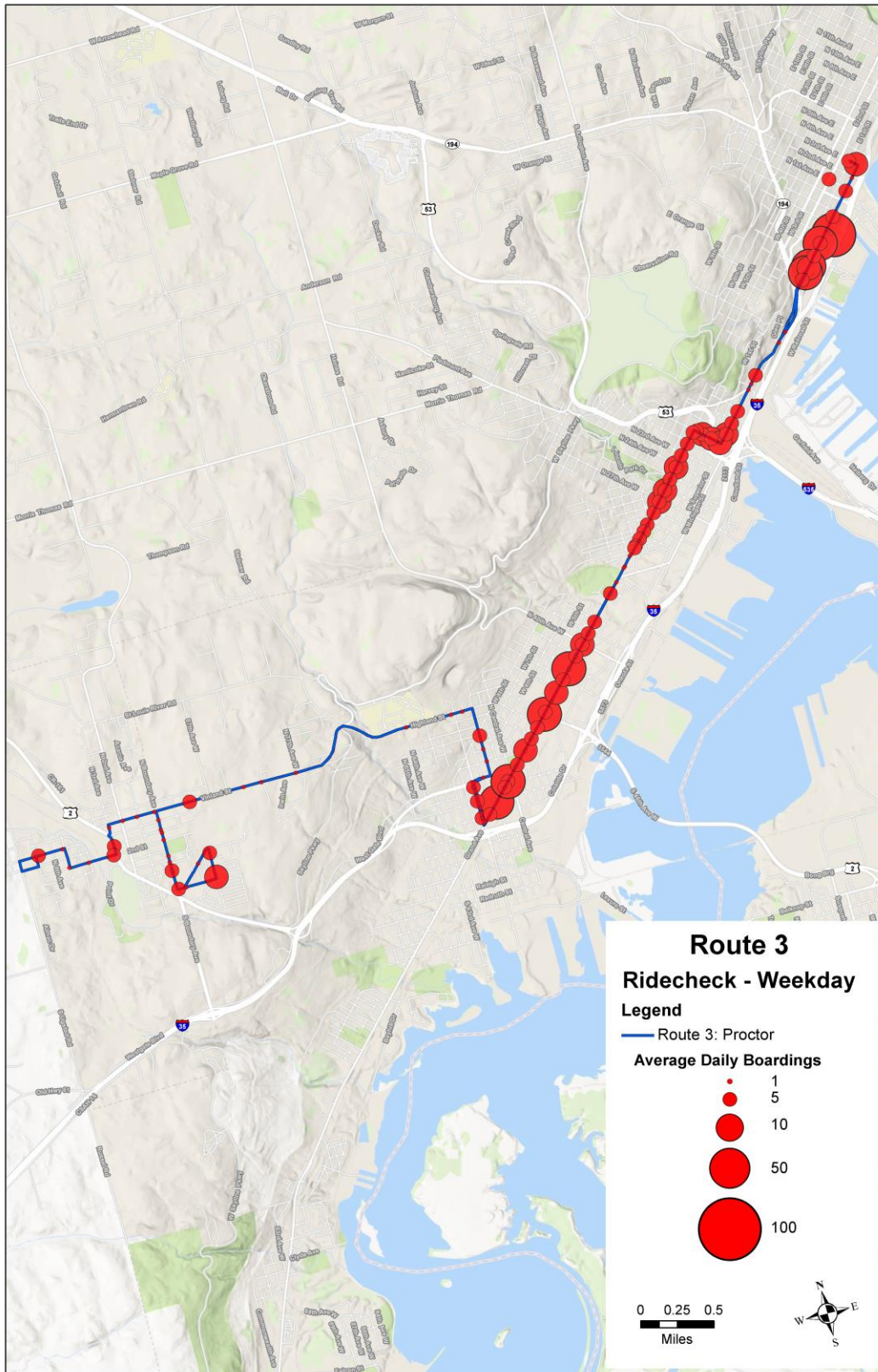
- South downtown Duluth
- Spirit Valley Mall
- Denfeld High School Area
- Zenith Terrace
- Proctor Public Schools

Interlined Routes

- Route 6
- Route 10H
- Downtown Trolley

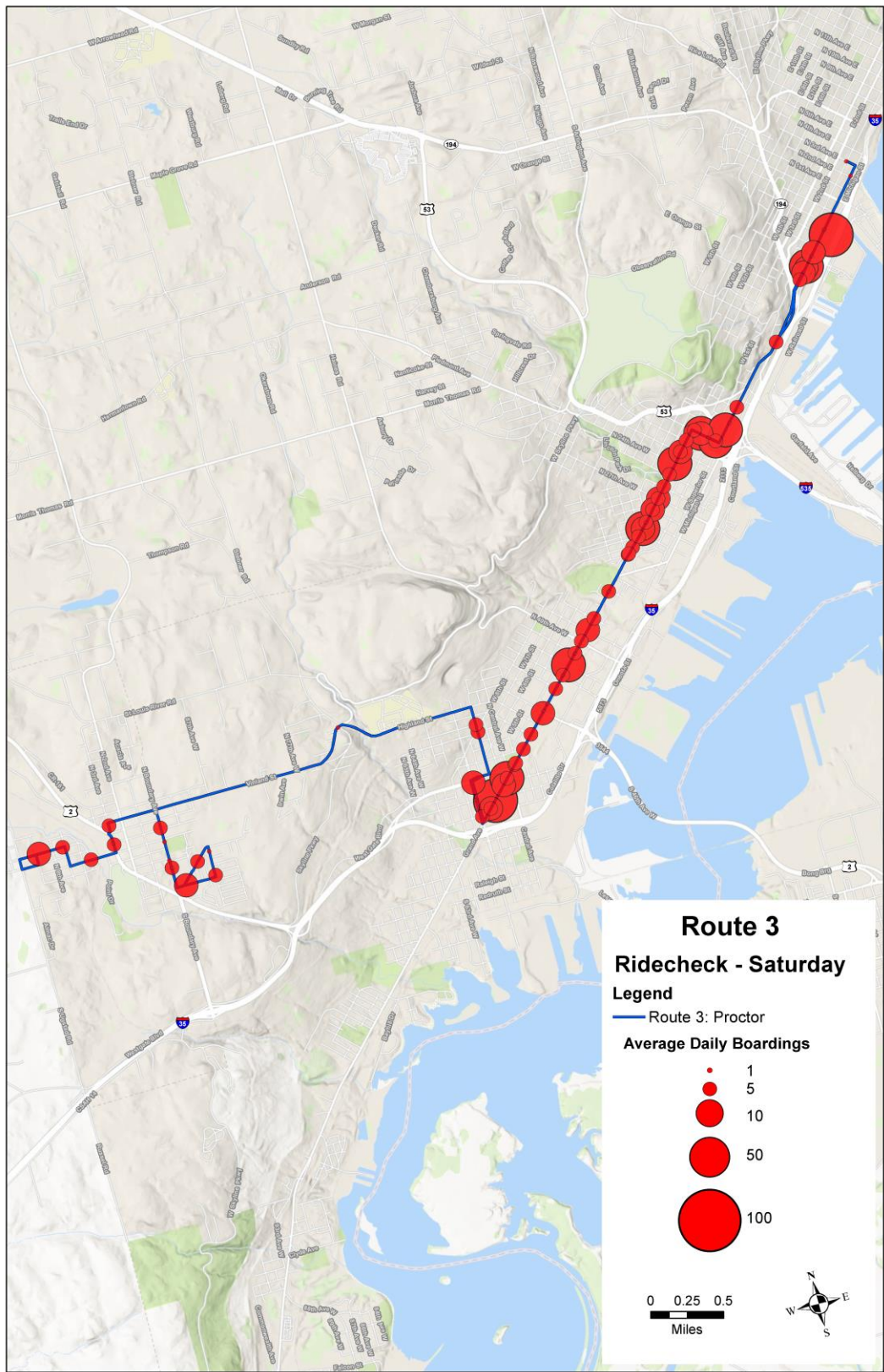
At a Glance		Proctor (3)
Weekday Boardings (rank)		2,294 (7/17)
Weekday Revenue Hours		34.72
Saturday Boardings (rank)		1,047 (2/15)
Saturday Revenue Hours		20.67
Sunday Boardings (rank)		365 (4/12)
Sunday Revenue Hours		14.40
AM Peak Hour (weekday boardings)		9am -10am (149)
PM Peak Hour (weekday boardings)		3pm – 4pm (252)
AM Peak Hour (Saturday boardings)		8am - 9am (38)
PM Peak Hour (Saturday boardings)		4pm – 5pm (67)
AM Peak Hour (Sunday boardings)		9am - 10am (15)
PM Peak Hour (Sunday boardings)		3pm – 4pm (47)
Span of Service	Mon-Fri	5am – 10pm
	Sat	6am – 8pm
	Sun	9am – 7pm
Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 31: Weekday Boardings – Route 3 Proctor



Source: AECOM, 2017

Figure 32: Saturday Boardings – Route 3 Proctor



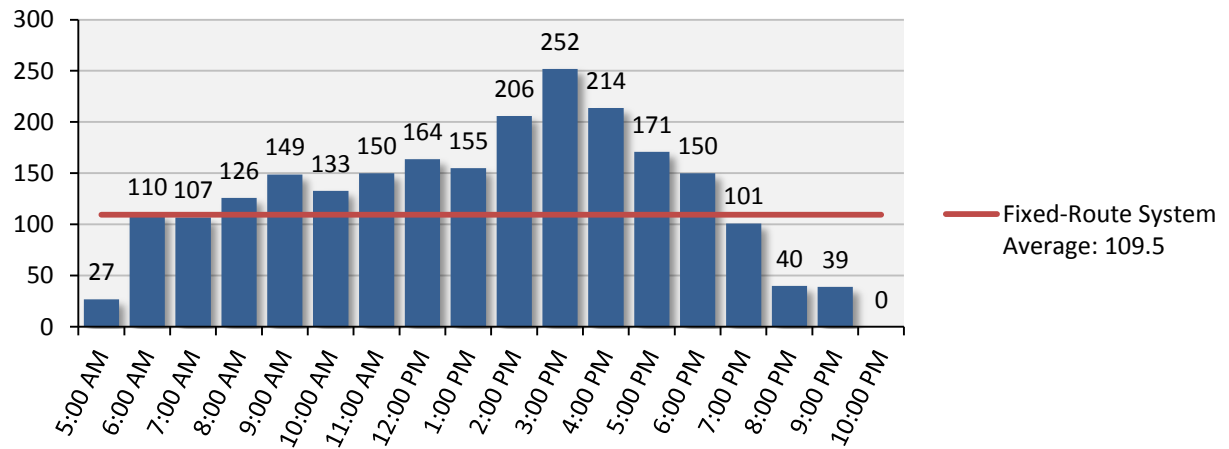
Source: AECOM, 2017

Figure 33: Sunday Boardings – Route 3 Proctor



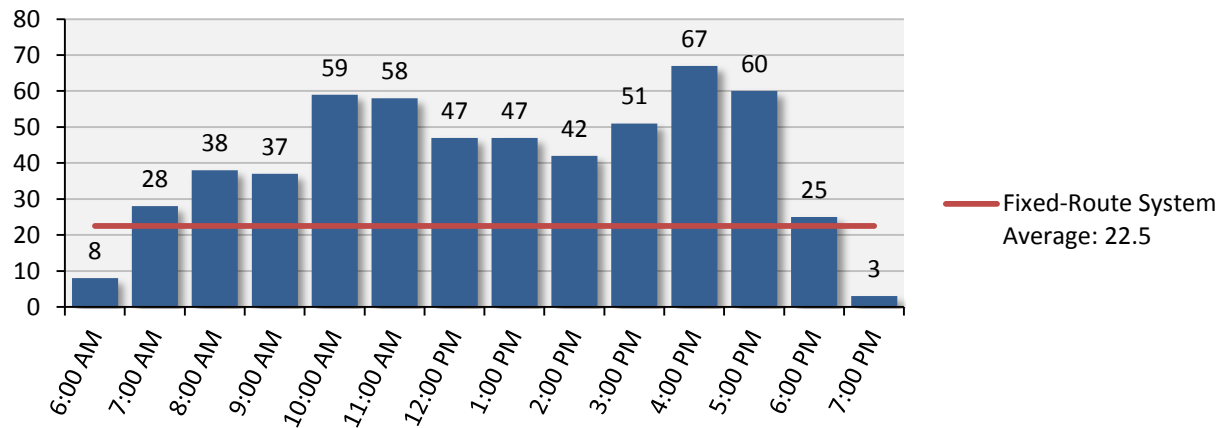
Source: AECOM, 2017

Figure 34: Weekday Boardings per Hour – Route 3 Proctor



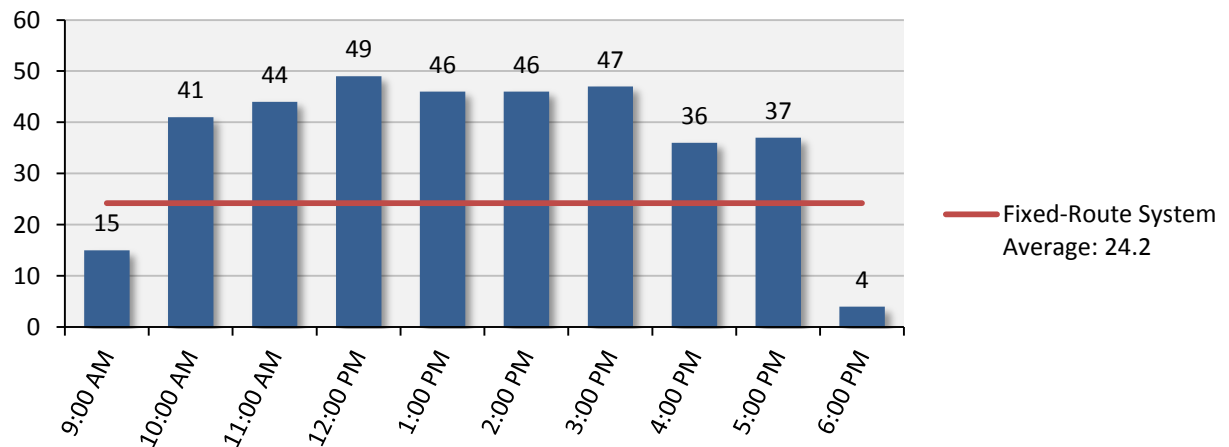
Source: AECOM, 2017

Figure 35: Saturday Boardings per Hour – Route 3 Proctor



Source: AECOM, 2017

Figure 36: Sunday Boardings per Hour – Route 3 Proctor



Source: AECOM, 2017

Route 3X – Proctor Express

Route Overview

Route 3X Proctor Express begins service in Proctor, Minnesota at 4th Street and 9th Avenue. The express route makes one stop at Grand Avenue and 57th Avenue before completing the one-way trip at the Transportation Center in downtown Duluth. In addition, Route 3X operates 2 trips a day once in the morning and once in the evening. Additionally, Route 3X operates on weekdays from 7:00 AM to 8:00 PM and 4:00 PM to 6:00 PM. **Figure 37** and **Figure 38** illustrate average weekday passenger boarding's for Route 3X.

- Most of the weekday boardings occur from 7:00 AM to 8:00 AM.
- No boardings occurred after 5:00 PM during the weekdays.
- Most boardings occur in downtown Duluth, Spirit Valley, and Proctor.

Key Ridership Areas

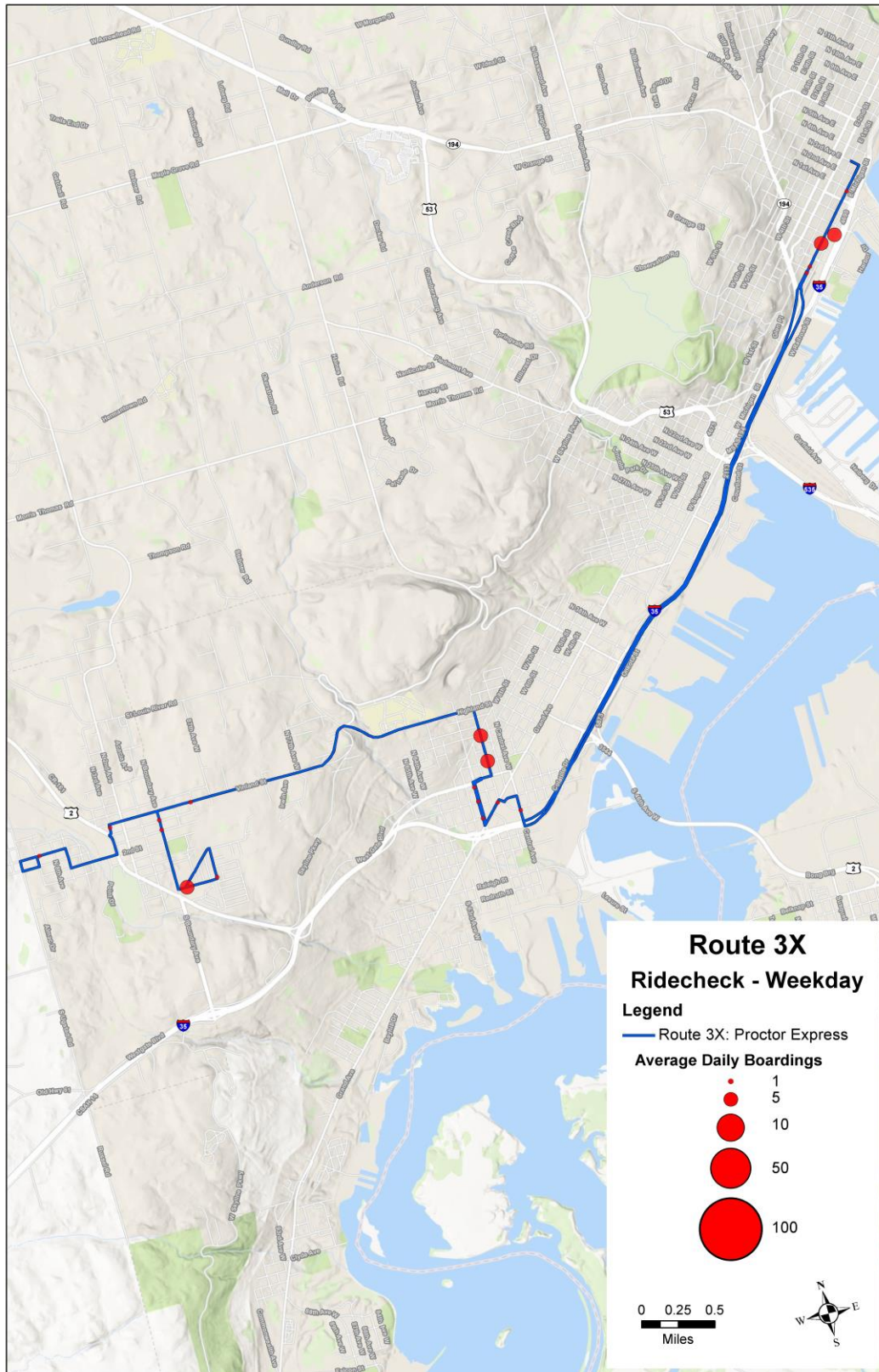
- Zenith Terrace
- Residences near Oneota and Spirit Valley
- South of downtown Duluth
- Spirit Valley Mall

Interlined Routes

- Route 10

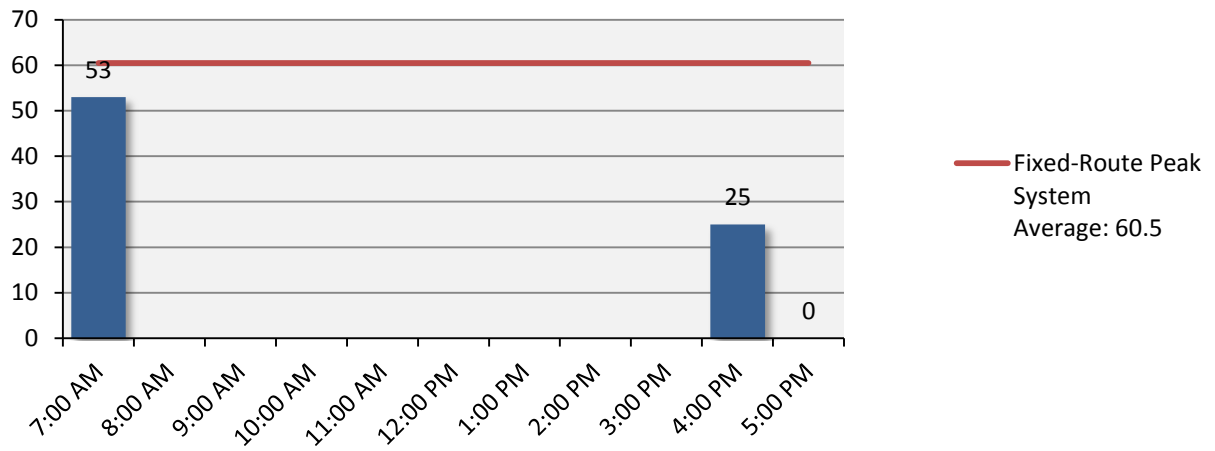
At a Glance		Proctor Express (3X)
Weekday Boardings (rank)		78
Weekday Revenue Hours		1.80
AM Peak Hour (weekday boardings)		7am -8am (53)
PM Peak Hour (weekday boardings)		4pm – 5pm (25)
Span of Service	Mon-Fri	7am – 8pm 4pm – 6pm
Peak Frequency (minutes)	Mon-Fri	60
Off-Peak Frequency (minutes)	Mon-Fri	60

Figure 37: Weekday Boardings – Route 3X Proctor Express



Source: AECOM, 2017

Figure 38: Weekday Boardings per Hour – Route 3X Proctor Express



Source: AECOM, 2017

Route 4 – Ramsey-Raleigh

Route Overview

Route 4 Ramsey-Raleigh operates weekdays from 5:00 AM to 7:00 PM and Saturday from 8:00 AM to 6:00 PM. There is no service on Sundays. Route 4 provides service between the Transportation Center in downtown Duluth and the Lake Superior Zoo. In addition, Route 4 makes three timed stops at Superior Street and 21st Avenue, 40th Avenue and Grand Avenue, and Raleigh Street and 62nd Avenue. Also, Route 4 operates a 32 minute frequency during weekday peak periods and a 60 minute frequency during off-peak periods. On Saturdays Route 4 has a 47 minute frequency for the entirety of service. **Figure 39** through **Figure 42** illustrate weekday and Saturday passenger boarding's for Route 4.

- The most boardings occur weekdays from 7:00 AM to 8:00 AM and Saturday from 12:00 PM to 1:00 PM.

Key Ridership Areas

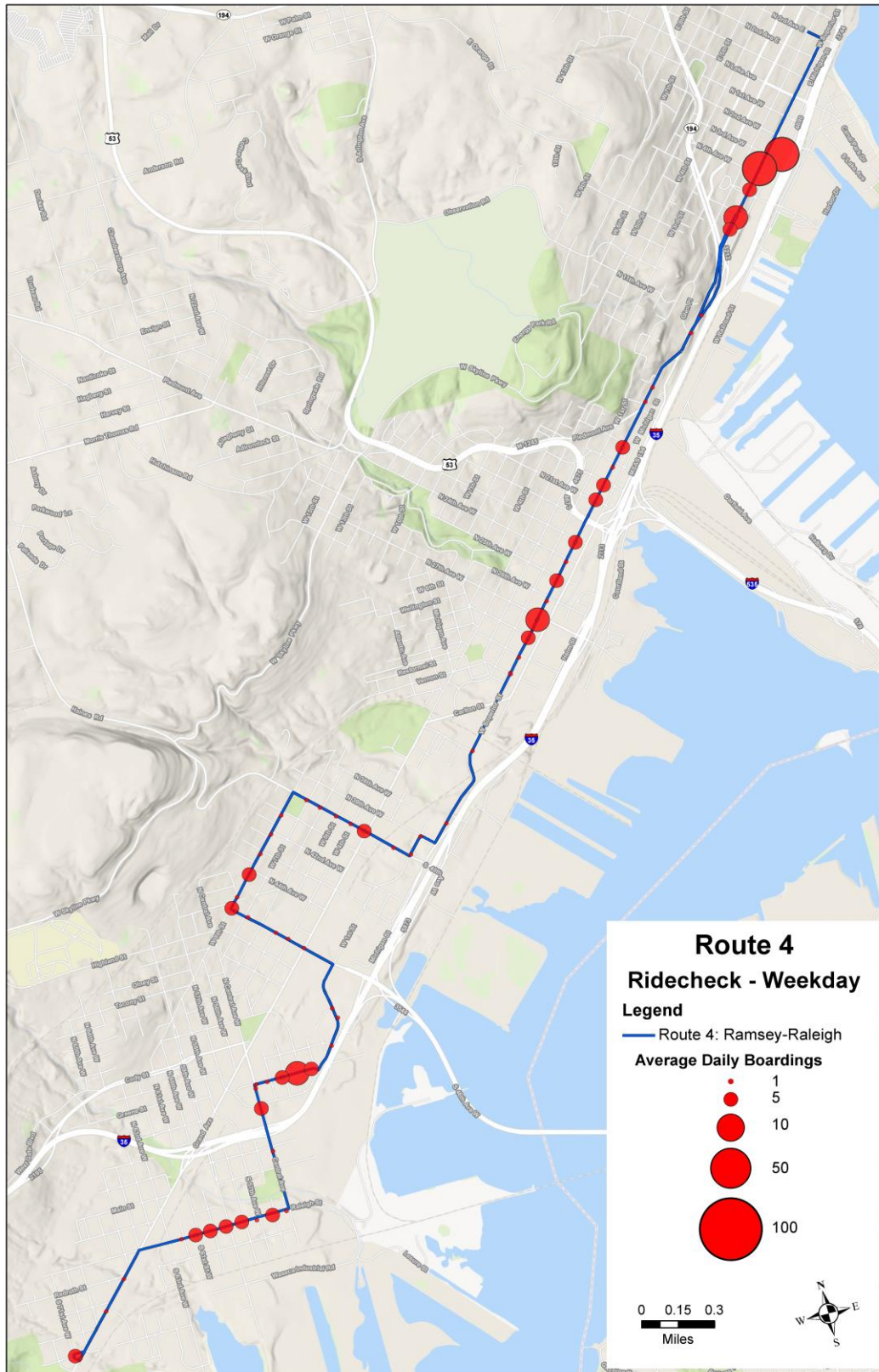
- East downtown Duluth
- Denfeld
- Lake Superior Zoo
- Super One

Interlined Routes

- Route 7
- Route 12
- Route 15
- Route 10E
- Downtown Trolley

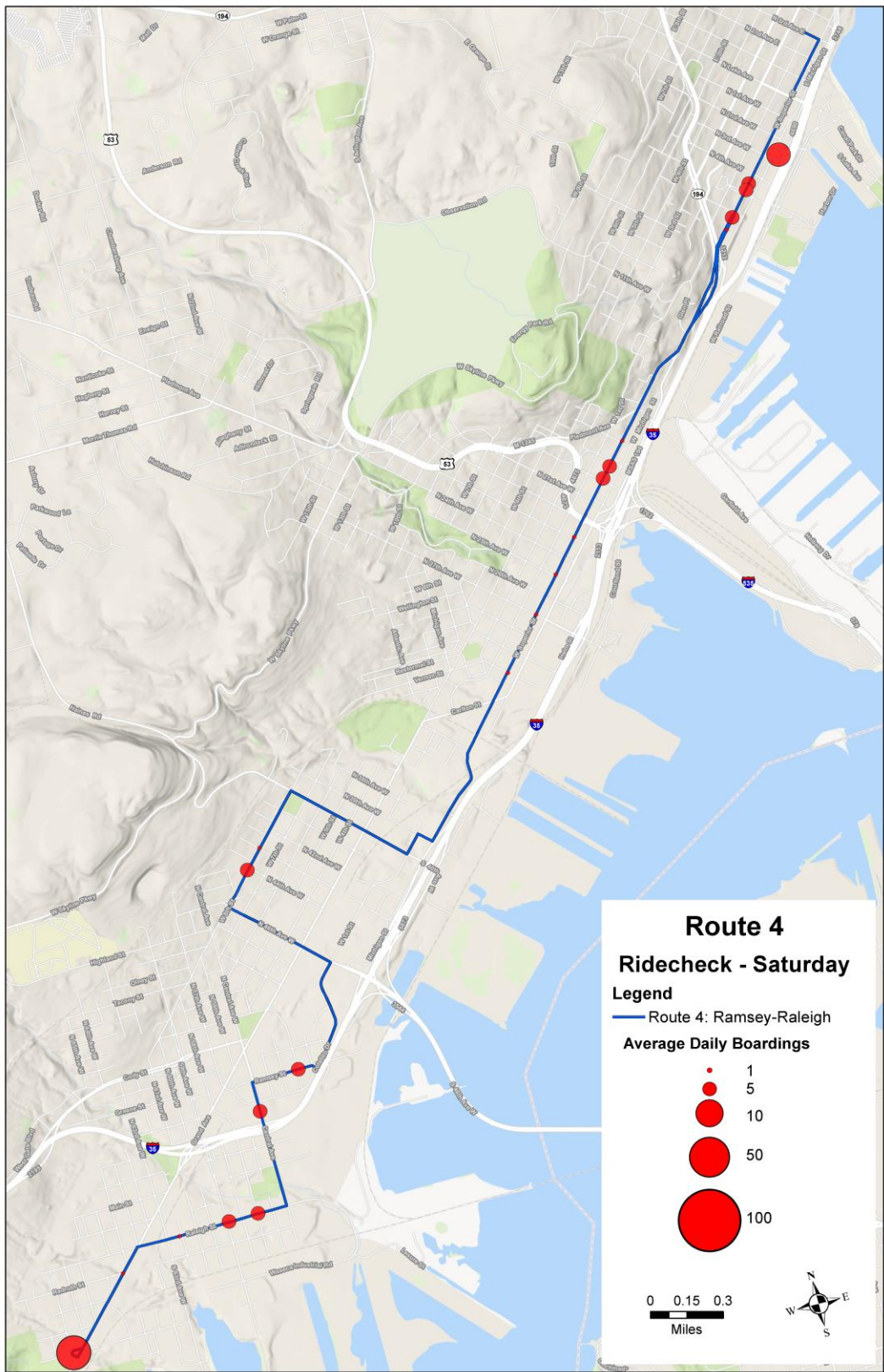
At a Glance		Ramsey-Raleigh (4)
Weekday Boardings (rank)		638 (13/17)
Weekday Revenue Hours		22.02
Saturday Boardings (rank)		67 (12/15)
Saturday Revenue Hours		5.78
AM Peak Hour (weekday boardings)		7am -8am (92)
PM Peak Hour (weekday boardings)		4pm – 5pm (85)
AM Peak Hour (Saturday boardings)		9am - 10am (6)
PM Peak Hour (Saturday boardings)		3pm – 4pm (9)
Span of Service	Mon-Fri	5am – 7pm
	Sat	8am – 6pm
Peak Frequency (minutes)	Mon-Fri	32
	Sat	47
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	47

Figure 39: Weekday Boardings – Route 4 Ramsey-Raleigh



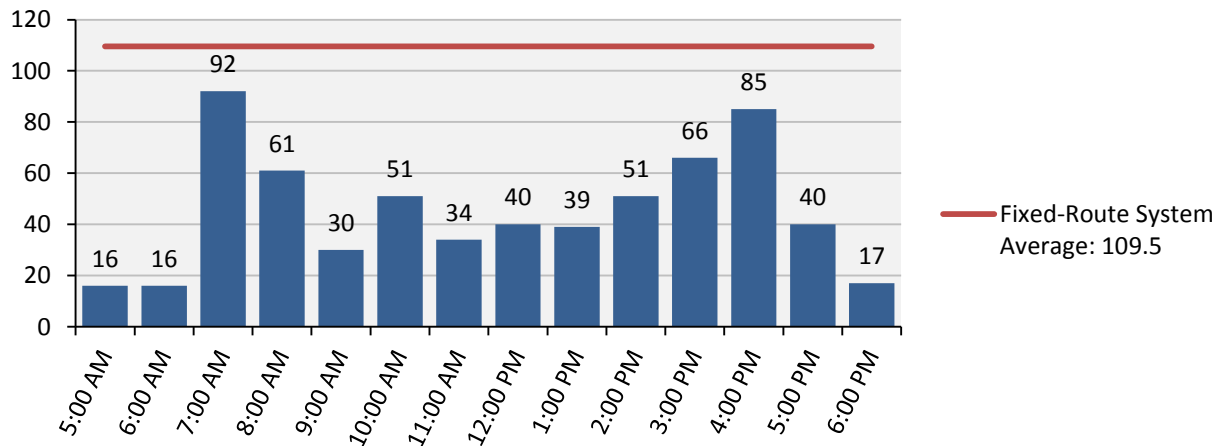
Source: AECOM, 2017

Figure 40: Saturday Boardings – Route 4 Ramsey-Raleigh



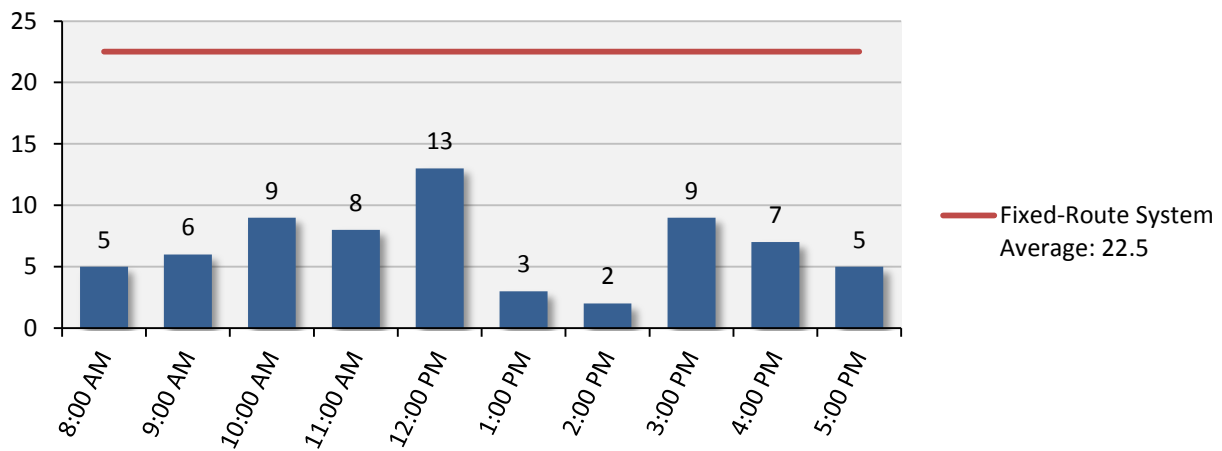
Source: AECOM, 2017

Figure 41: Weekday Boardings per Hour – Route 4 Ramsey-Raleigh



Source: AECOM, 2017

Figure 42: Saturday Boardings per Hour – Route 4 Ramsey-Raleigh



Source: AECOM, 2017

Route 5 – West to the Mall Area

Route Overview

Route 5 operates Saturday from 9:00 AM to 7:00 PM and Sunday from 12:00PM to 7:00 PM. There is no service on weekdays. Saturday service on Route 5 travels between the Lake Superior Zoo, Miller Hill Mall area, Walmart, and Duluth International Airport. On Sunday, Route 5 provides service between the Duluth International Airport, Walmart, and the Miller Hill Mall area. **Figure 43** through **Figure 46** illustrate average Saturday and Sunday passenger boardings for Route 5.

- Most of the boardings occur at the Burning Tree Plaza or Wal-Mart in Hermantown.
- Sunday service has no boardings along Superior Street.

Key Ridership Areas

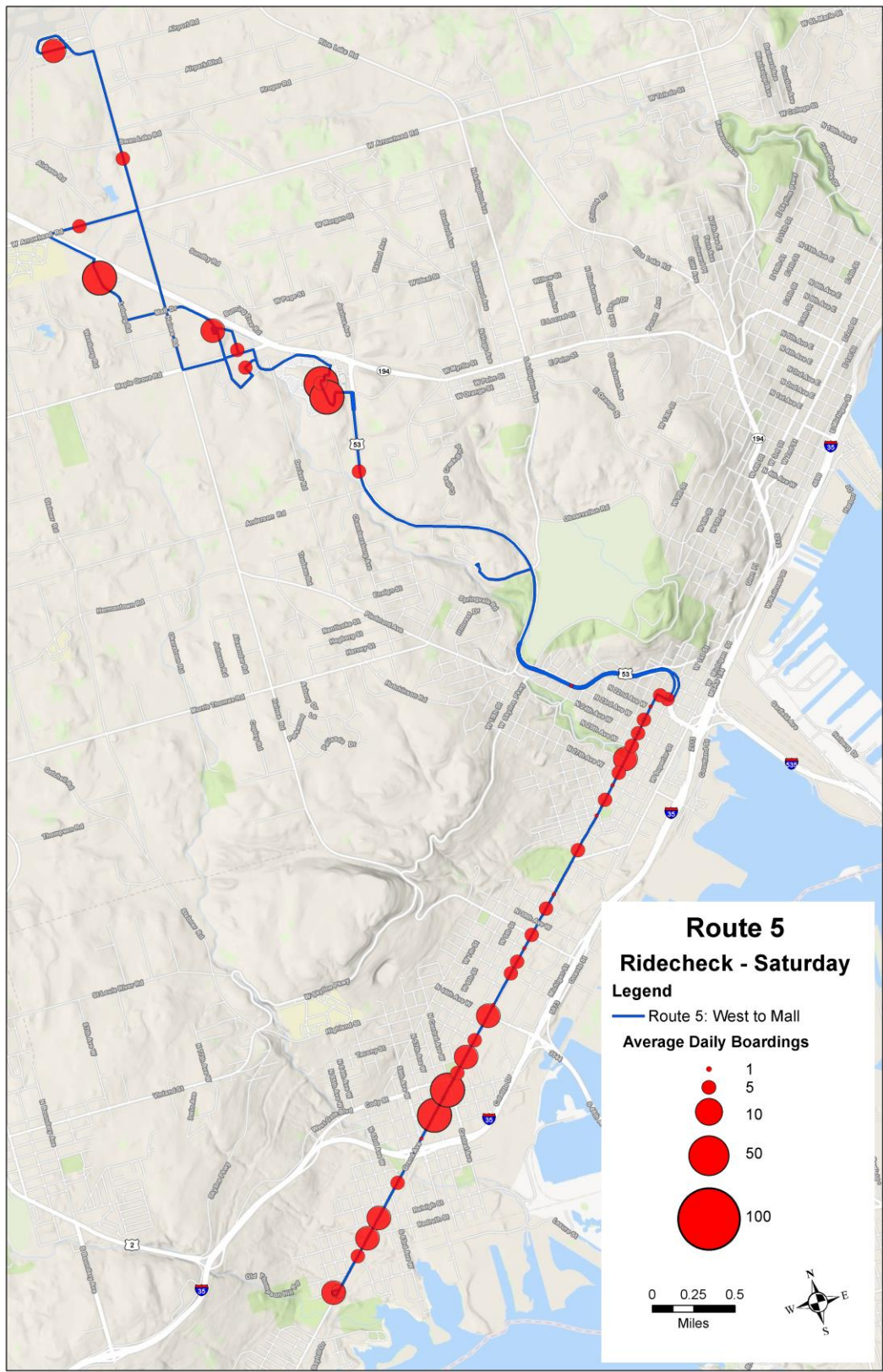
- Wal-Mart near Hermantown
- Burning Tree Plaza
- Spirit Valley Mall
- Miller Hill Mall
- Lincoln Park

Interlined Routes

- Route 5 does not interline with any routes on Saturday or Sunday.

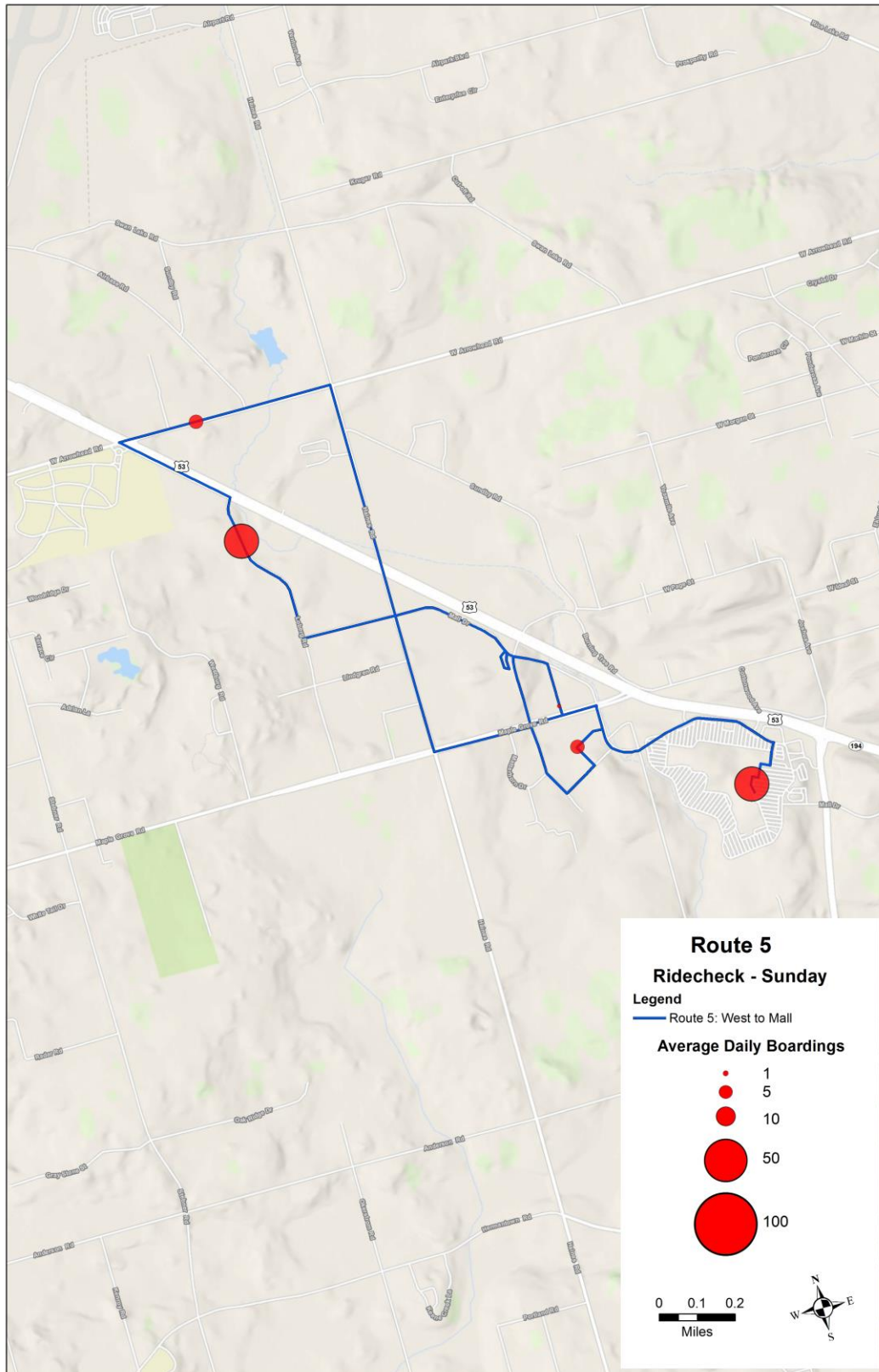
At a Glance		West to the Mall Area (5)
Saturday Boardings (rank)		242 (9/15)
Saturday Revenue Hours		18.30
Sunday Boardings (rank)		55 (11/12)
Sunday Revenue Hours		6.23
AM Peak Hour (Saturday boardings)		9am -10am (11)
PM Peak Hour (Saturday boardings)		3pm – 4pm (31)
AM Peak Hour (Sunday boardings)		N/A
PM Peak Hour (Sunday boardings)		3pm – 4pm (12)
Span of Service	Sat	9am – 7pm
	Sun	12pm – 7pm
Peak Frequency (minutes)	Sat	60
	Sat	60
Off-Peak Frequency (minutes)	Sat	60
	Sat	60

Figure 43: Saturday Boardings – Route 5 West to the Mall Area



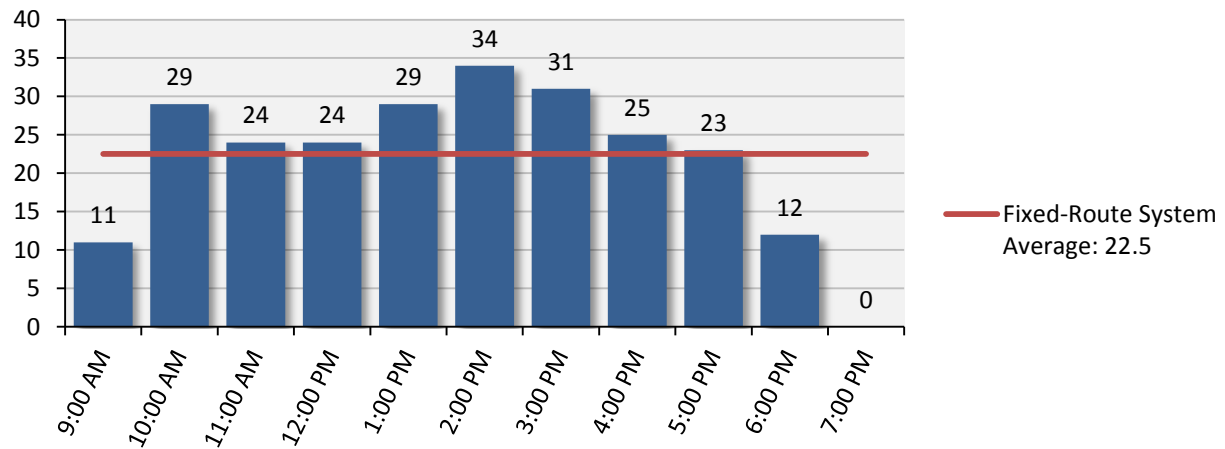
Source: AECOM, 2017

Figure 44: Sunday Boardings – Route 5 West to the Mall Area



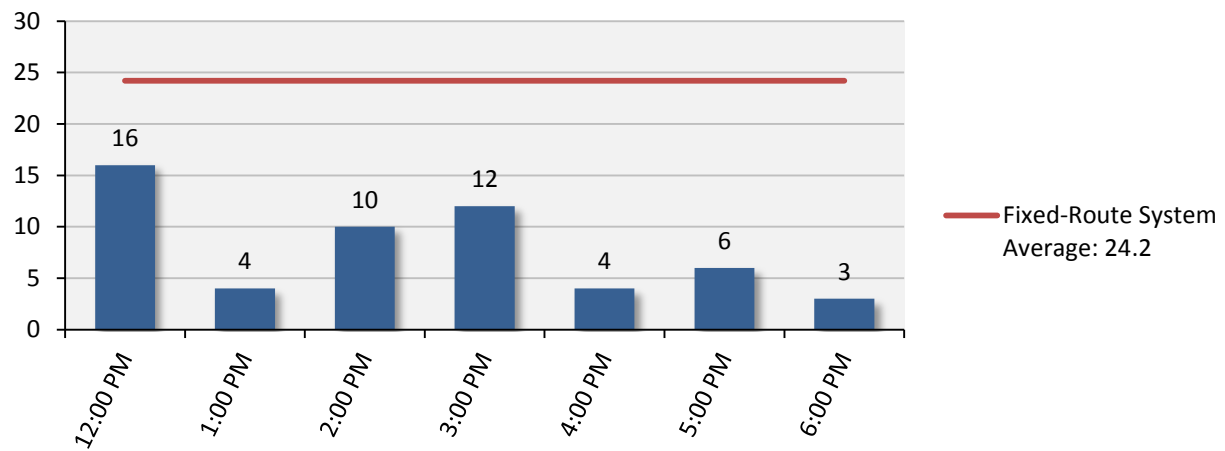
Source: AECOM, 2017

Figure 45: Saturday Boardings per Hour – Route 5 West to the Mall Area



Source: AECOM, 2017

Figure 46: Sunday Boardings per Hour – Route 5 West to the Mall Area



Source: AECOM, 2017

Route 6 – East Mainline UMD

Route Overview

Route 6 East Mainline UMD operates weekdays from 5:00 AM to 12:00 AM and Saturday from 8:00 AM to 10:00 PM. There is no service on Sundays. Route 6 provides service between the Transportation Center in downtown Duluth and University of Minnesota Duluth. In addition, Route 6 also serves St. Luke's Hospital and the Plaza Shopping Center. Route 6 operates a 15 minute frequency during weekday and 60 minute frequency on Saturday. **Figure 47** through **Figure 50** illustrate average weekday and Saturday passenger boarding's for Route 6.

- The route is used primarily by the student and faculty at the University of Minnesota-Duluth.

Key Ridership Areas

- University of Minnesota-Duluth
- North of downtown Duluth
- Northland Clinic
- Essentia Duluth Clinic

Interlined Routes

- Route 2
- Route 9MT
- Route 16
- Route 16X
- Downtown Trolley

At a Glance		East Mainline UMD (6)
Weekday Boardings (rank)		2,797 (4/17)
Weekday Revenue Hours		33.60
Saturday Boardings (rank)		299 (12/15)
Saturday Revenue Hours		17.85
AM Peak Hour (weekday boardings)		9am -10am (233)
PM Peak Hour (weekday boardings)		3pm – 4pm (235)
AM Peak Hour (Saturday boardings)		8am - 9am (6)
PM Peak Hour (Saturday boardings)		3pm – 4pm (30) 5pm – 6pm (30)
Span of Service	Mon-Fri	5am – 12am
	Sat	8am – 10pm
Peak Frequency (minutes)	Mon-Fri	15
	Sat	60
Off-Peak Frequency (minutes)	Mon-Fri	15
	Sat	60

Figure 47: Weekday Boardings – Route 6 East Mainline UMD



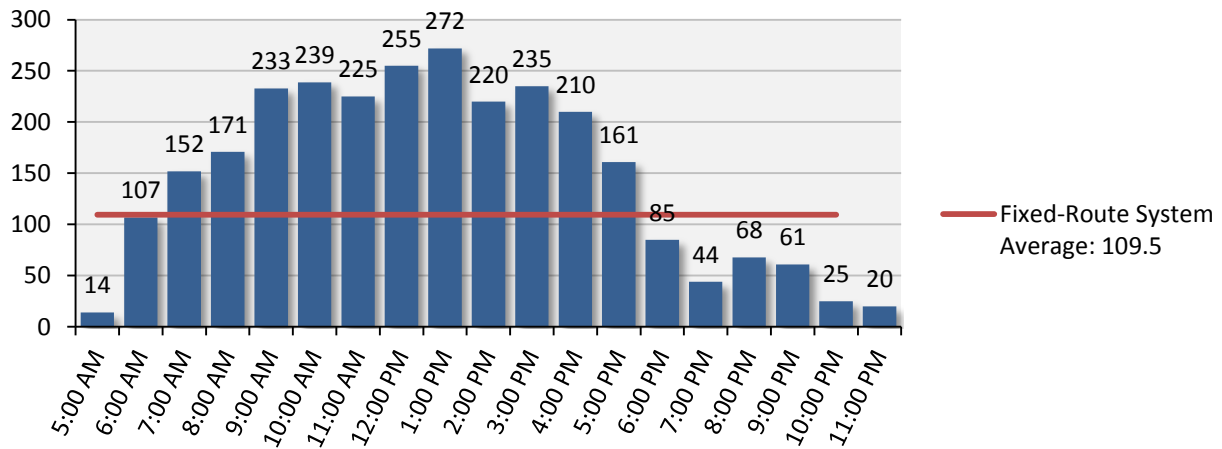
Source: AECOM, 2017

Figure 48: Saturday Boardings – Route 6 East Mainline UMD



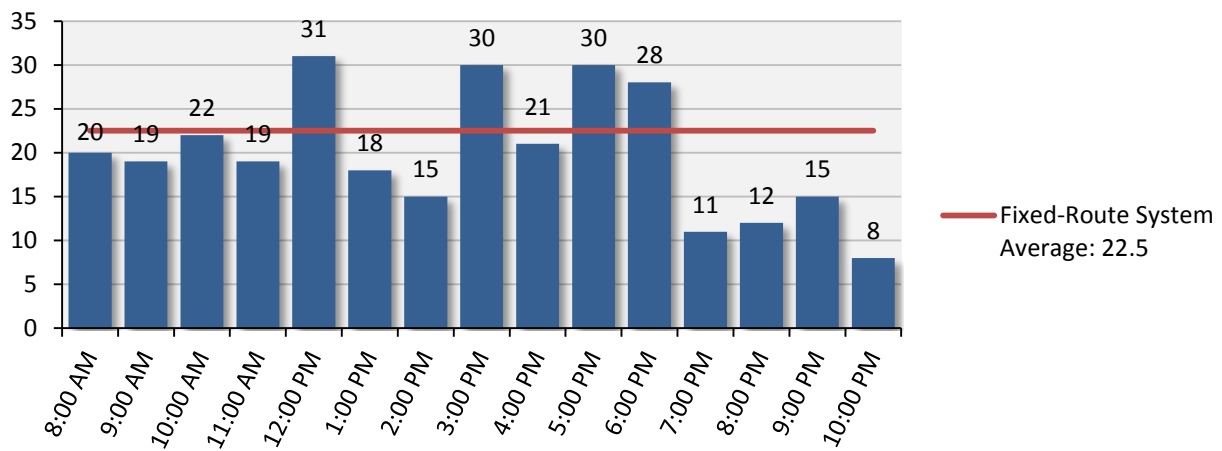
Source: AECOM, 2017

Figure 49: Weekday Boardings per Hour – Route 6 East Mainline UMD



Source: AECOM, 2017

Figure 50: Saturday Boardings per Hour – Route 6 East Mainline UMD



Source: AECOM, 2017

Route 7 – East Mainline Lakeside

Route Overview

Route 7 East Mainline Lakeside begins service at the Transportation Center in downtown Duluth at the intersection of Michigan Street and 3rd Avenue. The route travels north on Superior Street, left on 45th Street, right on Crosley Road, right on 52nd Avenue and left on Glenwood Street to complete the one-way trip at 60th Avenue and Superior Street. During off-peak periods on weekdays, Saturdays, and Sundays, Route 7 operates at a 60 minute frequency. The route operates weekdays from 4:00 AM to 11:00 PM, Saturday from 7:00 AM to 10:00 PM, and Sunday from 8:00 AM to 9:00 PM. **Figure 51** through **Figure 56** illustrate average weekday, Saturday, and Sunday passenger boarding's for Route 7.

Key Ridership Areas

- East High School
- Lakeside neighborhood
- St. Luke's Hospital
- Greysolon Plaza
- Super One in Lakeside

Interlined Routes

- Route 1
- Route 3
- Route 4
- Route 9M
- Route 11K
- Route 12
- Route 21

At a Glance		East Mainline Lakeside (7)
Weekday Boardings (rank)		2,248 (9/17)
Weekday Revenue Hours		26.97
Saturday Boardings (rank)		466 (4/15)
Saturday Revenue Hours		16.15
Sunday Boardings (rank)		329 (5/12)
Sunday Revenue Hours		13.82
AM Peak Hour (weekday boardings)		7am - 8am (225)
PM Peak Hour (weekday boardings)		3pm - 4pm (235)
AM Peak Hour (Saturday boardings)		8am - 9am (49)
PM Peak Hour (Saturday boardings)		4pm - 5pm (35)
AM Peak Hour (Sunday boardings)		9am - 10am (34)
PM Peak Hour (Sunday boardings)		3pm - 4pm (38)
Span of Service	Mon-Fri	4am - 11pm
	Sat	7am - 10pm
	Sun	8am - 9pm
Peak Frequency (minutes)	Mon-Fri	30
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 51: Weekday Boardings – Route 7 East Mainline Lakeside



Source: AECOM, 2017

Figure 52: Saturday Boardings – Route 7 East Mainline Lakeside



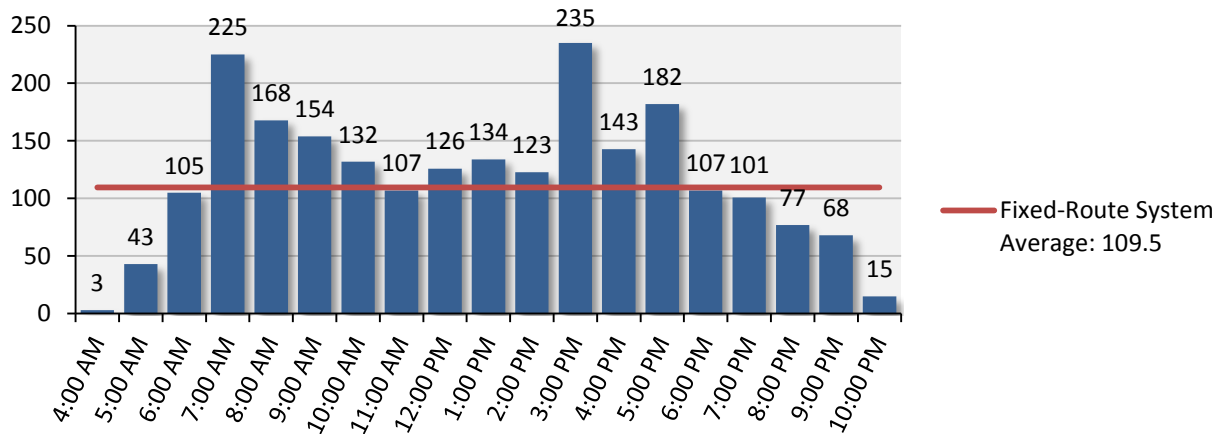
Source: AECOM, 2017

Figure 53: Sunday Boardings – Route 7 East Mainline Lakeside



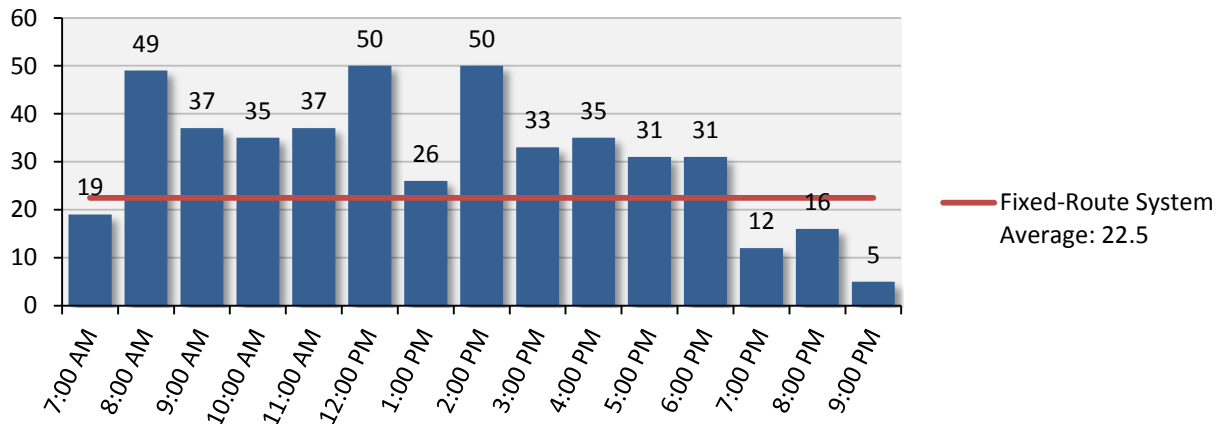
Source: AECOM, 2017

Figure 54: Weekday Boardings per Hour – Route 7 East Mainline Lakeside



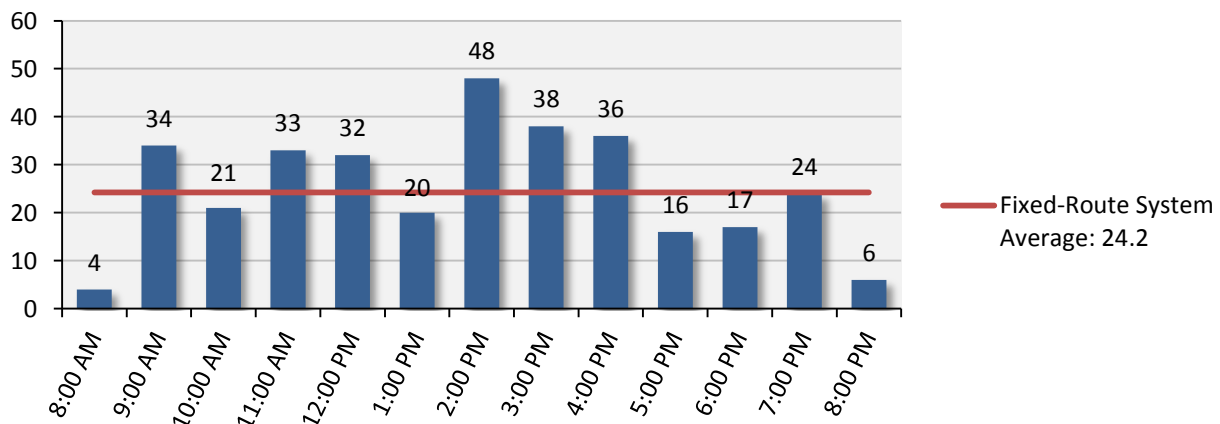
Source: AECOM, 2017

Figure 55: Saturday Boardings per Hour – Route 7 East Mainline Lakeside



Source: AECOM, 2017

Figure 56: Sunday Boardings per Hour – Route 7 East Mainline Lakeside



Source: AECOM, 2017

Route 7A – East Mainline 24AE

Route Overview

Route 7A is a peak weekday afternoon and evening service operated by DTA that begins service at the Transportation Center in downtown Duluth. After the route departs the Transportation Center, it travels to Superior Street and 24th Avenue via Superior Street where it completes the one-way trip. In addition, Route 7A operates four trips a day two in the peak afternoon hours and two during the evening. Route 7A operates on weekdays from 3:00 PM to 5:00 PM and 9:00 PM to 11:00 PM. **Figure 57** and **Figure 58** illustrate average weekday passenger boardings.

- Most boardings occur from 4:00 PM to 5:00 PM.
- Boardings occur near the medical clinics in downtown Duluth and St. Paul's Episcopal Church on Superior Street.

Key Ridership Areas

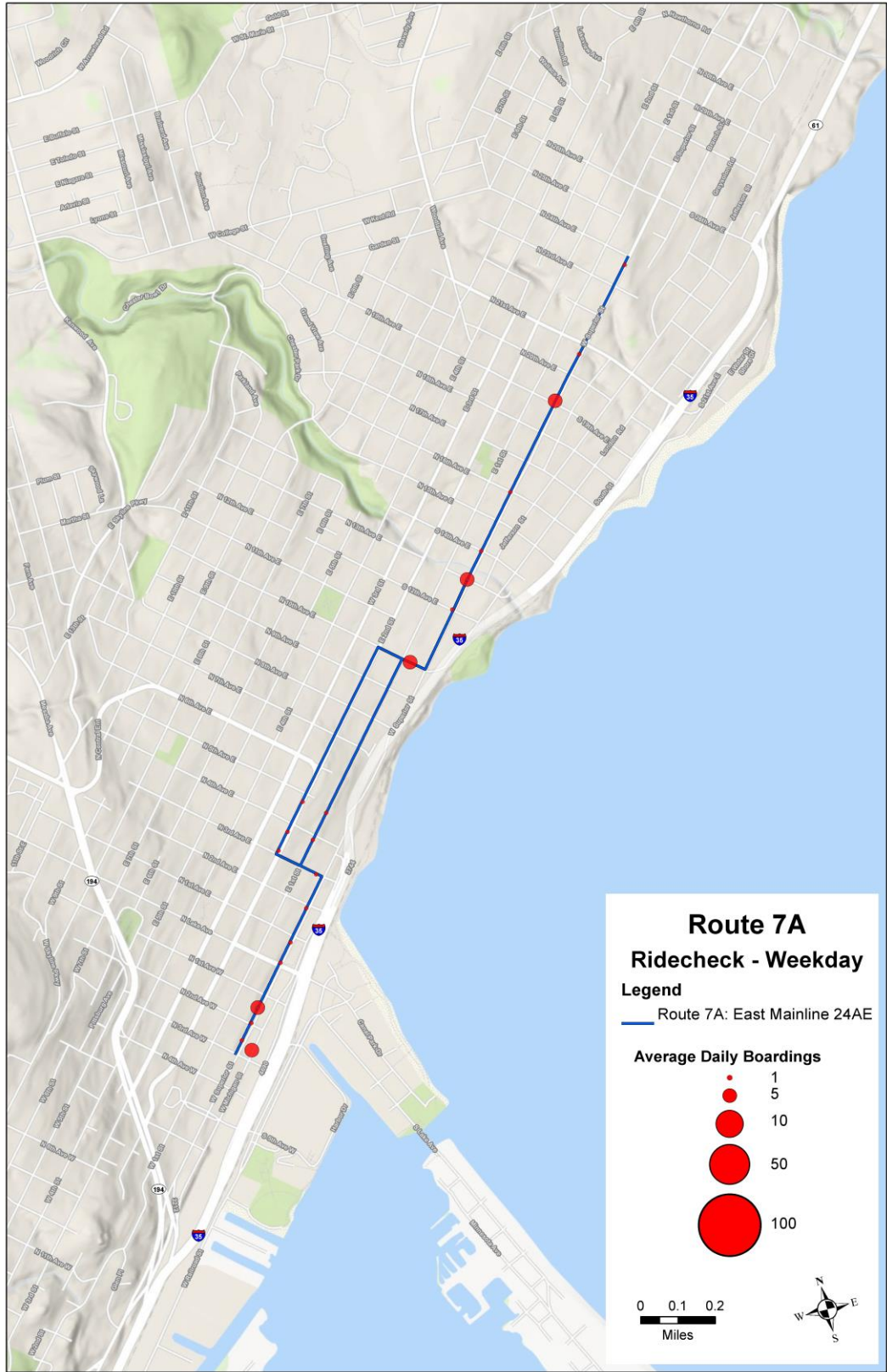
- East downtown Duluth
- Restaurants near Transportation Center

Interlined Routes

- Route 2
- Route 6

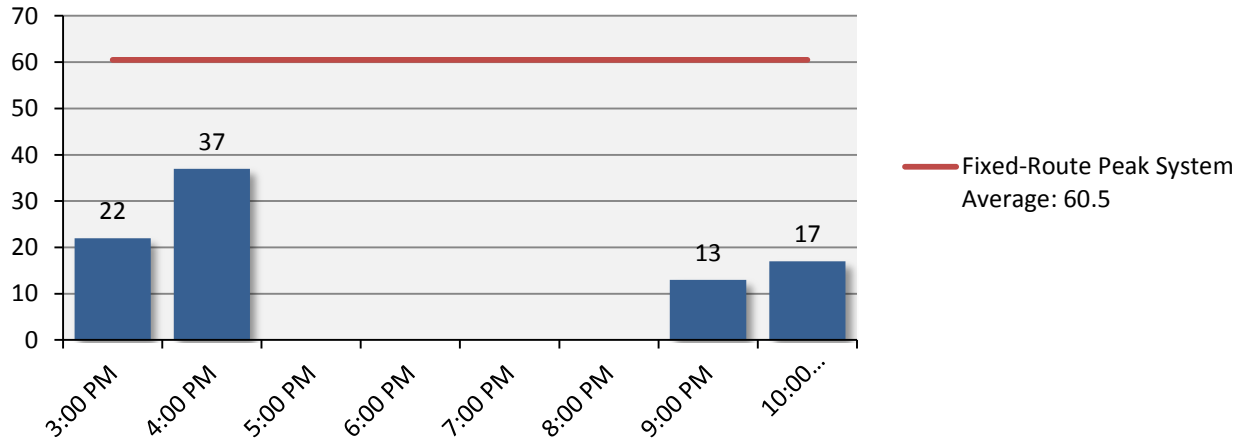
At a Glance		Proctor Express (3X)
Weekday Boardings (rank)		89
Weekday Revenue Hours		1.47
AM Peak Hour (weekday boardings)		N/A
PM Peak Hour (weekday boardings)		4pm – 5pm (37)
Span of Service	Mon-Fri	3pm – 5pm 9pm – 11pm
Peak Frequency (minutes)	Mon-Fri	56
Off-Peak Frequency (minutes)	Mon-Fri	56

Figure 57: Weekday Boardings – Route 7A East Mainline 24AE



Source: AECOM, 2017

Figure 58: Weekday Boardings per Hour – Route 7A East Mainline 24AE



Source: AECOM, 2017

Route 7X – East Mainline Express

Route Overview

Route 7X is an express service offered by DTA that operates one trip a day during afternoon/evening hours from 4:40 PM to 5:09 PM on weekdays only. The route travels from the Transportation Center in downtown Duluth to Superior Street and 45th Avenue via IH 35.

Figure 59 and **Figure 60** illustrate average weekday passenger boarding's for Route 3X.

Key Ridership Areas

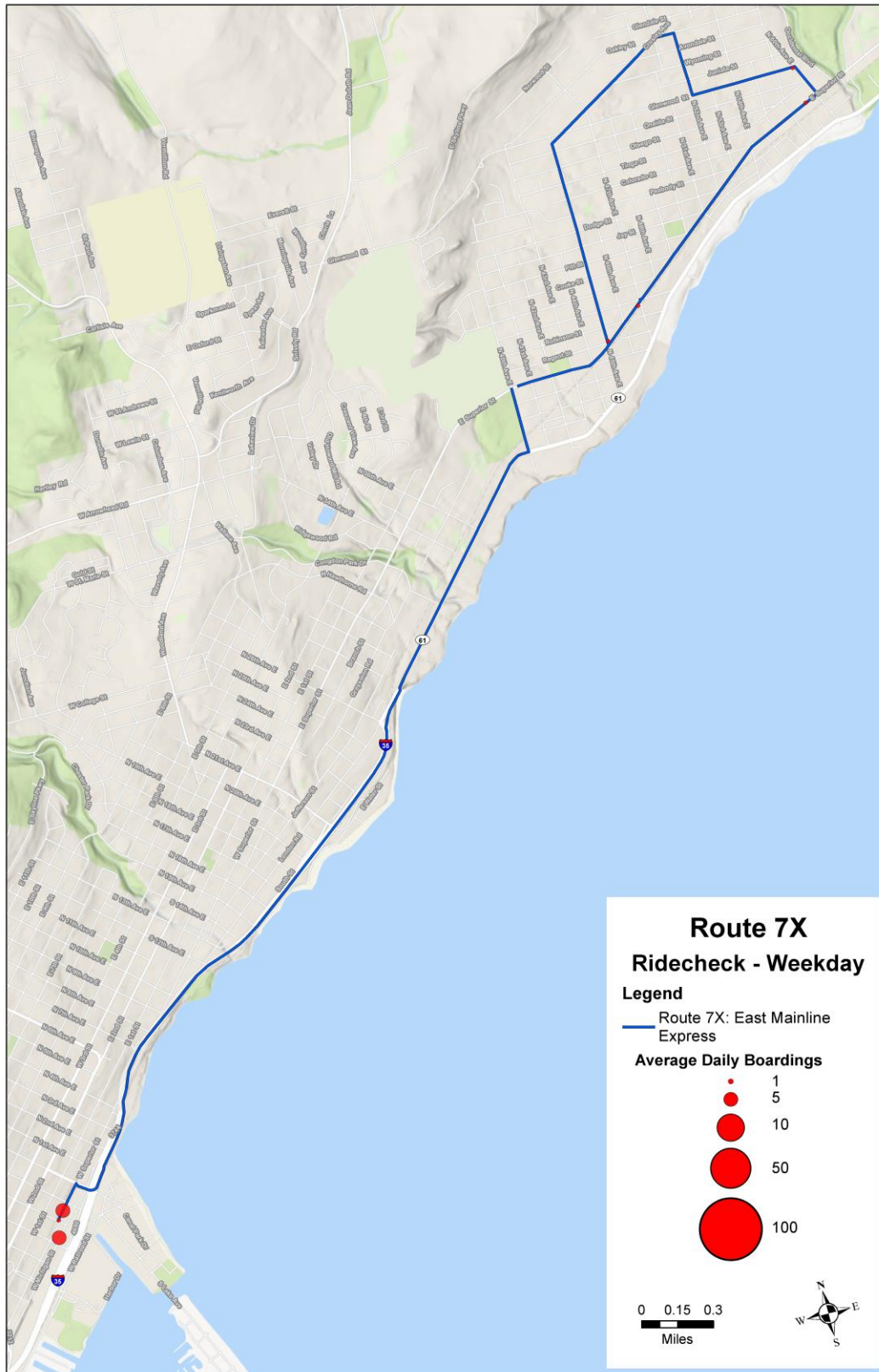
- Lakeside
- Essentia in Lakeside
- Transportation Center

Interlined Routes

- Route 7X does not interline with any routes.

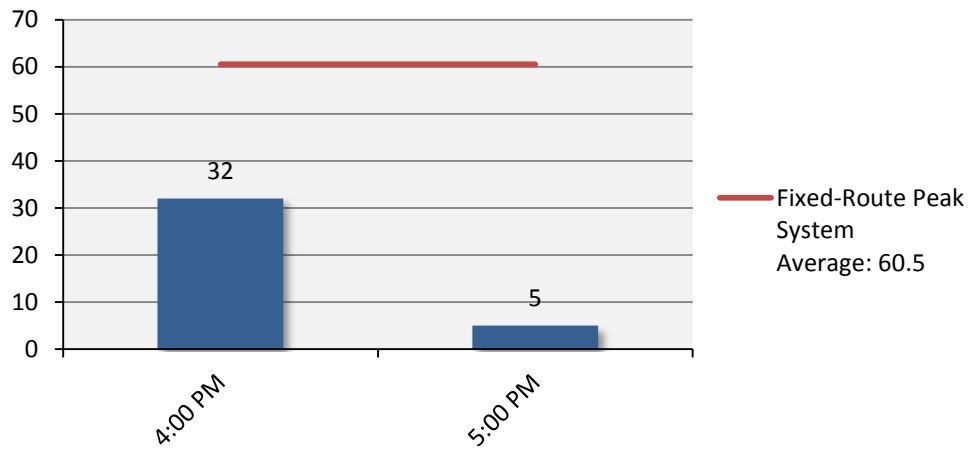
At a Glance		East Mainline Express (7X)
Weekday Boardings (rank)		37
Weekday Revenue Hours		39.00
AM Peak Hour (weekday boardings)		N/A
PM Peak Hour (weekday boardings)		4pm – 5pm (32)
Span of Service	Mon-Fri	4pm – 6pm
Peak Frequency (minutes)	Mon-Fri	56
Off-Peak Frequency (minutes)	Mon-Fri	56

Figure 59: Weekday Boardings – Route 7X East Mainline Express



Source: AECOM, 2017

Figure 60: Weekday Boardings per Hour – Route 7X East Mainline Express



Source: AECOM, 2017

Route 8 – LSC-WM-AP

Route Overview

Route 8 operates on weekdays from 7:00 AM to 8:00 PM with 60 minute frequencies for the duration of service. Route 8 operates service from the downtown Transportation Center to the Airport via Trinity Road and Haines Road. Route 8 also provides service to Lincoln Park, Lake Superior College, Miller Hill Mall, and Walmart. The route does not operate on Saturdays or Sundays. **Figure 61** and **Figure 62** illustrate average weekday passenger boardings.

- The majority of boardings occur from 2:00 PM to 3:00 PM on weekdays.
- Most riders use this route to access Lake Superior College, Burning Tree Plaza, and the Airport.

At a Glance		LSC-WM-AP (8)
Weekday Boardings (rank)		825 (11/17)
Weekday Revenue Hours		18.03
AM Peak Hour (weekday boardings)		7 am - 8am (36)
PM Peak Hour (weekday boardings)		3pm - 4pm (95)
Span of Service	Mon-Fri	7am - 8pm
Peak Frequency (minutes)	Mon-Fri	60
Off-Peak Frequency (minutes)	Mon-Fri	60

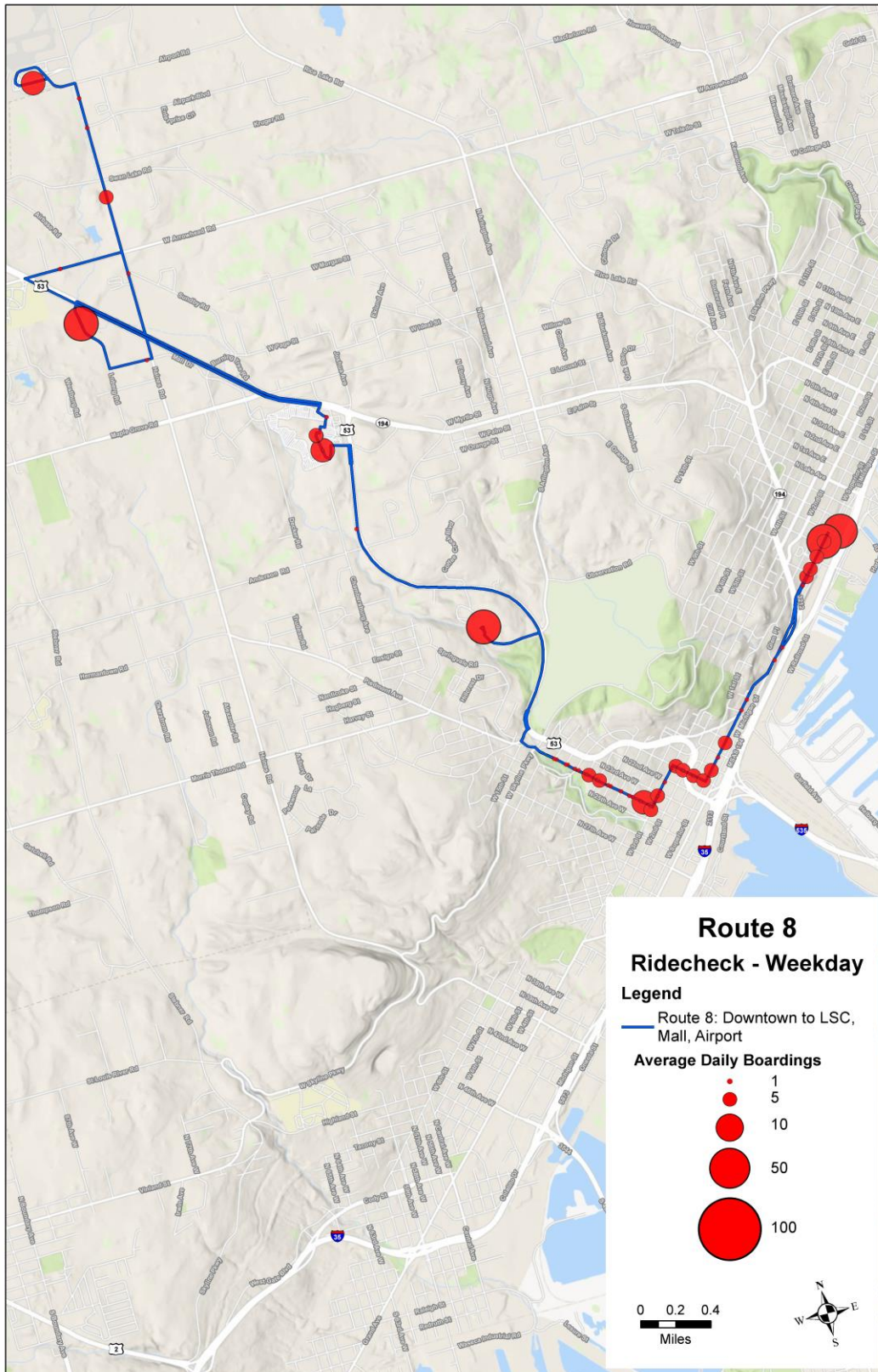
Key Ridership Areas

- Lake Superior College
- Burning Tree Plaza
- Airport
- Lincoln Park
- Wal-Mart

Interlined Routes

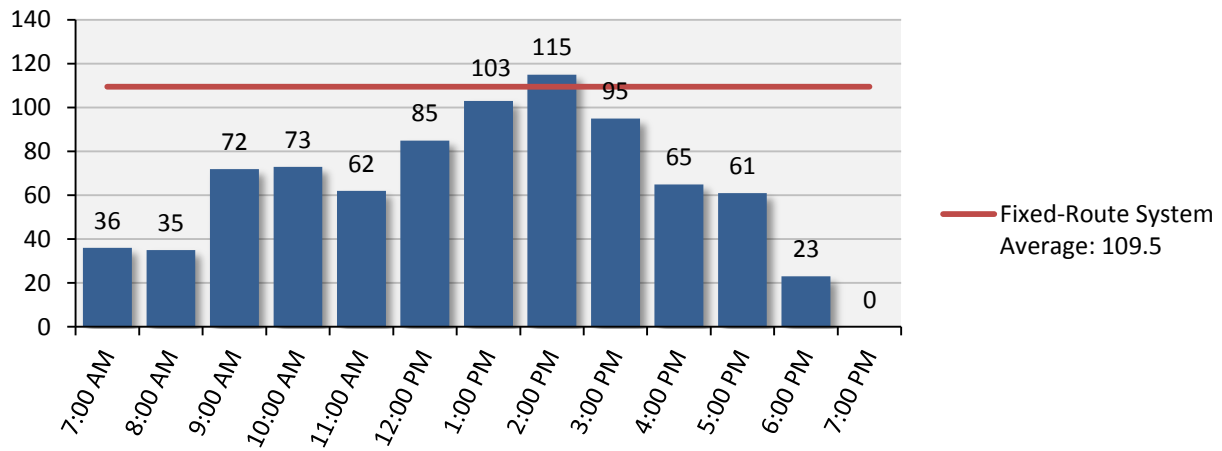
- Route 12

Figure 61: Weekday Boardings – Route 8 LSC-WM-AP



Source: AECOM, 2017

Figure 62: Weekday Boardings per Hour – Route 8 LSC-WM-AP



Source: AECOM, 2017

Route 9MT – Piedmont Morris Thomas

Route Overview

Route 9MT operates on weekdays from 5:00 AM to 10:00 PM with 30 minute frequencies during peak periods and 60 minute frequencies during off-peak periods. Route 9MT operates service from the downtown Transportation Center to the Piedmont Heights neighborhood located near the intersection of Haines Road and Morris Thomas Road. In addition, Route 9MT provides service to Lake Superior College and Morris Thomas Road via Chambersburg Avenue. **Figure 63** and **Figure 64** illustrate average weekday passenger boardings.

- The majority of the boardings occur in downtown Duluth near the Transportation Center, as well as Lincoln Park along 24th Street.

At a Glance		Piedmont Morris Thomas (9MT)
Weekday Boardings (rank)		563 (14/17)
Weekday Revenue Hours		23.45
AM Peak Hour (weekday boardings)		7 am - 8am (92)
PM Peak Hour (weekday boardings)		4pm – 5pm (85)
Span of Service	Mon-Fri	5am – 10pm
Peak Frequency (minutes)	Mon-Fri	60
Off-Peak Frequency (minutes)	Mon-Fri	60

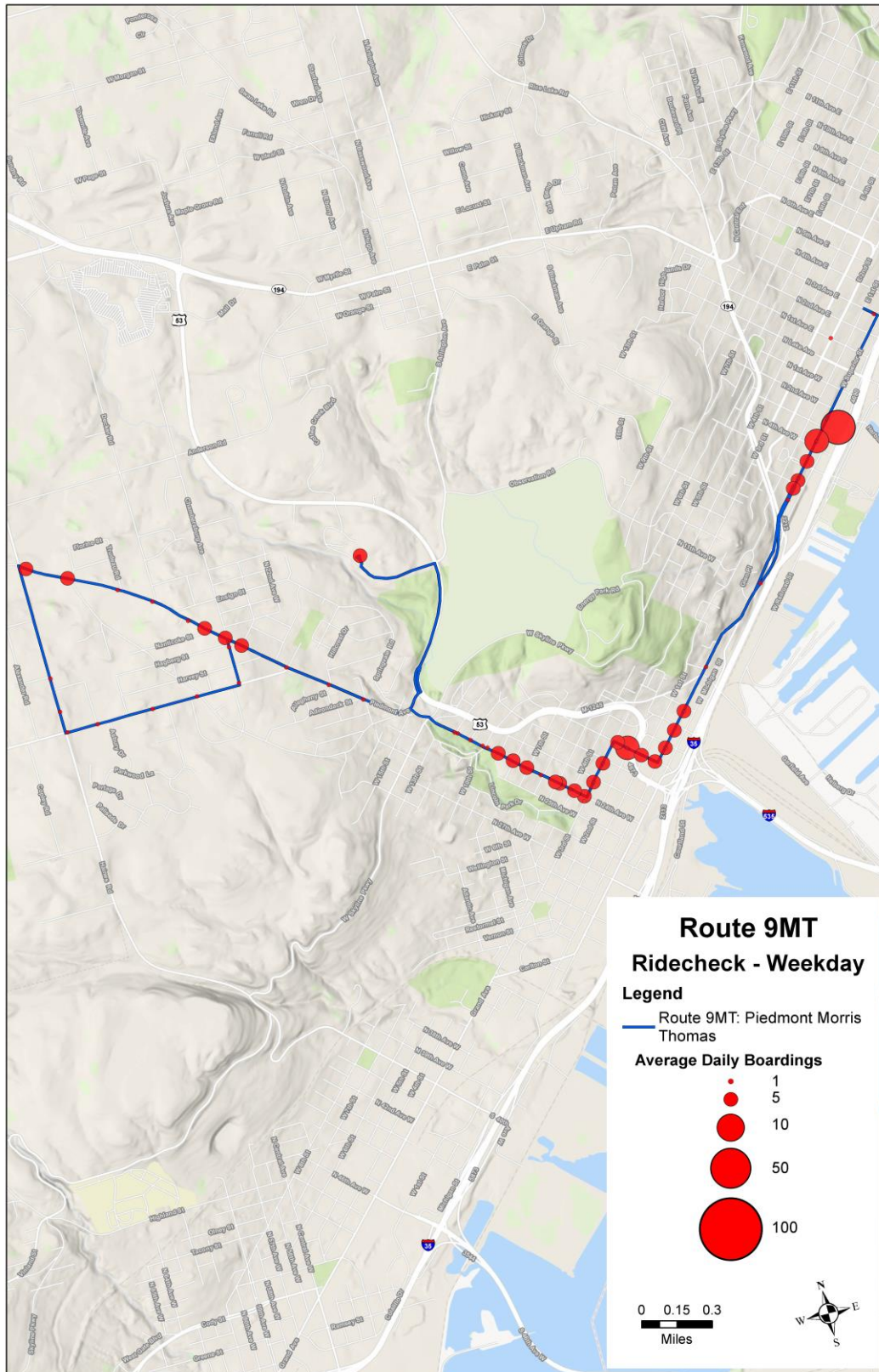
Key Ridership Areas

- Lake Superior College
- Burning Tree Plaza
- Piedmont
- Lincoln Park

Interlined Routes

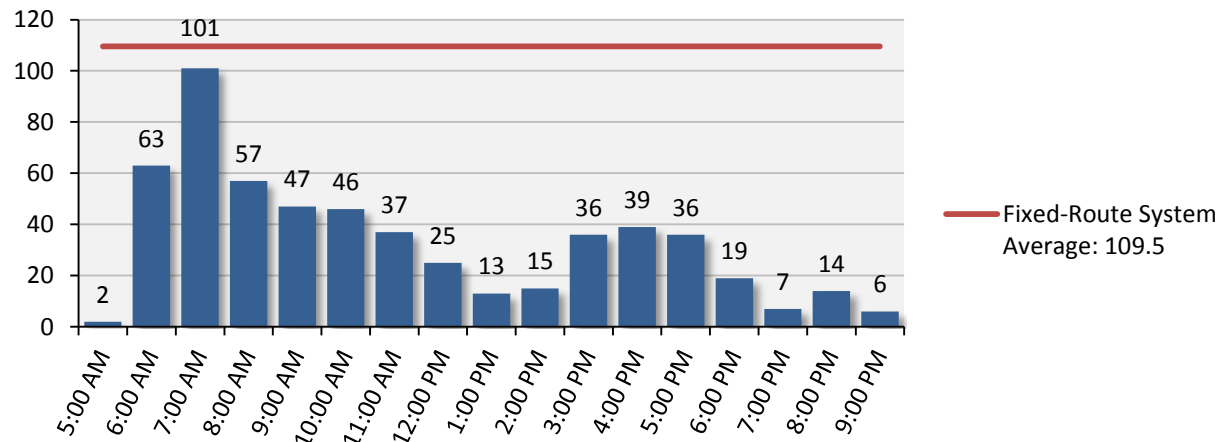
- Route 10
- Route 12
- Route 14W
- Downtown Trolley

Figure 63: Weekday Boardings – Route 9MT Piedmont Morris Thomas



Source: AECOM, 2017

Figure 64: Weekday Boardings per Hour – Route 9MT Piedmont Morris Thomas



Source: AECOM, 2017

Route 9M – Piedmont Mall Weekend

Route Overview

Route 9M operates Saturdays from 8:00 AM to 7:00 PM and Sundays from 9:00 AM to 7:00 PM. There is no service on weekdays. Saturday service on Route 9M differs from the weekday Route 9MT because it does not provide service to Lake Superior College or Morris Thomas Road via Haines Road. However, Route 9M still provides service from the downtown Duluth Transportation Center to the shops at near Maple Grove Road via Piedmont Avenue and Haines Road. These shops include Burning Tree Plaza, Target, Super One, Sam's Club, and Kohl's. In addition, Route 9M maintains a 60 minute frequency on both Saturday and Sunday. **Figure 65** through **Figure 68** illustrate average Saturday and Sunday passenger boardings for Route 9M.

- The majority of the weekend boardings occur at the shops north of Lincoln Park along Superior Street.
- The greatest number of boardings occur on Saturdays at 11:00 AM to 12:00 PM and Sundays from 12:00 PM to 1:00 PM.

Key Ridership Areas

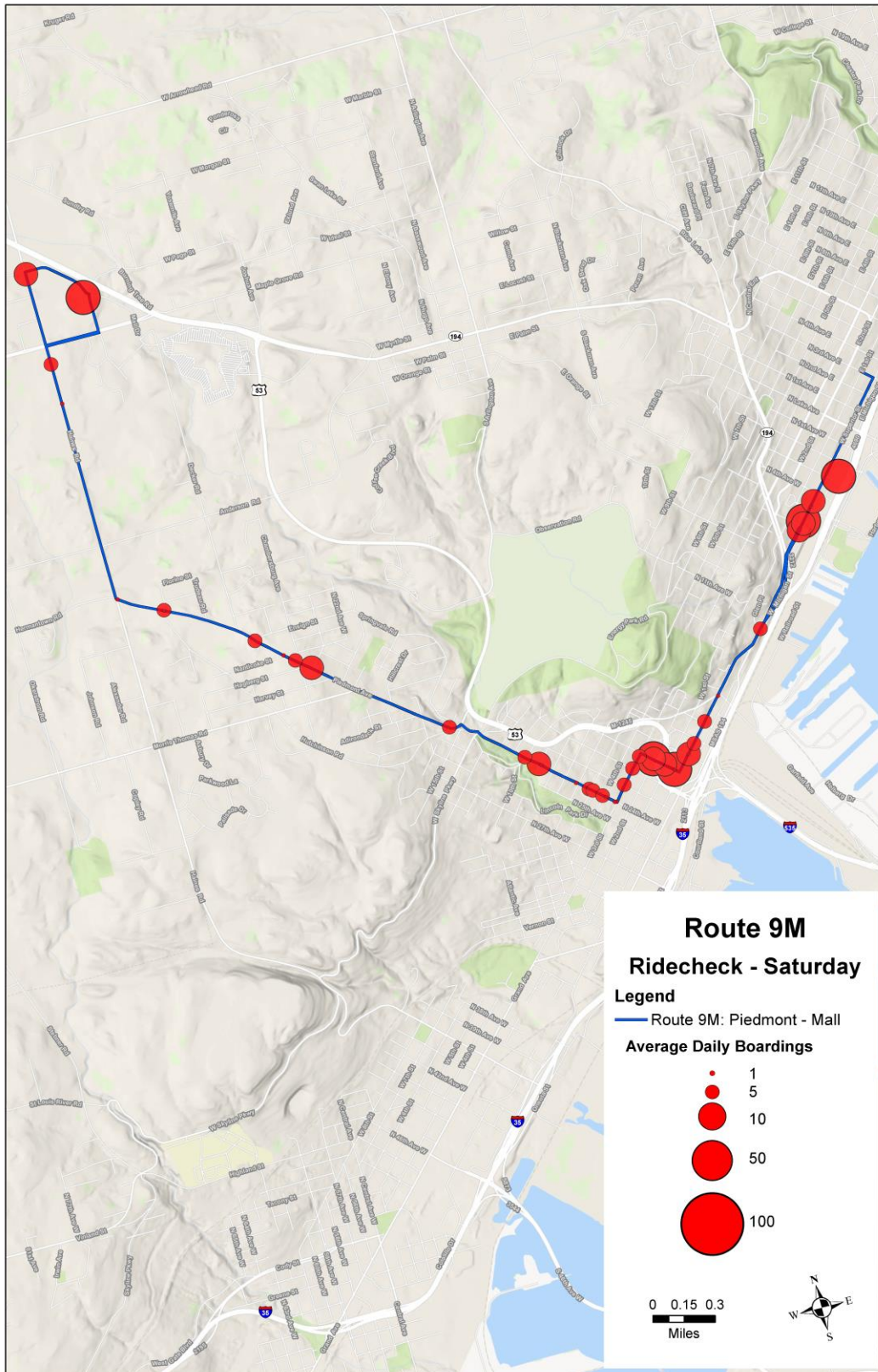
- East downtown Duluth
- Burning Tree Plaza
- Shops north of Lincoln Park
- Big Daddy's Burgers
- Great Lakes Children's Dental

Interlined Routes

- Route 11K

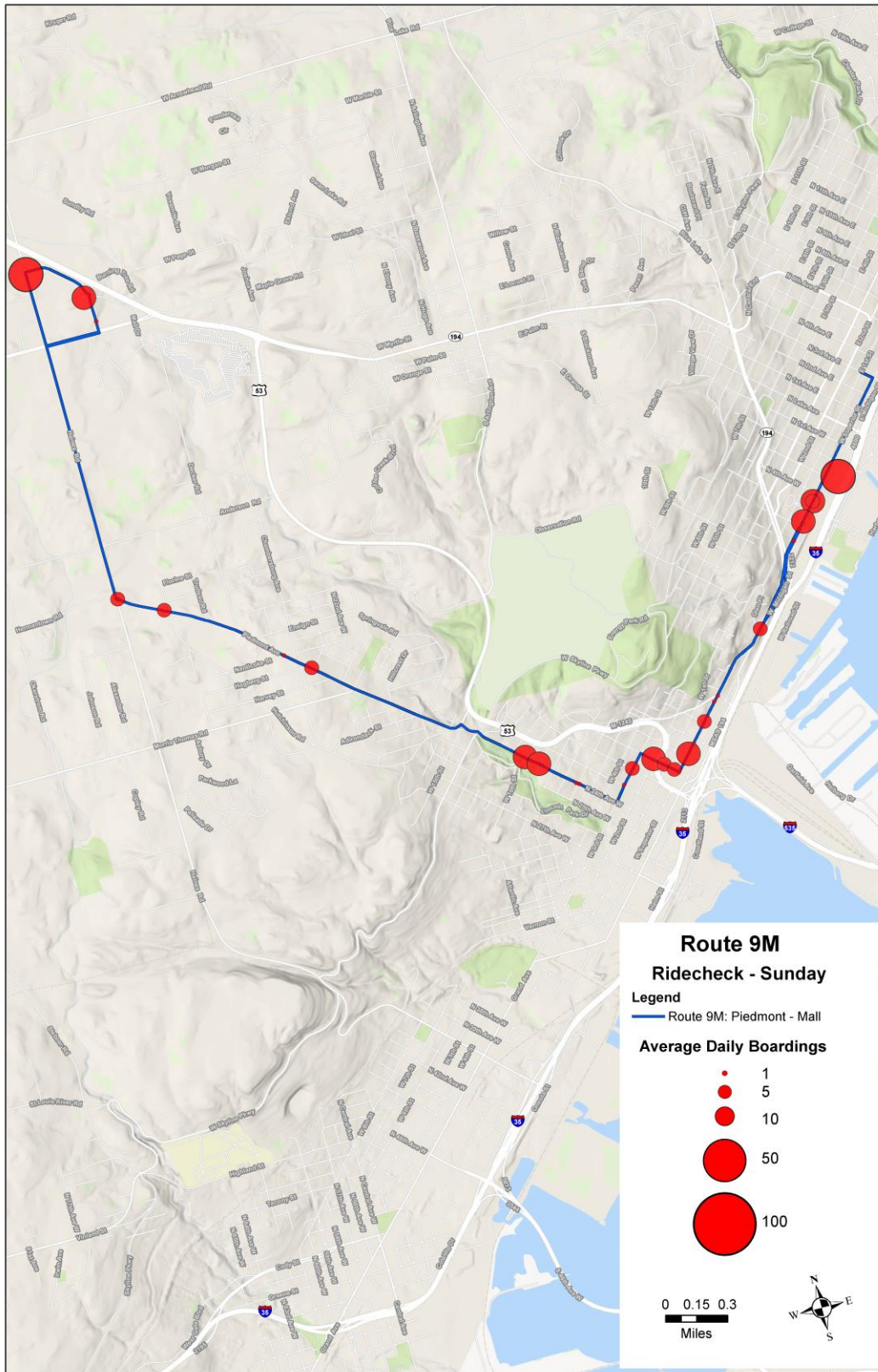
At a Glance		Piedmont Mall Weekend (9M)
Saturday Boardings (rank)		211 (10/15)
Saturday Revenue Hours		11.22
Sunday Boardings (rank)		142 (9/12)
Sunday Revenue Hours		9.70
AM Peak Hour (Saturday boardings)		8am - 9am (15)
PM Peak Hour (Saturday boardings)		3pm - 4pm (15) 5pm - 6pm (15)
AM Peak Hour (Sunday boardings)		9am - 10am (7)
PM Peak Hour (Sunday boardings)		4pm - 5pm (22)
Span of Service	Sat	8am - 7pm
	Sun	9pm - 7pm
Peak Frequency (minutes)	Sat	60
	Sat	60
Off-Peak Frequency (minutes)	Sat	60
	Sat	60

Figure 65: Saturday Boardings – Route 9M Piedmont Mall Weekend



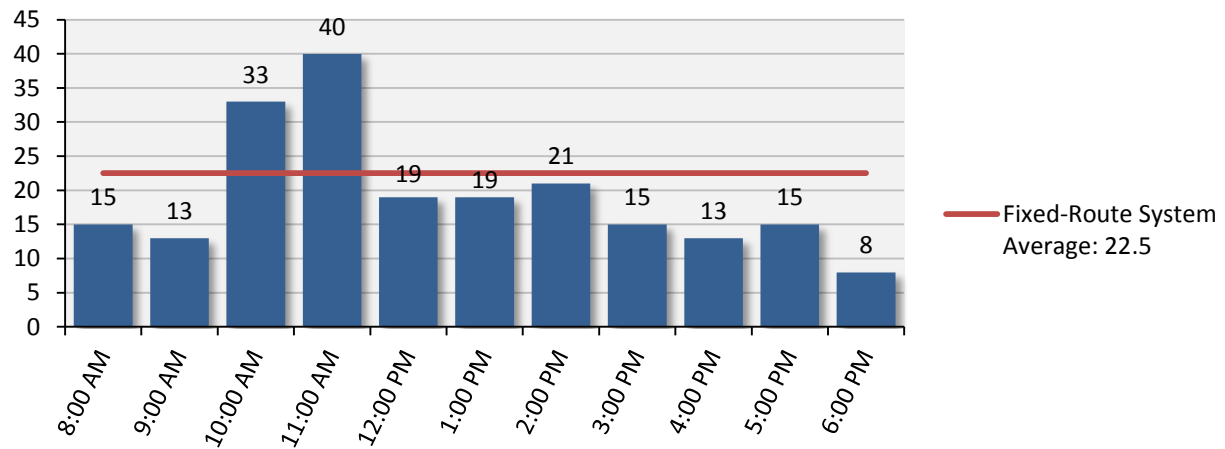
Source: AECOM, 2017

Figure 66: Sunday Boardings – Route 9M Piedmont Mall Weekend



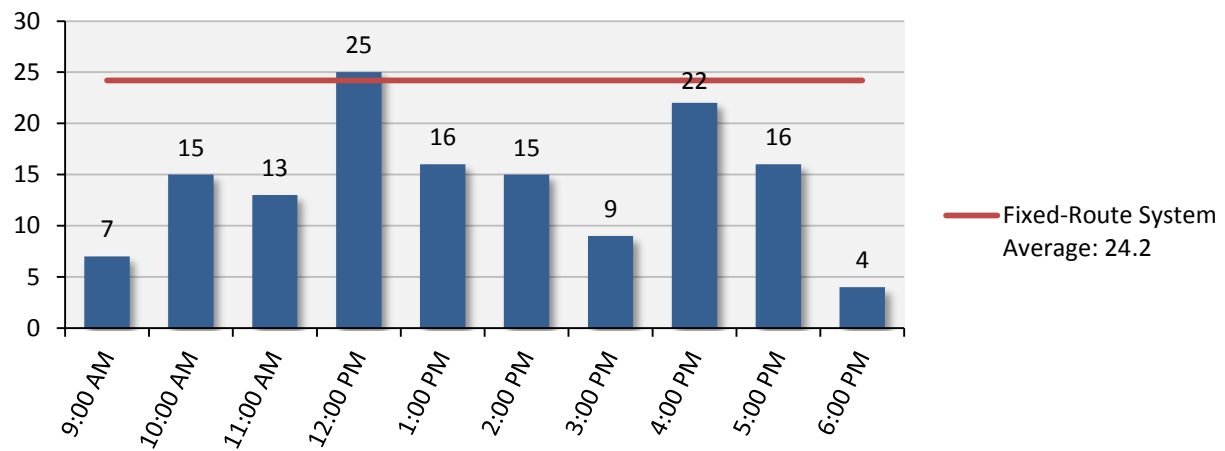
Source: AECOM, 2017

Figure 67: Saturday Boardings per Hour – Route 9M Piedmont Mall Weekend



Source: AECOM, 2017

Figure 68: Sunday Boardings per Hour – Route 9M Piedmont Mall Weekend



Source: AECOM, 2017

Route 10 – Duluth Heights Mall

Route Overview

Route 10 Duluth Heights Mall begins service at the Transportation Center in downtown Duluth and travels west on Central Entrance via Lake Avenue, 4th Street, and 7th Street. As the route travels west on Central Entrance, it makes stops at Stone Ridge Shopping Center, Miller Hill Mall, Medical District, and the shops near Burning Tree Plaza. Route 10 operates at 25 minute frequencies during peak periods on weekdays and a 60 minute frequencies during off-peak periods. During peak periods on Saturday the route operates at a 45 minute headway while the Sunday route operates every hour. In addition, during off-peak periods on Saturdays and Sundays, Route 10 operates 60 minute frequencies. Route 10 provides service on weekdays from 6:00 AM to 1:00 AM, Saturdays from 7:00 AM to 11:00 PM, and Sundays from 9:00 AM to 9:00 PM.

Figure 69 through **Figure 74** illustrate average weekday, Saturday, and Sunday passenger boardings for Route 10.

- Most of the boardings occur near major retail locations along Route 10.
- The the boarding areas are mostly along Haines Road, Arrowhead Road, and south Superior on weekdays, Saturday, and Sunday.

Key Ridership Areas

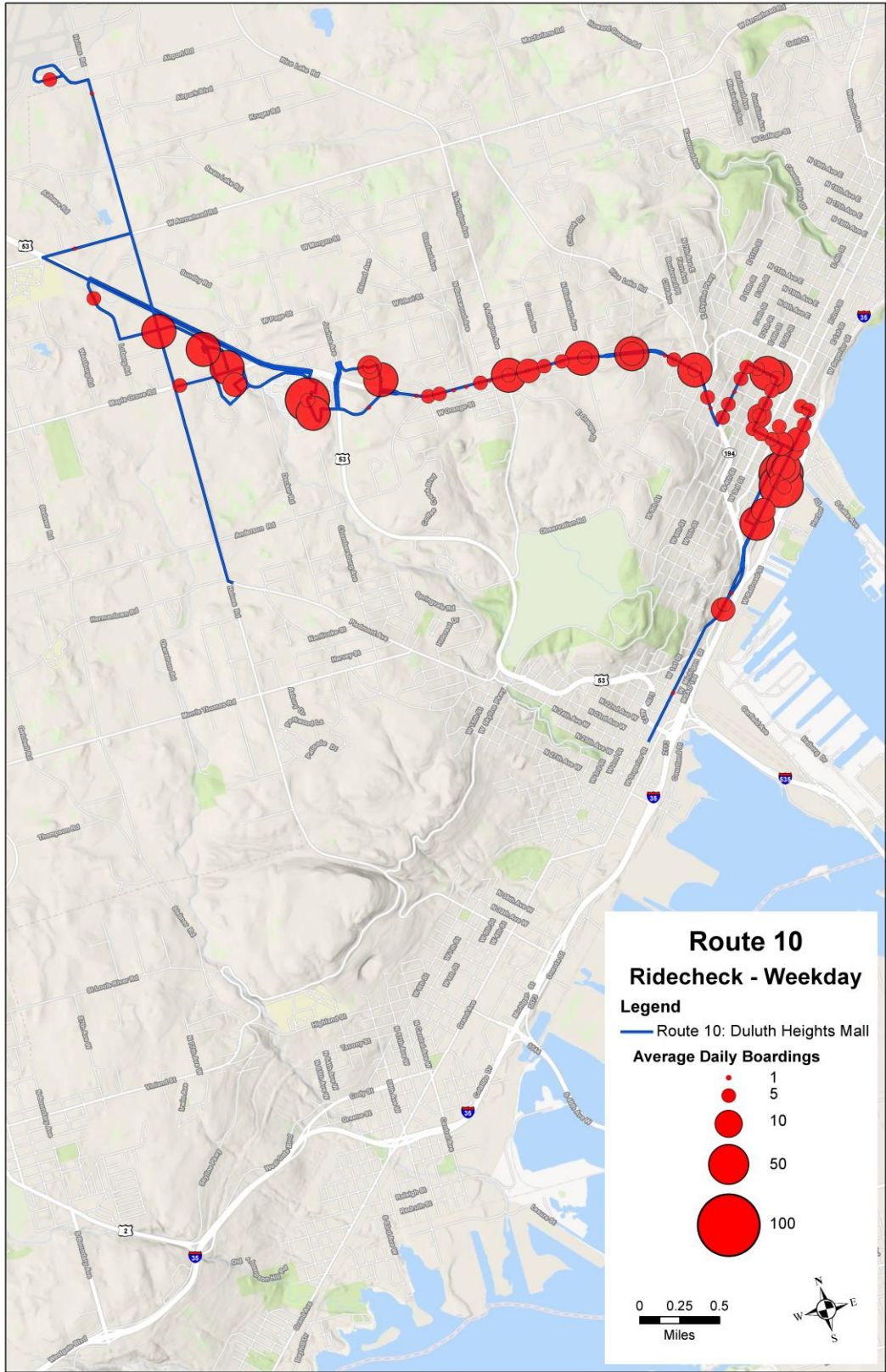
- North downtown Duluth
- Stone Ridge
- Miller Hill Mall
- Burning Tree Plaza
- Airport
- Target
- Central Entrance

Interlined Routes

- Route 1
- Route 2
- Route 3
- Route 9MT
- Route 13

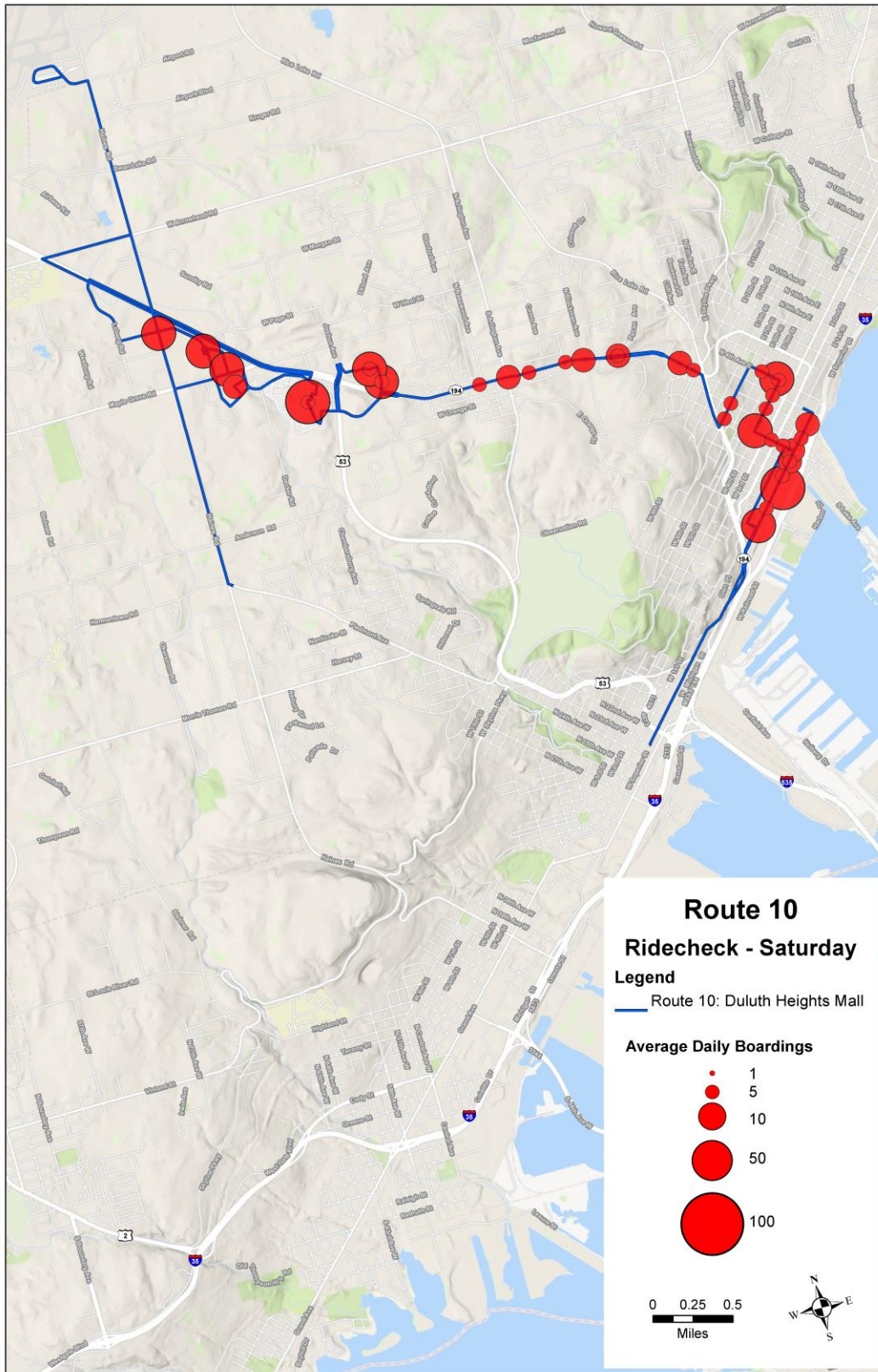
At a Glance		Duluth Heights Mall (10)
Weekday Boardings (rank)		3,700 (2/17)
Weekday Revenue Hours		31.48
Saturday Boardings (rank)		478 (3/15)
Saturday Revenue Hours		23.30
Sunday Boardings (rank)		245 (7/12)
Sunday Revenue Hours		17.38
AM Peak Hour (weekday boardings)		9am -10am (197)
PM Peak Hour (weekday boardings)		4pm – 5pm (394)
AM Peak Hour (Saturday boardings)		9am - 10am (15)
PM Peak Hour (Saturday boardings)		5pm – 6pm (53)
AM Peak Hour (Sunday boardings)		9am - 10am (3)
PM Peak Hour (Sunday boardings)		5pm – 6pm (25)
Span of Service	Mon-Fri	6am – 1am
	Sat	7am – 11pm
	Sun	9am – 9pm
Peak Frequency (minutes)	Mon-Fri	25
	Sat	45
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 69: Weekday Boardings – Route 10 Duluth Heights Mall



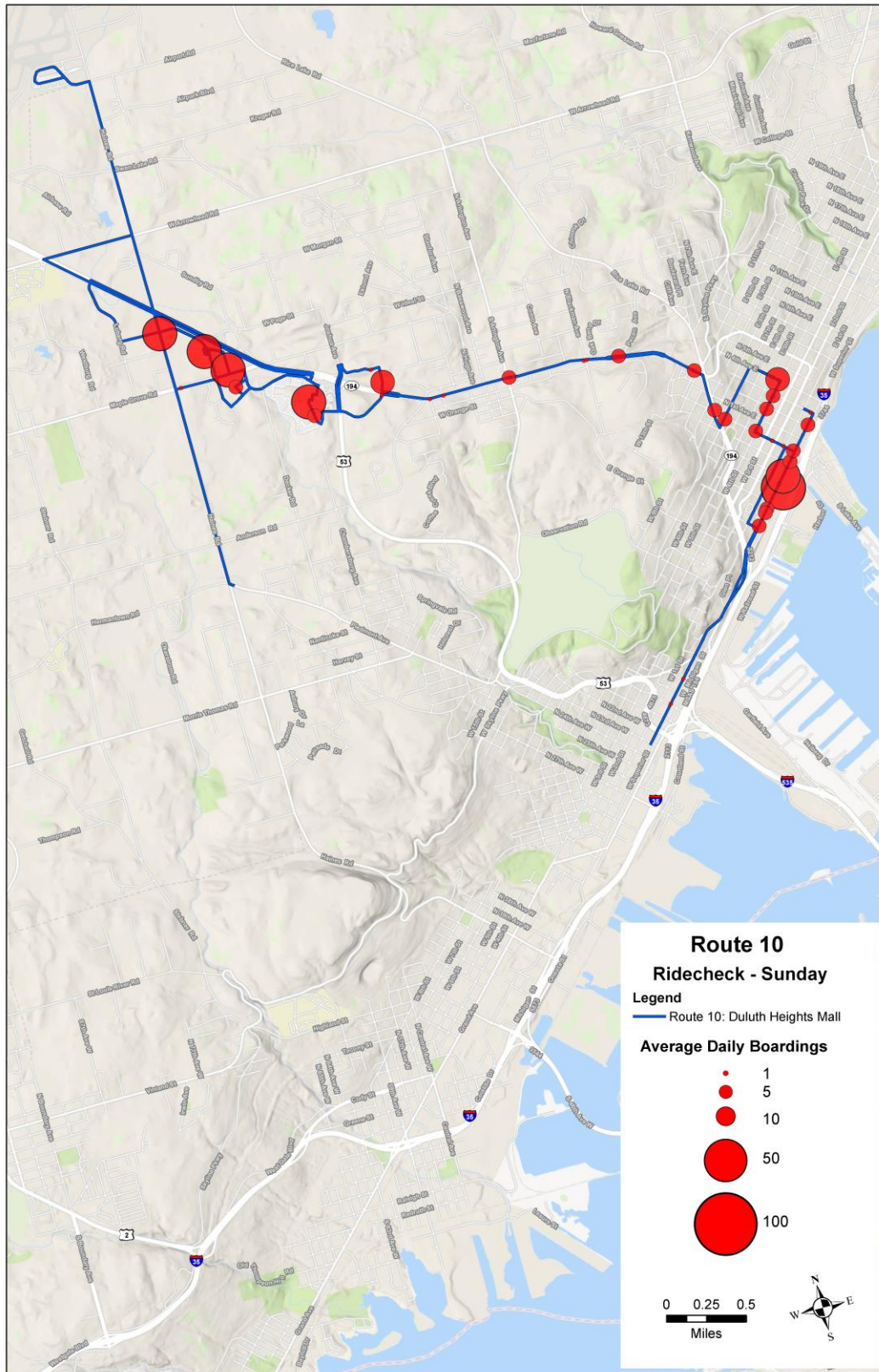
Source: AECOM, 2017

Figure 70: Saturday Boardings – Route 10 Duluth Heights Mall



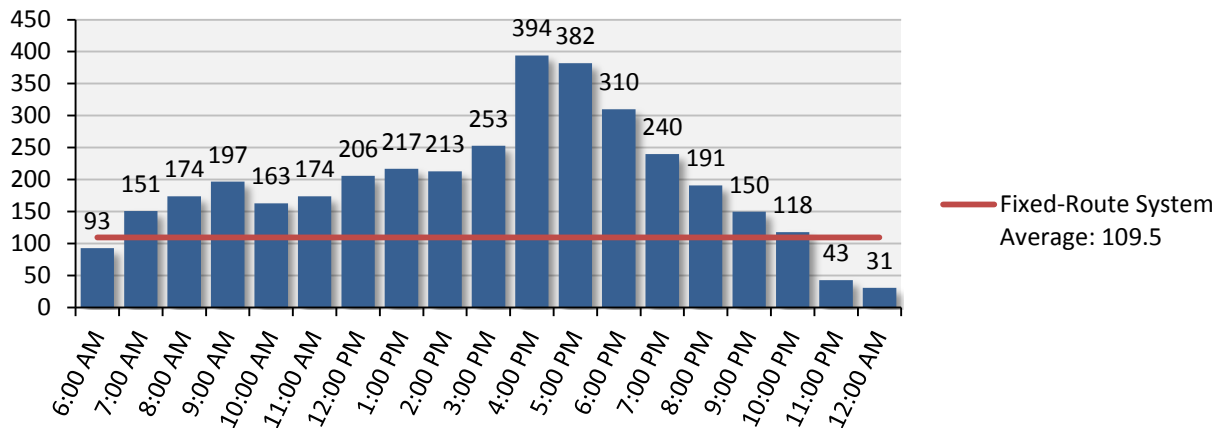
Source: AECOM, 2017

Figure 71: Sunday Boardings – Route 10 Duluth Heights Mall



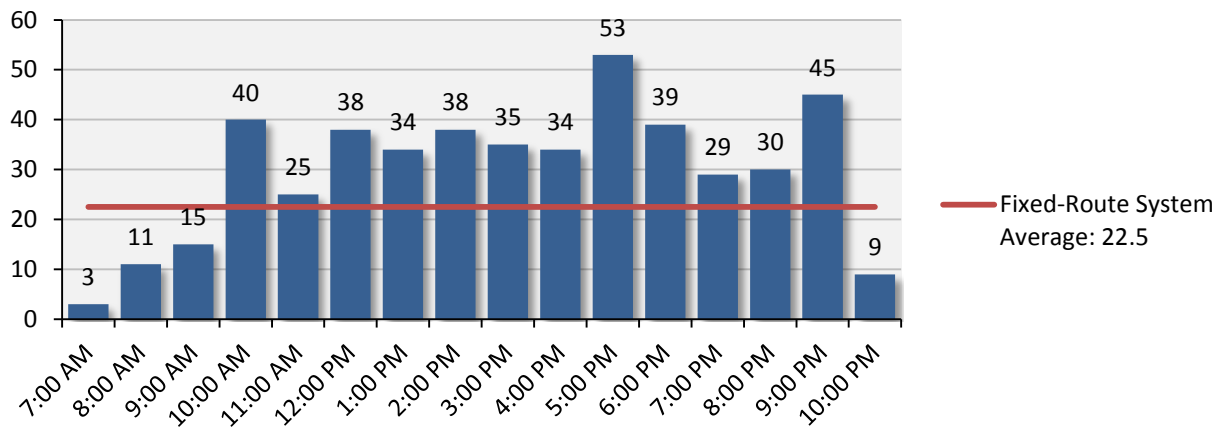
Source: AECOM, 2017

Figure 72: Weekday Boardings per Hour – Route 10 Duluth Heights Mall



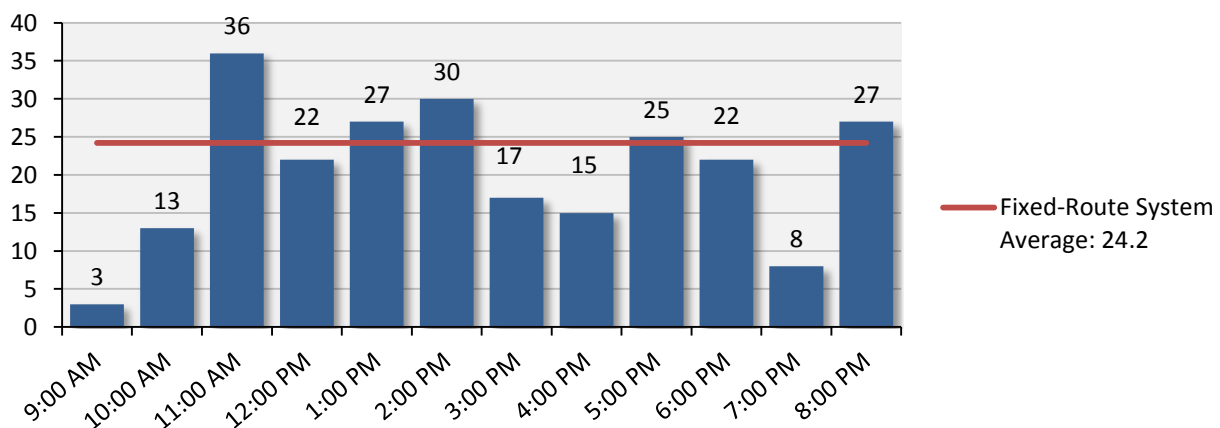
Source: AECOM, 2017

Figure 73: Saturday Boardings per Hour – Route 10 Duluth Heights Mall



Source: AECOM, 2017

Figure 74: Sunday Boardings per Hour – Route 10 Duluth Heights Mall



Source: AECOM, 2017

Route 10E – Duluth Heights - Eklund

Route Overview

Route 10E operates six trips a day during the week and operates at a 60 minute frequency during peak and off-peak hours. Route 10E operates during early morning hours and late afternoon and evening hours from downtown Duluth to the shops at Burning Tree Plaza. Route 10E has a slightly different pattern than Route 10 because it provides service on Ecklund Avenue via Swan Lake Road. This deviation provides transit to the neighborhoods north of Maple Grove Road and east of Eklund Avenue. **Figure 75** and **Figure 76** illustrate average weekday passenger boardings for Route 10E.

- The highest number of boarding activity occurs from 4:00 PM to 5:00 PM on weekdays.
- The majority of the boardings are along Central Entrance east of downtown Duluth and around St. Mary's Medical Center.

At a Glance		Duluth Heights - Eklund (10E)
Weekday Boardings (rank)		315
Weekday Revenue Hours		5.37
AM Peak Hour (weekday boardings)		7am - 8am (62)
PM Peak Hour (weekday boardings)		4pm - 5pm (80)
Span of Service	Mon-Fri	5am - 8am 3pm - 7pm
Peak Frequency (minutes)	Mon-Fri	60
Off-Peak Frequency (minutes)	Mon-Fri	60

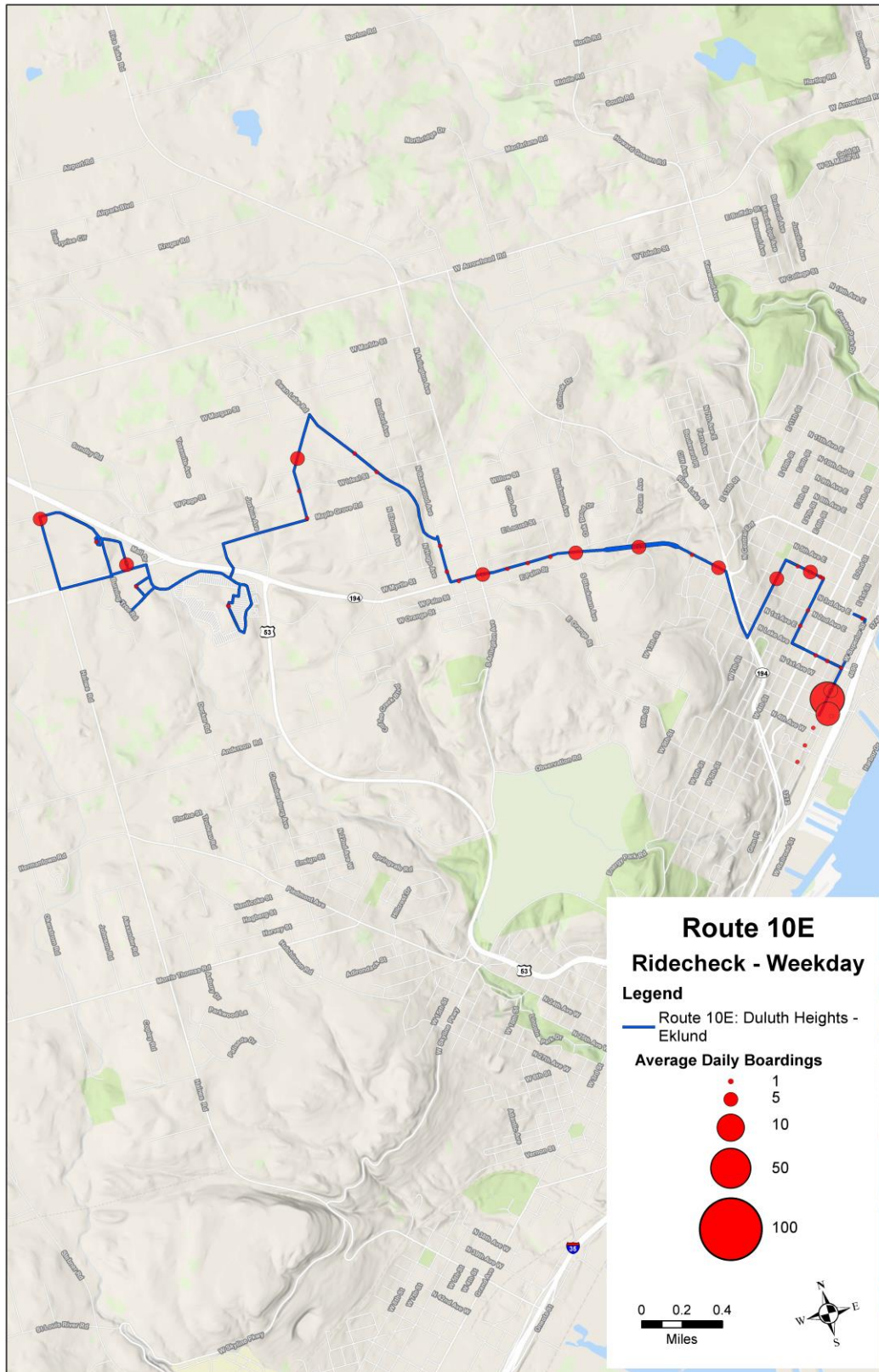
Key Ridership Areas

- North downtown Duluth
- St. Mary's Medical Center
- Burning Tree Plaza
- Target
- Central Entrance

Interlined Routes

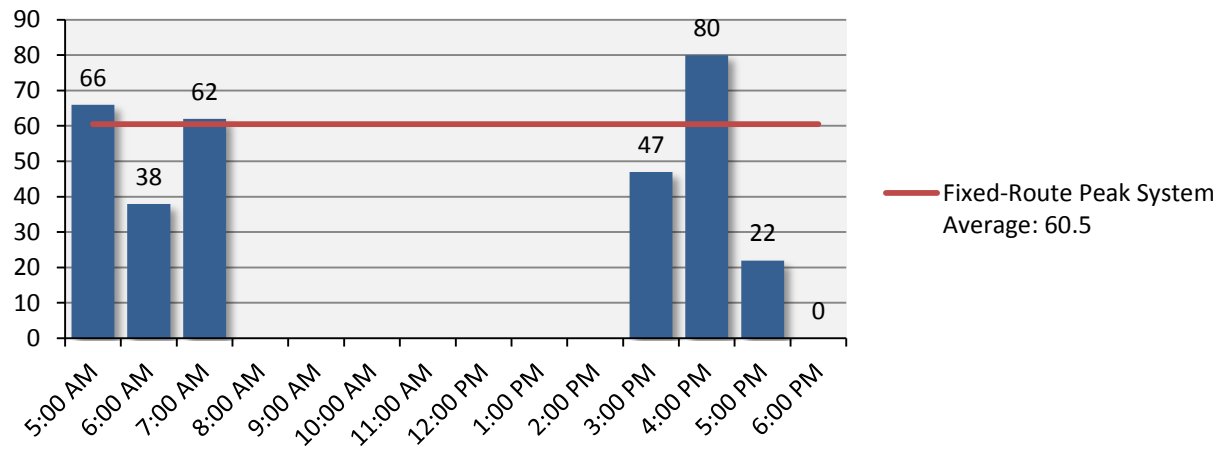
- Route 1

Figure 75: Weekday Boardings – Route 10E Duluth Heights - Eklund



Source: AECOM, 2017

Figure 76: Weekday Boardings per Hour – Route 10E Duluth Heights - Eklund



Source: AECOM, 2017

Route 10H – Duluth Heights Mall via 6AE

Route Overview

Route 10H Duluth Heights Mall operates on weekdays, Saturday, and Sunday. In addition, the weekday route has a 60 minute frequency during peak hours and off-peak hours, while the Saturday and Sunday service operates 30 minute frequency during peak hours and off-peak hours. Route 10H operates service from 8:00 AM to 6:00 PM, while the Saturday service operates from 7:00 AM to 7:00 PM, and the Sunday service operates from 9:00 AM to 6:00 PM. Route 10H operates the same route pattern as Route 10 and Route 10E; however, Route 10H does not stop on 4th Avenue and 4th Street, Swan Lake and Eucklund, or at Walmart. Instead, Route 10H serves 6th Avenue and 4th Street via 2nd Street and 3rd Street. Route 10H completes a one-way trip at Haines Road and Mall Drive via Central Entrance. **Figure 77** through **Figure 82** illustrate average weekday, Saturday, and Sunday passenger boarding's for Route 10H.

- No boardings occur south of downtown Duluth along Superior Street.
- Majority of the boardings occur north of downtown Duluth and east near Miller Hill Mall area.
- The greatest number of boardings occurs on weekdays from 12:00 PM to 1:00 PM, Saturday from 4:00 PM to 5:00 PM, and Sunday from 3:00 PM to 4:00 PM.

Key Ridership Areas

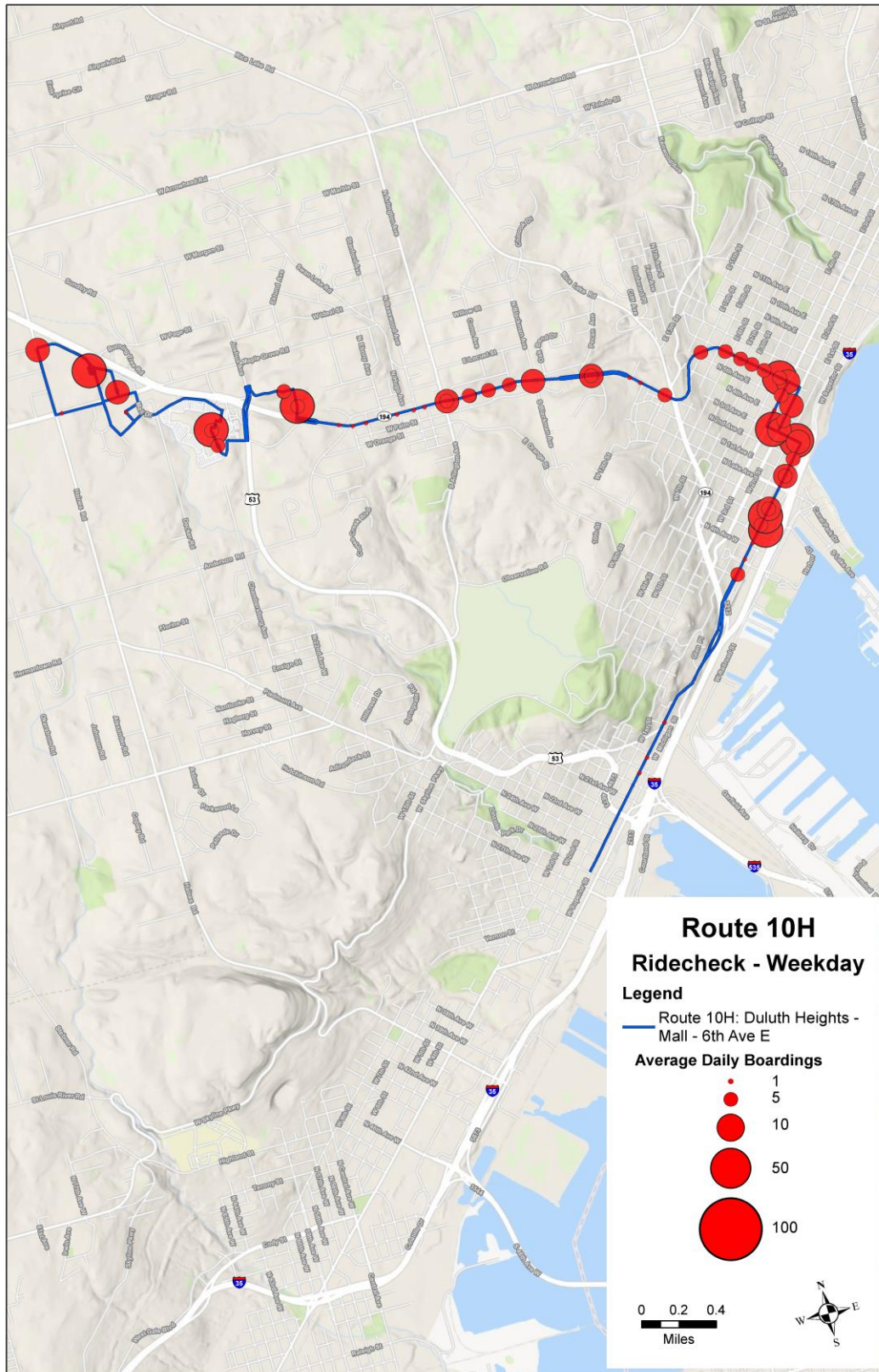
- North downtown Duluth
- Central Entrance
- Stone Ridge
- Burning Tree Plaza
- Miller Hill Mall

Interlined Routes

- Route 1
- Route 2
- Route 3

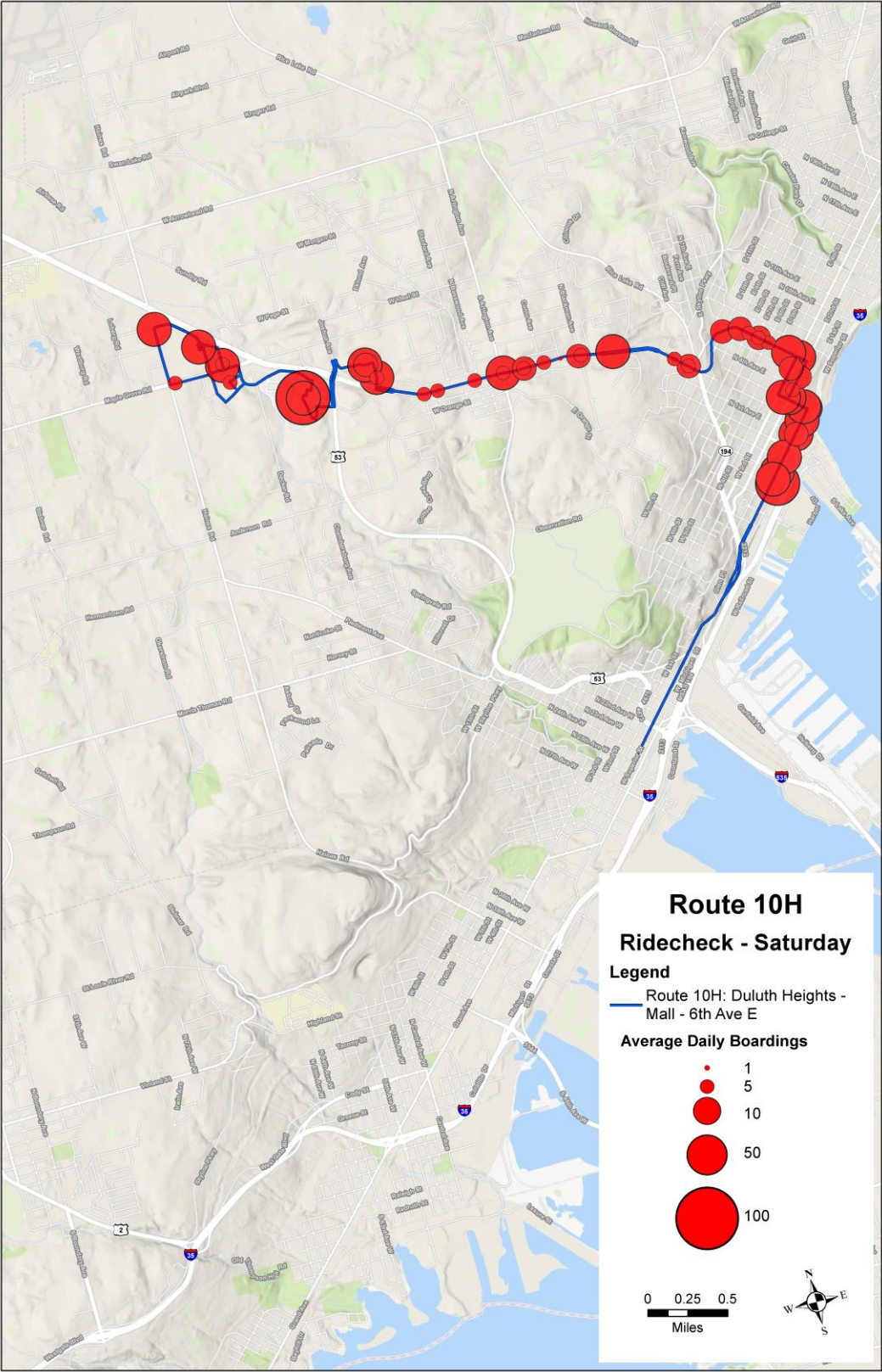
At a Glance		Duluth Heights Mall via 6AE (10H)
Weekday Boardings (rank)		1,611
Weekday Revenue Hours		11.92
Saturday Boardings (rank)		829
Saturday Revenue Hours		35.70
Sunday Boardings (rank)		614 (2/12)
Sunday Revenue Hours		28.33
AM Peak Hour (weekday boardings)		9am -10am (90)
PM Peak Hour (weekday boardings)		3pm – 4pm (286)
AM Peak Hour (Saturday boardings)		9am - 10am (50)
PM Peak Hour (Saturday boardings)		4pm – 5pm (109)
AM Peak Hour (Sunday boardings)		9am - 10am (28)
PM Peak Hour (Sunday boardings)		3pm – 4pm (97)
Span of Service	Mon-Fri	8am – 6pm
	Sat	7am – 7pm
	Sun	9am – 6pm
Peak Frequency (minutes)	Mon-Fri	60
	Sat	30
	Sun	30
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	30
	Sun	30

Figure 77: Weekday Boardings – Route 10H Duluth Heights Mall via 6AE



Source: AECOM, 2017

Figure 78: Saturday Boardings – Route 10H Duluth Heights Mall via 6AE



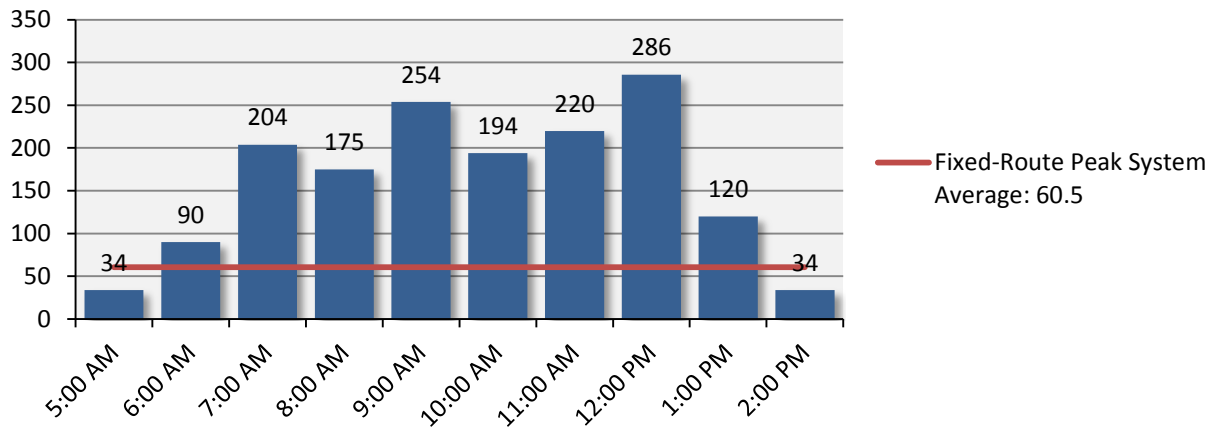
Source: AECOM, 2017

Figure 79: Sunday Boardings – Route 10H Duluth Heights Mall via 6AE



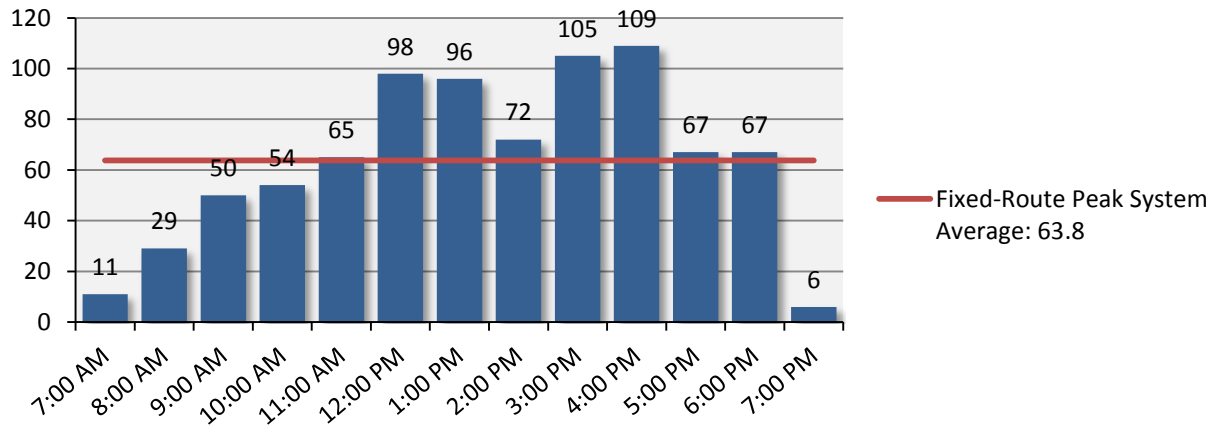
Source: AECOM, 2017

Figure 80: Weekday Boardings per Hour – Route 10H Duluth Heights Mall via 6AE



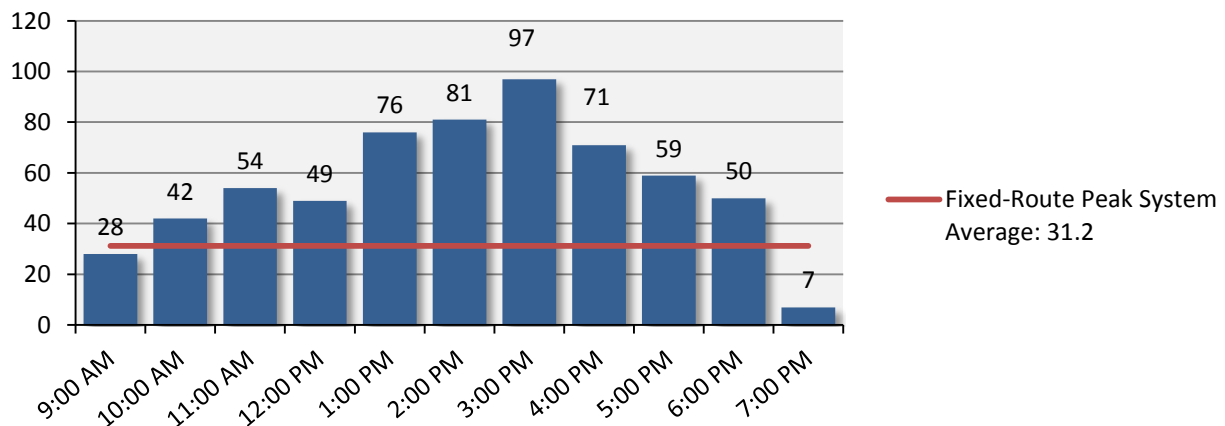
Source: AECOM, 2017

Figure 81: Saturday Boardings per Hour – Route 10H Duluth Heights Mall via 6AE



Source: AECOM, 2017

Figure 82: Sunday Boardings per Hour – Route 10H Duluth Heights Mall via 6AE



Source: AECOM, 2017

Route 11 – East 8th UMD

Route Overview

Route 11 operates on weekdays from 7:00 AM to 8:00 PM at a 15 minute frequency during peak periods and a 30 minute frequency during off-peak periods. Route 11 operates service from the downtown Transportation Center to the University of Minnesota-Duluth via 6th Avenue and 9th Street. In addition, on the outbound pattern Route 11 travels north on Superior Street and on the inbound pattern Route 11 travels on 3rd Street as it returns to the Transportation Center. **Figure 83** and **Figure 84** illustrate average weekday passenger boardings for Route 11.

- The majority of the boardings occur on the University of Minnesota-Duluth campus.
- The highest number of weekday boardings occur from 2:00 PM to 3:00 PM on weekdays.

At a Glance		East 8 th Kenwood (11)
Weekday Boardings (rank)		3,652 (3/17)
Weekday Revenue Hours		19.73
AM Peak Hour (weekday boardings)		9am - 10am (401)
PM Peak Hour (weekday boardings)		3pm - 4pm (379)
Span of Service	Mon-Fri	7am - 8pm
Peak Frequency (minutes)	Mon-Fri	15
Off-Peak Frequency (minutes)	Mon-Fri	30

Key Ridership Areas

- University of Minnesota-Duluth
- East Hillside
- St. Mary's Medical Center
- Transportation Center

Interlined Routes

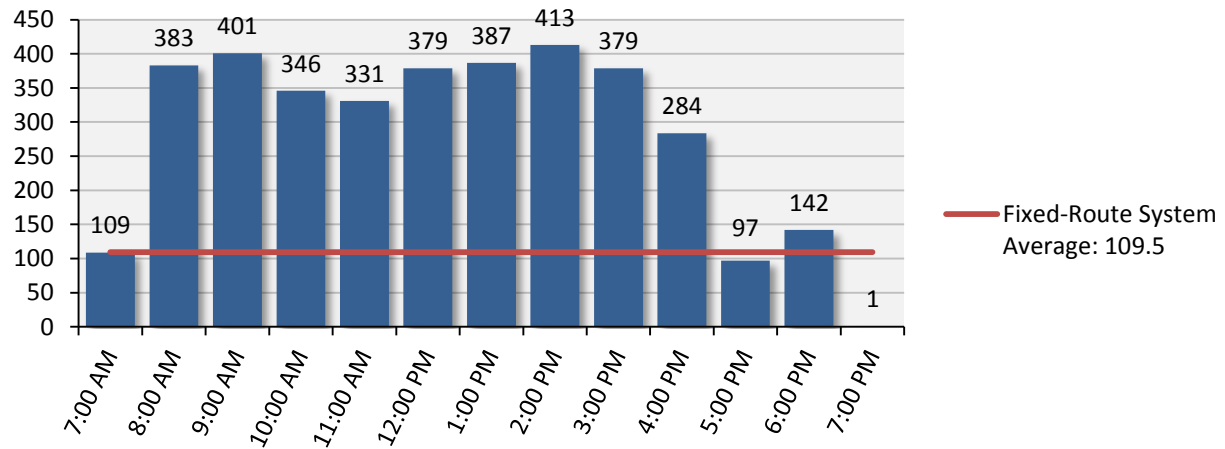
- Downtown Trolley

Figure 83: Weekday Boardings – Route 11 East 8th UMD



Source: AECOM, 2017

Figure 84: Weekday Boardings per Hour – Route 11 East 8th UMD



Source: AECOM, 2017

Route 11K – East 8th UMD Kenwood

Route Overview

Route 11K operates the same pattern as Route 11 but travels to the College of Saint Scholastica, Super 1, and Kenwood Shopping Center via College Street. Route 11K operates on weekdays from 7:00 PM to 1:00 AM, Saturday from 7:00 AM to 12:00 AM, and Sunday from 9:00 AM to 10:00 PM. In addition, Route 11K has a 60 minute frequency on weekdays, Saturdays, and Sundays. **Figure 85** through **Figure 90** illustrate average weekday, Saturday, and Sunday passenger boardings.

- Boardings are very infrequent along certain corridors including 3rd Street, north 9th Street, and areas east of the University of Minnesota-Duluth.
- The greatest number of boardings occurs on the University of Minnesota-Duluth and College of Saint Scholastica campuses.

Key Ridership Areas

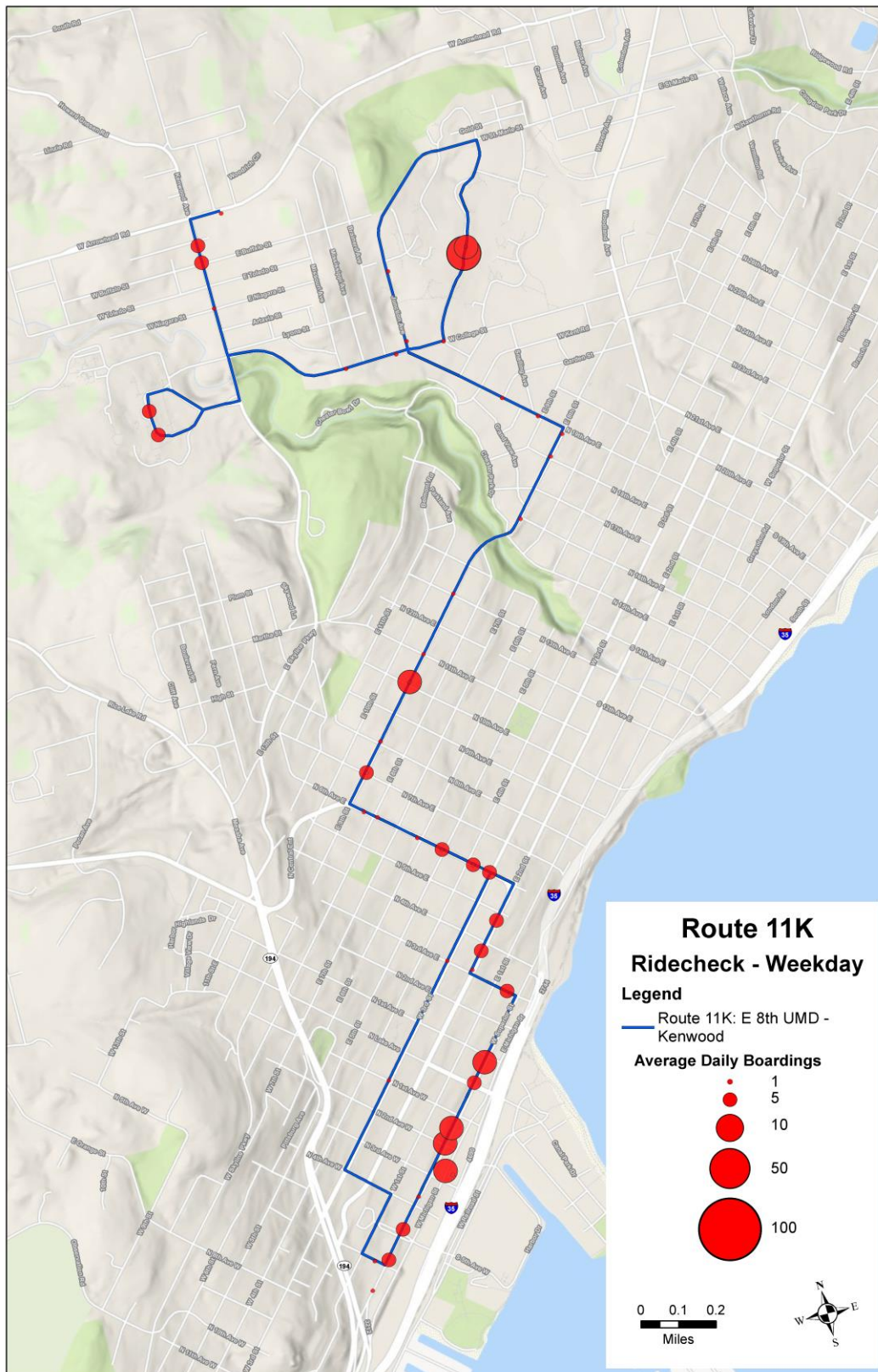
- University of Minnesota-Duluth
- College of Saint Scholastica
- Downtown Duluth
- Kenwood Shopping Center

Interlined Routes

- Route 7
- Route 10
- Downtown Trolley

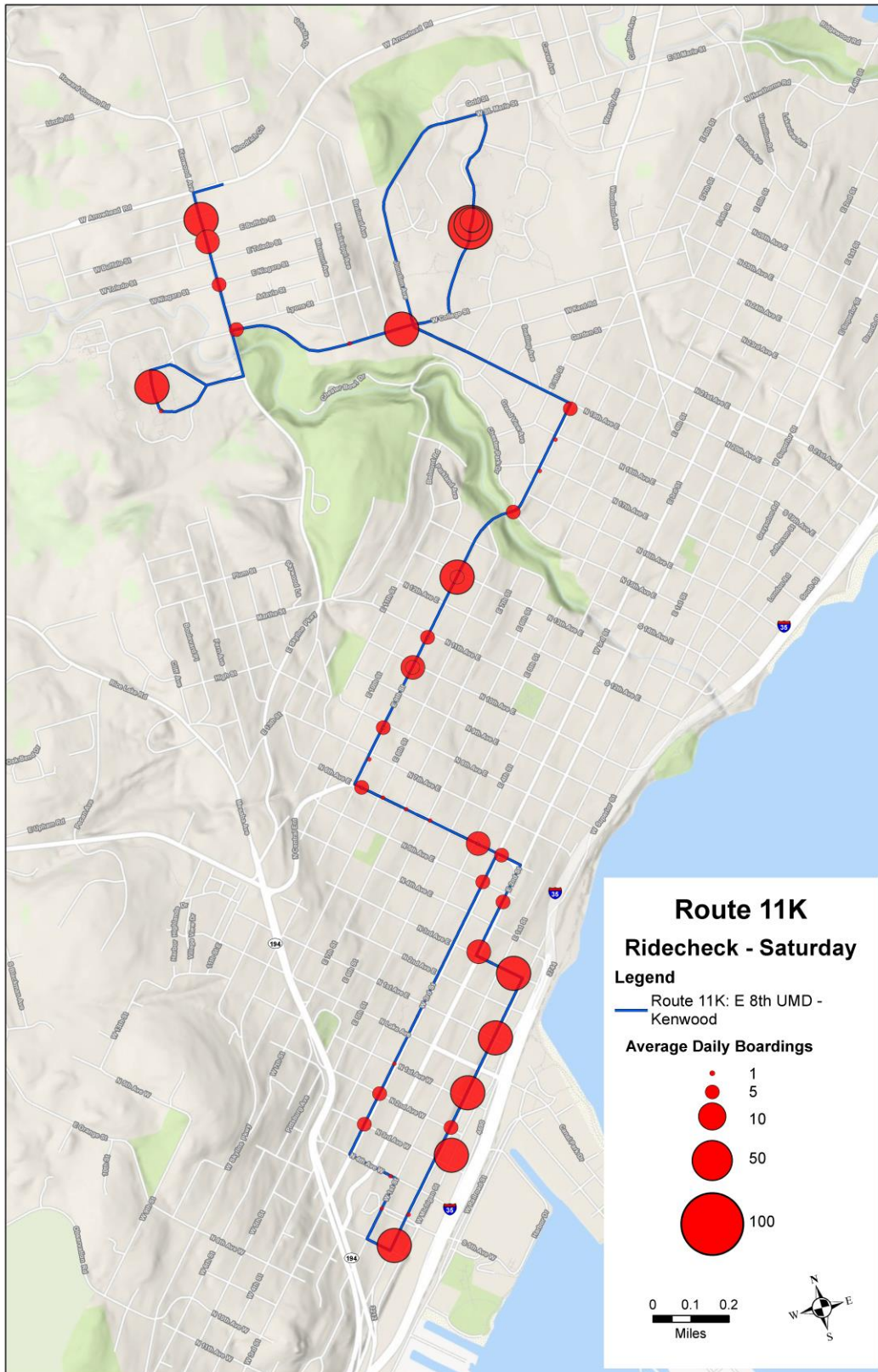
At a Glance		East 8 th UMD Morley Heights (11K)
Weekday Boardings (rank)		572
Weekday Revenue Hours		6.27
Saturday Boardings (rank)		408 (6/15)
Saturday Revenue Hours		18.06
Sunday Boardings (rank)		227 (8/12)
Sunday Revenue Hours		14.40
AM Peak Hour (weekday boardings)		N/A
PM Peak Hour (weekday boardings)		N/A
AM Peak Hour (Saturday boardings)		9am - 10am (18)
PM Peak Hour (Saturday boardings)		3pm - 4pm (44)
AM Peak Hour (Sunday boardings)		9am - 10am (10)
PM Peak Hour (Sunday boardings)		3pm - 4pm (30)
Span of Service	Mon-Fri	7pm - 1am
	Sat	7am - 12am
	Sun	9am - 10pm
Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 85: Weekday Boardings – Route 11K East 8th UMD Kenwood



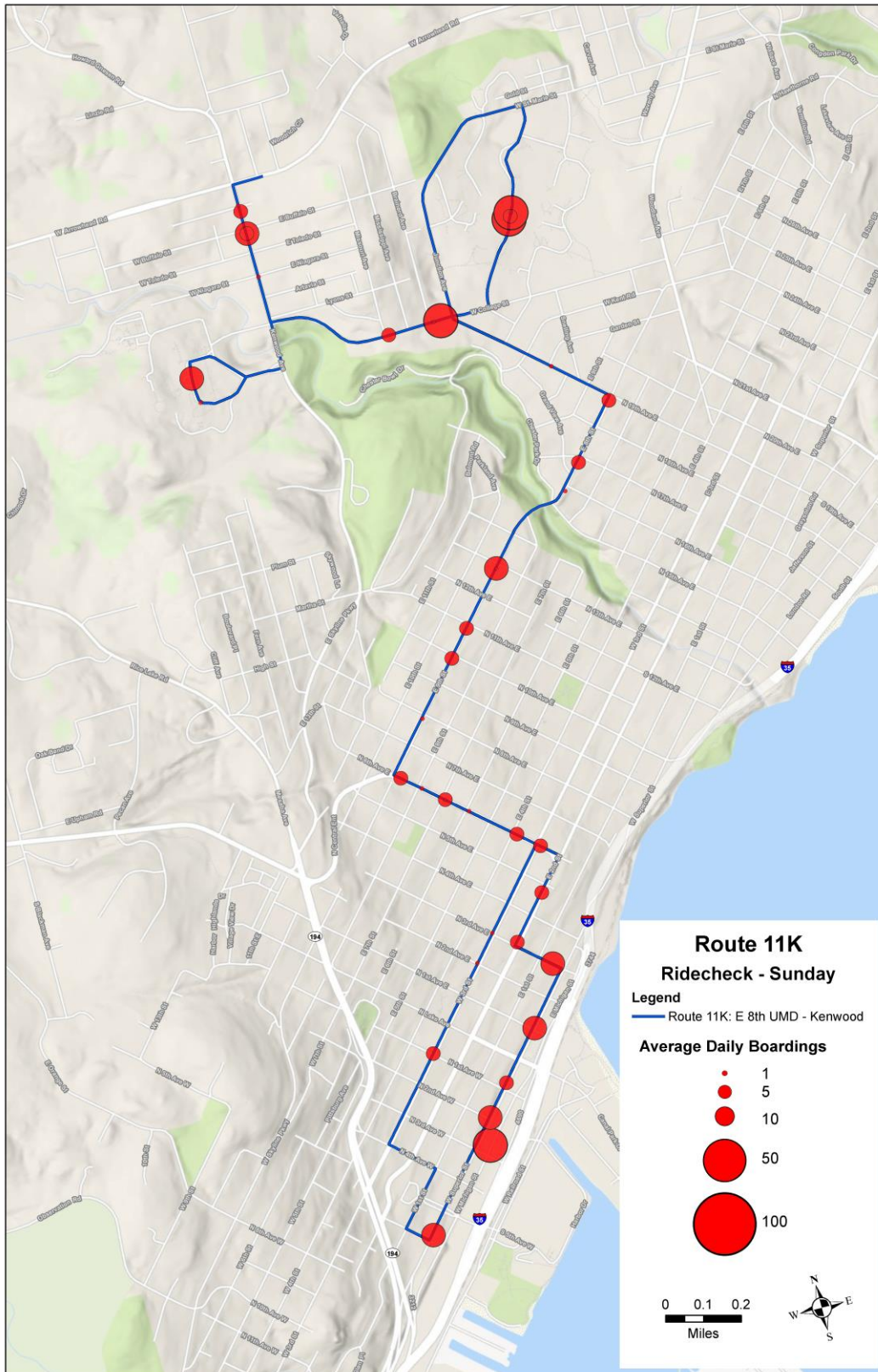
Source: AECOM, 2017

Figure 86: Saturday Boardings – Route 11K East 8th UMD Kenwood



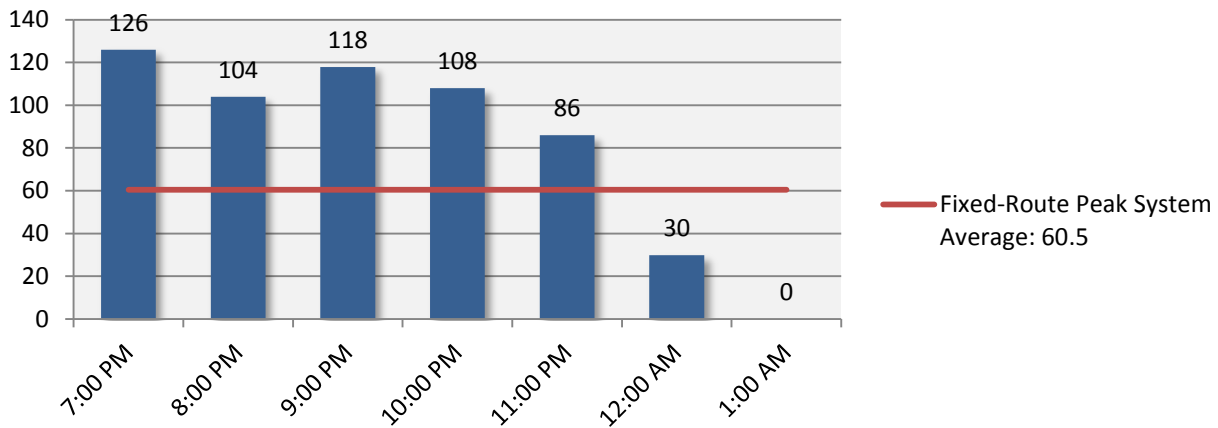
Source: AECOM, 2017

Figure 87: Sunday Boardings – Route 11K East 8th UMD Kenwood



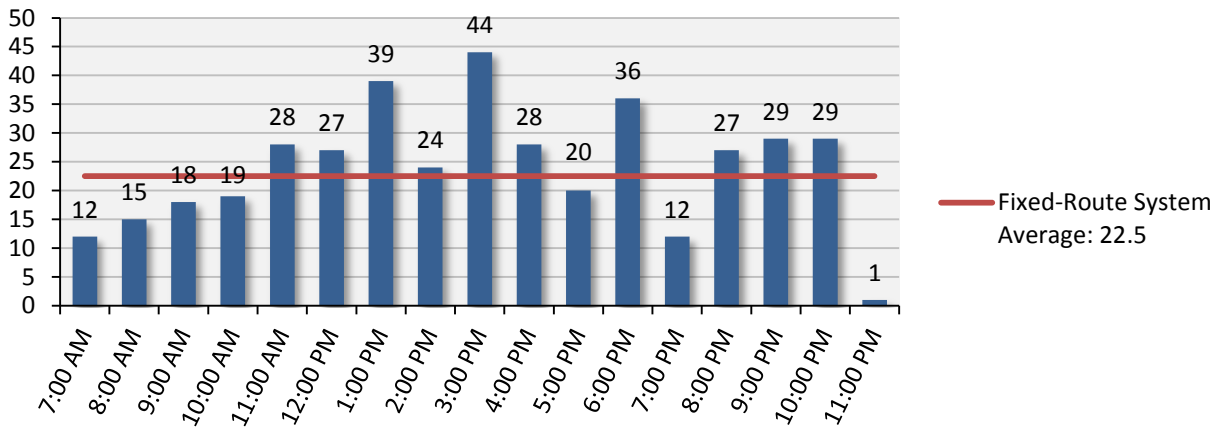
Source: AECOM, 2017

Figure 88: Weekday Boardings per Hour – Route 11K East 8th UMD Kenwood



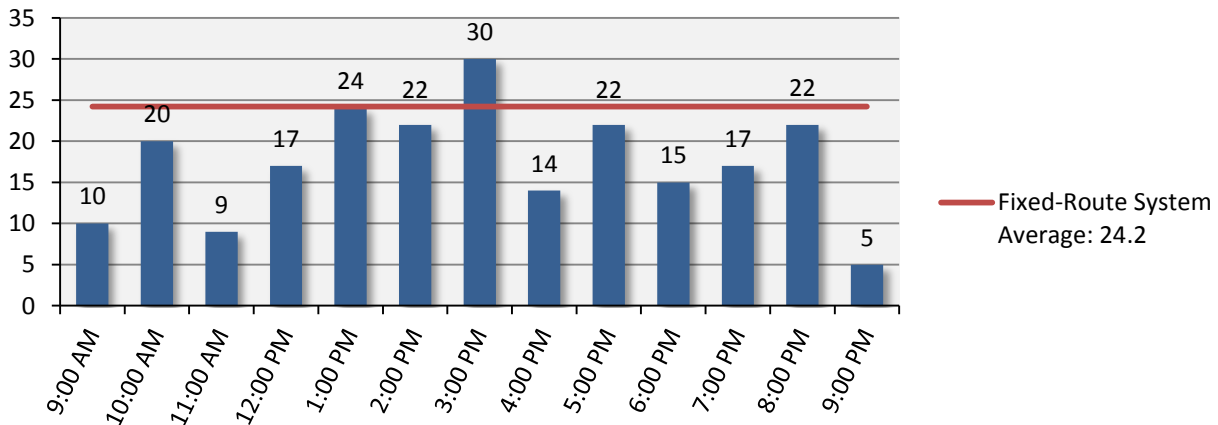
Source: AECOM, 2017

Figure 89: Saturday Boardings per Hour – Route 11K East 8th UMD Kenwood



Source: AECOM, 2017

Figure 90: Sunday Boardings per Hour – Route 11K East 8th UMD Kenwood



Source: AECOM, 2017

Route 11M – East 8th UMD Morley Heights

Route Overview

Route 11M operates only during the weekday peak periods from 5:00 AM to 9:00 AM and 3:00 PM to 7:00 PM. Route 11M operates the same route pattern as Route 11 but also provides service north to the neighborhoods of Morley Heights and Hunters Park via Snively Road, Glenwood Street, and Oxford Street. **Figure 91** and **Figure 92** illustrate average weekday passenger boarding's for Route 11M.

- The greatest number of boardings occurs from 7:00 AM to 8:00 AM on weekdays.
- Majority of the boardings occur along 9th Street just north of Myers-Wilkins Elementary School.

At a Glance		East 8 th UMD Morley Heights (11M)
Weekday Boardings (rank)		956
Weekday Revenue Hours		11.28
AM Peak Hour (weekday boardings)		7am - 8am (346)
PM Peak Hour (weekday boardings)		4pm - 5pm (183)
Span of Service	Mon-Fri	5am - 9am 3pm - 7pm
Peak Frequency (minutes)	Mon-Fri	27
Off-Peak Frequency (minutes)	Mon-Fri	35

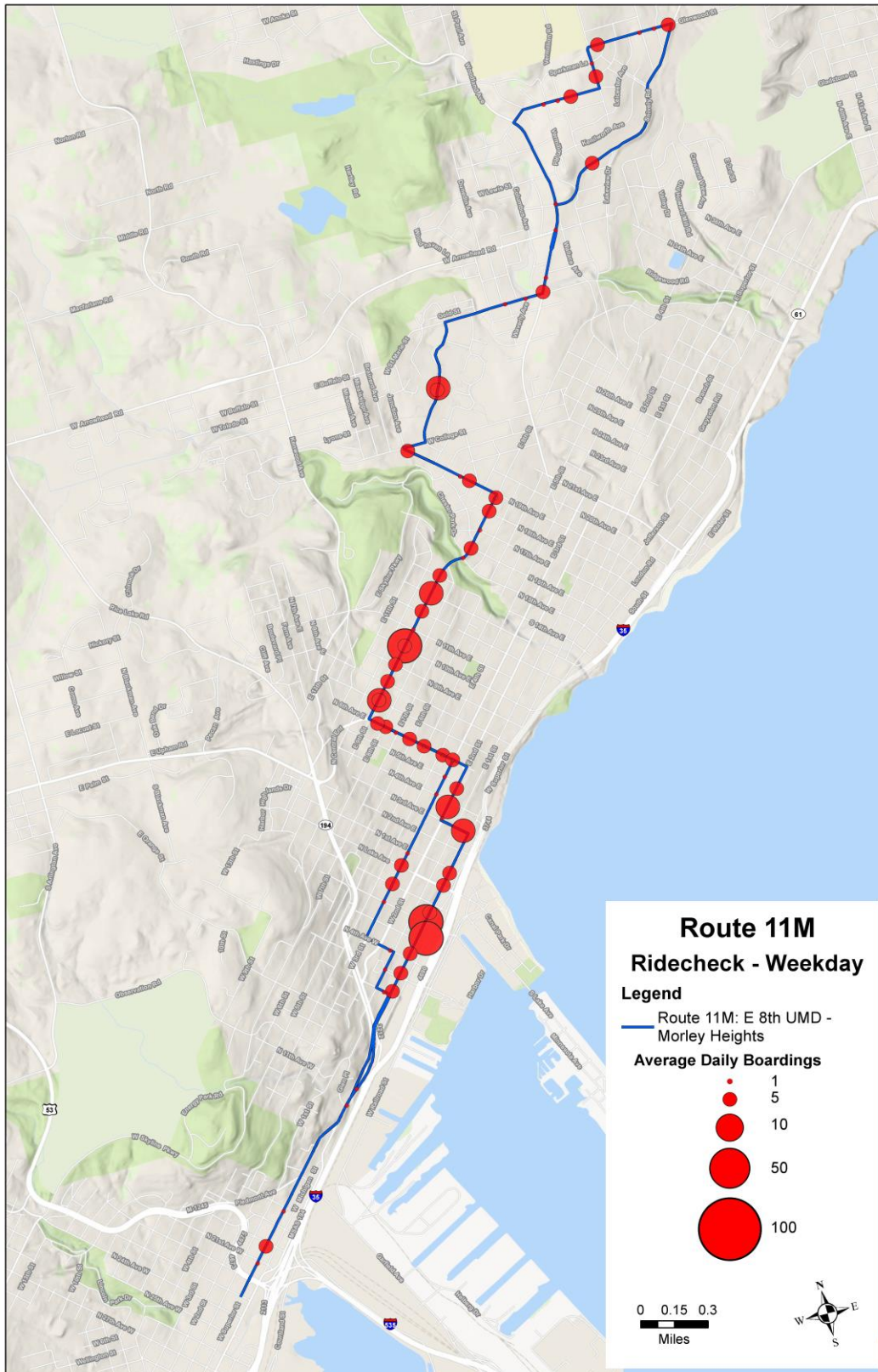
Key Ridership Areas

- Downtown Duluth
- 9th Street in west of downtown Duluth
- St. Mary's Medical Center

Interlined Routes

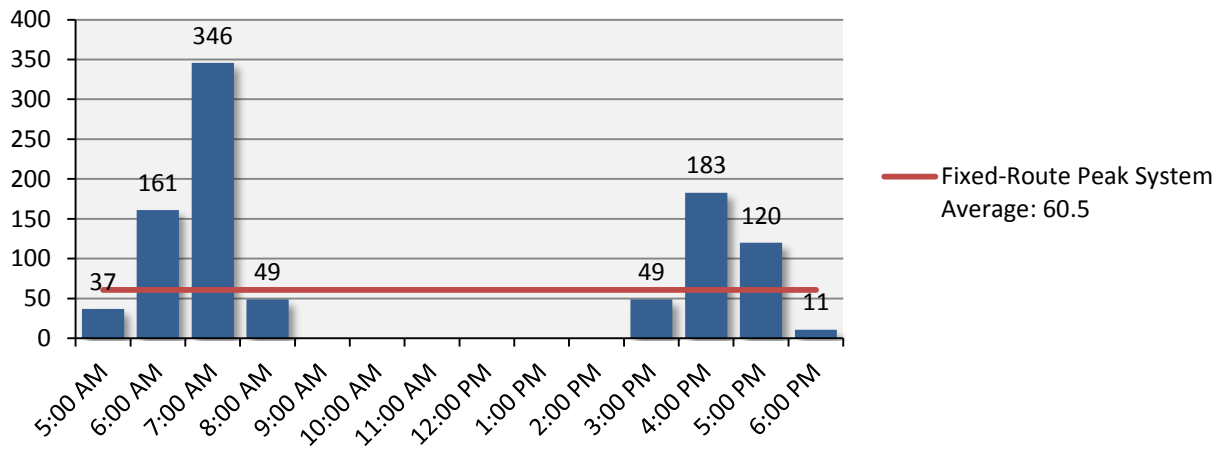
- Route 11
- Downtown Trolley

Figure 91: Weekday Boardings – Route 11M East 8th UMD Morley Heights



Source: AECOM, 2017

Figure 92: Weekday Boardings per Hour – Route 11M East 8th UMD Morley Heights



Source: AECOM, 2017

Route 12 – Kenwood

Route Overview

Route 12 operates on weekdays from 5:00 AM to 7:00 PM at a 30 minute frequency during peak periods and a 60 minute frequency during off-peak periods. Route 12 operates service from the downtown Transportation Center to the College of Saint Scholastica and the University of Minnesota-Duluth via Kenwood Avenue and Arrowhead Road. **Figure 93** and **Figure 94** illustrate average weekday passenger boardings.

- A low number of boardings occur south of downtown Duluth along Superior Avenue.
- Majority of boardings occur along Kenwood Avenue west of downtown and at the University of Minnesota-Duluth.
- The College of Saint Scholastica near Kenwood also has a large number of weekday boardings.

At a Glance		Kenwood (12)
Weekday Boardings (rank)		2,048 (10/17)
Weekday Revenue Hours		25.47
AM Peak Hour (weekday boardings)		7am - 8am (282)
PM Peak Hour (weekday boardings)		4pm - 5pm (225)
Span of Service	Mon-Fri	5am - 7pm
Peak Frequency (minutes)	Mon-Fri	30
Off-Peak Frequency (minutes)	Mon-Fri	60

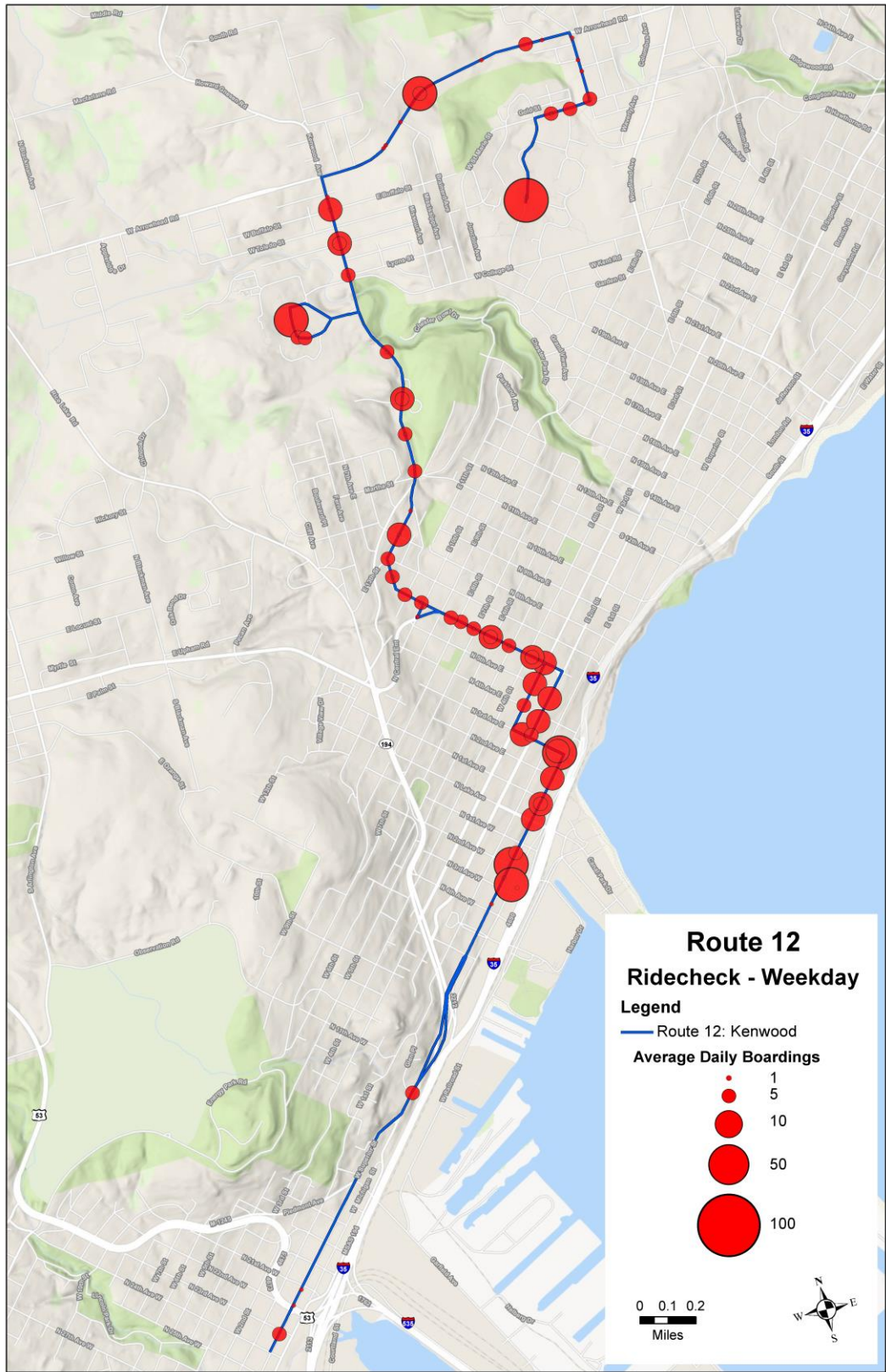
Key Ridership Areas

- University of Minnesota-Duluth
- College of Saint Scholastica
- Kenwood Avenue
- Downtown Duluth
- Residence near Goldfine Hall

Interlined Routes

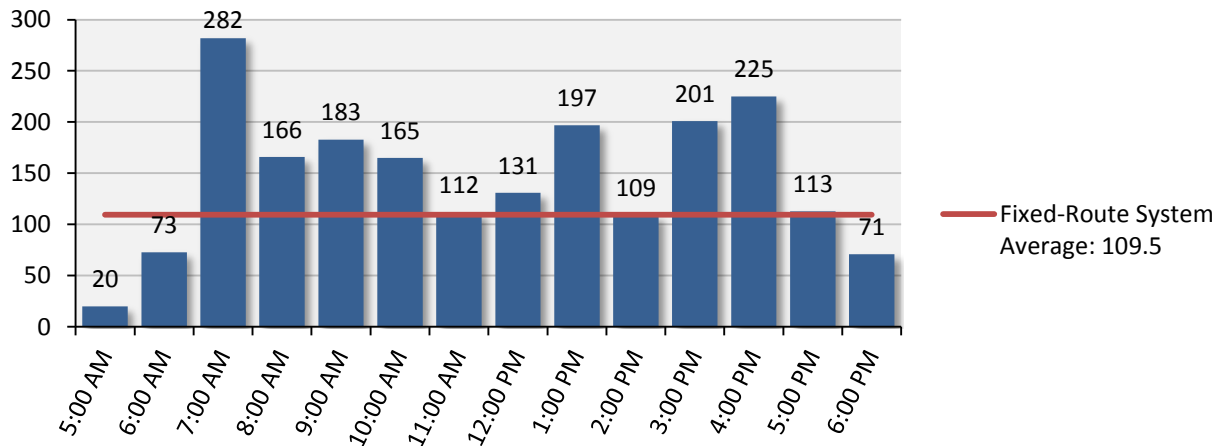
- Route 2F
- Route 3
- Route 8
- Downtown Trolley

Figure 93: Weekday Boardings – Route 12 Kenwood



Source: AECOM, 2017

Figure 94: Weekday Boardings per Hour – Route 12 Kenwood



Source: AECOM, 2017

Route 13 – E 4th – UMD - Woodland

Route Overview

Route 13 provides service to the University of Minnesota-Duluth and the Woodland Park and Ride. Route 13 operates at a 30 minute frequency during peak periods on weekdays and 60 minute frequency during off-peak periods. On Saturday and Sunday, Route 13 operates at a 60 minute frequency during on and off-peak frequency. In addition, Route 13 operates weekdays from 4:00 AM to 12:00 AM, Saturday from 6:00 AM to 9:00 PM, and Sunday from 8:00 AM to 9:00 PM. **Figure 95** through **Figure 100** illustrate average weekday, Saturday, and Sunday passenger boardings.

- The majority of the boardings for Route 13 occur in the medical area of downtown Duluth, as well as the University of Minnesota-Duluth and north portions of Woodland.
- A low number of boardings occur south of downtown Duluth along Superior Avenue.

Key Ridership Areas

- University of Minnesota-Duluth
- Woodland Park and Ride
- Woodland Marketplace
- Downtown Duluth

Interlined Routes

- Route 1
- Route 2
- Route 3
- Route 10
- Downtown Trolley

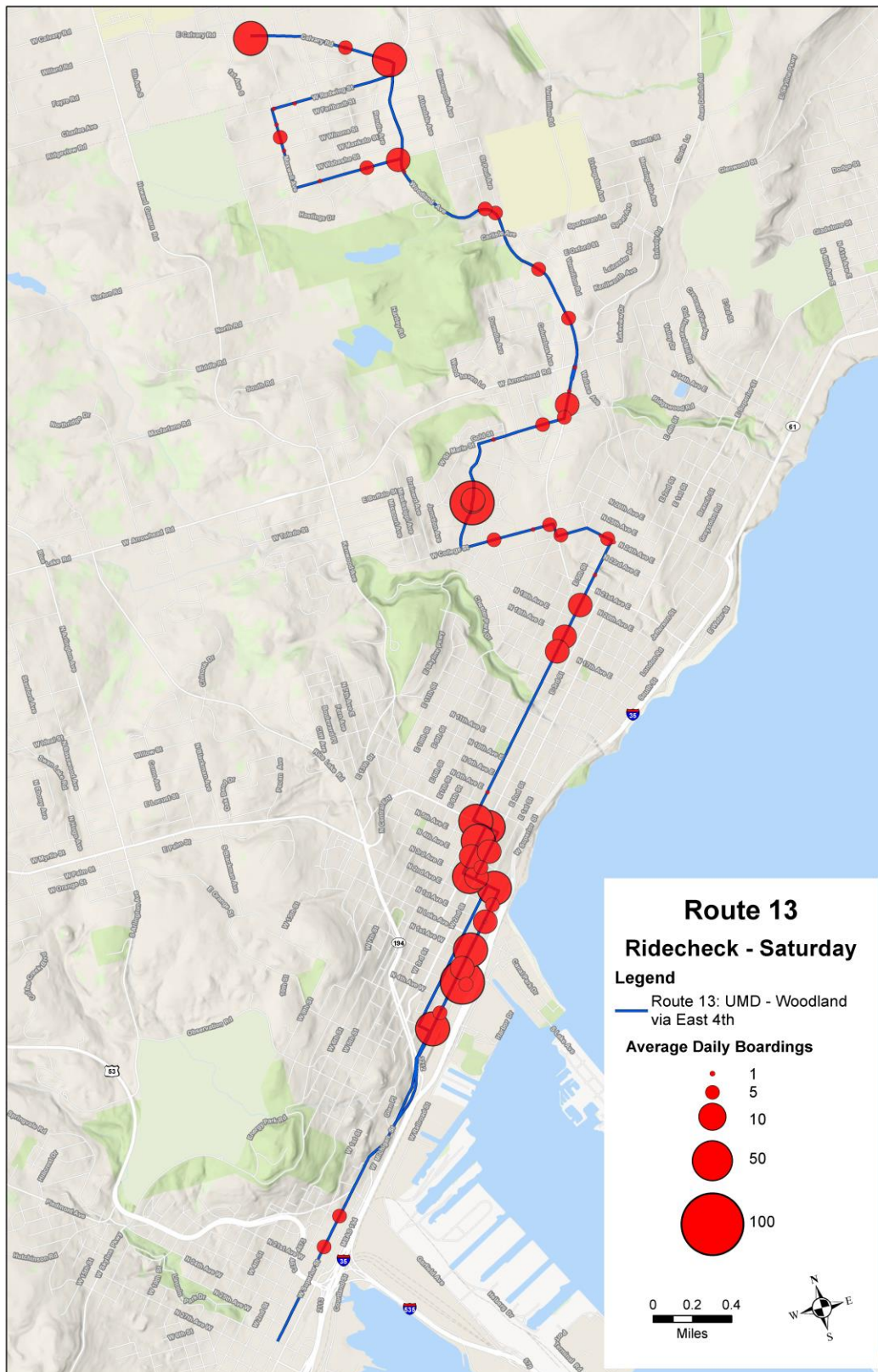
At a Glance		E 4 th – UMD - Woodland (13)
Weekday Boardings (rank)		2,784 (5/17)
Weekday Revenue Hours		37.40
Saturday Boardings (rank)		448 (5/15)
Saturday Revenue Hours		20.88
Sunday Boardings (rank)		308 (6/12)
Sunday Revenue Hours		18.95
AM Peak Hour (weekday boardings)		7am -8am (363)
PM Peak Hour (weekday boardings)		3pm – 4pm (281)
AM Peak Hour (Saturday boardings)		9am - 10am (29)
PM Peak Hour (Saturday boardings)		3pm – 4pm (46) 4pm – 5pm (46)
AM Peak Hour (Sunday boardings)		9am - 10am (37)
PM Peak Hour (Sunday boardings)		5pm – 6pm (31)
Span of Service	Mon-Fri	4am – 12am
	Sat	6am – 9pm
	Sun	8am – 9pm
Peak Frequency (minutes)	Mon-Fri	30
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 95: Weekday Boardings – Route 13 E 4th – UMD - Woodland



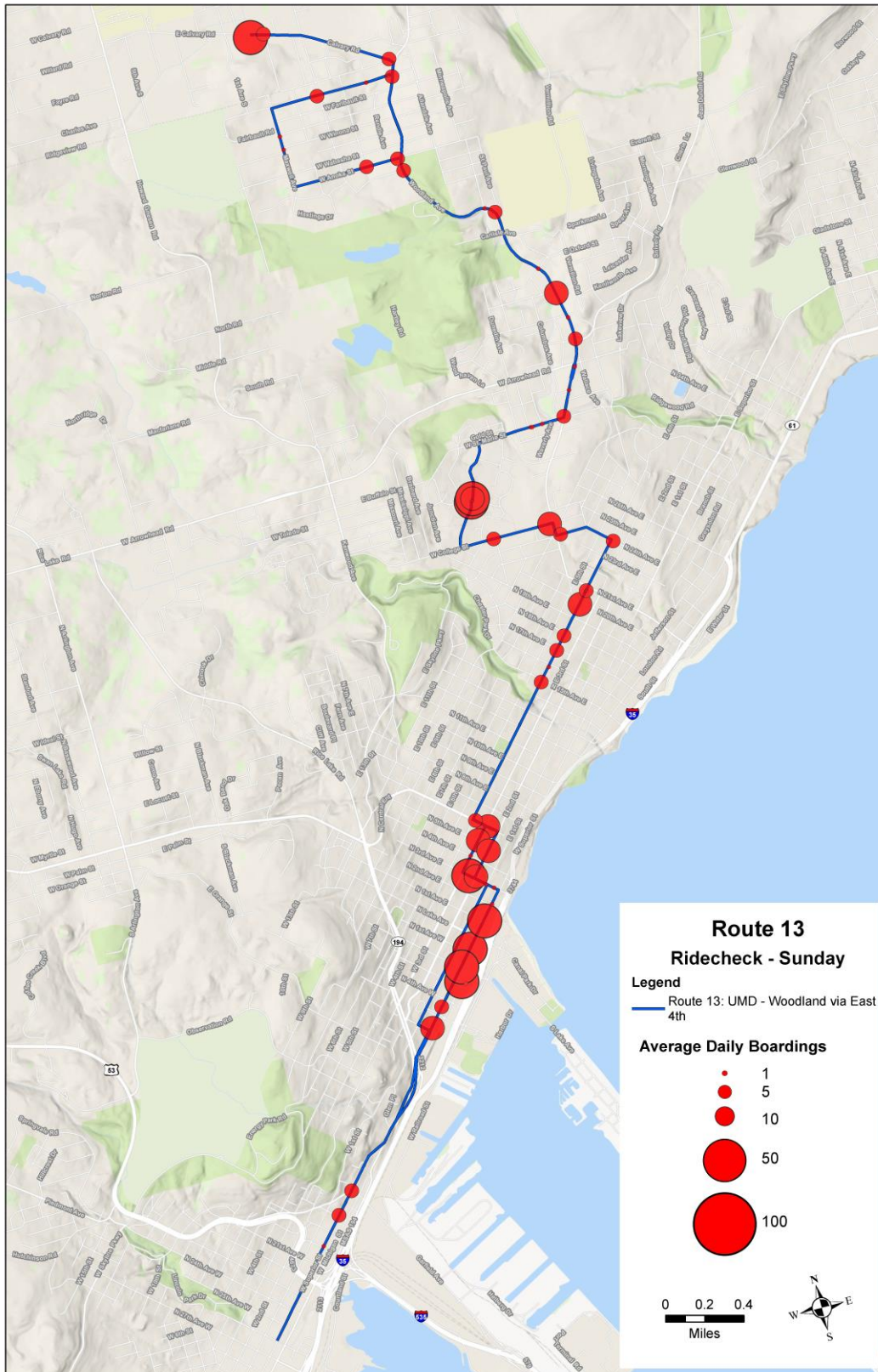
Source: AECOM, 2017

Figure 96: Saturday Boardings – Route 13 E 4th – UMD - Woodland



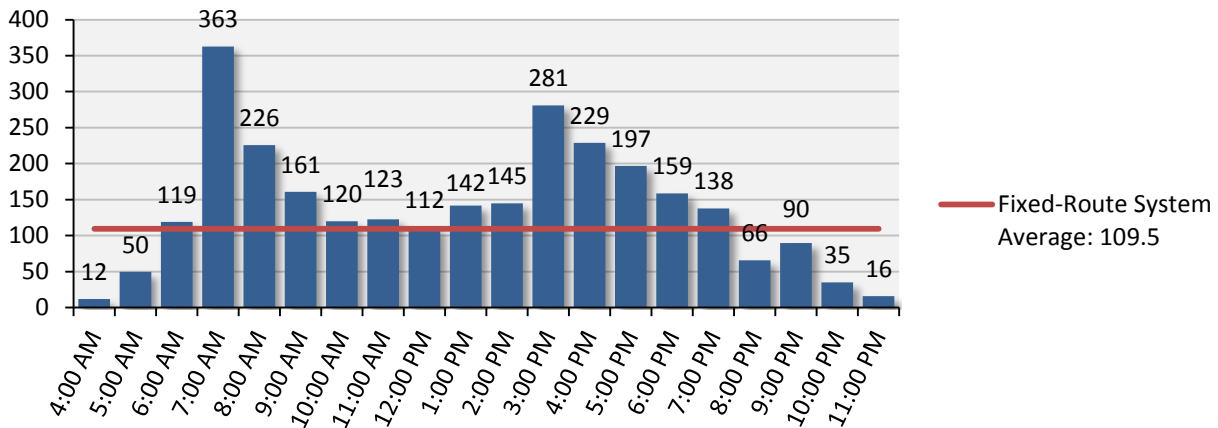
Source: AECOM, 2017

Figure 97: Sunday Boardings – Route 13 E 4th – UMD - Woodland



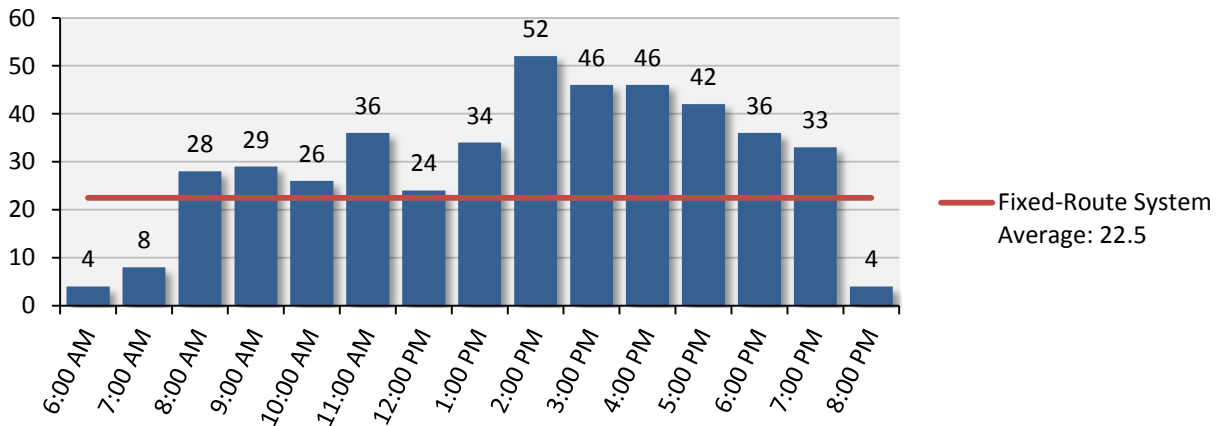
Source: AECOM, 2017

Figure 98: Weekday Boardings per Hour – Route 13 E 4th – UMD - Woodland



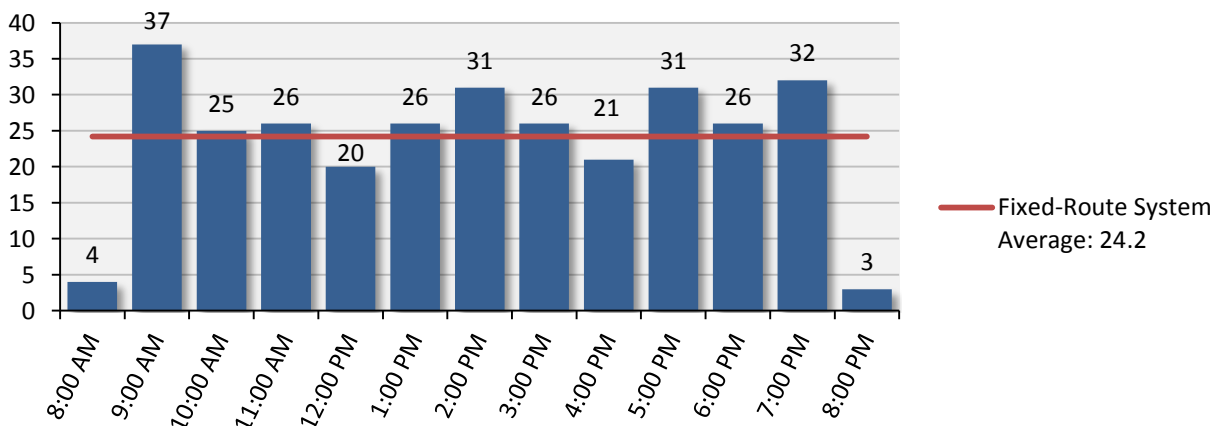
Source: AECOM, 2017

Figure 99: Saturday Boardings per Hour – Route 13 E 4th – UMD - Woodland



Source: AECOM, 2017

Figure 100: Sunday Boardings per Hour – Route 13 E 4th – UMD - Woodland



Source: AECOM, 2017

Route 13U – E 4th - UMD

Route Overview

Route 13U operates on weekdays from 7:00 AM to 4:00 PM with a 60 minute frequency during peak periods and 60 minute frequency during off-peak periods. Route 13U operates the same pattern as Route 13 but on the northbound pattern Route 13U bypasses the University of Minnesota-Duluth via Woodland Avenue and on the southbound pattern Route 13U travels through the University of Minnesota-Duluth via St Maria and Kirby Drive.

Figure 101 and **Figure 102** illustrate average weekday passenger boardings.

- No boardings occur south of downtown.
- The majority of the boardings occur on the University of Minnesota-Duluth campus, as well as areas of Superior Avenue just north of downtown Duluth.

At a Glance		E 4 th - UMD (13U)
Weekday Boardings (rank)		1,042
Weekday Revenue Hours		12.42
AM Peak Hour (weekday boardings)		9am - 10am (144)
PM Peak Hour (weekday boardings)		3pm - 4pm (25)
Span of Service	Mon-Fri	7am - 4pm
Peak Frequency (minutes)	Mon-Fri	60
Off-Peak Frequency (minutes)	Mon-Fri	60

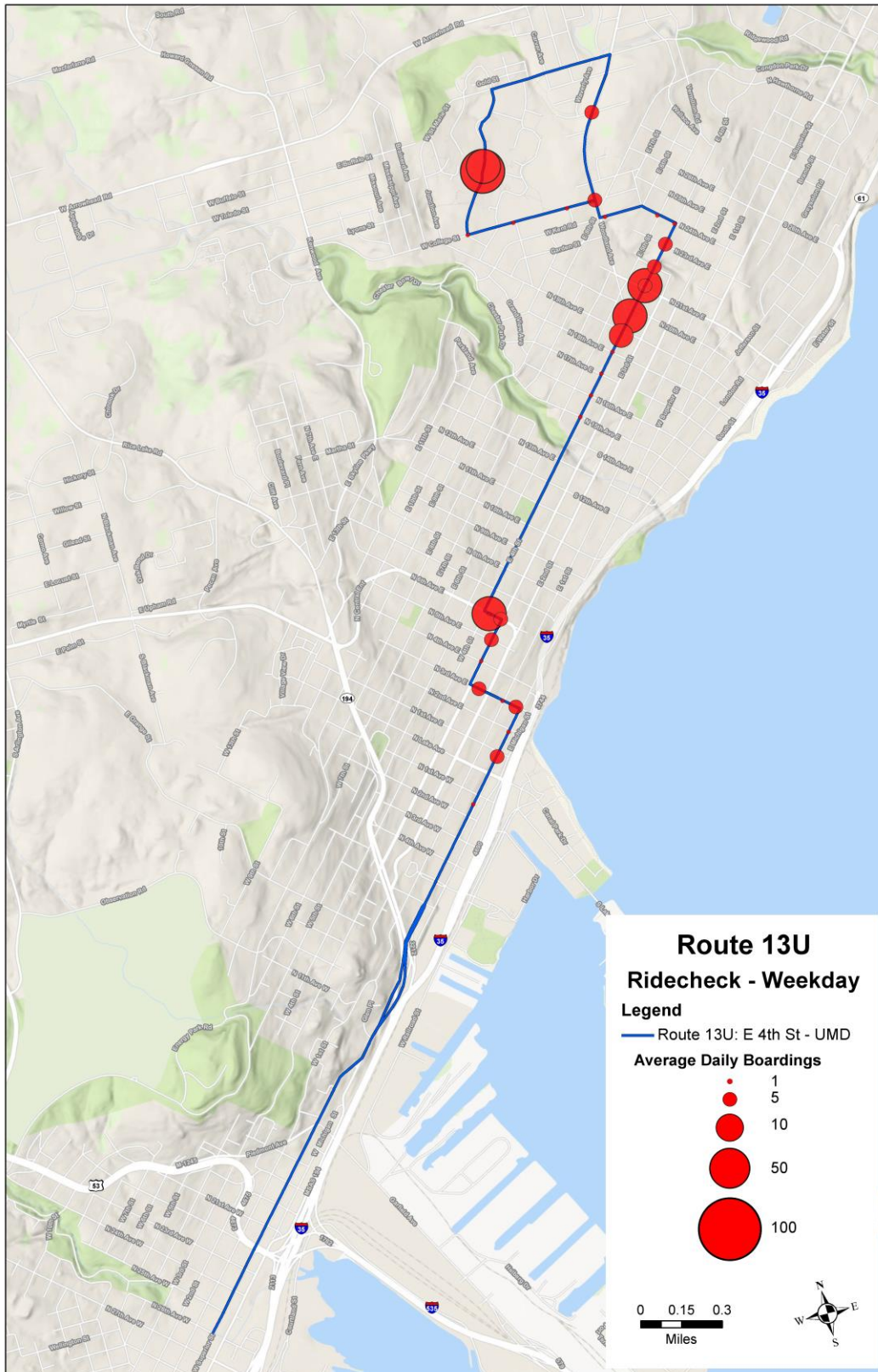
Key Ridership Areas

- University of Minnesota-Duluth
- 6th Avenue and 9th Street
- North 9th Avenue

Interlined Routes

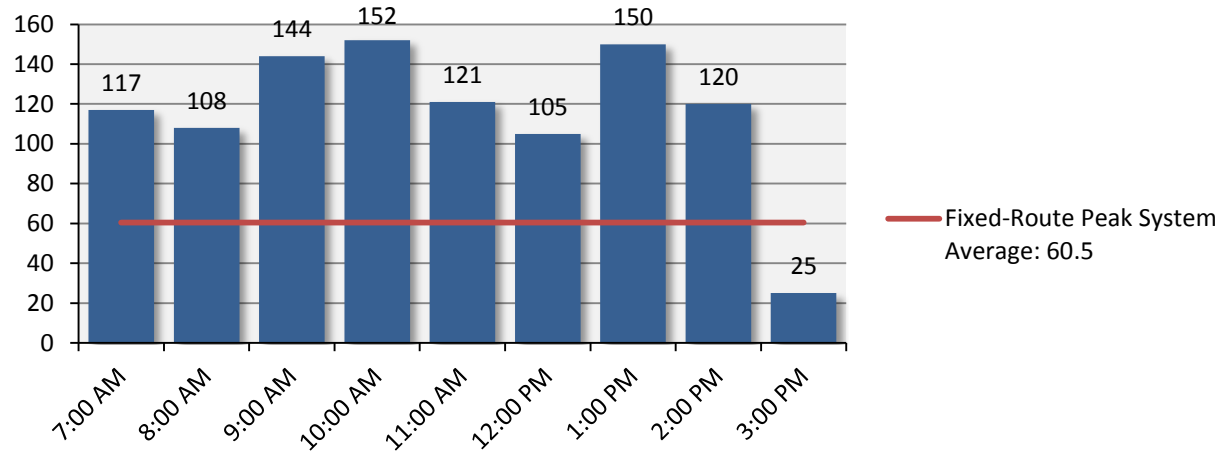
- Downtown Trolley

Figure 101: Weekday Boardings – Route 13U E 4th – UMD



Source: AECOM, 2017

Figure 102: Weekday Boardings per Hour – Route 13U E 4th – UMD



Source: AECOM, 2017

Route 14W – W 4th Boulevard

Route Overview

Route 14W operates primarily outside the central core and operates via 4th Street, Skyline Parkway, and Mesaba Avenue. Route 14W operates weekdays from 6:00 AM to 7:00 AM and Saturdays from 9:00 AM to 5:00 PM. There is no Sunday service. Route 14W operates at a 60 minute frequency during weekday peak periods and weekday off-peak periods. The route operates at a 120 minute frequency on Saturdays. **Figure 103** through **Figure 106** illustrate average weekday and Saturday passenger boardings.

- The greatest number of boardings occurs on weekdays from 2:00 PM to 3:00 PM and on Saturdays from 1:00 PM to 2:00 PM.
- Boardings occur primarily at the Transportation Center and areas within the downtown.

Key Ridership Areas

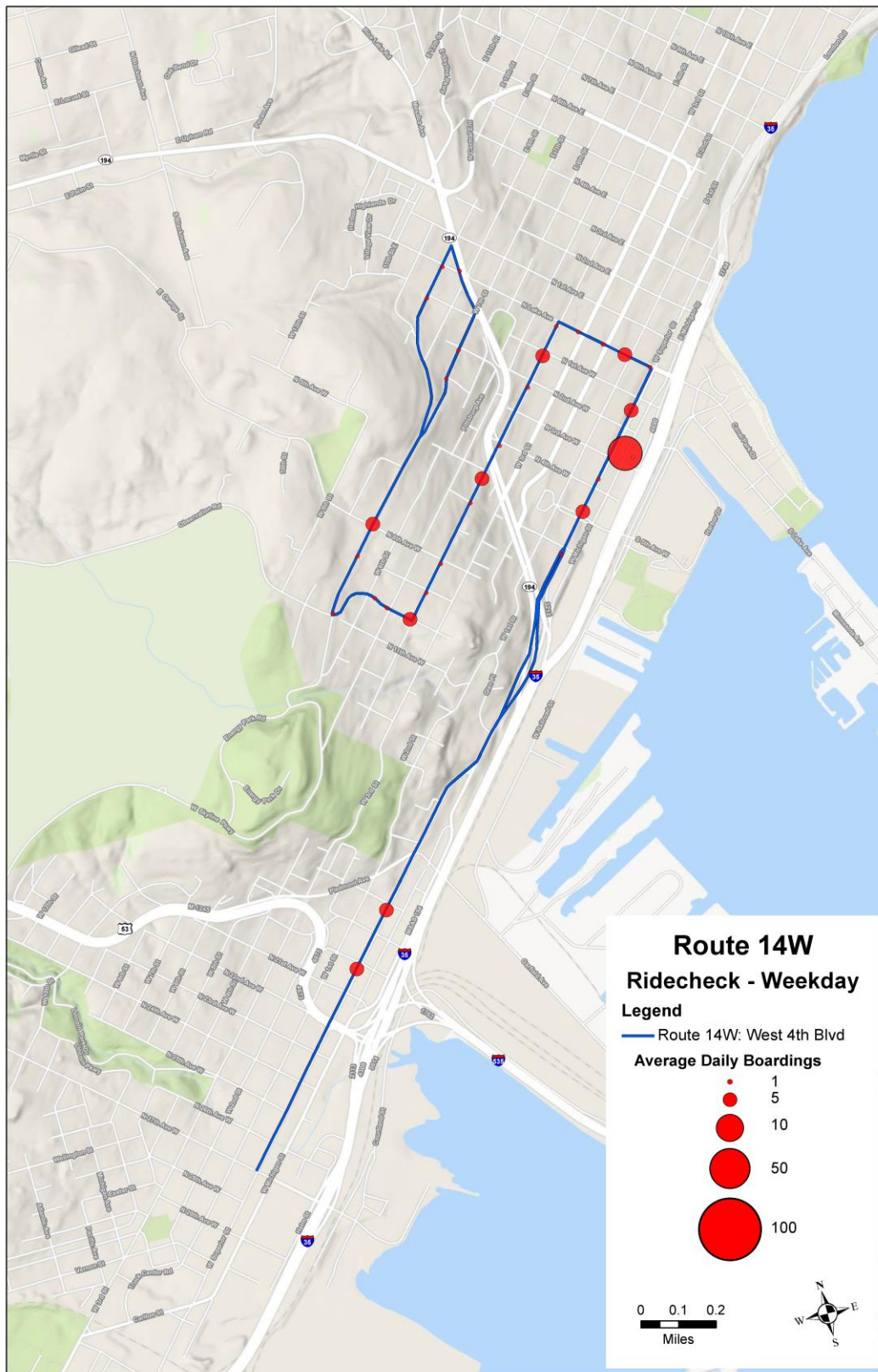
- Transportation Center
- Throughout downtown Duluth

Interlined Routes

- Route 9MT
- Downtown Trolley

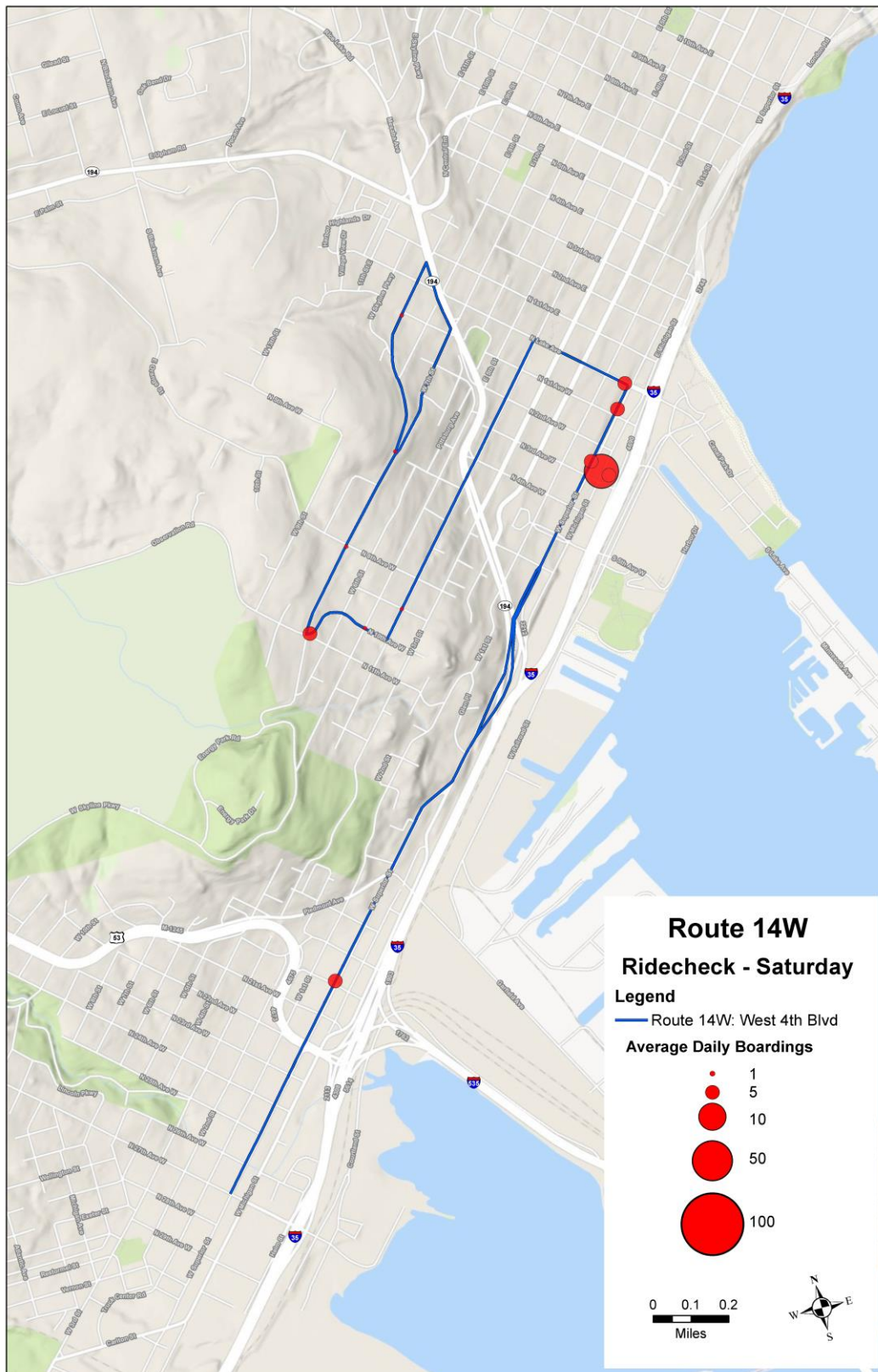
At a Glance		W 4 th Boulevard (14W)
Weekday Boardings (rank)		227 (16/17)
Weekday Revenue Hours		9.30
Saturday Boardings (rank)		35 (14/15)
Saturday Revenue Hours		2.45
AM Peak Hour (weekday boardings)		6am - 7am (19)
PM Peak Hour (weekday boardings)		4pm - 5pm (29)
AM Peak Hour (Saturday boardings)		9am - 10am (3)
PM Peak Hour (Saturday boardings)		4pm - 5pm (5)
Span of Service	Mon-Fri	6am - 7am
	Sat	9am - 5pm
Peak Frequency (minutes)	Mon-Fri	60
	Sat	120
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	120

Figure 103: Weekday Boardings – Route 14W W 4th Boulevard



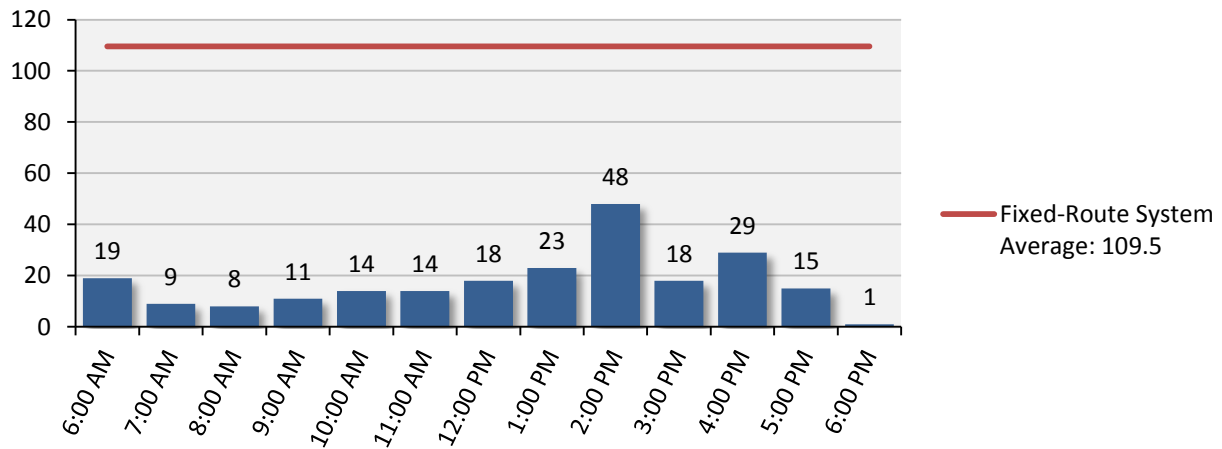
Source: AECOM, 2017

Figure 104: Saturday Boardings – Route 14W W 4th Boulevard



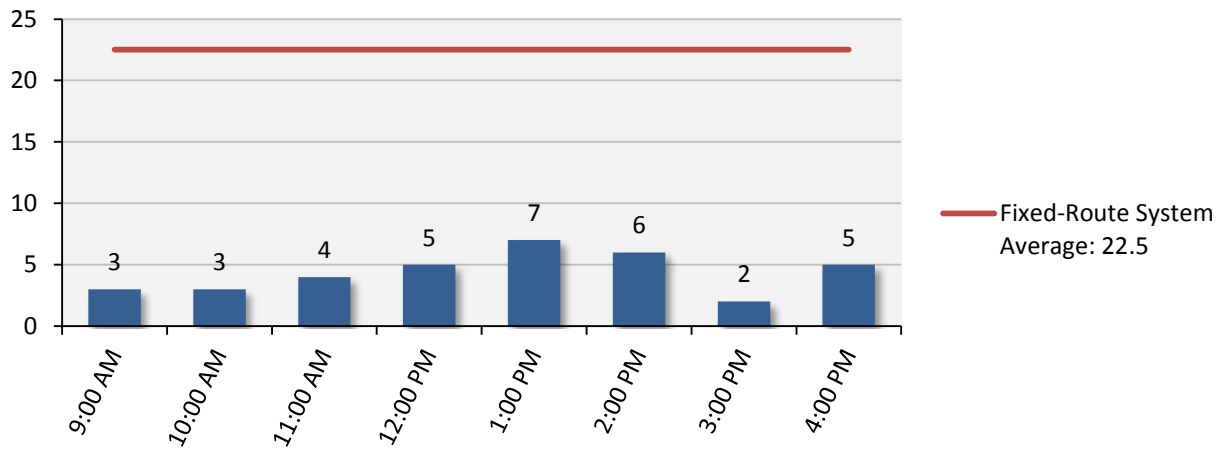
Source: AECOM, 2017

Figure 105: Weekday Boardings per Hour – Route 14W W 4th Boulevard



Source: AECOM, 2017

Figure 106: Saturday Boardings per Hour – Route 14W W 4th Boulevard



Source: AECOM, 2017

Route 15 – Park Point

Route Overview

Route 15 provides service from the downtown Transportation Center to the Park Point Recreation Center and Canal Park located on Park Point. Route 15 operates weekdays from 6:00 AM to 7:00 PM and Saturdays from 9:00 AM to 6:00 PM. On weekdays, Route 15 has a 60 minute frequency, while on Saturday Route 15 has a 120 minute frequency.

Figure 107 through **Figure 110** illustrate average weekday and Saturday passenger boardings.

- The majority of the boardings are at the Park Point Recreation Area.

Key Ridership Areas

- Downtown Duluth
- Park Point Rec Area
- Lincoln Park
- Park Point

Interlined Routes

- Route 4

At a Glance		Park Point (15)
Weekday Boardings (rank)		158 (17/17)
Weekday Revenue Hours		8.85
Saturday Boardings (rank)		39 (13/15)
Saturday Revenue Hours		3.73
AM Peak Hour (weekday boardings)		7am - 8am (15)
PM Peak Hour (weekday boardings)		4pm - 5pm (23)
AM Peak Hour (Saturday boardings)		9am - 10am (3)
PM Peak Hour (Saturday boardings)		4pm - 5pm (5)
Span of Service	Mon-Fri	6am - 7pm
	Sat	9am - 6pm
Peak Frequency (minutes)	Mon-Fri	60
	Sat	120
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	120

Figure 107: Weekday Boardings – Route 15 Park Point



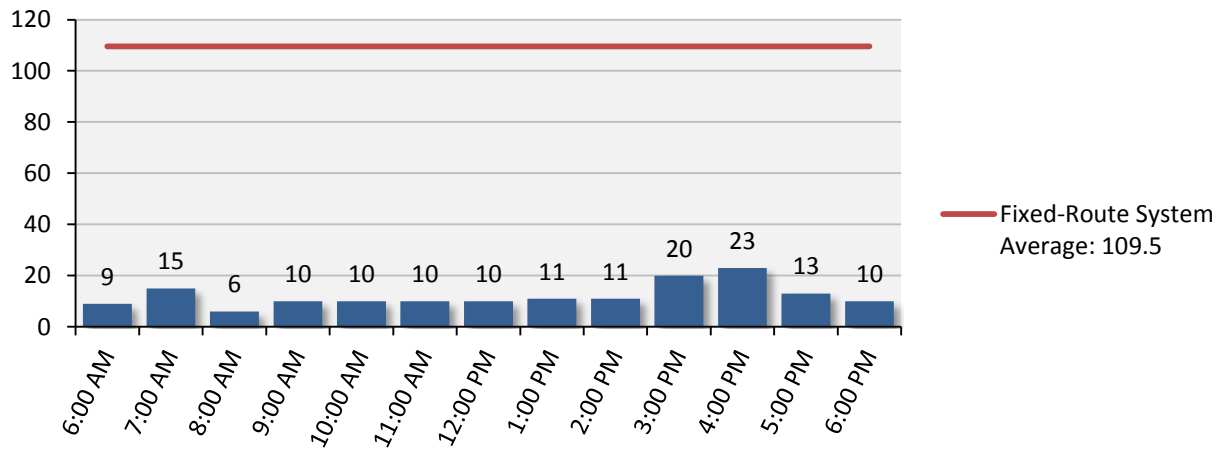
Source: AECOM, 2017

Figure 108: Saturday Boardings – Route 15 Park Point



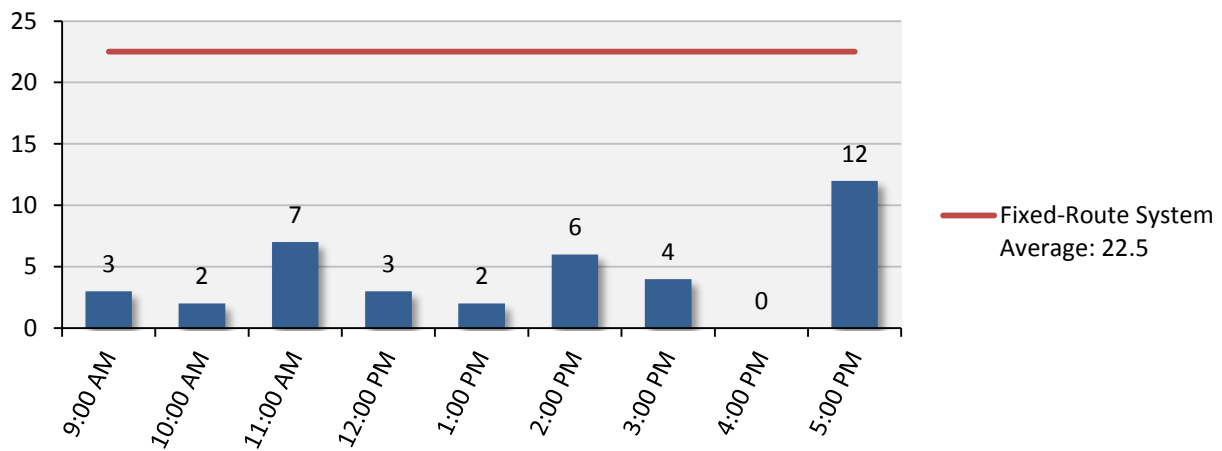
Source: AECOM, 2017

Figure 109: Weekday Boardings per Hour – Route 15 Park Point



Source: AECOM, 2017

Figure 110: Saturday Boardings per Hour – Route 15 Park Point



Source: AECOM, 2017

Route 16 – Duluth Superior

Route Overview

Route 16 begins service at the Transportation Center in downtown Duluth traveling to Superior via Garfield Street and Blatnik Bridge. As the route travels south, it provides service to downtown Superior, East End Superior and Itasca. Route 16 operates weekdays from 5:00 AM to 8:00 PM, Saturday from 6:00 AM to 7:00 PM, and Sunday from 10:00 AM to 8:00 PM. On weekday peak periods the service has a 30 minute frequency, while all other operation hours are 60 minute frequencies. **Figure 111** through **Figure 116** illustrate average weekday, Saturday, and Sunday passenger boardings.

- The highest number of boardings occurs in downtown Superior near Super One, as well as the University of Wisconsin-Superior.

Key Ridership Areas

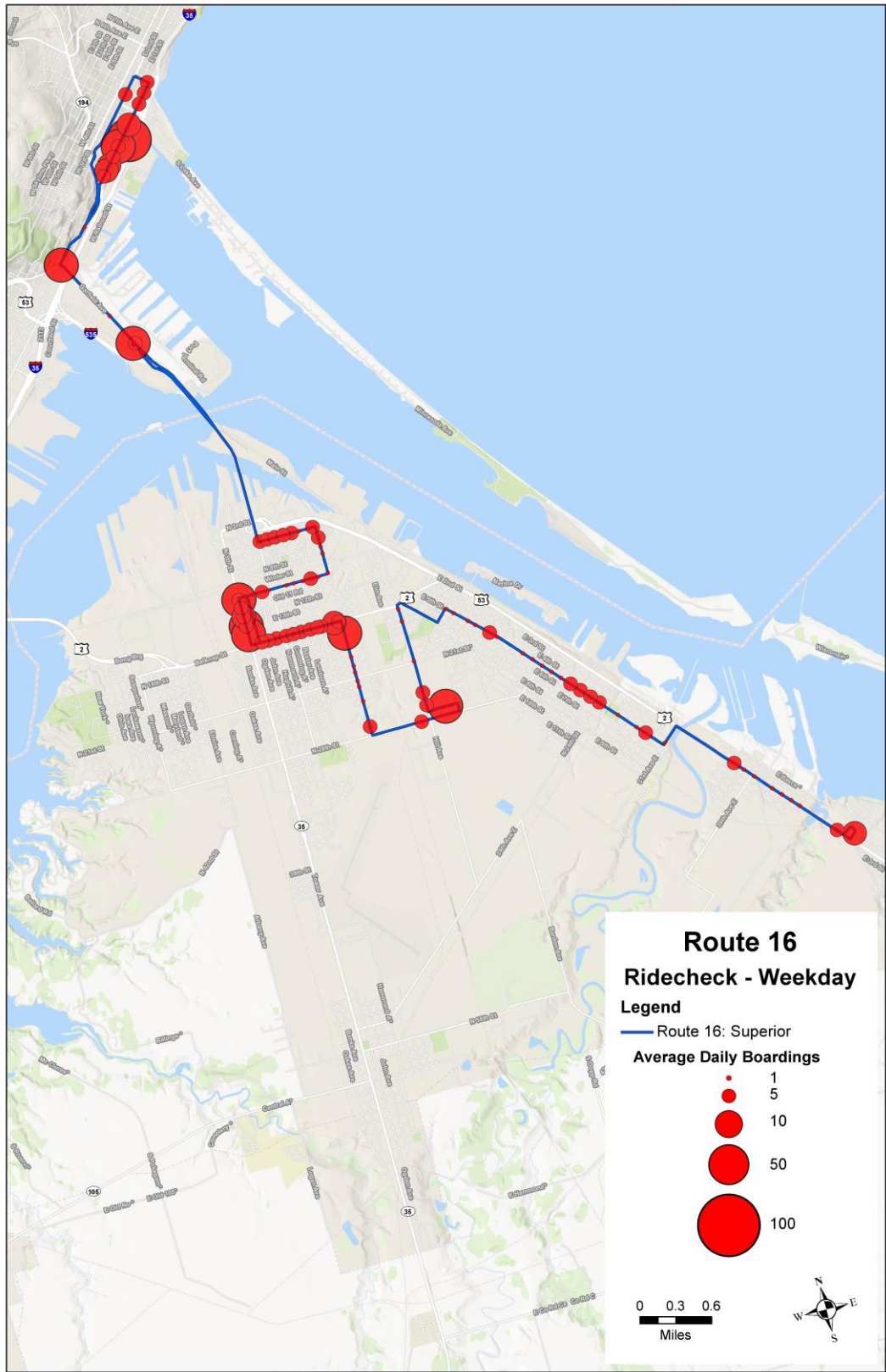
- Super One – Superior, WI
- University of Wisconsin-Superior
- East End

Interlined Routes

- Route 6
- Route 12
- Route 14W
- Downtown Trolley

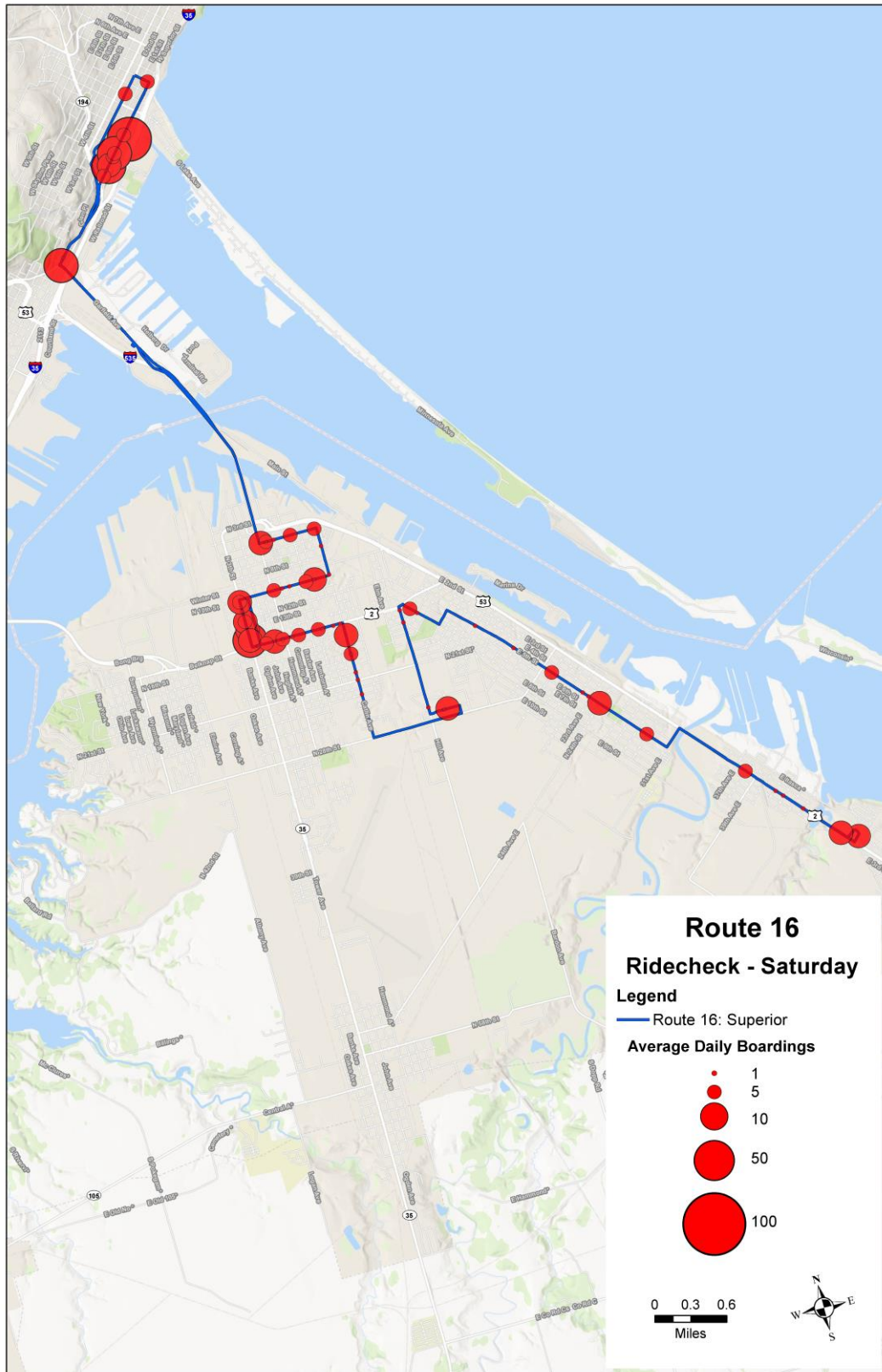
At a Glance		Duluth Superior (16)
Weekday Boardings (rank)		2,250 (5/17)
Weekday Revenue Hours		38.67
Saturday Boardings (rank)		378 (5/15)
Saturday Revenue Hours		23.27
Sunday Boardings (rank)		376 (6/12)
Sunday Revenue Hours		18.07
AM Peak Hour (weekday boardings)		7am - 8am (349)
PM Peak Hour (weekday boardings)		3pm - 4pm (289)
AM Peak Hour (Saturday boardings)		9am - 10am (35)
PM Peak Hour (Saturday boardings)		3pm - 4pm (31)
AM Peak Hour (Sunday boardings)		N/A
PM Peak Hour (Sunday boardings)		3pm - 4pm (39)
Span of Service	Mon-Fri	5am - 8pm
	Sat	6am - 7pm
	Sun	10am - 8pm
Peak Frequency (minutes)	Mon-Fri	30
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 111: Weekday Boardings – Route 16 Duluth Superior



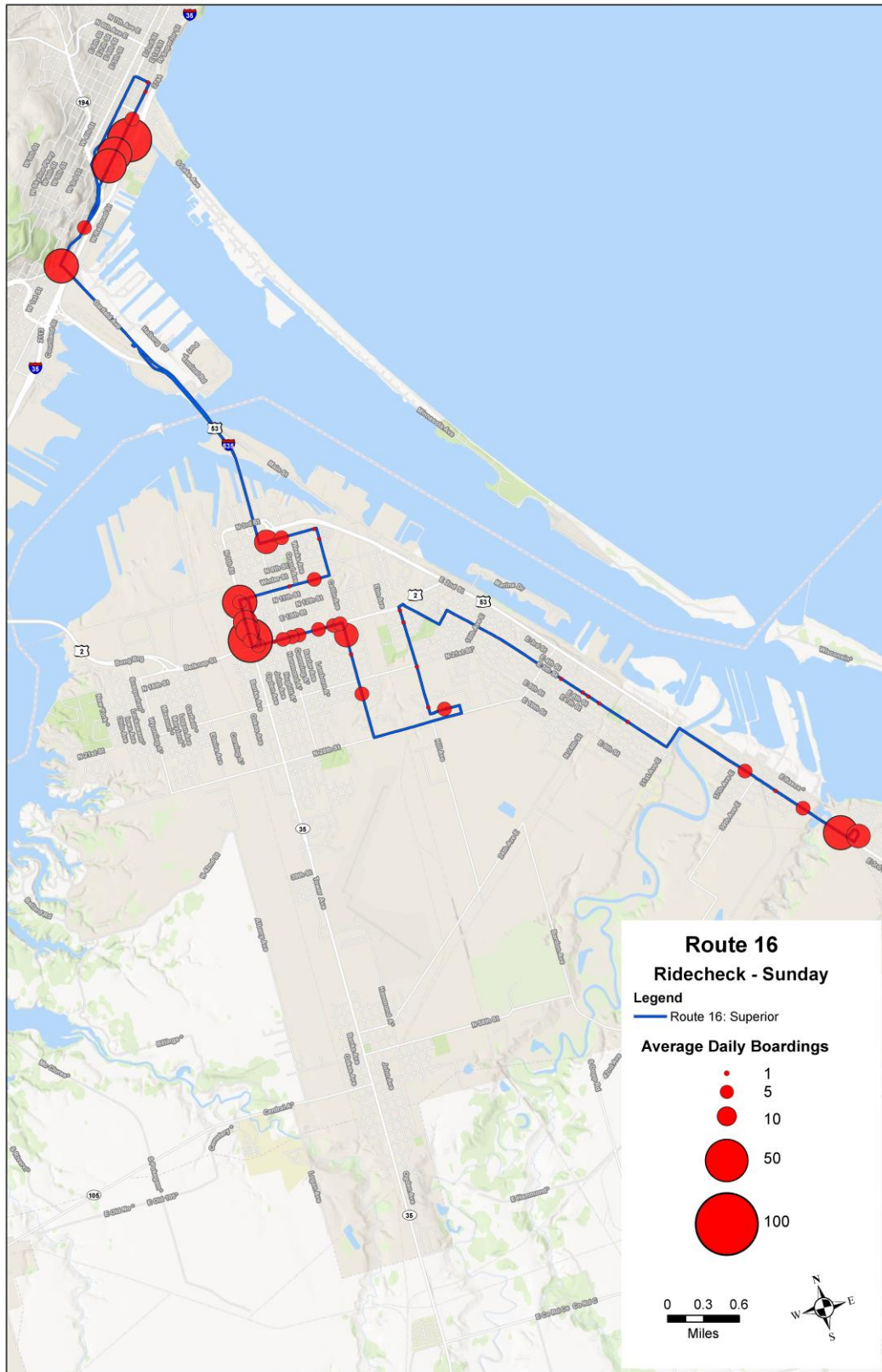
Source: AECOM, 2017

Figure 112: Saturday Boardings – Route 16 Duluth Superior



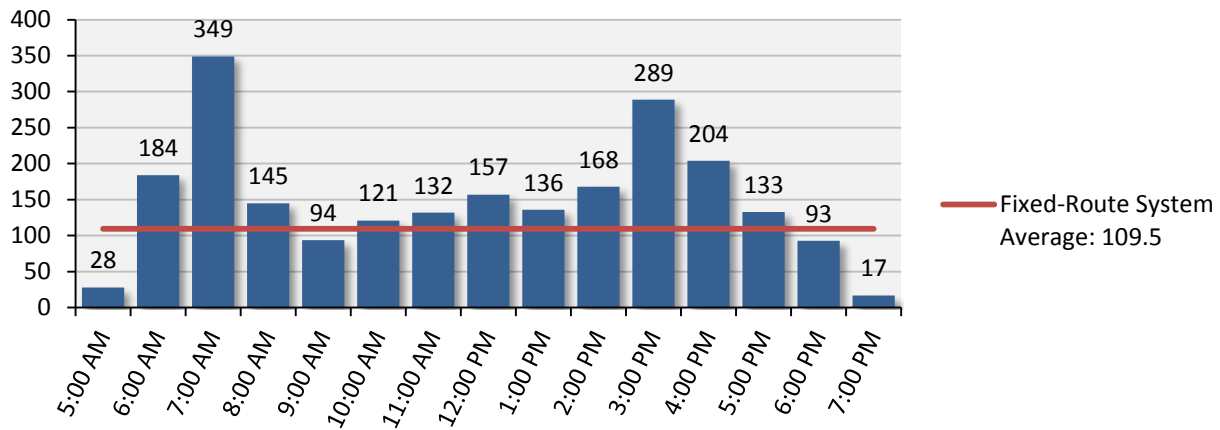
Source: AECOM, 2017

Figure 113: Sunday Boardings – Route 16 Duluth Superior



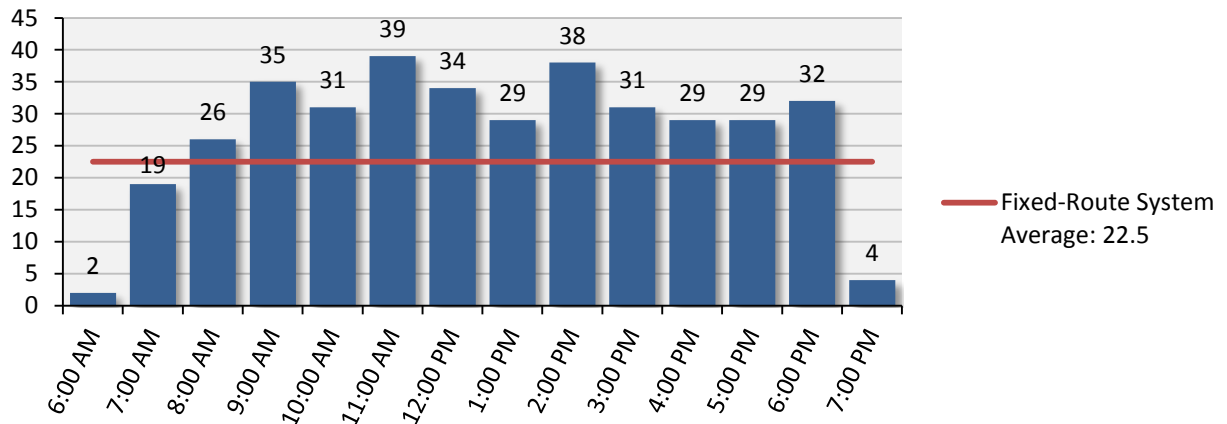
Source: AECOM, 2017

Figure 114: Weekday Boardings per Hour – Route 16 Duluth Superior



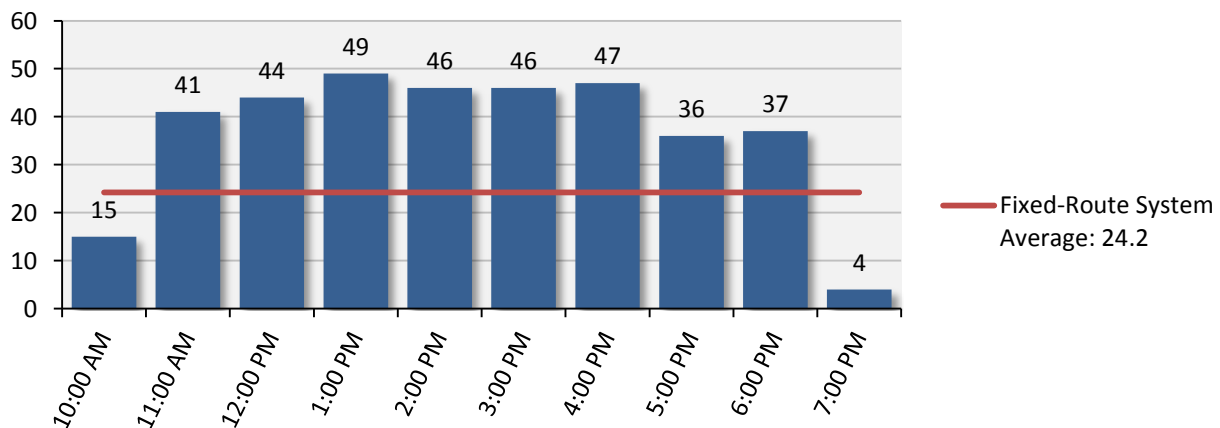
Source: AECOM, 2017

Figure 115: Saturday Boardings per Hour – Route 16 Duluth Superior



Source: AECOM, 2017

Figure 116: Sunday Boardings per Hour – Route 16 Duluth Superior



Source: AECOM, 2017

Route 16X – Superior Express

Route Overview

Route 16X only operates during afternoon peak hours on weekdays from 4:00 PM to 6:00 PM utilizing the same route pattern as Route 16. Similar to Route 16, this route serves downtown Superior, East End Superior and Itasca. **Figure 117** and **Figure 118** illustrate average weekday passenger boardings for Route 16X.

Key Ridership Areas

- Downtown Duluth
- Mariner Mall

Interlined Routes

- Route 16X does not interline with any weekday routes.

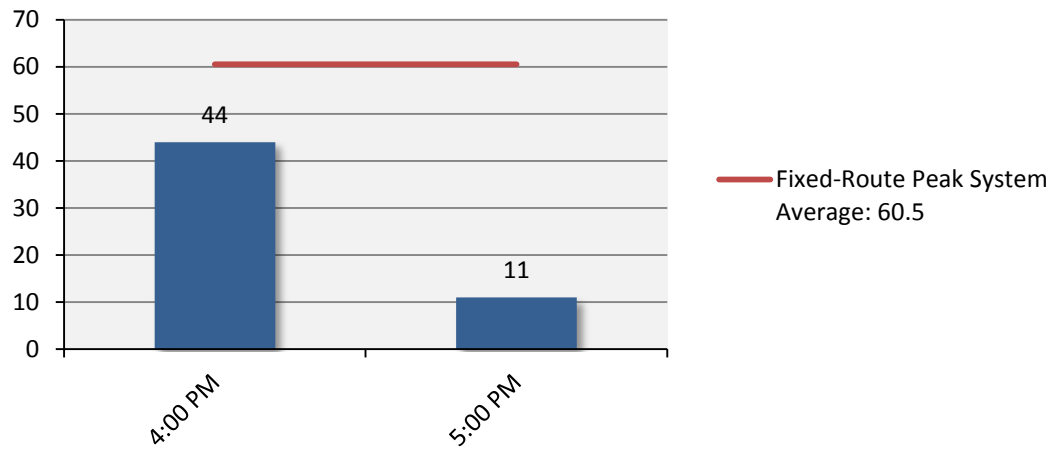
At a Glance		Superior Express (16X)
Weekday Boardings (rank)		55
Weekday Revenue Hours		50.00
AM Peak Hour (weekday boardings)		N/A
PM Peak Hour (weekday boardings)		4pm – 5pm (44)
Span of Service	Mon-Fri	4pm – 6pm
Peak Frequency (minutes)	Mon-Fri	N/A
Off-Peak Frequency (minutes)	Mon-Fri	N/A

Figure 117: Weekday Boardings – Route 16X Superior Express



Source: AECOM, 2017

Figure 118: Weekday Boardings per Hour – Route 16X Superior Express



Source: AECOM, 2017

Route 17 –Superior WI

Route Overview

Route 17 provides service between downtown Superior, Billings Park, and South Superior. As the route travels to South Superior, it serves Super One, Kmart, St. Mary's Hospital, Superior Middle School, Walmart, Menards, Aldi, and the Tri State Fairgrounds. In addition, Route 17 has a 60 minute frequency on weekdays, Saturdays, and Sundays. Route 17 operates weekdays from 5:00 AM to 7:00 AM and 9:00 AM to 5:00 PM. On weekdays, after Route 17 completes the trip at 4:05 PM at Tower Avenue and 14th Street, Route 17S maintains the same route pattern between Downtown Superior and South Superior from 4:15 PM to 7:00 PM by utilizing Tower Avenue. However, Route 17S does not provide access to Iowa Street or New York Street and Wal-Mart is accessible only off Tower Avenue. On Saturday Route 17 operates from 8:00 AM to 8:00 PM and on Sunday from 10:00 AM to 7:00 PM. **Figure 119** through **Figure 124** illustrate average weekday, Saturday, and Sunday passenger boardings.

- Majority of the boardings occur near Royalton Manor in Billings Park, downtown Superior, and near Mendards and Wal-Mart.

Key Ridership Areas

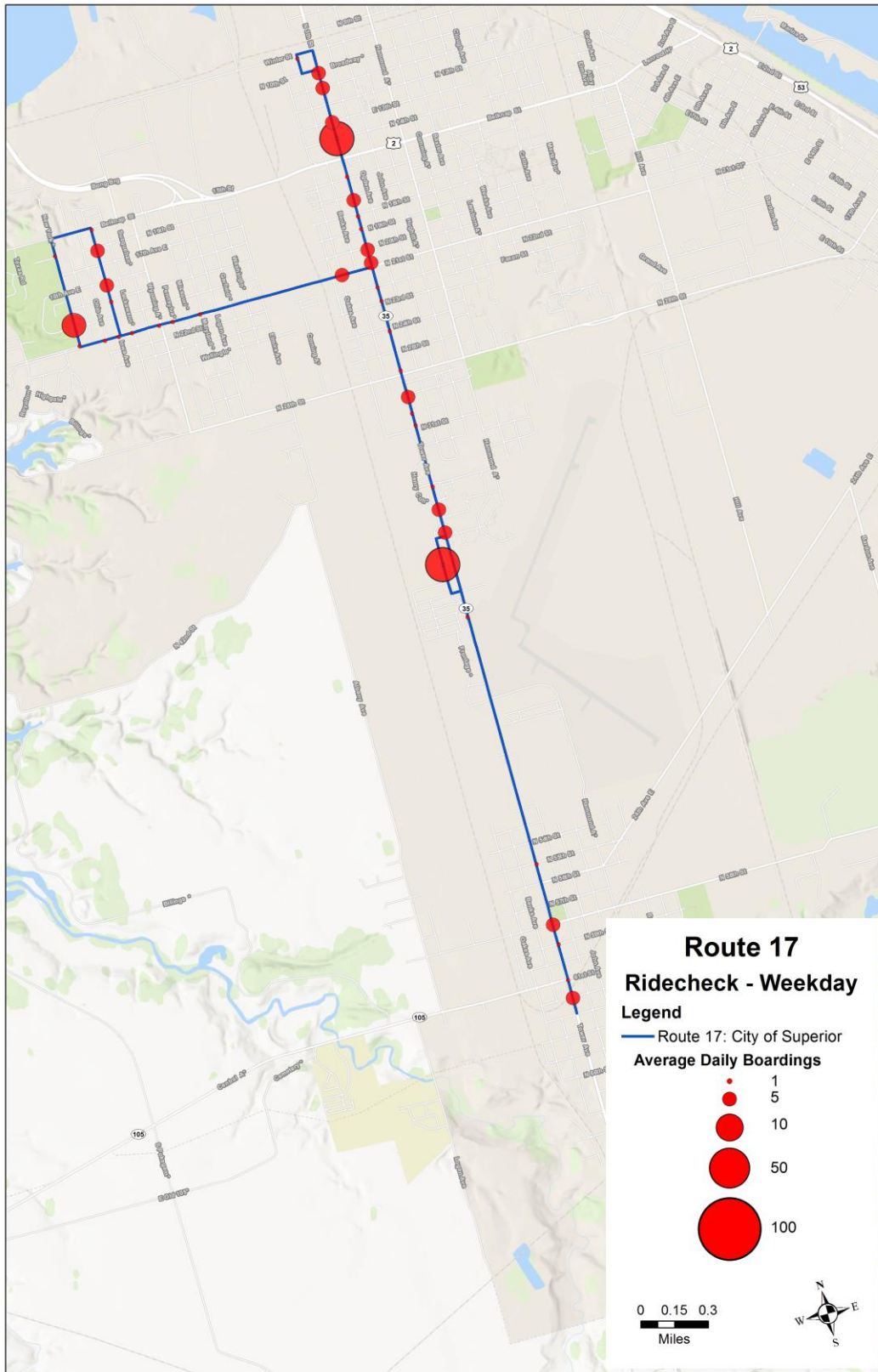
- Downtown Superior
- Royalton Manor
- Menards
- Wal-Mart

Interlined Routes

- Downtown Trolley

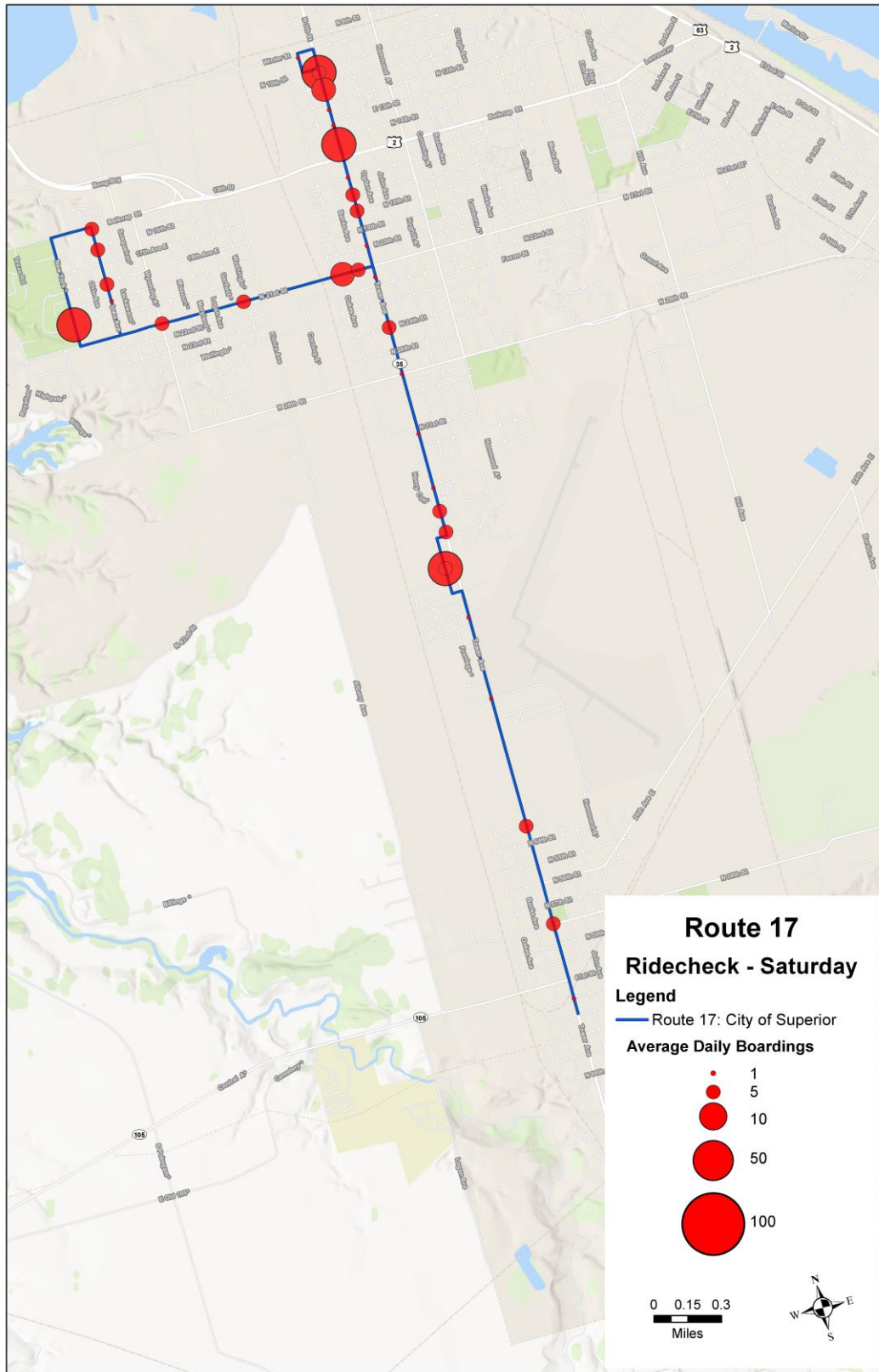
At a Glance		Superior WI (17)
Weekday Boardings (rank)		404 (15/17)
Weekday Revenue Hours		8.17
Saturday Boardings (rank)		174 (11/15)
Saturday Revenue Hours		11.70
Sunday Boardings (rank)		99 (10/12)
Sunday Revenue Hours		7.33
AM Peak Hour (weekday boardings)		9am - 10am (36)
PM Peak Hour (weekday boardings)		3pm - 4pm (66)
AM Peak Hour (Saturday boardings)		9am - 10am (17)
PM Peak Hour (Saturday boardings)		4pm - 5pm (22)
AM Peak Hour (Sunday boardings)		N/A
PM Peak Hour (Sunday boardings)		3pm - 4pm (22)
Span of Service	Mon-Fri	5am - 7am 9am - 5pm
	Sat	8am - 8pm
	Sun	10am - 7pm
Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sat	60
	Sun	60

Figure 119: Weekday Boardings – Route 17 Superior WI



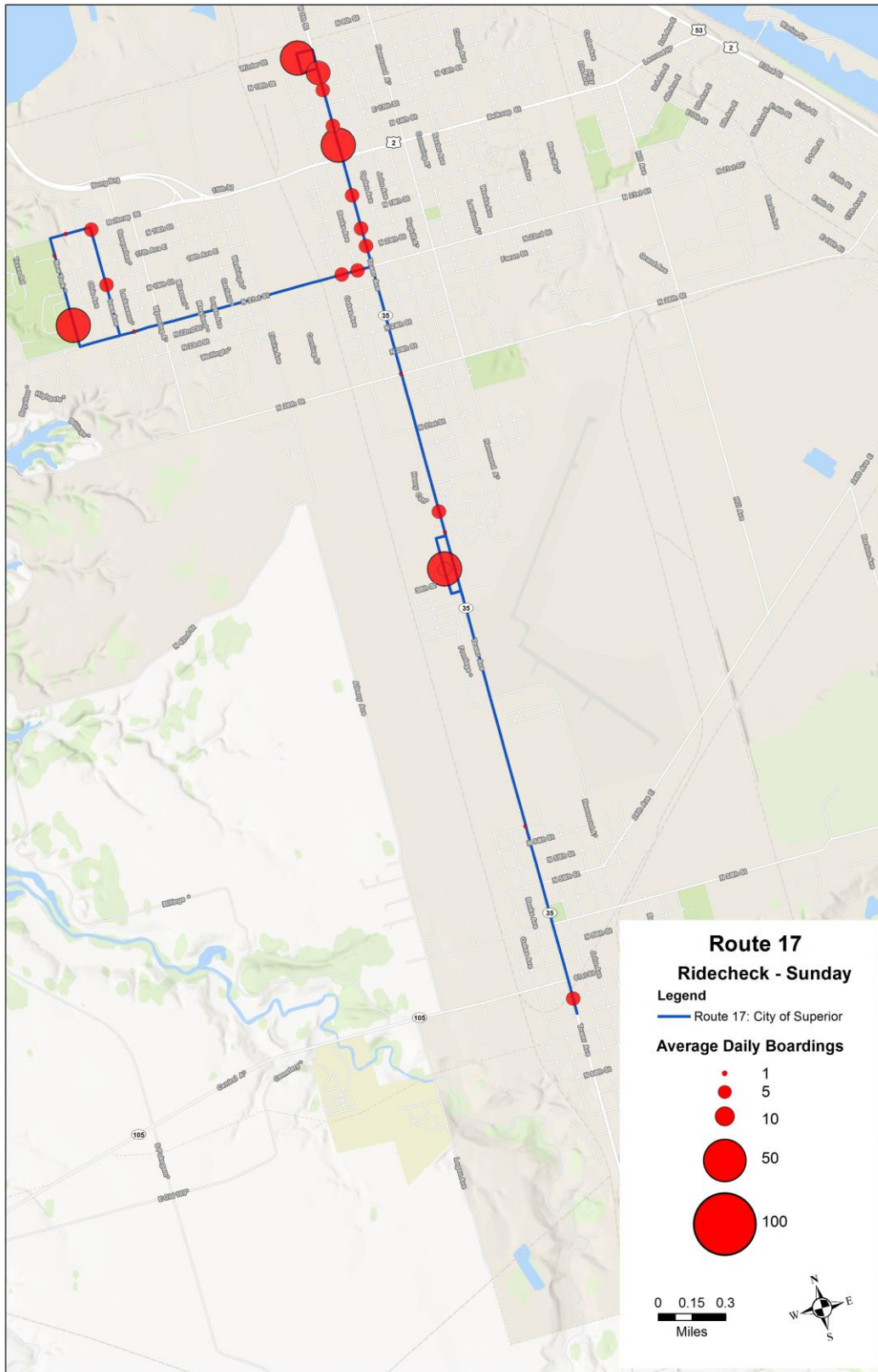
Source: AECOM, 2017

Figure 120: Saturday Boardings – Route 17 Superior WI



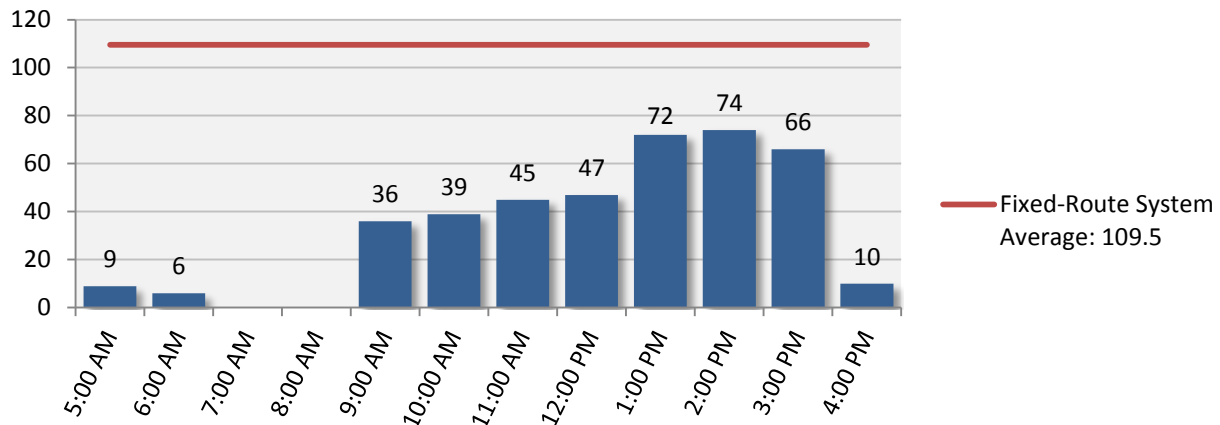
Source: AECOM, 2017

Figure 121: Sunday Boardings – Route 17 Superior WI



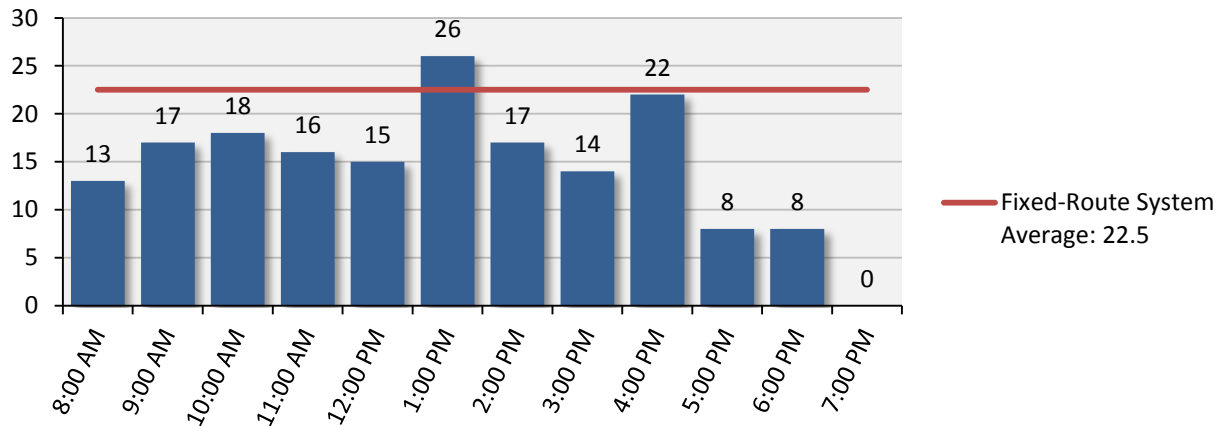
Source: AECOM, 2017

Figure 122: Weekday Boardings per Hour – Route 17 Superior WI



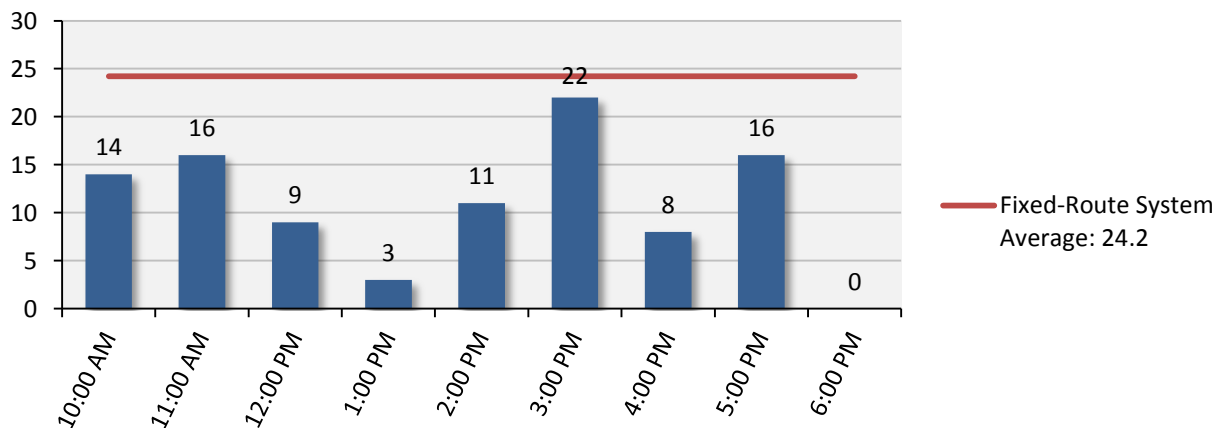
Source: AECOM, 2017

Figure 123: Saturday Boardings per Hour – Route 17 Superior WI



Source: AECOM, 2017

Figure 124: Sunday Boardings per Hour – Route 17 Superior WI



Source: AECOM, 2017

Route 17B – Superior WI Billings Park

Route Overview

Route 17B operates on weekdays from 6:00 AM to 9:00 AM and 4:00 PM to 7:00 PM. In addition, Route 17B operates service between downtown Superior and Billings Park via Tower Avenue and 21st Street. **Figure 125** and **Figure 126** illustrate average weekday passenger boardings.

- The highest number of boardings occurs in downtown Duluth and near Royalton Manor.
- The greatest number of boardings occurs from 7:00 AM to 8:00 AM on weekdays.

Key Ridership Areas

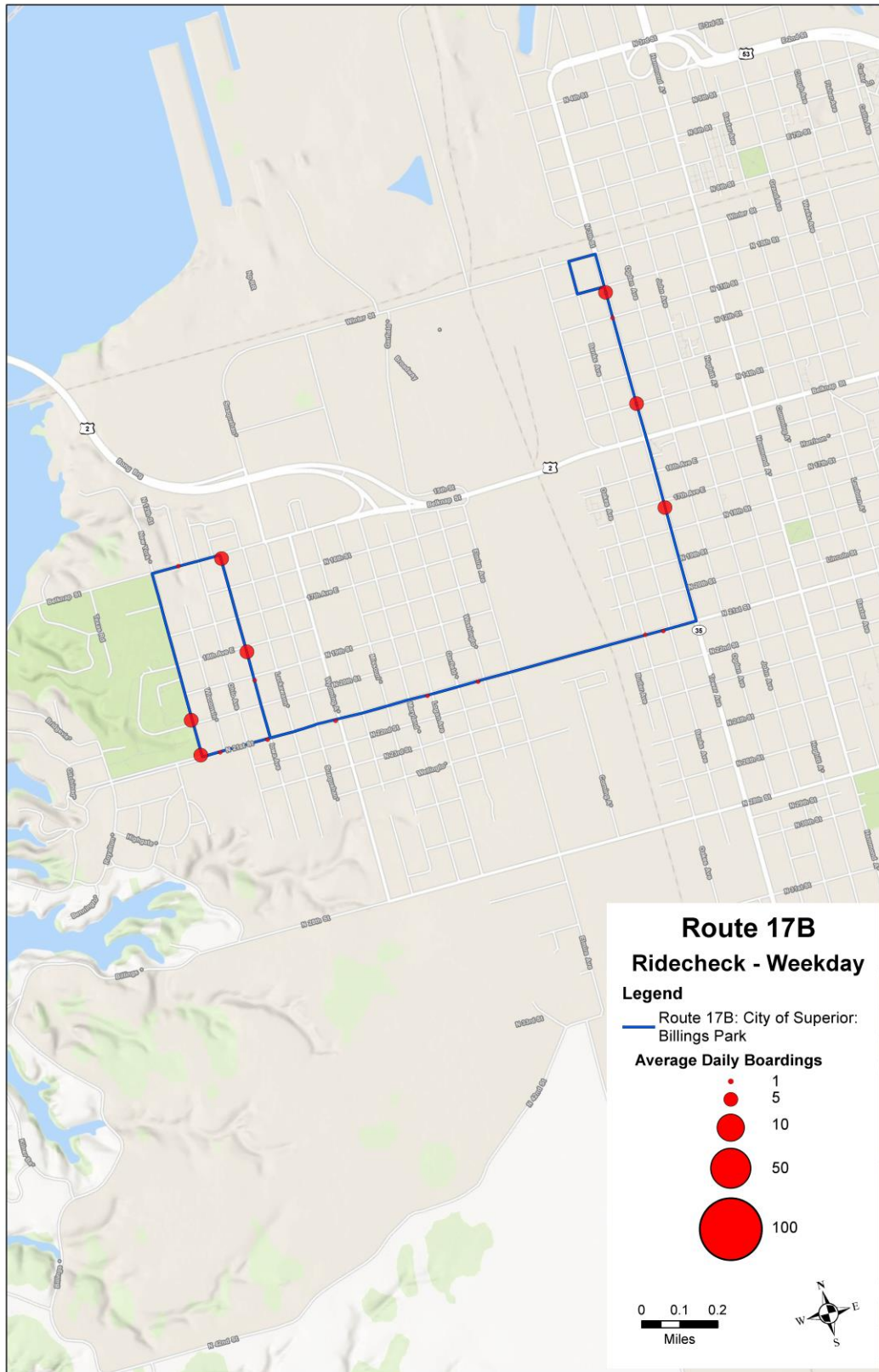
- Downtown Superior
- Royalton Manor

Interlined Routes

- Downtown Trolley

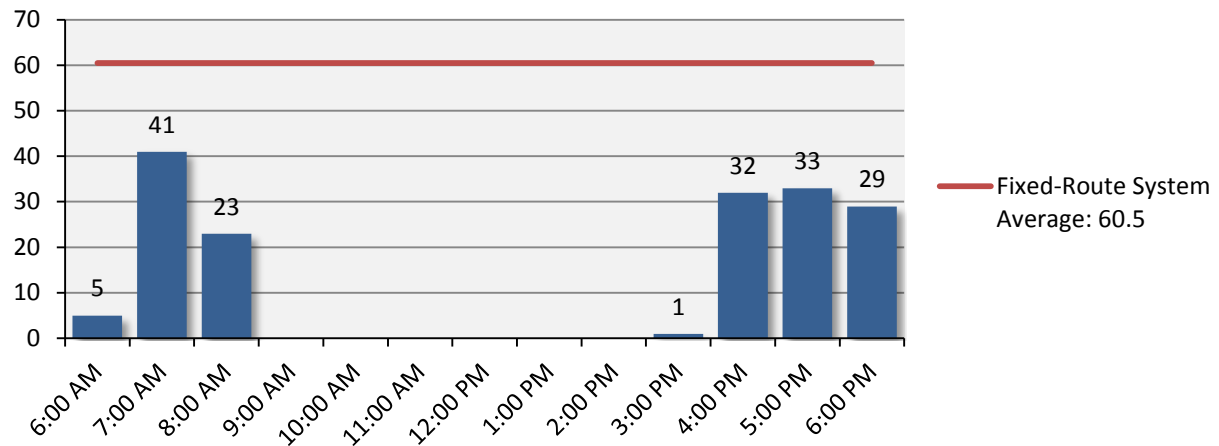
At a Glance		Superior WI Billings Park (17B)
Weekday Boardings (rank)		103
Weekday Revenue Hours		5.35
AM Peak Hour (weekday boardings)		7am – 8am (23)
PM Peak Hour (weekday boardings)		5pm – 6pm (24)
Span of Service	Mon-Fri	6am – 9am 4pm – 7pm
Peak Frequency (minutes)	Mon-Fri	25
Off-Peak Frequency (minutes)	Mon-Fri	30

Figure 125: Weekday Boardings – Route 17B Superior WI Billings Park



Source: AECOM, 2017

Figure 126: Weekday Boardings – Route 17B Superior WI Billings Park



Source: AECOM, 2017

Route 17S – Superior WI South Superior

Route Overview

Route 17S provides transit between downtown Superior and South Superior on weekdays and Sunday. On weekdays, Route 17S operates from 6:00 AM to 9:00 AM and 3:00 PM to 7:00 PM, and on Sundays from 1:00 PM to 3:00 PM. The route serves the same major destinations as Route 17 but does not provide service to Billings Park. On weekdays the route maintains a 60 minute frequency during peak periods and off-peak periods, while on Sunday the route maintains a 55 minute frequency on peak periods and off-peak periods. **Figure 127** through **Figure 130** illustrate average weekday and Saturday passenger boardings for Route 17S.

- Most of the boardings occur in downtown Superior, as well as near Wal-Mart and Superior Middle School.

Key Ridership Areas

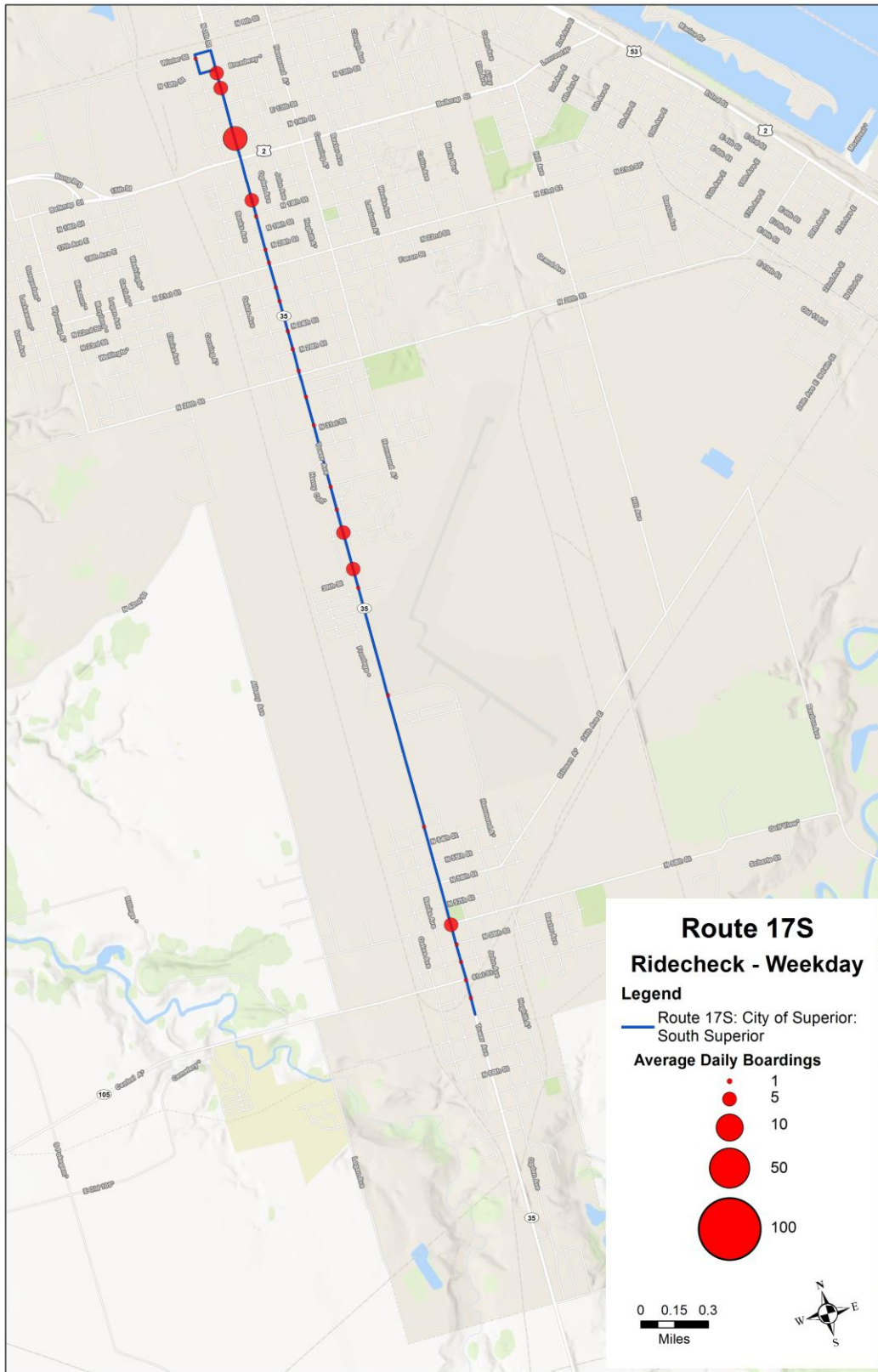
- Wal-Mart
- Downtown Superior
- South Superior
- Superior Middle School

Interlined Routes

- Downtown Trolley

At a Glance		Superior WI South Superior (17S)
Weekday Boardings (rank)		164
Weekday Revenue Hours		5.15
Sunday Boardings (rank)		13
Sunday Revenue Hours		1.00
AM Peak Hour (weekday boardings)		7am - 8am (15)
PM Peak Hour (weekday boardings)		5pm - 6pm (23)
AM Peak Hour (Sunday boardings)		N/A
PM Peak Hour (Sunday boardings)		N/A
Span of Service	Mon-Fri	6am - 9am 3pm - 7pm
	Sun	1pm - 3pm
Peak Frequency (minutes)	Mon-Fri	60
	Sun	55
Off-Peak Frequency (minutes)	Mon-Fri	60
	Sun	55

Figure 127: Weekday Boardings – Route 17S Superior WI South Superior



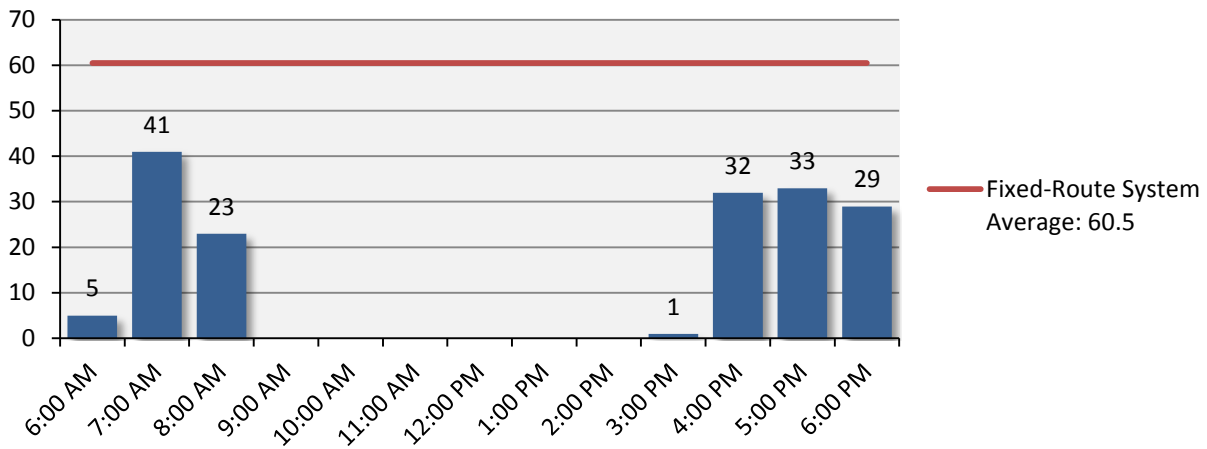
Source: AECOM, 2017

Figure 128: Sunday Boardings – Route 17S Superior WI South Superior



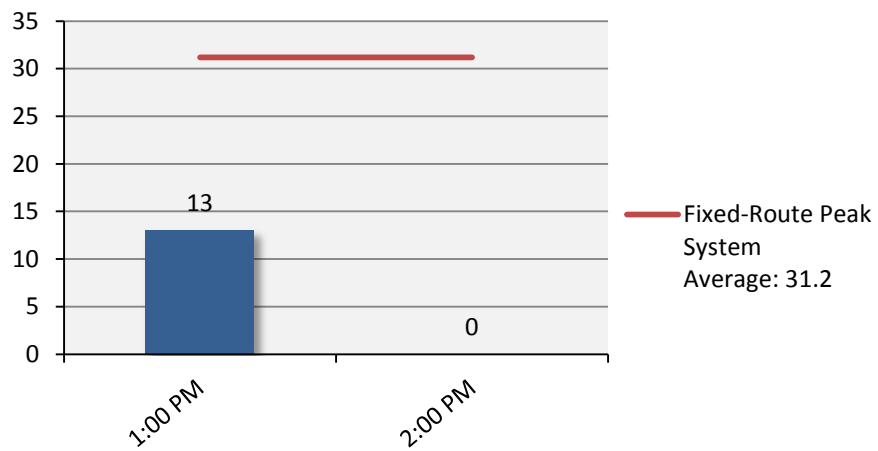
Source: AECOM, 2017

Figure 129: Weekday Boardings per Hour – Route 17S Superior WI South Superior



Source: AECOM, 2017

Figure 130: Sunday Boardings per Hour – Route 17S Superior WI South Superior



Source: AECOM, 2017

Route 18 – UMB Boulder Ridge CPH

Route Overview

Route 18 provides weekday service from 7:00 AM to 11:00 PM with 60 minute frequency during peak periods off-peak periods. Route 18 operates service from the Kirby Transit Center, located on the University of Minnesota-Duluth campus, to Central Entrance and Pecan. On the return trip, Route 18 provides service to Highland Village, Marshall School, Boulder Ridge, Boulder Summit, Campus Park, Kenwood Shopping Center, and the College of Saint Scholastica. **Figure 131** and **Figure 132** illustrate average weekday passenger boardings for Route 18.

- The highest number of boardings are concentrated primarily near the University of Minnesota-Duluth and College of Saint Scholastica.
- Other high ridership areas are located near the offices off Rice Lake Road.
- The greatest number of weekday boardings occurs from 3:00 PM to 4:00 PM.

At a Glance		UMB Boulder Ridge CPH (18)
Weekday Boardings (rank)		768 (12/17)
Weekday Revenue Hours		15.85
AM Peak Hour (weekday boardings)		7am – 8am (64)
PM Peak Hour (weekday boardings)		3pm – 4pm (72)
Span of Service	Mon- Fri	7am – 11pm
Peak Frequency (minutes)	Mon- Fri	60
Off-Peak Frequency (minutes)	Mon- Fri	60

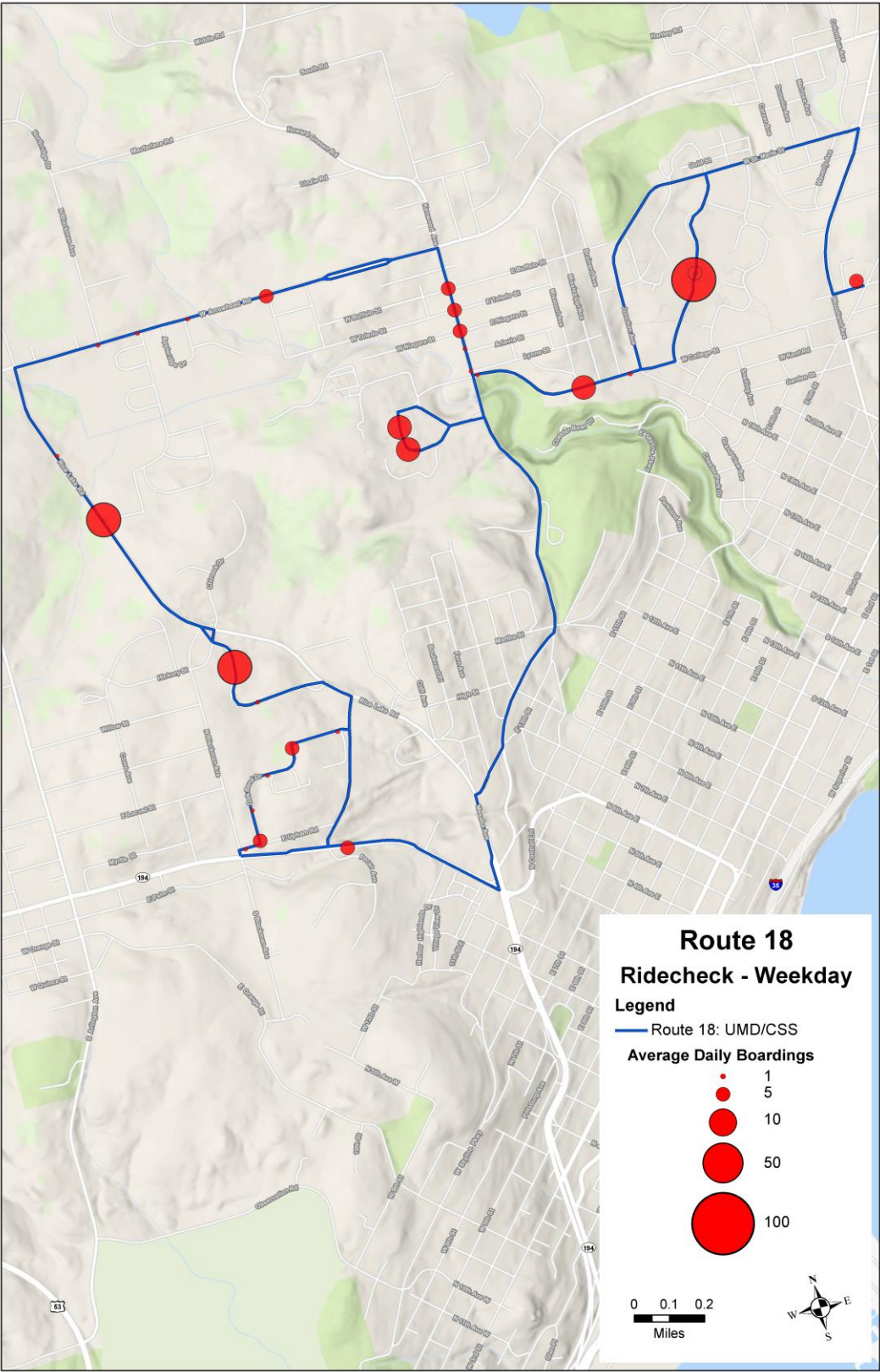
Key Ridership Areas

- University of Minnesota-Duluth
- College of Saint Scholastica
- Offices near east Duluth Heights
- Residence near Marshall School

Interlined Routes

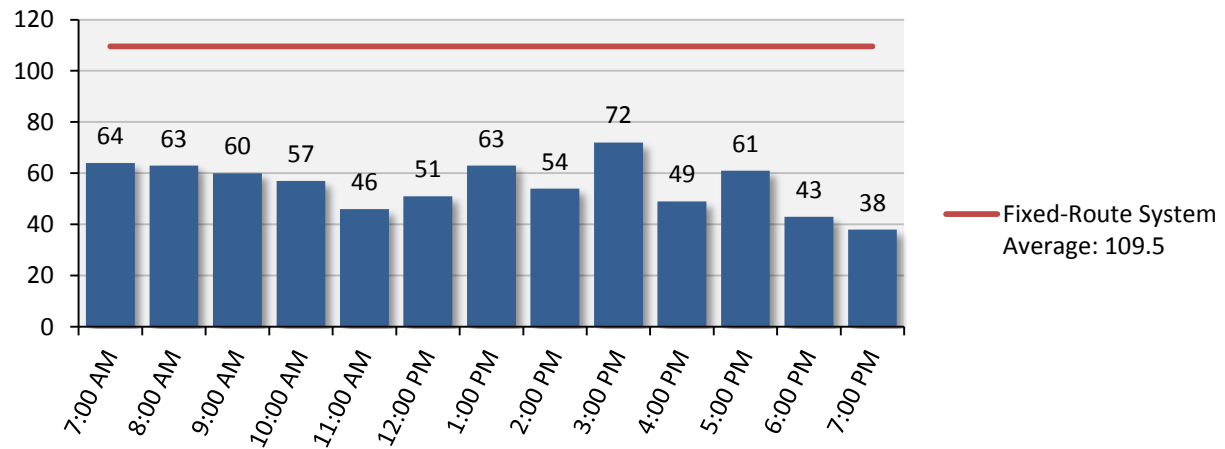
- Route 18 does not interline with any weekday routes.

Figure 131: Weekday Boardings – Route 18 UMB Boulder Ridge CPH



Source: AECOM, 2017

Figure 132: Weekday Boardings per Hour – Route 18 UMB Boulder Ridge CPH



Source: AECOM, 2017

Route 21 – Grocery Express

Route Overview

Route 21 operates north and south via Superior Street and 3rd Street/Grand Avenue. Route 21 operates on Saturdays from 10:00 AM to 2:00 PM providing service from the Transportation Center in downtown Duluth to Super One located at Central Avenue and Bristol Street. In addition, Route 21 operates 70 minute frequencies on Saturdays during peak periods and off-peak periods. **Figure 133** and **Figure 134** illustrate average passenger boardings for Saturday.

- The highest number of boardings occurs around 11:00 AM to 12:00 PM on Saturday.

Key Ridership Areas

- Super One

Interlined Routes

- Route 21 does not interline with any Saturday routes.

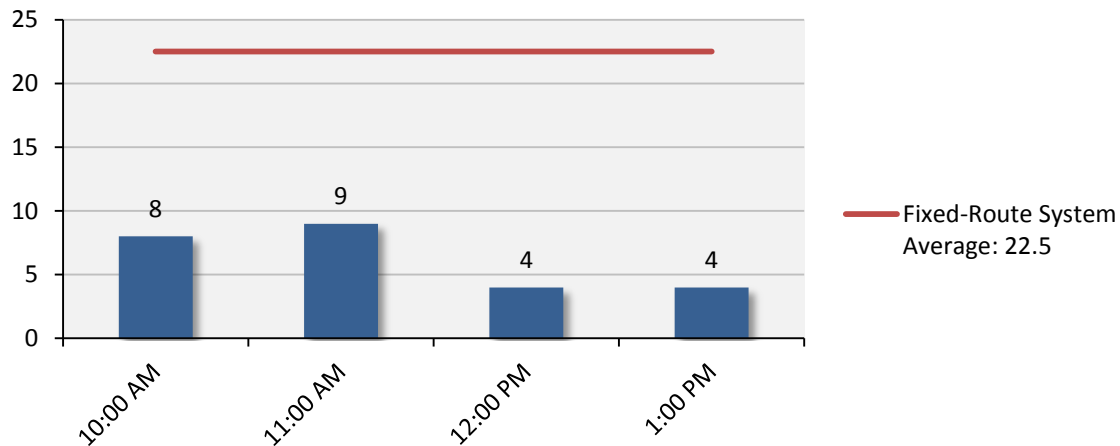
At a Glance		Grocery Express (21)
Saturday Boardings (rank)		25 (15/15)
Saturday Revenue Hours		3.65
AM Peak Hour (Saturday boardings)		N/A
PM Peak Hour (Saturday boardings)		N/A
Span of Service	Sat	10am – 2pm
Peak Frequency (minutes)	Sat	70
Off-Peak Frequency (minutes)	Sat	70

Figure 133: Saturday Boardings – Route 21 Grocery Express



Source: AECOM, 2017

Figure 134: Saturday Boardings per Hour – Route 21 Grocery Express



Source: AECOM, 2017

Demand Response Analysis

Overview of Service

Demand response transit services are delivered by STRIDE, an independent contractor who supplies schedulers and vehicle operators. STRIDE is owned by DTA and operated by Transit Special Service Incorporated. STRIDE services are available to residents within the city limits of Duluth and Proctor, as well as clients located $\frac{3}{4}$ of a mile from DTA's regular fixed routes in the City of Superior. STRIDE is a demand response transit service operating in accordance with the Americans with Disabilities Act (ADA) for qualified individuals. The service operates weekdays and weekends with a large span of service, as shown in **Table 11**.

Table 11: STRIDE Service Hours

Location	Weekdays	Saturday	Sunday
Duluth	4:25am – 1:20am	6:20am – 12:00am	7:35am – 10:20pm
Superior	5:50am – 7:08pm	6:44am – 7:08pm	10:44am – 7:01pm

Source: DTA, 2017.

Individuals with a disability, or temporary disability, that prevents them from boarding, alighting, or riding on a DTA bus may qualify for STRIDE service. For qualification, an ADA Eligibility Application, completed by a physician, must be given STRIDE for review. Once eligible, riders must contact the STRIDE office between 7:30 AM and 4:00 PM to reserve a trip. Trips may be scheduled up to seven days in advance and same day trips are provided based on availability. A limited number of passengers may qualify for subscription trips provided their schedule is routine.

All trips must start and end within the City of Duluth or within $\frac{3}{4}$ mile of a bus route in the City of Superior. Individuals may still be eligible for STRIDE if they live outside of these boundaries, but

they are responsible for getting within the service area. Trip destinations cannot be altered once the trip has been reserved. Trips must be cancelled by passengers two hours in advance of the reserved pick-up time.

STRIDE's fare is \$1.50 during off-peak hours and \$3.00 during peak hours. Peak hour periods are 7:00 AM to 9:00 AM and 2:30 PM to 6:00 PM on weekdays. All other hours are considered off-peak. Booklets of ten tickets are available for purchase from STRIDE drivers. Additionally, eligible STRIDE riders may be accompanied by up to three companion riders who must pay a fare. Companions do not have to be certified for STRIDE, but the scheduler must be informed of any companions when reserving trips. Personal Care Attendants (PCA) ride for free.

DTA owns nine STRIDE vehicles, of which six are designated as large and three vehicles are classified as small. The large vehicles can carry up to eight passengers and three wheelchairs, and the small vehicle can carry two passengers and one wheelchair. During weekdays STRIDE will operate with seven vehicles in service, leaving two buses in reserve with a goal of one spare vehicle. On weekends, the service will operate two vehicles. Transit Special Services, Inc. has three staff members that work as schedulers and dispatchers on eight-hour shifts.

Reservations, Scheduling, and Dispatching

Three Transit Special Services employees manage the reservations, scheduling, and dispatching. Staff takes reservations during weekdays between 7:30 AM and 8:00 PM; however, staff leaves for the day at 4:00 PM. DTA staff will answer phones when they are available, otherwise requests go unanswered or messages are left. The service operates with seven vehicles during the weekdays and two vehicles during the weekend. On weekdays, the goal is to keep one spare vehicle as a reserve; however, all vehicles have been used when the schedule is tight leaving no reserve vehicles. There is one ADA taxi in the City of Duluth, but there is no current contract in place to procure services during periods of overflow demand.

Regulations require STRIDE to provide no more than 50 percent subscription rides, leaving call-in riders at least 50 percent of available rides. One bus is provided to the City of Superior and transfers are not required when entering Duluth.

Reporting and Complaints

STRIDE vehicle operators self-report incidents regarding no-shows, cancellations, comments from passengers, and disruptive or disorderly behavior from passengers. Operators also notify dispatch of incidents to report. Complaints are logged by STRIDE staff and operators.

Only one formal complaint was returned from STRIDE's reporting system, which is a very low number of complaints for the number of total trips provided. The complaint reported a driver running through a stop sign. The operator was advised of the incident and reminded to use caution at all times. According to staff, complaints are only filed if a name and phone number is left on the complaint.

Service Analysis

The following section provides a detailed summary of one-month of data collected from October 2016. **Table 12** describes trip summaries which include the number of passengers, attendants, total trips, and passengers per trip.

In 31 days of service, STRIDE completed over 2,500 trips with an average trip length of 35 minutes and average trip distance of over 6 miles. Data shows very few attendants are required by eligible riders, and very few trips include more than one passenger. However, even though it may seem like STRIDE trips are not efficiently scheduled, there are a number of different circumstances that prohibit passenger trips from being combined. For instance, Duluth's major population centers are spread out along a 26-mile central corridor that makes up the bulk of Duluth's population, along with a secondary major corridor to the Miller Hill Mall area. STRIDE also serves Proctor, which is approximately a twenty-minute drive west of downtown. In addition, the area's topography limits access points between the western end of Duluth and Proctor, which limits the potential to combine passengers from both points of origination traveling at similar times. Trips originating in Gary or New Duluth cannot be easily combined with trips originating from Proctor, due to the travel distance.

Conversely, paratransit requests from the east end of town also have extended travel time to the Miller Hill Mall corridor, and travel time from Lakeside to the opposite end of Duluth or to Proctor can take almost an hour.

Construction also complicates scheduling. During summer months, prolonged traffic delays cause problems throughout the City, further complicating the schedule and on-time performance.

Table 12: October STRIDE Trip Summary, October 2016

Indicator	Outcome
Clients	2,664 passengers
	99.37%
Attendants (PCAs)	15 passengers
	0.56%
Others	2 passengers
	0.07%
Ambulatory	
Total trips	2,557
Passengers per trip	1.04
Average trip length	35.3 minutes
Average trip distance	6.67 miles

Source: DTA, February 2017.

Table 13 provides a summary of reservation data. Over 3,000 reservations were requested in October 2016. Of these requests, 15 percent cancelled, 0.5 percent were no shows, and 0.7 percent were unscheduled. The majority of cancellations were completed following the correct procedures; however, 11 percent of those who cancel did not provide sufficient notice to STRIDE staff.

Table 13: October STRIDE Reservations Summary, October 2016

Indicator	Outcome
Total Requested	3,048
Unscheduled	20 (0.66%)
No Shows	16 (0.56%)
Total Cancellations	454 (14.9%)
Cancellation in advance	401
Late cancellations	37
Same Day	16
Cancellations at the door (No Show)	1

Source: DTA, February 2017.

On-time performance for STRIDE service is over 90 percent, as shown in **Table 14**. There are no major differences between weekday and weekend services. Sunday has the highest percentage of on-time performance.

Table 14: October STRIDE On-Time Performance Summary, October 2016

Indicator	Total	Weekday	Saturday
Trips	2,574	2,279	168
Early	942	839	63
Late	225	201	15
% On-Time	91.3%	91.2%	91.1%

Source: DTA, February 2017.

Performance and Service Standards

This section presents a description of DTA Board of Director approved goals, objectives, and performance measures and evaluates the performance of DTA operations. The goals, objectives, and performance measures were approved in 2010. This evaluation was conducted using the most recent five-years of data (2011-2015) available from the National Transit Database (NTD). The range of date provides a five-year summary of what has happened after the goals, objectives, and performances were approved. As a part of the overall performance review of the system, this analysis will help assess the extent to which DTA service is meeting its goals and objectives.

DTA Goals, Objectives, and Performance Measures

The following goals, objectives, and performance measures were approved by the DTA Board of Directors in 2010. The goals and objectives (see **Table 15** through **Table 18**) are integral to any transportation plan and network because they provide policy direction to achieve the agency and community's vision.

The Mission of the DTA shall be to provide public transit service that is safe, convenient, efficient, and affordable. The following goals and objectives set standards towards accomplishing this mission:

Table 15: Goal 1: Increase transit use in the Duluth area by providing high quality transit service.

	Objective	Standard
1.1	Customer Satisfaction: The DTA will improve customer satisfaction each year and will strive to minimize unsatisfied customers by monitoring customer complaints and offering corrective action when possible/appropriate.	• 75 percent of on-board survey respondents satisfied with service (survey fielded every two years). • Investigating and classifying the customer dissatisfaction complaints on a semi-annual basis.
1.2	Fixed Route Headways: The DTA will determine headways based on time of day, passenger loads and service area characteristics (such as population density, job density, income and auto ownership).	• Peak hours and/or transit supportive areas: Not more than 30 minutes. • Peak hours (mainline and University of Minnesota at Duluth (UMD) Routes): 15 minutes. • Off-peak hours and/or non-transit supportive areas: Not more than 60 minutes.
1.3	Transit Service Availability: The DTA will maximize transit service availability (based on demand) to congregate housing units with high concentrations of senior, low income and disabled populations.	• Provide access to major employers, higher education institutions, and other major destinations. • Assure equitable delivery of transit services to population sections traditionally underserved such as people with disabilities, low income population and population with limited English proficiency.
1.4	Passenger Loading: The DTA will adopt maximum loading standards based on operating costs, revenues produced, passenger comfort and quality of service for different types of operations.	Maximum load: • System-wide: 150 percent. • Peak hours and/or transit supportive areas: 105 percent (DTA will adhere to this standard in 95 percent of all scheduled trips). • Off-peak hours and/or non-transit supportive areas: 85 percent (DTA will adhere to this standard in 95 percent of all scheduled trips). • Freeway operation: 100 percent.
1.5	Service Expansion: The DTA will evaluate opportunities of service expansion based on regional community and municipality support (financial and/or marketing) and current and future growth of the area.	• Provide service when the municipality, area business or institution served provides the local share of the operating subsidy for the service and guarantees the fare-box revenue. • Expand service on a minimum one-year trial basis when publicity campaigns are supported by local community or municipality and before and after route data collections are enforced.
1.6	STRIDE Service Availability: The DTA will strive to meet the existing demand for STRIDE service and meet minimum ADA requirements.	• Meet existing ADA demand based on FTA requirements.

Table 16: Goal 2: Provide safe, clean and reliable transit service and infrastructure to all current and potential DTA riders.

	Objective	Standard
2.1	On-time Performance: The DTA will maintain on-time performance at all destination points and maintain scheduled trip service reliability.	- Schedule adherence: 95 percent on-time service (based on destination station) during peak periods and 95 percent during off-peak periods. - On-time operation: Zero minutes ahead of schedule and no more than 5 minutes behind schedule. - Service reliability: 99 percent scheduled trips operated and at least 4500 vehicle miles between road calls.
2.2	On-time Performance for STRIDE services: The DTA will strive to maintain on-time performance for STRIDE services.	±15 minutes of scheduled time for 90 percent of the operations during peak hours and 80 percent operations during off-peak hours (evenings and weekends).
2.3	Safety and Security: The DTA will ensure maximum safety and security for all patrons and parties affected by the system by maintaining video monitored transit buses/facilities and a safe transit system perception among the patrons.	- Passenger safety: Zero passenger accidents per 100,000 passengers - Zero vehicle collisions per 100,000 miles. - Passenger security: At least 75 percent of riders should indicate themselves as safe in the security perception question asked in the passenger survey (survey fielded every two years).
2.4	Transit Facilities and Rolling Stock: The DTA will ensure that all transit facilities and equipment are well-maintained and enhance the overall transit experience of DTA customers.	- Fleet size: Total number of vehicles needed to service an area shall be related to the changing demand consistent with operating and replacement standards. - Fleet Condition: 1. Large, heavy-duty transit buses including over the road buses (approximately 35'-40', and articulated buses): at least 12 years of service or an accumulation of at least 500,000 miles. 2. Light Duty Vehicles (regular and specialized vans and light-duty buses): At least 4 years or an accumulation of at least 100,000 miles. - Shelters: Shelters must have seating, lighting, schedule and route information and should provide clear visibility in all directions. - Shelter location and amenities: Any stop where 25 or more people board on an average weekday (with seniors and disabled counted as two) must be a shelter. At least one shelter on each bus route. The number of shelters located on a route or neighborhood should not result in a disparate impact on the basis of race, color or national origin of the local riders (as per FTA's Title VI). Every shelter should have up-to-date DTA schedule and route information meeting ADA requirements. <i>Standard is based on State of Good Repair guidelines by Minnesota DOT and Federal Transit Administration.</i>
2.5	Bus Stop Spacing: The DTA will evaluate the number of transit stops on a transit route by maintaining a balance between speed (riding time) and passenger access convenience (walking distance to bus stop).	- Residential areas: Bus stop spacing between 660-1320 feet (4-8 stops per mile). Exceptions: Route operating on steep hill (greater than 6 percent slope) or two major transit trip generators located less than a block apart. - Commercial areas: The distance between stops determined based on safe pedestrian accessibility and proximity to major transit trip generators. <i>Safe Pedestrian Accessibility: People should be able to reach the transit vehicle from their origin point or reach their destination from the transit vehicle with minimal risk.</i>

Table 17: Goal 3: Provide Efficient and sustainable transit service.

	Objective	Standard
3.1	Transit Effectiveness: The DTA will strive to increase transit ridership each year.	Transit ridership measurement: Total revenue passengers increase by at least 3 percent.
3.2	Economic Efficiency: The DTA will strive to increase transit service efficiency each year.	Performance measures used – total cost per passenger, revenue per passenger, subsidy per passenger.
3.3	Route Efficiency and Effectiveness: The DTA will analyze route level performance to determine where corrective actions are warranted.	• Performance measures used – trip capacity, ridership per trip, ridership growth, senior ridership, transit dependent ridership and revenue efficiency. • One example of using ridership criteria for corrective actions: - 20-35 percent subsidy per passenger above the system average and/or 20-35 percent passenger per revenue hour below the system average: considered for extra marketing efforts and/or minor modifications. - 36-50 percent subsidy per passenger above the system average and/or 36-50 percent passenger per revenue hour below the system average: Significant route change. - Greater than 50 percent subsidy per passenger above the system average and/or greater than 50 percent passenger per revenue hour below system average: Major restructuring or possible elimination. • These standards are guidelines to help inform when route modifications might be considered; however, DTA will have final discretion to maintain any route due to other circumstances.
3.4	Transit Planning Coordination: The DTA will continue to promote transit planning consideration during the development of short and long range plans and policies in the Duluth metropolitan area.	Continued participation in the Metropolitan Interstate Council (MIC) Transportation Advisory Committee (TAC), Duluth city planning issues and City of Duluth reviews.
3.5	Multimodal Coordination: The DTA will continue to promote transit in coordination with the design and development of roadways, pedestrian and bicycle infrastructure and with transportation network companies (TNCs) like Uber, Lyft, etc.	Bus routes and stop locations coordinated with pedestrian and bicycle trails, Park and Rides and regional transfer stations (for example: Downtown Terminal)
3.6	Recycling and Carbon Footprint: The DTA will continue to maximize on-site recycling and minimize its carbon footprint of vehicles and facility operation.	DTA shall adopt a policy to evaluate its current greenhouse gas emissions and commit to a reduction in accordance with MN Statute 216H.02.

Table 18: Goal 4: Improve customer information and marketing strategies to increase ridership and customer satisfaction.

	Objective	Standard
4.1	Schedule and Routing: Provide integrated, useful, and easy to understand schedule and routing information (including information on website and other social media).	• 75 percent of on-board survey and passenger survey respondents indicating schedule and routing information useful and easy to understand. • Seek feedback from riders and non-riders via on-board and passenger survey for best practices of providing scheduling and routing information.
4.2	Transit Education and Marketing Activities: The DTA will promote the use of transit by educating Duluth and surrounding community residents and businesses about the benefits of public transit using social media, Chamber of Commerce, Greater Downtown Council, Duluth Visitors and Convention Bureau for public outreach.	• Minimum of 3 transit awareness and education events organized per month. • Provide regular travel training to DTA patrons. • At least one percent of the total operating cost will be spent on marketing activities.
4.3	Service Operations and Customer Service: The DTA will actively study and indulge in more proficient user interface software and technological methods of improving service delivery, ridership, effectiveness and customer service.	Need DTA input on this.
4.4	Commuter Pass Program: The DTA will continue to work with employers to promote participation in commuter pass program.	• Monitor ridership by group in the commuter pass program • Maintain 3-4 new businesses' increase to the commuter pass program

Required Systemwide Standards and Policies

Table 19 describes the performance measures for the types of transit services offered by DTA. These measures are required by the FTA as part of the Title VI Plan developed in 2016.

Table 19: Performance Measure by Transit Mode

Measure	Fixed Route Peak	Fixed Route Off-Peak	Express Service	Demand Response
Vehicle load for each mode. Peak & Off Peak	105%	85%	100%	85%
Vehicle headway for each mode	30 minutes	60 minutes	N/A	On demand
On-time performance for each mode	95%	95%	95%	95%
Service availability for each mode	98%	98%	98%	100%

Source: DTA Title VI Plan, 2016

Table 20 describes services policies by transit mode as required in the Title VI plan developed in 2016.

Table 20: Service Policies by Transit Mode

Amenities	Fixed Route	Demand Response
Bus Shelters	One per route and stops over 25 boardings per days	Curb-to-curb service
Printed signs, system maps, route maps, and schedules	Major stops over 100 boardings per day	N/A because on-demand service
Digital equipment	Major stops over 300 boardings per day	N/A because on-demand service
Vehicle Assignment	Rotated by vehicle size, not age or amenities	Based on demand, not age or amenities

Source: DTA Title VI Plan, 2016

DTA Performance Measures Trend Analyses

A trend analysis was conducted to examine the performance of DTA's transit service for the five years from 2011 to 2015, the most recent years of validated NTD data available and one year after the approved goals, objectives, and performance measures. These analyses include statistical tables and graphs that summarize selected performance indicators and effectiveness and efficiency measures for the selected time period. These measures are designed to review various trend components as follows:

- **Performance Measures** report absolute data for the selected categories and tend to be key indicators of overall system performance.
- **Effectiveness Measures** refine the data further and indicate the extent to which various service-related goals are being achieved.
- **Efficiency Measures** involve reviewing the level of resources required to achieve a given level of output. It is possible to have very efficient service that is not effective or to have highly effective service that is inefficient.

Table 21 reflects the measures used in this performance trend analysis. The summary shows the areas DTA has improved or has performed poorly and may help DTA provide a more productive and efficient service in the future. **Appendix A** includes figures of the fixed-route and demand response service which correspond to the performance review measures identified in this section.

Table 21: DTA Performance Review Measures

Performance Measures	Effectiveness Measures	Efficiency Measures
Service Area Population	Passenger Trips per Revenue Mile	Operating Expense per Service Area Capita
Service Area Density (person/sq mi)	Passenger Trips per Revenue Hour	Operating Expense per Passenger Trip
Passenger Trips	Passenger Trips per Service Area Capita	Operating Expense per Revenue Mile
Revenue Miles	Weekday Span of Service (hrs)	Operating Expense per Revenue Hour
Revenue Hours		Farebox Recovery Ratio (%)
Operating Expense		Revenue Miles per Vehicle Mile
Subsidy per Passenger		Revenue Miles per Total Vehicle
Vehicles Operated in Maximum Service		Average Fare Average Fare
Fuel Consumption (gal)		
Service Area Size (sq mi)		

Fixed-Route Performance Indicators

Performance indicators are used to present the data that relate to overall system performance. The following is a summary of the trends that were observed among the performance indicators provided in **Table 22**.

- Service area population decreased from 122,970 to 116,566 persons, an overall decrease of 5.2 percent during the 5-year period from 2011 to 2015.
- The total number of passenger trips decreased from 3,264,479 to 3,051,665 million from 2011 to 2015, which is an overall decrease of 6.5 percent. Decrease in trips can be partially attributed to fluctuations in full-time student enrollment at UMD which decreased from 11,196 in 2010-2011 to 10,629 in 2014-2015, according to Integrated Postsecondary Education System (IPEDS).
- Revenue miles during the 5-year period decreased from 1,810,380 to 1,769,627, as well as revenue hours from 136,500 to 134,610, a 1.4 percent decrease from 2011 to 2015.
- Operating expenses increased by nearly 9 percent from \$12,276,427 to \$13,372,308 and the vehicles operated in maximum service also increase from 47 to 48. However, in 2014 DTA was operating 51 vehicles during maximum service while in 2015 only 48 vehicles are operated in maximum service.
- The total gallons consumed decreased from 416,251 to 400,697, an overall decrease of 3.7 percent.

Table 22: DTA Fixed-Route Performance Measures

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Service Area Population	122,970	115,000	115,000	116,566	116,566	-5.2%
Service Area Density (person/sq mi)	859.93	804.2	804.2	1,665.23	1,618.97	88.3%
Passenger Trips	3,264,479	3,261,494	3,195,020	3,107,305	3,051,665	-6.5%
Revenue Miles	1,810,380	1,800,663	1,752,637	1,721,557	1,769,627	-2.3%
Revenue Hours	136,500	135,418	132,446	130,001	134,610	-1.4%
Operating Expense	\$12,276,427	\$12,716,990	\$12,697,760	\$13,293,653	\$13,372,308	8.9%
Subsidy per Passenger	\$3.04	\$3.15	\$3.20	\$3.44	\$3.48	14.5%

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Vehicles Operated in Maximum Service	47	47	50	51	48	2.1%
Fuel Consumption (gal)	416,251	419,385	420,106	405,862	400,697	-3.7%
Service Area Size (sq mi)	143	143	143	70	72	-49.7%

*Subsidy per Passenger was calculated using average fare multiplied by passenger trips to achieve total fare revenue.

Source: National Transit Database

Fixed-Route Effectiveness Measures

Effectiveness measures indicate the extent to which service-related goals are being met. Selected effectiveness measures are presented in **Table 23**.

- Passenger trips per revenue mile decreased from 1.8 to 1.72 from 2011 to 2015, and overall decrease of 4.4 percent.
- Passenger trips per revenue hour decrease 5.2 percent from 23.92 to 22.67, and passenger trips per service area capita also decreased from 26.55 to 26.18 which is an overall decrease of 1.4 percent from 2011 to 2015.
- The weekday span of service increase from 20.92 to 21.25, which is nearly 2 percent.

Table 23: DTA Fixed-Route Effectiveness Measures

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Passenger Trips per Revenue Mile	1.8	1.81	1.82	1.8	1.72	-4.4%
Passenger Trips per Revenue Hour	23.92	24.08	24.12	23.9	22.67	-5.2%
Passenger Trips per Service Area Capita	26.55	28.36	27.78	26.66	26.18	-1.4%
Weekday Span of Service	20.92	20.92	21.08	21.25	21.25	1.6%

Source: National Transit Database

Fixed-Route Efficiency Measures

Efficiency measures are intended to measure the level of resources necessary to achieve a given level of output. Efficiency measures are presented in **Table 24**.

- Operating expense per service area capita increased from \$99.83 to \$114.72 from 2011 to 2015, an overall increase of nearly 15 percent. Additionally, operating expense per passenger trip increased from \$3.76 to \$4.38, an overall increase of 16.5 percent over the 5-year period.
- Operating expense per revenue mile increased 10.5 percent, as well as operating expense per revenue hour which had an overall increase of 7.2 percent from 2011 to 2015.
- There was a 2.2 percent increase in revenue miles per vehicle mile from 2011 to 2015, but a 11 percent decrease in revenue miles per total vehicles.
- The average fare increased substantially from \$0.72 to \$0.90, an increase of 25 percent from 2011 to 2015.

Table 24: DTA Fixed-Route Efficiency Measures

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Cost Efficiency						
Operating Expense per Service Area Capita	\$99.83	\$110.58	\$110.42	\$114.04	\$114.72	14.9%
Operating Expense per Passenger Trip	\$3.76	\$3.90	\$3.97	\$4.28	\$4.38	16.5%
Operating Expense per Revenue Mile	\$6.78	\$7.06	\$7.24	\$7.72	\$7.56	11.5%
Operating Expense per Revenue Hour	\$89.94	\$93.91	\$95.87	\$102.26	\$99.34	10.5%
Farebox Recovery Ratio (%)	19.19	19.28	19.35	19.66	20.58	7.2%
Vehicle Utilization						
Revenue Miles per Vehicle Mile	0.93	0.93	0.93	0.93	0.95	2.2%
Revenue Miles per Total Vehicle	30,173.00	28,581.95	27,819.63	27,326.30	26,812.53	-11.1%
Fare						
Average Fare	\$0.72	\$0.75	\$0.77	\$0.84	\$0.90	25.0%

Source: National Transit Database

Demand Response Performance Indicators

Performance indicators for the Demand Response system are used to present data that relate to overall system performance. In addition, the following is a summary of trends that are observed among the performance indicators provided in **Table 25**.

- Demand Response passenger trips increased from 2011 to 2015 by nearly 20 percent, as well as the Revenue Miles (23.6%) which increase from 205,317 in 2011 to 253,826.
- Revenue hours increased from 15,544 to 19,405 which is a 25 percent increase from 2011 to 2015.
- Demand Response operating expense increased substantially from \$695,879 to \$862,708 which is a 24 percent increase from 2011 to 2015.
- Vehicles operated in maximum service and fuel consumption increased 40 percent or more from 2011 to 2015 which may have to do with the increased number of revenue miles and hours the service has operated.

Table 25: DTA Demand Response Performance Measures

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Service Area Population	122,970	115,000	115,000	116,566	116,566	-5.2%
Service Area Density (person/sq mi)	859.93	804.2	804.2	1,665.23	1,618.97	88.3%
Passenger Trips	25,285	26,686	25,790	28,027	30,220	19.5%
Revenue Miles	205,317	217,272	233,484	246,689	253,826	23.6%
Revenue Hours	15,544	16,467	17,615	18,705	19,405	24.8%
Operating Expense	\$695,879	\$741,183	\$764,533	\$808,072	\$862,708	24.0%
Subsidy per Passenger	\$25.59	\$25.84	\$27.64	\$26.84	\$26.49	3.5%
Vehicles Operated in Maximum Service	5	5	5	6	7	40.0%
Fuel Consumption (gal)	21,003	22,799	22,481	26,269	29,609	41.0%
Service Area Size (sq mi)	143	143	143	70	72	-49.7%

Source: National Transit Database

Demand Response Effectiveness Measures

Demand Response effectiveness measures indicate the extent to which service-related goals are being met. Selected effectiveness measures are presented in **Table 26**.

- Passenger trips per revenue mile did not decrease or increase in 2011 or 2015; however, in 2013 and 2014 passenger trips per revenue mile decreased 8.3 percent from 2012 but then increase 8.3 from 2014 to 2015.
- Demand Response passenger trips per revenue hour decreased from 1.63 to 1.56 which is a 4.3 percent decrease from 2011 to 2015.
- The weekend span of service increased substantially from 17 hours to 20.92 hours which is a 23 % increase from 2011 to 2015.

Table 26: DTA Demand Response Effectiveness Measures

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Passenger Trips per Revenue Mile	0.12	0.12	0.11	0.11	0.12	0.0%
Passenger Trips per Revenue Hour	1.63	1.62	1.46	1.5	1.56	-4.3%
Passenger Trips per Service Area Capita	0.21	0.23	0.22	0.24	0.26	23.8%
Weekday Span of Service	17	17	21.08	21.25	20.92	23.1%

Source: National Transit Database

Demand Response Efficiency Measures

Demand Response efficiency measures are intended to measure the level of resources necessary to achieve a given level of output. Efficiency measures are presented in **Table 27**.

- Demand response operating expense per service area capita increase substantially from \$5.66 in 2011 to \$7.40 in 2015, which is an overall increase of nearly 31 percent.
- Operating expense per passenger trip increased 3.7 percent, while operating expense per revenue mile only increased .3 percent from 2011 to 2015.
- Demand response operating expense per revenue hour decrease .7 percent from 2011 to 2015. In addition, revenue miles per vehicle mile also decreased slightly (-2.1%) from 0.97 in 2011 to 0.95 in 2015.
- The average fare increased from \$1.93 in 2011 to \$2.06 in 2015 which is an overall increase of 6.7 percent for the 5-year period.

Table 27: DTA Demand Response Efficiency Measures

Performance Measures	2011	2012	2013	2014	2015	% Change from 2011-2015
Cost Efficiency						
Operating Expense per Service Area Capita	\$5.66	\$6.45	\$6.65	\$6.93	\$7.40	30.7%
Operating Expense per Passenger Trip	\$27.52	\$27.77	\$29.64	\$28.83	\$28.55	3.7%
Operating Expense per Revenue Mile	\$3.39	\$3.41	\$3.27	\$3.28	\$3.40	0.3%
Operating Expense per Revenue Hour	\$44.77	\$45.01	\$43.40	\$43.20	\$44.46	-0.7%
Farebox Recovery Ratio (%)	7	6.97	6.76	6.9	7.21	3.0%
Vehicle Utilization						
Revenue Miles per Vehicle Mile	0.97	0.96	0.98	0.96	0.95	-2.1%
Revenue Miles per Total Vehicle	22,813.00	24,141.33	25,942.67	27,409.89	28,202.89	23.6%
Fare						
Average Fare	\$1.93	\$1.93	\$2.00	\$1.99	\$2.06	6.7%

Source: National Transit Database

DTA Performance Measures Evaluation

This section states the current status of meeting the goals, objectives, and performance measures of DTA's adopted goals, objectives, and performance measures.

Goal I

Increase transit use in the Duluth area by providing high quality transit service.

DTA will evaluate this goal using the following six objectives which are listed below:

- Customer Satisfaction
- Fixed-Route Headway
- Transit Service Availability
- Passenger Loading
- Service Expansion
- STRIDE Service Availability

Customer Satisfaction Performance Evaluation: DTA has high percentage of respondents who believe DTA provides good customer service and availability to the riders in the community. More information will be evaluated once customer concerns and suggestions are compiled.

Fixed-Route Headway Performance Evaluation: DTA currently maintains 30 minute peak frequency and 60 minute off-peak frequency for the duration of service on weekdays, Saturday, and Sunday.

Transit Service Availability Performance Evaluation: Based on demographic data, DTA provides transit to most areas that have been identified as being in poverty, as well as having zero vehicles in their household, and areas with limited English proficiency.

Passenger Loading Performance Evaluation: A fleet inventory including year, make, and model is preferred to assess the maximum load standards for each vehicle. In addition, a brief list of specifications including occupancy for each vehicle is essential to calculate the maximum load standards. As previously mentioned, DTA currently maintains 30 minute peak frequency and 60 minute off-peak frequency for the duration of service on weekdays, Saturday, and Sunday.

Service Expansion Performance Evaluation: DTA will promote transit consideration in decision-making and the development of plans and policies affecting land-use and transportation as an alternative to the construction of additional roadways and parking facilities. Cooperation with the community or communities will be included as new services and route extensions will be initiated to include publicity campaigns and local area support.

STRIDE Service Availability Performance Evaluation: DTA is striving to maintain a level of availability to transit riders who have disabilities by providing the STRIDE service and maintaining a level of accessibility near transportation centers throughout Duluth.

Goal II

Provide safe, clean and reliable transit service and infrastructure to all current and potential DTA riders.

DTA will evaluate this goal using the following five objectives which are listed below:

- On-Time Performance Objective
- On-time Performance for STRIDE Services Objective
- Safety and Security Objective
- Transit Facilities and Rolling Stock Objective
- Bus Stop Spacing Objective

On-Time Performance Evaluation: DTA has a high percentage of OTP and is striving to meet or surpass the OTP in previous periods. However, some routes such as Route 2X, Route 7X, Route 16X, and Route 10H have lower than 80% OTP which is much lower than other fixed-route provided by DTA. The majority of DTA's fixed-routes operate between 80% - 90% OTP.

Vehicle miles between road call information are needed to evaluate how routes are functioning on weekdays, Saturday, and Sunday. However, the greatest number of missed trips occurs on Route 10, while the least number of missed trips occurs on Route 16X and Route 7X.

On-time performance is hampered during summer season due to tourism and construction especially in downtown when streets become gridlocked from the influx of people traveling from out of town. From May to October is when virtually all projects commence due to weather conditions. Often, there is no advance notice of street closures which impacts bus routes during operating times. The DTA is sometimes the first to report a street closure to the City which reflects in the performance of the West Mainlines, as well as the East 4th Street routes.

On-time Performance for STRIDE Services Performance Evaluation: OTP performance is needed to evaluate the STRIDE service to adequately assess whether or not service is meeting the recommended operating standards.

Safety and Security Performance Evaluation: To identify route or system safety and security, the number of accidents by route is necessary to evaluate the level of safety and security needed on the DTA fixed-route and Demand Response service.

Transit Facilities and Rolling Stock Performance Evaluation: DTA will have to strive to maintain the number of vehicles available in maximum service in order to meet the level of demand in both fixed-route and Demand Response. The number of vehicles operated in the fixed-route service increased from 47 to 51 from 2011 to 2014; however, from 2014 to 2015 the fixed-route vehicles operated in maximum service decreased to 48 which would be inconsistent with the changing level of demand in the service. There has been a slight increase in the number of Demand Response vehicles provided by STRIDE which is appropriate for the increased level of ridership from 2011 to 2015. In 2011 there were 5 buses operating in the Demand Response service which has increase to 7 in 2015.

A list of all stops with 25 or more boardings which include a shelter must be gathered to assess whether or not DTA is providing the following infrastructure at shelter locations:

- clear vision in all directions

- seats
- lighting
- schedule
- route information

Bus Stop Spacing Performance Evaluation: Bus stop information will be evaluated to identify adequate distances within residential areas. In addition, DTA is maintaining a standard for accessibility between bus stops near major destinations based on boarding information identified in the fixed-route analysis. However, some bus stops need to be evaluated for adequate spacing and accessibility in areas where ridership is lower such as New Duluth and Fond-Du-Lac.

Goal III

Provide efficient and sustainable transit service.

DTA will evaluate this goal using the following six objectives which are listed below:

- Transit Effectiveness Objective
- Economic Efficiency Objective
- Route Efficiency and Effectiveness Objective
- Transit Planning Coordination Objective
- Multimodal Coordination Objective
- Recycling and Carbon Footprint Objective

Transit Effectiveness Performance Evaluation: Overall, the fixed-route service provided by DTA has slightly decreased ridership by 6.5 percent from 2011 to 2015. In addition, ridership on the fixed-route service from 2011-2015 has seen a slight decrease in ridership from the year before. The Demand Response service has been steadily increasing from 2011 to 2015; however, from 2012 to 2013 there was a slight decrease in ridership which was accounted for in 2014 with an 8.7% increase in passenger trips.

The result of decreasing passenger on the fixed-route service may come from a number of different situations; however, one cause of this may be due to the increase number of construction projects along fixed-route corridors. In particular, Route 2X from Grand Avenue Zoo to the route termination was under construction for a two-year period which forced transit vehicles to sit in traffic on a daily basis because there are no alternate routes. The four lane corridor was narrowed to two lanes during construction periods which caused major delays for transit and passenger vehicles.

Economic Efficiency Performance Evaluation: Based off the information provided by NTD, Demand Response and fixed-route subsidy per passenger has gradually increased over the 5-year period from 2011 to 2015. This is primarily based on increased operating expenses over the 5-year period.

Route Efficiency and Effectiveness Performance Evaluation: Route level performance measures are essential to evaluate subsidy per passenger above the system average, as well as ridership per trip, ridership growth, senior ridership, transit dependent ridership and revenue efficiency.

Transit Planning Coordination Performance Evaluation: Recently, DTA finalized the construction of the Transportation Center in downtown Duluth which provides transit to the

surrounding areas of Duluth, Proctor, and Superior. In addition, this facility provides adequate accessibility to and from areas in downtown and pays special attention to larger commercial development in the metropolitan area.

Multimodal Coordination Performance Evaluation: Connecting multimodal networks to pedestrian and bicycle facilities is essential to maintain a properly functioning transportation network.

Recycling and Carbon Footprint Performance Evaluation: A list of new Hybrid or low-emissions vehicles, including the make and model, is needed to evaluate how DTA is striving to increase sustainability through the use of new transit vehicles in their network, as well as any programs DTA coordinates with to promote recycling or minimize the carbon footprint.

Goal IV

Improve customer information and marketing strategies to increase ridership and customer satisfaction.

DTA will evaluate this goal using the following four objectives which are listed below:

- Schedule and Routing Objective
- Transit Education and Marketing Activities Objective
- Service Operations and Customer Service Objective
- Commuter Pass Program Objective

Schedule and Routing Performance Evaluation: Routing and scheduling information is an essential item for riders and non-riders to understand the best practices associated with current transit operating characteristics. Currently, over 100 facilities in the Duluth service area contain scheduling and routing information as a marketing tool for riders and no-riders.

Transit Education and Marketing Activities Performance Evaluation: DTA provides marketing tools and information at all major destinations along the route, as well as inside the bus and online. In addition, DTA also provides advertising at transit shelters and at transfer stations. However, the funding amount spent on advertising is essential to evaluate how spending is being allocated.

Service Operations and Customer Service Performance Evaluation: Need the DTA's support on this objective.

Commuter Pass Program Performance Evaluation: Information of which employer utilize transit passes for the employees is desired to assess how DTA is promoting commuter pass benefits to their riders.

Performance Evaluation

This section provides an analysis of the efficiency and effectiveness of DTA services. The indicators reviewed include productivity, revenue recovery, route design and scheduling, and operating procedures to determine how these factors impact service efficiency and service quality. In this analysis we consider how services are performing based on agency objectives and performance measures, public perceptions of service quality, and if services will meet projected future needs.

System Performance

According to the most recent on-board survey conducted in 2015 by the Minnesota Department of Transportation (MnDOT), 80 percent of respondents were satisfied with DTA services. This indicates DTA is providing a good level of service for a clear majority of its riders. The top three preferred improvements were indicated as longer service hours, better frequency, and increased reliability and on-time performance. DTA typically operates from 5:00 am to at least 7:00 pm, but does start some routes at 4:00 am and will end routes at late as 2:00 am. The existing span of service provides an adequate level of service for most riders. Extending the span of service may solve issues for some riders but could impact meeting the operating budget.

Approximately half of the fixed routes operate with peak frequencies at 60 minutes, and five routes operate with peak frequencies better than 30 minutes. Though DTA performance measures recommend at least 30 minutes frequencies during peak periods, the objective notes that adjusting frequencies must be economically feasible. Increasing operating expenses to add more frequencies could result in raising fares to meet economic productivity measures.

Opportunities

- Solid network of routes reaching most origins and destinations
- Add service to potential new market connecting Lakeside, UMD, and the Mall area
- Stakeholder comments regarding adding on-call zones for smaller areas with lower ridership or harder to reach.

Challenges

- Increasing service spans and frequencies would increase operating costs
- Long service area requires long miles and hours on vehicles and travel times for cross-town passengers
- Declining ridership
 - Decreasing population
 - Lower gas prices
 - Convenience of driving

On-Time Performance

A key objective for DTA is to maintain at least 90 percent on-time performance, which is currently not met by the fixed route system as a whole (84%). Only four fixed routes operate above 90 percent on-time, Route 18 UMD Boulder Ridge CPH (96%), Route 21 Grocery Express (95%), Route 4 Ramsey-Raleigh (91%), and Route 14W W4th Blvd (91%). Four routes are performing under 80 percent on-time, Route 16X Superior Express (79.7%), Route 7X East Mainline Express (77%), Route 10H Duluth Heights Mall via 6AE (77%), and Route 2X New Duluth Express (54%).

According to the data presented in **Table 10** within Section 1.2.5 Fixed Route Analysis, only one express route performed above the system average for on-time performance (Route 21 Grocery Express). Prior to March 5th, 2017 this route only operated seven trips within four hours on Saturdays and only averaged 25 passengers per day. Therefore, Route 21, which now operates six trips within six hours on weekdays (effective March 5th, 2017) should be expected to have reliable service.

The remaining four express routes operate one vehicle each during peak periods only on weekdays. General peak period traffic could be slowing these routes; however, Route 2X is very unreliable, which could be attributed to many frequent stops along Grand Avenue, as shown in the Ridecheck maps. Forcing the bus to make several frequent stops defeats the purpose of an express service, which could also be an issue for Routes 3X and 16X. Route 7X does not make many stops and only operates one trip. It is likely this route is caught in traffic delaying the bus.

The most recent on-board survey conducted in 2015 stated 25 percent of respondents would prefer to see improvement to reliability and on-time performance. Additionally, the 2008 on-board survey revealed 31 percent of respondents would like DTA to improve on-time performance. According to the data provided by DTA, there are opportunities for the service to improve the reliability and on-time performance of the fixed route system. In order for DTA to improve on-time performance recommendations will likely include route, schedule, and bus stop spacing redesign, as well as adjustments to current operations frequencies and capacity.

Opportunities

- Increase performance measure monitoring and update operations to changing conditions
- Dedicated bus lanes in specific areas with high traffic that have room to separate lanes
- Redesign bus stop spacing and locations
- Schedule redesign

Challenges

- Peak period traffic causing bus delays
- Long service area from end to end
- Too many frequent stops on express routes
- Many frequent stops required on route segments on hills

Customer Satisfaction

According to the most recent on-board survey conducted in 2015 by MnDOT, 80 percent of respondents were satisfied with DTA service which meets the 75 percent satisfaction performance measures adopted by the DTA. The DTA should continue to conduct regular on-board surveys to monitor satisfaction and areas of improvement as requested by the community.

Opportunities

- Enhance and update website and marketing outreach
- Review adding smart phone bus location technology
- Dedicated bus lanes in specific areas with room
- Revaluation of bus stop locations
- Improve reliability and on-time performance
- New potential market connecting Lakeside, UMD, and the Mall area

Challenges

- Customer requests typically require:
 - Longer service hours
 - More frequent service
 - New service areas
- Long routes create long travel time on buses
- Costs to upgrade or purchase buses

Route Design

The objectives and performance measures guiding DTA evaluate route design based on variety of indicators, such as travel time compared to automobiles, population and employment densities, key demographic characteristics, street configuration and physical characteristics, load capacities, and monitoring transit facilities and rolling stock conditions. Many of these indicators are dependent on the type of service provided and should group similar services when reviewing data. The current travel time performances are provided by service type and shown in **Table 28**.

Table 28: Travel Time Measure by Service Type

Service Type	Travel Time Measure (shall not exceed)
Major Destination and Express Service	1.5 times automobile travel time
Regular Route Destinations (non-major destinations)	2 times automobile travel time
Cross-town Route	3 times automobile travel time
ADA and Non-Regular Route	60 minutes

Source: DTA Title VI Plan, 2016.

DTA faces some challenges as the service area is very long and can take over one hour to travel on some cross-town routes; however, the most recent on-board survey indicated only 6 percent of respondents preferred seeing improvements to travel time, which is down from 10 percent as reported in the 2008 on-board survey. Therefore, based on survey results, DTA is improving the perception of travel time. Detailed travel times for each route are necessary to analyze individual route and service type performance.

The average fleet age cannot be determined at this time based on the level of detail provided for the rolling stock; however, a few comments from the TAC kick-off meeting specifically mentioned the DTA fleet. Two comments mentioned the buses should be updated to attract choice riders and some smaller buses were needed to reach certain areas.

Opportunities

- Travel time monitoring by individual route
- Review Next Bus Technology implementation which provides bus tracking capabilities at bus stops so individuals do not have to own a smartphone to track the bus.
 - This technology can decrease wait times if passengers know when the bus is coming.
- Update all bus shelters with complete schedule information

Challenges

- Comments from stakeholders and staff mentioned some routes do not need to go through Downtown Duluth to save time.
- Increased operating costs to add frequency
- Costs and time to update all bus stops and shelters to meet ADA requirements
- Costs to upgrade or purchase buses, bus stops, and shelters
 - Wide range of weather conditions makes it hard to maintain full-use of all bus stops and shelters. Snow maintenance is especially hard.

Economic Productivity

As stated in DTA's approved objectives and performance measures, transit ridership should increase by three percent each year, based on revenue by passenger. Using the average fare and total trips,

passenger revenue was calculated for years 2011 to 2015. DTA is currently exceeding their performance measure. In order to achieve this level of performance despite losing ridership each year, DTA has increased average fares an average of six percent per year from 2011 to 2015.

Fixed route subsidy per passenger has increased every year from 2011 to 2015. The overall increase is 14.5 percent, although the smallest increase occurred recently from 2014 to 2015. Subsidy per passenger for demand response services has increased 3.5 percent from 2011 to 2015, and has only been reduced once in this timeframe (2014 to 2015).

Opportunities

- Potential to tap into more funding from UMD students according to comments from stakeholders and during a UMD workshop

Challenges

- Decreasing ridership requires higher fares to meet economic productivity
 - Decline in fuel prices
 - Population decrease

Safety and Security

Bus stop spacing is a component of the safety and security objective for DTA. Shorter walking distances may result in increased ridership, but could slow busses down if stops become too frequent. In some locations there are several bus stops spaced every two blocks or less. Although this strategy may follow DTA performance measures, it may contribute to lower on-time performance ratings. A detailed number of incidents were not included in the NTD submission.

Opportunities

- Far-side stops were preferred by supervisors in order to increase safety for passengers and other cars. Far-side stops would also take advantage of the signal priority system.
- Revaluation of bus stop locations
- Continue to gather input from supervisors and operators regarding issues pertaining to potentially unsafe turns, dangers pedestrian crosswalks, and unsafe bus stop locations.
- Add more police to the staff, in addition to the one office now under contract.

Challenges

- Supervisors noted a few turn issues at:
 - Mall area
 - 10th and Superior Street
 - Kenwood and College (right turn)
 - Grand and 59th
 - 6th Avenue and 9th Street (outbound) – traffic calming project
 - Skyline and Mesabe

- Super One (by Mall)
- Long routes create long travel time on buses
- Moving near-side stops to far-side stops would be costly in some areas and may negatively impact some businesses in downtown.
- Costs to upgrade or install bus stops and shelters

Demand Response

DTA measures performance of the demand response system by monitoring on-time performance, where service will be provided within 15 minutes (before or after) scheduled trips. STRIDE is currently performing slightly under the designated on-time performance measure of 95 percent. STRIDE's current on-time performance based on October 2016 services was 92 percent. This would require the service to eliminate at least approximately 85 late trips.

DTA also measures demand response performance by monitoring the number of trips and trip grouping, which helps eliminate one-passenger trips. Currently, very few trips are grouped due to scheduling issues; however, the number of trips have increased by almost 5,000 from 2011 to 2015 which puts more pressure on existing resources.

Opportunities

- Increase ridership
- Add more service to meet demands
- Replace the small vehicle this year, and begin replacing the large vehicles in 2018.
- Increase monitoring of reporting and review reporting procedures that meet regulatory compliance

Challenges

- DTA staff covering duties for STRIDE staff at the end of weekdays
- Unanswered phones
- How can STRIDE predict future demand?
- No turn down regulations put pressure on existing capacity
- The schedule is squeezed and when backups are required there are no vehicles in reserve for emergencies.
- Hard to group rides or create a rideshare program because origins and destinations are unique and often change.
- Subscriptions are limited due to regulations

Marketing Strategies

DTA currently markets its services to the public through several outlets, including paper schedules and maps at facilities and on buses, and online materials through its website. Several comments regarding marketing strategies were voiced during the TAC kickoff meeting. Comments discussed updating the appearance of buses, signage at bus stops, and upgrading amenities and stops and shelters. These statements were mostly in relation to attracting choice riders; however, most agreed

that real-time tracking devices at bus stops, or through smartphones, would benefit the system and riders. Other comments and observations related to the appearance and function of the website. Maps and schedules did not always match the paper maps and schedules available at DTA facilities and on vehicles. Additionally, a comment mentioned the Google Plan and Ride Guide is very helpful on computer but the website loses some functionality on mobile devices.

Opportunities

- Increase ridership with enhanced marketing strategies
- Update website to be more user-friendly and mobile-friendly
- Reduce confusion reading schedules and maps
- Continue relationship building with UMD students
 - Students expressed interest in raising more money to give to DTA
- Update maps with current alignments which show complete route coverage
- Review implementation of real-time bus location signage at bus stops

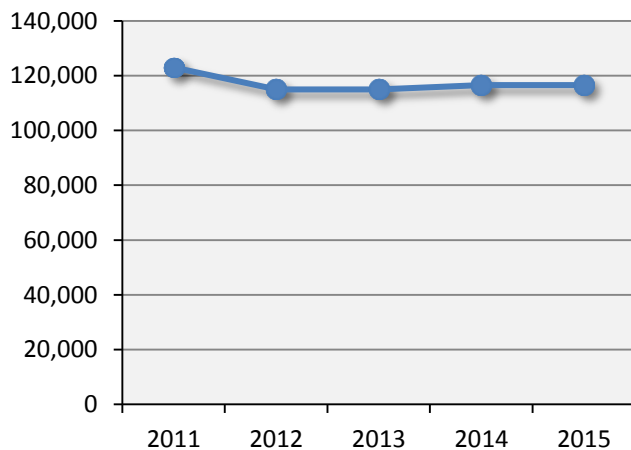
Challenges

- Frequent schedule changes require reprinting schedules
- Real-time bus monitoring apps may be costly

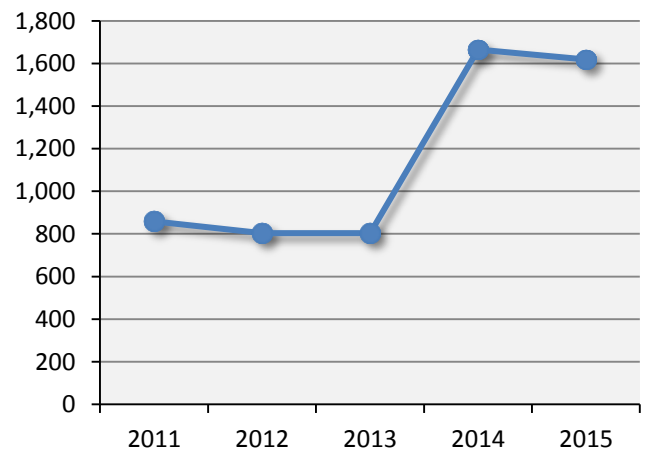
Appendix A – Fixed Route and Demand Response Performance Indicators

Fixed-Route Performance Indicators

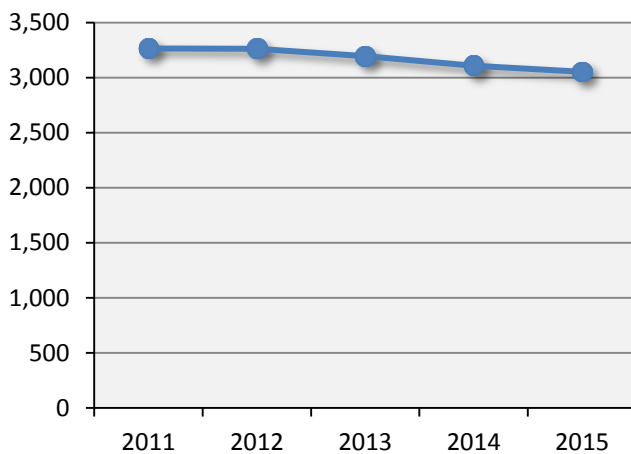
Service Area Population



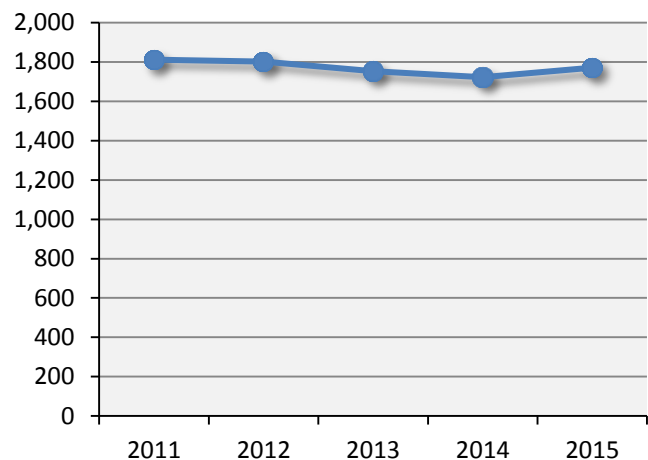
Service Area Population Density (sq mi)



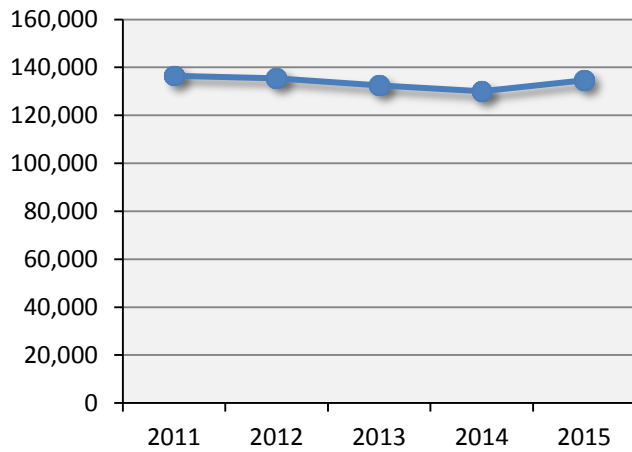
Passenger Trips (000)



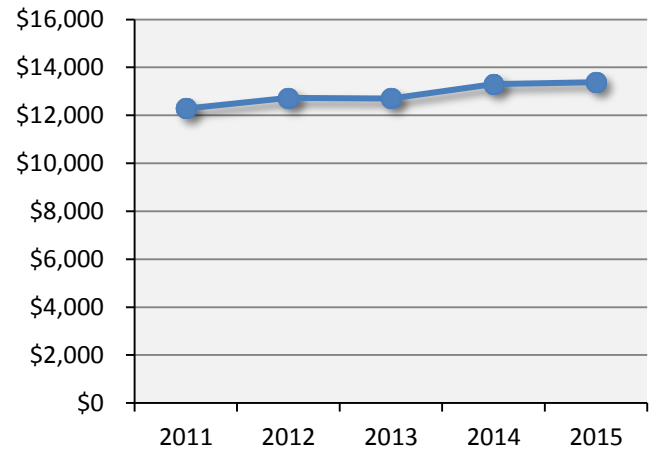
Revenue Miles (000)



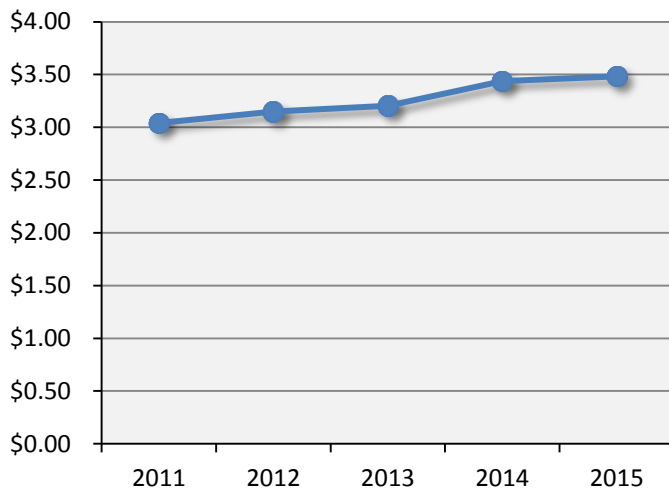
Revenue Hours



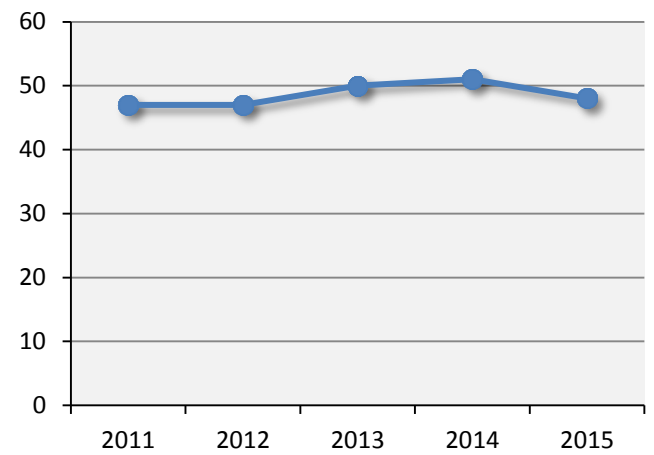
Operating Expense (000)



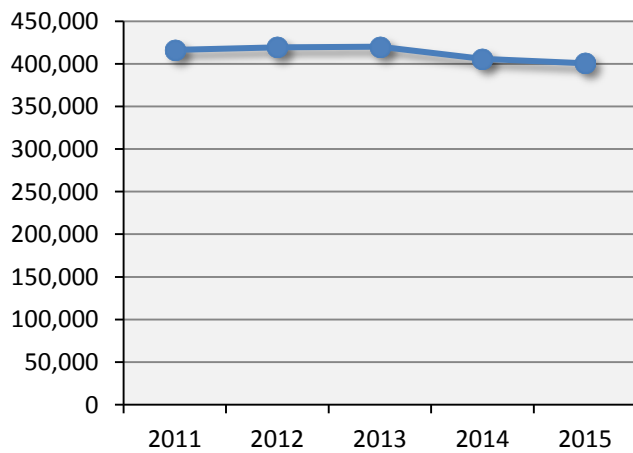
Subsidy per Passenger



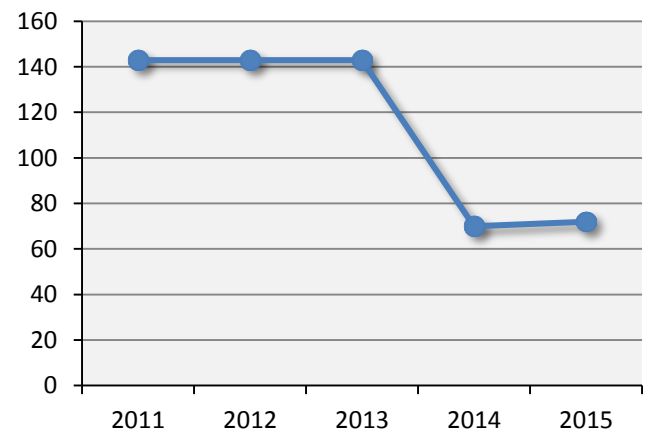
Vehicles Operated in Maximum Service



Fuel Consumption (gal)

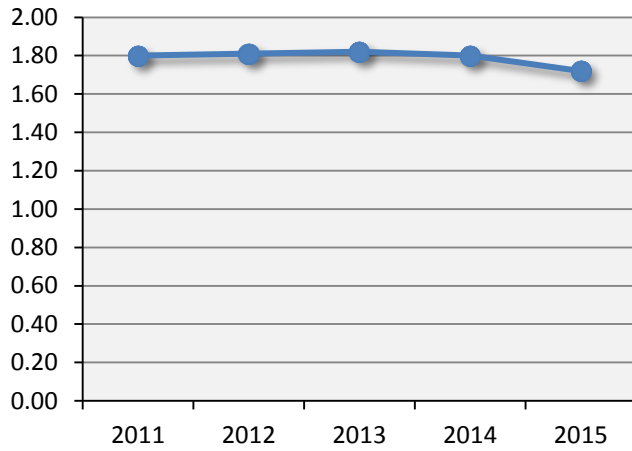


Service Area Size (sq mi)

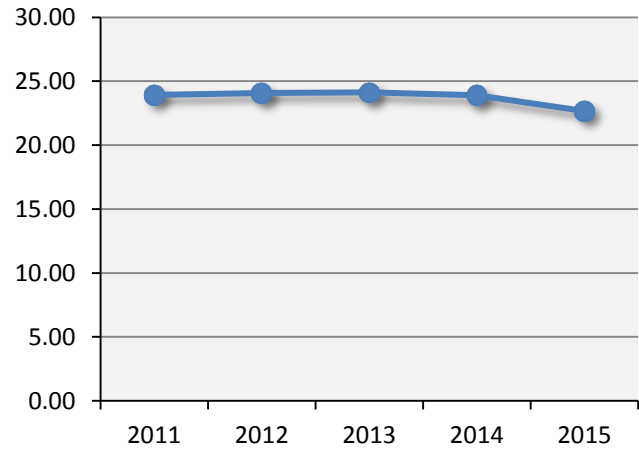


Fixed-Route Effectiveness Measures

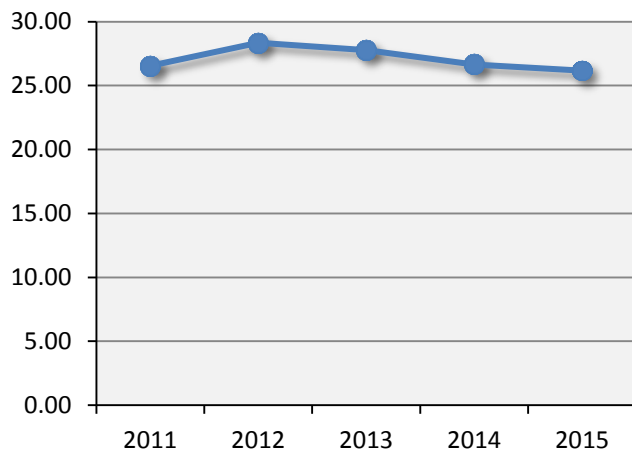
Passenger Trips per Revenue Mile



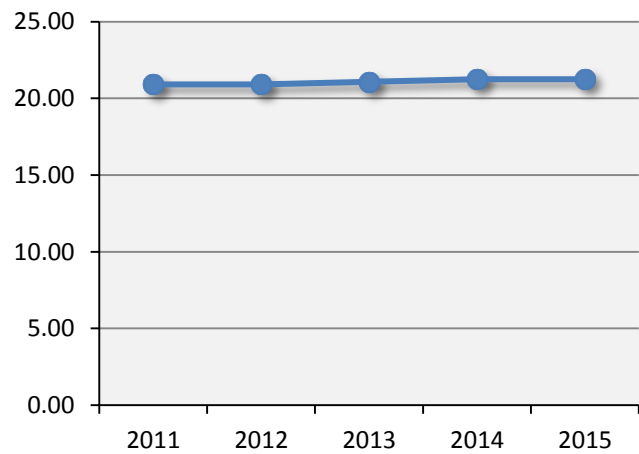
Passenger Trips per Revenue Hour



Passenger Trips per Service Area Capita

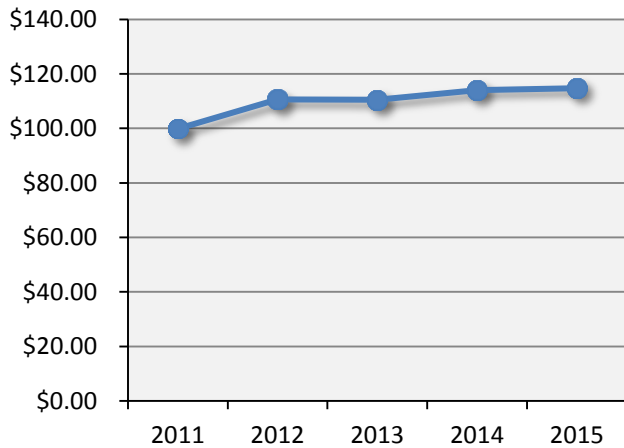


Weekday Span of Service

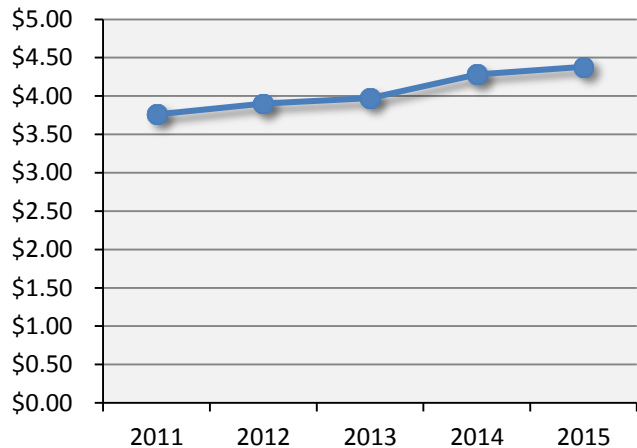


Fixed-Route Efficiency Measures

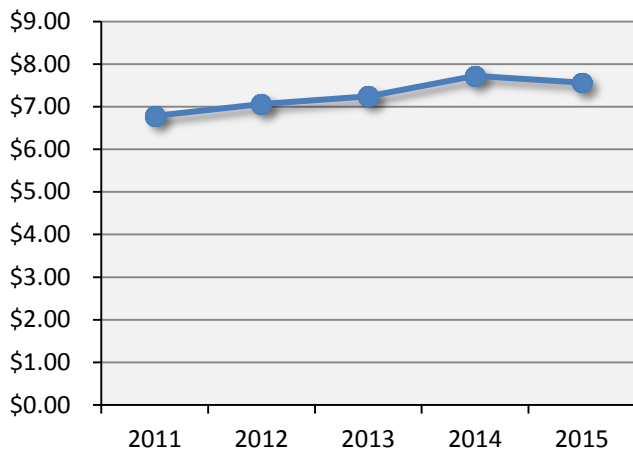
Operating Expense per Service Area Capita



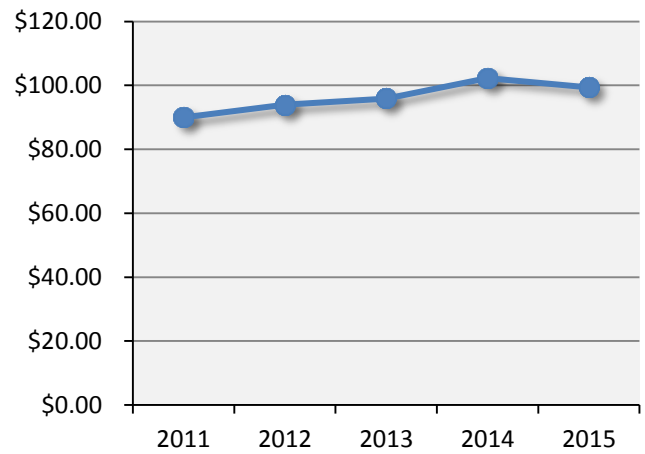
Operating Expense per Passenger Trip



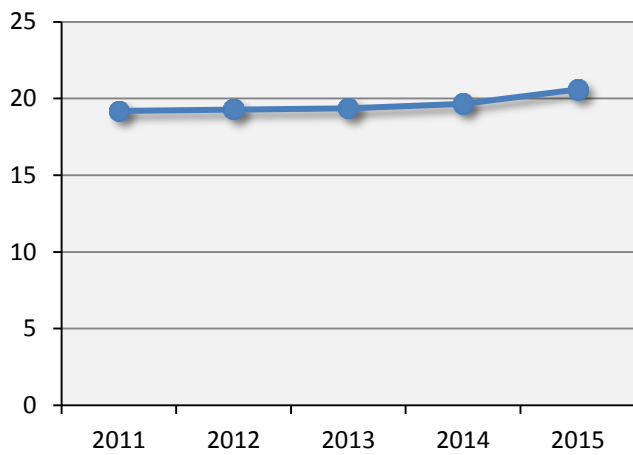
Operating Expense per Revenue Mile



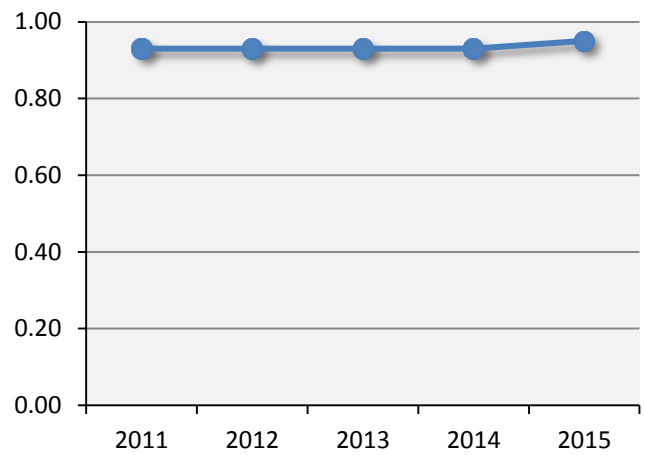
Operating Expense per Revenue Hour



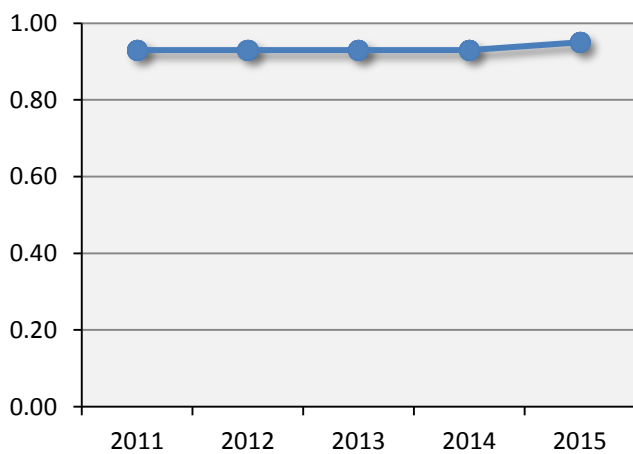
Farebox Recovery Ratio (%)



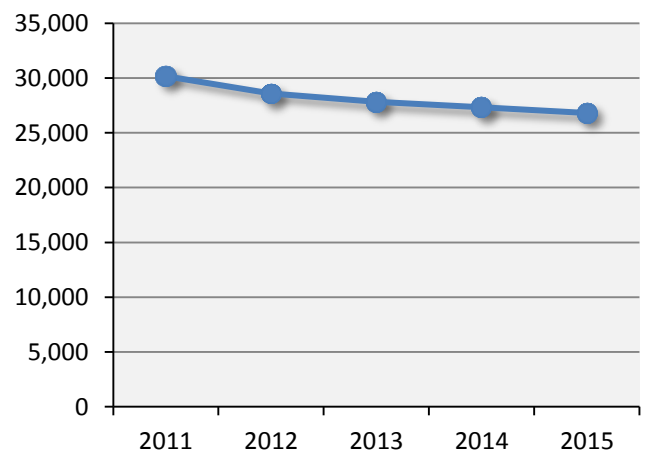
Revenue Miles per Vehicle Mile



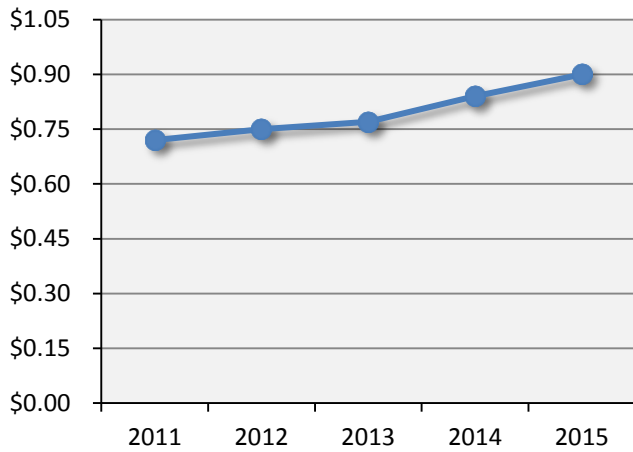
Revenue Miles per Vehicle Mile



Revenue Miles per Total Vehicle

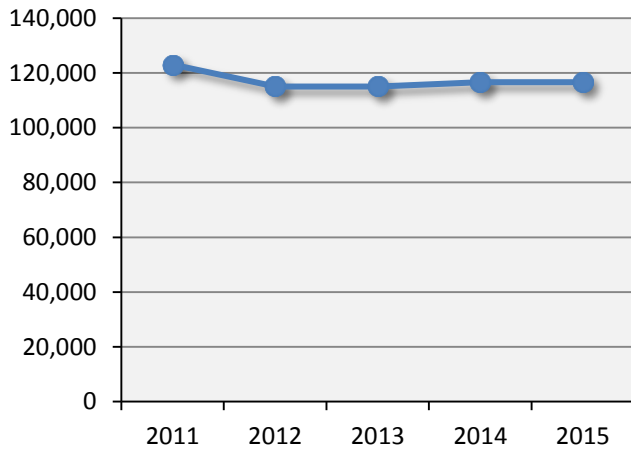


Average Fare

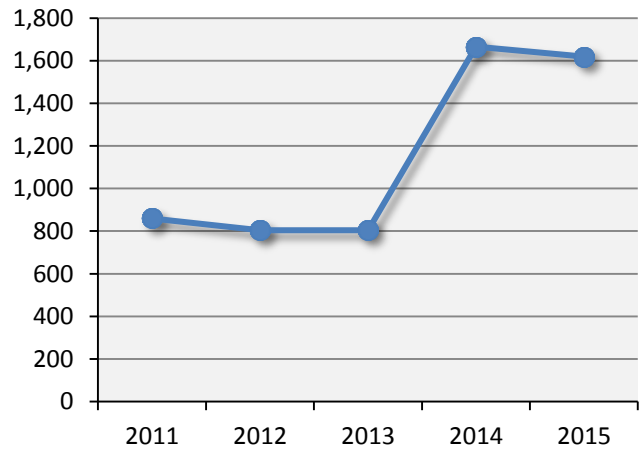


Demand Response Performance Measures

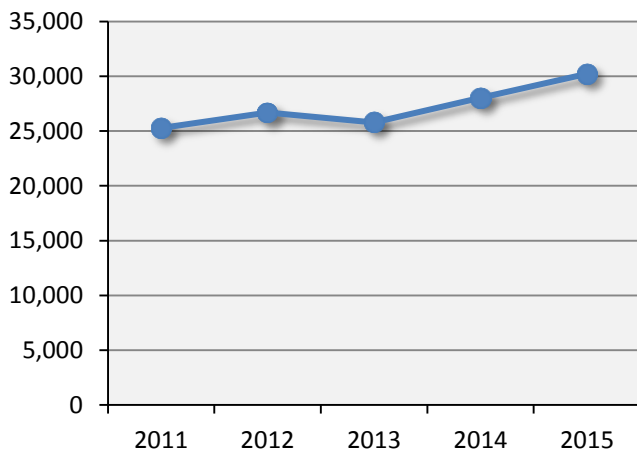
Service Area Population



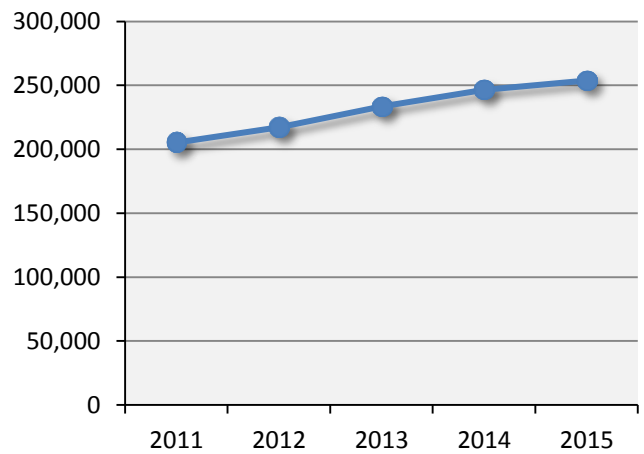
Service Area Population Density (sq mi)



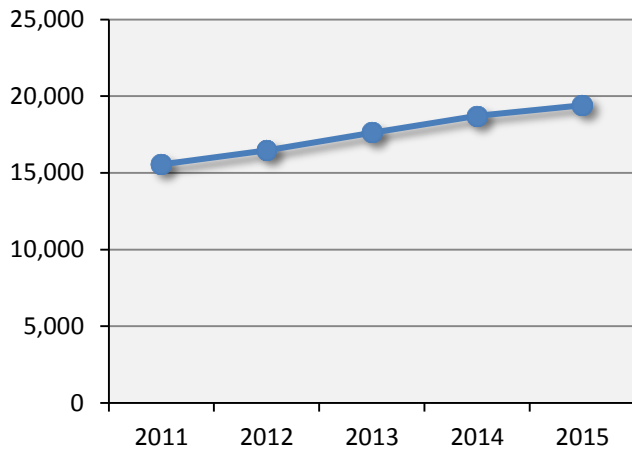
Passenger Trips



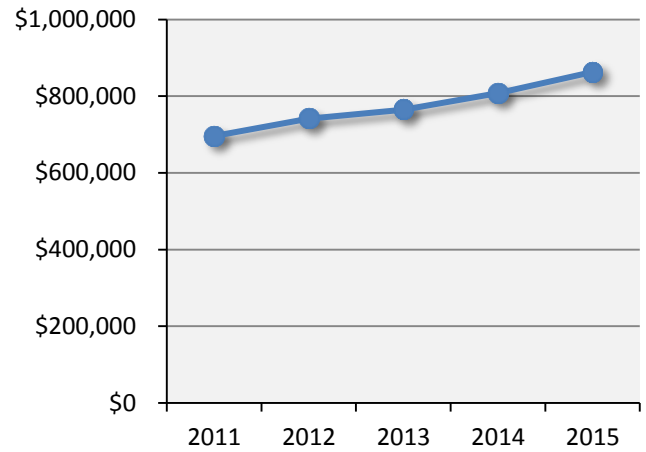
Revenue Miles



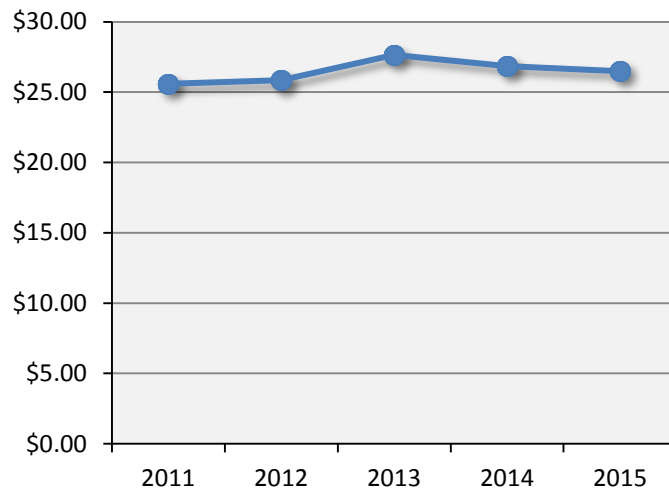
Revenue Hours



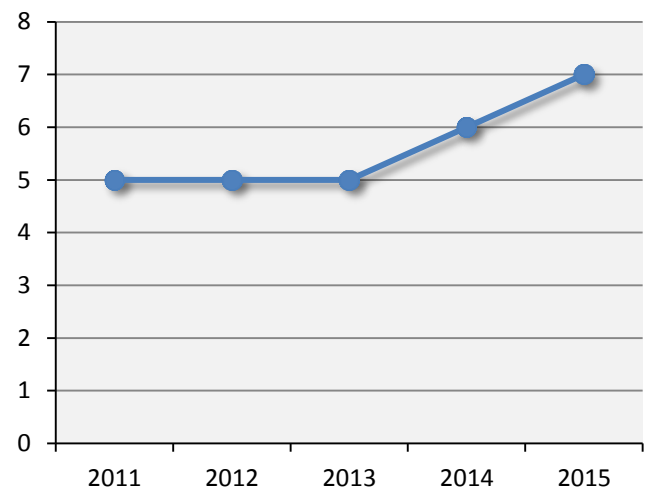
Operating Expense (000)



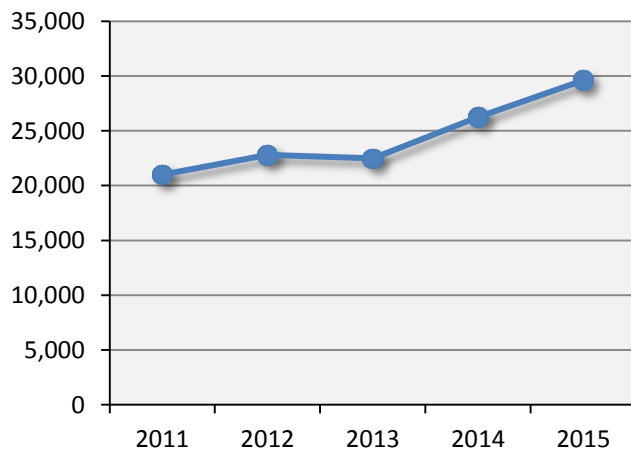
Subsidy per Passenger



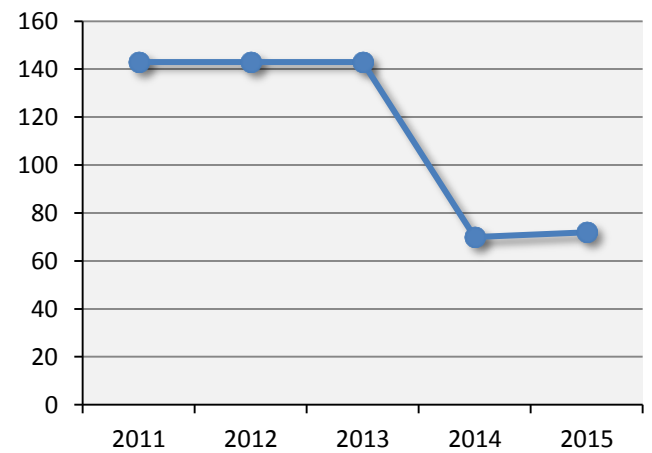
Vehicles Operated in Maximum Service



Fuel Consumption (gal)

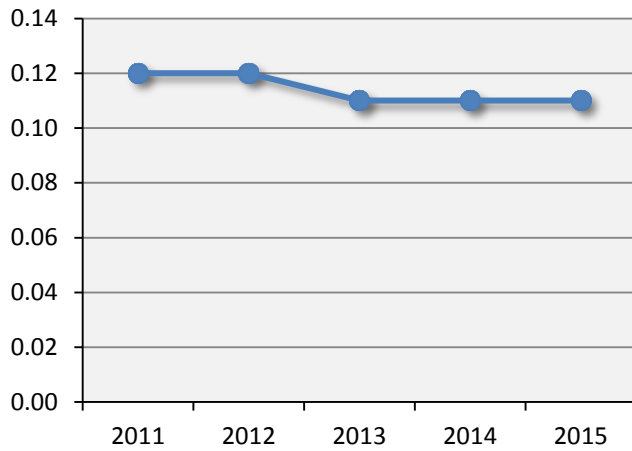


Service Area Size (sq mi)

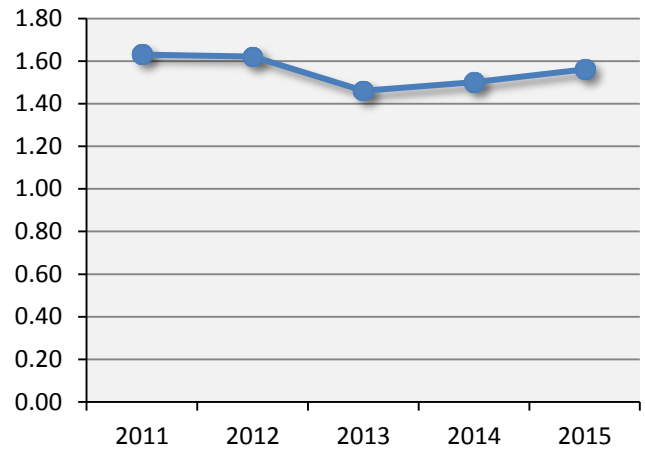


Demand Response Effectiveness Measures

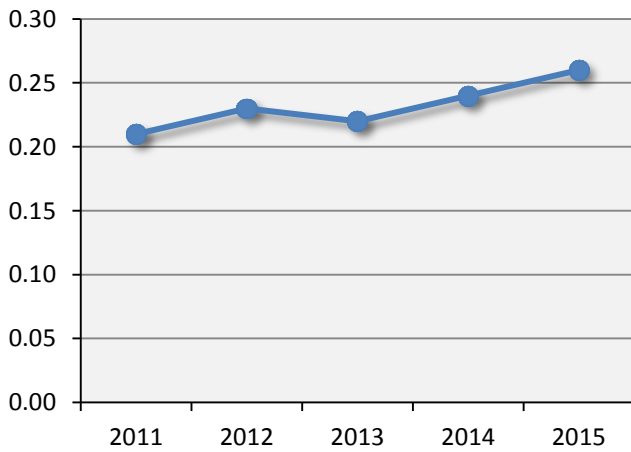
Passenger Trips per Revenue Mile



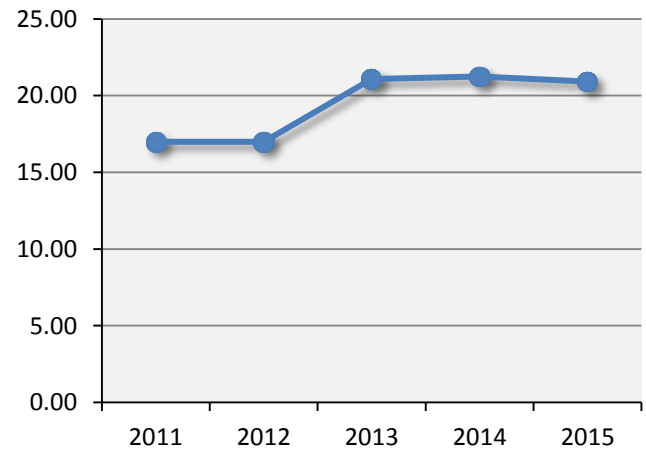
Passenger Trips per Revenue Hour



Passenger Trips per Service Area Capita

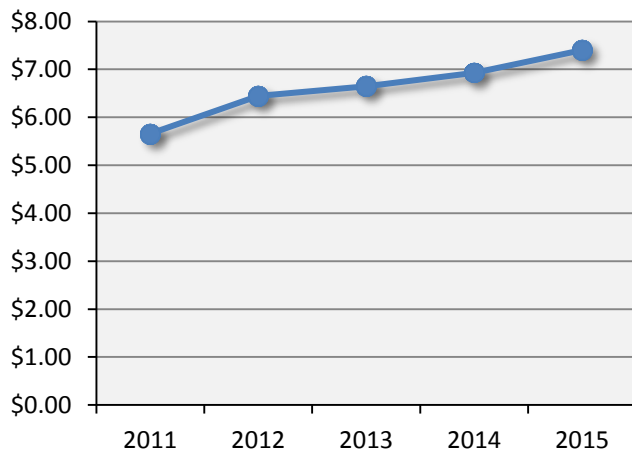


Weekday Span of Service (hrs)

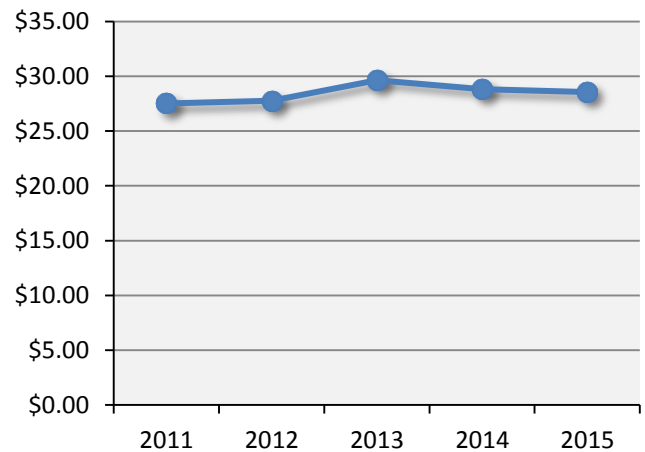


Demand Response Efficiency Measures

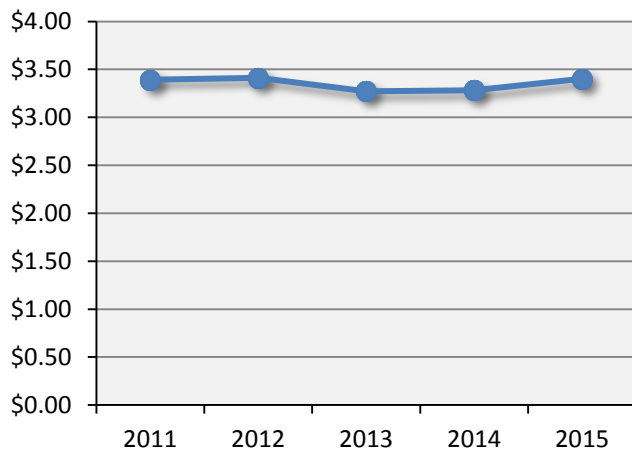
Operating Expense per Service Area Capita



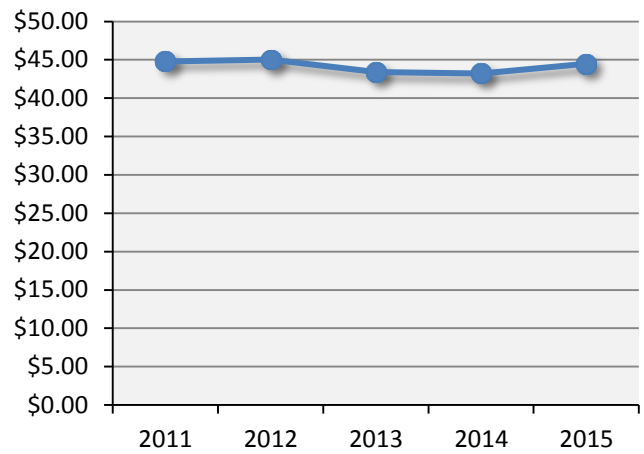
Operating Expense per Passenger Trip



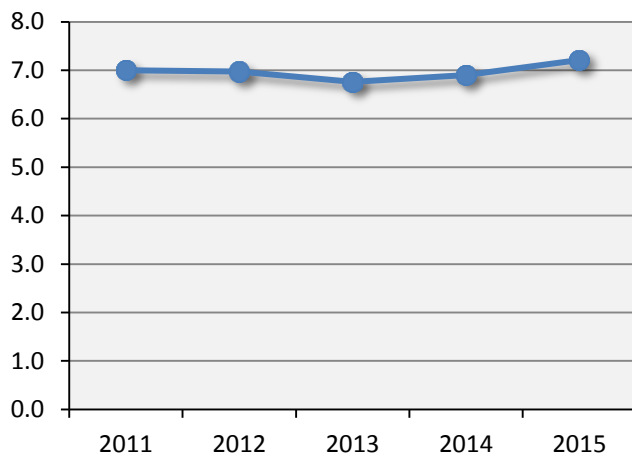
Operating Expense per Revenue Mile



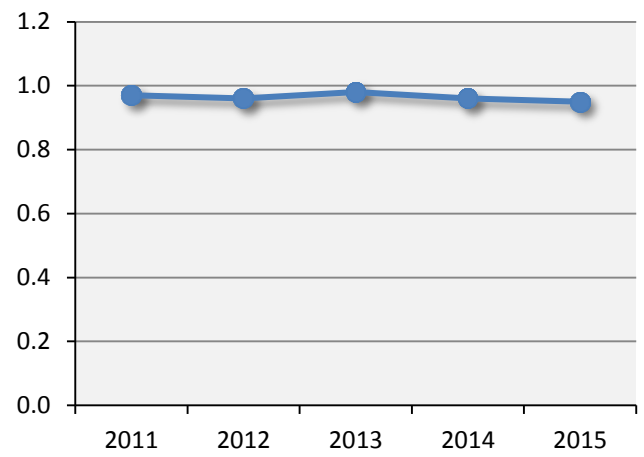
Operating Expense per Revenue Hour



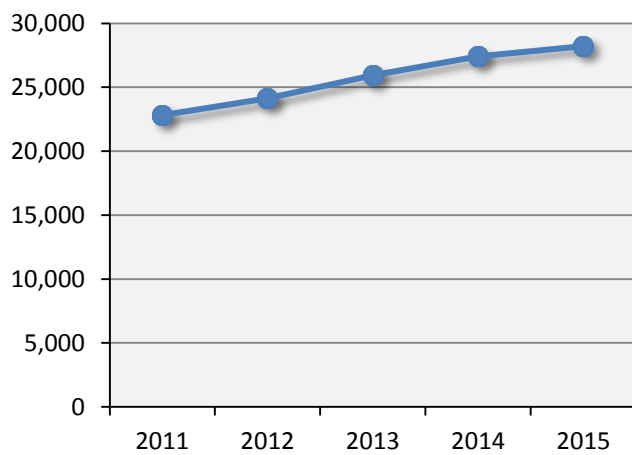
Farebox Recovery Ratio (%)



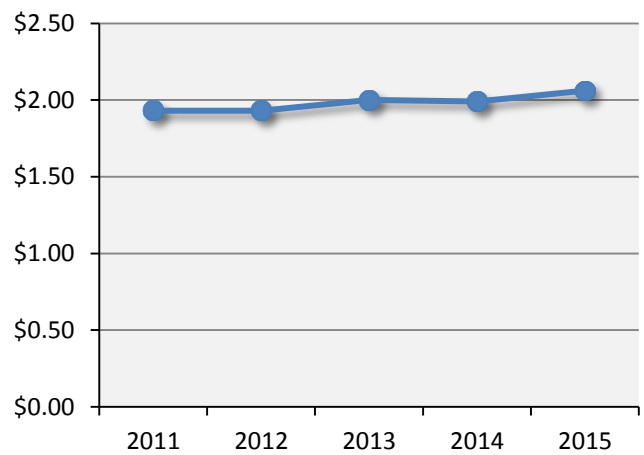
Revenue Miles per Vehicle Mile



Revenue Miles per Total Vehicle



Average Fare



Appendix 4. Community Engagement Summary

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



August 2017

SRF No. 10113

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Introduction

A Community Engagement Plan was developed to help facilitate stakeholder and community engagement throughout the study. The Community Engagement Plan provided a framework for the outreach strategies, activities, and interactions with local stakeholders and the public by identifying the outreach purpose, targeted audience, timeline, and the intended outcome.

The DTA TDP Community Engagement Plan was focused on getting input on transit needs. It identified engagement strategies that facilitate both in-person and online options for stakeholders and the community to be involved and provide feedback early and often throughout the study. These strategies included:

- Policy Advisory Committee (PAC) meetings
- Technical Advisory Committee (TAC) meetings
- Stakeholder workshops
- Public input meetings
- Pop Up meetings
- Individual meetings
- General community, STRIDE, and employer survey

The following sections provide a summary of the community engagement activities performed for the DTA TDP update.

Policy Advisory Committee (PAC)

The consultant team met with the PAC throughout the duration of the project to seek their input on the TDP. The PAC consists of key DTA staff, DTA Board Members, MnDOT representative and members of the consultant team. The PAC is made up of members of the DTA Board. The first of five PAC meetings was held on January 25, 2017 and was used as an introduction to the Transit Development Plan (TDP) and to receive input on the following subjects:

1. What are some of the critical needs in the region regarding transit?
2. What would be some successful outcomes of the project?

The remaining four PAC meetings were used to present TDP updates and receive comments. The fifth and final PAC meeting included a recommendation to approve the TDP Update and pass it on to the DTA Board for final approval.

The key themes from the first PAC meeting are summarized below.

Technology

There is a need for better mobile applications with real-time schedule and bus location abilities. Real time mobile application will provide confidence in the service and add an element of convenience. There should be a balance between service provision/expansion and providing tools such as real-time mobile applications.

Transit Service

Access to regional service is of primary importance. The amount of service provided and its ability to get people where they need/want to go should be the focus. Providing service that meets the needs of the service industry is very important. Understanding shift start and end times and providing service at those hours is crucial to enabling service (and hospital) workers to utilize DTA service. An express-style late night service from downtown entertainment areas to major residential nodes in the city may address these types of trips.

Uniqueness/Innovation

Take advantage of the unique geographic features of Duluth. The spine running west to east along the lakefront, with its historic street grid, is an amenity that DTA should focus on. Important to “take the blinders off” – expanding our scope of transit and transportation alternatives to include innovative services such as Uber and SouthWest Prime, and bus rapid transit (BRT).

Land Use

Land use is a very important factor to the success of transit and the study must look at land use, transit-oriented development, and safe pedestrian connectivity. Coordinate with the City's Comprehensive Plan update.

Technical Advisory Committee (TAC)

The consultant team met with the TAC throughout the duration of the project to seek their input on the TDP. Members of the TAC include representatives from MnDOT, County, Cities of Duluth, Superior, Hermantown, Proctor, Metropolitan Interstate Council, and the University of Minnesota – Duluth. The first of four TAC meetings was held on February 6, 2017 and consisted of introducing the TAC to the study and receiving input on needs to be addressed by the project. The remaining three TAC meetings were used to present TDP updates and receive comments.

During the first TAC meeting, there were similar themed responses as were heard at the first PAC meeting, but reflecting the variety of members, there were also more specific needs mentioned.

Technology

Improved technology, such as a mobile app and Wi-Fi on buses, will help attract more millennials.

Transit Service

Improved frequency is important. Consider service options that don't require a transfer in downtown. Potential connections could be from the west to the Mall, from Lakeside to the Mall (via UMD), and Lakeside to UMD. Consider higher frequency service between Lincoln Park and Downtown. Improve span and weekend service for STRIDE customers. Improve DTA span on weekends. UMD students don't use transit is due to circuitous routing, lack of frequent service and trips that don't perfectly align with class schedules. DTA is the building block to regional system which is a goal of the MPO; what is required to make it feasible?

Facilities

Improve weather protection at bus stops and consider bus pull-outs at certain locations to make stops safer. Improve bus stop maintenance in the winter. Consider a transit center in Superior.

Marketing

Improve customer marketing to make transit service more attractive and change perception of transit users.

Stakeholder Workshop

The stakeholders include staff from public agencies and the general public, including area residents, community members, and underrepresented populations. The first stakeholder workshop was held on February 21, 2017 to introduce the stakeholders to the TDP and to participate in a Strengths Weakness Opportunities Threats (SWOT) analysis of the current DTA transit system. The second stakeholder meeting, held on July 19, 2017, was used to present TDP findings and receive comments.

The SWOT analysis of the current DTA transit system had the following findings:

Strengths

- Good customer service and great drivers
- Good access with lots of bus stops
- Reliable service
- DTC
- Clean buses and facilities
- Safe
- Affordable

Weaknesses

- Lacking frequency and span
- Too many stops
- Not enough shelters and amenities
- Website
- STRIDE reservation system
- Marketing/branding

Opportunities

- Improved frequencies and spans
- Potential to serve Hermantown and Proctor
- Mobile App technology
- Improved marketing
- Partnerships

Threats

- Funding
- Parking availability and affordability
- Perception
- Sprawled development
- Lack of business support

Priorities

- Improved frequency
- Longer service spans and more service on weekends
- Real-time information including signage and mobile app
- Improved marketing and branding
- Mobility manager

Public Input Meetings

An Open House was held on February 21, 2017 at the Duluth Transportation Center. People who attended the open house had the opportunity to comment on the reasons they do, or do not, ride DTA transit. They were also provided with the opportunity to select what they would prioritize for DTA transit service improvements. The most selected priority for improvements to DTA transit service was “span” running buses earlier and later, followed by “frequency” more buses per hour, and then “coverage” more convenient destinations. Two pop up meetings were held on February 21, 2017 (DTC Skyway) and February 22, 2017 (UMD campus). The pop up meetings were an informal conversation with community members and provided the opportunity to introduce the study, its purpose, how they can participate and an opportunity to take a survey (paper or online). The Open House and pop up meetings identified the following reasons for not using DTA transit service:

- No convenient stops at the mall area and downtown.
- Superior Street service and service to Walmart in Hermantown stop running too early.
- Need increased service during the evenings. Buses are not child or stroller friendly.
- Bus stops are not handicap accessible.

A second Open House was held on July 19, 2017 to present findings and recommendations of the TDP Update. People who attended the open house had the opportunity to comment on the findings and recommendations. The overall response to the proposed transit service recommendations was very positive and supported by the public.

Surveys

General Community Survey

A general community survey was performed to understand the needs and opportunities for transit service from current and potential DTA customers. The General Community survey:

- Had both paper and online (Survey Monkey) versions with 20 questions primarily asking about perceptions about current DTA service and recommendations for improvement.
- Included 8 optional socio-demographic questions and a chance to win \$25 Visa gift card.
- Was launched on February 11th, 2017 and remained open until April 10th, 2017.

The survey was promoted through several venues, including at an open house, stakeholder workshop, pop-up meetings, DTA and partner websites and via social media. A wide variety of organizations were involved in promoting the survey to ensure that the survey population is diverse enough to represent Duluth Metropolitan area. The following organizations helped with survey outreach:

- City of Duluth
- Duluth Workforce Center
- SOAR Careers
- United Way
- American Indian Community Housing Organization (AICHO)
- University of Minnesota at Duluth (UMD)
- Arrowhead Regional Development Commission (ARDC)/Metropolitan Interstate Council (MIC)
- Community Action Duluth
- St. Louis County Government Services
- Catholic Charities (for paper survey)
- Duluth Housing and Redevelopment Authority (HRA) (for paper survey)

The broad promotion of the survey generated 1,210 total responses (197 in paper version and 1,013 in online version).

Respondent Demographics

Thirty six percent of the respondents had less than \$20,000 household income, 21 percent fell into the \$20,000-\$49,999 household income range, and 22 percent were in the \$50,000-\$100,000 range. The age ranges for respondents were well distributed with 25 percent in the 19-24 years old range, 18 percent in the 25-34 range, 22 percent in 35-50 range and 23

percent in 51-60 years old range. About 8 percent respondents belonged to the 65+ years old category.

Analysis was performed to compare demographic characteristics of online versus paper sample of respondents. The paper survey respondent sample had 61 percent respondents with an age more than 51 years and 65 percent respondents with household income less than \$20,000. The online survey respondent sample had 24 percent respondents with an age more than 51 years and 30 percent respondents with household income less than \$20,000.

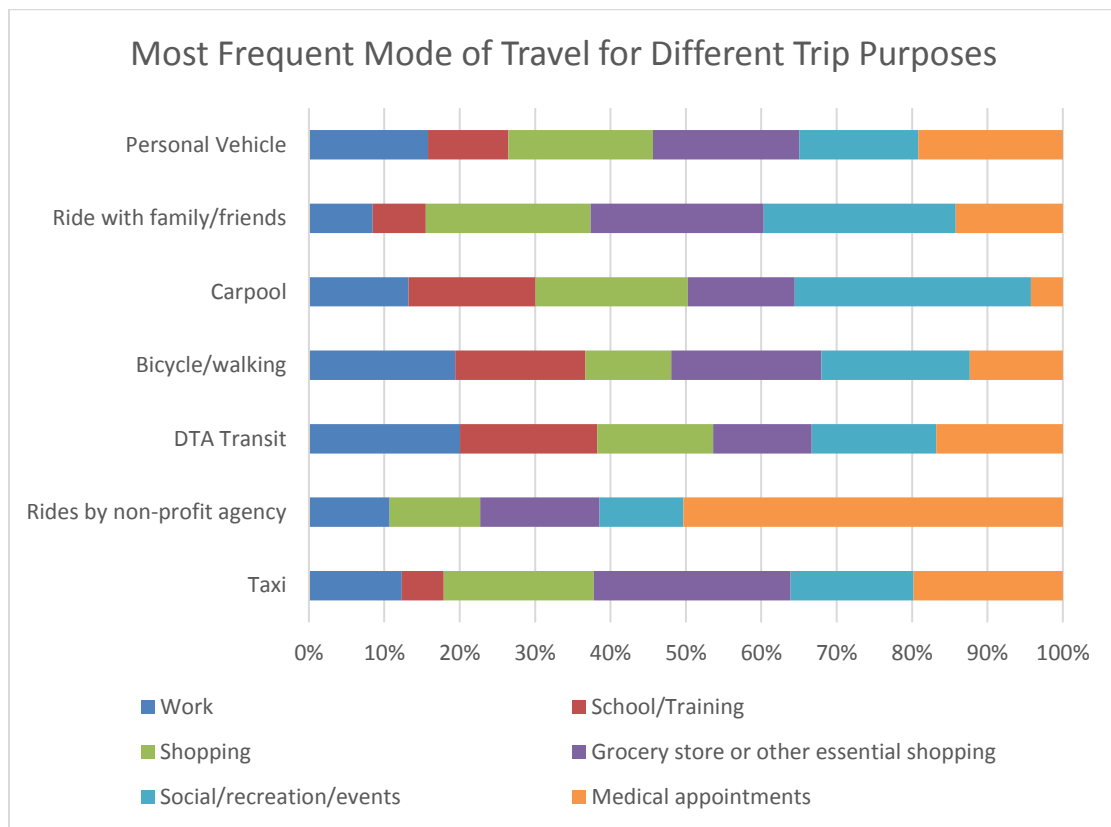
Primary Purpose of Trip and Chosen Mode

As shown in Figure 1, trips using personal vehicle were almost equally distributed between the 6 trips purposes. Carpool was more commonly used for social or recreational trips while almost 20 percent of DTA transit trips were for work with school and medical trips accounting for about 17-18 percent. About 50 percent of trips using rides by non-profit agencies were made to medical appointments.

Online and paper version survey responses were analyzed to indicate any difference in response to Question 1.

- The paper survey respondents are older and with lower household income, and have a higher usage of DTA Transit and taxi for different trip purposes as compared to online survey respondent sample.
- DTA transit trips were well distributed between the different trip purposes for paper survey respondents while the online survey respondents used DTA transit more for work and school/training trips.
- Paper survey respondents selected rides using non-profit agencies for shopping, essential shopping, social/recreational and medical purpose trips, whereas online survey respondents did not.

Figure 1. Primary Trip Purpose and Most Frequent Mode of Travel



Primary Purpose of Trip, Household Income and Age

As shown in Figure 2, the highest share of personal vehicle trips for all trip purposes belongs to the \$50,000-\$100,000 household income group. DTA Transit trips had higher share of respondents with household income less than \$20,000 and the respondent group with household income over \$100,000 had the least share (as shown in Figure 3).

As shown in Figure 4, the highest share of personal vehicle trips for all trip purposes belongs to the 19-24 age group which is also the most dominant age group in the survey sample. DTA Transit trips had a higher share of respondents with age 19-24 years for school/training trip purpose (as shown in Figure 5). Trip purposes of shopping, essential shopping, social/recreation and medical appointments had more respondents older than 51 years taking DTA transit for their trips.

Figure 2. Personal Vehicle Trips and Household Income for Respondents

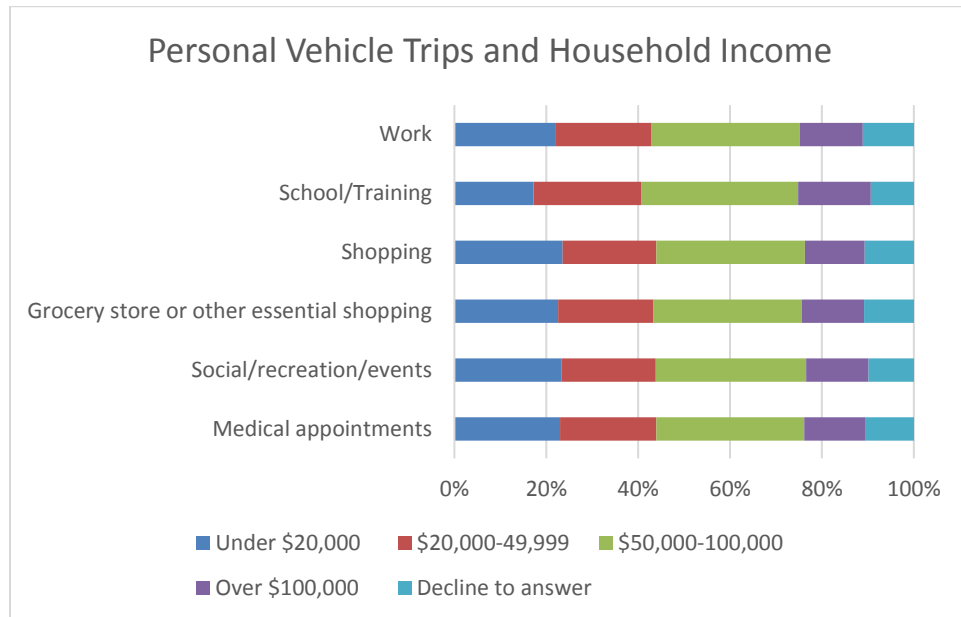


Figure 3. DTA Transit Trips and Household Income for Respondents

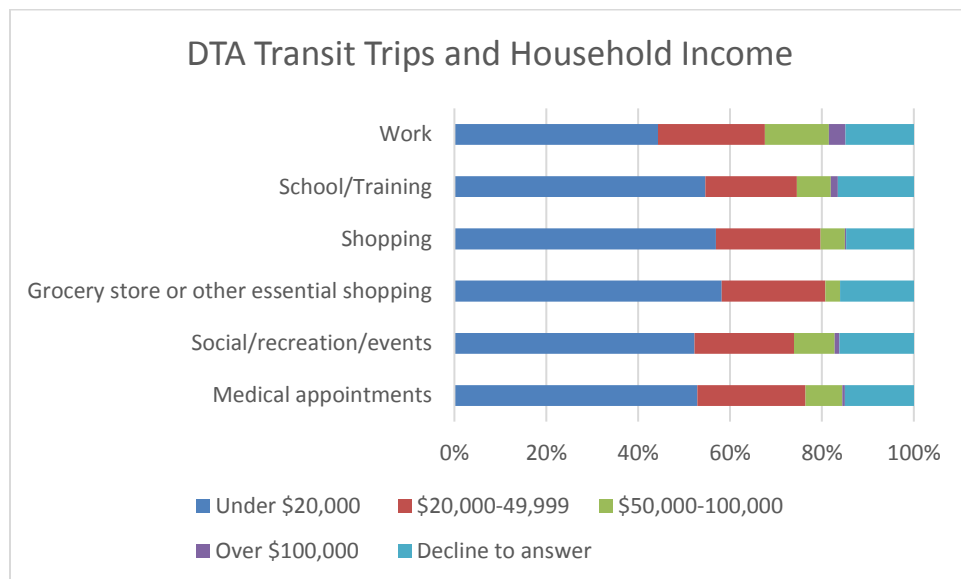


Figure 4. Personal Vehicle Trips and Age for Respondents

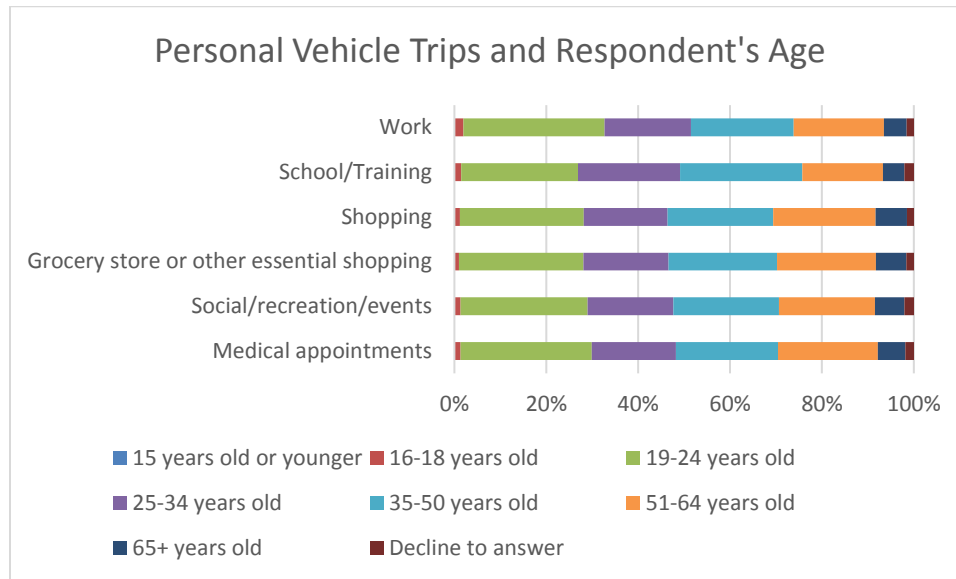
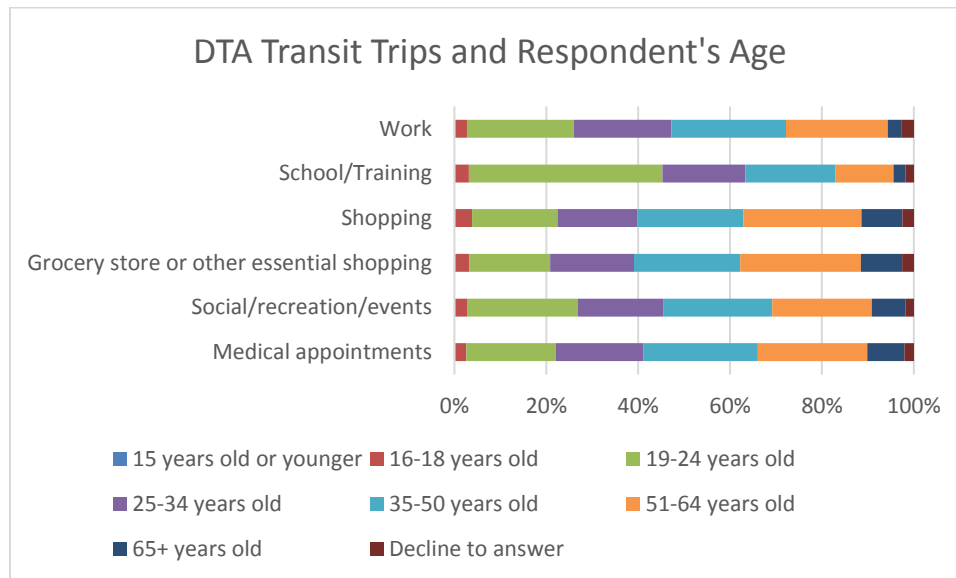


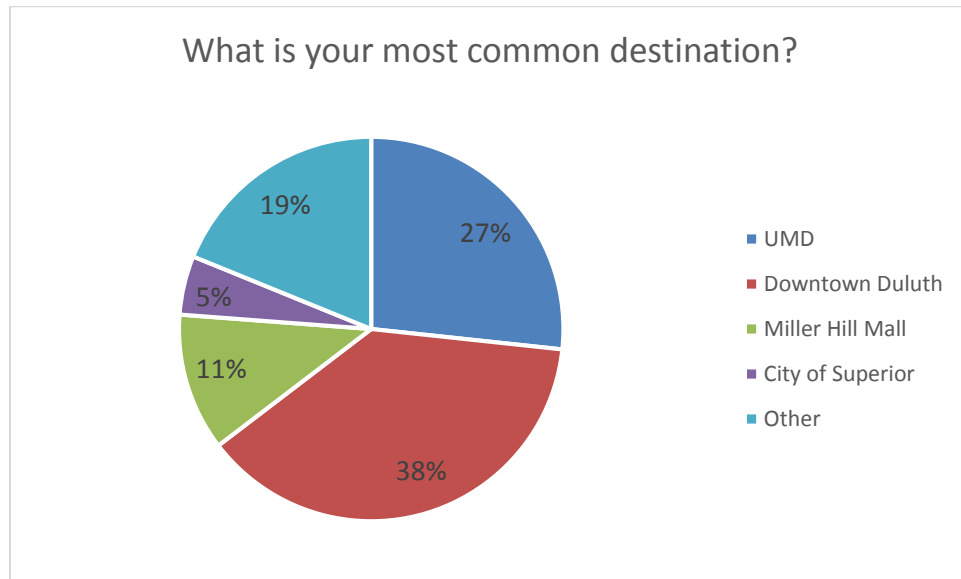
Figure 5. DTA Transit Trips and Age for Respondents



Most Common Destinations

As shown in Figure 6, Downtown Duluth was the most selected response and University of Minnesota at Duluth (UMD) was the next most common response.

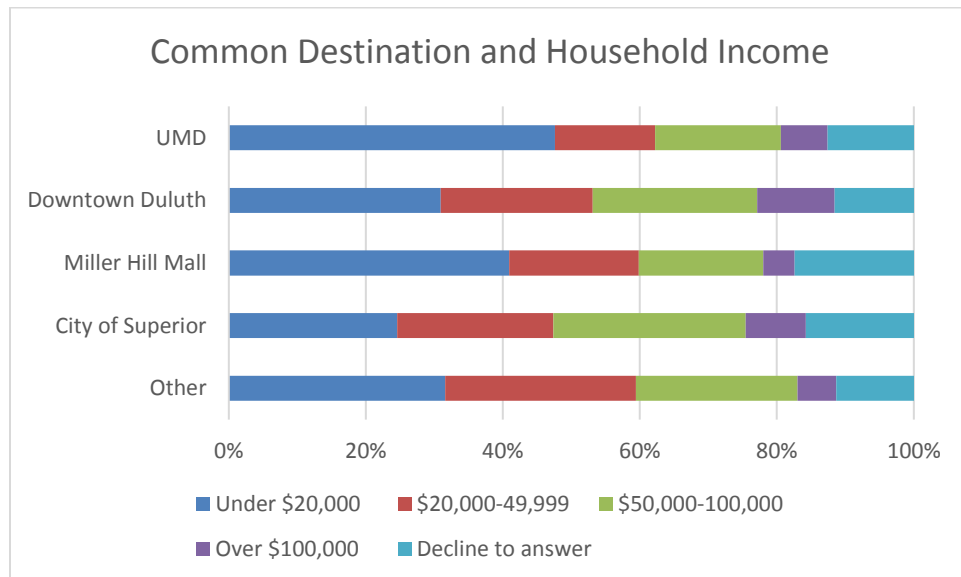
Figure 6. Most Common Destinations for Respondents



Most Common Destination and Respondent's Household Income

As shown in Figure 7, UMD and Downtown Duluth are the most common destinations for all income groups. The under \$20,000 household income respondents had more than 20 percent share for each most common destination while the next major share was for income group \$20,000-\$40,000.

Figure 7. Most Common Destinations and Household Income for Respondents



Potential Destinations

As shown in Figure 8, 26 percent respondents indicated a preference for London Road as a potential destination, while 21 percent respondents indicated ‘other’ as their response and included specific destinations. The ‘other’ responses included a combination of Walmart, Miller Hill Mall, Downtown Duluth and UMD (as shown in Table 1).

Figure 8. Potential Destinations for Respondents

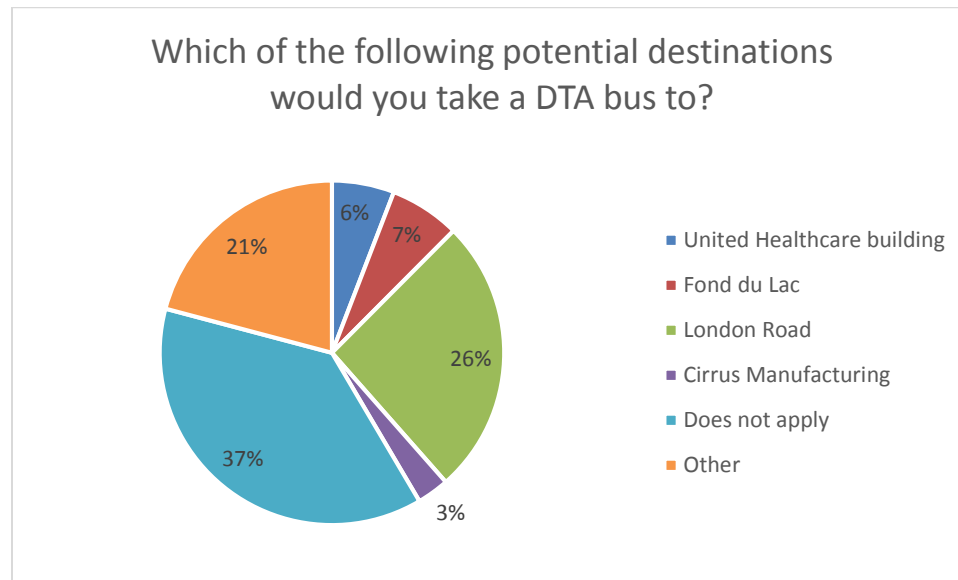


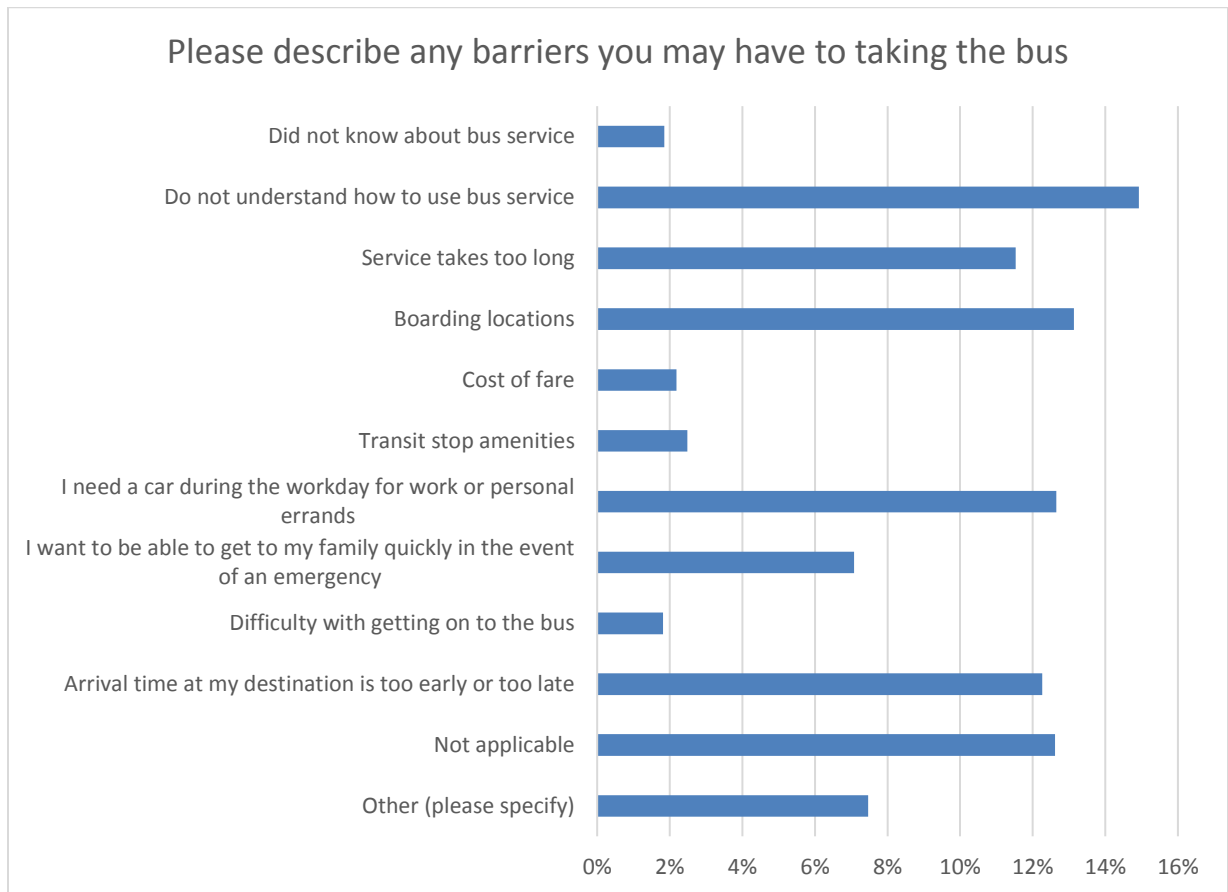
Table 1. Text Analysis and Categorization of ‘Other’ Responses for Potential Destinations

Destination	Number of Occurrences	Percent Occurrences
Walmart	17	6%
Miller Hill Mall	39	14%
Downtown	33	12%
UMD	33	12%
Other (User specific)	207	75%

Barriers Affecting Transit Ridership

Survey respondents were asked to indicate the barriers that they may have to riding the DTA bus. Although the questions had 15 percent response rate (out of which 13 percent are paper responses), the responses indicate some key barriers associated with taking transit. As shown in Figure 9, the most selected barriers were ‘do not understand how to use bus service’, ‘boarding locations’, ‘I need a car during the workday for work or personal errands’, ‘service takes too long’ and ‘arrival time at my destination is too early or too late’.

Figure 9. Barriers to Riding DTA Transit as Indicated by Respondents

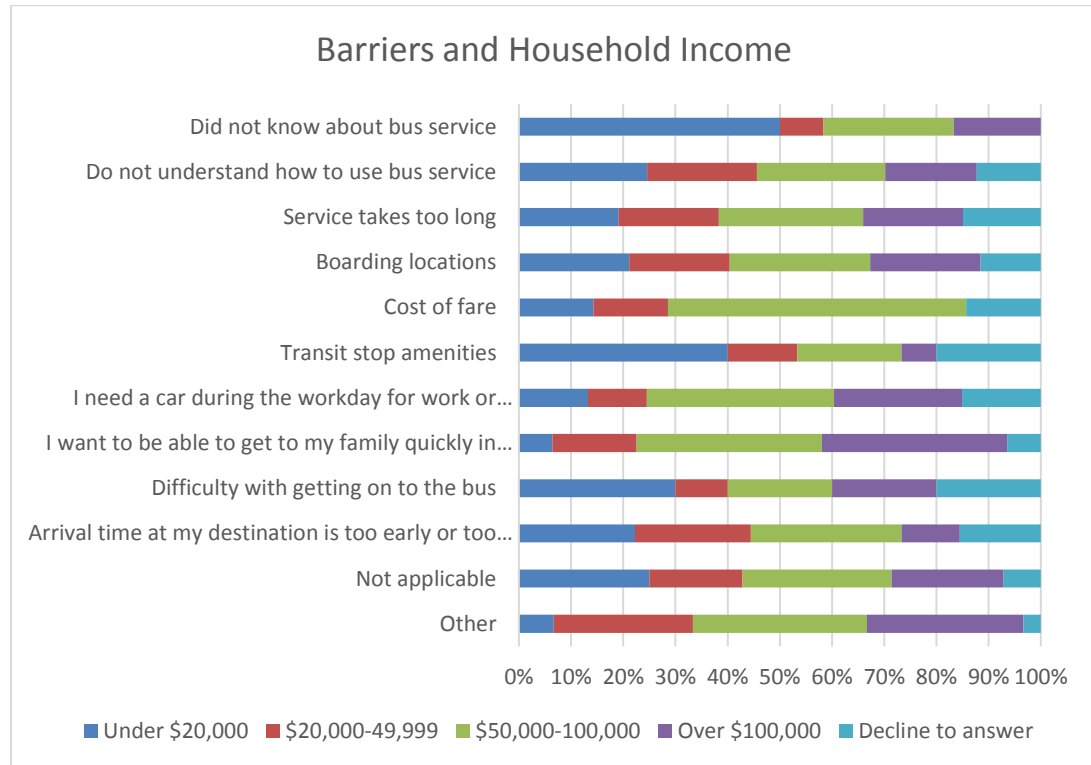


Barriers and Household Income

As shown in Figure 10, for the respondents with a household income less than \$50,000, the most selected barrier was ‘Do not understand how to use bus service’. Fifty percent of the respondents indicating ‘Did not know about bus service’ belonged to the group with a household income less than \$20,000. Respondents with a household income more than \$50,000, mostly selected the barrier ‘I need car during the workday for work or personal errands’ and ‘I want to be able to get to my family quickly in the event of an emergency’.

Barriers like ‘Service takes too long’ and ‘Boarding locations’ were indicated by all household income groups at a consistent share.

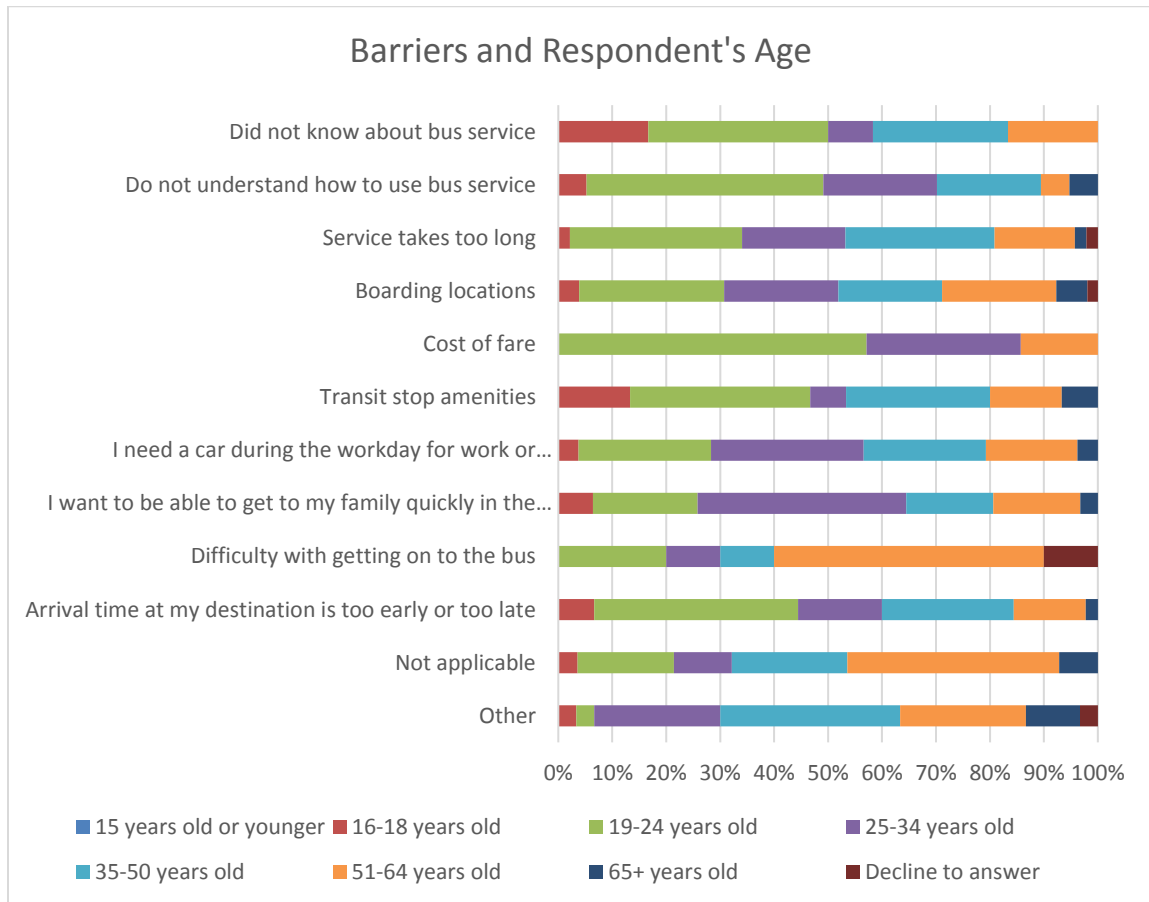
Figure 10. Barriers to Riding DTA Transit and Respondents’ Household Income



Barriers and Respondents’ Age

As shown in Figure 11, 50 percent of the respondents indicating the barriers ‘Did not know about bus service’ and ‘Do not understand how to use bus service’, were less than 25 years old. Respondents older than 65 years indicated each ‘Do not understand how to use bus service’ and ‘Boarding locations’.

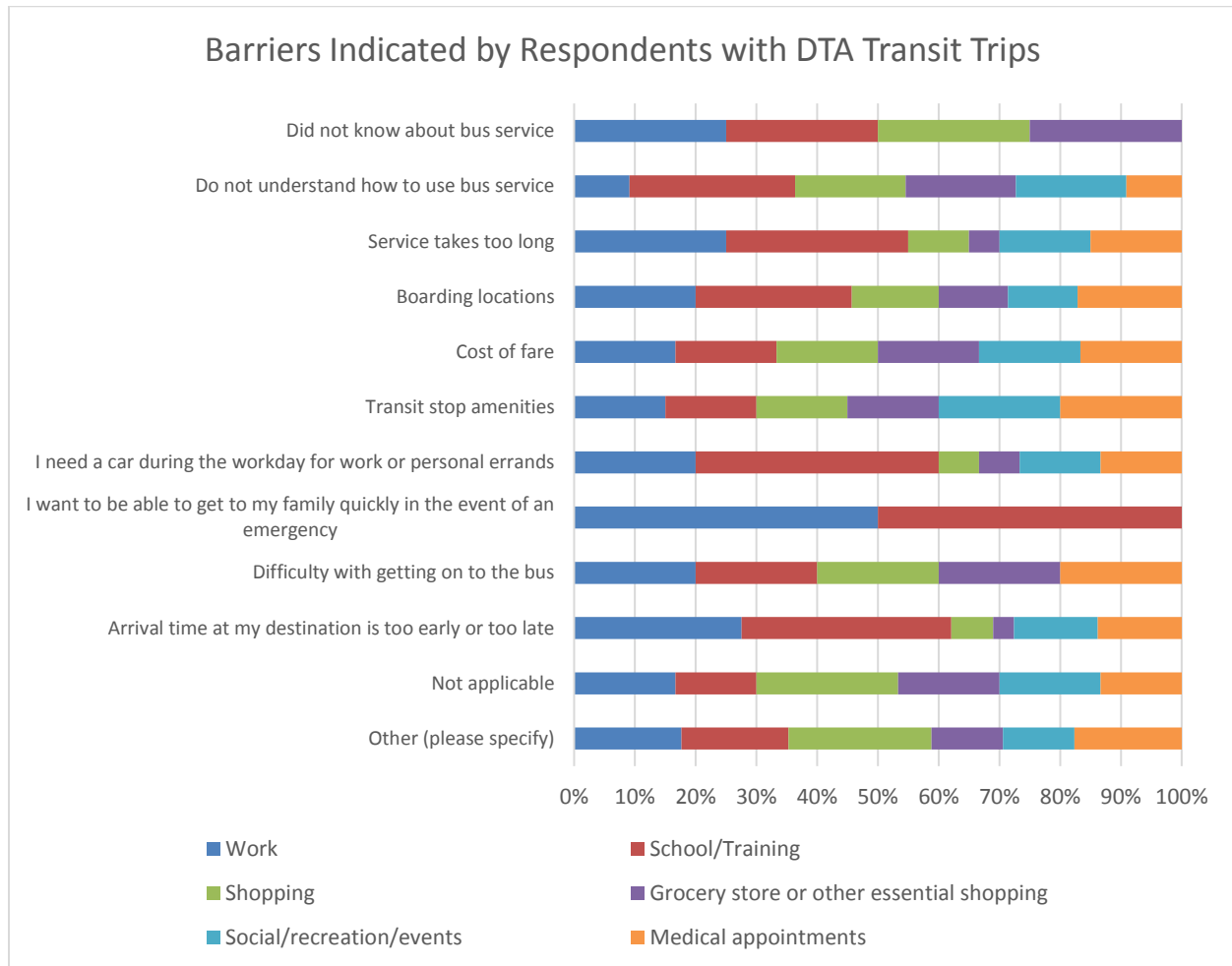
Figure 11. Barriers to Riding DTA Transit and Respondents' Age



Barriers and Primary Purpose of Travel

As shown in Figure 12, for existing DTA Transit users, the two major barriers that may limit their transit use were 'boarding locations' and 'arrival time at destination too early or too late'. These transit users were mostly using transit for work and school trips.

Figure 12. Barriers to Riding DTA Transit and Purpose of Travel (DTA Transit Trips)



Respondents who don't understand 'How to use the Bus'

To understand the demographic and travel characteristics of respondents who indicated that they don't understand how to use the bus, the distribution of race/ethnicity, household income, age and primary purpose of travel were analyzed for the subset.

Ninety five percent of subset respondents¹ were white/Caucasian. As shown in Figure 13, 25 percent of respondents belonged to each household income group of under \$20,000 and \$50,000-\$100,000. Forty four percent of the subset respondents belonged to the 19-24 years old age group (as compared to 25 percent in the survey sample). As shown in Figure 14, 3 percent of the 65+ age group subset respondents indicated that they 'don't understand how to use the bus' while 9 percent of the 19-24 age group subset respondents indicated the same.

¹ Subset respondents is used for the respondents who indicated that they don't understand how to use the bus.

Figure 13. Annual Household Income Distribution of Respondent Subset

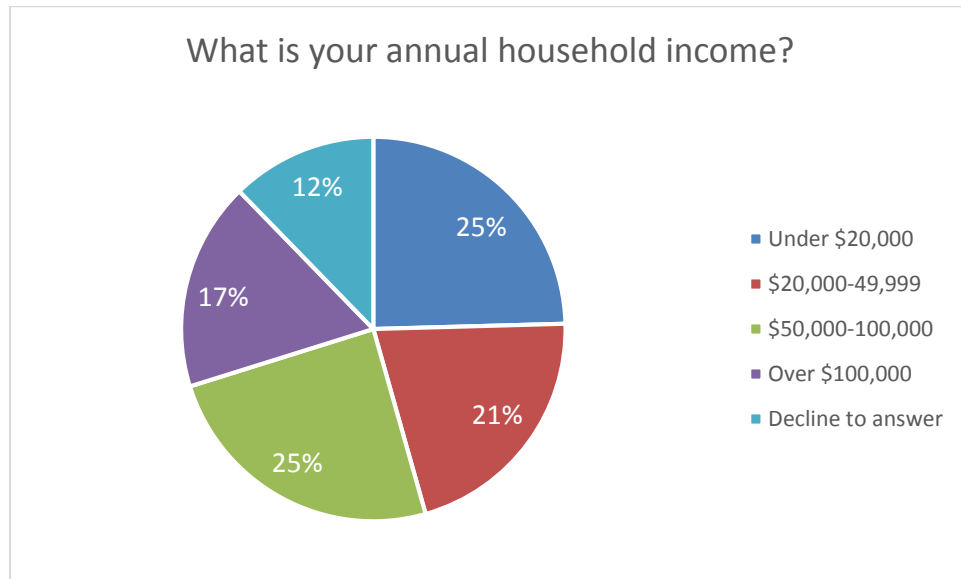
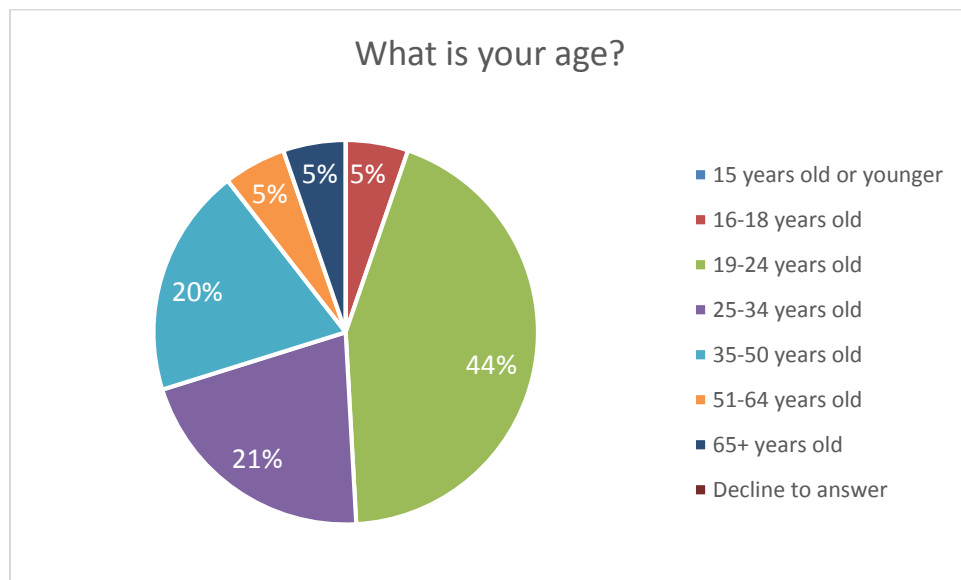


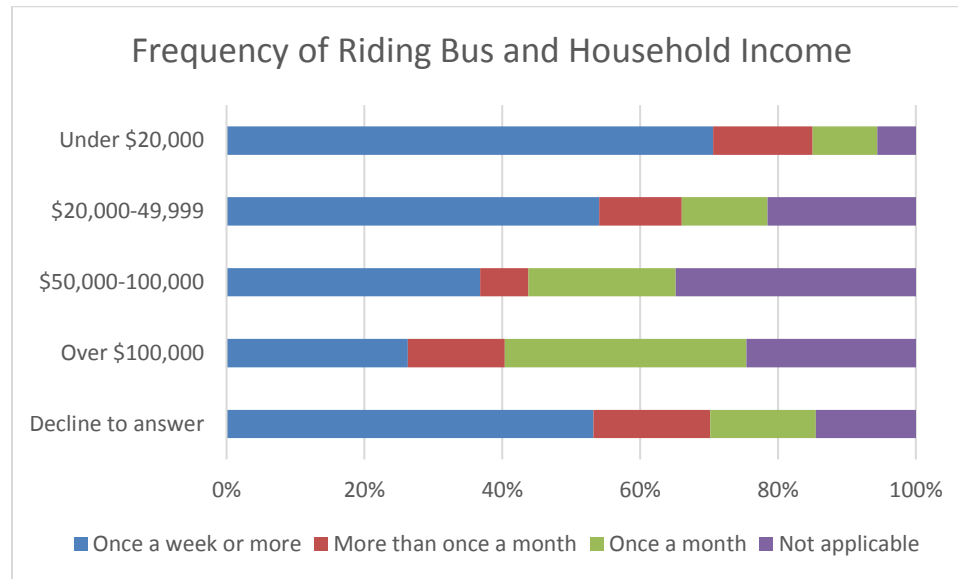
Figure 14. Age Distribution of Respondent Subset



Household Income and Frequency of Ridership

As shown in Figure 15, 57 percent of the respondents riding DTA transit once a week had a household income less than \$20,000. The highest share (35 percent) of respondents riding DTA transit once a month belonged to the \$50,000-\$100,000 household income range followed by less than \$20,000 range (28 percent). Seventy one percent of respondents with less than \$20,000 household income rode DTA transit once a week while 14 percent rode DTA transit more than once a month. Thirty five percent of respondents with household income more than \$100,000 rode DTA transit once a month followed by 26 percent riding transit once a week.

Figure 15. Frequency of Riding Bus and Household Income of Respondents

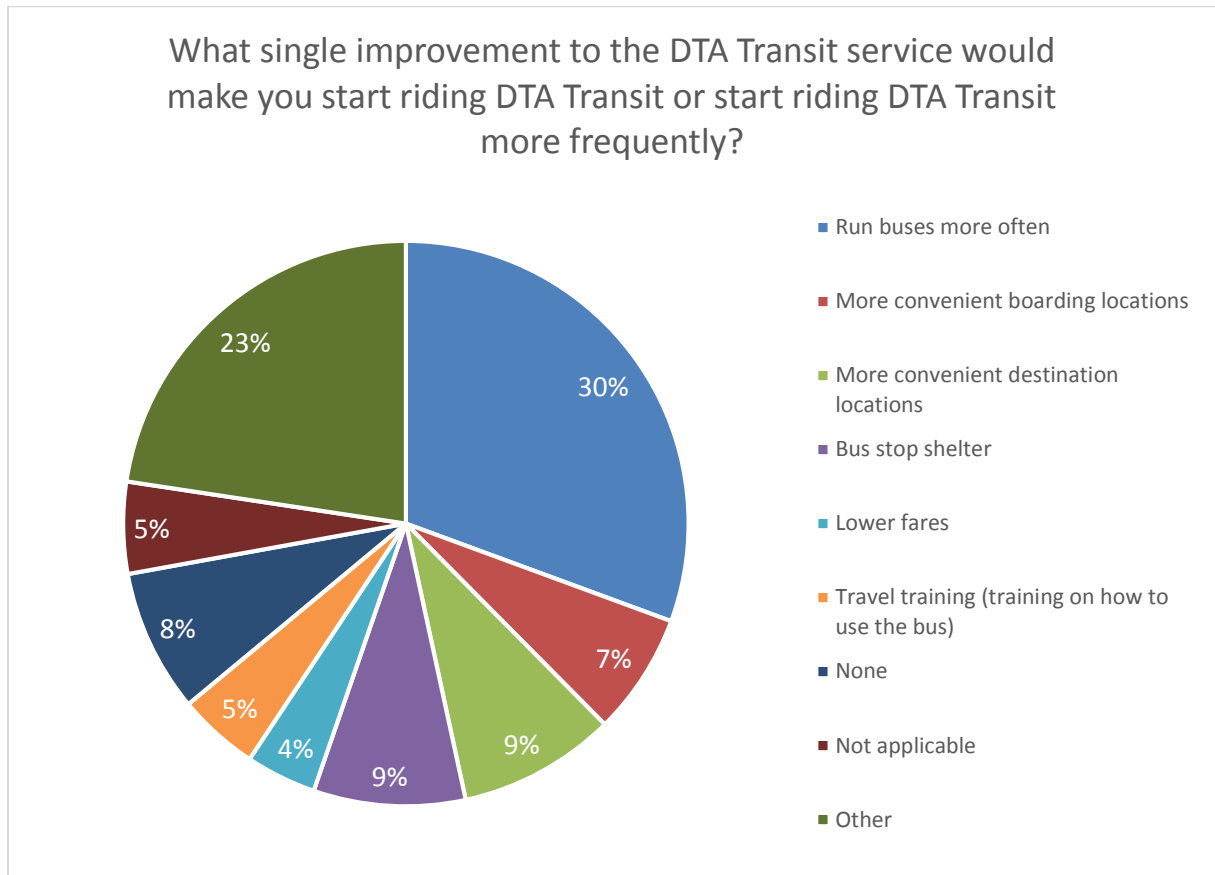


Improvement Suggestions for DTA Transit

The survey asked the respondents to indicate what single improvement to the DTA Transit service would make them start riding DTA Transit or start riding DTA Transit more frequently. As shown in Figure 16, 30 percent of respondents indicated ‘run buses more often’ as their suggested improvement while 23 percent had specific suggestions and marked an ‘other’ response. The open-ended responses were analyzed separately to carefully categorize each response into one or more of the following five categories:

1. **Service:** The responses in this category mentioned service hours, frequency of service, on-time function and quicker service.
2. **Routes and Stops:** The responses in this category include service to specific destinations, accessibility issues for vehicle and stops and amenities.
3. **Drivers and Buses:** The responses in this category include driver’s social and driving behavior, cleanliness of buses and dogs on the buses.
4. **Fares:** The responses in this category include mentions about fare being reasonable or not, passes, kiosk, payment options, etc.
5. **Technology:** The responses in this category include mentions of technology (like mobile applications, improvement in website, etc.) to improve service.

Figure 16.Improvement Suggestions by Respondents



General Comments for DTA Transit

The survey asked the respondents to provide general comments about DTA Transit. The responses were open-ended and were analyzed by carefully categorizing each response. Six categories were selected:

1. **Service:** The responses in this category mentioned service hours, frequency of service, on-time function and quicker service.
2. **Routes and Stops:** The responses in this category include service to specific destinations, accessibility issues for vehicle and stops and amenities.
3. **Drivers and Buses:** The responses in this category include driver's social and driving behavior, cleanliness of buses, dogs on the buses, accurate information display for route numbers on buses, etc.
4. **Fares:** The responses in this category include mentions about fare being reasonable or not, passes, kiosk, payment options, etc.
5. **Technology:** The responses in this category include mentions of technology (like mobile applications, improvement in website, etc.) to improve service.

6. Marketing: The responses in this category included comments about understanding how to use bus, travel training, providing information about routes, marketing for changes in service, etc.

Major Findings

The results of this survey create a clear picture of who benefits from transit service in Duluth, what the service is most frequently used for, and how to improve the service to meet the needs of riders.

People with incomes below \$20,000 a year are the most frequent users of the transit system across reasons for trips, but also represented a significant portion of respondents that did not know how to use the bus service. Young people under the age of 25 largely responded that they didn't know how to use the bus service, this provides an opportunity for targeted education. Partnering with an institution, like schools or universities, will provide an effective venue and population. Overall, not knowing how to ride the bus was widely reported across age and annual earnings, so general education campaigns could also benefit ridership.

More than half of people who responded that their most common destination while using transit was the City of Superior made more than \$50,000 a year, which was the highest ridership for earners over that value of any destination. There was an even balance of incomes that most frequently use the service to reach downtown Duluth. London Road was chosen the most among options for expansions of service locations.

Resoundingly, riders chose higher frequency of routes as the one improvement they would most like to see. Bus shelters and more convenient destination locations followed as the next most popular choices for improvements, both garnering just under ten percent of respondents.

STRIDE Survey

The purpose of the STRIDE survey was to understand the STRIDE rider's perception of the STRIDE service, willingness to use other transportation services (including public transit) and service improvement suggestions. After discussing with DTA, the consultant team designed a 7-question survey. DTA staff conducted phone interviews from March 23 to April 17, 2017 and 180 responses were sought. To ease the process of notes taking and data entry during phone interviews, consultant staff designed the survey on Survey Monkey and provided manual data-entry (data-entry kiosk) link to the phone interviewers. The analysis of STRIDE survey data is not included in this summary since the analysis is being conducted in-house by DTA.

Employer Survey

The purpose of the employer survey was to get a better understanding of the role transit service plays in increasing the labor shed, lower absenteeism, and general benefit to businesses. The survey consisted of 20 questions primarily asking about the employer's workforce and commuter incentive programs.

Working with DTA, MIC and City of Duluth staff, a list of employers was created. The employers were contacted by phone to garner their interest in participating in the survey. Those who agreed to take the survey were sent a link to Survey Monkey for access to the survey. Ten responses were received for the survey. Seven out of the ten responses were filled out by St. Luke's hospital or clinic at different locations in Duluth area (including one in Superior, WI). The three other respondents were Ecumen Lakeshore, Chris Jenson Health and Rehabilitation Center and Edgewater Hotel and Waterpark. However, St. Luke's at 915 E 1st Street only responded to the first three questions about employment location, number of employees and parking. Hence, most of the analysis only deals with 9 responses.

Number of Employees and Employee Parking

The survey asked the respondents to provide the number of employees at their location. Seven out of ten respondents answered the question. Table 2 shows the number of employees working at each of the respondent's employment location (7 employers responded to the question). Only Edgewater Hotel and Waterpark has seasonal or contractual employment (January through August). Also, all employers indicated that their employees worked onsite at the listed location.

Table 2. Number of Employees in Each of the Respondent Employer Location

Name of Organization	Location	Regular full-time	Regular part-time	Additional contract/seasonal	Total Employees
Chris Jensen Health & Rehabilitation Center	Duluth	78	200		278
Edgewater Hotel & Waterpark	Duluth	30	180	30	240
St. Luke's	Superior				57
St. Luke's Cardiology Associates (Superior St)	Duluth	30			30
St. Luke's Hospital (2 nd St)	Duluth	39			39
St Luke's OB/GYN Clinic (1 st St)	Duluth	19	17		36
St Luke's (1 st St)	Duluth	200	150		350

All respondents indicated that they provide parking to their employees except two of the St. Luke's locations. St. Luke's provides employee parking at a charge to the employee at 4 of their locations with 2 locations charging \$36 (St. Luke's OB/GYN) and \$ 40 per month (915 E 1st St). St. Luke's Superior location does not charge for parking.

Commute Information or Assistance

None of the 9 respondent employers:

- Provided assistance in forming carpools/vanpools.
- Had commute/transportation information office or staff.
- Organized events to promote use of alternatives to driving alone (e.g. transportation fairs, bike to work day, contests, etc.).
- Had an employer newsletter or website that provides information about commute alternatives.
- Had a commuter or daytime shuttle to/from the employment site.

Only Chris Jensen Health and Rehabilitation Center provided their employees information about commuter options (e.g. bus schedules).

Special Employee Programs or Services

Four employees (Ecumen Lakeshore, Chris Jensen Health and Rehabilitation Center, Edgewater Hotel and Waterpark and St. Luke's on E 1st St) have flexible work hours for their employees. Moreover, Ecumen Lakeshore and St. Luke's on E 1st St also have telecommuting options for their employees while Chris Jensen Health and Rehabilitation

Center and St. Luke's OB/GYN Clinic have compressed work schedule (e.g., 4-10, 9-80, 3-36) availability.

Employee Incentives

The survey asked the employers to indicate the incentives they provide for their employees and this section summarizes the responses:

Only Edgewater Hotel and Waterpark offers guaranteed/emergency ride home program to their employees (offers employees who did not drive alone a taxi ride home in case of an emergency)

None of the employers provided any of the following incentives:

- Preferential parking for carpools/vanpools.
- Financial incentives for bicycling, transit, walking, carpooling, telecommuting, vanpooling (e.g., subsidies, bonuses, random financial rewards, etc.).
- Transportation allowance (employer helps offset transportation costs).
- Pre-tax set-aside to pay for transit or vanpool costs (also known as Commuter Choice).
- Other incentives to encourage people not to drive alone (e.g., prize drawings).

Employee Commute Characteristics

Table 3 shows the estimated employee commute characteristics for 4 employers which responded to the survey question. Edgewater Hotel and Waterpark representative indicated that 45 percent of their employees commute by public transit.

Table 3. Estimated Percentage of Employees Commuting to Work Location Using Different Modes

	Percent Employees Commuting by the Following Modes						
	Drive alone	Get a ride/drive with another person/carpool	Public transit	Participate in a vanpool	Walk	Bike	Other
Edgewater Hotel & Waterpark	40	5	45		10		
St. Luke's - Superior	100				0		
St. Luke's (East 1st St.)	75	10		10	5		
St Luke's OB/GYN Clinic	100						

Work Schedule

Six employers responded to the survey question asking about their employees' work schedule.

- Chris Jenson Health and Rehabilitation Center indicated that they had three work shifts every weekday: 6 a.m. – 2 p.m., 2 p.m. – 10 p.m. and 10 p.m. – 6 a.m.
- Edgewater Hotel and Waterpark indicated that they had three work shifts every weekday: 6 a.m. – 3:30 p.m., 3 p.m. – 10 p.m. and 10 p.m. – 6 a.m.
- St. Luke’s Cardiology Associates indicated that they had 8 a.m. – 4:30 p.m. work shift every weekday.
- St. Luke’s OB/GYN Clinic indicated that they had 8 a.m. – 5 p.m. work shift every weekday.

Commute Issues facing Employees

The survey questionnaire included an open-ended question that asked the respondents about the any employee-related issues/concerns/needs about commutes. The respondents were also asked to indicate any specific transportation workforce issues/needs for seniors, people with disabilities, immigrants/refugees, etc.

Chris Jenson Health and Rehabilitation Center representative wrote, “The bus that comes to our facility does not run if University of Minnesota at Duluth (UMD) is closed. We find this very frustrating because we have many employees, visitors and volunteers that depend on the DTA to get to and from work. If this bus would run all the time, it would greatly help that staff of Chris Jensen that depend on the bus to be able to get to work to feed their families.”

St. Luke’s at Superior representative wrote, “We are located near the Mariner Mall in Superior. Patients may take public transportation to arrive for their appointments but our staff all drive themselves to work.”

Appendix A. General Community Survey

Duluth Transit Authority Transit Development Plan Update

Community Survey

The Duluth Transit Authority (DTA) is performing a Transit Development Plan Update. An important part of this study is to receive feedback from current and potential DTA passengers. To gather meaningful community input on the project, you are invited to participate in a brief survey to help us understand needs and opportunities for DTA transit service.

If you have any questions or need assistance taking the survey, please contact Dennis Jensen, DTA General Manager, at 218-623-4306 or djensen@duluthtransit.com.

Your participation is voluntary and responses are completely anonymous. Thank you for your participating in this study, your feedback is important.

All participants who complete this survey will have a chance to win one of two \$25 VISA gift cards. Although the responses are anonymous and will only be used in aggregation, the DTA is asking you to provide your email address in order to be eligible to win one of two gift cards.

- * 1. Check your **primary** purpose of travel and the associated most frequent mode of the transportation for each travel purpose.

	Personal Vehicle	Ride with family/friends	Carpool	Bicycle/walking	DTA Transit	Rides by non-profit agency	Taxi
Work	☐	☐	☐	☐	☐	☐	☐
School/Training	☐	☐	☐	☐	☐	☐	☐
Shopping	☐	☐	☐	☐	☐	☐	☐
Grocery store or other essential shopping	☐	☐	☐	☐	☐	☐	☐
Social/recreation/events	☐	☐	☐	☐	☐	☐	☐
Medical appointments	☐	☐	☐	☐	☐	☐	☐

Other (please specify)

* 2. What is your most common destination?

- ☐ UMD
- ☐ Downtown Duluth
- ☐ Miller Hill Mall
- ☐ City of Superior
- ☐ Other (please specify)

* 3. Are you currently employed (part-time or full-time)?

- ☐ Yes
- ☐ No
- ☐ Retired
- ☐ Work from home

* 4. In the past, have you used DTA transit to travel?

- ☐ Yes
- ☐ No

Community Survey

* 5. How often do you ride the bus?

- ☐ Once a week or more
- ☐ More than once a month
- ☐ Once a month
- ☐ Not applicable

Community Survey

* 6. Please describe any barriers you may have to taking the bus (check all that apply).

- ☐ Did not know about bus service
- ☐ Do not understand how to use bus service
- ☐ Service takes too long
- ☐ Boarding locations
- ☐ Cost of fare
- ☐ Transit stop amenities
- ☐ I need a car during the workday for work or personal errands
- ☐ I want to be able to get to my family quickly in the event of an emergency
- ☐ Difficulty with getting on to the bus
- ☐ Arrival time at my destination is too early or too late
- ☐ Not applicable

Other (please specify)

Community Survey

* 7. What single improvement to the DTA Transit service would make you start riding DTA Transit or start riding DTA Transit more frequently?

- ☐ Run buses more often
- ☐ More convenient boarding locations
- ☐ More convenient destination locations
- ☐ Bus stop shelter
- ☐ Lower fares
- ☐ Travel training (training on how to use the bus)
- ☐ None
- ☐ Not applicable
- ☐ Other (please specify)

* 8. Which of the following destinations would you take a DTA bus to? Check all that apply.

- ☐ United Healthcare building
- ☐ Fond du Lac
- ☐ London Road
- ☐ Cirrus Manufacturing
- ☐ Does not apply
- ☐ Other (please specify)

* 9. Which of the following routes would you ride if they were offered? Check all that apply.

- ☐ Direct route between UMD and Miller Hill Mall area
- ☐ Direct route between Lakeside and UMD
- ☐ Direct route between West Duluth and Miller Hill Mall area
- ☐ Direct route between Piedmont and Miller Hill Mall Monday through Friday
- ☐ Does not apply

* 10. By what method do you prefer to receive information about DTA transit service?

- ☐ Website
- ☐ Social media
- ☐ Email
- ☐ Newsletter
- ☐ Other (please specify)

Community Survey

The following socio-demographic questions are being asked to understand if this survey is successful at receiving input from a wide audience. These questions are **optional**.

11. What is the race/ethnicity that best describes you?

- ☐ Asian
- ☐ Black or African-American
- ☐ Hispanic or Latino
- ☐ American Indian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ White/Caucasian
- ☐ Decline to answer

Other (please specify)

12. What is your annual household income?

- ☐ Under \$20,000
- ☐ \$20,000-49,999
- ☐ \$50,000-100,000
- ☐ Over \$100,000
- ☐ Decline to answer

13. What is your age?

- ☐ 15 years old or younger
- ☐ 16-18 years old
- ☐ 19-24 years old
- ☐ 25-34 years old
- ☐ 35-50 years old
- ☐ 51-64 years old
- ☐ 65+ years old
- ☐ Decline to answer

14. Is English your first language?

- ☐ Yes
- ☐ No

15. What is the zip code where you live?

16. What is the zip code where you work or attend college/university?

17. Do you have a driver's license?

- ☐ Yes
- ☐ No

18. Does your household own one or more vehicles?

- ☐ Yes
- ☐ No

19. Would you like to provide any other general comments about DTA transit service?

20. How did you hear about this survey?

- ☐ Website
- ☐ Social media
- ☐ Email
- ☐ Newsletter
- ☐ In-person outreach
- ☐ Word of mouth
- ☐ Other (please specify)

Thanks for taking the survey!

Please click [here](#) to enter the drawing for a \$25.00 gift card.

Appendix B. STRIDE Survey Questions

1. How often do you use STRIDE?

- ☐ Daily (Monday through Friday)
- ☐ Once a week or more
- ☐ More than once a month
- ☐ Once a month
- ☐ Less than once a month
- ☐ Never; Certified, but don't use STRIDE

Comments

2. Do you sometimes use DTA's general bus service?

Yes

☐

Reason

No

☐

Reason

General Comments

☐

Reason

3. Do you use any of these transportation services

- ☐ Northern Access
- ☐ Arrowhead Transit
- ☐ North Country Independent Living
- ☐ Senior Connections
- ☐ Pathways to Achievement
- ☐ Taxi Cab

Other or Comments

4. Please indicate how you agree/disagree with the following statements:

	Agree	Neutral	Disagree
STRIDE service picks me up on-time (within 15 minutes of my scheduled appointment)	☐	☐	☐
Comments			
STRIDE service drops me off on-time	☐	☐	☐
Comments			
STRIDE scheduler and dispatchers are helpful and polite	☐	☐	☐
Comments			
STRIDE drivers are helpful and polite	☐	☐	☐
Comments			
I feel safe while riding STRIDE buses	☐	☐	☐
Comments			
STRIDE fares are affordable	☐	☐	☐
Comments			

5. Are there any destinations, not currently served by STRIDE or other accessible transportation providers (Northern Access Arrowhead Transit, etc.), that you would like access to?

Mark your response

Yes

☐

Please specify

No

☐

Please specify

Other Comments

☐

Please specify

6. What is the single most important improvement that you would make to STRIDE service?

☐

Operate earlier or later

☐

Add more vehicles between 6 a.m. and 6 p.m.

☐

Improved electronic communication (email, texts, smartphone apps)

☐

Improved traditional communication (mailings, newsletters, on-board posters/flyers)

☐

Travel training (learning how to ride the regular route bus)

Other (please specify)

General Comments

7. Do you have any other comments?

End of Survey

Thank you for sharing all of this information, your feedback is important. Would you like to be entered in for a chance to win one of two \$25 VISA gift cards? Please click [here](#) to enter the drawing for a \$25.00 gift card.

Appendix C. Employer Survey Questions

Introduction

The Duluth Transit Authority (DTA) is updating their Transit Development Plan (TDP). The TDP will evaluate the connectivity, performance, and efficiency of the existing transit system and identify potential future improvements. One of our goals is to get a better understanding of the role transit service plays in increasing the labor shed, lower absenteeism, and general benefit to businesses.

To gather meaningful employer input on the project, we invite you to voluntarily participate in a brief survey. All information from this survey will only be used in aggregate and individual responses will be kept confidential.

Please complete this survey no later than April 28, 2017. Thank you for your input!

If you have any questions, please contact Jo Ann Olsen, SRF Consulting Group, Inc. by calling 763-251-4002 or emailing jolsen@srfconsulting.com

Employer Information

1. Information about your company/organization.

Name of your company/organization	
Your name	
Position/role	
Phone	
Email	

Employer Information

Please provide the address (or addresses) and number of employees for your company's or organization's work locations in the Duluth area

2. Primary Location

Address

City/Town

Zip

3. Number of employees at primary location

Regular full-time

Regular part-time

Additional
contract/seasonal

4. If you indicated that you have seasonal employees in the previous question please check during which months do you typically have additional staffing?

If you didn't indicate any seasonal employees, please skip the question.

☐ January

☐ February

☐ March

☐ April

☐ May

☐ June

☐ July

☐ August

☐ September

☐ October

☐ November

☐ December

Comments

5. Do you provide parking for your employees?

☐ No

☐ Yes

6. Is there a charge for employee parking (at any of your locations)?

☐ No

☐ Yes

7. How much are the employees charged?

8. Do your employees primarily work onsite at these locations, or do they work offsite/elsewhere throughout the region? (i.e., housecalls, deliveries, etc.).

☐ Yes

☐ No

9. Please enter the percentage that work onsite versus offsite (should total to 100).

% of employees that work
onsite

% of employees that work
onsite

Commuter Benefits and Programs

There are many benefits or services that may encourage employees not to drive alone to work. We are interested in whether you currently offer, or would consider offering, any of the following commute services:

(If you work for a multi-site company/organization, please answer in terms of the PRIMARY site or policies that apply for all sites)

10. Information/Assistance

	YES, we currently offer this	NO, we do not currently offer this but would consider it	NO, we do not currently offer this and would not be interested in offering this
Employer assistance in forming carpools and vanpools	☐	☐	☐
Information about commuter options (e.g., provide bus schedules, etc.)	☐	☐	☐
A commute/transportation information office or staff	☐	☐	☐
Events to promote use of alternatives to driving alone (e.g., transportation fairs, bike to work day, contests, etc.)	☐	☐	☐
Employer newsletter or website that provides information about commute alternatives	☐	☐	☐

11. Special Programs or Services

	YES, we currently offer this	NO, we do not currently offer this but would consider it	NO, we do not currently offer this and would not be interested in offering this
A commuter or daytime shuttle to/from the employment site	☐	☐	☐
Flexible work hours	☐	☐	☐
The ability to telecommute (work from home)	☐	☐	☐
Compressed work schedule (e.g., 4-10, 9-80, 3-36)	☐	☐	☐

12. Incentives

	YES, we currently offer this	NO, we do not currently offer this but would consider it	NO, we do not currently offer this and would not be interested in offering this
Guaranteed/Emergency ride home program (offers employees who did not drive alone a taxi ride home in case of an emergency)	☐	☐	☐
Preferential parking for carpools/vanpools	☐	☐	☐
Financial incentives for bicycling, transit, walking, carpooling, telecommuting, vanpooling (e.g., subsidies, bonuses, random financial rewards, etc.)	☐	☐	☐
Transportation allowance (employer helps offset transportation costs)	☐	☐	☐
Pre-tax set-aside to pay for transit or vanpool costs (also known as Commuter Choice)	☐	☐	☐
Other incentives to encourage people not to drive alone (e.g., price drawings)	☐	☐	☐

13. Are there any other programs not listed above, you have considered offering or would consider offering? If so, please explain.

Information about Employee Commutes

14. If you keep statistics about how many of your employees commute by the following modes, please enter below. If you do not have actual statistics, please estimate the percentage that commute by each mode.

Total of all the responses should add to 100.

% Drive alone	
% Get a ride/drive with another person/carpool	
% Public transit	
% Participate in a vanpool	
% Walk	
% Bike	
% Other	

15. If you didn't have an answer for the previous question about how many of your employees commute by different modes, and would like to provide a comment instead, please write it here.

Information about Employee Commutes (Contd.)

Please list the regular/scheduled shifts at your workplace, if applicable. If your employees work traditional business hours only, enter hours in Shift 1. If you don't have specific start and end times, please list the approximate hours that most people are at the work site.

16. Primary Work Schedule or Shift 1.

If the schedule is the same for all weekdays, enter it in the first column. Otherwise, enter the work schedule times under the appropriate days.

	ALL Weekdays (Same Schedule)	Mondays	Tuesdays	Wednesdays	Thursdays	Fridays	Saturdays	Sundays
Start Time								
End Time								

Comments

17. Shift 2 Work Schedule (if applicable).

If the schedule is the same for all weekdays, enter it in the first column. Otherwise, enter the work schedule times under the appropriate days.

	ALL Weekdays (Same Schedule)	Mondays	Tuesdays	Wednesdays	Thursdays	Fridays	Saturdays	Sundays
Start Time								
End Time								

Comments

18. Shift 3 Work Schedule (if applicable).

If the schedule is the same for all weekdays, enter it in the first column. Otherwise, enter the work schedule times under the appropriate days.

	ALL Weekdays (Same Schedule)	Mondays	Tuesdays	Wednesdays	Thursdays	Fridays	Saturdays	Sundays
Start Time								
End Time								

Comments

19. Shift 4 Work Schedule (if applicable).

If the schedule is the same for all weekdays, enter it in the first column. Otherwise, enter the work schedule times under the appropriate days.

	ALL Weekdays (Same Schedule)	Mondays	Tuesdays	Wednesdays	Thursdays	Fridays	Saturdays	Sundays
Start Time								
End Time								
Comments								

20. Are you aware of any employee-related issues/concerns/needs about commutes that might be helpful for us to know as we move forward in this study? We are also interested in whether you have specific transportation workforce issues/needs for seniors, people with disabilities, immigrants/refugees, etc.

A Final - and Important - Request

Do you have more than 100 employees? If so, would you please provide an electronic file with home addresses or zip code information (without names) for your employees. We assure you this information will be kept confidential. This will help us map commutes that are being made throughout the region. You may provide a spreadsheet or table with a list of zip codes and the number of employees by zip code.

Please send the requested information to Jo Ann Olsen, SRF Consulting Group, Inc. by emailing at jolsen@srfconsulting.com. You can also call Jo Ann at 763-251-4002 if you have any concerns about the data request.

Thank you!

Appendix 5. Service Plan Report

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



September 2017

SRF No. 10113

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Fixed-Route Service and Operations Plan

Duluth Transit Authority (DTA) is a highly productive transit system carrying more than three million passengers per year. The system has very high productivity on its West Mainline routes, some routes serving University of Minnesota – Duluth (UMD), and its primary route to the commercial area near Miller Hill Mall. Other routes operate at 30- to 60-minute intervals and are lower productivity routes that serve a community connection function.

This report presents the short-term service and operations plan as part of the five-year Transit Development Plan (TDP). The basis of the recommendations is to provide a higher level of service to improve the overall efficiency and productivity of the service. These service recommendations are intended to complement the proposed DTA Pilot Program service package that will be implemented between June and December 2017. The consultant team has outlined areas that can further improve the DTA system and begin to focus on simplification of routing and adding more frequency to the system to help improve the overall ridership and productivity. The service plan will be implemented in three phases over the five-year TDP planning horizon.

Phase 1: Years 1 and 2 – Implementation of 2-Year Pilot Program of Routes

Phase 2: Years 3 and 4 – Frequency and Efficiency

Phase 3: Year 5 – High Capacity Options and Regional Connectivity

Fixed Route Issues and Strategies

The TDP process has included an analysis of the existing conditions of the DTA service including data and information about service performance trends, APC boarding counts, and field observations. In addition, the project team has conducted a public outreach effort that included community surveys, stakeholder meetings, public meetings, and staff and operator interviews. Through this process the team has identified key findings and opportunities to be addressed through the service and operations plan.

Key components of the service plan include:

- Introduction of new routes through the 2-Year Pilot Program.
- Simplification of route interlining and route variations.
- Improvement to weekday and weekend frequencies on some routes.
- Introduction of new service delivery options.
- Introduction of new routing structures for some services to the mall.

Longer term service goals for DTA should focus on continuing to improve service through higher frequencies where there is demand. Longer term strategies include:

- Continuation of coordination with other regional transit providers.
- Development of a high capacity service along the West Mainline or the highest ridership corridor.

DTA will need to continue to provide equitable service that meets the requirements of the Title VI Civil Rights Act of 1964 (Title VI). Title VI ensures that no person shall be excluded from participation in, denied benefits of, or be subjected to discrimination on the basis of race, color, or national origin under any program receiving federal financial assistance.

It is important to develop performance measures to address standards within the categories of efficiency, service quality, and service design. These standards will be used to guide future service evaluation; set standards for future service changes including expansion and reduction of service; and ensure compliance with the American with Disabilities Act (ADA) and other local, state, and federal requirements.

Service quality standards help staff evaluate system performance pertaining to reliable and high quality service which encourages ridership. Service standards for DTA to define and track should include key metrics such as passengers per hour, passengers per mile, cost per passenger, farebox recovery, missed trips, and revenue to non-revenue hour ratio.

Fixed Route Recommendations

Service Plan

The route structure proposed in the service plan provides a baseline for service growth with the introduction of the 2-Year Pilot Program. The proposed service plan is intended to build ridership and better position DTA for future MnDOT funding opportunities through improved productivity and sustainability of the system.

Phase 1 - DTA 2-Year Pilot Program (TDP Years 1 and 2)

Prior to the development of the TDP service plan, DTA submitted route plans and other improvements to MnDOT to qualify for state grant funding. The grant is part of the Greater Minnesota Transit Investment Plan (GMTIP) which is a strategic and investment plan to support state goals of meeting 100% of transit demand by 2035. DTA was awarded \$4 million over a two year period for a defined program including transit operating, capital costs and planning projects. Additional grant funding will be made available in future years to continue to fund transit programs around the state.

DTA's 2-year pilot program service updates are Years 1 and 2 of the 5-year TDP plan.

Proposed Pilot Program Routes and Projects

As part of the Pilot Program, DTA will introduce new strategies that include:

- Five new routes
- A trolley extension
- Additional service hours on Saturdays
- One additional bus dedicated to STRIDE paratransit services

- Development of a new agency mobile device app

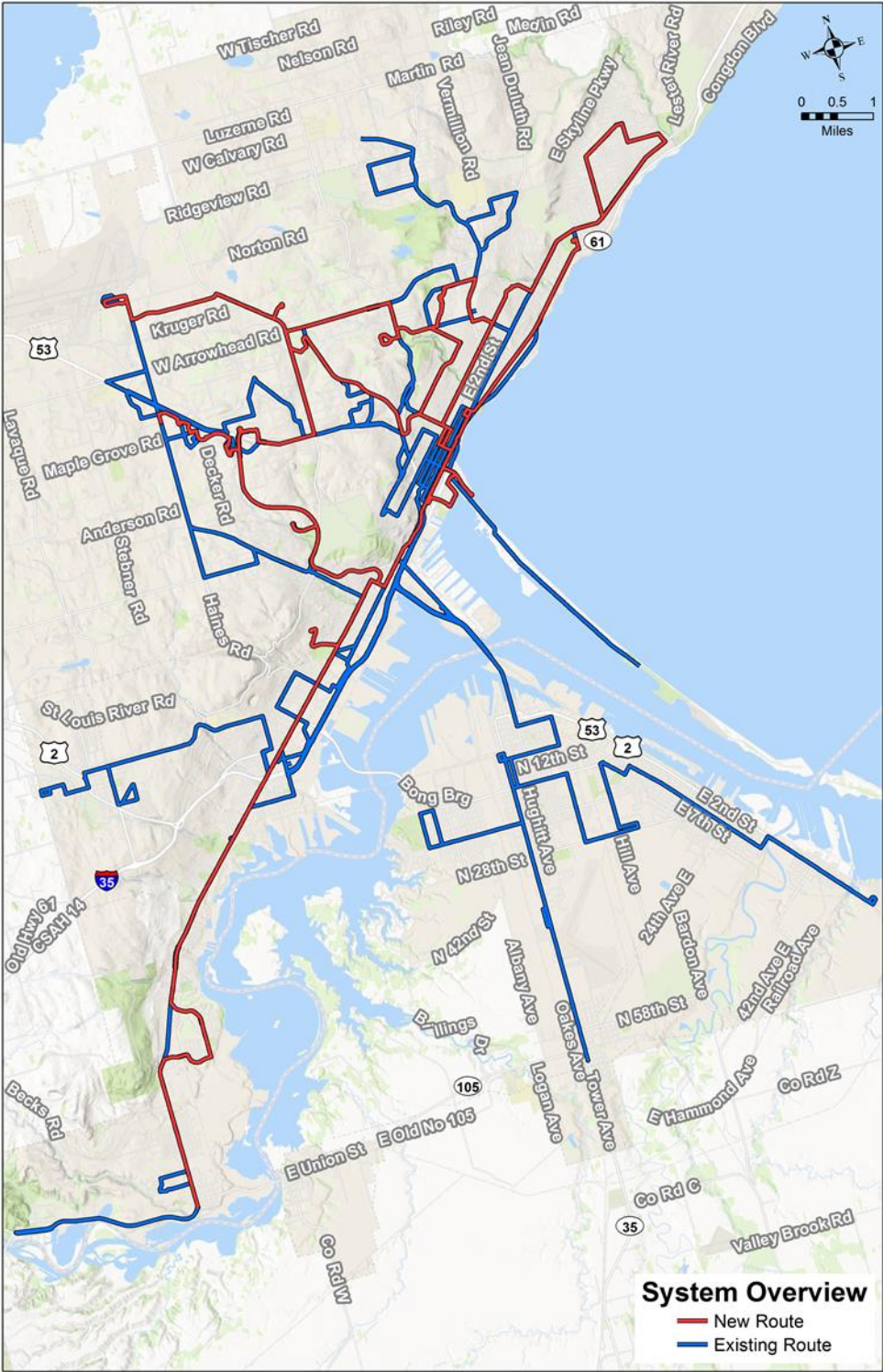
The proposed Pilot Program will build on DTA's existing robust system. DTA has a strong system including several high frequency routes, a limited timed transfer system at the Downtown Center, and extended service hours from 4:00 am to 1:00 am on some routes. The proposed Pilot Program would increase annual revenue hours by 23,858 and put 12 additional daily buses into service. Through these measures the proposed Pilot Program intends to provide additional coverage extended throughout the service area. **Table 1** provides an overview of the proposed Pilot Program, and **Figure 1** displays proposed routes.

Table 1: DTA 2 Year Pilot Program Overview

Route/ Update	Overview	Additional Daily Rev Hours	Span of Service/ Frequency	Implementation Date
Route 5 New Duluth – Miller Hill Mall	- Extend Route 5 west to New Duluth - Provide one seat ride from New Duluth to Mall	23	7:15am – 8:00pm/ 60 mins	August 27, 2017
Route 19 Port Town Trolley	- Extends existing Trolley west on Superior to Fitgers - Extends Trolley service hours from 7:30pm to 11:00pm	11.6	11:30am – 11:00pm/ 20 mins	June 5, 2017
Route 20 Downtown – Airport via United Health Care	- Introduces new service to employment centers on Arrowhead Road and Rice Lake Road including the Airpark and United Healthcare - Provides additional service between downtown and the airport	6.6	6:00am – 5:30pm/ 60 mins	December 3, 2017
Route 21 Lakeside to UMD/Miller Hill Mall	- Introduces new service with direct connections between two major activity centers – UMD and Miller Hill Mall - Improves connections between Lakeside and UMD	31.4	7:18am – 8:35pm/ 60 mins	August 27, 2017
Route 22 Lincoln Park Middle School – London Road	- Introduces new direct service to Lincoln Park Middle School - Provides additional service on the West Mainline - Introduces new service on London Road	14	7:00am – 7:00pm/ 60 mins	August 27, 2017
Route 23 UMD Circulator	- Two-way loop operating on E. 4th Street and E. 9th Street and through the UMD campus - Helps to relieve overloads on Routes 11 and 13 - Improves frequencies to UMD	11	7:30am – 5:30pm weekdays only during UMD session/60 mins	August 27, 2017
Additional STRIDE bus	Provides additional STRIDE bus in service to improve paratransit availability	8	Extend service Monday - Saturday	August 27, 2017
Additional Saturday Service	Extend late night Saturday service on Routes 2, 6 and 10	10.2	Extending service hours past 10:30pm	June 2017
Technology Improvements	- Develop a DTA app for real time information - Update the agency website	N/A	N/A	2017 - 2018

Source: AECOM, 2017

Figure 1: Phase 1 Pilot Program Route Map



Source: AECOM, 2017

Phase 2: Efficiency and Frequency (TDP Years 3 - 4)

The following sections provide details for the proposed Phase 2 route structure and service changes. Since DTA has already adopted new services through the Pilot Program, the Phase 2 approach includes a series of improvements to continue to build on the foundation of the system to improve productivity and ridership. Phase 2 is planned to begin during Year 3 of the TDP however it can be implemented earlier if needed earlier in the process.

Route Variations

Phase 2 begins to simplify the existing DTA system for new and existing riders by consolidating route variations. In some cases, existing routes may have up to three variations. These variations may include a routing deviation at certain times of the day or a completely different routing on weekends or weekdays. **Table 2** provides an overview of the proposed route variation changes.

Table 2 – Proposed Route Variation Changes

Existing Route Names	Proposed Route(s)	Overview of Changes
9M and 9MT Piedmont	9 Piedmont	• Consolidate the 9M and 9MT into one route called Route 9 • Operate the Route 9M routing seven days per week from the Piedmont corridor to the mall • Route no longer provides direct service to LSC and the Morris Thomas Road segment
Route 10 and 10E Duluth Heights Mall	10 Duluth Heights Mall	• Discontinue the 10E variation • Route operates on the highest ridership segments of the Route 10 services • Eliminates service along Eklund segment
Route 11, 11K, 11M East 8 th UMD	11 and 11M East 8 th UMD	• No routing changes • Eliminate the route number 11K and operate the Route 11 with night service to Kenwood Avenue

Source: AECOM, 2017

Routing Changes— Route 9 Piedmont

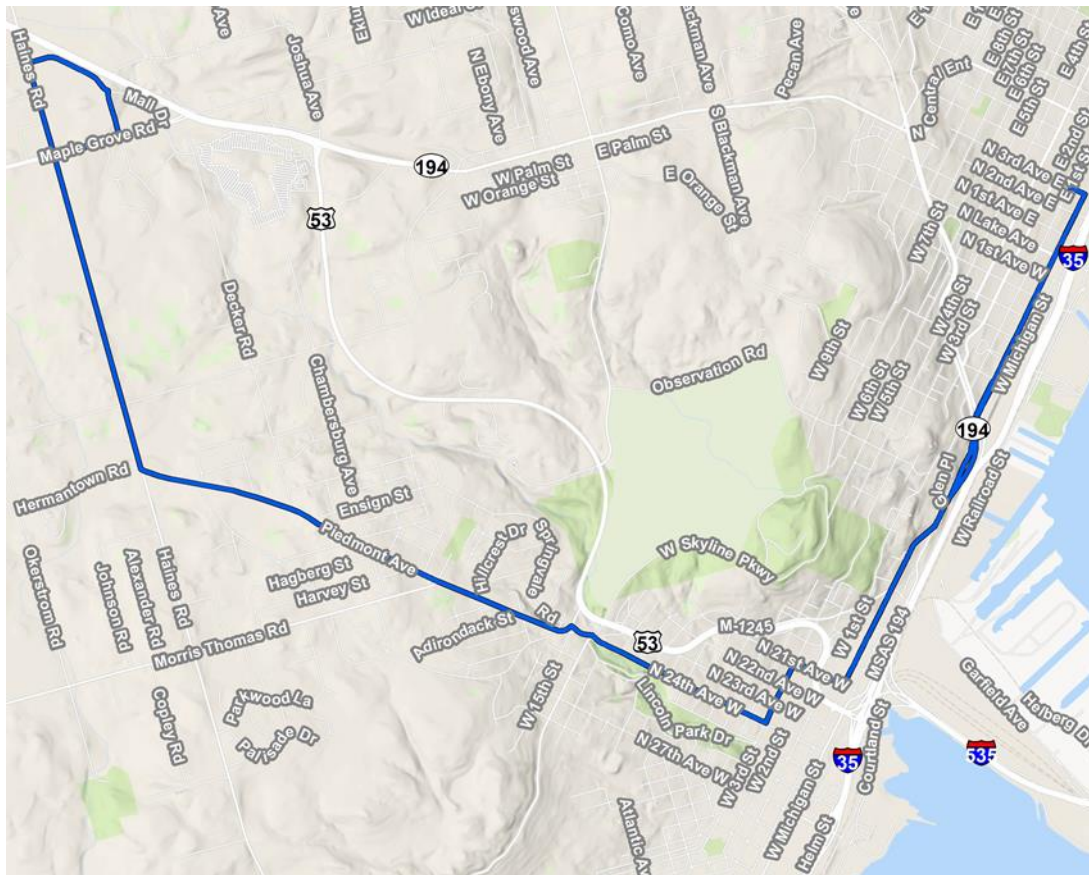
Route 9 currently consists of varying route patterns for weekdays (9MT) and weekends (9M). The proposed Route 9 Piedmont will operate the existing Route 9M routing seven days per week. This change will provide consistency throughout the week, and it will focus the service on trips to the key Mall market. Currently the Piedmont corridor riders must transfer to Routes 8 at Skyline and 24th Avenue to travel to the mall. Key components of the route:

- The proposed route will no longer travel to Lake Superior College (LSC) during the week. Routes 5 and 8 will continue to serve the college.
- The northern portion of the proposed route will extend to the Mall using the 9M routing along Haines Road.
- The round trip travel time is 46 minutes.
- The eliminated segment on Morris Thomas Road currently has an average of four daily boardings and the Route 9 LSC boarding total is six. Of these boardings a total of three are within a ¼ mile walking distance of the proposed routing.

- Options can be developed for riders who are affected by route changes beyond ¼-mile on a case by case basis.

Figure 2 displays the proposed Route 9 Piedmont routing.

Figure 2: Route 9 Piedmont Map



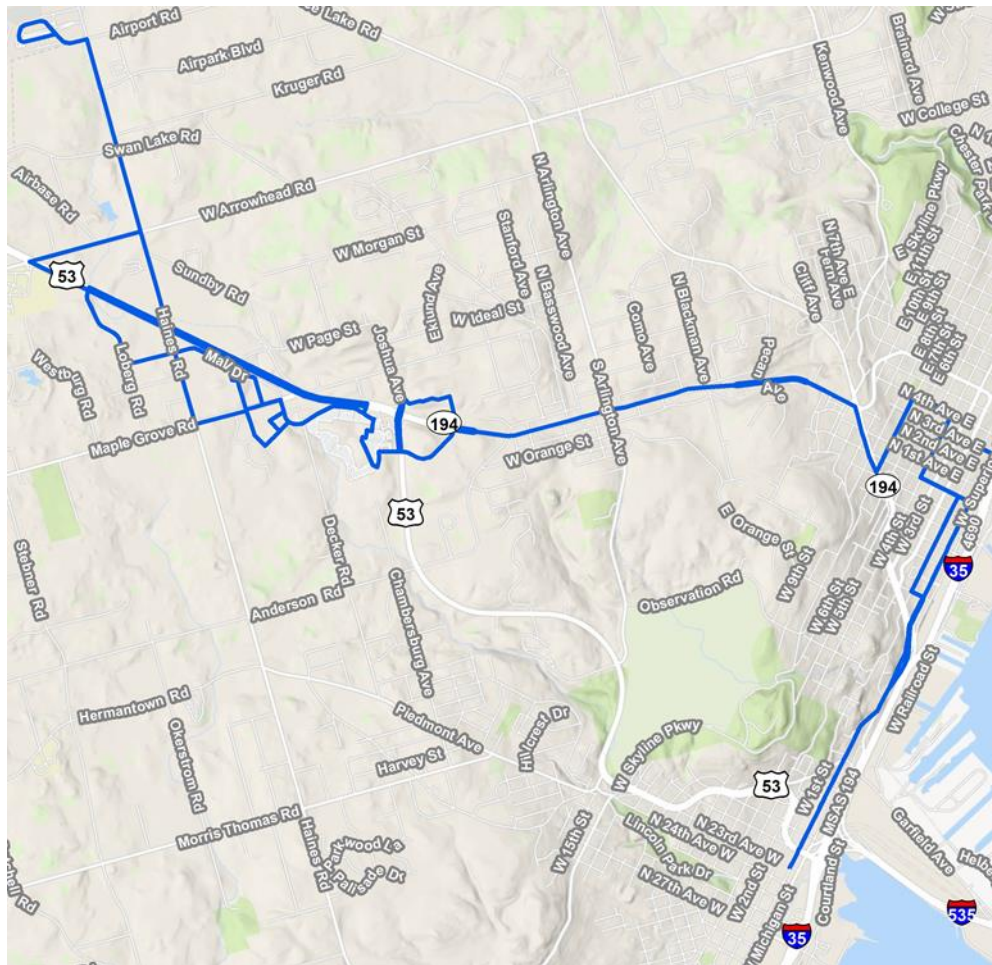
Source: AECOM, 2017

Routing Changes— Route 10 Duluth Heights Mall

In Phase 2, Route 10 and 10E will be consolidated into one route that will provide more direct trips between downtown and the mall. The proposed Route 10 will follow the existing Route 10 pattern with the downtown routing on Lake Avenue, 4th Street, 4th Avenue East, 7th Street, and Mesaba Avenue. **Figure 3** displays the proposed Route 10 routing. Key components of the proposed service include:

- Removal of the Eklund route deviation on Swan Lake Road and Eklund Road.
- Routing in downtown follows the current Route 10 pattern with direct service to Essentia.
- The Route 10H will continue its current routing and schedule.
- Maintain all day frequency of 30 minutes on the same routing, which could potentially be phased into 15 minute frequency as demand increases.
- The eliminated 10E segment on Swan Lake and Eklund has a total of five daily boardings. Of those boardings a total of two are within a ¼ mile walking distance of the proposed Route 10.
- Options can be developed for riders who are affected by route changes beyond ¼-mile on a case by case basis.

Figure 3: Route 10 Duluth Heights Mall Map



Source: AECOM, 2017

Routing Changes— Route 21 Lakeside to UMD / Miller Hill Mall

The new route 21 will provide direct service from UMD to the Mall area. The new service provides an opportunity to look at other ways of serving the circuitous nature of the shopping centers in the Mall area. Currently routes operate through parking lots at the Target and Hobby Lobby shopping centers. For Phase 2 it is recommended to apply a more direct service eliminating service from parking lots and removing the conflicts with pedestrians and cars in the constrained parking lot environment. The new routing will provide two stops near the new Aldi market and Hobby Lobby and two stops at the Target store. The proposed routing, as shown in **Figure 4**, travels east on Mountain Shadow Drive with a stop next to Aldi and continues north on Burning Tree Road with a stop at the northeast corner of Burning Tree and Maple Grove to serve Burning Tree Plaza and Target. The route continues north on Burning Tree Road with a layover at Super One and continues southeast on Mall Drive with a stop in front of Target and continues south to Aldi.

Capital investment will be needed for street improvements to allow for more space for right turns from Mountain Shadow to Burning Tree. In addition, the new stop on Burning Tree and Maple Grove will need an extension of sidewalks and ADA accessibility improvements. Lastly, pedestrian improvements and safe accessible pathways will be needed to connect the stop on Mall Drive to Target.

Figure 4: Route 21 Lakeside to UMD/Miller Hill Mall



Source: AECOM, 2017

Routing Changes— Route 22 Lincoln Park Middle School/London Road

When implemented in August 2017, the Route 22 will travel from Lakeside west on London Road to the Downtown Transportation Center and continue west along the West Mainline to Lincoln Park Middle School off West 3rd Street.

The route will operate every trip up the driveway and into the parking lot of the middle school. Although the proposed route will provide direct service for students and staff to the middle school, it may not be the best use of the service hours as boarding activity will occur primarily during bell and shift times. In addition, there are potential safety issues with operating the buses on the narrow hill on the school driveway and turning around in the school parking lot. It should also be noted that the attendance boundary is mostly west of the school and the route runs mostly east.

The project team recommends servicing the school with an alternative delivery method. A targeted routing with a smaller bus or demand response service with a contracted service provider or Uber would provide a right sized approach for the school market.

In addition a new service along the West Mainline corridor may not be necessary as three routes (Routes 1, 2, 3) currently operate along the routing at a high frequency of service. A shuttle or

Uber/taxi services could connect directly with existing DTA service at the bus stop at West 3rd Street and Pacific Avenue. Pedestrian and safety upgrades would be needed at the bus stop to accommodate the increase in student boarding activity. An addition of a crossing guard would also be necessary during the bell times.

As part of Phase 2 it is recommended for DTA to continue operating the London Road segment as a standalone route. By keeping the route on London Road there may be an option for 30-minute frequency as the new route builds ridership. The western portion of the route on the West Mainline corridor will be removed from the Phase 2 routing and taken over by the existing service on Routes 1, 2, and 3. By eliminating the western portion of the route, DTA could reallocate six service hours into increased frequency on other routes. The total cost savings is dependent on the type of service that is used to provide transportation options to the middle school. **Figures 5 and 6** display the proposed Route 22 and the service area zone for Lincoln Park Middle School.

Potential options include:

- Partnership with Uber, Lyft, taxi service, or other transportation providers to offer on demand service with subsidized trips through DTA and other local agencies
- Use of the Grocery Shopper route to cover midday trips when needed
- Use DTA cutaway buses during the school shift and bell times to transport students and staff between the school and the West 3rd Street & Pacific Avenue bus stop
- Partner with Northern Access or other social service bus program to provide services as needed
- Explore options to deviate Route 4 to the school moving the service from 40th Avenue West to 34th Avenue West to align better with the school attendance boundaries
- Partner with the school district to provide shuttles from the DTA bus stop to the middle school with alternate transportation modes
- Implement a pedestrian safety program to allow for safe access to the bus stop on West 3rd and Pacific Avenue (see example photos below)

SRF Consulting Group, Inc.

Examples of Pedestrian Safety Treatments



SRF Consulting Group, Inc.

Phase 2 Service Improvement Options

The following section provides an overview of the Phase 2 service recommendations (**Table 3**).

Table 3 – Phase 2 Recommendations

Recommendation	Overview of Changes
Bus Interlining	Simplify route pairing to develop a more consistent daily route pattern
Frequency and Frequent Network Tiers	- Future service changes should focus on adding frequency to the system on weekdays and weekends based on demand - Build a Frequent Tiered approach including Frequent, Core, Circulator and Express routes
Park & Ride	- Opportunities to increase park and ride usage by focusing on the college market - UMD and College of St. Scholastica students currently pay parking fees between \$150 - \$350 per academic year, parking and ride service is free with student IDs
Airport Service	- Coordinate trip times with airport employee shifts and flight schedules where possible - Improve wayfinding and signage for the airport bus service
Fares	- Consider lowering Day Pass pricing and eliminating transfers - Simplify the fare system and eliminate the need to process paper transfers
Bus Stop Inventory	Continue to develop a bus stop inventory and bus stop placement plan with a focus on efficiency, accessibility and safety

Bus Interlining

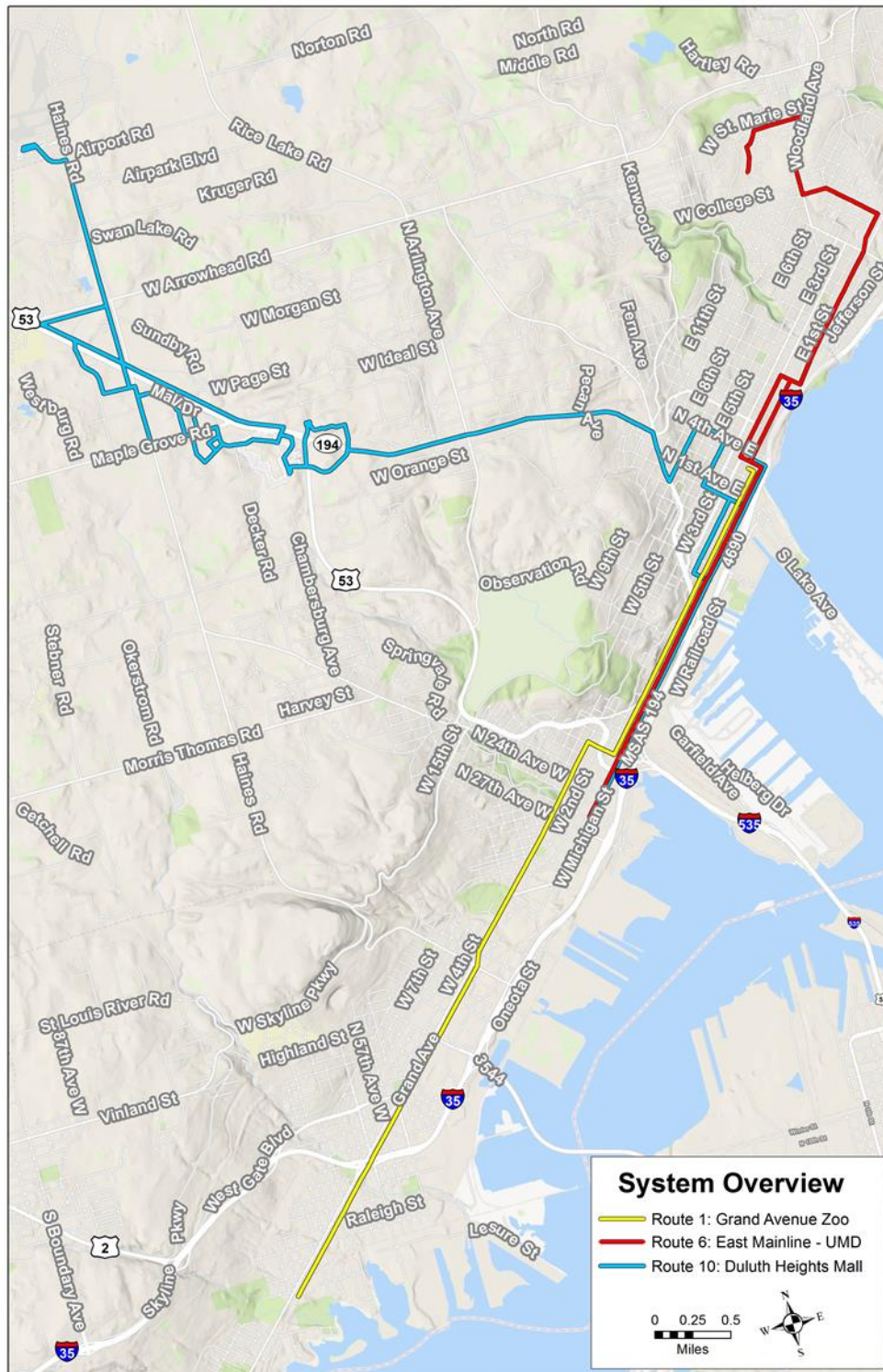
DTA currently has a comprehensive and sophisticated interlining system that in some cases can include up to three routes in one interline. Routes that can be efficiently interlined, based on headways and spans of service, are matched to create patterns that ease transfers. However, throughout Phase 2, opportunities could exist for a need to simplify the route pairing and develop a more consistent daily route pattern. Potential changes to the interlining system include:

- Interlining the same two routes throughout the day providing more predictability for passengers and simplifying transfers.
- Continue to interline routes with high demand origin and destination pairs.
- Change interlining system on a limited number of routes to reduce long layovers at the ends of lines, and replace them with a lunch time driver relief program, as used by other agencies.

Frequency and Frequent Network Tiers

Frequency of service is the key element of transit that makes the service more attractive by reducing the wait times and providing greater reliability. More frequent service, especially with headways of 15 minutes or better, allows passengers to utilize the service without depending on a schedule. By developing a network of frequent routes, overall travel times can be reduced and mobility and connections between routes for all passengers will be improved. Currently DTA has three routes operating at 15 minute frequencies at some portion of the day. As shown in **Figure 7** the frequent network provided by Routes 1, 6, and 10 creates a backbone of 15-minute headway service with direct connections between the major transit generators of downtown, the mall and UMD.

Figure 7: Existing DTA Frequent Network (15 minute headways)



Source: AECOM, 2017

As part of Phase 2, it is recommended to continue building on the frequent network of routes as demand grows over the first two years of the TDP. As ridership builds and capacity becomes limited there may be opportunities to add 15-minute service on other routes, potentially the new segment of Route 21 between UMD and the mall. The higher frequencies can also occur during targeted high ridership periods of the day. For DTA these peaks of service are primarily during the mid-day (9:00 am – 3:00 pm) not during the traditional AM and PM peak periods.

In addition, DTA can begin to create a tiered service delivery system based on the frequency of the service. To build the frequent network of service there also needs to be a supporting tiered route system that provides a comprehensive set of services. Not all routes are designed as high ridership or high frequency service. Some routes provide key lifeline services to the community and may only need to operate every 60 minutes. These services can be called “Circulator” routes. The Circulators also benefit from a frequent network as passengers can take advantage of better transfer opportunities between the service and frequent routes. In between the frequent and lifeline service are the core routes that tend to operate at 30-minute headways and make up the set of services providing key connections to major activity centers. DTA also operates peak only Express services from areas within the service area to downtown Duluth. The Express services should also be tracked for ridership trends to determine if there is sufficient demand to add trips. The additional trips may make the service more attractive to choice riders. A breakdown of the existing DTA tiered service is shown in **Table 4**.

Table 4 – Frequency Tiered Network of Services

Type	Route	Peak Weekday Frequency (in mins)	Weekend Frequency (in mins)
Frequent	1, 6, 10	15	30 - 60
Core	2, 3, 4, 7, 9, 10, 11, 12, 13, 17	30	45 - 60
Circulator	5, 8, 14, 15, 16, 18, 20, 21, 22, 23	60	60 - 120
Express	2X, 3X, 7X, 16X	Peak Only	N/A

Source: AECOM, 2017

Park and Rides

DTA currently has two park and ride lots in the service area – Piedmont Park and Ride (Haines Road and Piedmont Avenue) and Woodland Park and Ride (Calvary Road and Chicago Avenue). Both lots are underutilized. Park and Ride services tend to perform best when there are cost and travel time advantages to using the bus service as compared to driving. Currently limitations to driving such as heavy congestion and high parking costs are not prevalent in the DTA service area. One potential market for the park and ride service is the college market. There are several colleges in Duluth however UMD and CSS may provide the greatest potential for transit as parking is limited and on-campus parking permits cost between \$150 and \$350 per academic year. DTA’s free parking and free bus service (for students with IDs) provides a definite cost advantage to parking on campus.

The Woodland Park and Ride may already be tapping into the college market however there may be opportunities for other locations west and south of the colleges. As part of Phase 2, a targeted park and ride marketing campaign should be implemented that includes outreach to the colleges through online advertisements and information provided at the student union and the new student orientations.

Airport Service

DTA is introducing new service on Route 20 to the Duluth International Airport as part of Phase 1. This will complement the existing airport service on Routes 5 (weekend only) and 8 (weekday only). Bus services to airports tend to have the most success when they are attracting airport employees. The Duluth airport is relatively small with two airlines and limited services. There are opportunities to attract riders who are flying into and out of the airport but the transit service has to be timed with the flight times. The service also has to be considered reliable since airport travel is very time sensitive. Matching bus service with flight times can be challenging as airlines change schedules on a regular basis. In addition hourly frequencies and longer travel times on the buses can be a deterrent for some passengers.

It is recommended as part of Phase 2 to monitor the airport bus services and look to coordinate with the airport to better time services to shift and flight times. In addition, DTA should market the services to the community and other organizations including the Visit Duluth to raise awareness about the service to the airport. Lastly, wayfinding and signage at the airport are critical to the success of the service. Clear and concise signs with schedules, location of stops and fares should be posted at several locations in the airport.

Fares

Existing daily cash fares range from \$.75 for off peak hours to \$1.50 for peak hours and offer a 60-minute transfer with each fare.

DTA should examine the feasibility of eliminating transfers in lieu of a Day Pass fare structure. The new fare structure would eliminate the 60-minute transfer policy and replace it with a reduced cost unlimited-use day pass that will sell for approximately \$2.50 (or some variation of the cost of two to three trips). Currently the day pass sells for \$4.00. Eliminating transfers also simplifies services for DTA as the agency will no longer have to track transfer slips and it will reduce the extra printing and paper costs.

While transit fares are not elastic (small changes in fare typically do not effect ridership long term), changes in ridership based solely on fare are not easily forecast. There are too many variables in level of service, service area and demographic characteristics that also relate to transit choices. Predicting the change in ridership based on a change to fares, is difficult to know without a full analysis.

Bus Stop Inventory

A bus stop location placement plan, developed collaboratively with input from local resources, should be developed, with the goal of providing safe, easily accessible bus stop locations that meet the needs of both passenger and drivers, while promoting efficiency of the system.

Standards and processes explained in TCRP Report #19; TCRP Synthesis #117; TCRP Report #125; and Easter Seals Project Action Toolkit for Assessment of Bus Stops should be the guiding documents in bus stop planning and development. The process should be a collaborative endeavor that garners input from different departments within DTA and includes the Public Works Departments of the cities served by DTA.

Passenger consideration and input should also be part of the process and included at an appropriate time. Public comments should be balanced against system efficiency, good bus stop practices, and the needs of current customers. A rationalization program that eliminates or combines bus stops to reduce the total number of stops should be developed in the next year. Improved maintenance of bus stops should be included in the next budget cycle. The final step is a program for ADA accessibility should be developed with the goal of every other bus stop being accessible within 10 years.

An approach to the implementation of bus stop changes is outlined in the TDP's *Bus Stop Report* (see Appendix).

Other Service Improvements

- Continue to monitor activity and trends on the STRIDE service to identify efficiencies of service. DTA will be adding an additional bus to the service in Phase 1 and that should provide the needed capacity for the demand of the service.

Phase 3 – (Year 5) – High Capacity Corridor and Regional Connectivity

In addition to the implemented frequency improvements already in place, the goal of Phase 3 is to further improve the operations by extending service to new markets and improving headways. As the system matures it is important to continue to make improvements that benefit existing riders and attract new riders. After the implementation of Phases 1 and 2 service changes have been in place for several years it is recommended that DTA begins to plan out the next phase of improvements. This next phase will not be intended to be cost-neutral. Instead, these changes will include additional costs for the next tier of service improvements. The Phase 3 changes are recommended to be phased in as resources are available.

Phase 3 improvements that should be considered with additional resources include the following:

- **Expand Regional Service** – Begin to look for opportunities to partner with other communities and providers to expand the regional transit services. Services may include employment and shopping service to Hermantown or improved connections with other regional providers for lifeline service throughout St. Louis County. DTA will need to take a targeted approach to look for opportunities that provide the greatest benefit to the community without duplicating services provided by Arrowhead Transit. There may also be future needs to expand services to existing partner cities such as Fond du Lac and develop more formal partnerships with surrounding cities such as Proctor who would need to join the service area to continue to receive the current level of bus service. It is important to have well defined service agreements in place with member cities to allow for equitable service partnerships within the region.
- **High Capacity Service** – After the Phase 1 implementation, there will be four routes operating on a portion of the West Mainline. It is the highest ridership corridor and when the routes are offset, DTA can operate better than 10 minute headways at different times of

the day. With the high ridership and frequency of service, there is an opportunity to introduce a premium bus service to the corridor. A Rapid Ride or BRT-light type service would provide a uniquely branded high capacity option with high frequency (10 minutes or better) and fewer stops. Travel times could be reduced by 20 % depending on the elements added to the service. This service could replace the current Route 1. Other elements of the service could include transit signal priority, enhanced bus stops, branded stops and buses, and frequency-based schedules. The capital investment in the service will depend on the level of amenities used for the service which may include new buses, upgraded stops and transit signal priority at signals along the corridor. It is recommended to implement a mixed traffic solution to reduce the overall capital investment of a dedicated busway.

Example of High Capacity Bus and Station



Source: VTA



Source: KC MAX

Technology and Marketing

DTA currently uses Trapeze software for service, CAD-AVL, APC and scheduling. Customer facing technology, such as real-time bus arrival information, mobile app fare payment, and new modern fareboxes, can make transit more attractive to potential users, expanding the number of riders who take transit to jobs, medical appointments, or special events.

Available Transit Technology

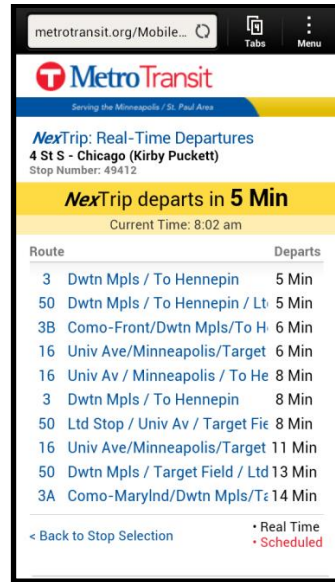
Real Time Transit Information

A CAD/AVL System can perform the additional function of using the known location of the bus to provide real-time bus arrival information to passengers at specific stops along a route. Real-time information can help increase ridership by reducing customer anxiety, enhancing perceived service reliability, and presenting a more “modern” image of public transit, in particular among discretionary riders that could choose other means of transportation.

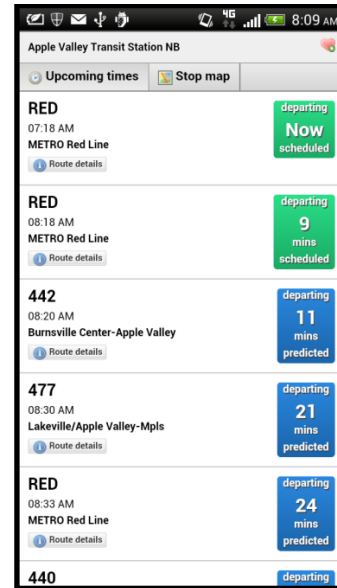
Real-time information can also be presented on an agency website for passengers to view pre-trip, and also made available while passengers are en-route via smartphone application. These features may be

implemented as part of Phase 1 of the plan. **Figure 8** presents a few options for how information is presented on a mobile website and a mobile application.

Figure 8: Displays of Real-Time Transit Information Based on AVL System Data



Metro Transit Mobile Website Display of Real-Time Transit Arrivals at Bus Stop



RouteMatch Mobile Application Display of Real-Time Transit Information

Source: <http://metrotransit.org/Mobile/NexTrip.aspx?stopnumber=49412> Webpage was developed by Metro Transit staff;
<http://m.routeshout.com> Webpage was developed by AVL System provider.

Fareboxes

Fareboxes are an important interface with customers that should be clear to understand, convenient, and hassle-free. Current DTA riders use cash, or Stored Value Cards to pay fares. Exact change is needed upon boarding, as fareboxes or drivers do not provide change. Paper transfers are issued at the time of boarding. It is recommended that as future grants and funding become available DTA should consider modernizing the fareboxes on the buses to allow for optimization of the fare collection process.

Newer systems can provide riders a multitude of payment and pass options and efficiency for riding transit. Additionally, updated fareboxes provide powerful data-capture technology that allows for robust analytics on ridership, fare collection, real-time monitoring, and real-time system updates.

Website and Mobile Application Improvement

A website is the face of a company or agency and is the first place many people look for information on services offered. Phase 1 presents an important opportunity to relaunch the brand in conjunction with the proposed service changes. Other important benefits of the updated website:

- Increased access to necessary information for riders and the community as needed. New and potential riders will be able to quickly understand the service and how to use it.
- Relaunching the website along with service changes provides an opportunity to rebrand DTA to the community, and to provide an improved way to interact with existing and potential riders.
- Provide a space to sell online tickets and passes for riders.
- Begin to incorporate next bus or bus tracking system in the future.
- Provide updated schedules and service hours to help inform the public about the changes.

In addition to website improvements, DTA is in the process of developing mobile applications that provide real time information to riders. The app can be developed to provide static information related to routing, schedules, service updates and the fare system. Apps can also be developed to have dynamic features such as trip planning, next bus and fare payment. Another key component of the app would be the mobile payment feature to allow passengers to load fares and passes on to their smart phones. Larger transit agencies such as DART (Dallas) and TriMet (Portland) have had success over the past several years with the app payment system (see **Figure 9**). However smaller and medium sized systems have also implemented the feature. Mobile fare payment has the advantage of speeding up the fare collection on the buses to allow for faster travel times and improved reliability. The smart phone payment is designed to complement the cash fare system and offer options to riders. The fee associated with processing mobile payment options is expected to decline in the future as technology improves, making the mobile payment options more affordable for smaller transit systems.

Figure 9: Dallas Area Rapid Transit Mobile Application



Source: Dallas Area Rapid Transit

Marketing Plan

Short and long-term marketing strategies have been identified not only to increase community awareness for the DTA service changes as part of Phase 1, but to increase ridership in the future. The marketing initiatives are aimed at promoting DTA services through engagement with the community, and encouraging the use of the transit system. Due to budget limitations for marketing efforts, a variety of strategies are outlined to provide options for potential partnership opportunities, or additional funding.

Short-Term Marketing Strategies

In coordination with recommended service changes, short-term marketing strategies are presented below. These strategies are recommended to be implemented to support service changes to the DTA network as well as improve the visibility of the service within the community as a way to increase potential ridership.

Information Updates

In coordination with Phase 1 service changes, all marketing materials including maps, schedules and signage would need to be updated to reflect the updated system. These materials are important to inform riders of routes changes and the updated frequencies at which they operate. Notification and marketing to the public will be necessary in advance due to significant changes in parts of the DTA system. Completed marketing materials will be in easing the transition to updated routing and schedule structure. Including information on an updated website as part of these marketing materials is also an opportunity to let riders know where new (and continually updated) information can be found.

Long-Term Marketing Strategies

Long-term marketing strategies are meant to consistently remind the customer about a brand and encourage them to continue purchasing those services. The following long-term marketing strategies are recommended for DTA to maintain and expand their ridership base into the future.

Community Outreach Activities

Community outreach is a good way to increase the visibility of a business. For a transit agency, it is a way to increase awareness of the services provided and potentially attract new ridership. In addition to continued excellent customer service, it is recommended that DTA participate in and organize community outreach events to promote the brand. The following are ideas for potential community outreach activities, one or more of these items could be initiated in the short term as well.

- Providing maps and schedules at community gatherings.
- Organize a ‘Free Ride Day’ where all riders ride at no cost for one day. This type of outreach program will encourage new riders to try the system at no cost and may result in return customers.
- Organize a ‘Stuff the Bus’ event. ‘Stuff the Bus’ is an event where the community is encouraged to deliver donated, non-perishable items to a bus in a specific location on a specific day. The items collected will then be delivered to a local charity of choice and is a good way to engage the community with the local transit system. DTA could opt to give a free ride pass to people who make donations as a way to encourage participation and attract new riders. Community outreach events should be scheduled in conjunction with other community activities or celebrations. This type of outreach is evolving in the transit industry as a way to engage the community through activities that will improve the awareness of services provided by DTA.

Implementation Plan

The following section outlines the recommended phased approach of the five-year TDP.

Year 1 – FY 2017

- Monitor and track the performance measures for both fixed-route and demand response
- Prepare Title VI review to ensure that the level and quality of fixed-route and demand response services are provided in a non-discriminatory manner.
- Assess existing bus stops and prepare bus stop inventory and guidelines.
- Implement marketing and outreach plans for Phase 1
- Test Phase 1 route realignment.
- Update digital destination signs.
- Update operator’s schedule and shifts.
- Implement marketing and outreach plans
- Implement Phase 1 service changes in August 2017
- Begin to work with vendor to develop DTA mobile device app

Year 2 – FY 2018

- Continue to monitor performance of fixed-route and demand response services to track the system after the Phase 1 implementation
- Update Goals, Objectives, and Strategies with input from staff
- Update performance measures based on data collected after Phase 1 implementation
- Make service updates based on performance of routes including frequencies on existing routes for the summer of 2018
- Begin to implement Year 2 route changes and service improvements
- Monitor fleet needs to plan for adequate inventory

Year 3 – FY 2019

- Assess service to prioritize Phase 2 implementation needs
- Develop marketing plan for Phase 2
- Continue to implement Phase 2 route changes and service improvements
- Monitor fleet needs to plan for adequate inventory

Years 4 and 5 – FY 2021 and 2021

- Begin to identify corridors based on ridership to develop a frequent high capacity service
- Develop a regional planning strategy to build partnerships to deliver new services

Appendix. Bus Stop Report

Duluth Bus Stops

May 30, 2017

Introduction

An important initiative contained within the current Comprehensive Operations Analysis is the bus stop location review. Duluth has typical low-density, small-urban land-use development patterns with a good sidewalk network in the older parts of the community, a non-existent sidewalk network in some post-WWII residential areas, and a sporadic sidewalk network in the newer commercial areas.

Duluth Transit Authority (DTA) is a highly productive transit system carrying more than three million passengers per year. The system has very high productivity on its West Mainline routes, some routes serving University of Minnesota – Duluth, and its primary route to the commercial area near Miller Hill Mall. Other routes operate at 60-minute intervals and are low productivity routes that serve a community connection function. Bus stop activity is very high on the primary routes and low on the community routes.

Duluth has some unique bus stop issues regarding safe pedestrian access to the nearest bus stop. The hilly residential areas have an inconsistent sidewalk network. Additionally, the sidewalk network in the older parts of the community has several areas where the sidewalks have significant deterioration and may not be safe for walking for some pedestrians. This situation limits easy access to bus stops in some locations where there are existing sidewalks.

There are also many “T” intersections from residential streets to roads with bus routes. To accommodate a minimal walking distance from residences to bus stops, DTA has established bus stops at almost every location where there is a “T” intersection, as well as traditional cross street intersections. This policy minimizes distances that bus passengers must walk when traveling on arterial and collector streets that are bus routes. Winter pedestrian navigation often requires passengers to walk in the traveled portion of streets; a dangerous practice even in ideal weather conditions. The result is a seemingly excessive number of bus stops, closely spaced. However, many of the “T” intersection stops should be retained where there is no connecting sidewalk network that is properly maintained.

There is no formalized bus stop location process or policy. Bus stops are established by the DTA staff, using a common-sense approach. Overall, this process has worked well, but has created too many bus stop locations in some parts of the community. A more formal approach, using current transit practices, will create safer bus stops and an appropriate spacing of bus stops. It will also allow DTA to develop a long-term plan for ADA access to bus stops.

There are several strategies for DTA to develop to improve bus stops. Well designed, regularly maintained bus stops enhance passenger safety and make it easier for drivers to stop and start safely. Some of these strategies can be completely controlled by DTA, and others will require assistance from other agencies, as well as capital funding from MnDOT or FTA.

The primary goal of bus stop improvement is to provide a safe location for boarding and alighting for passengers and drivers. Analysis of current conditions is required. Safe

Duluth Bus Stops May 30, 2017

passenger/pedestrian movement must be examined before bus stops can be eliminated or moved.



Deteriorated sidewalk adjacent to bus stop

Winter access to bus stops is also a concern. Many passengers are required to wait in the traveled portion of roadways due to lack of sidewalks and inadequate snow removal. It is important that any elimination of bus stops be done in a thoughtful manner regarding passenger safety, and only where there is a sidewalk network to provide access to the remaining bus stops.



Winter conditions must be considered in bus stop location policy

Duluth Bus Stops May 30, 2017

In commercial areas, DTA frequently operates the bus route through the parking lot of the commercial area. This is convenient for passengers and reduces the need for passengers to walk to a bus stop on an adjacent street. However, it maximizes bus-pedestrian conflicts in parking lots. In some situations, it is best to keep the bus in the commercial parking lot. In other situations, it may be more efficient and equally safe to move the bus route to adjacent streets next to the parking areas. Consideration of pedestrian pathways versus potential bus/vehicle/pedestrian conflicts should be carefully analyzed to minimize pedestrian risk versus convenience for bus passengers.



Distracted walking is problematic in parking lots

In the downtown/hospital area, all stops are adequately paved, although the brick pavers on some sidewalks may not be ADA compliant. Some bus stops in downtown do not have adequate length for the bus to move out of traffic. The stops are a mix of near-side and far-side stops. Careful traffic engineering that considers pedestrian flows is needed before changes are made in the downtown area.



Duluth Bus Stops

May 30, 2017

Data

There are approximately 227.2 miles of directional, non-duplicated bus routes. 181.4 miles are on the primary (core and frequent) routes, and 45.8 miles on the low-ridership community circulator routes that operate at 60-minute intervals (Routes 4,5,8,14,15,18).

There are 1,835 unique bus stop locations with 1,465 on the primary routes and 370 on the community circulator routes. 663 (36.1%) of bus stops are less than 440 feet apart. For this analysis, 440 feet (1/12 mile) was chosen because that appears to be a common spacing of city blocks in Duluth and is the most common spacing in the downtown area.

A separate attachment shows the calculations of bus stop spacing on each route and identifies the areas where spacing is less than 440 feet.

Community Routes						
	Route	Average	Unduplicated		Percent	
	Length	Spacing	Total	Less than	less than	More than
Route	(feet)	(feet)	Bus Stops	440 ft	440 ft	1000 feet
4 out	30623	567	54	24	44.4%	4
4 in	31111	536	58	27	46.6%	3
5	duplicated by other routes					
8 out	46357	1717	27	10	37.0%	10
8 in	46231	1651	28	10	35.7%	10
14 out	11294	513	22	7	31.8%	0
14 in	12946	539	24	4	16.7%	0
15 out	22712	598	38	12	31.6%	0
15 in	24289	623	39	14	35.9%	0
18 out	51086	982	52	15	28.8%	19
18 in	27001	964	28	7	25.0%	9
Total	241916		370	130	35.1%	55
	45.8	Miles				

Duluth Bus Stops May 30, 2017

Primary Routes						
	Route	Average	Unduplicated		Percent	
	Length	Spacing	Total	Less than	less than	More than
Route	(feet)	(feet)	Bus Stops	440 ft	440 ft	1000 feet
1	included in Route 2					
2 out	65751	592	110	38	34.5%	11
2 in	65168	598	109	36	33.0%	11
2F in	14700	1225	12	0	0.0%	6
3 out	36739	612	60	26	43.3%	4
3 in	36242	636	57	23	40.4%	7
6 out	24522	511	48	22	45.8%	2
6 in	23704	551	43	13	30.2%	1
7 out	30459	476	64	29	45.3%	2
7 in	12239	583	19	4	21.1%	2
9M out	11767	981	12	0	0.0%	4
9M in	15526	1294	12	0	0.0%	6
9MT out	13482	586	23	7	30.4%	1
9MT in	10390	577	18	9	50.0%	2
10 out	49048	1001	49	10	20.4%	12
10 in	54737	977	56	12	21.4%	14
10E out	10314	793	13	3	23.1%	3
10 E in	15224	692	14	3	21.4%	2
10H out	10616	664	16	5	31.3%	1
10H in	10363	740	14	4	28.6%	1
11 out	22329	588	38	12	31.6%	2
11 in	21120	491	43	15	34.9%	1
11K out	15032	1074	14	5	35.7%	4
11K in	15551	972	16	3	18.8%	5
11M out	25018	894	38	16	42.1%	3
11M in	16649	438	28	14	50.0%	2
12 out	22808	713	32	11	34.4%	4
12 in	22923	674	34	9	26.5%	3
13 out	37193	630	59	13	22.0%	2
13 in	38284	617	62	19	30.6%	3
13U	1953	488	4	2	50.0%	0
16 out	59649	603	94	42	44.7%	13
16 in	60655	589	103	48	46.6%	10
17 out	43952	581	76	40	52.6%	6
17 in	43878	585	75	40	53.3%	5
Total	957985		1465	533	36.4%	155
	181.4	Miles				

Duluth Bus Stops

May 30, 2017

Transit Cooperative Research Project Report #19 recommends bus stop spacing as a function of land use. The recommended standards are:

Environment	Spacing Range	Typical Spacing
Central Core Areas of CBDs	300 to 1000 feet	600 feet
Urban Areas	500 to 1200 feet	750 feet
Suburban Areas	600 to 2500 feet	1000 feet
Rural Areas	650 to 2640 feet	1250 feet

Close bus stop spacing can be a negative factor on busy bus routes. Frequent stops at short intervals reduce average bus speed and create longer travel times for all passengers. Fewer stops, where safe to do so, will improve average bus speed and may also improve schedule reliability. On low-ridership community routes, bus stop spacing is not a significant problem.

Bus Stop Considerations

The issues for DTA to consider are:

- Development of a bus stop policy
- Inventory and analysis of existing bus stops
- Rationalization of bus stop spacing
- ADA-compliant bus stop capital improvement program
- Bus stop maintenance (including snow removal)

Bus Stop Policy

A bus stop that is designed properly meets the needs of bus passengers, drivers, and management. Passengers need a bus stop that is safe, clean and clear of snow/ice, and easy to find and access. Bus drivers need a bus stop that is easy accessible and clear of snow/ice, allows them to quickly see waiting passengers, and permits a safe stop and safe start. Management needs a bus stop policy that minimizes passenger and driver concerns and allows for consistent budgeting for capitalization and maintenance.

A multi-functional team of DTA employees including operations, planning, and training should be established to develop bus stop policies. Collaborative input from the Public Works Departments of cities served by DTA should also be sought. Communication with commercial properties is also needed to consider pedestrian and bus movements on their property. Safe pedestrian paths in all seasons should be a primary consideration in bus stop policy. The Transit Board should allow decisions to be made at the DTA staff level and only unusual appeals should be brought to the Transit Board for consideration.

Duluth Bus Stops

May 30, 2017

Recommended documents for review in designing a bus stop location plan include:

- Transit Cooperative Research Board (TCRP) Report #19 – Guidelines for the Design and Location of Bus Stops
- TCRP Report #125 – Guidebook for Mitigating Fixed-Route Bus-and-Pedestrian Collisions
- TCRP Synthesis #117 - Better On-Street Bus Stops
- Easter Seals Project Action – Toolkit for the Assessment of Bus Stop Accessibility and Safety
- TCRP Legal Research Digest #24 – Transit Bus Stops: Ownership, Liability, and Access.

The Principles of Universal Design should also be incorporated into bus stop planning, as well as adjacent streetscapes in some areas of Duluth where there is significant pedestrian activity. Universal Design incorporates ADA requirements and provides design guidelines for all pedestrians as outlined below:

- Principle 1: Equitable Use.
- Principle 2: Flexibility in Use.
- Principle 3: Simple and Intuitive Use.
- Principle 4: Perceptible Information.
- Principle 5: Tolerance for Error.
- Principle 6: Low Physical Effort.
- Principle 7: Size and Space for Approach and Use.

Inventory of Bus Stops

The Metropolitan Interstate Council (MIC) is in the process of completing a bus shelter inventory. This process will determine a condition report and will allow for asset management of the shelters. An inventory of all bus stops should be completed by summer, 2018 with the goal of determining the physical improvements needed to bring stops to ADA compliance standards. Additionally, the inventory should include condition evaluations of sidewalks adjacent to the bus stops. Standards for bus stop inventory are provided in the Easter Seals Project Action document.

Rationalization of Bus Stops

Using the guidelines in TCRP #19 and the best practices of TCRP Synthesis #117, the number of bus stops can be reduced in locations where there is a safe sidewalk network. Consideration of passengers who have special needs that make the extra distance to wider spaced stops should be part of the rationalization process.

Excellent boarding/alighting data at each bus stop is available that can assist in eliminating minimally used bus stops. A standard for the minimum number of boardings and alightings

Duluth Bus Stops

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should also be established by DTA staff. The initial standard is suggested as at least one boarding and alighting per week. This standard can be adjusted as part of a cost/benefit/safety analysis after the inventory of bus stops is completed. The separate document with bus stop spacing shows areas where the initial effort should be concentrated.

ADA Plan

After the inventory of bus stops is completed and bus stops are rationalized, DTA will have a more appropriately distributed number of stops. Most of the downtown/hospital stops and many of the West Mainline stops are ADA compliant with a good sidewalk system supporting safe pedestrian movement. Most of the residential stops and several commercial stops are not ADA compliant, and/or do not have safe supporting pedestrian sidewalk networks. An initial estimate is that there will be more than 1,000 stops that are not ADA compliant with good pedestrian access after the rationalization is completed.

The cost for ADA improvements can be staggering, and it is recommended that the priorities should be in locations with high usage by the general public and by people with disabilities. A suggested priority list would include:

- Locations where there are existing customers who have mobility limitations and use the fixed routes on a regular basis
- Prioritization based on the number of boardings/alightings per day
- Every other stop should be ADA accessible in initial phase of improvements

The initial program should be a 10-year plan for bus stop improvements of approximately 50 stops per year. The first two years should focus on stops with consistent usage by people with disabilities. The subsequent years should focus on total boardings and alightings. The boarding/alighting standard will create a bias towards the busiest routes. The second phase will complete ADA accessibility for all stops in years 11 to 20 of the program.

Consideration of equity distribution of bus stop improvement on the lightly used community circulator routes should also be a part of the bus stop plan in locations where there are passengers with mobility limitations. A recommendation of 80% investment in the busy routes and 20% in the community routes should be considered as an initial standard to balance ridership demands with service levels and equitable distribution throughout the community. The 80/20 ratio should be discussed by DTA staff and modified after the inventory and rationalization program is completed.

Maintenance

Maintenance of bus stops is always a challenge. Physical repair, such as damaged shelters or sign replacement, is relatively easy to identify and repair. More difficult issues are timely trash removal, concrete heaving, and snow maintenance. Adequate resources should be budgeted for shelter cleaning, trash removal, and snow maintenance. Cooperative policies with adjacent landowners is often time consuming to establish, but can result in improved snow removal. There are several options for developing relationships that are mutually beneficial for the transit system and the adjacent landowners.

Duluth Bus Stops

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An increase in the operating budget will be necessary for enhanced bus stop maintenance. Standards for appearance and maintenance should be developed to assist the operating employees in reporting bus stop problems, and protocols should be established for the timely completion of reported bus stop problems.

Summary

A bus stop location placement plan, developed collaboratively with input from local resources, should be developed, with the goal of providing safe, easily accessible bus stop locations that meet the needs of both passenger and drivers, while promoting efficiency of the system.

Standards and processes explained in TCRP Report #19; TCRP Synthesis #117; TCRP Report #125; and Easter Seals Project Action Toolkit for Assessment of Bus Stops should be the guiding documents in bus stop planning and development. The process should be a collaborative endeavor that garners input from different departments within DTA and includes the Public Works Departments of the cities served by DTA.

Passenger consideration and input should also be part of the process and included at an appropriate time. Public comments should be balanced against system efficiency, good bus stop practices, and the needs of current customers. A rationalization program that eliminates or combines bus stops to reduce the total number of stops should be developed in the next year. Improved maintenance should be included in the next budget cycle. The final step is a program for ADA accessibility should be developed with the goal of every other bus stop being accessible within 10 years.

Appendix 6. Capital and Facility Plan

Duluth Transit Development Plan Update

Prepared for: Duluth Transit Authority



ENGINEERS
PLANNERS
DESIGNERS



September 2017

SRF No. 10113

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Capital and Facility Plan

Introduction

This Capital and Financial Plan identifies capital needs including vehicles, facilities, and enhancements to support Duluth Transit Authority (DTA) operations through 2021. The DTA provided a list of projects, including funding source, grant program and total project amount, for years 2017 through 2024. The elements of the Capital and Financial Plan are a result of the findings from the 2017 Transit Development Plan (TDP) Update along with 2017-2024 list of projects supplied by DTA staff. The line items listed under the Financial Plan in this document are funded through a combination of federal, state and local funding sources. In addition to describing capital and financial needs to support the findings of the TDP, a summary of DTA requirements for Transit Asset Management under FTA and MnDOT guidelines has been provided.

Capital Facility Plan

Vehicles

Phased service improvements will be implemented in three phases over the five-year TDP planning horizon:

Phase 1: Years 1 and 2: Implementation of Two-year Pilot Program of Routes

Phase 2: Years 3 and 4: Frequency and Efficiency

Phase 3: Year 5: High Capacity Options and Regional Connectivity

The DTA has identified the purchase of the following vehicles as part of their list of projects:

- Year 2017: ten regular route buses, one regular route electric bus and three para-transit (STRIDE) vehicles.
- Year 2018: six para-transit (STRIDE) vehicles.
- Year 2019: up to ten regular route buses.
- Year 2021: up to ten regular route buses.
- Year 2022: three para-transit (STRIDE) vehicles.
- Year 2023: up to ten regular buses and six para-transit (STRIDE) vehicles.
- Year 2024: two para-transit (STRIDE) vehicles.

The proposed Phase 1 and 2 improvements from the TDP Update do not require the purchase of additional vehicles beyond what were already identified by the DTA. The TDP Update proposes studying the potential for High Capacity Options and Regional Connectivity during Phase 3 (Year 5). The outcome of this study could identify the need for

additional vehicles to deliver high frequency service. The DTA Financial Plan will be updated to reflect type, number and cost of any vehicles identified as part of the Phase 3 High Capacity and Regional Connectivity findings.

Bus Stop Access and Enhancements

Access to bus stops and the bus stop waiting environment is an important element for transit riders. Without a safe and accessible path to a bus stop, existing, and potential, riders will not be able to access the DTA system. It is important for every bus stop to have sidewalk access that connects to locations that passengers are coming from or going to. The sidewalk must be accessible not only to pedestrians, but also to those who use mobility devices such as walkers and wheelchairs.

The DTA, City of Duluth, and Metropolitan Interstate Council (MIC) are all taking steps to ensure bus stops are located where needed, provide Americans with Disabilities Act (ADA) access and enhancements to provide safe and comfortable shelter. The City of Duluth is developing a requirement for new and improved sidewalks associated with property being developed or redeveloped to enhance access to the transit system. The Metropolitan Interstate Council (MIC) performed a 2017 DTA Shelter Audit. The MIC developed an interactive map that provides the data collected as part of this audit, including the location and design (including ADA compliance) for each shelter. The following is a link to the DTA Shelter Audit: [2017 Duluth Transit Authority Shelter Audit](#).

The DTA recently purchased 30 shelters and will use these to replace existing shelters and add shelters where needed. The DTA is developing a bus stop location placement plan that will be used to identify locations for replacement shelters, and installation of shelters at new locations.

As part of the Capital Plan, it is recommended that DTA identify 50 stops per year for improvements. The first two years (2018/2019) will focus on ADA accessibility improvements and installation of shelters. These improvements are estimated at \$80,000 per year to cover accessible connectivity. The second two years (2020/2021) of improvements are estimated at \$60,000 per year. The current DTA Capital Plan has a line item for Capital Support/Facilities Equipment. The funds identified for this line item will cover the estimated costs for bus stop access and enhancements.

Other Major Capital Needs

Beyond vehicles and bus stop access/enhancements, other major capital needs have been identified as part of the TDP Update. Below is a summary of these additional capital needs. Additional detail on capital improvements were provided in the previous chapter on service recommendations.

Park and Rides

DTA currently has two park and ride lots in the service area – Piedmont Park and Ride (Haines Road and Piedmont Avenue) and Woodland Park and Ride (Calvary Road and Chicago Avenue). These facilities need site improvements and both have been added as projects under the Financial Plan. In addition to site improvements, Phase 2 of the Service Plan identified implementation of a targeted park and ride marketing campaign that includes outreach to the colleges through online advertisements and information provided at the student union and the new student orientations. The Financial Plan includes funds for this marketing campaign.

Technology and Marketing

Customer facing technology, such as real-time bus arrival information, mobile app fare payment, and new modern fareboxes, can make transit more attractive to potential users, expanding the number of riders who take transit to jobs, medical appointments, or special events. The DTA Service Plan identified Technology and Marketing improvements to support implementation of customer facing technology.

Real Time Transit Information

Real-time information can help increase ridership by reducing customer anxiety, enhancing perceived service reliability, and presenting a more “modern” image of public transit among discretionary riders that could choose other means of transportation. Real-time information can also be presented on an agency website for passengers to view pre-trip, and made available while passengers are en-route via smartphone application.

Fare Collection System

Fareboxes are an important interface with customers that should be clear to understand, convenient, and hassle-free. Current DTA riders use cash, or Stored Value Cards to pay fares. Exact change is needed upon boarding, as fareboxes or drivers do not provide change. Paper transfers are issued at the time of boarding. A new fare payment and reporting system will increase service effectiveness, system efficiency by establishing employee identification pass programs, Auto Vehicle Location integration, electronic tickets, and advanced fare tracking by route and location. It is recommended that as future grants and funding become available DTA should consider modernizing the fareboxes on the buses to allow for optimization of the fare collection process.

A significant capital investment has been identified for a fare payment and reporting system. The current system that DTA is using is 12 years old, has hardware reaching the end of its useful life, and software that is outdated and unable to provide needed reports. This investment allows DTA to meet one of the Greater Minnesota Investment Plan Objectives: “Invest in customer amenities that improve the transit experience, such as vehicles and enhancements, automatic vehicle locators, electronic fare systems, waiting shelters and

benches as appropriate.” This capital investment will replace existing fare boxes and infrastructure with new equipment that can support all forms of fare payment media, including mobile device tickets and software that can support DTA reporting requirements, with capacity to support a mobile fare payment application in the future. DTA is submitting a 2017 5339 Federal Grant application for this system, with an estimated cost of \$2,200,000.

Marketing

Short and long-term marketing strategies have been identified not only to increase community awareness for the DTA service changes as part of Phase 1, but to increase ridership in the future. The marketing initiatives are aimed at promoting DTA services through engagement with the community, and encouraging the use of the transit system. Short term strategies are recommended to be implemented to support service changes to the DTA network as well as improve the visibility of the service within the community to increase potential ridership. In coordination with Phase 1 service changes, all marketing materials including maps, schedules and signage would need to be updated to reflect the updated system.

Long-term marketing strategies are meant to consistently remind the customer about a brand and encourage them to continue purchasing those services. Community outreach is a good way to increase the visibility of a business. In addition to continued excellent customer service, it is recommended that DTA participate in and organize community outreach events to promote the brand.

Financial Plan

The costs associated with capital improvements are presented below in Table 1. Capital projects are funded by a combination of federal, state, and local funding sources. The local sources include the passenger and advertising revenue, and local tax levy. The projects listed in Table 1 updated the current list of DTA projects (including funding source, grant program and total project amount) to reflect findings from the 2017 DTA TDP update and include the 2017 MnDOT Office of Transit New Service Expansion (NSE) Funding Award.

The MnDOT Office of Transit NSE Award funded the following projects for SFY 2018:

- Expand Server Infrastructure.
- Mobile Device Application.
- Website Redesign.
- Para-transit Vehicle.
- 30-ft bus/trolley.

The MnDOT Office of Transit NSE Award funded the following projects for SFY 2019:

- Mobile Device Application.
- Website Design.

These capital costs are included in the 2018 and 2019 MN Expansion Grant-Capital Projects in Table 1.

Table 1. DTA TDP Financial Plan Update

Project	Funding Source	2017	2018	2019	2020	2021
Regular Route Electric Bus	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 788,000.00	\$ -	\$ -	\$ -	\$ -
	Local	\$ 197,000.00	\$ -	\$ -	\$ -	\$ -
Regular Route Buses	FHWA	\$3,014,400.00	\$ -	\$ 3,680,000.00	\$ -	\$3,756,000.00
	FTA	\$ 753,600.00	\$ -		\$ -	\$ -
	Local	\$ 942,000.00	\$ -	\$ 920,000.00	\$ -	\$ 939,000.00
STRIDE Vehicles	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ 652,800.00	\$ -	\$ -	\$ -
	Local	\$ -	\$ 163,200.00	\$ -	\$ -	\$ -
Low Floor Trolleys	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ 480,000.00	\$ -	\$ -	\$ -
	Local	\$ -	\$ 120,000.00	\$ -	\$ -	\$ -
Support Vehicle Acquisition	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 48,000.00	\$ -	\$ -	\$ -	\$ -
	Local	\$ 12,000.00	\$ -	\$ -	\$ -	\$ -
Capital Support/Facilities Equipment	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 320,000.00	\$ 400,000.00	\$ 860,000.00	\$ 560,000.00	\$ 592,000.00
	Local	\$ 80,000.00	\$ 100,000.00	\$ 215,000.00	\$ 140,000.00	\$ 148,000.00
Capital Facility Rehabilitation	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 860,000.00	\$ 240,000.00	\$ 320,000.00	\$ 240,000.00	\$ 320,000.00
	Local	\$ 215,000.00	\$ 60,000.00	\$ 80,000.00	\$ 60,000.00	\$ 80,000.00
Park and Ride Transfer Hub and Rehab	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ 468,000.00	\$ -		\$ -
	Local	\$ -	\$ 117,000.00	\$ -	\$ -	\$ -
Fare Payment and Farebox Replacement	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ 2,060,000.00	\$ -	\$ -	\$ -
	Local	\$ -	\$ 515,000.00	\$ -	\$ -	\$ -
ITS Updates	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 48,000.00	\$ -	\$ 80,000.00	\$ -	\$ 80,000.00
	Local	\$ 12,000.00	\$ -	\$ 20,000.00	\$ -	\$ 20,000.00
Real-Time Signage	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 80,000.00	\$ -	\$ -	\$ -	\$ -
	Local	\$ 20,000.00	\$ -	\$ -	\$ -	\$ -
Transit Signal Priority	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 320,000.00	\$ -	\$ -	\$ -	\$ 120,000.00
	Local	\$ 80,000.00	\$ -	\$ -	\$ -	\$ 30,000.00
Marketing	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA		\$ -	\$ 20,000.00	\$ -	\$ -
	Local	\$ -	\$ -	\$ -	\$ -	\$ -
Acquisition of new electric and hybrid batteries	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ 444,000.00	\$ -	\$ -	\$ -	\$ -
	Local	\$ 111,000.00	\$ -	\$ -	\$ -	\$ -
Preventative Maintenance	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ -	\$ -	\$ -	\$ -
	Local	\$ -	\$ 1,000,000.00	\$ 1,000,000.00	\$ -	\$ -
Capital Surveillance/Security	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ 40,000.00	\$ -	\$ 40,000.00	\$ -
	Local	\$ -	\$ 10,000.00	\$ -	\$ 10,000.00	\$ -
2018 MN Expansion Grant - Capital	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ -	\$ -	\$ -	\$ -
	Local	\$ -	\$ 1,318,000.00		\$ -	\$ -
2019 MN Expansion Grant - Capital	FHWA	\$ -	\$ -	\$ -	\$ -	\$ -
	FTA	\$ -	\$ -	\$ -	\$ -	\$ -
	Local	\$ -	\$ 100,000.00	\$ -	\$ -	\$ -

Transit Asset Management Requirements

FTA

Transit asset management (TAM) is a business model that prioritizes funding based on the condition of transit assets, to achieve or maintain transit networks in a state of good repair (SGR). The new standards will help transit agencies keep their systems operating smoothly and efficiently. Transit asset management involves a set of strategic and systematic processes and practices for managing the performance, risks, and costs of transit assets across their entire lifecycle to deliver service reliably, safely, and cost effectively. The FTA Federal Register 49 CFR Parts 625 and 630 final rule was issued in July 2016 and the full document is provided with this link [final rule](#).¹ This document was the source of the following information.

Per Moving Ahead for Progress in the 21st Century (MAP-21), FTA grant recipients or subrecipients are required to develop a TAM Plan and report data on their capital assets to the National Transit Database (NTD). TAM plan sponsors, which include States, and designated and direct recipients, must develop group TAM plans for their Tier II provider subrecipients, except those subrecipients that also are direct recipients under the Urbanized Area Formula Program authorized at 49 U.S.C. 5307. Tier II providers are those transit operators that do not operate rail fixed-guideway public transportation systems and have either one hundred (100) or fewer vehicles in fixed-route revenue service during peak regular service or have one hundred (100) or fewer vehicles in general demand response service during peak regular service hours. The group TAM plan approach is intended to reduce the burden on smaller transit providers of developing their own TAM plans and reporting to FTA's National Transit Database (NTD). A group TAM plan is subject to the same requirements for individual TAM plans. However, sponsors and participants should coordinate to determine their specific roles and responsibilities in complying with this rule.

Group Plan/Tier II Providers

A Tier II provider may participate in a single Group Plan or opt out and develop its own TAM Plan. Each transit provider must designate an Account Executive, so DTA is required to do this. A Group Plan participant must collaborate with the sponsor in the development of the plan. Tier II providers TAM Plan elements must include the following:

- Inventory of Capital Assets
 - A listing of all capital assets:
 - Owned by the transit provider
 - Equipment: Non-service vehicles & equipment > \$50,000
 - Include third-party exclusive-use non-equipment

¹ Federal Transit Administration, Federal Register/Vol. 81, No. 143/Tuesday, July 26/ Rules and Regulations

- Level of detail is same as in Capital Program of Projects
 - May use existing inventories already collected
 - E.g., existing rolling stock and equipment reports
 - Include assets acquired without FTA funds
- Condition Assessment
 - A rating of the inventoried assets
 - E.g., age; good/fair/poor; percentage of residual life
 - Ratings should be sufficiently detailed to monitor performance and plan capital investment
 - Condition assessments may be collected at the individual or asset class level
 - Condition assessments may include vulnerabilities to natural/climate hazards
 - Condition assessments are only required for assets with direct capital responsibility
- Decision Support Tools
 - List analytical process(es) used to make
 - Investment prioritization
 - To estimate capital investment needs over time
 - To assist in prioritization
 - The tool does not have to be specialized software
- Investment Prioritization
 - A ranked listing of proposed projects and programs ordered by year of planned implementation
 - Prioritization locally determined based on policy and need
 - Must adequately consider
 - Identified unacceptable safety risks
 - Accessibility requirements
 - Fiscally constrained based on estimated funding levels

Tier II providers are not required to provide the following additional elements required of all Tier I providers:

- TAM and State of Good Repair (SGR) Policy.
- Implementation Strategy.
- List of Key Annual Activities.
- Identification of Resources.
- Evaluation Plan.

These additional elements are useful tools that DTA may want to consider adding when possible.

TAM Plan Timeframes

Initial TAM Plans must be completed no later than October 2018 (two years after effective date). The TAM Plans must be updated in their entirety at least every four years when they will coincide with relevant (Statewide) Transportation Improvement Program, cover at least four years, or be amended during this period when there is a significant change.

MnDOT Office of Transit Asset Management Plan

MnDOT Office of Transit has developed a Transit Asset Management “Group Plan” that Tier II providers can follow. The full document can be found here [MnDOT Transit Asset Management Plan](#). Below is the introduction to MnDOT’s Office of Transit Asset Management Plan.

The 2012 Federal Transportation Authorization Bill (MAP-21) includes a requirement of State DOTs to develop a Transit Asset Management plan (TAM) as well as implement and maintain it.

Transit asset management is a strategic and systematic approach to managing transit physical assets. It focuses on business priorities and processes for resource allocation and utilization. Its objective is better decision making based upon quality information and well-defined objectives.

A transit asset management plan is a comprehensive documentation of how assets are managed over their lifecycle, including the asset inventory and condition, performance measures and a plan for asset preservation. The goal of the Minnesota Office of Transit is to maintain quality service throughout Greater Minnesota; expand and improve services where possible; and to preserve or maintain financial stability. One of the ways of doing that is through maximizing useful life of existing assets.

Every transit system in Minnesota is required to have an Asset Management Plan. Elements of the plan, such as vehicle inventory and capital replacement plans are entered and maintained in Minnesota’s Black Cat Grants Transit Database. (Future reference: Black Cat Grants)

Assets include: All rolling stock – purchased with Federal or State funds; All facilities built with Federal or State funds; and equipment with a replacement value of \$100,000 or more.

Once the plan is created, the systems will be required to update their plans annually. The fleet and facility inventory will be kept as part of the Black Cat Grants system.

- Will be a living document.
- Acceptable to FTA.
- Written to last at least 10 years – could be out to 30 years for MPOs.

MnDOT continues to further develop their Group Plan and provide additional supporting working documents.