



# Final Report

OKC Moves Bus Study

EMBARK

# FINAL

February 2022



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# EXECUTIVE SUMMARY

This report summarizes the results of the *OKC Moves Bus Study* Comprehensive Operational Analysis (COA) for the EMBARK transit system.

This report outlines the background conditions in which EMBARK operates, provides a comprehensive evaluation of existing service characteristics and system performance, and makes recommendations for the future. The planning process examined the existing market and operating conditions, engaged in public and stakeholder outreach, developed and refined alternative service scenarios, and recommended a series of service improvements for short-term implementation and long-term implementation.

## BACKGROUND

In February 2021, EMBARK initiated a comprehensive transit study with several objectives:

- Assessing the existing route network design
- Developing a detailed plan to guide service improvements and capital investments
- Actively engaging the public and community stakeholders throughout the study

The nearly year-long study examined existing transit and market conditions. The study also included robust and dynamic community and stakeholder outreach. The outcome of the study is an implementable plan with short-term and long-term improvements to optimize and expand public transit in Oklahoma City.



## EXISTING CONDITIONS

### \$ Funding

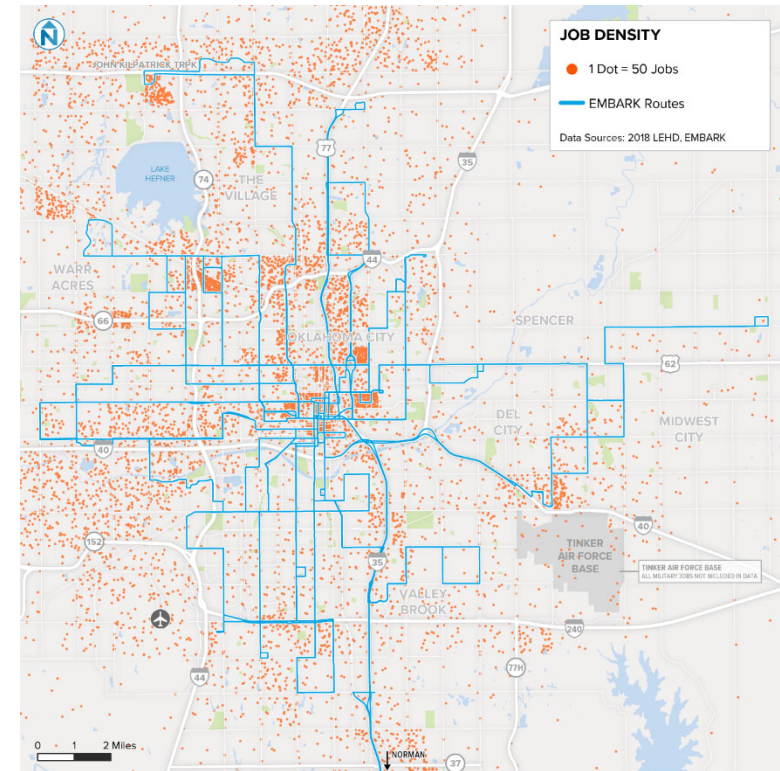
- **The lack of dedicated funding is a key barrier to implementing regional transit improvements.** Several local and regional studies found that transit funding per capita is significantly lower than for other similarly sized metropolitan areas and recommend looking for alternative funding sources such as partnerships involving non-traditional sources or exploring the potential for dedicated funding sources.



### Market Analysis

- **Population density and transit propensity are both generally highest in the southern, and western areas of the city.** The highest population density and transit propensity areas of the city are currently served by EMBARK service, including the Classen Blvd, 23<sup>rd</sup> St, and Western Ave corridors.
- **Most large employment centers are currently served by EMBARK. Employment centers are generally distributed throughout the region and are well served by existing EMBARK service. In addition, the proposed NW BRT serves many of the biggest job concentrations.** There is an opportunity to expand service to reach the employment hub including Silver Springs Pointe and Walmart on NW Expressway (Figure ES-1).

Figure ES-1 Employment Density

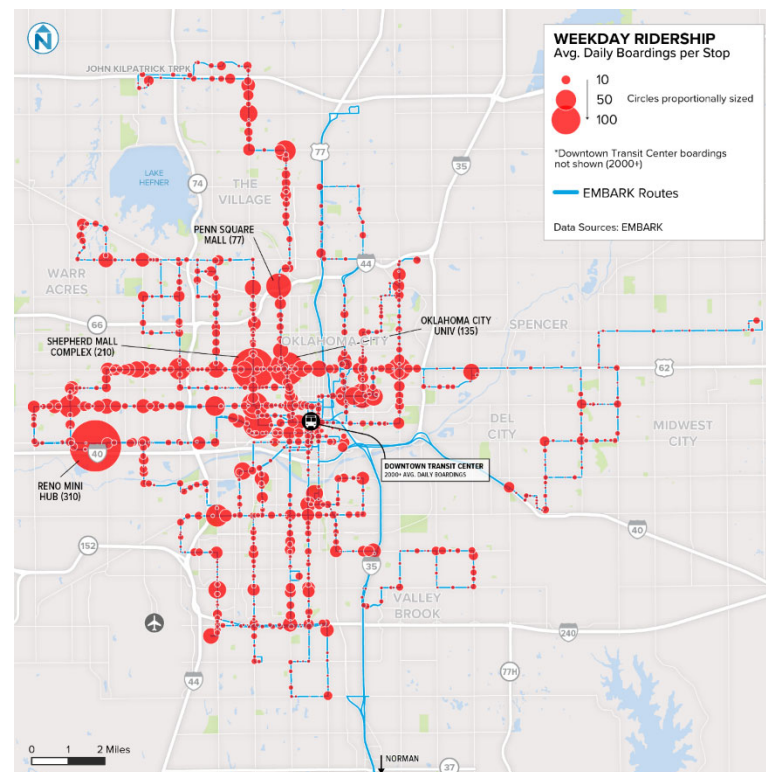


Note: The Census LEHD data source used for this analysis does not include military jobs, thus the Tinker Air Force Base appears underrepresented in this map.

## Route and System Performance

- **Ridership is highest in downtown Oklahoma City and along key corridors.** The highest ridership stops and corridors include key transfer locations like the Downtown Transit Center and Reno Mini Hub, the 23<sup>rd</sup> St and 10<sup>th</sup> St corridors, and the general areas of south and west Oklahoma City (Figure ES-2).
- **Several routes struggle with on-time performance issues.** On average, 74% of trips are on-time systemwide with some routes averaging as low as 50% on-time. There are significant opportunities to improve on-time performance and reliability by making minor schedule adjustments, alignment changes, or implementing transit signal priority improvements.

Figure ES-2 Average Weekday Boardings by Stop



## COMMUNITY OUTREACH

Community participation was essential to the development of this plan. Two rounds of outreach were conducted as a part of this process and consisted of virtual public meetings, a pop-up event at the downtown transit center, stakeholder discussions, a project website, online surveys, and agency staff interviews. The first round of outreach focused on receiving comments on existing transit service and opportunities for improvement. The second round of outreach introduced potential changes to the existing route network.



### Phase I Outreach

During Phase I of public outreach, members of the community and stakeholders were asked to identify aspects of the EMBARK system that were working well, were not working well, and to provide their highest priority service improvements. Key findings from this phase of outreach include:

- The highest improvement priorities are providing **later evening service, expanding weekend service, and more frequent service** on key corridors.
- Commonly identified unserved destinations include Will Rogers Airport and several major employers like the Amazon Fulfillment Center, Paycom, and Hobby Lobby Headquarters.



### Phase II Outreach

After identifying the highest priority improvements from the community, three preliminary service scenarios were developed to present different potential visions for the future of transit in Oklahoma City. In Phase II of public outreach, these scenarios were presented to the community, stakeholders, and agency staff and participants provided feedback on what aspects of each scenario they supported or did not support.

Key findings from Phase II of public outreach include:

- There is strong support in the community to transition to a **grid-oriented network**.
- There is also support for providing service to **new areas** like Moore and providing **more direct** crosstown service.

## RECOMMENDATIONS

After hearing from customers and members of the community, the components from each scenario with the highest support were then combined into a single Preferred Alternative. The Preferred Alternative included Short-Term Recommendations to best meet the needs of the community within the existing budget and Long-Term Recommendations to guide the development of transit improvements over the next 10 years.



### Short-Term Recommendations

The improvements included in the Short-Term Recommendations are intended to accomplish several key goals, including:

- Integrate the NW BRT into the existing fixed-route network
- Extend service to new destinations
- Address on-time performance issues
- Better connect northeast Oklahoma City to jobs and services
- Standardize frequency on routes to improve daily transfers

### Reliability Improvements

Reliability improvements and frequency standardization are recommended for several routes, including Routes 002, 012,

013, 016, 023, 024, and 038. These improvements include minor modifications to route alignments and schedules to reduce travel times or increase average operating speeds, improving on-time performance and service reliability.

### Extend Service to New Destinations

Route alignment extensions and frequency changes are proposed for Routes 014, 015, and 019 which would operate outside of the Oklahoma City limits in Midwest City, Del City, Spencer, and Oklahoma County. This would improve regional accessibility and access to employment and retail opportunities for more residents in the region.

### BRT Integration

A key component of the Short-Term Recommendations is to realign the local service network to better integrate with the NW BRT route. This improvement includes an initial truncation of Route 005 to feed into the BRT and a realignment and extension of Route 008.

There is an opportunity to replace Route 005 with an extended alignment of Route 003. This would improve access to jobs and services from northeast OKC and further enhance integration with NW BRT. *This improvement, however, would require additional resources for implementation and should be prioritized after the initial integration improvements.*

A system map of Short-Term Recommendations is shown in Figure ES-4.



## Long-Term Recommendations

The Long-Term Recommendations outline a 10-year vision that addresses regional growth, supports economic development, and responds to public priorities. The improvements included in the Long-Term Recommendations are not cost constrained and will require additional resources and capital investments to implement and operate. Key goals and improvements contained within the Long-Term Recommendations include:

- Addressing additional on-time performance challenges
- Re-focusing service away from downtown Oklahoma City
- Improving service frequency on key corridors
- Operating later evening service
- Better weekend service
- Focusing on improving access to employment opportunities
- Expanding regional access to transit
- Developing new service delivery alternatives to expand service coverage

A summary of Long-Term Recommendations is shown in Figure ES-3 and a system map of Long-Term Recommendations is shown in Figure ES-5.

Figure ES-3 Long-Term Improvements Summary







Service Improvement	Recommendations
 <b>Improved Frequency of Service</b>	<ul style="list-style-type: none"> <li>▪ Create a four-route frequent transit network that operates 7 days a week</li> <li>▪ Provide 30-minute on almost all Saturday routes</li> </ul>
 <b>Improved Span of Service</b>	<ul style="list-style-type: none"> <li>▪ Provide service until midnight on weekdays and Saturdays</li> <li>▪ Provide service until 10 p.m. on Sundays</li> </ul>
 <b>Keep Buses On Time</b>	<ul style="list-style-type: none"> <li>▪ Budget for schedule maintenance for four routes</li> </ul>
 <b>Service to New Areas</b>	<ul style="list-style-type: none"> <li>▪ Downtown to Airport &amp; 44<sup>th</sup>/Council</li> <li>▪ 44<sup>th</sup> Street Crosstown</li> <li>▪ SE 15<sup>th</sup> Street Route</li> <li>▪ May Avenue Crosstown</li> <li>▪ NE OKC to Quail Springs</li> <li>▪ Baptist Integris to Reno Hub</li> <li>▪ Service to Moore</li> <li>▪ Better south OKC service</li> </ul>
 <b>On-Demand Zones</b>	<ul style="list-style-type: none"> <li>▪ Improve coverage in growing areas with three on-demand zones</li> </ul>
 <b>Secondary Transfer Hubs</b>	<ul style="list-style-type: none"> <li>▪ New secondary transfer hubs are recommended at Quail Springs Mall, Oklahoma City Community College, Reno Hub, Santa Fe Walmart, and at the Del City Walmart.</li> </ul>

Figure ES-4 Cost Neutral Short-Term Recommendations Map

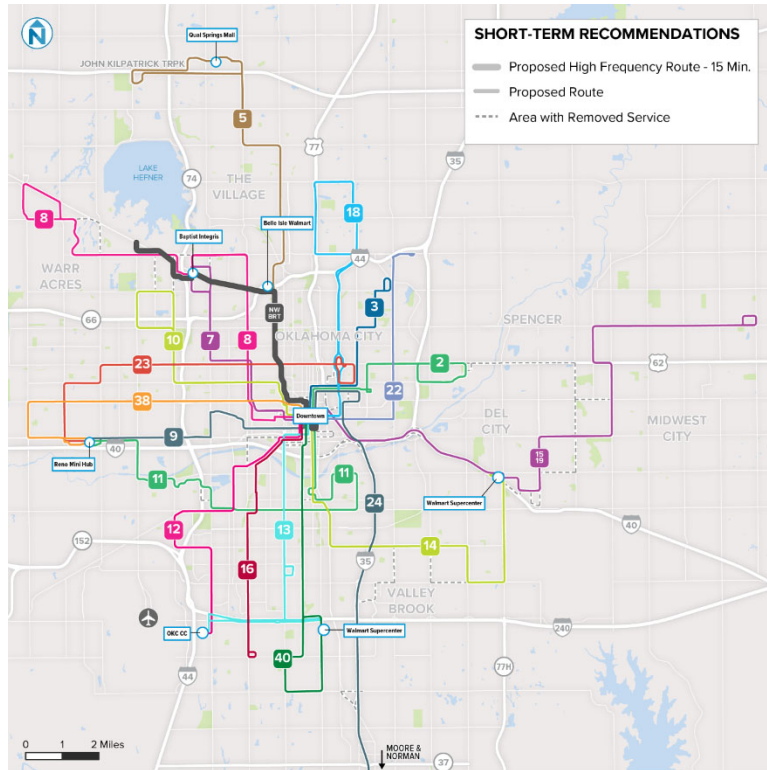
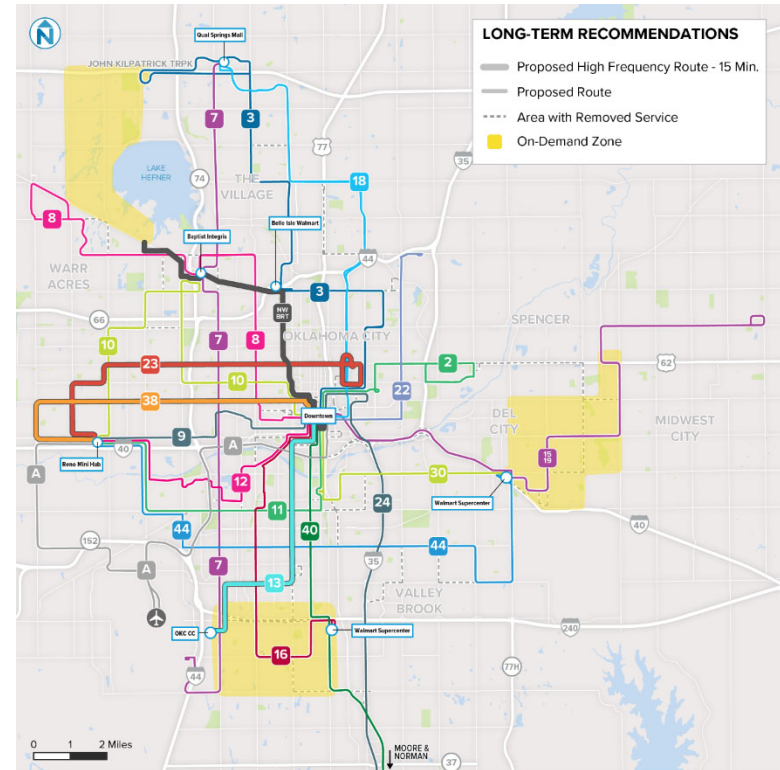


Figure ES-5 Cost Unconstrained Long-Term Recommendations Map



# 1 INTRODUCTION

This Final Report is the final element of the Comprehensive Operational Analysis (COA) effort for EMBARK, branded as the *OKC Moves Bus Study*.

The purpose of this report is to summarize the background conditions in which EMBARK operates, provide a comprehensive evaluation of existing service characteristics and system performance, present preliminary service scenarios, summarize public engagement, and describe the preferred alternative for the EMBARK system.

## REPORT ORGANIZATION

This report assesses the operating context in the EMBARK service area, including the cities of Oklahoma City and Midwest City, and the connecting communities and adjacent cities of Warr Acres, Del City, Edmond, Valley Brook, Moore, Norman, Oklahoma County, and Cleveland County. The Final Report assesses the demographic and socioeconomic characteristics of the service area, and transit system characteristics and performance. This Final Report also presents preliminary service scenarios, summarizes public involvement, and summarizes the key changes recommended to the EMBARK system in the preferred alternative. The remainder of this document consists of the following:

- **Chapter 2** considers and summarizes a variety of local and regional planning efforts within the EMBARK service area and discusses any potential implications for future service planning.
- **Chapter 3** evaluates socioeconomic and demographic conditions within the EMBARK service area to better understand transit demand and service gaps between the community and the existing service network.
- **Chapter 4** contains a travel pattern analysis showing the travel flows and volumes between key origins and destinations in the Oklahoma City area before and after the COVID-19 Pandemic.
- **Chapter 5** provides detailed service and performance information for existing EMBARK routes including identified strengths and opportunities for each route.
- **Chapter 6** provides a summary of outreach activities performed in conjunction with the existing conditions analysis and identifies key findings from public outreach.



- **Chapter 7** describes initial service concepts and the community's comments on those concepts through the second phase of public engagement.
- **Chapter 8** contains a robust reliability assessment which analyzes the average, 85<sup>th</sup> percentile, and 95<sup>th</sup> percentile travel times between every timepoint for every trip of every route in the EMBARK system to identify where and when on-time performance issues are occurring and includes recommendations for improving reliability on specific routes.
- **Chapter 9** details the recommended route structure based on the community's input, including both cost-neutral recommendations in the short-term and unconstrained recommendations in the long-term.
- **Chapter 10** identifies and prioritizes the phased implementation of Long-Term Recommendations based on community priorities and estimated costs.
- **Appendix A** contains a detailed review of peer agencies including service and operating characteristics as well as an evaluation of dedicated funding sources and best practices for these agencies.
- **Appendix B** contains the verbatim comments and open-ended responses received through the community surveys conducted during both Phase I and Phase II of public outreach.
- **Appendix C** contains the segment level runtime charts used in the reliability assessment, including the average, 85<sup>th</sup> percentile, and 95<sup>th</sup> percentile travel times between every timepoint for every trip of every route in the EMBARK system.
- **Appendix D** includes the individual route maps for each route with proposed service changes in the Preferred Alternative. This appendix includes maps for both the Short-Term Recommendations and Long-Term Recommendations.
- **Appendix E** contains an evaluation of existing service standards and presents recommendations for updated service standards, guidelines, and performance measures.
- **Appendix F** includes several memos related to operations, including Bus Rapid Transit integration, on-time performance, scheduling and runcutting, supervisory scheduling and deployment, and scheduling technology.

## 2 DOCUMENT REVIEW

This chapter summarizes content from existing local and regional planning documents to ensure that EMBARK services and recommendations are consistent with regional goals. This review includes a diverse cross-section of plans and studies conducted by Oklahoma City, Central Oklahoma Transportation and Parking Authority (COTPA), and the Association of Central Oklahoma Governments (ACOG). Documents reviewed in this chapter include:

- GoNorman Transit Plan (2021)
- EMBARK Rider and Non-Rider Survey (2020)
- Oklahoma City Public Transportation and Parking FY20 Final Plan (2019)
- ACOG 2020-2023 Transportation Improvement Program for the OCARTS Transportation Management Area (2019)
- Oklahoma City EMBARK Northwest Multimodal Transportation Corridor Concept Plan (2017)
- ACOG Encompass 2040 (2016)
- COTPA Compressed Natural Gas (CNG) Operational Needs Assessment Recommended Improvement Study (2016)
- Oklahoma City PlanOKC Comprehensive Plan (2015)
- ACOG Central Oklahoma Commuter Corridors Study (2015)
- Oklahoma City Housing Market Preference and Demand Study (2013)
- COTPA Transit Service Analysis (2013)
- COTPA – METRO Transit<sup>1</sup> 2030 Fixed Guideway Study (2005)
- COTPA Long-Range Service Plan (2001)

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<sup>1</sup> METRO Transit is now EMBARK

## KEY FINDINGS

- **The lack of available funding is a key barrier to implementing regional transit improvements.** Numerous studies found that transit funding per capita is significantly lower than for other similarly sized metropolitan areas and recommend looking for alternative funding sources such as partnerships involving non-traditional sources or exploring the potential for dedicated funding sources.
- **Regional transit services are prioritized in several documents.** New and expanded BRT and commuter rail in particular are commonly mentioned and evaluated in local and regional plans including ACOG and EMBARK. Additionally, the Regional Transportation Authority (RTA) board of directors has transitioned from working with ACOG to working with EMBARK as the administrative arm of the RTA, which is currently conducting an updated commuter rail line study called the Transit System Plan: Regional Corridors.
- **Regional population growth is expected to be concentrated in the downtown Oklahoma City area and in smaller regional cities.** The cities of Norman, Edmond, Moore, and Yukon are expected to experience population growth in the future.
- **Most recommendations from the 2013 COTPA Transit Service Analysis have been implemented, including improved frequency, later evening service, and Sunday service.**

## LOCAL DOCUMENTS

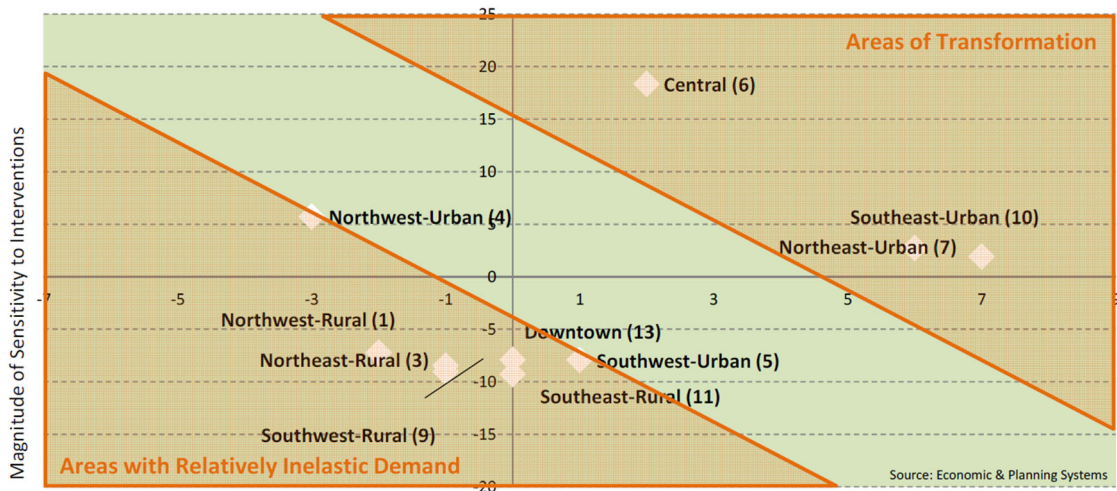
### Oklahoma City Housing Market Preference and Demand Study (2013)

The purpose of this study is to better understand demand and preferences for housing within Oklahoma City’s municipal boundaries. The findings from this study were used to inform and shape the PlanOKC Comprehensive Plan.

Primary strategies recommended for Oklahoma City include:

- All future programs, policies and projects need to address improved ‘sense of safety and security’.
- Improve access to school by identifying the City’s role in school districts and education improvements.
- Evaluate all existing and potential funding sources to achieve placemaking within the city.
- The city should prioritize completing projects within the Areas of Transformation (Figure 2-1) identified in the report.
- Create Area Plans that can highlight walkability and connectivity for priority locations.
- The city should also invest in public infrastructure including sidewalks, trails, bike lanes, and transit.
- Oklahoma City should consider removing some barriers in their regulations so that more diverse goals can be achieved such as higher densities, and preserving, or enhancing desirable neighborhood characteristics.
- City-wide regulations should be modified in order to establish a ‘sense of place’ opportunity within the city.

Figure 2-1 Areas of Transformation



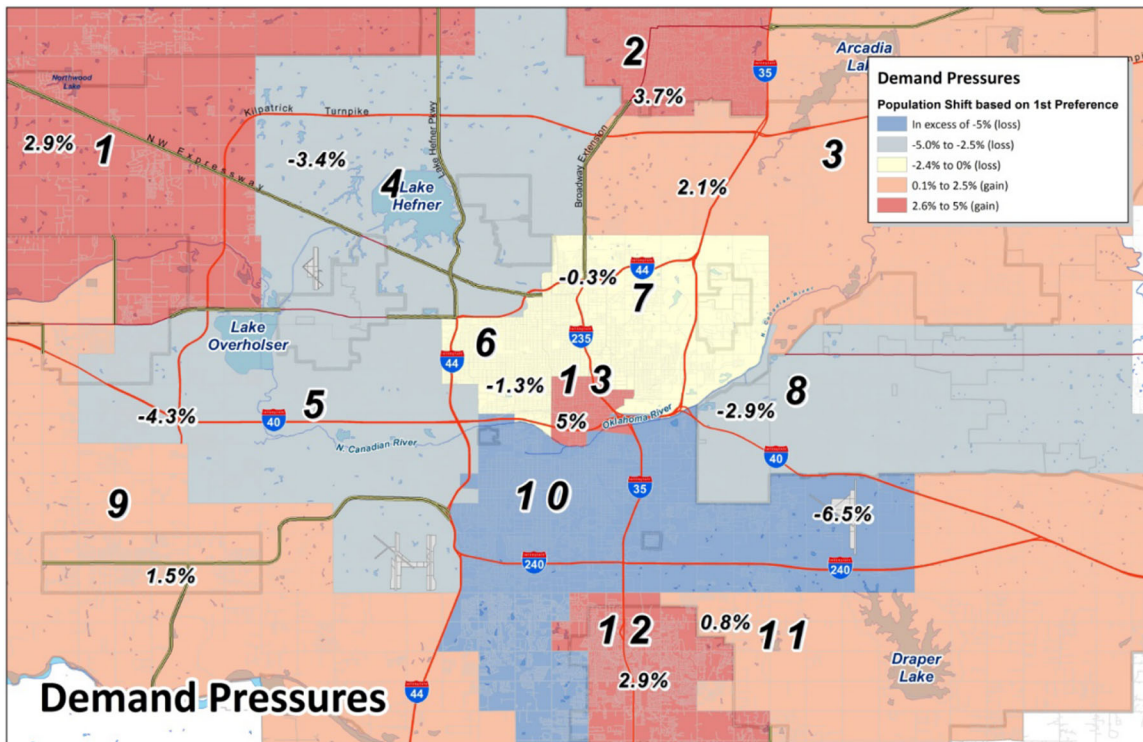
Impact on Subarea's Attractiveness

The following needs, gaps, and barriers were also identified:

- The study finds that the city’s existing housing stock is meeting approximately 50% (more than 65,000 units) of the estimated increase in housing demand over the next 20 years.
- Gen X and Gen Y would constitute more than 70% of all homebuyers in the next 20 years.
- The study also had a public survey component and 15% of the respondents stated that they had plans to leave the Oklahoma City region in less than five years.
- Nearly 80% of households prioritize neighborhood characteristics over building characteristics.
- Access to schools play a very strong role in attracting or deterring population in the region.

Figure 2-2 identifies expected migration patterns based on which neighborhoods people say they would like to move amongst the surveyed households. The neighborhoods or Subareas in orange and red are expected to have net population increases from intraregional migration, while the blue and yellow areas are expected to experience net population decreases due to intraregional migration. The cities of Norman, Edmond, Moore, and Yukon as well as downtown Oklahoma City are expected to have the largest increases in regional population growth.

Figure 2-2 City of Oklahoma City Housing Market Preference and Demand Study’s identified Demand Pressures



## Oklahoma City PlanOKC Comprehensive Plan (2015)

PlanOKC is the latest comprehensive plan for Oklahoma City. As a comprehensive plan, PlanOKC is a policy document used by city leaders, developers, business owners, and citizens to make decisions about future growth, development, policy, and capital improvements.

The plan contains eight elements which can serve as individual focus areas within the larger document. Element chapters cover different topics and discuss issues, goals, and initiatives related to each topic. Each initiative includes a summary of policies the city and its partners intend to pursue in order to accomplish the goals outlined in each element. These elements are as follows:

**sustainokc**  
future land use

**connectokc**  
transportation

**greenokc**  
environmental & natural resources

**liveokc**  
communities

**enrichokc**  
preservation | appearance | culture

**playokc**  
parks & recreation

**strengthenokc**  
economic development

**serveokc**  
public services

Focusing on **ConnectOKC** for this review, the plan looks at the existing conditions of:

- **Streets and roadways:** focusing on condition, network connectivity, access, capacity, and its multi-modality.
- **Transit:** focusing on system re-branding, service hours and coverage, infrastructure needs, technology, multi-modal access, and density.
- **Bicycle facilities:** focusing on network continuity, coverage, user comfort, facilities, and safety.
- **Trails:** focusing on connectivity, linkages in network, user conflicts, design and facilities, and maintenance.
- **Sidewalks:** focusing on limited areas of service, condition of sidewalks, funding, and accessibility.
- **Airports:** focusing on multi-modal accessibility.
- **Freight:** focusing on rail volumes, intermodal facilities, and local impact.

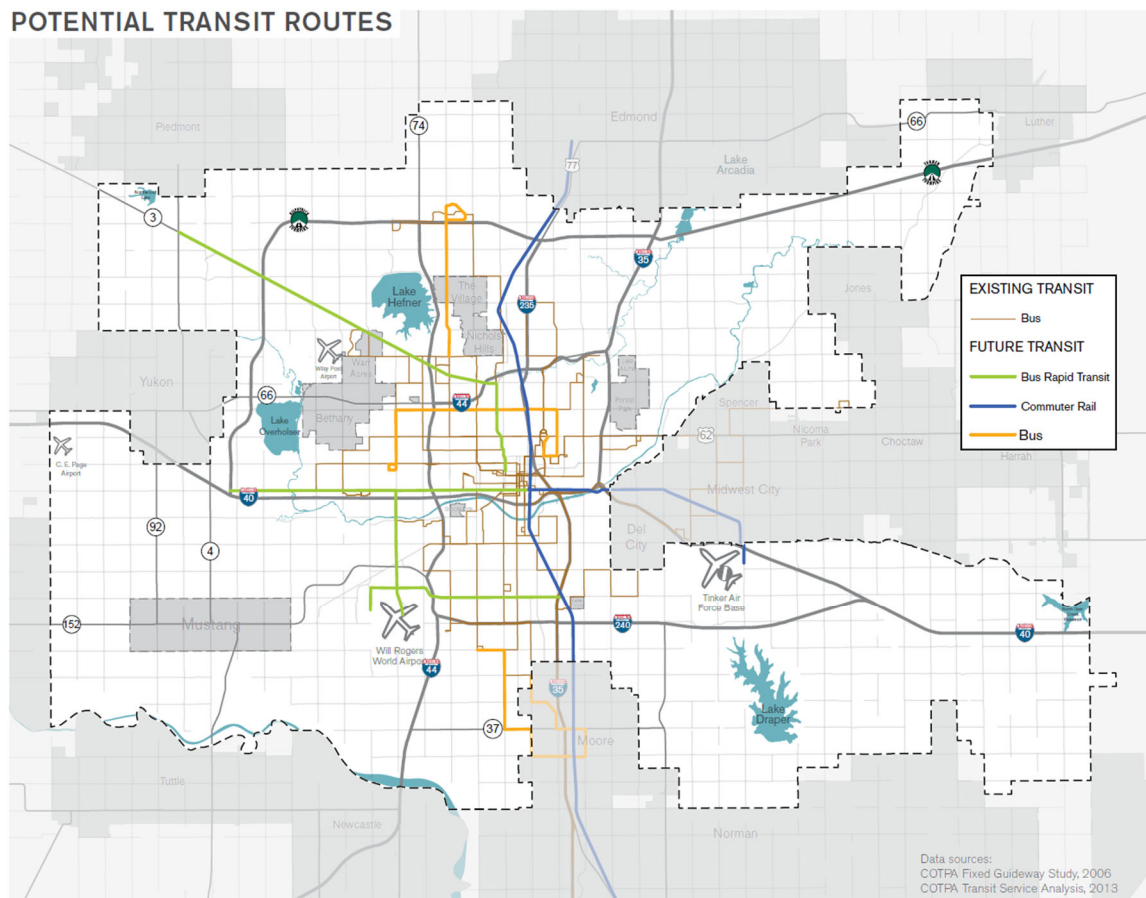
The plan provides goals for each focus area (nine in total) within this element and lists 22 initiatives that fulfill at least two or more of these goals. As well as identifying potential future local, express, and Bus Rapid Transit (BRT) route alignments as seen in Figure

2-3. The plan states in its C-38 implementation policy that it aims to implement the policies and strategies recommended in the 2013 COTPA Transit Service Analysis.

From a transit perspective, a key goal includes: “People have convenient access to an efficient and effective transit system that connects them to their daily activities and is valued as a public benefit.” There are nine initiatives that directly or indirectly fulfill this goal:

- Implement street connectivity standards.
- Create multi-modal corridors.
- Establish a regional transit authority.
- Implement major transit improvement plans.
- Interconnect transit with other modes.
- Design for transit access.
- Provide transit to airport.
- Implement street and land use typology standards.
- Develop Livable Streets.

Figure 2-3 PlanOKC Comprehensive Plan ConnectOKC's Potential Transit Routes



## Oklahoma City EMBARK Northwest Multimodal Transportation Corridor Concept Plan (2017)

This Corridor Concept Plan primarily builds on EMBARK's 2030 System Plan as outlined in the COTPA Regional 2005 Fixed Guideway Plan (FGP). This plan includes goals and objectives, data, maps, and design concepts for the Northwest Multimodal Transportation Corridor (NW Corridor).

The plan identifies the potential for multimodal transportation in the NW Corridor. The NW Corridor is defined as the area that runs along North Classen Boulevard and Northwest Expressway in Oklahoma City. The goal of the concept plan is to focus on increasing mobility and healthcare access through multimodal public transportation options.

This corridor was selected as one of the five in the U.S. for a health-in-planning beta test by the United States Department of Transportation (USDOT) in late 2014. Figure 2-4 shows the study corridor and the seven intersections explored in the 2015 health-in-planning beta test. The beta test was for a six-step pilot planning approach wherein healthy community factors are made part of a corridor planning project.

The study analyses the proposed corridor and provides six recommended next steps. The necessary requirements under each step have been detailed along with the deliverable and outcomes. The recommended next steps are as below:

- Additional Outreach with Stakeholders
- Prepare Final Report
- Review Beta Test Results
- Identify Interim Implementation Projects
- NEPA Work and other Planning & Design
- Funding Options/Sources





## Oklahoma City Public Transportation and Parking FY20 Leading for Results Strategic Business Plan (2019)

The purpose of this document is to lay out a strategic plan for Oklahoma City’s Public Transportation and Parking Department’s fiscal year 2020. The report states the city and department’s vision and mission along with core issues and how they will be addressed. Three core issues stated in the plan are shown below in Figure 2-5. Each issue includes a list of strategies that the department has identified to address the issues.

Figure 2-5 Public Transportation and Parking Department Core Issues

Service	Safety	Growth
<ul style="list-style-type: none"> <li>▪ Complete equipment and facility preventative maintenance work on schedule.</li> <li>▪ Expand commitment to recruiting, retaining, and developing our workforce.</li> <li>▪ Modernize practices and maximize technology to improve the customer experience.</li> <li>▪ Educate our community about EMBARK services and develop community partners.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement federally required Safety Management System (SMS).</li> <li>▪ Modernize and intensify employee safety training systems.</li> <li>▪ Invest in ongoing transit and parking asset maintenance and management.</li> <li>▪ Develop and implement an incident tracking and reporting system.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Implement private sector employee transit pass program.</li> <li>▪ Affect change in the municipal code to support Transit Oriented Development and land use strategies.</li> <li>▪ Update and implement long-range and short-range transit and parking plans.</li> <li>▪ Promote technology-based customer centric programs, improve ADA eligibility process, and establish a travel training program.</li> <li>▪ Continued coordination with state, local and federal partners regarding transit funding.</li> <li>▪ Launch pilot program to manage private parking assets.</li> </ul>

The report also details key programs and their respective budgets for FY 2020. These programs are categorized into three lines of business:

- **Administrative:** Executive Leadership Program; Customer Relations Program; Safety, Security and Training Program.
- **Parking:** Municipal Off-Street Parking Program; On-Street Parking Meter Program.
- **Public Transportation:** Bus Operations Program; Bus Stop Management Program; EMBARK Plus ADA Transportation Program; Facilities Management Program; Fleet Management Program; EMBARK Norman; vRide Vanpool; Oklahoma River Cruises Program; Mobility Management Program; Spokies Bike Share Program; Streetcar Program.

## GoNorman Transit Plan (2021)

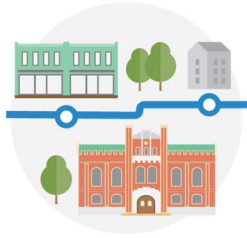
The Go Norman Transit Plan is a roadmap for optimizing and expanding transit service within the City of Norman. The plan is the outcome of a nearly year-long study that included a comprehensive review of the City of Norman's existing transit service and numerous community engagement activities. The Go Norman Transit Plan provides detailed and prioritized recommendations for improving and expanding transit.

The comprehensive transit study included several objectives:

- Assessing the existing route network design
- Recommending the location and characteristics of a future downtown transit center
- Developing a detailed plan to guide service improvements and capital investments
- Actively engaging the public and community stakeholders throughout the study

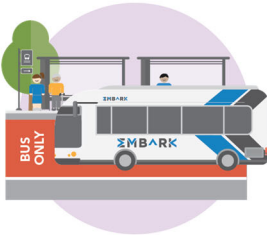
The nearly year-long study examined existing transit and market conditions. The study also included robust and dynamic community and stakeholder outreach. The outcome of the study is an implementable long-range plan to optimize and expand public transit in Norman. Recommendations from the plan are shown in Figure 2-6.

Figure 2-6 GoNorman Transit Plan Recommendations



### Update and streamline the route network

Realign bus routes to better serve the needs of existing and potential transit riders by improving access to key destinations and reducing travel time.



### Establish a Downtown Transit Center

Relocate the local route transfer hub from the OU campus to downtown Norman to maximize efficiency and allow for future service expansion.



### Strategically expand bus service

Extend routes to serve emerging destinations, offer longer hours and more frequent service, and operate on Sundays.



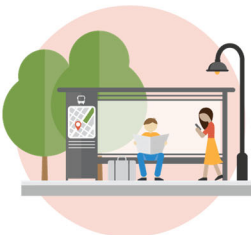
### Upgrade and standardize the fleet

Replace aging vehicles and assemble a uniform fleet to minimize maintenance costs. Pursue Federal Transit Administration (FTA) grants for replacement buses.



### Continue to operate fare-free

Avoid costly fare collection equipment on new buses. Allow riders to adjust to route changes and the local economy to recover from the pandemic before re-evaluating the fare policy.



### Promote transit supportive land use

Make transit easier to access and encourage more sustainable development. Maximize rider safety, comfort, and convenience.

## COTPA DOCUMENTS

### COTPA Long-Range Service Plan (2001)

The COTPA Long Range Service Plan establishes a vision for public transit services in the greater Oklahoma City area. The development of the plan was guided by public outreach, research into forecasted travel patterns in the metro area, and demographic and development trends. Primary strategies for improving service within the Oklahoma City area include:

- Provide an array of mobility options to serve the greater Oklahoma City metropolitan area. These options range from trolleys, to fixed route buses, to express buses with park-and-ride lots, to carpools and vanpools, to demand responsive services.
- Deliver innovative services that are responsive to the market needs of the community and services that place the customer first.
- Deliver services that are reliable, on-time, safe, clean, and friendly.
- Efficiently use financial resources and seek out alternative funding sources.
- Increase the availability of transit information and ensure materials are user-friendly.
- Enhance service within the current service area by increasing the number of operating hours and increasing the frequency of service.

The study identified several needs, gaps, and barriers for public transportation, many of which have been addressed in the years following this study. These needs, gaps, and barriers include:

- The lack of available funding is a key barrier to implementing LRTP recommendations. The study recommended looking for alternative funding sources such as partnerships, involving non-traditional sources and other communities in funding of services that benefit them directly.
- EMBARK is not viewed as an asset for the entire community.
- Oklahoma City is underserved for ADA complementary paratransit compared to peer cities with similar characteristics to the Oklahoma City area, including area and urbanized area population size.

## **COTPA – 2030 Fixed Guideway Study (2005)**

The purpose of the Regional Fixed Guideway Study is to identify potential transportation solutions that improve connections between Oklahoma’s growth centers, enhance economic development opportunities, expand transportation options, and improve air quality. The study is a continuation of previous LRTP efforts. The study resulted in the creation of the 2030 System Plan Vision for the Oklahoma Metropolitan Area, which recommends routes and corridors most appropriately suited for commuter rail, BRT, modern streetcar, and enhanced bus service.

Through agency collaboration and public input, the study developed a range of conceptual corridors, as seen in Figure 2-7. The analysis and input resulted in eleven concept corridors to be analyzed. The corridors consist of a central corridor encompassing downtown, seven radial corridors, and three cross-town corridors.

Primary strategies for improving service within the Oklahoma City area include:

- Identify transit technologies that would best fit the Oklahoma City metropolitan area.
- Designate a Project Champion to enhance credibility, public awareness, and focus on project needs during early implementation.
- Spread awareness of the COTPA Fixed Guideway System Plan using various media outlets to keep the public informed.

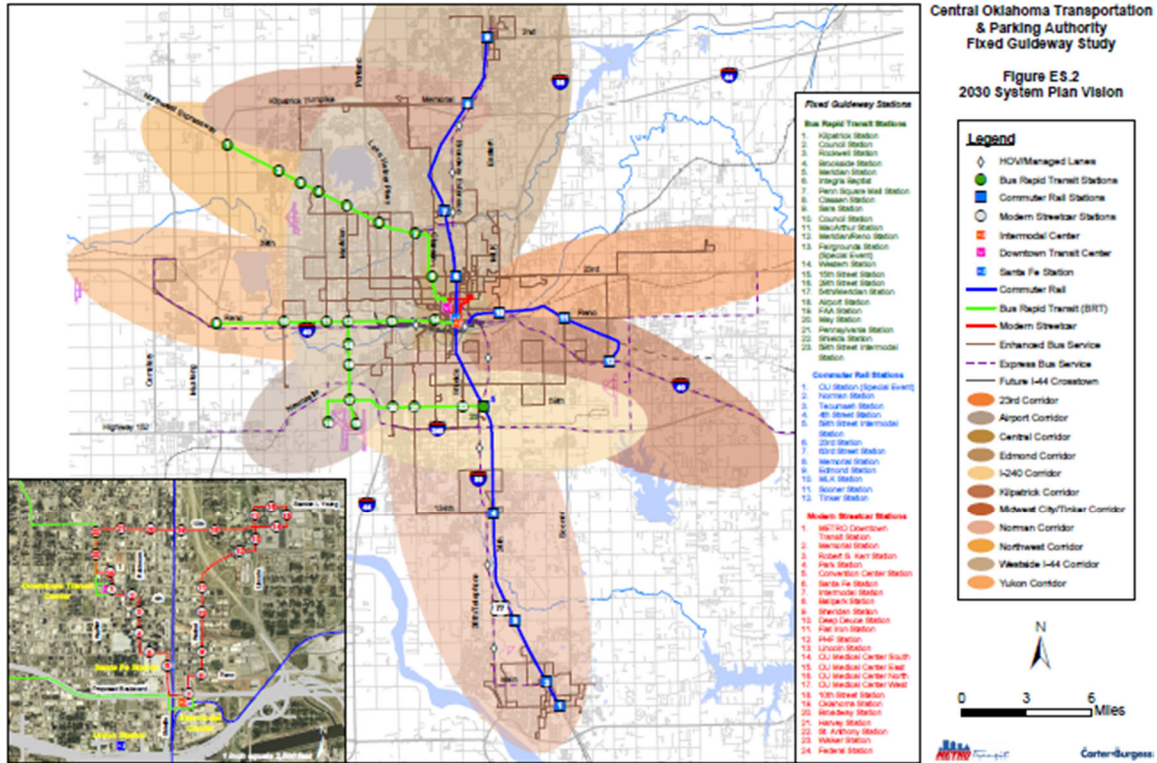
The following needs, gaps, and barriers were also identified:

- No dedicated source of funding is in place to support transit improvements, such as new routes, increased frequencies, or expanded coverage.

In addition to the recently launched OKC Streetcar, the Fixed Guideway Plan identified several BRT corridors and enhanced bus transportation. Oklahoma City’s first Northwest BRT route is beginning design and engineering. EMBARK and Oklahoma City have incrementally improved local fixed-route service with improved frequency, weeknight service, holiday service, and Sunday service.

This analysis has also guided the strategies for MAPS 4, which is a debt-free public improvement program funded by a temporary penny sales tax that will raise a projected \$978 million over eight years.

Figure 2-7 COTPA Regional Fixed Guideway 2030 System Plan Vision



## COTPA Transit Service Analysis (2013)

The goals of the Transit Service Analysis were to evaluate the existing bus system, improve the route network to increase ridership and productivity within the existing budget, and identify future service improvements if additional resources become available.

The study looked at the existing routes in the transit system, identified the needs of the community, and analyzed gaps between the market for transit in Oklahoma City and the existing transit network. The study included a community input element that consisted of stakeholder interviews and a community rider survey. Twenty-four stakeholders were interviewed, including a wide spectrum of transit users, transit providers, community leaders, government and private sector participants, and community planners. The rider survey profiled 2,600 existing riders of local, express, and trolley service. Riders were asked about travel patterns, transit access, overall satisfaction with the service, and desired service improvements. Some of the findings from the 2012 Rider Survey are:

- Majority of riders (64%) needed to transfer at least once to reach their destination.
- EMBARK, then known as Metro Transit, represented the only transportation alternative for many of its riders. Thirty-eight percent of riders cannot drive or have no license to drive.
- EMBARK, then known as Metro Transit, was highly regarded for its safety, knowledgeable drivers, and transit center staff helpfulness. Information about the transit stops, fares, and on-time performance were areas of improvement.
- The most requested service improvement was additional Sunday service (48% requested), followed by later weekday service (10%).
- Most of the Express Route 24 riders (58%) would drive a car if the route was unavailable. The most common reasons they choose this route are cost (30%), no car (17%), traffic (15%), and environmental (13%).
- Trolley service mainly caters to visitors and tourists with 55% of riders identifying as non-residents.

Combining the results from the analysis and community inputs, the study provides a series of recommendations for both the short- and long-term. These recommendations include:

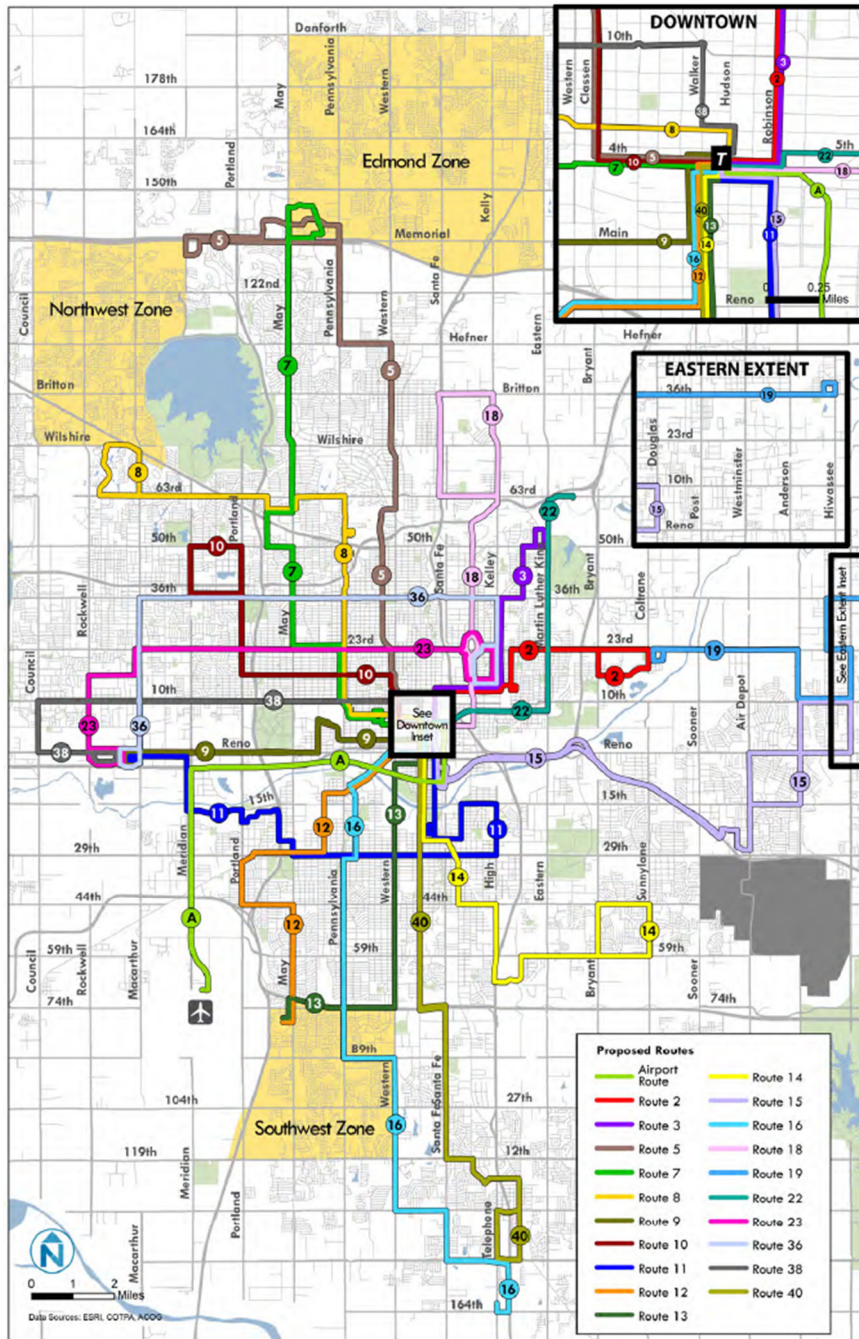
- Changes in route alignments
- Changes in service span and frequency
- Additional stop locations
- Removing service for underperforming routes
- Additional new service routes

Figure 2-8 shows the proposed route changes in long-term with the Unconstrained Resources Scenario.



As of now, most short-term and long-term recommendations from this analysis, have been implemented and have already improved frequency and added late night and Sunday service. Additional frequency improvements and new and expanded routes are some of the remaining recommendations outlined within the final report. This analysis has also guided the strategies for the MAPS 4, which is a debt-free public improvement program funded by a temporary penny sales tax that will raise a projected \$978 million over eight years. This plan's recommendations also inform PlanOKC's strategy C-38 which states: Implement policies and strategies recommended in the 2013 COTPA Transit Service Analysis.

Figure 2-8 COTPA Transit Service Analysis Long Term Proposed Route Network



## COTPA Compressed Natural Gas (CNG) Operational Needs Assessment Recommended Improvement Study (2016)

This study is a phase 1 report in COTPA’s plan to convert the fixed route and paratransit bus fleet to operate on Compressed Natural Gas (CNG). This report provides an

overview of financial impacts of upgrading maintenance and constructing the CNG fueling facilities required to continue transitioning the fleet to CNG operations. The report highlights the upfront costs to implement the three core components of the CNG program and offers two alternative options within each program:

- Maintenance Facility Retrofits and Upgrades
- EMBARK CNG Fueling Station
- EMBARK Public Access CNG Fueling

The key findings from the report include:

- The required electrical infrastructure necessary for the project is available near the site and the electrical upgrades to a CNG station site do not present an implementation or schedule concern.
- The natural gas infrastructure in the area is not adequate to operate a CNG station and to make it feasible a natural gas pipeline will need to be built under May Avenue.

The CNG fuel station for the City's transit fleet began construction in April 2019 and opened later that year on South May Ave.

The study identifies five areas for which necessary improvements, upgrades, and new infrastructure is recommended:

- Facility Upgrades
- CNG Fueling Station
- Parking and Site Circulation
- Mobile Fueling Capabilities
- Cost Benefit Analysis of Public Access to CNG

The following gaps and barriers were also identified:

- Operational efficiency, safety, and site utilization could be improved with an added entrance on southwest 18th Street and a reconfiguration of the fixed route bus parking layout.
- Fixed route bus travel conflicts with paratransit bus backing and the pedestrian walkway between the administration and maintenance buildings are minimized.

## **EMBARK Rider and Non-Rider Survey (2020)**

In December 2020, EMBARK conducted a survey of current transit riders, non-transit riders, and an origin-destination survey to better perceptions of service, priorities for service improvements, and ridership behavior patterns. The top priority service improvements for both riders and non-riders are shown below in Figure 2-9 and Figure 2-10, respectively. The top priorities for existing EMBARK riders include:

- Improving service reliability (buses arriving on time)
- Improving service frequency

- Availability of accessible bus stops

Priorities for non-riders are improvements that may make them more likely to ride transit in the future, and include:

- Transit stops located closer to home/work
- Faster or more frequency service
- Employer provided incentives to ride transit

Figure 2-9 December 2020 Rider Survey – Priority Service Improvements

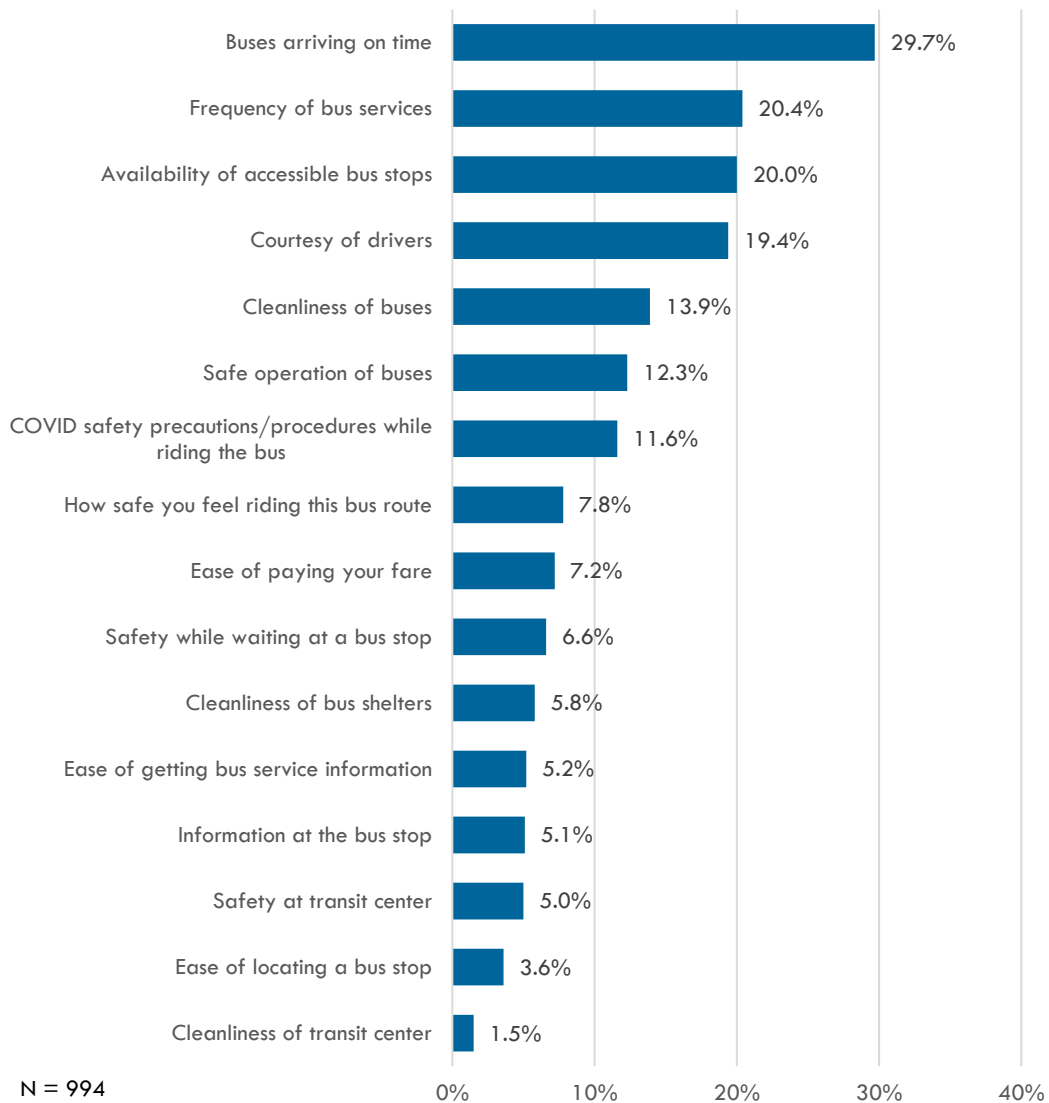
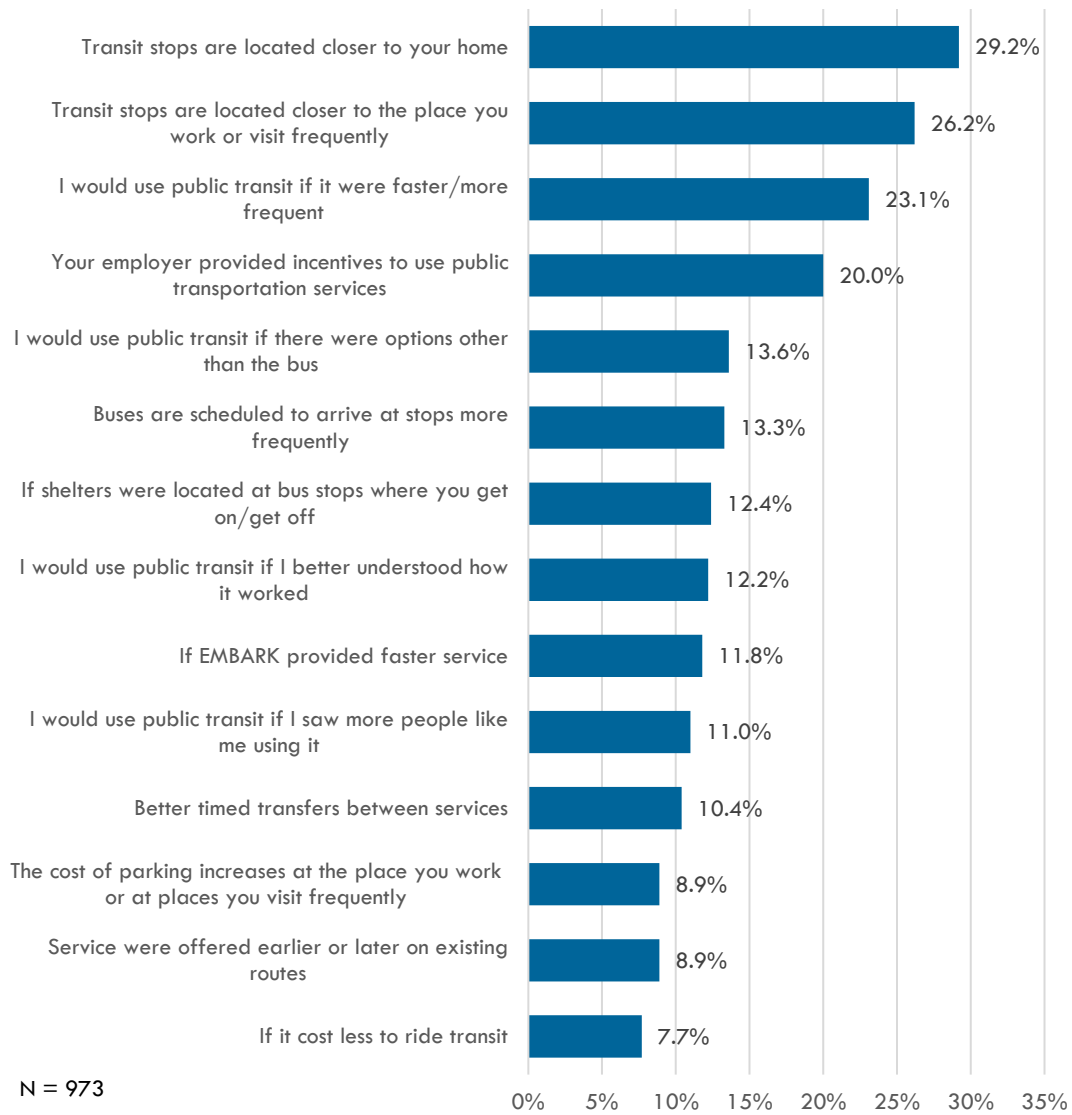


Figure 2-10 December 2020 Non-Rider Survey – Priority Service Improvements



## REGIONAL DOCUMENTS

### ACOG Encompass 2040 (2016)

The Association of Central Oklahoma Governments' Encompass 2040 is the comprehensive, long-range transportation plan for the Central Oklahoma region. The plan forecasts land use, population, employment, and other socioeconomic factors through 2040 to assess the region's future development and transportation needs. The plan analyzes two development scenarios:

- **Scenario 1 – Historical Trend**
  - Continues the region's historical trend of outward growth based on the assumption that no new zoning initiatives will be adopted.
- **Scenario 2 – Nodal Growth**
  - Assumes a change in regional land use policy which focuses on growth that would encourage infill, nodal, and downtown development within communities, which would be more supportive of future regional transit.

Based on existing conditions data from 2010, the plan found that transit ridership accounted for less than half of one percent of total daily trips made throughout the region and that transit funding per capita is significantly lower than for other similarly sized metropolitan areas. Identified transit needs for the region include a desire for walkable urban neighborhoods, expanded bus service, more multi-modal options, and a greater mix of commercial and residential areas. A lack of continuous sidewalks, an absence of bicycle trails, and a scarcity of bus shelters have also been identified as a key challenge for regional transit connectivity.

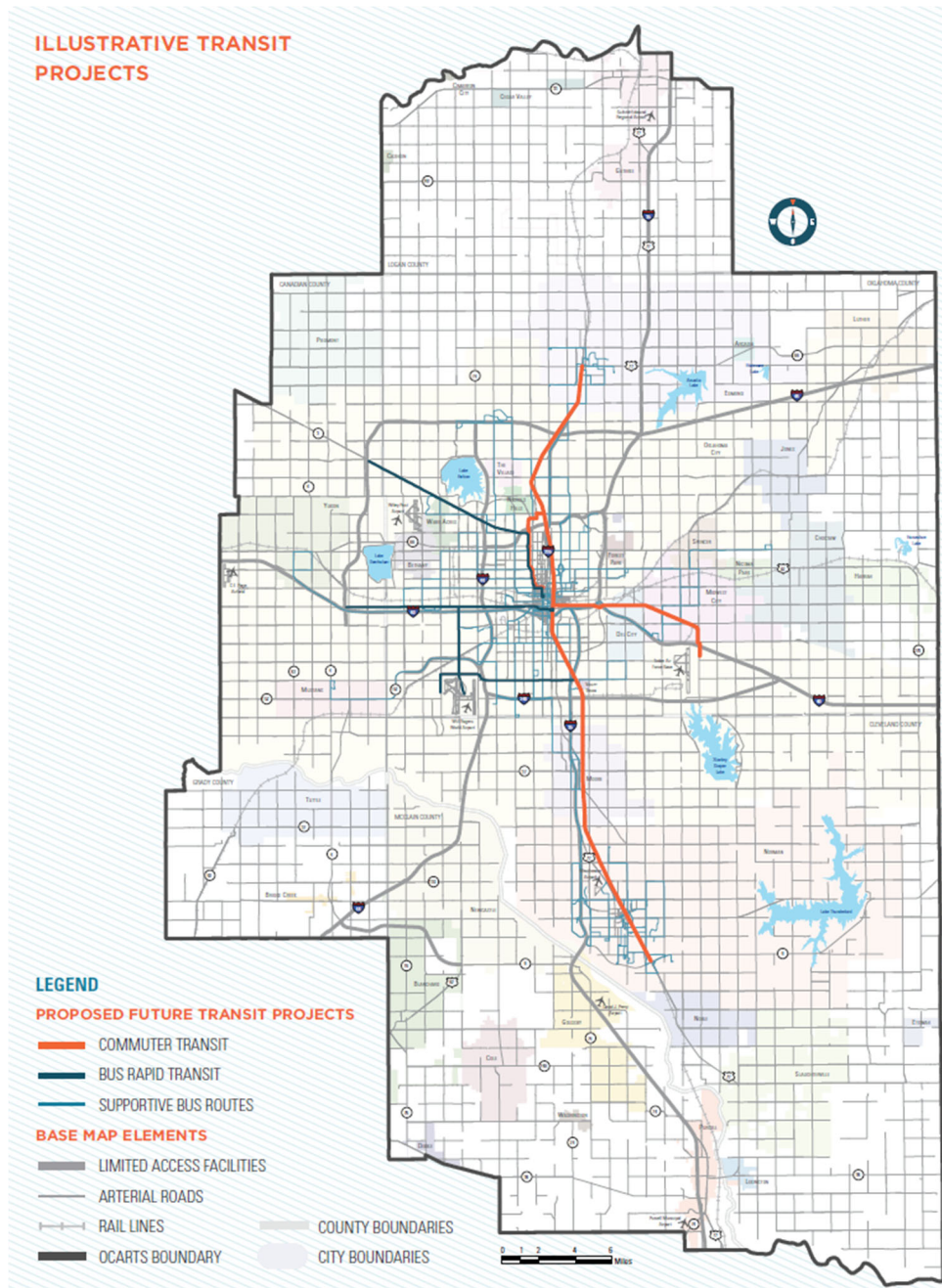
Encompass 2040 includes numerous transit recommendations, some of which are shown in Figure 2-11. The detailed recommendations include:

- Establish a regional transit authority and dedicated local funding sources to expand public transportation.
- Continue implementing the recommendations of the 2005 Fixed Guideway Study.
- Promote the further development of the Regional Intermodal Transportation Hub.
- Encourage improved coordination between land use and transit planning, including pedestrian and bicycle connections to transit routes.
- Explore transit access to Will Rogers World Airport.
- Promote regional clean air goals by providing alternatives to the single occupant motor vehicle, including more express bus routes, park-and-ride opportunities, reduced or fare free bus service, and assist with funding to purchase alternative-fueled buses.
- Enhance marketing of new and existing transit services to expand ridership.
- Pursue efforts to fund and expand passenger rail service linking Oklahoma City with other cities and states.

- Advocate for transit as an alternative mode of transportation to alleviate regional congestion.
- Incorporate Oklahoma City Streetcar into regional transit plans.

Several of these recommendations have since been completed, including moving forward with the 2005 Fixed Guideway Study recommendations and further developing the Regional Intermodal Transportation Hub in downtown Oklahoma City.

Figure 2-11 Encompass 2040 Illustrative Transit Projects



Source: Encompass 2040, 2016

## **ACOG Central Oklahoma Commuter Corridors Study (2015)**

The Central Oklahoma Commuter Corridors Study, led by ACOG and branded as CentralOK!go, is an analysis of transit options for three major commuter corridors in the central Oklahoma region converging at the Santa Fe Station Intermodal Hub in downtown Oklahoma City. CentralOK!go builds upon the findings of the 2005 Regional Fixed Guideway Study, which recommended further investigation for the implementation of passenger rail, BRT, a downtown Oklahoma City streetcar system, and an improved bus system to enhance connectivity between public transit services.

Each of the three corridor evaluations included multiple potential alignments and high-capacity transit modes, including commuter rail, BRT, streetcar, light rail, and conventional and express bus service. A detailed evaluation including evaluation criteria based on identified goals and objectives, ridership estimates, technical feasibility, environmental and social impacts, capital costs, and operating and maintenance costs was used to identify and select a locally preferred alternative (LPA) for each of the three corridors.

The South Corridor LPA (Figure 2-12) would connect the downtown Oklahoma City Santa Fe Intermodal Hub and the City of Norman, extending to State Highway 9 via commuter rail. Existing BNSF rail right-of-way would be used as available along the 17-mile route. Capital costs for commuter rail between Norman and Oklahoma City are estimated between \$310 million and \$410 million, with an estimated operating and maintenance cost of \$5.5 million per year. The South Corridor LPA would combine with the North Corridor LPA to provide a one seat commuter rail connection between Edmond, Oklahoma City, and Norman and is projected to attract approximately 5,700 daily riders.

Following this study, the Regional Transportation Authority (RTA) board of directors has transitioned from working with ACOG to working with EMBARK as the administrative arm of the RTA. The RTA is currently conducting an updated commuter rail line study and has adopted a Transit System Plan for future regional transit corridors. The full plan development is currently ongoing.



Figure 2-12 CentralOK!go South Corridor LPA



Source: Central Oklahoma Commuter Corridors Study, 2015



## **ACOG 2020-2023 Transportation Improvement Program for the OCARTS Transportation Management Area (2019)**

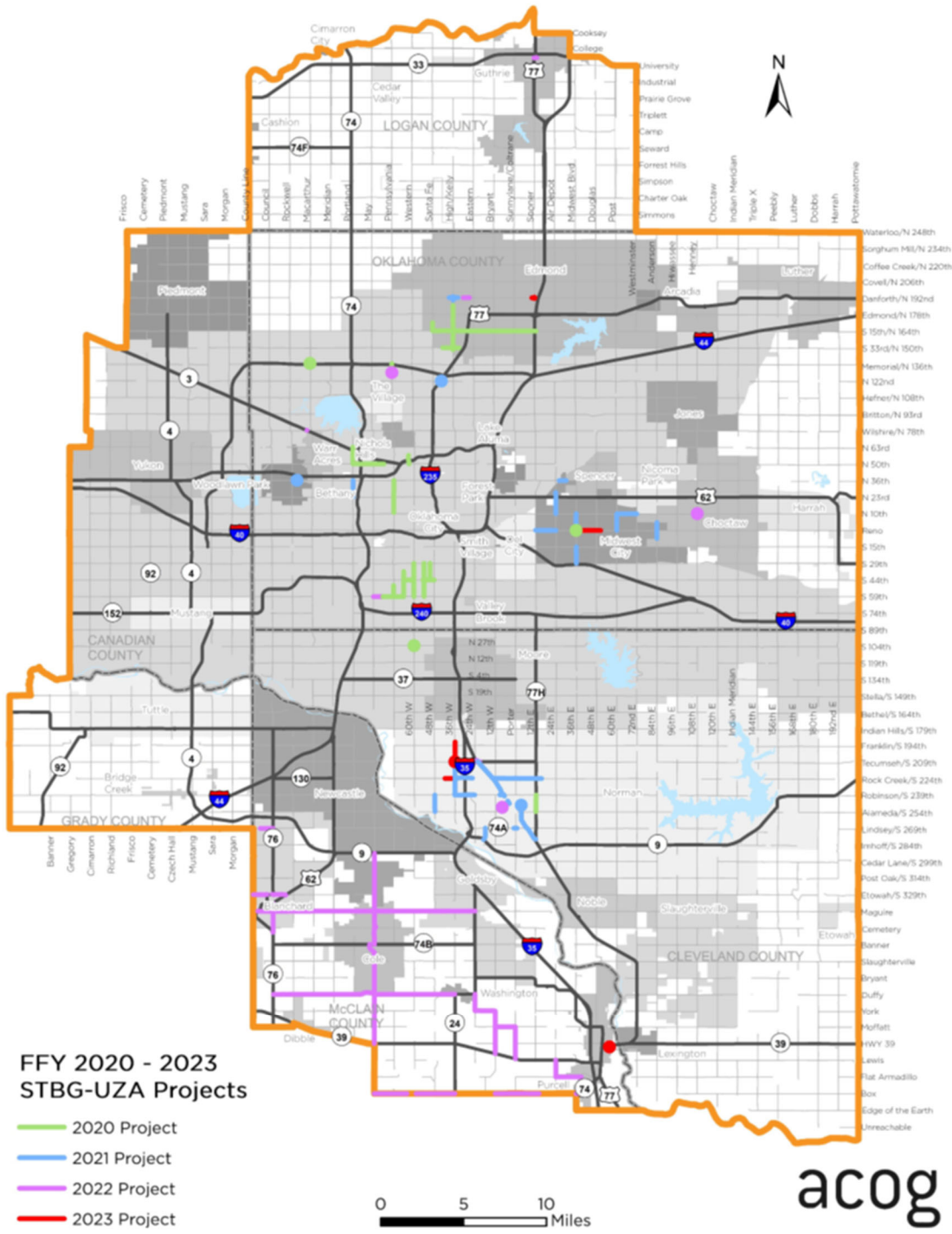
This Transportation Improvement Program prepared by ACOG is a four-year plan outlining multimodal transportation improvements and services to be implemented in the Oklahoma City Area Regional Transportation Study (OCARTS) area. The plan serves as a short-range implementation tool to achieve goals set out in the regional LRTP and identifies projects recommended for implementation by mode, type of improvement, funding source, and geographic area between 2020 and 2023. Transit-specific improvements include:

- Service vehicle replacements
- Bus and bus facilities enhancement/bus shelter accessibility improvement
- COTPA shop improvement
- Bus replacement of 10 paratransit vans
- Northwest BRT BUILD Grant (FY 2018 funded)

Figure 2-14 identifies the capital projects for FY 2020-2023. Many of the capital projects included on the map will be funded with 80 percent Section 5307 funds administered by the Federal Transit Administration (FTA) and matched with 20 percent local funds.

Final Report | OKC Moves  
EMBARK

Figure 2-14 TIP for the OCARTS Transportation Management Area FFY 2020-2023 Projects



### 3 MARKET ANALYSIS

This market analysis presents demographic characteristics associated with the market for transit ridership in the Oklahoma City area. The purpose of this analysis is twofold: (1) to identify gaps in transit service in areas with high demand and (2) to identify overserved areas where transit demand is weak. To do so, it uses a set of seven demographic indicators typically associated with transit ridership.

Several of the indicators provide the basis for two composite assessments, the Transit Demand Index (TDI) and the Transit Propensity Index (TPI). The TDI assesses the level of transit service that can be supported by different ranges of combined population and employment densities. The TPI assesses relative densities of specific demographic characteristics associated with transit ridership and transit dependency, which in turn highlights the potential for transit use and areas that are more likely to rely on transit.

Figure 3-1 lists each indicator included in this analysis, and (1) whether the data is linked to the place of residence or place of work, (2) the unit of measure, (3) the data source, and (4) the geographic level of the analysis.

**Figure 3-1 Market Analysis Indicators**

Indicator	By place of	Unit	Source	Geography	TPI/TDI
Population	Residence	People per Acre	2019 ACS <sup>1</sup>	Block Group	TDI
Employment	Work	Jobs per Acre	2018 LEHD <sup>2</sup>	Block Group	TDI
Low-Wage Employment	Work	Jobs paying \$1,250/ month or less per square mile	2018 LEHD	Block Group	--
Low-Income	Residence	People earning less than 100% of the federal poverty level per square mile	2019 ACS	Block Group	TPI
People with Disabilities	Residence	People with disabilities per square mile	2019 ACS	Block Group	TPI

<sup>1</sup> American Community Survey, five-year estimates

<sup>2</sup> Job data was taken from the US Census Bureau's Longitudinal Employer-Household Dynamics database.

Indicator	By place of	Unit	Source	Geography	TPI/TDI
Rental Units	Residence	Rental units per square mile	2019 ACS	Block Group	TPI
Zero-Vehicle Households	Residence	Households without access to a vehicle per square mile	2019 ACS	Block Group	TPI

## KEY FINDINGS

- Population density is relatively low in the Oklahoma City area but is generally highest in the southern and western areas of the city.
- Employment is generally spread throughout the region but concentrated in a few areas, most notably downtown Oklahoma City, the State Capitol, University of Oklahoma Medical Center, INTEGRIS Baptist Medical Center, and Mercy Hospital Oklahoma City.
- Transit propensity is generally aligned with population density. The areas with the highest propensity for transit use include:
  - S May Ave corridor
  - Oakcliff and Highland Park neighborhoods in east Oklahoma City
  - The Plaza District
  - West Oklahoma City
  - Communities adjacent to Northwest Expressway
  - South Oklahoma City
  - Midwest City along Reno Ave between N Airport Depot Blvd and N Midwest Blvd
  - North Oklahoma City apartment complexes near the intersection of W Hefner Rd & N Western Ave

## POPULATION

Population density is a key determinant of transit demand. Higher density residential areas have more people within walking distance of streets that buses can operate along. Therefore, these areas are more likely to support frequent transit service than lower density areas. Additionally, studies have shown that a doubling of population density is correlated with as much as a 30% decrease in driving.<sup>3</sup> Many of these driving trips are replaced with transit trips. In the Oklahoma City area, the highest population densities, 16 or more people per acre, exist in several locations throughout the service area (Figure 3-2), including:

- The Silver Tree neighborhood north of NW 122<sup>nd</sup> St between N May Ave and N Pennsylvania Ave
- The Knights Lake neighborhood east of Wiley Post Airport
- The residential neighborhood in Midwest City to the southeast of S Air Depot Blvd & Reno Ave

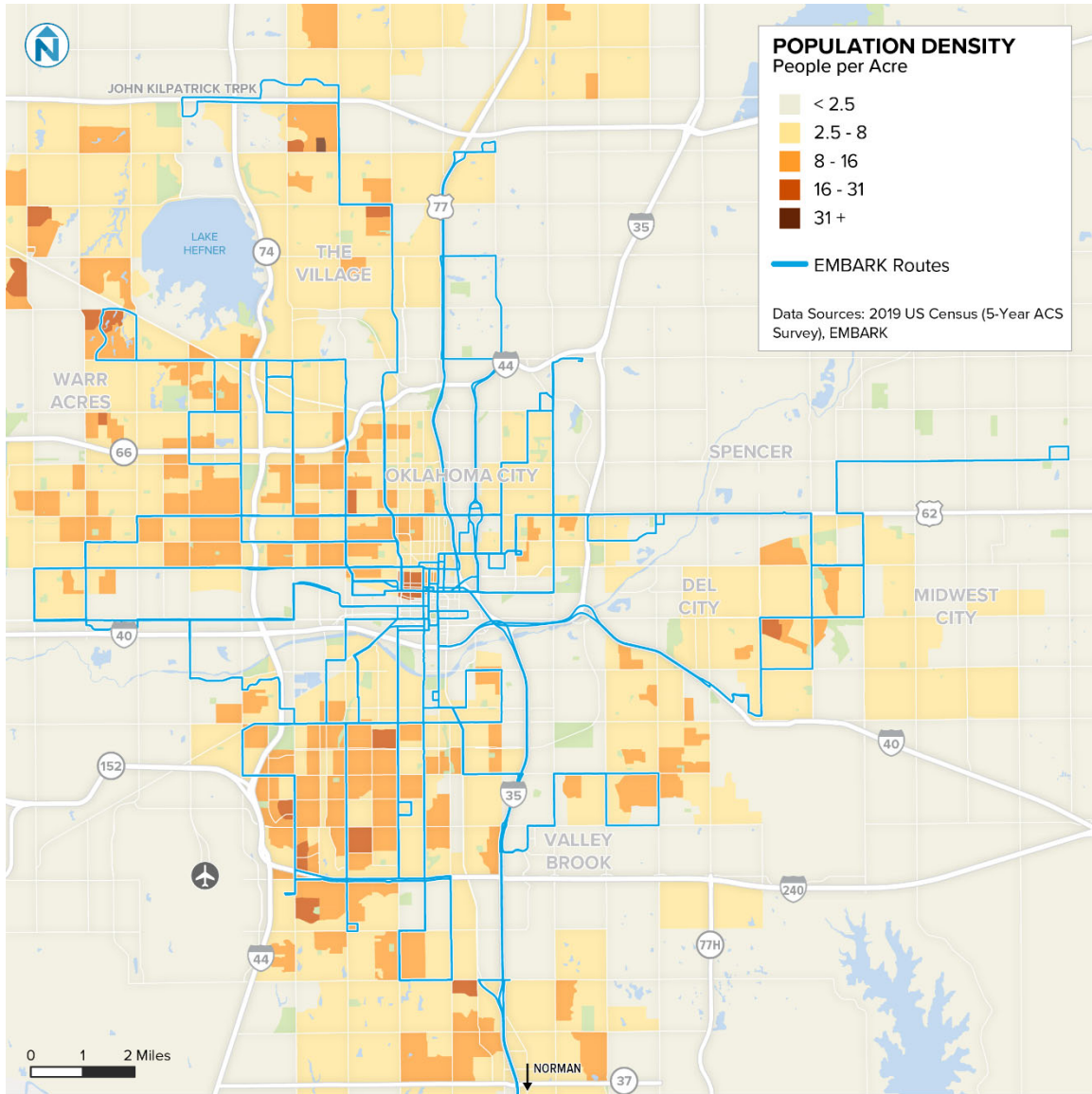
Additionally, much of south Oklahoma City and west Oklahoma City has moderate to high population density, between 8 and 31 people per acre, including:

- South Oklahoma City between SW 29<sup>th</sup> St, I-44, S Western Ave, and SW 89<sup>th</sup> St
- West Oklahoma City between NW 10<sup>th</sup> St, N Ann Arbor Ave, NW 36<sup>th</sup> St, and N Portland Ave
- Central Oklahoma City and Shepherd Historic District north of downtown Oklahoma City

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<sup>3</sup> *Patterns of Automobile Dependence in Cities*. Newman and Kenworthy, 1989

Figure 3-2 Population Density



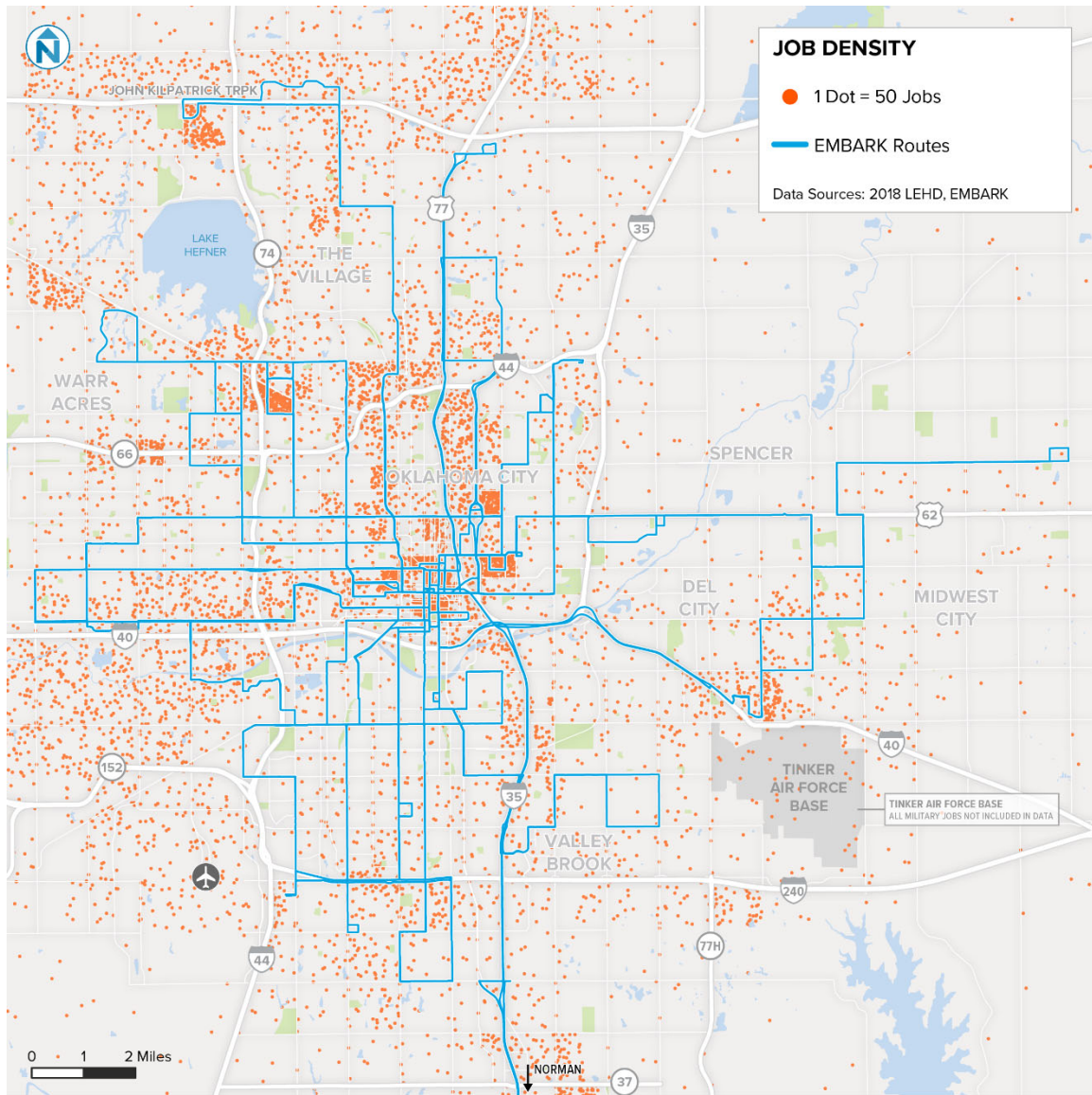


## EMPLOYMENT

Employment density shares a similar nexus with transit demand as population density. Areas with a higher density of jobs are more popular destinations and have a higher demand for transit trips, particularly during the am and pm peak periods. Employment density, shown in Figure 3-3, is primarily clustered in downtown Oklahoma City as well as a few other locations throughout the area, including:

- The University of Oklahoma Medical Center
- The Midwest City Town Center Plaza
- The Oklahoma State Capitol
- Curahealth Oklahoma City
- St. Anthony Hospital
- Penn Square Mall
- Baptist Medical Center
- Silver Springs Point Shopping Center
- Rockwell Plaza Shopping Center
- Mercy Hospital Oklahoma City

Figure 3-3 Employment Density



Note: The Census LEHD data source used for this analysis does not include military jobs, thus the Tinker Air Force Base appears underrepresented in this map.

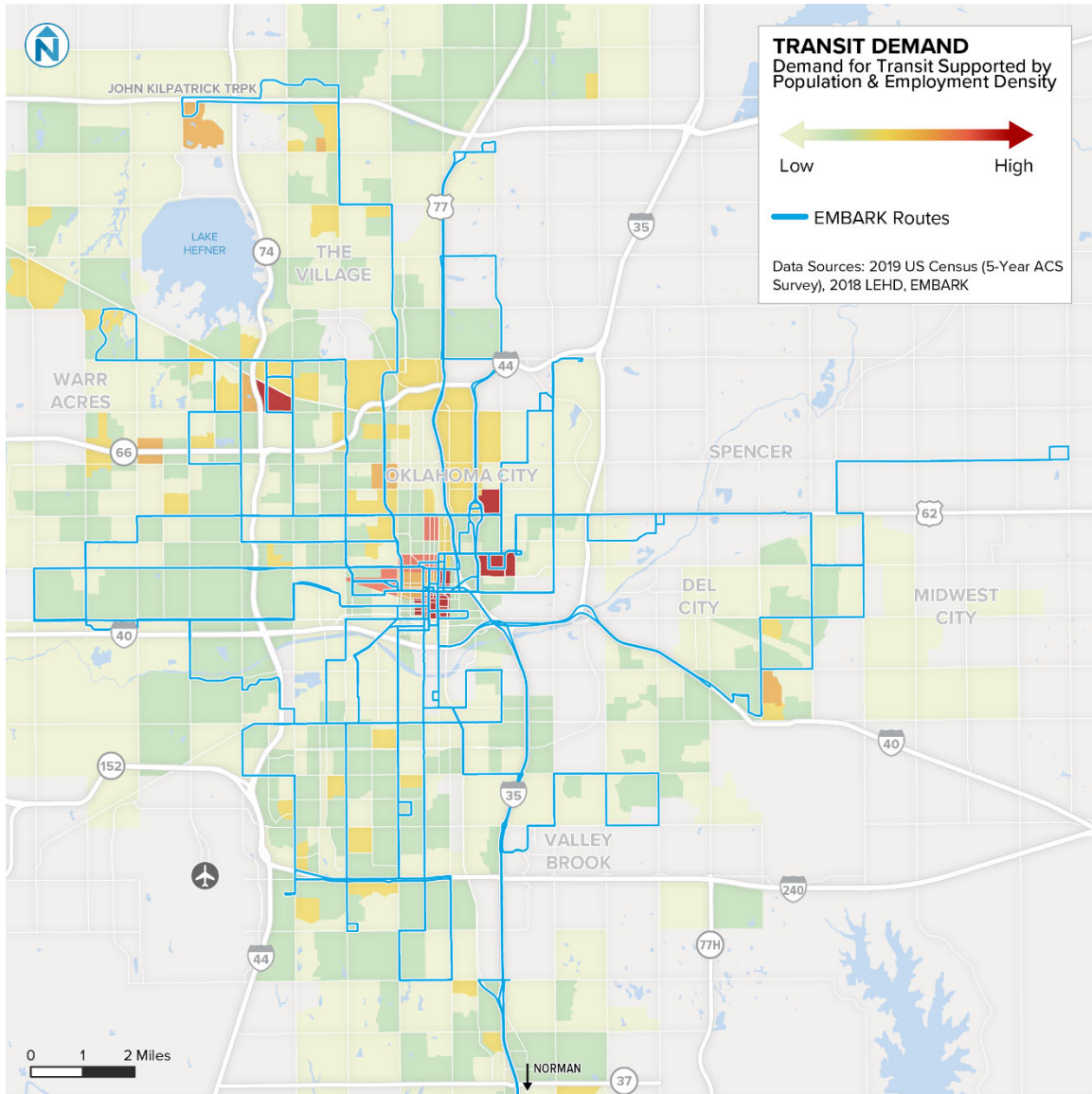
## TRANSIT DEMAND INDEX

The single most important factor influencing demand for transit service is the combined metric of population and employment density. Each metric has been shown to be capable of supporting a certain level of transit service. Combining the transit service supported by both of these factors into a single Transit Demand Index indicates the level of demand for transit service that may be supported throughout the Oklahoma City area on a scale of low demand to high demand, as shown in Figure 3-4.

In general, the highest demand for transit service is located in downtown Oklahoma City, north of downtown along the N Lincoln Blvd, N Santa Fe Ave, N Classen Blvd, and Northwest Expressway corridors, and at a few key employment locations, including:

- The University of Oklahoma Medical Center
- The Oklahoma State Capitol
- Baptist Medical Center

Figure 3-4 Transit Demand Index

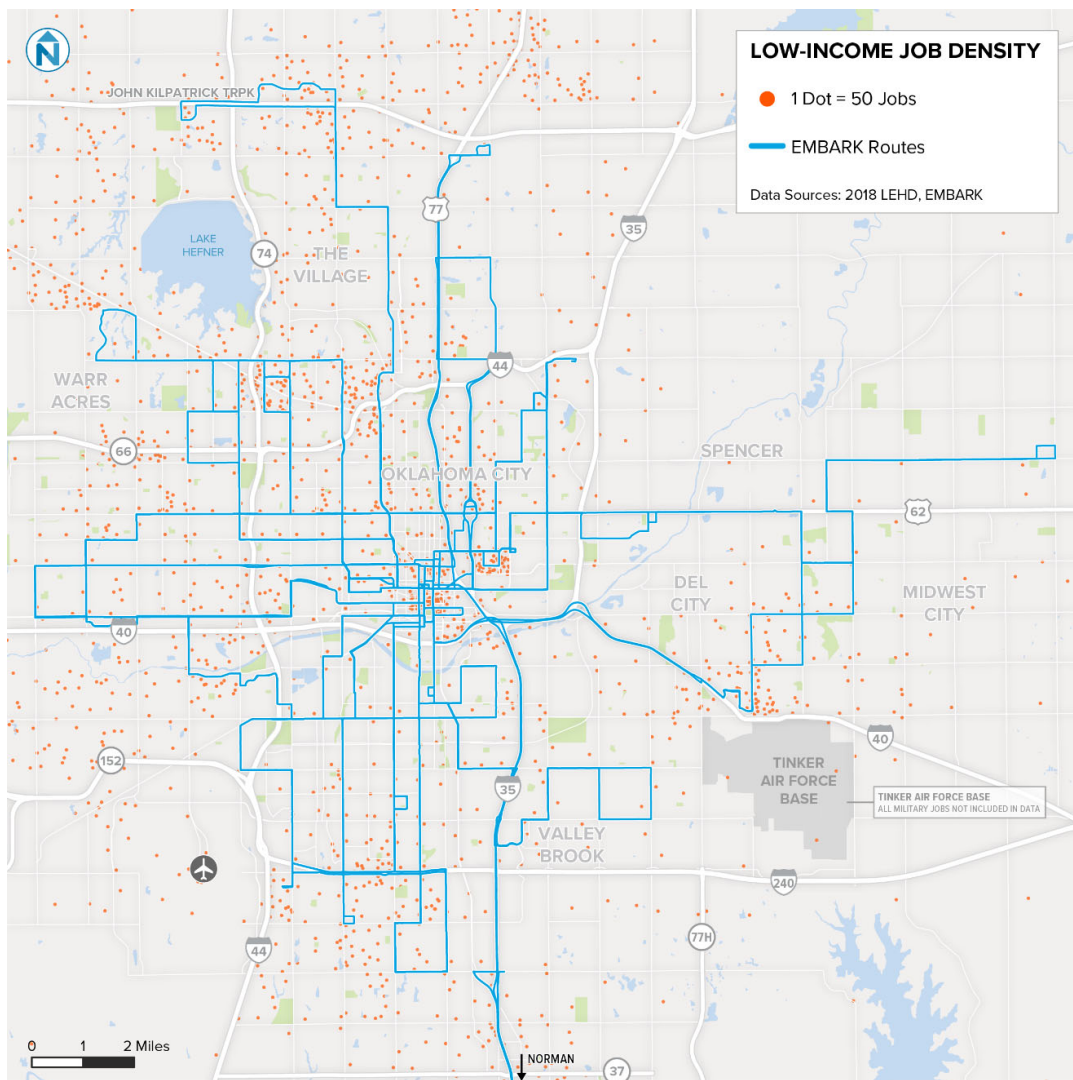


## LOW-WAGE EMPLOYMENT

Low-wage employment, shown in Figure 3-5, follows a similar pattern as total employment, with the bulk of jobs located in downtown Oklahoma City and at a few key employment hubs throughout the area. Notable concentrations of low-income jobs are located in and around:

- The University of Oklahoma Medical Center
- Midwest City Town Center Plaza
- Silver Springs Pointe Shopping Center
- Rockwell Plaza Shopping Center
- Penn Square Mall

Figure 3-5 Low-Wage Employment Density



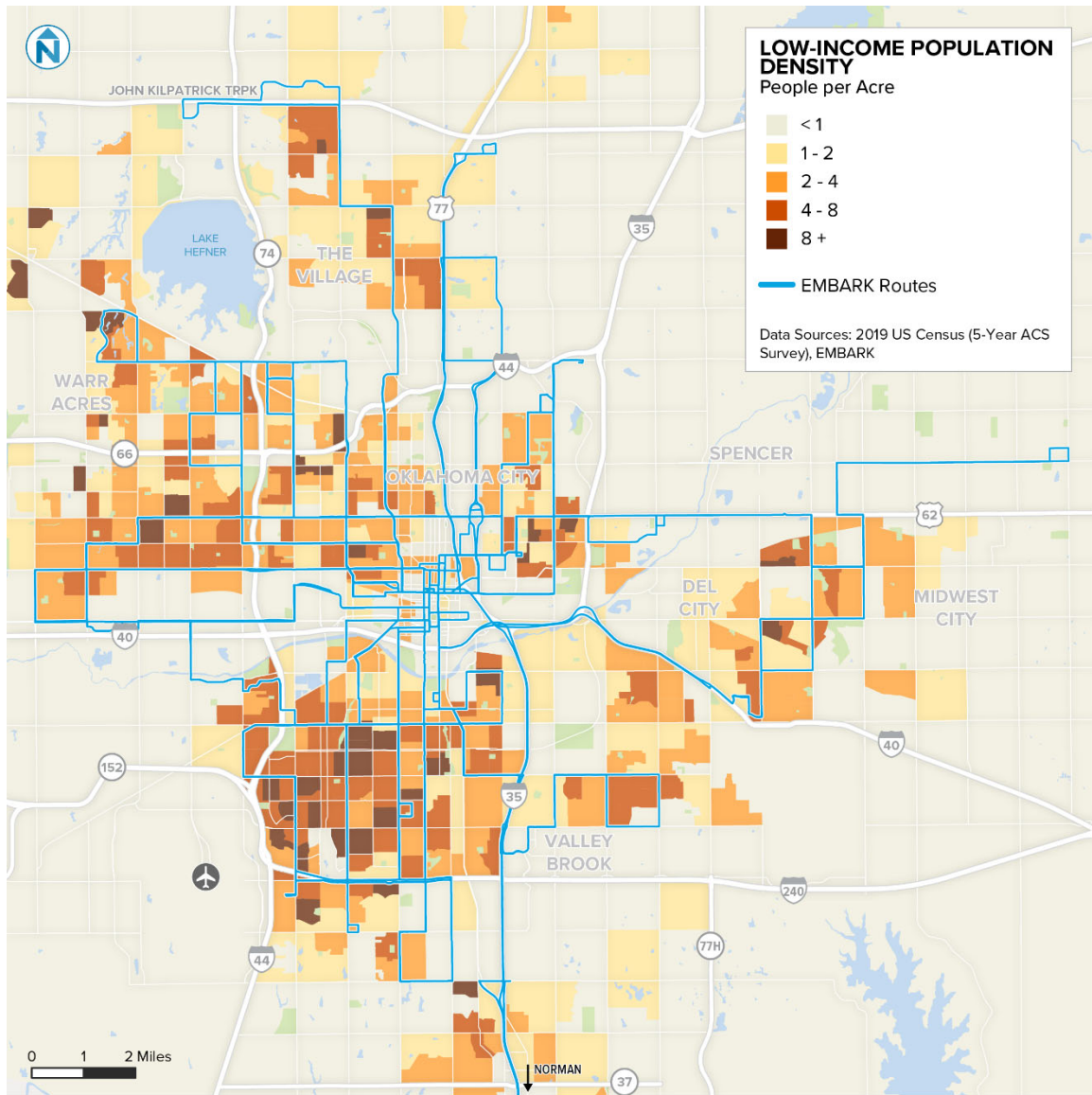
Note: The Census LEHD data source used for this analysis does not include military jobs, thus the Tinker Air Force Base appears underrepresented in this map.

## LOW-INCOME POPULATIONS

Low-income populations, shown in Figure 3-6, are dispersed throughout the Oklahoma City area in a few key clusters, including:

- South Oklahoma City between SW 29<sup>th</sup> St, I-44, S Santa Fe Ave, and SW 89<sup>th</sup> St
- West Oklahoma City between NW 10<sup>th</sup> St, N MacArthur Ave, NW 23<sup>rd</sup> St, and N Portland Ave
- The Silver Tree neighborhood north of NW 122<sup>nd</sup> St between N May Ave and N Pennsylvania Ave
- The residential neighborhood in Midwest City to the southeast of S Air Depot Blvd & Reno Ave
- The residential neighborhood in Midwest City to the northwest of NE10th St & N Air Depot Blvd

Figure 3-6 Low-Income Population Density



## PEOPLE WITH DISABILITIES

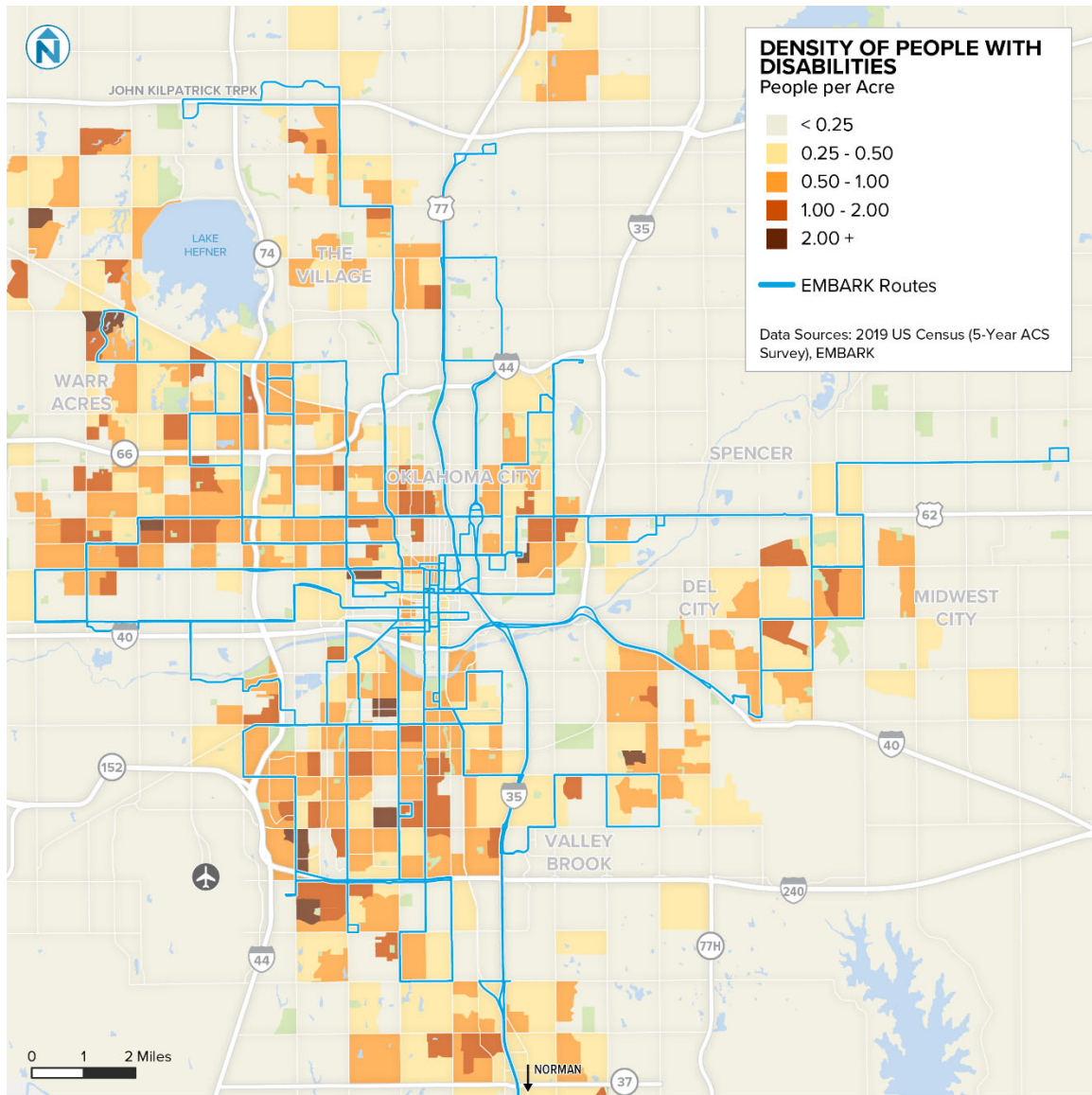
People with disabilities, shown in Figure 3-7, are spread throughout the Oklahoma City area with a few notable concentrations of over two people per acre. These areas include:

- The apartment complexes near W Wilshire Blvd between N MacArthur Blvd and N Rockwell Ave
- The apartment complexes near NW 23<sup>rd</sup> St between N Ann Arbor Ave and N MacArthur Blvd
- The Metro Park neighborhood to the northwest of downtown Oklahoma City
- The Meadowcliff neighborhood to the northeast of S May Ave & SW 89<sup>th</sup> St
- The Hillcrest neighborhood to the southeast of SW 59<sup>th</sup> St & S May Ave

Due to several funding programs, including the 2007 GO Bond, 2017 Go Bond, MAPS 3, and Better Streets Safer City programs, many of these areas with a high density of people living with a disability have benefitted from new sidewalks and other infrastructure.



Figure 3-7 Density of People Living with a Disability

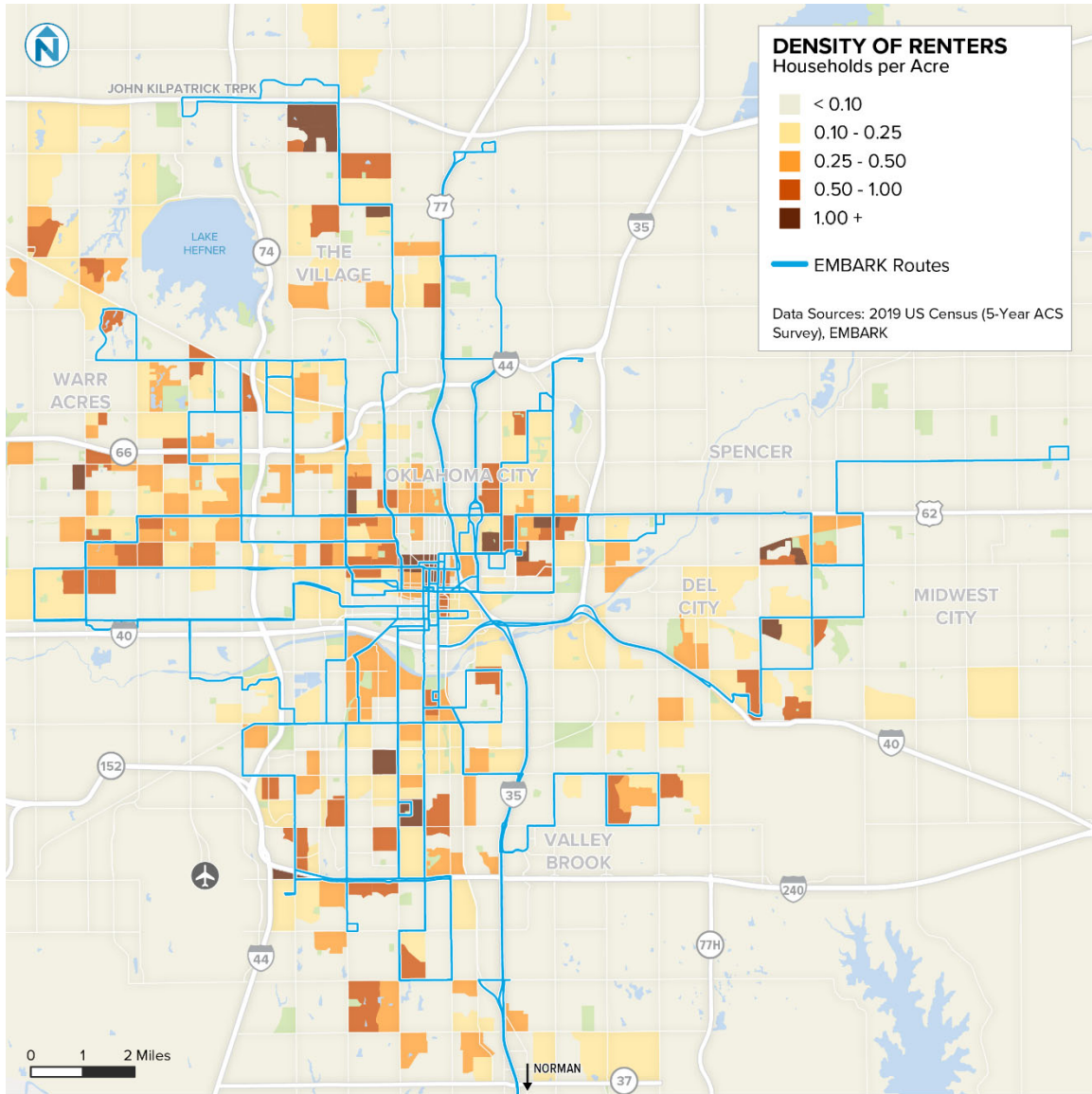


## RENTERS

There is also a relationship between rental units and transit ridership, with higher concentrations of renters correlating with higher transit ridership. The highest concentrations of renters, shown in Figure 3-8, generally corresponds to large apartment complexes and other multifamily residential areas that are distributed throughout the Oklahoma City area. Some of these locations include:

- The apartment complexes located north of NW 122<sup>nd</sup> St between N May Ave and N Pennsylvania Ave
- The Arts District near downtown Oklahoma City
- Several apartment complexes in south Oklahoma City off of S Western Ave, including Reding Square Apartments, Gardens at Reding, and Oak Creek Apartments
- Moderate densities of renters also exist throughout west Oklahoma City, adjacent to NW 10<sup>th</sup> St

Figure 3-8 Density of Renters

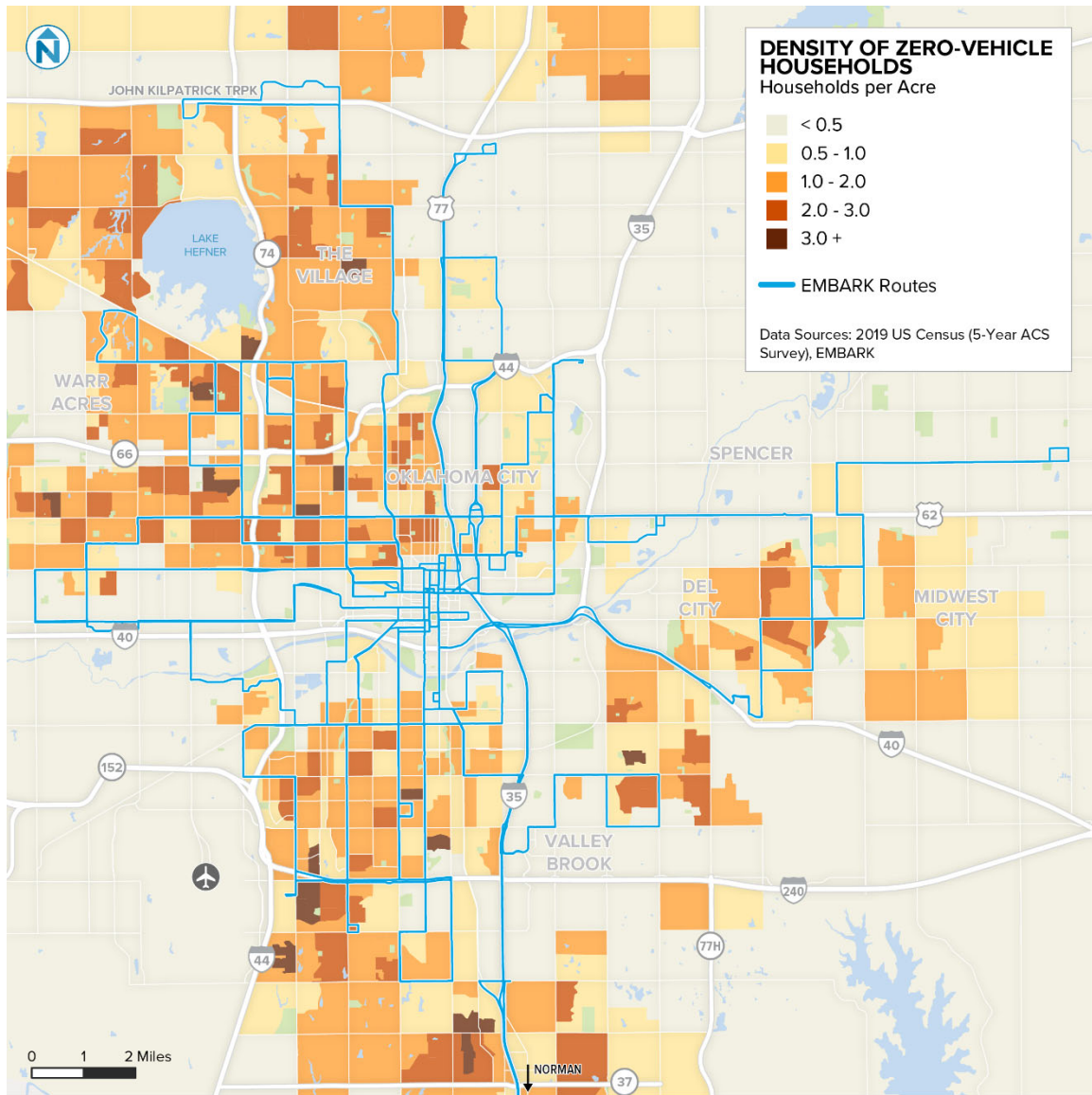


## ZERO-VEHICLE HOUSEHOLDS

Many households in the EMBARK service area have access to a motor vehicle. However, some areas, particularly neighborhoods in west and south Oklahoma City have two or three households per acre without access to a motor vehicle, shown in Figure 3-9. The areas with the highest density of zero-vehicle households include:

- The Meadowcliff neighborhood located adjacent to Oklahoma City Community College
- The neighborhoods in west Oklahoma City generally located between NW 16<sup>th</sup> St, N Meridian Ave, NW 36<sup>th</sup> St, and N Portland Ave
- The Coronado Heights neighborhood generally located between N Portland Ave, NW 50<sup>th</sup> St, N Meridian Ave, and Northwest Expressway
- There are also several communities toward the south of the service area near I-35 and SW 134<sup>th</sup> St with a high density of zero-vehicle households.

Figure 3-9 Density of Households without Access to a Motor Vehicle

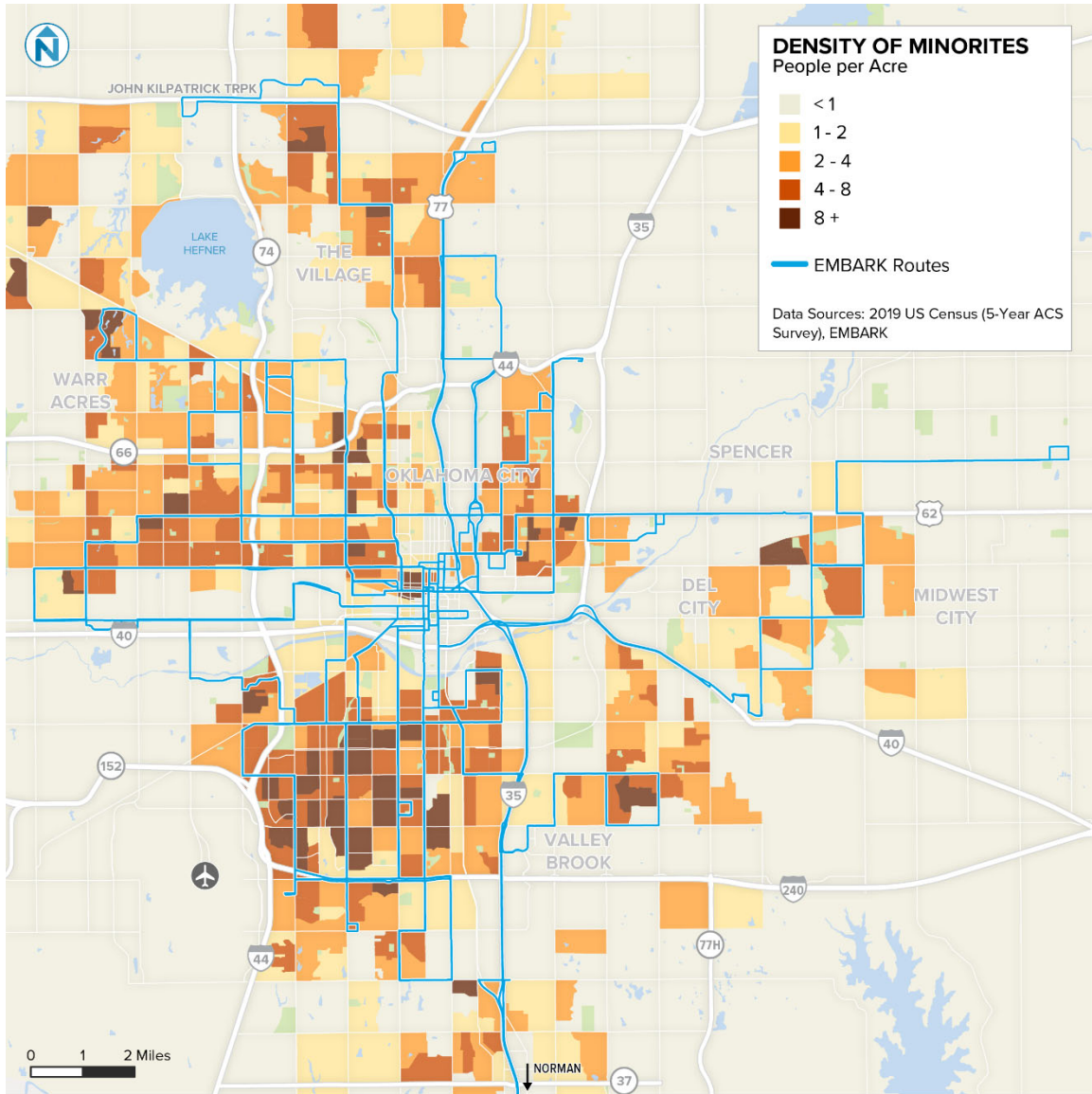


## MINORITY POPULATIONS

From a service equity perspective, it is important to identify areas with higher concentrations of non-white populations. In Oklahoma City, the highest concentrations of minority populations, as shown in Figure 3-10, are generally located in:

- South Oklahoma City, between I-44, I-240, I-35, and I-40.
- West Oklahoma City adjacent to the north along the Reno Ave corridor.
- Residential neighborhoods near the intersection of N Pennsylvania Ave and I-44.
- The Pines and Twin Lakes neighborhoods south of Northwest Expressway.
- The Silver Tree neighborhood and nearby apartment complexes between NW 122<sup>nd</sup> St, N Pennsylvania Ave, W Memorial Rd, and N May Ave.
- The Oakwood, Oakcliff, and Highland Park neighborhoods near Valley Brook, located between SE 59<sup>th</sup> St, S Sunnyside Rd, SE 44<sup>th</sup> St, and S Bryant Ave.
- The apartment complexes in Midwest City, located between NE 10<sup>th</sup> St, N Midwest Blvd, Solder Creek, and N Air Depot Blvd.

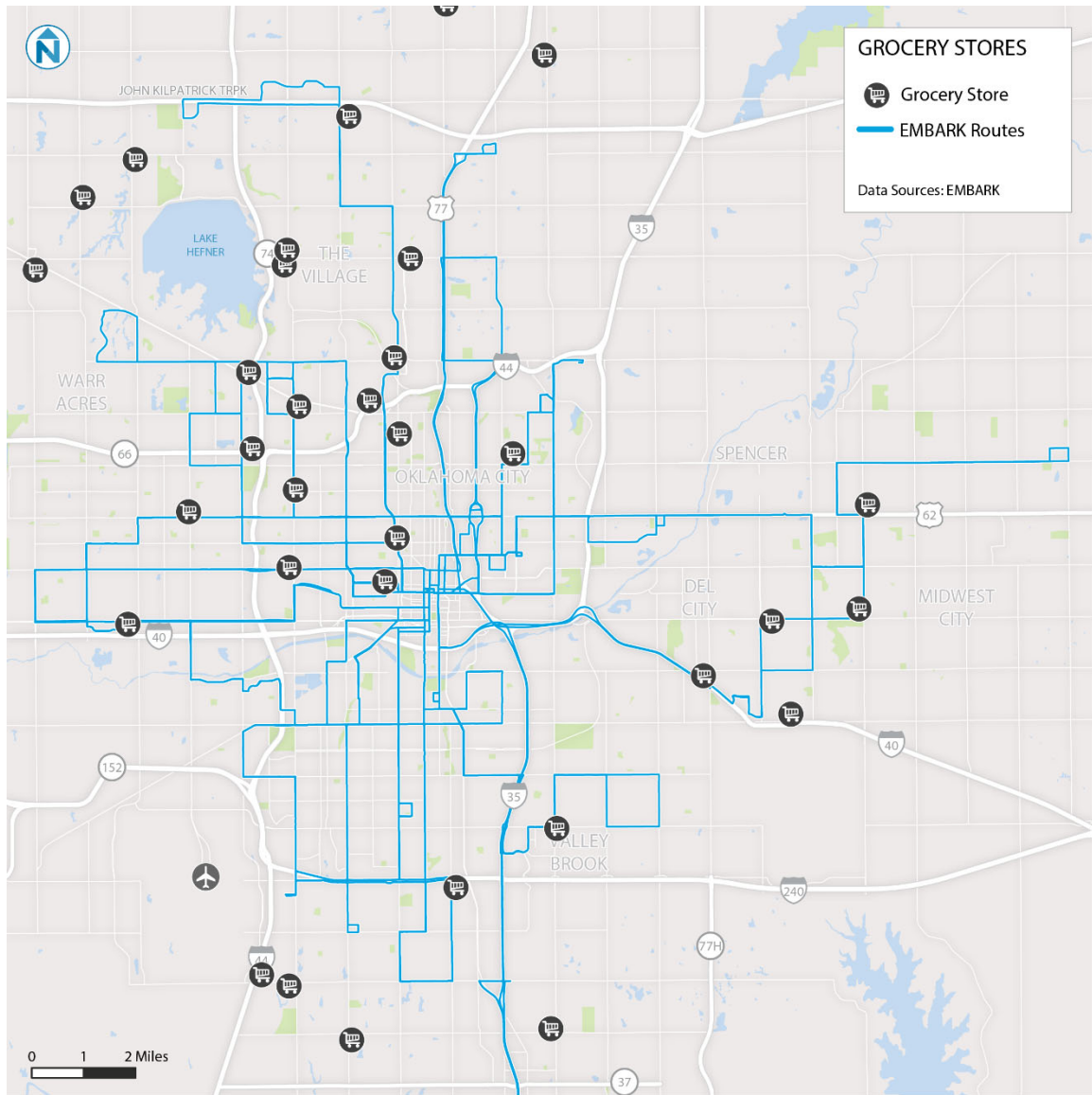
Figure 3-10 Density of Non-White Populations



## FOOD DESERT ASSESSMENT

The ability to access services through public transportation is critical for people without access to a vehicle. This is often a function of both the availability of useful transit service and the prevalence and location of grocery stores within the service area. Large areas with few or no grocery stores are often referred to as food deserts. The map shown in Figure 3-11 identifies the locations of prominent grocery stores in the EMBARK service area and can be used to identify potential gaps and food deserts. Potential food deserts are most prominent in south Oklahoma City and east Oklahoma City.

Figure 3-11 Existing EMBARK Service and Grocery Store Locations





## TRANSIT PROPENSITY INDEX

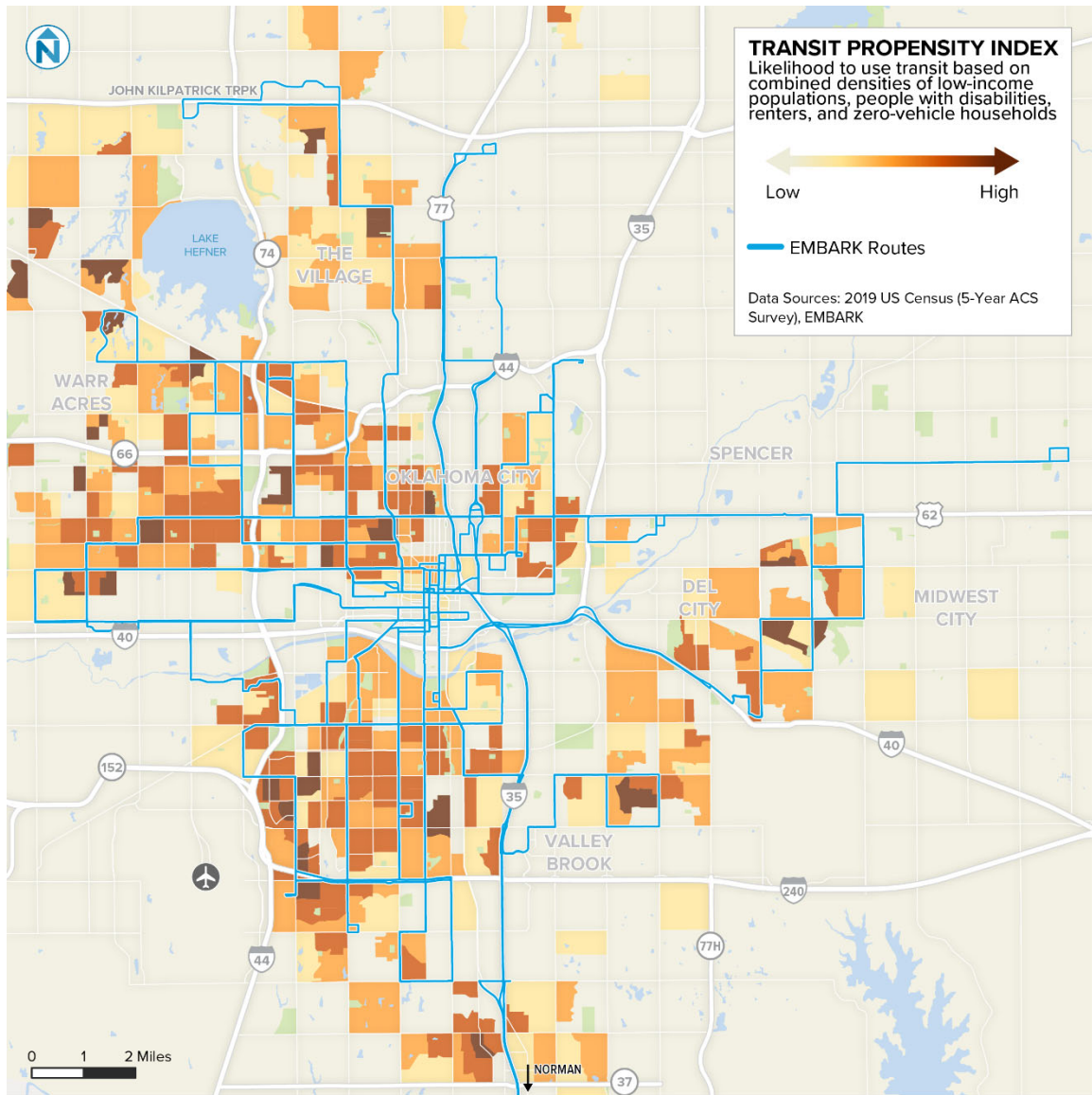
For the purposes of this analysis, propensity to take transit is based on the density of four combined indicators: people with low-incomes (less than 200% of the federal poverty level), people with disabilities, renters, and zero-vehicle households. This Transit Propensity Index is developed by taking the relative densities for each of these four indicators and assigning each block group a score from 1-5 based on the respective quintile for each indicator. These scores are then added together to result in one combined score to yield a single index that weights each of these four indicators evenly. Based on this index, the largest demand for transit is clustered in eight general areas:

- **S May Ave Corridor** in south Oklahoma City, currently served by Route 012, includes several pockets of high transit propensity areas between SW Grand Blvd and SW 89<sup>th</sup> St. These neighborhoods are generally characterized as moderate density residential with a few large apartment complexes and townhomes.
- **Oakcliff and Highland Park Neighborhoods** in east Oklahoma City, currently served by Route 014, is a relatively small area but has high transit propensity. These neighborhoods include moderate density single family homes, several large apartment complexes including The Commons at Sunnyslane, Aspen Walk Apartments, The Heights on Forty4, and Apartments in the Park.
- **The Plaza District** generally located between NW 23<sup>rd</sup> St, N Classen Blvd, Linwood Blvd, and Villa Ave. This area is located near downtown Oklahoma City and is characterized as moderate density residential and includes a few commercial areas, the Shepherd Center, and is located adjacent to Oklahoma City University. This area is currently served by Routes 005, 007, 008, 010, 023, and 038.
- **West Oklahoma City** has moderately high transit propensity throughout the area, with a few pockets of notably higher propensity. These pockets are located near the intersection of NW 10<sup>th</sup> St and N Rockwell Ave and near the intersection of NW 23<sup>rd</sup> St & N MacArthur Blvd. Both of these locations include several large apartment complexes and are served by Routes 023 and 038.
- **Communities near Northwest Expressway.** There are several disparate communities located near the Northwest Expressway that have high transit propensity, including:
  - The apartment complexes along Lyrewood Ln
  - The residential neighborhood south of W Britton Rd between N Rockwell Ave and N MacArthur Blvd
  - The residential neighborhood to the southwest of the intersection of N Council Rd & W Britton Rd
  - The apartment complexes along N Council Rd between Northwest Expressway and W Hefner Rd

Of these locations, only the apartment complexes along Lyrewood Ln are currently served by EMBARK (Route 008).

- **Midwest City** contains a few neighborhoods with high transit propensity, most notably along Reno Ave between Air Depot Blvd and Midwest Blvd and along NE 10th Ave between Air Depot Blvd and Midwest Blvd. Both of these areas include several large apartment complexes that exhibit relatively high transit propensity. These areas are currently served by Routes 015 and 019.
- **North Oklahoma City** includes several apartment complexes like North Village Apartments and River Chase, as well as the surrounding residential neighborhoods near the intersections of W Hefner Rd & N Western Ave and W Hefner Rd & N Pennsylvania Ave that have high propensity for transit.
- **South Oklahoma City** generally between SW 29<sup>th</sup> St, S Western Ave, I-240, and S Pennsylvania Ave all has moderate transit propensity compared to the rest of the service area. This area is served by Routes 011, 013, and 016.

Figure 3-12 Transit Propensity Index



## 4 TRAVEL PATTERN ANALYSIS

The travel pattern analysis discussed in this chapter uses anonymized mobile device location data, made available through the enterprise data platform Replica, to determine specific travel volumes and travel patterns throughout the Oklahoma City area. This evaluation builds upon previous analyses in this report, identifying key origins and destinations within the EMBARK service area, and expands upon them. The mobile device data is used to assess where people are traveling from to reach key destinations and where people are traveling to when they leave key origins. This travel pattern analysis is performed at the census tract level. Key origins and destinations are shown in Figure 4-1 and discussed in more detail below.

This travel pattern analysis also evaluates travel patterns over two distinct time periods, January 2020 and January 2021. This approach provides insight into how travel patterns have evolved before and after the COVID-19 Pandemic.

### Origins

Key origins were identified through the Market Analysis (Chapter 3) and through close coordination with EMBARK staff. Specific locations include neighborhoods with higher population density and higher transit propensity, locations with large apartment complexes, and neighborhoods included in Oklahoma City's Strong Neighborhoods Initiative (SNI). Specific key origins evaluated in this analysis include:

- W Hefner Rd & N Western Ave
- The Pines & Lyrewood Ln
- NW 63<sup>rd</sup> St & N Meridian Ave
- NW 23<sup>rd</sup> St & N MacArthur Blvd
- Creston Hills neighborhood
- Capitol Hill SNI
- Capitol View SNI
- Metro Park SNI
- Midwest City – Reno Ave & N Air Depot Blvd
- South Walker neighborhood
- Valley Brook

## Destinations

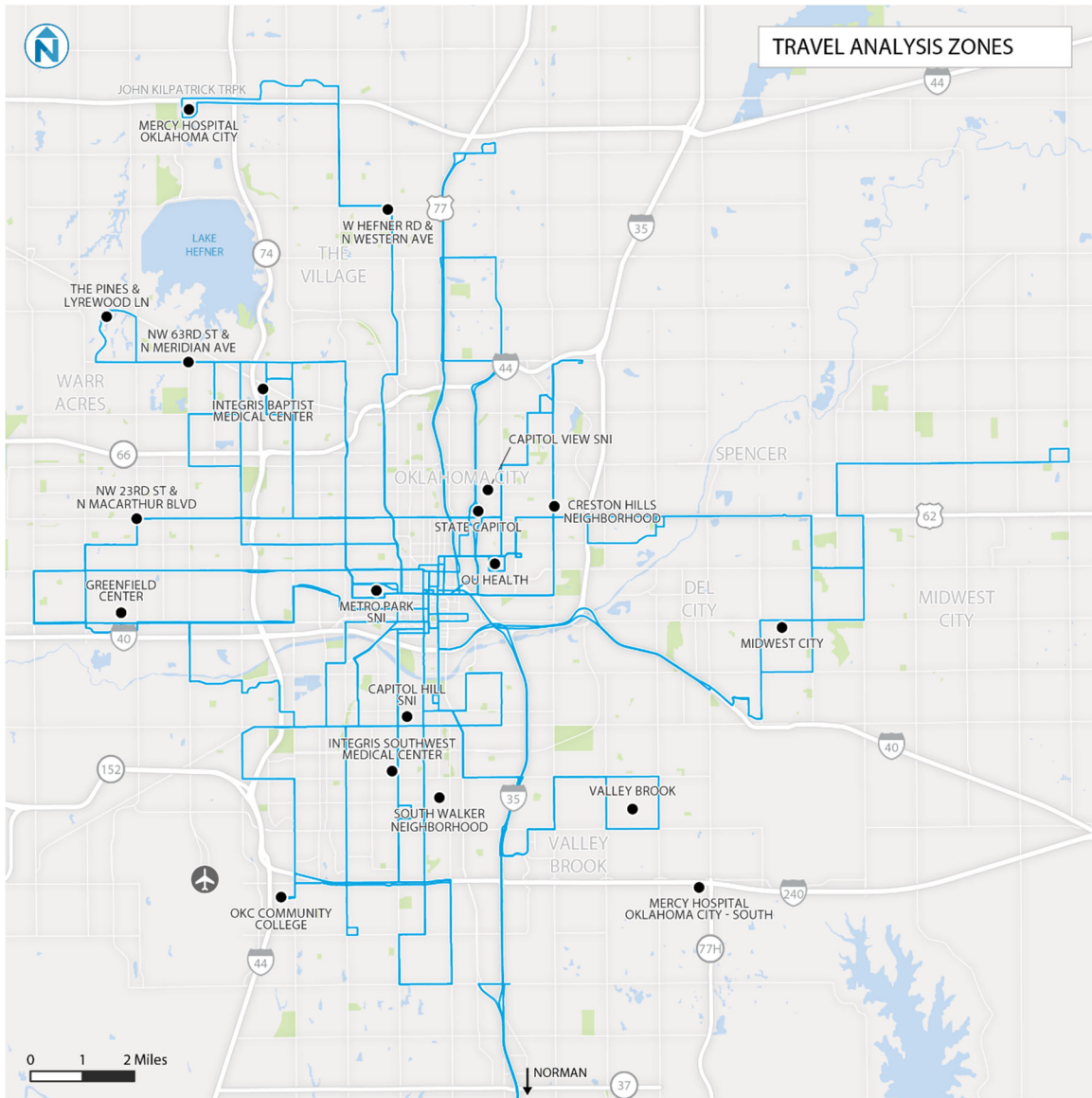
Key destinations were identified through the Market Analysis (Chapter 3) and through close coordination with EMBARK staff. Specific locations include destinations with high existing transit ridership and high concentrations of jobs. Specific key destinations evaluated in this analysis include:

- INTEGRIS Baptist Medical Center
- INTEGRIS Southwest Medical Center
- Greenfield Center
- Oklahoma State Capitol
- OU Health – University of Oklahoma Medical Center
- Oklahoma City Community College
- Mercy Hospital Oklahoma City
- Mercy Hospital Oklahoma City – South

## KEY FINDINGS

- Travel volumes generally appear to be lower between January 2020 and January 2021, indicating that people made fewer trips overall following the COVID-19 Pandemic. Within Oklahoma City, total travel decreased by approximately 14% between January 2020 and January 2021. It is unknown to what extent travel patterns and travel volumes will return following the pandemic recovery.
- Changes in travel patterns between January 2020 and January 2021 generally included a higher concentration of travel to nearby areas and less travel to areas further away from the analysis zone. This indicates there may be fewer long-distance commute related trips and more local errand-based trips.
- There are observed travel flows between west Oklahoma City and south Oklahoma City, most notably from NW 23<sup>rd</sup> St & N MacArthur Blvd, NW 63<sup>rd</sup> St & N Meridian Ave, and Greenfield Center. Transit trips between these locations would typically require a transfer in downtown Oklahoma City and may be improved by providing a more direct one-seat ride.
- Key origins and destinations along the highest ridership routes, like Route 005 and Route 008, generally retained higher travel volumes following the pandemic than other locations. In particular, travel between key origins and downtown Oklahoma City and other employment hubs. This indicates these neighborhoods may have a higher proportion of essential workers.
- Travel from key origins east of Oklahoma City, particularly in the Valley Brook and Mid-Del areas, appear to be even more highly concentrated around local trips in east or south Oklahoma City than for origins in other areas of the region.
- Large medical facilities like Mercy Hospital Oklahoma City, INTEGRIS Baptist Medical Center, and OU Health generally retained a higher volume of pre-pandemic travel than other types key destinations, like retail or educational facilities.

Figure 4-1 Key Origins and Destinations



## ORIGINS

### NW 23<sup>rd</sup> St & N MacArthur Blvd

The intersection of NW 23<sup>rd</sup> St and N MacArthur Blvd is located in west Oklahoma City and was identified as a key origin for trips in the region due to the presence of several large apartment complexes, including Forest Oaks Apartments, Apple Tree Apartments, and Castle Tower Apartments, among others. This area was identified as having a relatively high propensity for transit use (more information in Chapter 3). NW 23<sup>rd</sup> St & N MacArthur Blvd is currently served by Route 023.

Trips beginning near the intersection of NW 23<sup>rd</sup> ST & N Macarthur Blvd in the western area of Oklahoma City have destinations that are generally spread throughout the region (Figure 4-2). Prior to the COVID-19 Pandemic, the most common destinations include:

- Adjacent census tracts to the east, north, and northwest
- INTEGRIS Baptist Medical Center
- OU Health – University of Oklahoma Medical Center
- Downtown Oklahoma City

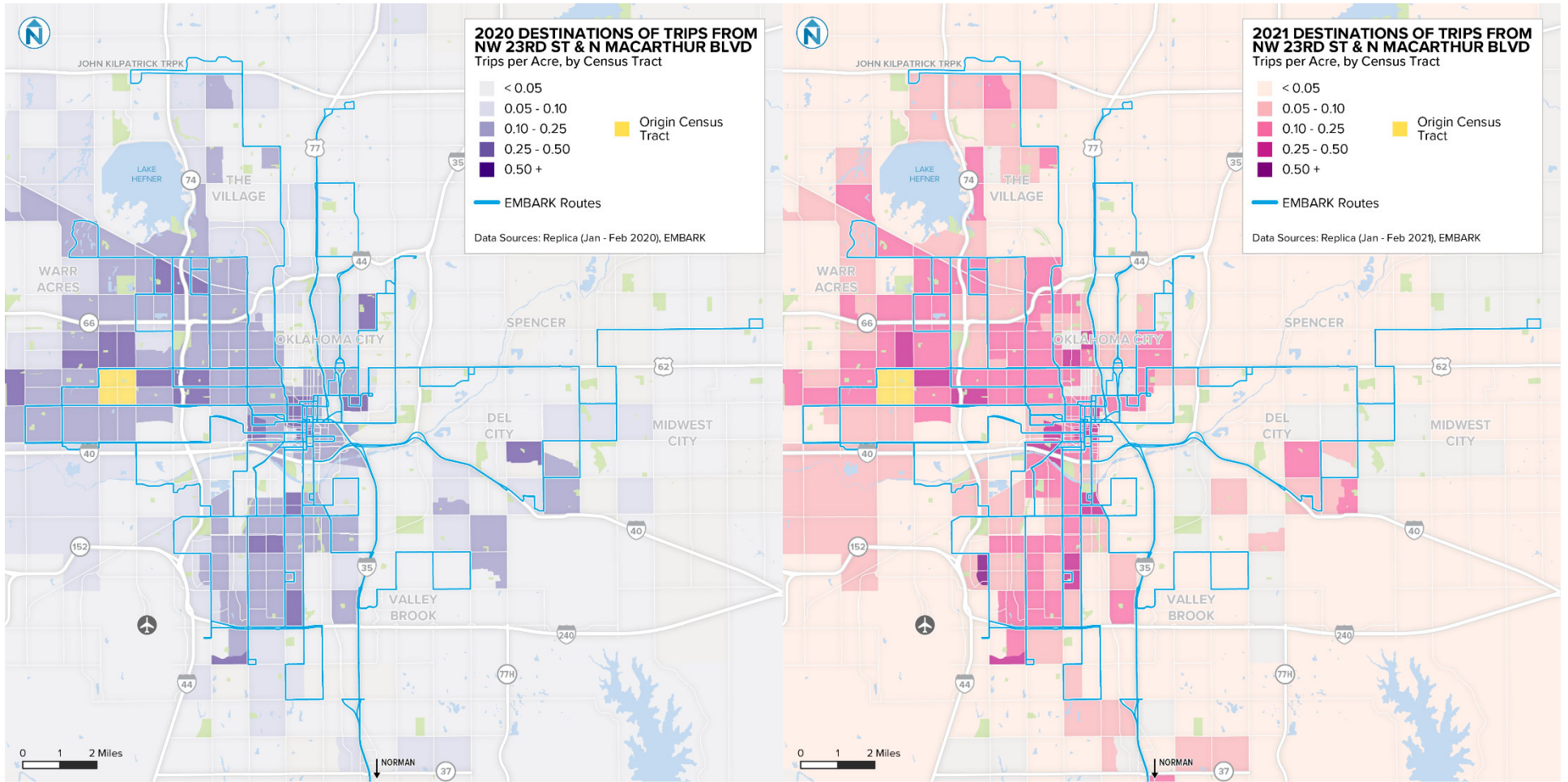
In addition to these common destinations there were several other disparate areas in south Oklahoma City and Del City with frequent destinations.

Following the onset of the COVID-19 Pandemic, travel patterns for trips originating near NW 23<sup>rd</sup> St & N MacArthur Blvd have shifted, with the most common destinations including:

- Adjacent census tracts to the east, north, and northwest
- Downtown Oklahoma City
- South May Shopping Center
- Park Terrace Shopping Center and Salvation Army Senior Center
- The Capitol Hill neighborhood

Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-3. On weekdays in January 2020, an average of ~7,000 trips originated at this location compared to an average of ~3,300 in January of 2021, a 53% decrease. The average distance traveled from this location was 5.83 miles compared to 5.30 miles, a 9% decrease. Areas with the largest decrease in trips include west Oklahoma City, Del City, and downtown Oklahoma City. Areas with the largest increases in trips include the areas south of downtown Oklahoma City, NW 23<sup>rd</sup> St & N Walker Ave, and the Mayridge neighborhood.

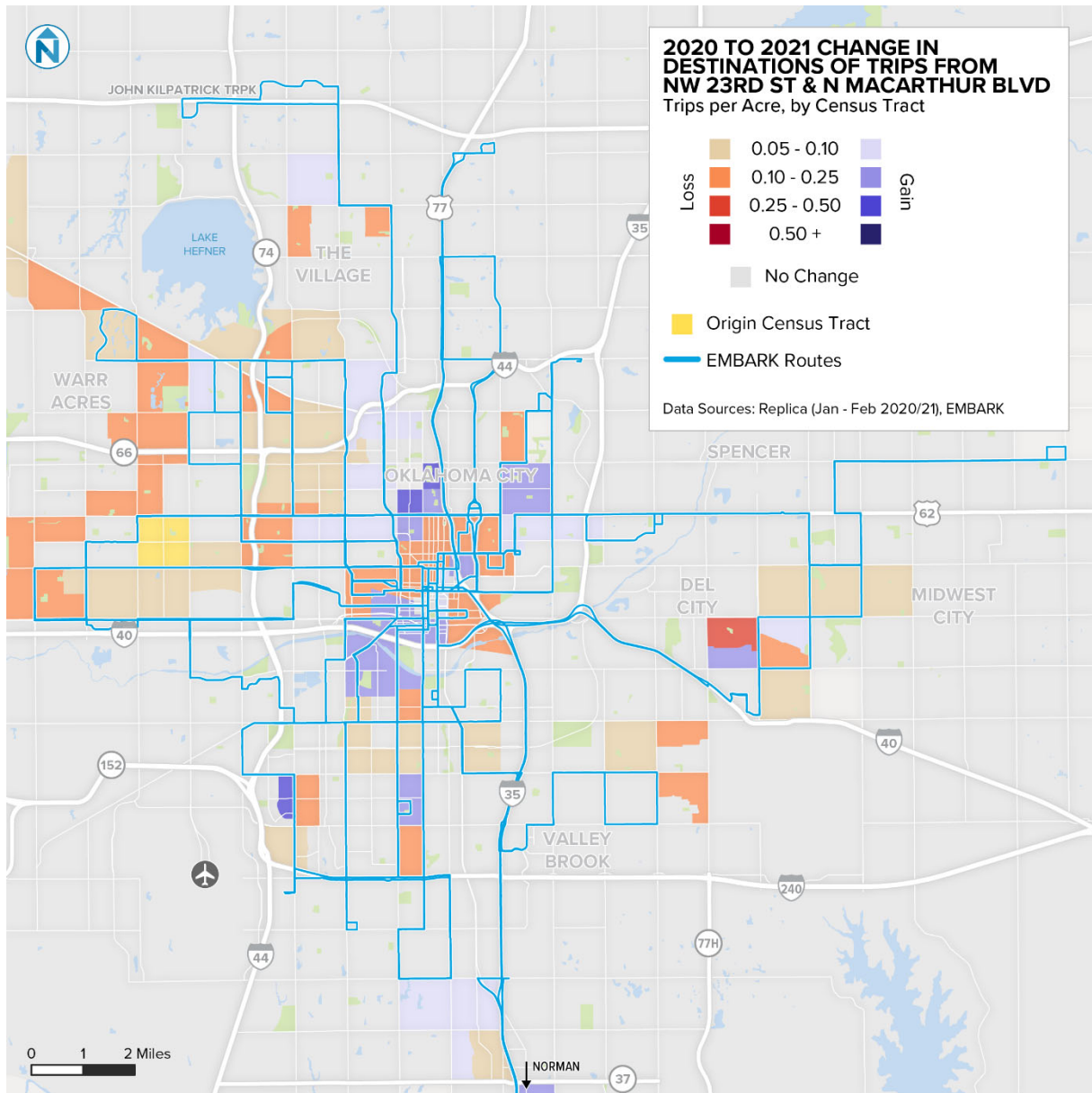
Figure 4-2 Destinations of Trips Beginning near NW 23<sup>rd</sup> St & N MacArthur Blvd (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021



**Figure 4-3 Difference in Trips Beginning near NW 23<sup>rd</sup> St & N MacArthur Blvd between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## NW 63<sup>rd</sup> St & N Meridian Ave

The intersection of NW 63<sup>rd</sup> St & N Meridian Ave is located in west Oklahoma City adjacent to the south of Northwest Expressway and the planned Northwest BRT route. This location was identified as a key origin for trips due to the presence of several large apartment complexes, as well as being a high transit propensity area within the region. NW 63<sup>rd</sup> St & N Meridian Ave is currently served by Route 008.

Pre-covid travel from this area most commonly ends in adjacent census tracts, notably the tract immediately to the east, which includes the Coronado Heights neighborhood and the INTEGRIS Baptist Medical Center Portland Avenue complex. The Penn Square Mall shopping center is also among the most common destinations for trips beginning in this census tract. Other areas with common destinations include:

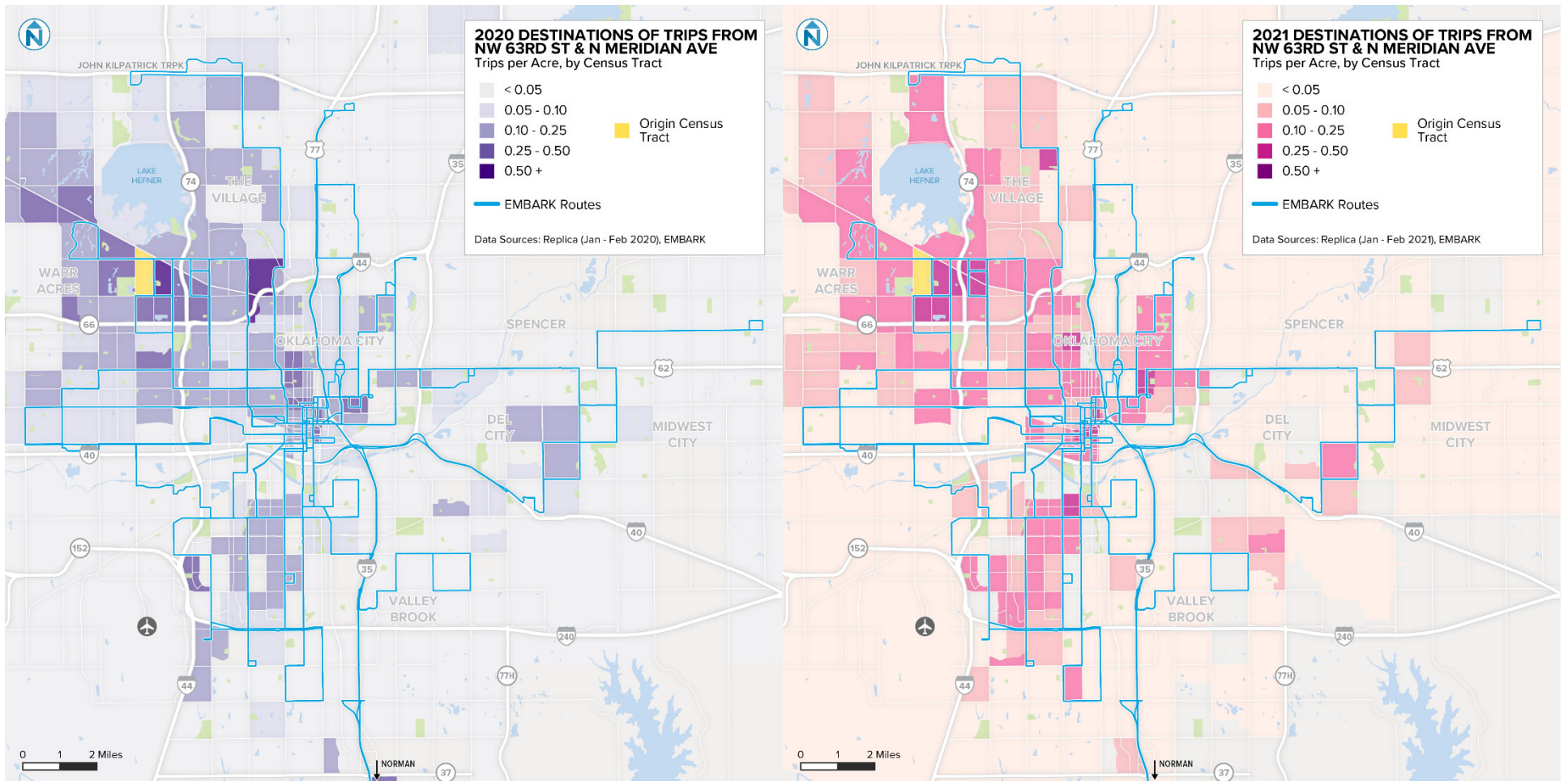
- Downtown Oklahoma City
- The Paseo neighborhood
- OU Health – University of Oklahoma Medical Center
- The Mayridge neighborhood located in south Oklahoma City adjacent to the I-44 & Route 152 interchange

Following the COVID 19 Pandemic, trips from NW 63<sup>rd</sup> St & N Meridian Ave appear to become more localized, with the most common destinations occurring in census tracts adjacent to the east and south. Other common destinations are located throughout the Oklahoma City area, including:

- The Paseo neighborhood
- The Capitol Hill neighborhood
- The Pitts Park neighborhood
- The area near the intersection of N Western Ave & W Hefner Rd

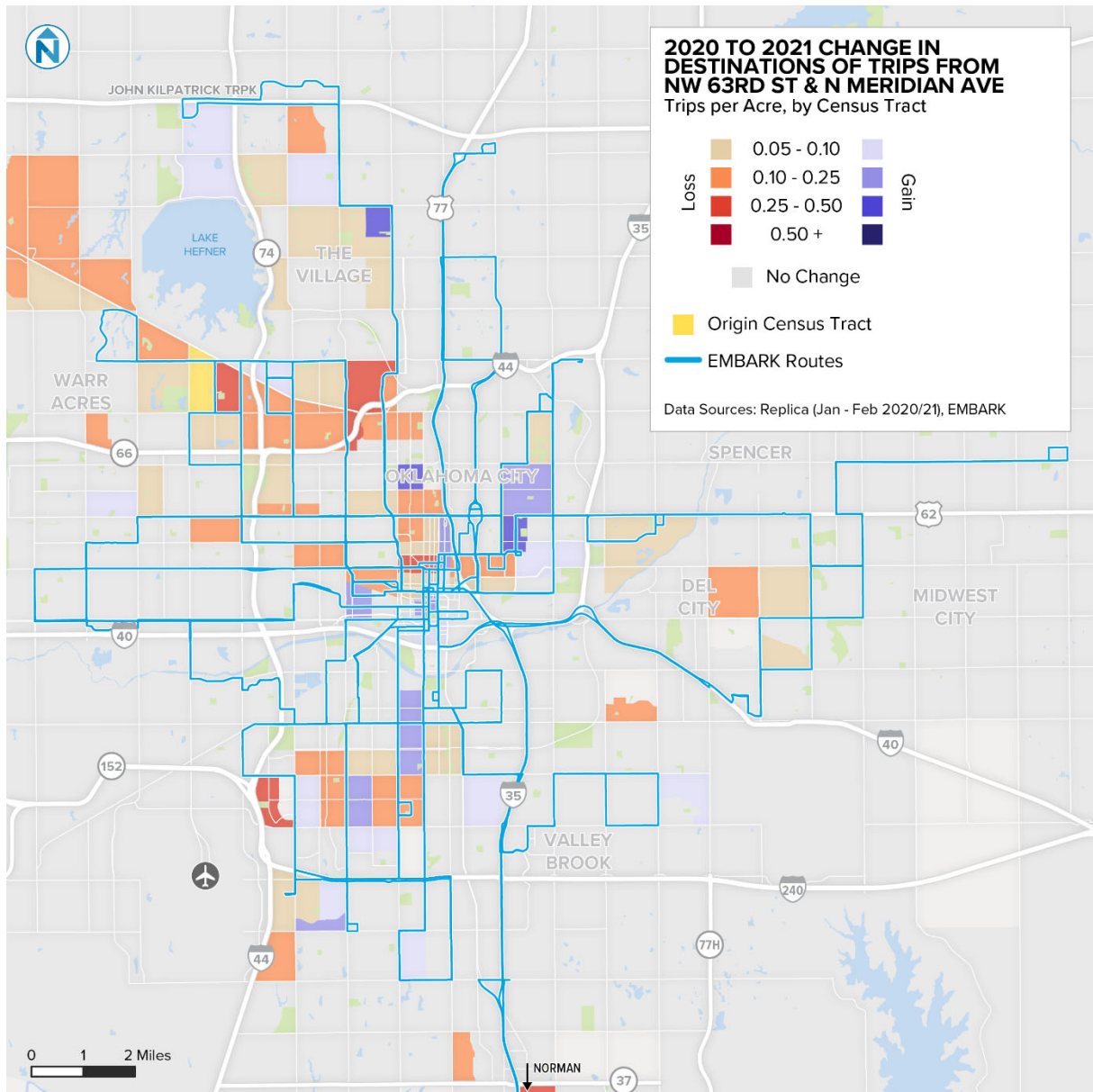
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-5. On weekdays in January 2020, an average of ~6,500 trips originated at this location compared to an average of ~6,000 in January of 2021, an 8% decrease. The average distance traveled from this location was 6.83 miles compared to 5.98 miles, a 12% decrease. Areas with the largest decrease in trips include the Northwest Expressway corridor, Penn Square Mall, and the Mayridge neighborhood. Areas with the largest increases in trips include Pennsylvania Ave & Hefner Rd, the Creston Hills neighborhood, and the South Walker neighborhood.

**Figure 4-4 Destinations of Trips Beginning near NW 63<sup>rd</sup> St & N Meridian Ave (Jan-Feb 2020 and Jan-Feb 2021)**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-5 Difference in Trips Beginning near NW 63rd St & N Meridian Ave between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Capitol Hill SNI Neighborhood

The Strong Neighborhoods Initiative (SNI) seeks to holistically improve struggling neighborhoods through beautification projects, increasing home construction, encouraging maintenance for existing homes, and providing additional afterschool programs. The Capitol Hill neighborhood, located in south Oklahoma City, is a current SNI neighborhood and has been identified as a key origin for regional trips. The Capitol Hill neighborhood is currently served by Routes 011, 013, 014, and 040.

Common January 2020 destinations for trips beginning in the Capitol Hill neighborhood are generally spread throughout the Oklahoma City area (Figure 4-6), including:

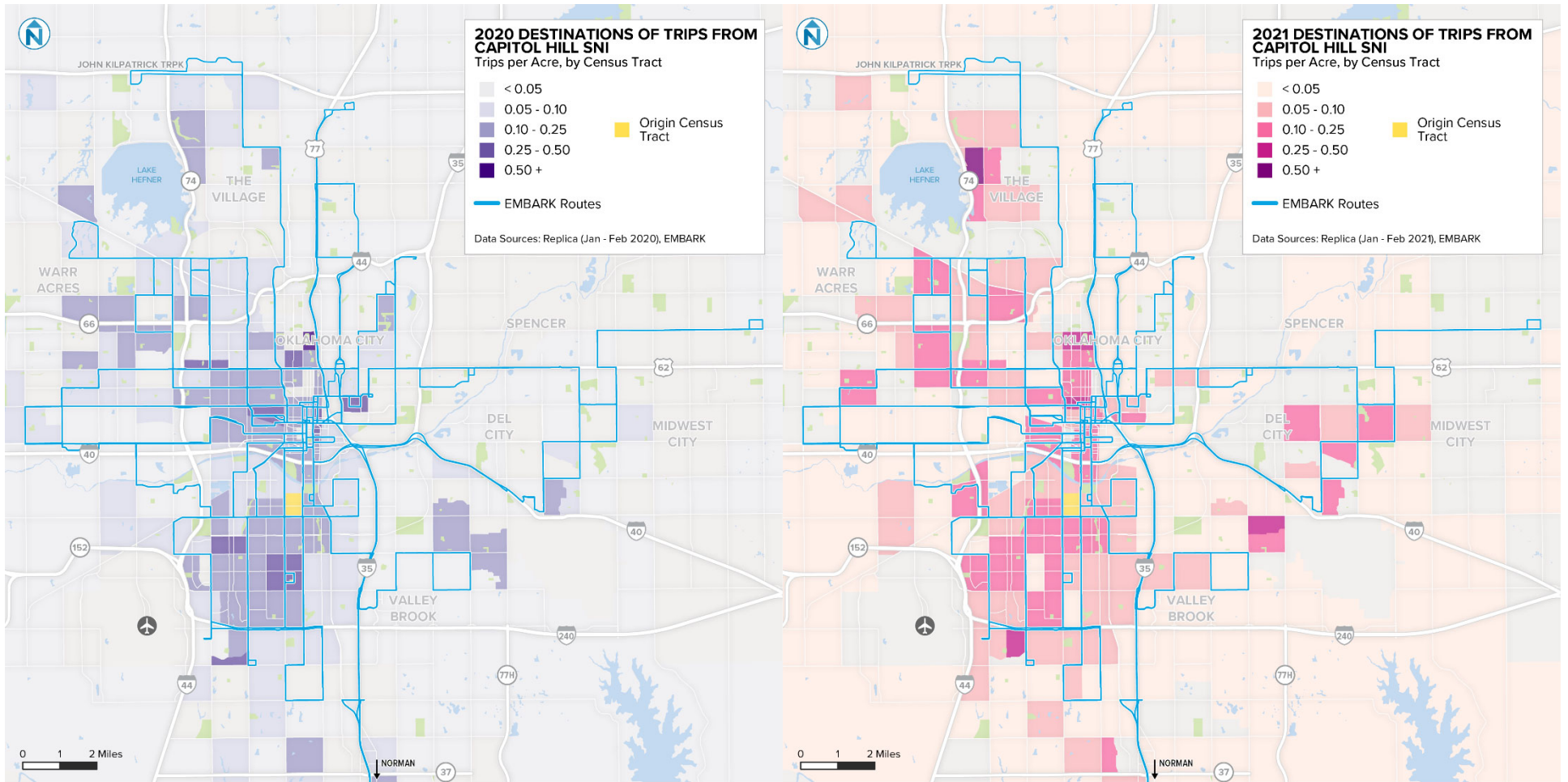
- The South Walker neighborhood
- The Rancho Village neighborhood
- OU Health – University of Oklahoma Medical Center
- The Edgemere Park neighborhood
- The Paseo neighborhood
- The Metro Park neighborhood

The January 2021 travel patterns for the Capitol Hill neighborhood indicate some shifts following the COVID-19 Pandemic. The most common destinations include:

- The Lake Hefner neighborhood along N May Ave between W Hefner Rd and W Britton Rd
- Del City, along SE 29<sup>th</sup> St between S Sunnyslane Rd and S Sooner Rd
- The Meadowcliff neighborhood between US 62, S Pennsylvania Ave, SW 89<sup>th</sup> St, and S Hillcrest Dr
- The Midtown neighborhood
- The Shepherd Historic District

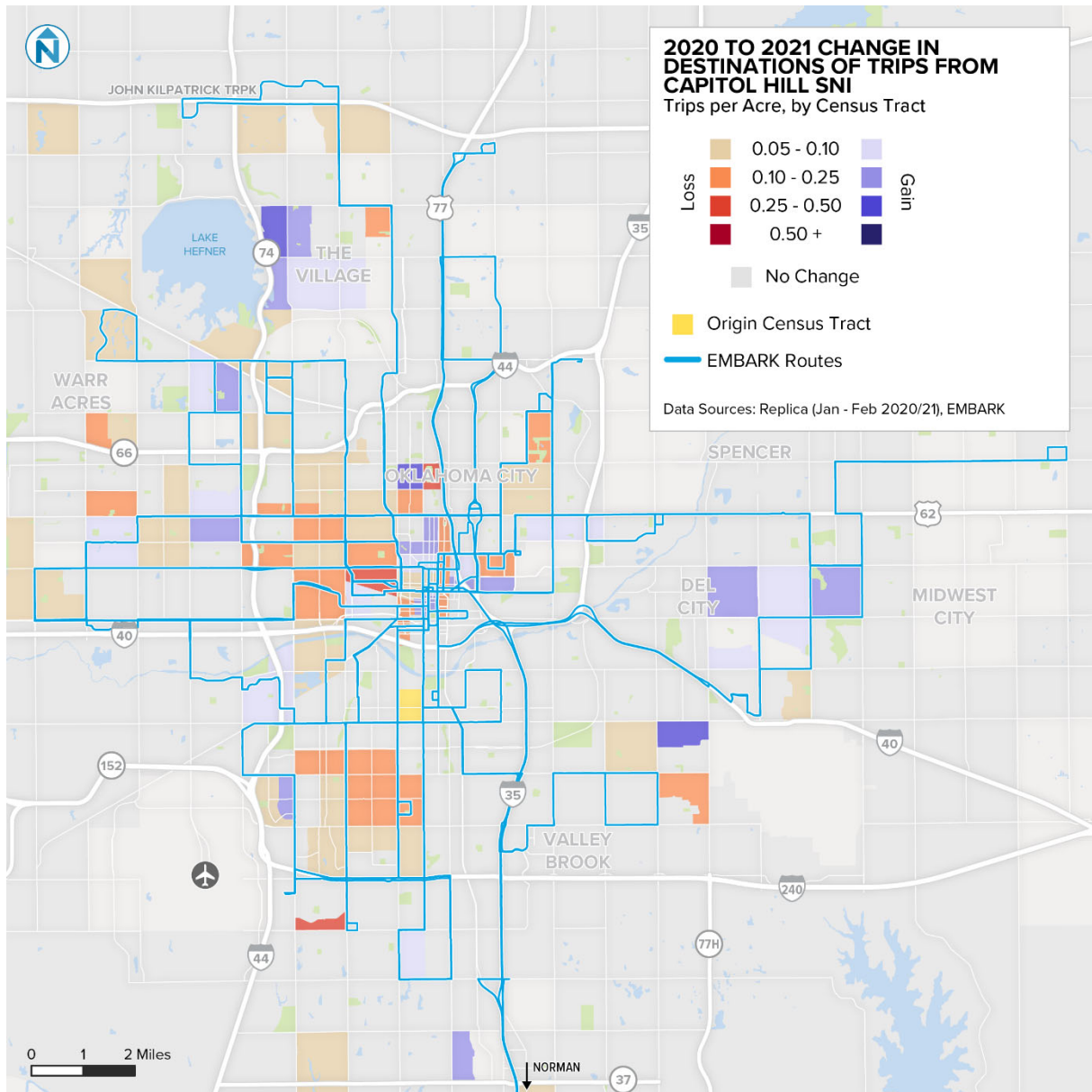
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-7. On weekdays in January 2020, an average of ~3,400 trips originated at this location compared to an average of ~1,200 in January of 2021, a 64% decrease. The average distance traveled from this location was 6.69 miles in January 2020 compared to 6.57 miles in January 2021, a 2% decrease. Areas with the largest decrease in trips include Central Oklahoma City, and the South Walker neighborhood. Areas with the largest increases in trips include Del City, Midwest City, and The Village.

**Figure 4-6 Destinations of Trips Beginning near the Capitol Hill Strong Neighborhoods Initiative Area (Jan-Feb 2020 and Jan-Feb 2021)**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-7 Difference in Trips Beginning near the Capitol Hill Strong Neighborhoods Initiative Area between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Capitol View SNI Neighborhood

Similar to Capitol Hill, the Capitol View neighborhood is also a designated SNI neighborhood located north of the state capitol campus area in Oklahoma City. This neighborhood was identified as a key origin for regional travel due to this designation. Travel patterns for January 2020 and January 2021 are shown below in Figure 4-8. The Capitol View neighborhood is currently served by Routes 003 and 018.

January 2020 travel patterns indicate that a large number of trips beginning in the Capitol View neighborhood end in nearby census tracts, including:

- The state capitol campus area
- OU Health – University of Oklahoma Medical Center
- The Metro Park neighborhood
- The Edgemere Park and Jefferson Park neighborhoods adjacent to the west

The Mayridge neighborhood located in south Oklahoma City adjacent to the I-44 & Route 152 interchange also emerged as a common destination.

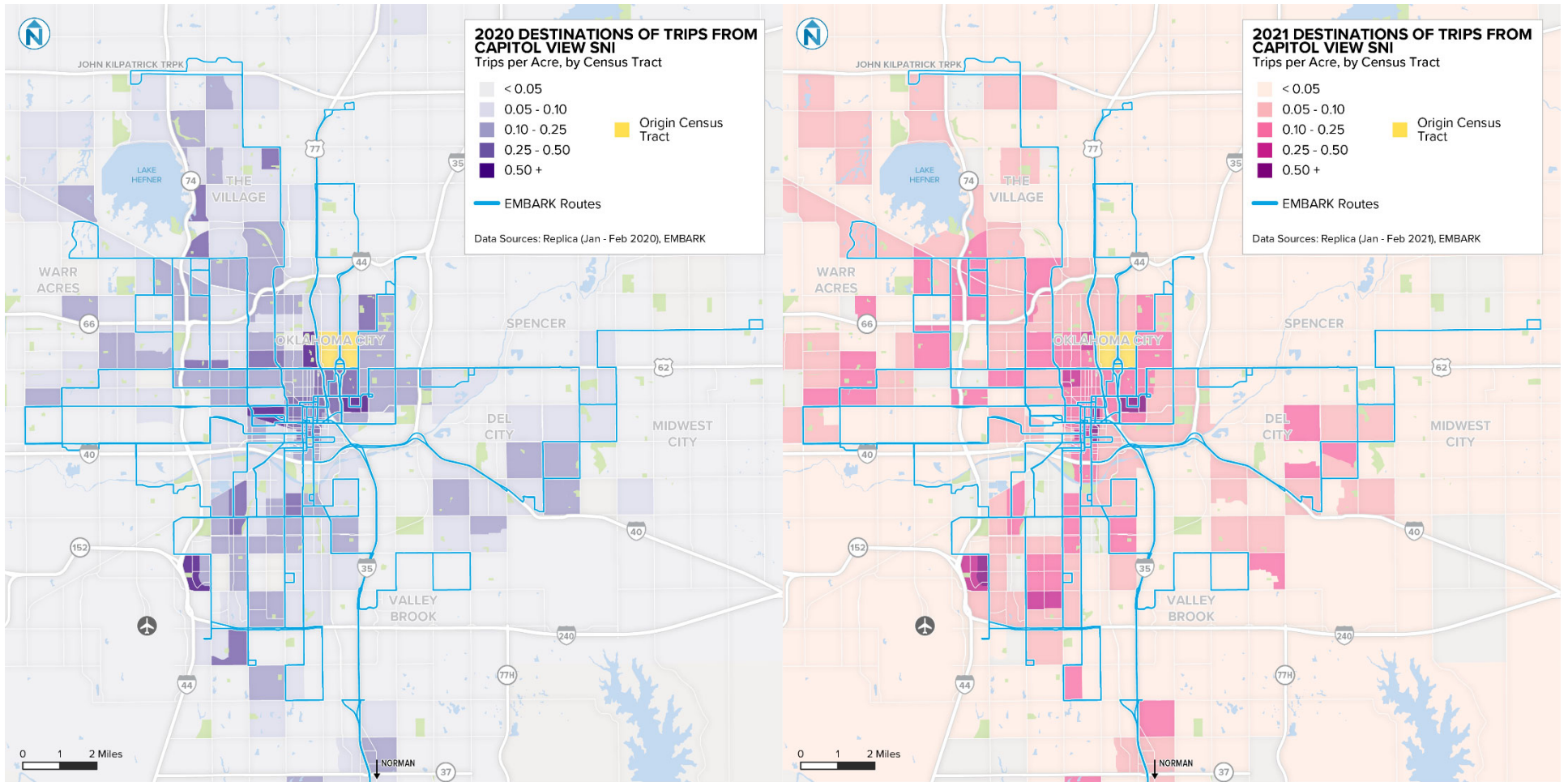
Travel patterns in January 2021 appear similar to January 2020 with many of the same common destinations, including:

- The Mayridge neighborhood
- The Edgemere Park neighborhood
- OU Health – University of Oklahoma Medical Center

Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location increased slightly. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-9. On weekdays in January 2020, an average of ~11,100 trips originated at this location compared to an average of ~6,000 in January of 2021, a 47% decrease. The average distance traveled from this location was 6.44 miles in January 2020 compared to 6.63 miles in January 2021, a 3% increase. Areas with the largest decrease in trips include downtown Oklahoma City, central Oklahoma City, Jefferson Park, the Capitol Hill neighborhood, and the Meadowcliff neighborhood. Areas with the largest increases in trips are spread throughout the service area and primarily include the South Walker and Highlander Community South neighborhoods in south Oklahoma City.

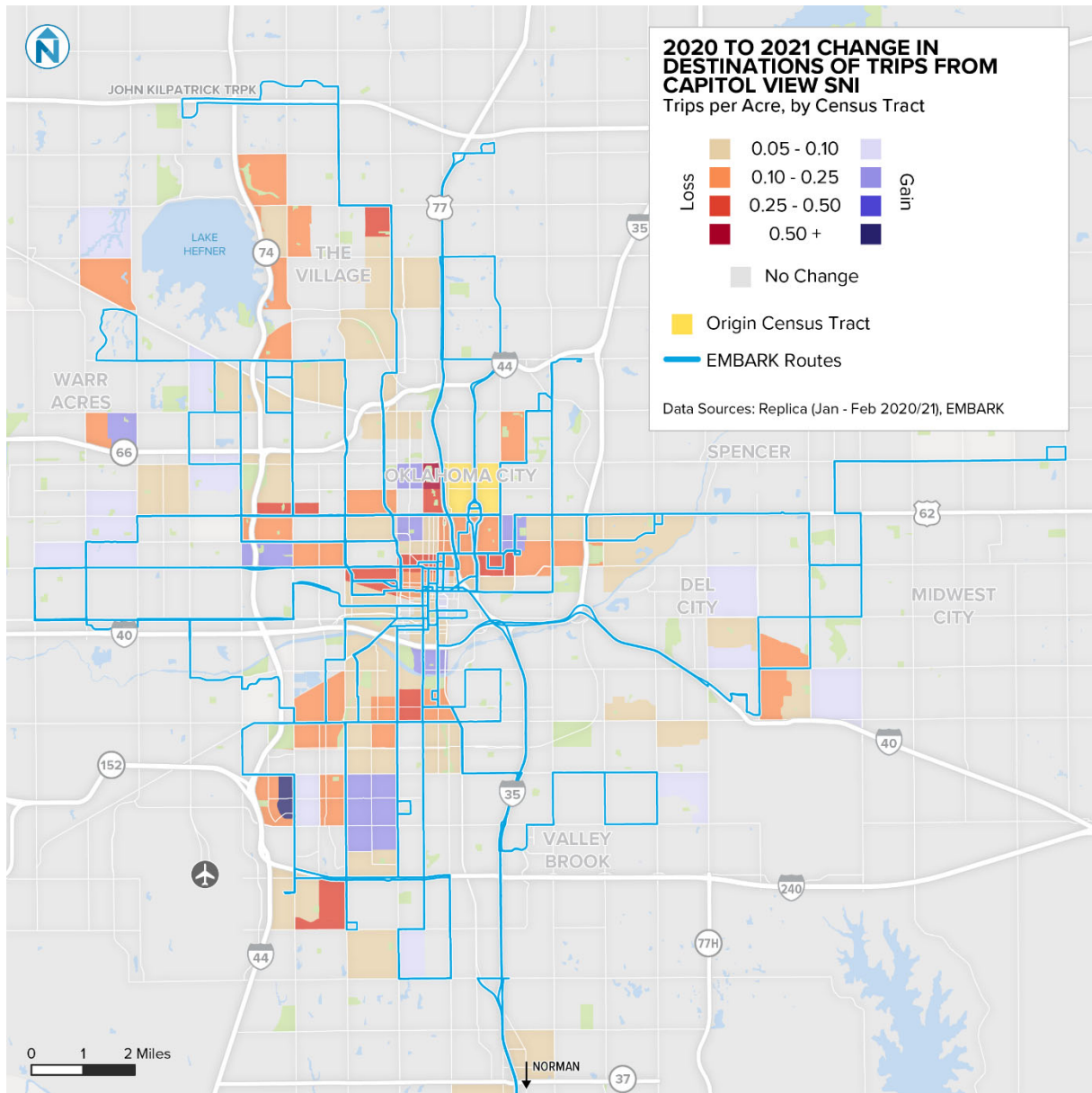


**Figure 4-8 Destinations of Trips Beginning near the Capitol View Strong Neighborhoods Initiative Area (Jan-Feb 2020 and Jan-Feb 2021)**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-9 Difference in Trips Beginning near the Capitol View Strong Neighborhoods Initiative Area between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Metro Park SNI Neighborhood

The Metro Park neighborhood is the third SNI neighborhood included in this travel pattern analysis and is located adjacent to the northwest of downtown Oklahoma City. Common destinations for trips beginning in the Metro Park neighborhood in January 2020 and 2021 are shown in Figure 4-10. The Metro Park neighborhood is currently served by Routes 007, 008, 010, and 038.

Common destinations in January 2020 include:

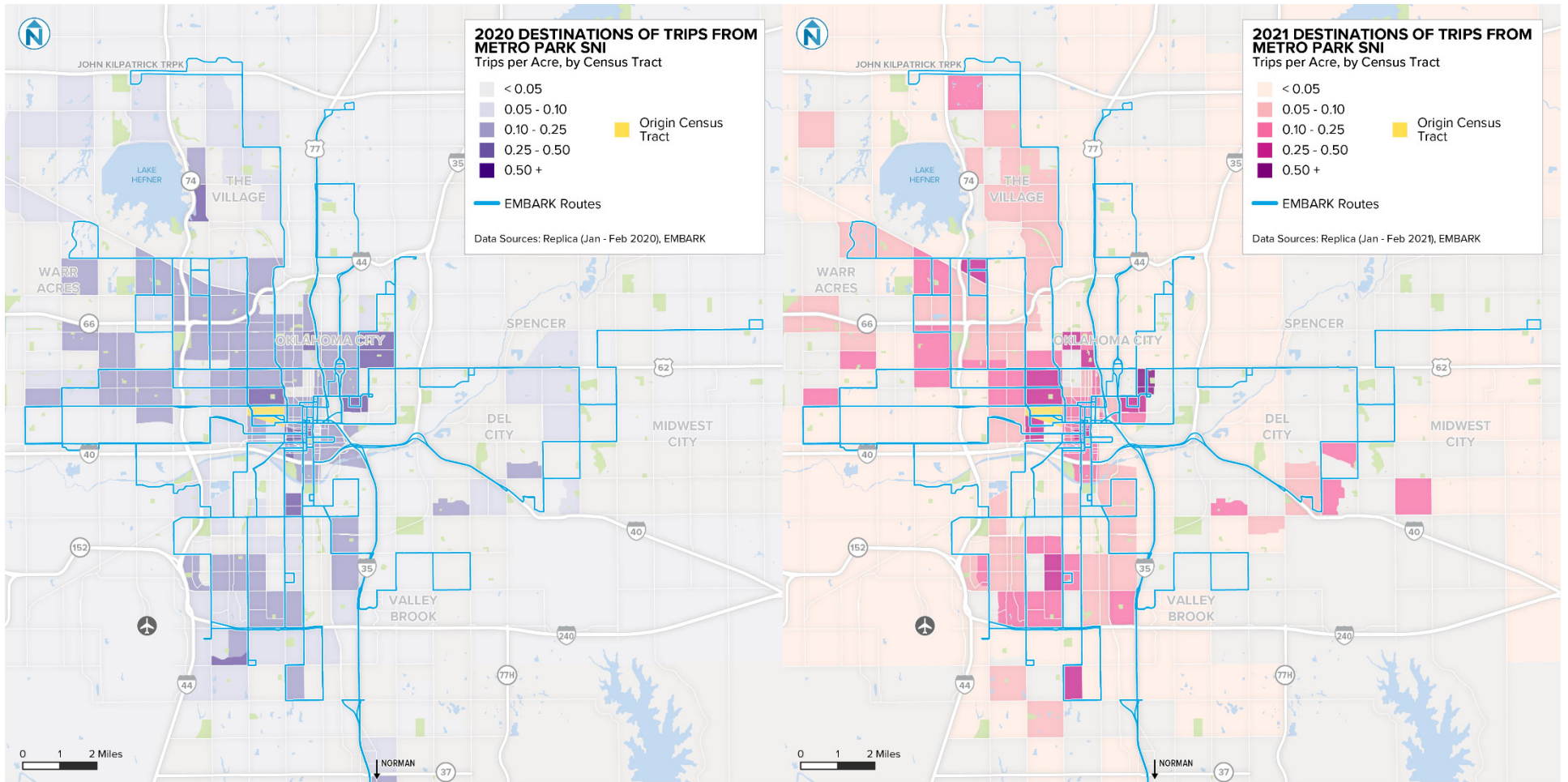
- OU Health – University of Oklahoma Medical Center
- The Eastside, Martin Luther King, and Briarwood Circle neighborhoods located east of Capitol View
- The Plaza District adjacent to the north
- The Capitol Hill neighborhood in south Oklahoma City

Several destinations appear to have higher travel volumes in 2021 than in 2020, including:

- The Medical Community and Pitts Park neighborhoods north of OU Health
- The Brookwood Shopping Center area along S Western Ave between SW 89<sup>th</sup> St and SW 104<sup>th</sup> St
- The Highlander Community South neighborhood between SW 44<sup>th</sup> St, S Western Ave, SW 59<sup>th</sup> St, and S Blackwelder Ave
- Centennial Plaza shopping center and Brookline Office Park located near N May Ave and NW Expressway

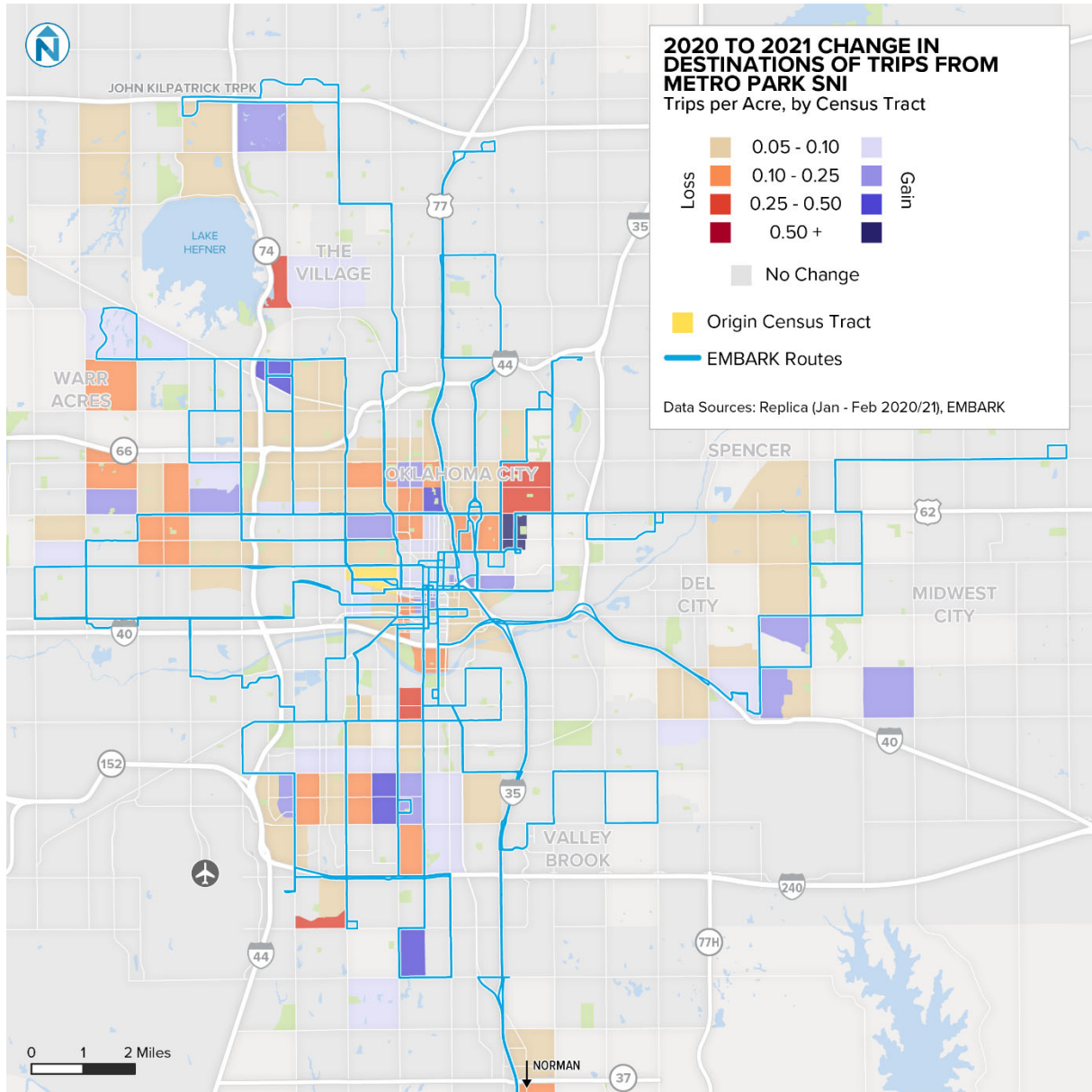
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-11. On weekdays in January 2020, an average of ~1,800 trips originated at this location compared to an average of ~800 in January of 2021, a 53% decrease. The average distance traveled from this location was 6.37 miles in January 2020 compared to 5.68 miles in January 2021, an 11% decrease. Areas with the largest decrease in trips include the Eastside and Martin Luther King neighborhoods, the Capitol Hill neighborhood, and the Lakehurst neighborhood. Areas with the largest increases in trips include the South Walker neighborhood, NW 63<sup>rd</sup> St & N May Ave, the Pitts Park and Ross Heights neighborhoods, and SW 104<sup>th</sup> St between S Western Ave and S Walker Ave.

Figure 4-10 Destinations of Trips Beginning near the Metro Park Strong Neighborhoods Initiative Area (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-11 Difference in Trips Beginning near the Metro Park Strong Neighborhoods Initiative Area between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Creston Hills Neighborhood

The Creston Hills neighborhood, located east of the state capitol area, includes several potential high transit needs locations, like the Atkins Opportunities Garden assisted living facility and the Oklahoma City Housing Authority facility located near N Martin Luther King Ave & NE 23<sup>rd</sup> St. This neighborhood was identified as a key origin for regional travel analysis due to the presence of these locations and its moderate propensity for transit use. Common destinations for trips beginning in the Creston Hills neighborhood for January 2020 and 2021 are shown in Figure 4-12. Creston Hills is currently served by Routes 002, and 022.

Common destinations in January 2020 are generally spread throughout the service area with a few areas with higher volumes of travel, including:

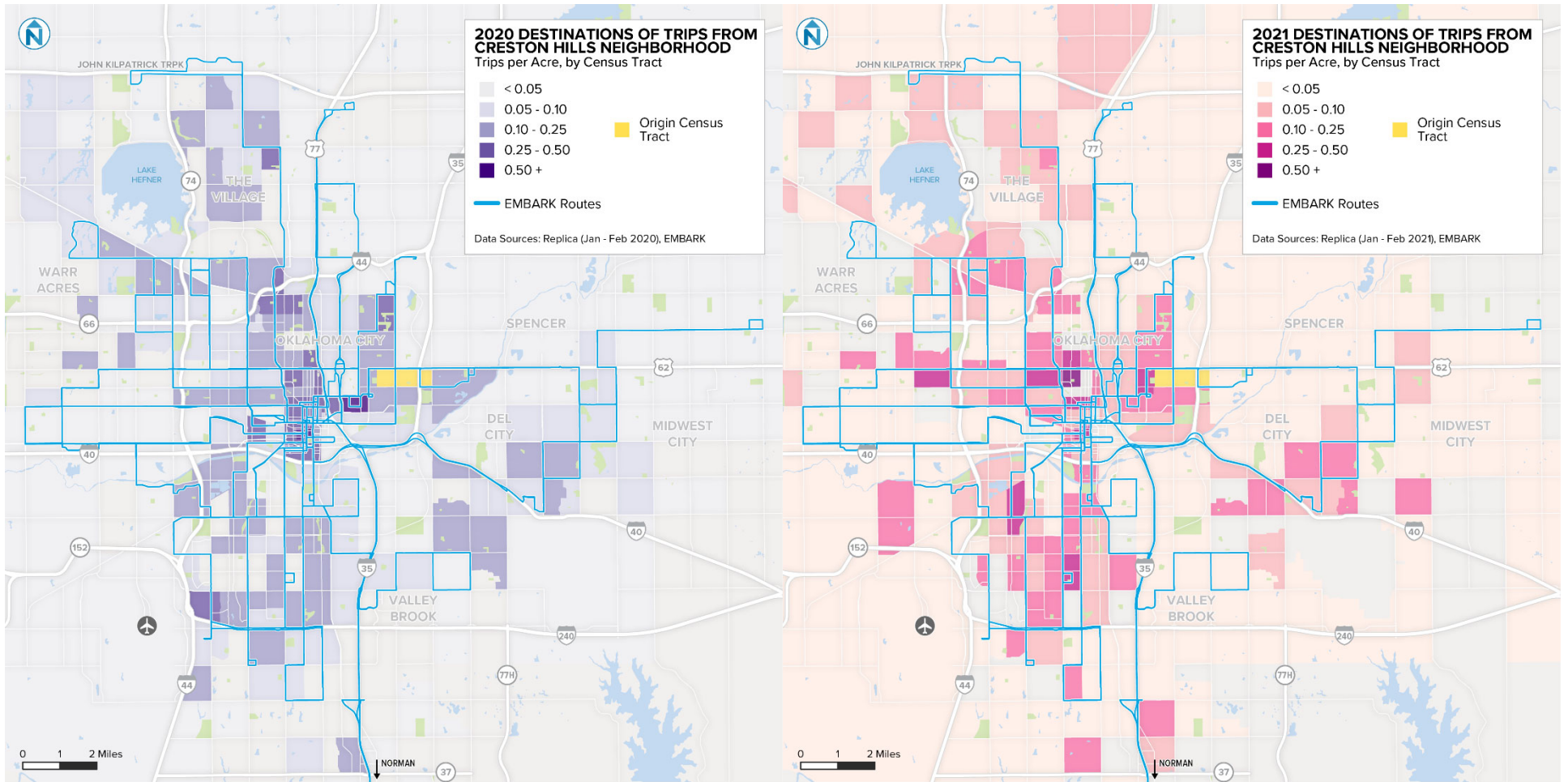
- OU Health – University of Oklahoma Medical Center
- Downtown Oklahoma City
- The John Glenn neighborhood area located north of Oklahoma City Community College (OCCC), including the OCCC FACE Center, Glenn School, and Almonte Library
- The Penn Square Mall area

Travel patterns are relatively consistent between January 2020 and January 2021. However, there are a few areas with higher travel volumes in January 2021, including:

- The Aurora neighborhood in south Oklahoma City, including Capitol Steel & Iron, Transload Logistics, and DW Distribution Inc.
- The Park Terrace Shopping Center and Salvation Army Senior Center area
- The Paseo neighborhood

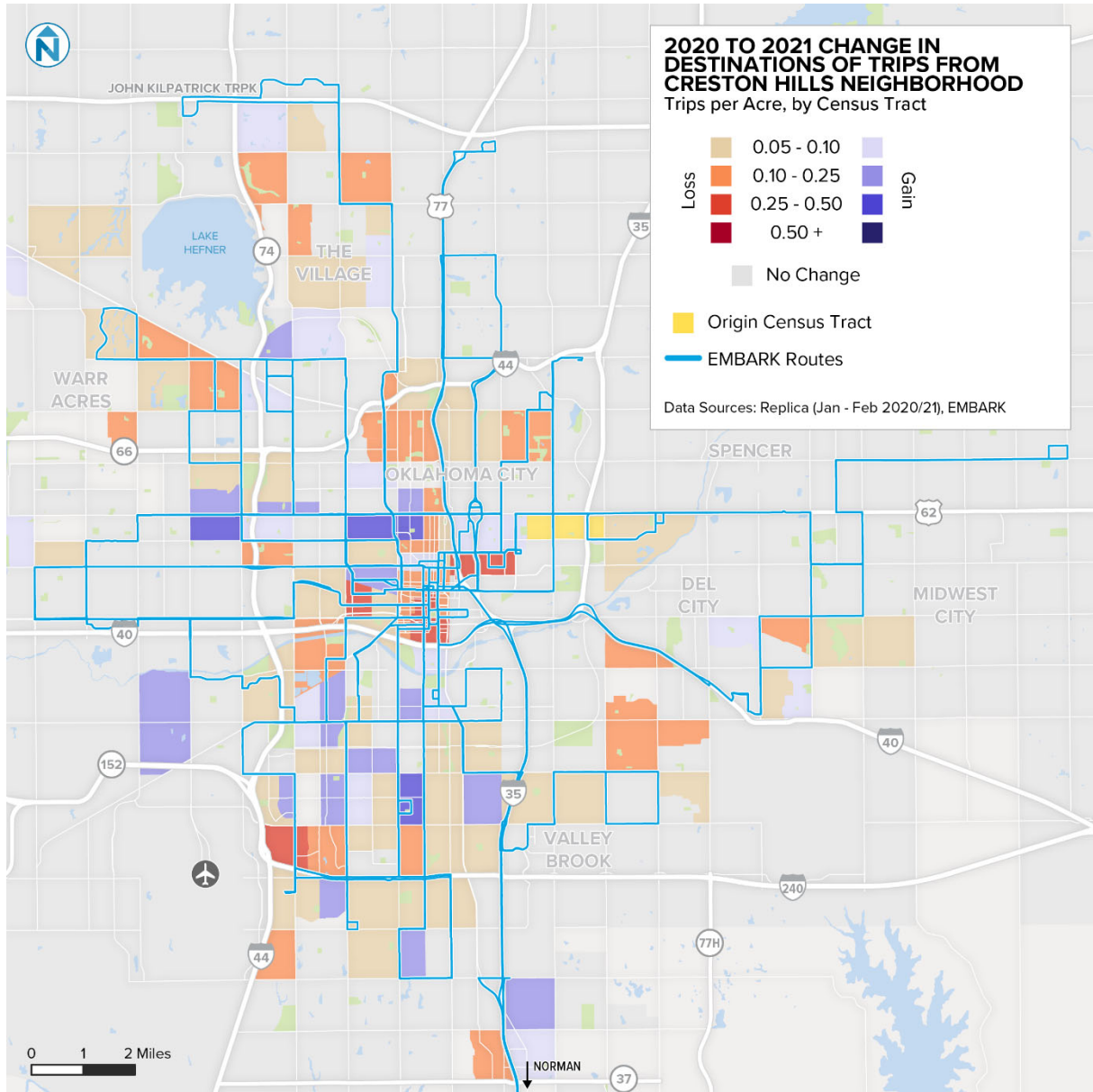
Following the COVID-19 Pandemic, the total volume of trips from this location increased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-13. On weekdays in January 2020, an average of ~2,300 trips originated at this location compared to an average of ~2,700 in January of 2021, a 14% decrease. The Creston Hills neighborhood is one of only two analysis zones with increased travel volumes following the COVID-19 Pandemic. The average distance traveled from this location was 5.79 miles in January 2020 compared to 5.48 miles in January 2021, a 4% decrease. Areas with the largest decrease in trips include OU Health, SW 59<sup>th</sup> St & S May Ave, and downtown Oklahoma City. Areas with the largest increases in trips include the Plaza District and Mesta Park neighborhoods, the South Walker neighborhood, and NW 23<sup>rd</sup> St between N Portland Ave and N Meridian Ave.

Figure 4-12 Destinations of Trips Beginning near the Creston Hills Neighborhood (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-13 Difference in Trips Beginning near the Creston Hills Neighborhood between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021



## W Hefner Rd & N Western Ave

The area in north Oklahoma City surrounding the intersection of W Hefner Rd & N Western Ave includes several large apartment complexes including North Village Apartments, Autumn Run Apartments, Cottages at Hefner Road, and Arden Park. This area was also determined to have a high propensity for transit use. Because of these two factors, the area was identified as a key origin for regional travel in the travel pattern analysis. Travel patterns and common destinations for trips beginning in this area are shown for January 2020 and 2021 in Figure 4-14. W Hefner Rd & N Western Ave is currently served by Route 005.

The most common destinations in January 2020 for trips beginning near W Hefner Rd & N Western Ave tend to be clustered in a few areas, including:

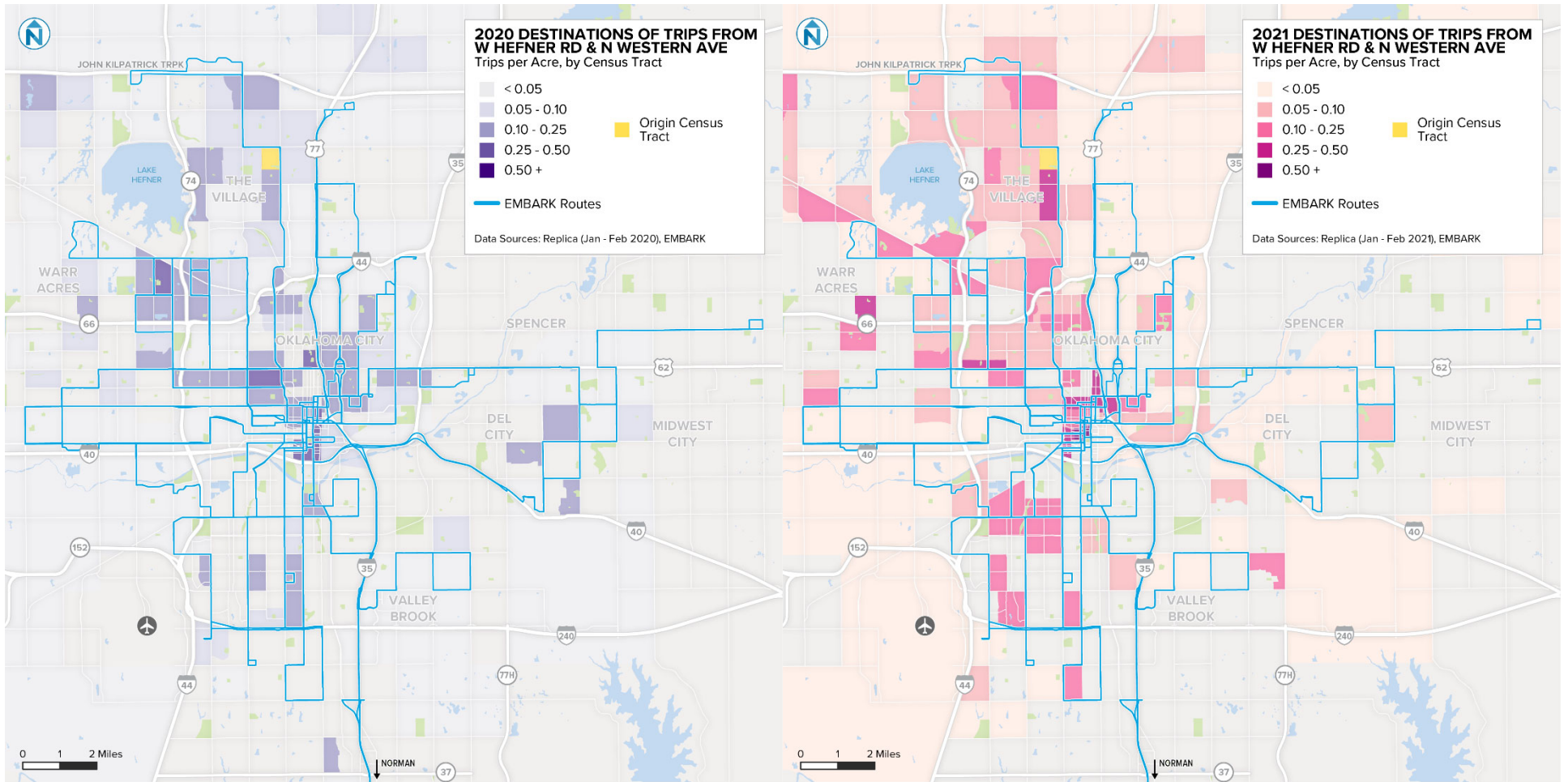
- Downtown Oklahoma City
- The state capitol area
- Central Oklahoma City, Miller, and Reed Park neighborhoods along NW 10<sup>th</sup> St
- The Coronado Heights, Springdale, and Mayfair neighborhoods located south of NW Expressway, including INTEGRIS Baptist Medical Center

It is notable that many of the highest volume destinations in 2020 are not the adjacent census tracts to this location, indicating that there may be higher proportion of longer distance trips beginning near W Hefner Rd & N Western Ave.

The January 2021 travel patterns appear to show a shift toward more local destinations with a larger volume of trips ending in census tracts within north Oklahoma City and The Village. There also appear to be fewer trips to the state capitol area but more trips to downtown Oklahoma City and south Oklahoma City.

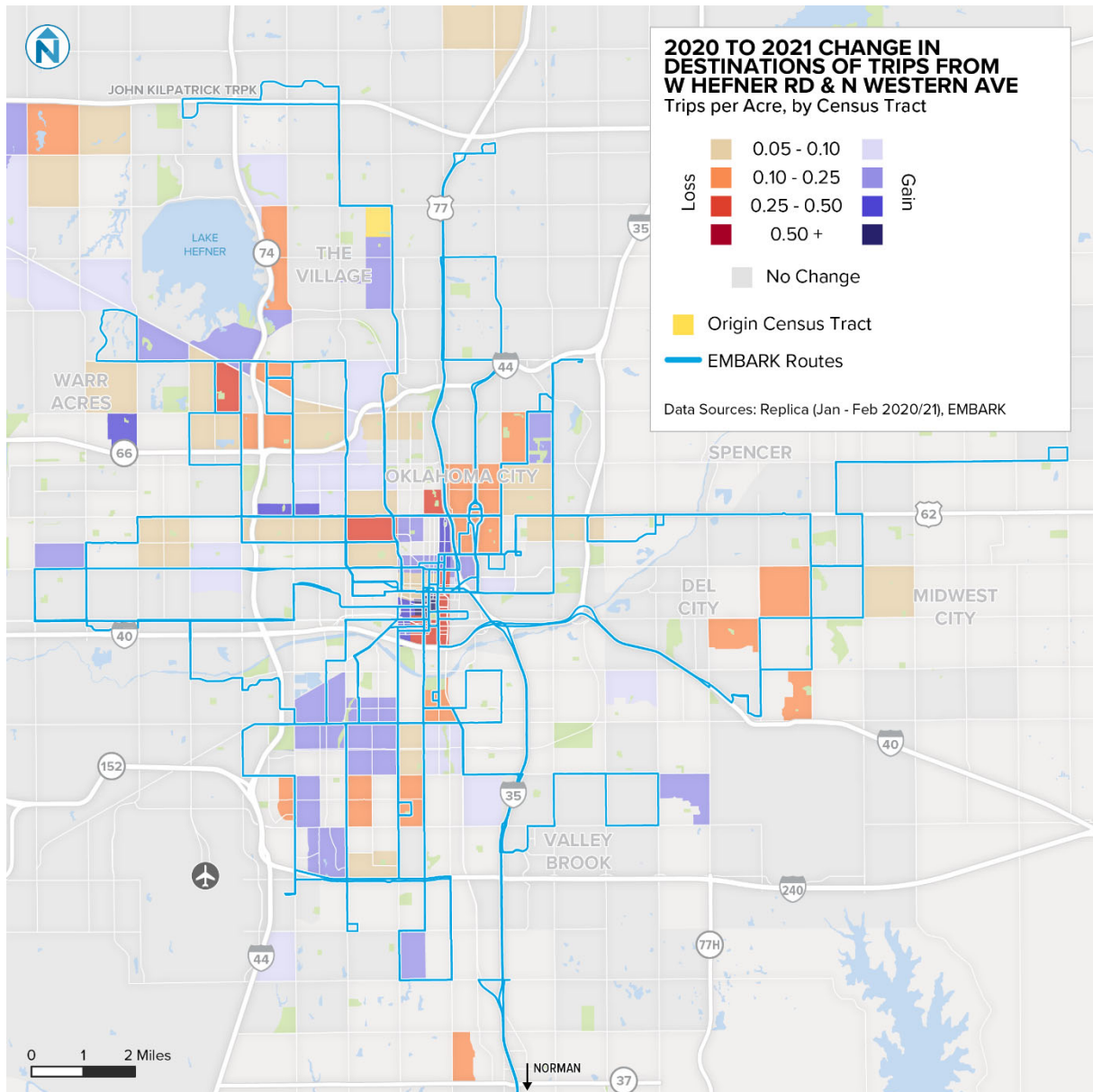
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location increased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-15. On weekdays in January 2020, an average of 1,833 trips originated at this location compared to an average of 1,469 in January of 2021, a 20% decrease. The average distance traveled from this location was 5.92 miles in January 2020 compared to 6.93 miles in January 2021, a 17% increase. Areas with the largest decrease in trips include Coronado Heights, the Plaza District, and Jefferson Park. Areas with the largest increases in trips include portions of downtown Oklahoma City, the N Broadway Ave corridor, and the SW 29<sup>th</sup> St corridor.

**Figure 4-14 Destinations of Trips Beginning near W Hefner Rd & N Western Ave (Jan-Feb 2020 and Jan-Feb 2021)**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-15 Difference in Trips Beginning near W Hefner Rd & N Western Ave between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Midwest City – Reno Ave & N Air Depot Blvd

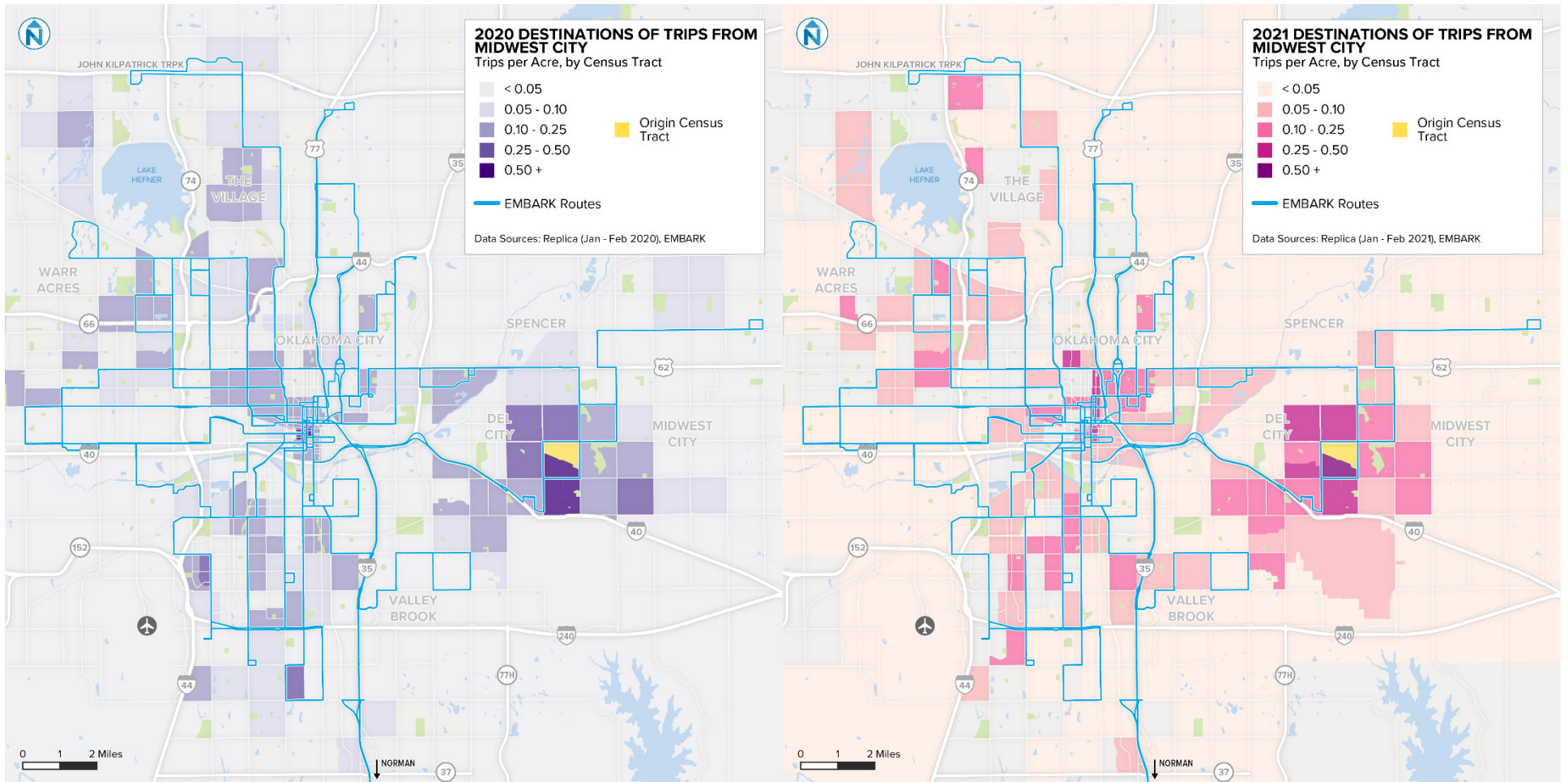
The area of Midwest City near the intersection of Reno Ave & N Air Depot Blvd was identified as having a high propensity for transit use and includes several large multi-family housing developments like the Vista Green Apartments and Calico Corners. The high transit propensity of this area make it an important regional origin for the travel pattern analysis. Common destinations for trips beginning from this location in January 2020 and 2021 are shown below in Figure 4-16. Reno Ave & N Air Depot Blvd is currently served by Route 015.

Common destinations for trips beginning near Reno Ave & N Air Depot Blvd are generally clustered around the Midwest City and Del City area in January 2020. Other destinations include downtown Oklahoma City and Western Ave between SW 89<sup>th</sup> St and SW 104<sup>th</sup> St.

In January 2021, destinations appear to be even more concentrated in the Midwest City and Del City area than in January 2020. Other common destinations outside of this area include the Paseo neighborhood and the Broadway Ave corridor on the eastern side of downtown Oklahoma City.

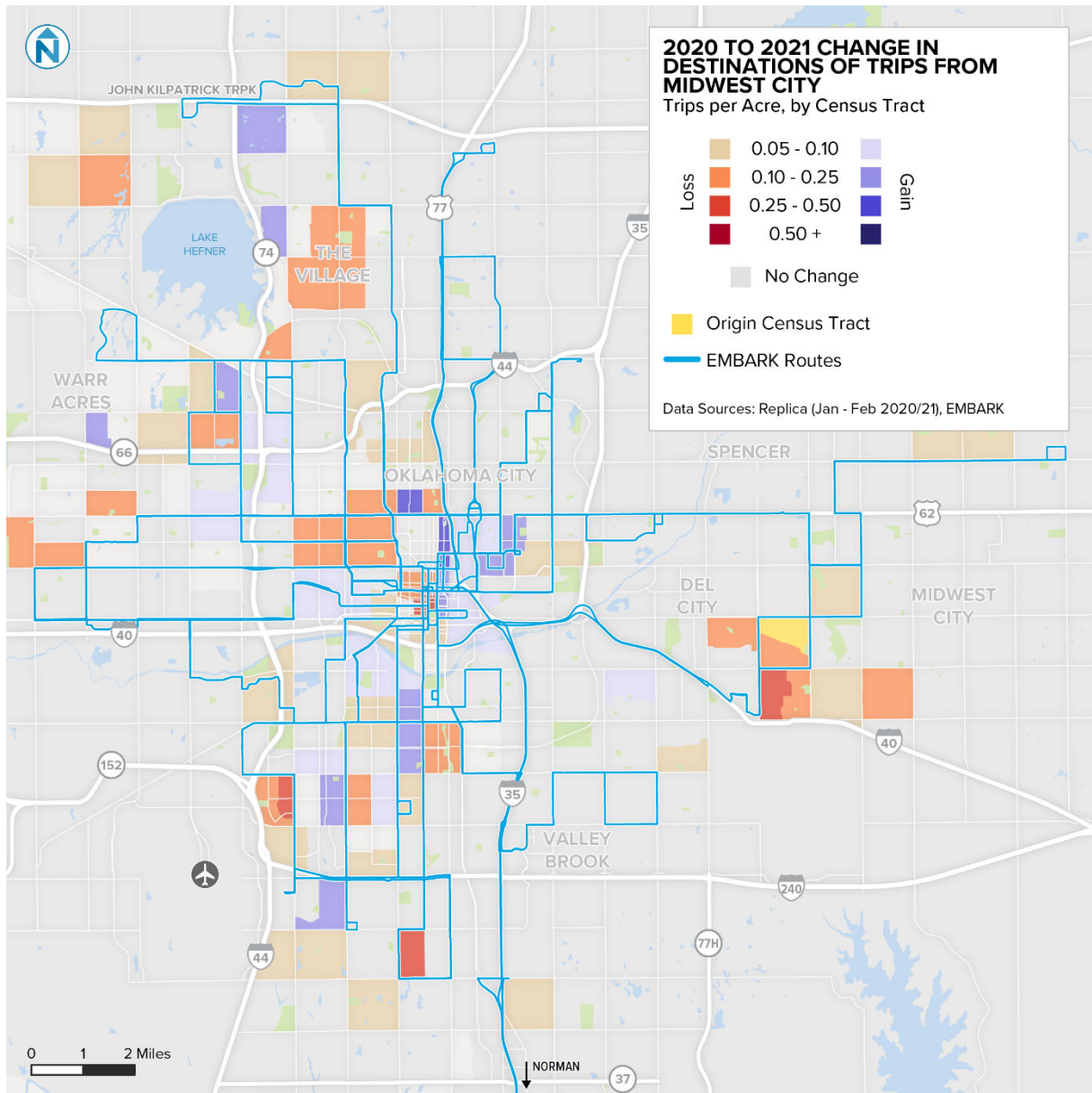
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-17. On weekdays in January 2020, an average of 5,661 trips originated at this location compared to an average of 5,251 in January of 2021, a 7% decrease. The average distance traveled from this location was 6.75 miles in January 2020 compared to 6.36 miles in January 2021, a 6% decrease. Areas with the largest decrease in trips include Midwest City, Del City, S Walker Ave & SW 104<sup>th</sup> St, The Village, and central Oklahoma City. Areas with the largest increases in trips include the N Broadway Ave corridor, the South Walker neighborhood, and OU Health.

Figure 4-16 Destinations of Trips Beginning near Reno Ave & N Air Depot Blvd in Midwest City (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-17 Difference in Trips Beginning near Reno Ave & N Air Depot Blvd in Midwest City between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## South Walker Neighborhood

The South Walker neighborhood is located in south Oklahoma City, generally between SW 74<sup>th</sup> St, S Shields Blvd, SE 44<sup>th</sup> St, and S Walker Ave. This neighborhood was identified to have a high propensity for transit use and determined to be a key origin for regional travel analysis. The travel patterns and common destinations for trips beginning in the South Walker neighborhood for January 2020 and January 2021 are shown below in Figure 4-18. South Walker is currently served by Route 013, 014, and 040.

Travel patterns in January 2020 appear to be highly concentrated in the surrounding census tracts in south Oklahoma City, generally between SW 104<sup>th</sup> St, I-35, SW 29<sup>th</sup> St, and S May Ave. Other common destinations include:

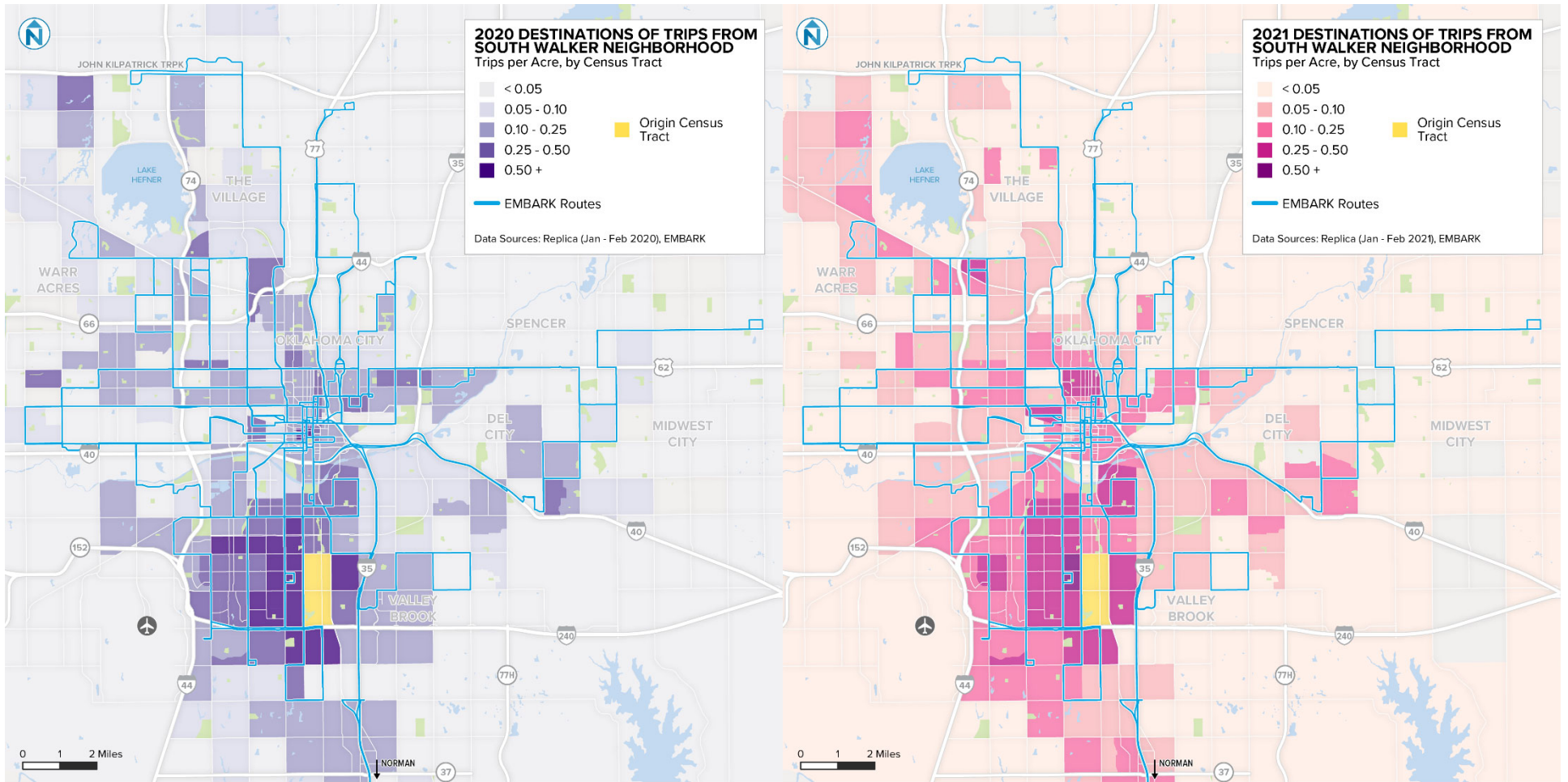
- OU Health – University of Oklahoma Medical Center
- The Broadway Ave corridor east of downtown Oklahoma City
- The Creston Hills neighborhood
- Penn Square Mall

In January 2021, overall trip volumes appear to decrease from 2020 levels but continue to be concentrated in south Oklahoma City, particularly around the Park Terrace Shopping Center and Salvation Army Senior Center. Other common destinations include:

- The Metro Park neighborhood
- The Mesta Park neighborhood
- INTEGRIS Baptist Medical Center

Following the COVID-19 Pandemic, the total volume of trips from this location increased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-19. On weekdays in January 2020, an average of 10,728 trips originated at this location compared to an average of 11,653 in January of 2021, a 9% increase. The South Walker neighborhood is one of two analysis zones with increased trip volumes following the COVID-19 Pandemic. The average distance traveled from this location was 6.16 miles in January 2020 compared to 5.19 miles in January 2021, a 16% decrease. Areas with the largest decrease in trips include the SW 44<sup>th</sup> St corridor, Penn Square Mall, Midwest City, and south Oklahoma City. Areas with the largest increases in trips include central Oklahoma City, NW 63<sup>rd</sup> St & May Ave, and the Shidler-Wheeler neighborhood.

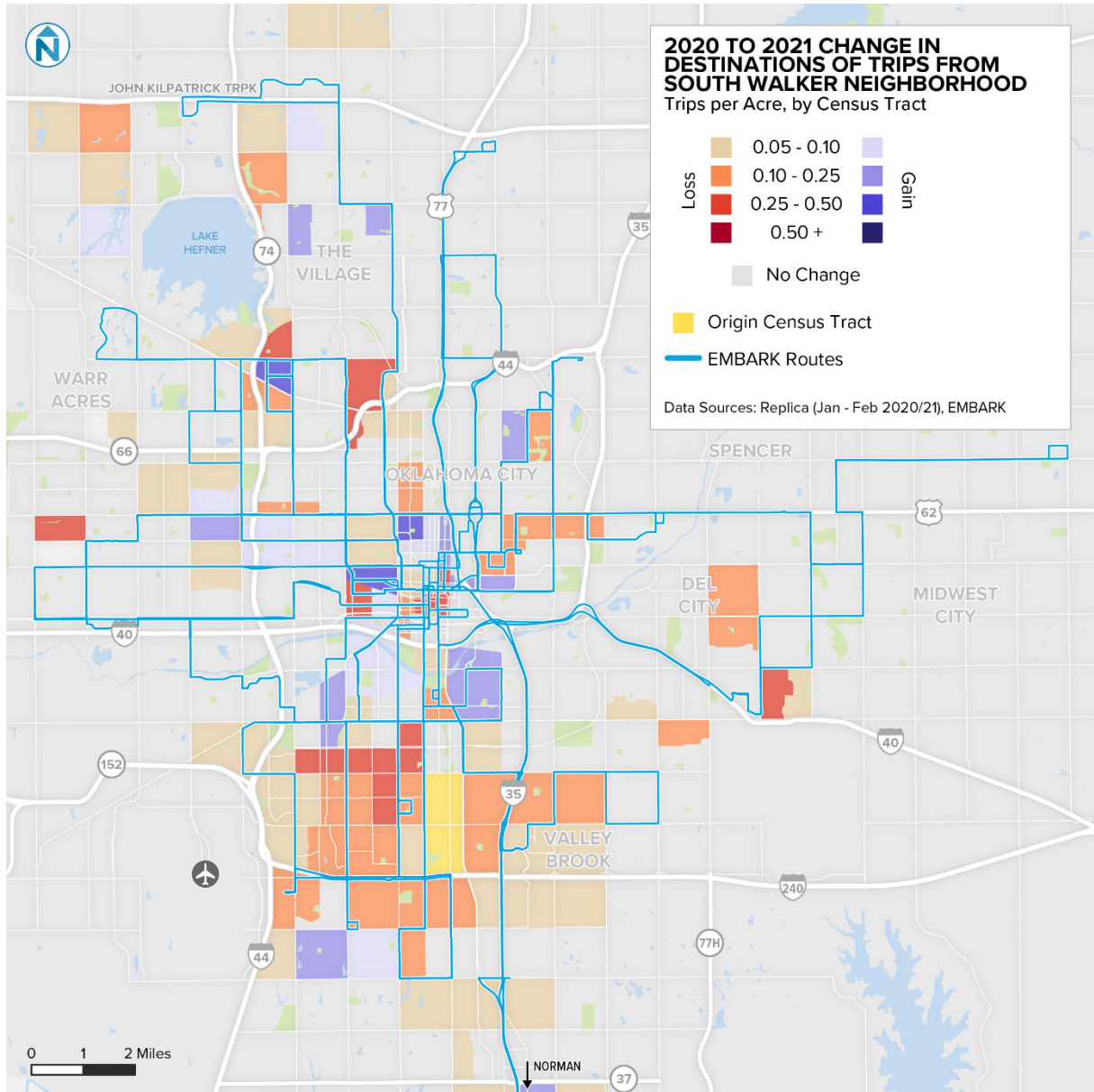
Figure 4-18 Destinations of Trips Beginning near the South Walker Neighborhood (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021



**Figure 4-19 Difference in Trips Beginning near the South Walker Neighborhood between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## The Pines & Lyrewood Ln

The Pines neighborhood and the surrounding communities adjacent to Lyrewood Ln in northwest Oklahoma City include several large multi-family housing developments, including Lakeside Village Apartments, Lakewood Estates, Hefner Hollows Apartments, Tuscany Village Apartments, and Putnam Green Apartments, among others. This area was also found to have a high propensity for transit use and is adjacent to the proposed alignment for the NW BRT route. The common destinations for trips beginning in this area in January 2020 and January 2021 are shown below in Figure 4-20. The Pines neighborhood and Lyrewood Ln are currently served by Route 008.

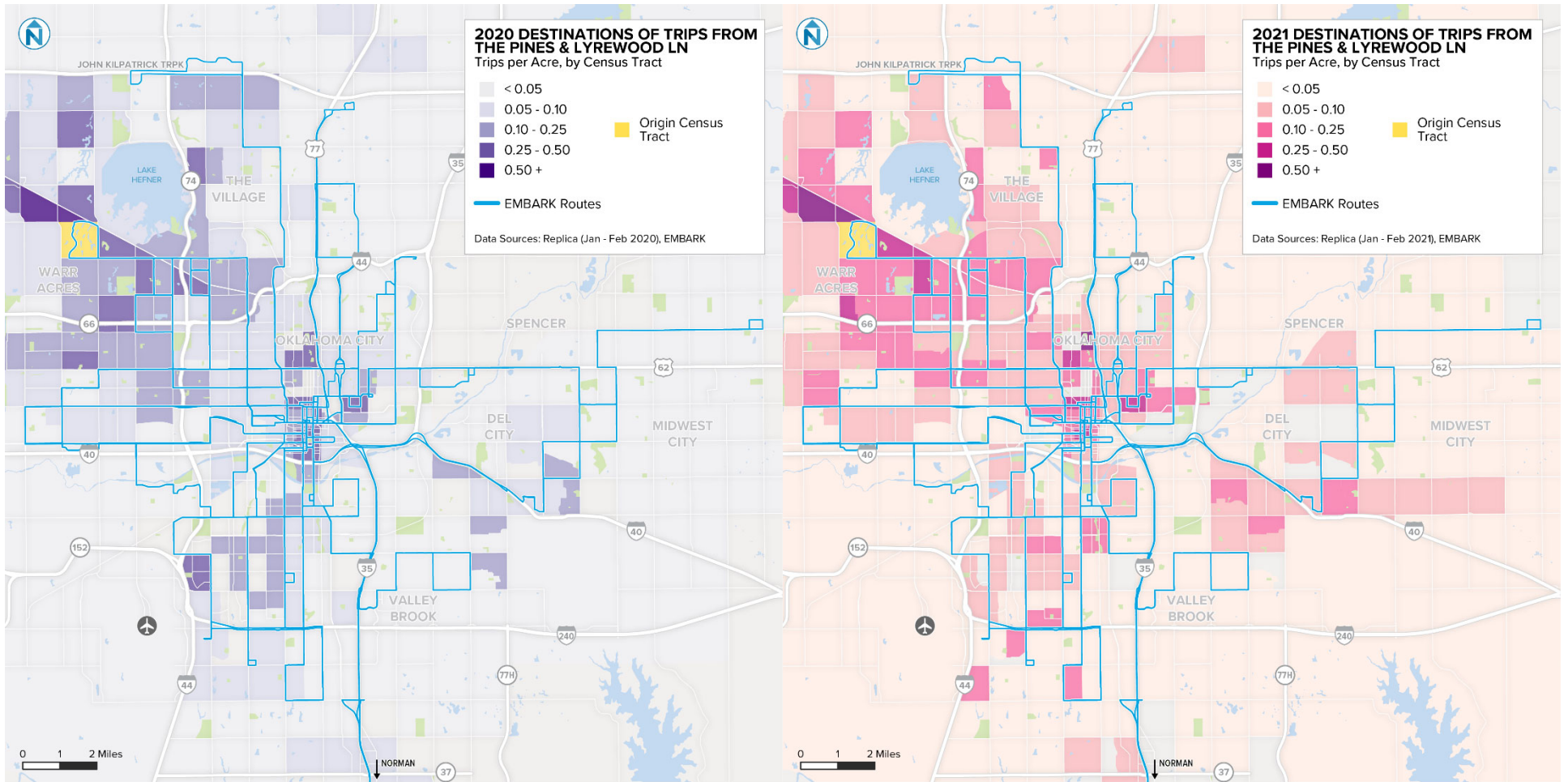
Common destinations for January 2020 are largely within northwest Oklahoma City and adjacent to NW Expressway, most notably at the Rockwell Plaza and Silver Springs Pointe shopping centers that are not currently served by EMBARK. Additional common destinations include:

- Downtown Oklahoma City
- The Paseo neighborhood
- OU Health – University of Oklahoma Medical Center
- The Mayridge neighborhood

Travel patterns for January 2021 are generally consistent with January 2020, including the concentration of trips within northwest Oklahoma City and the Rockwell Plaza and Silver Springs Pointe shopping centers, the Paseo neighborhood and OU Health – University of Oklahoma Medical Center.

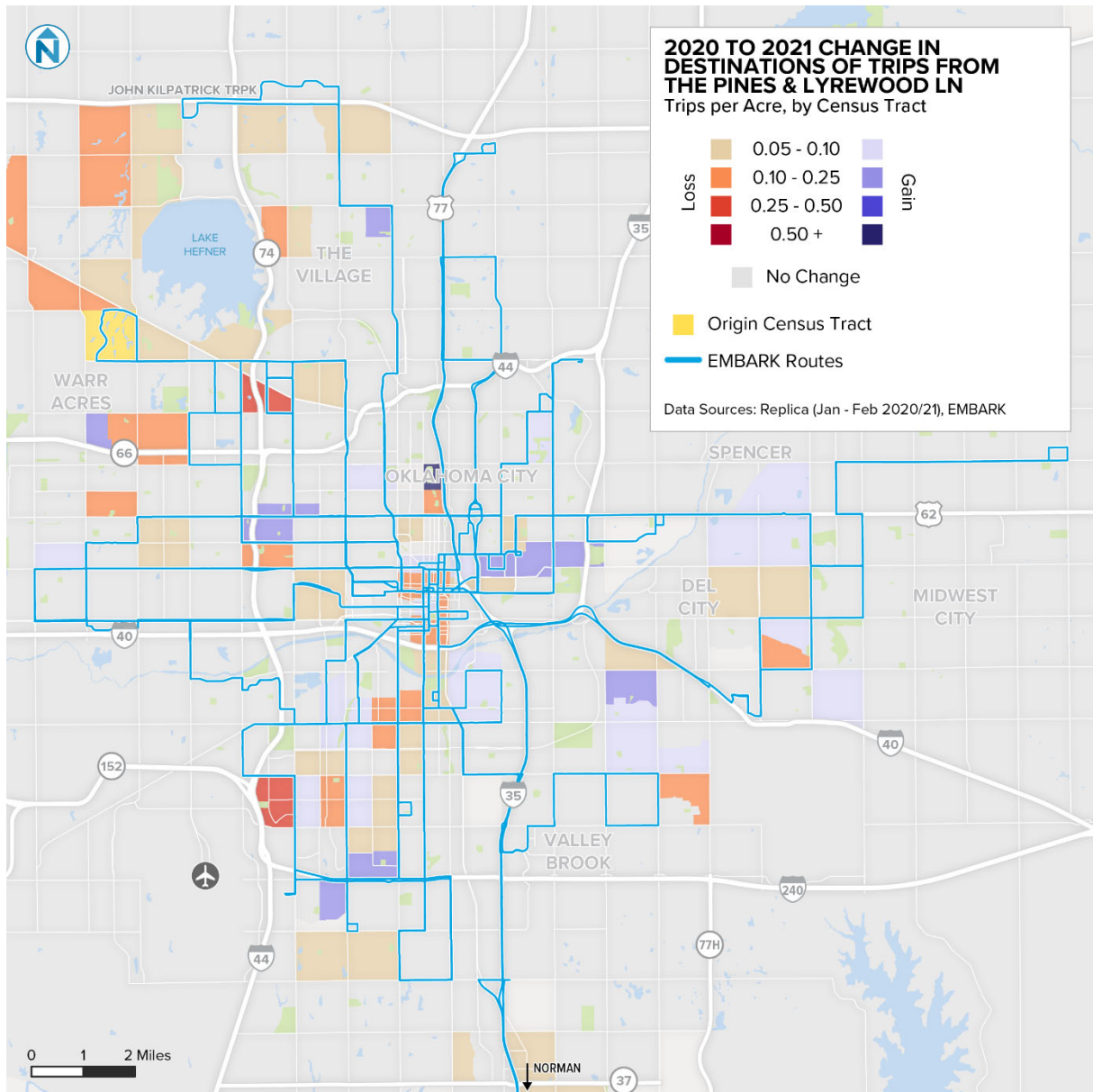
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-21. On weekdays in January 2020, an average of 7,934 trips originated at this location compared to an average of 4,704 in January of 2021, a 41% decrease. The average distance traveled from this location was 6.29 miles in January 2020 compared to 6.19 miles in January 2021, a 2% decrease. Areas with the largest decrease in trips are spread throughout the service area and include Integris Baptist Medical Center, the Mayride neighborhood, and the area to the northwest of Lake Hefner. Areas with the largest increases in trips include Uptown, the SW 74<sup>th</sup> St corridor, OU Health, and the Creston Hills neighborhood.

Figure 4-20 Destinations of Trips Beginning near The Pines & Lyrewood Ln (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-21 Difference in Trips Beginning near The Pines & Lyrewood Ln between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Valley Brook

The Oakwood, Oakcliff, and Highland Park neighborhood areas of Valley Brook, generally between SE 44<sup>th</sup> St, S Sunnyside Rd, SE 59<sup>th</sup> St, and S Bryant Ave, was identified as having a relatively high propensity for transit use and several large multi-family residential developments. The common destinations for trips beginning in this area in January 2020 and 2021 are shown in Figure 4-22. Valley Brook is currently served by Route 014.

The most common destinations for trips beginning in Valley Brook in January 2020 are generally spread throughout the Oklahoma City area, including:

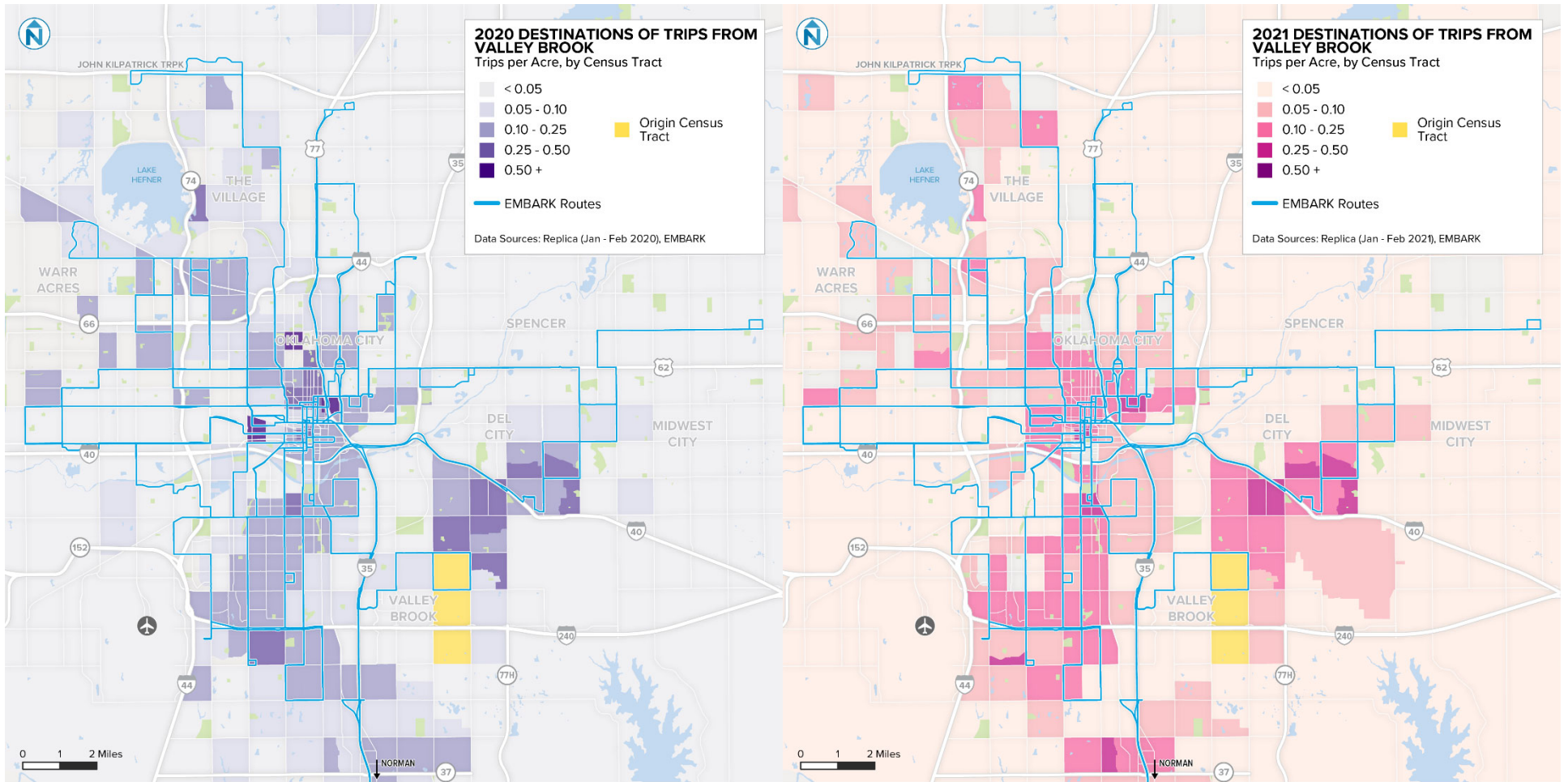
- Downtown Oklahoma City
- The Paseo neighborhood
- The Metro Park neighborhood
- Adjacent census tracts in Del City and Midwest City

Travel volumes appear to generally decrease between January 2020 and January 2021. The most common destination for trips beginning in Valley Brook in January 2021 include:

- The Del City High School area, between SE 15<sup>th</sup> St, S Sooner Rd, SE 29<sup>th</sup> St, and S Sunnyside Rd
- The SE 15<sup>th</sup> Ave Corridor between S Sooner Rd and S Midwest Blvd, including:
  - Midwest City High School
  - Mid-Del Public Schools Administration Building
  - Uptown Plaza Shopping Center
- OU Health – University of Oklahoma Medical Center
- The Central Capitol Hill neighborhood

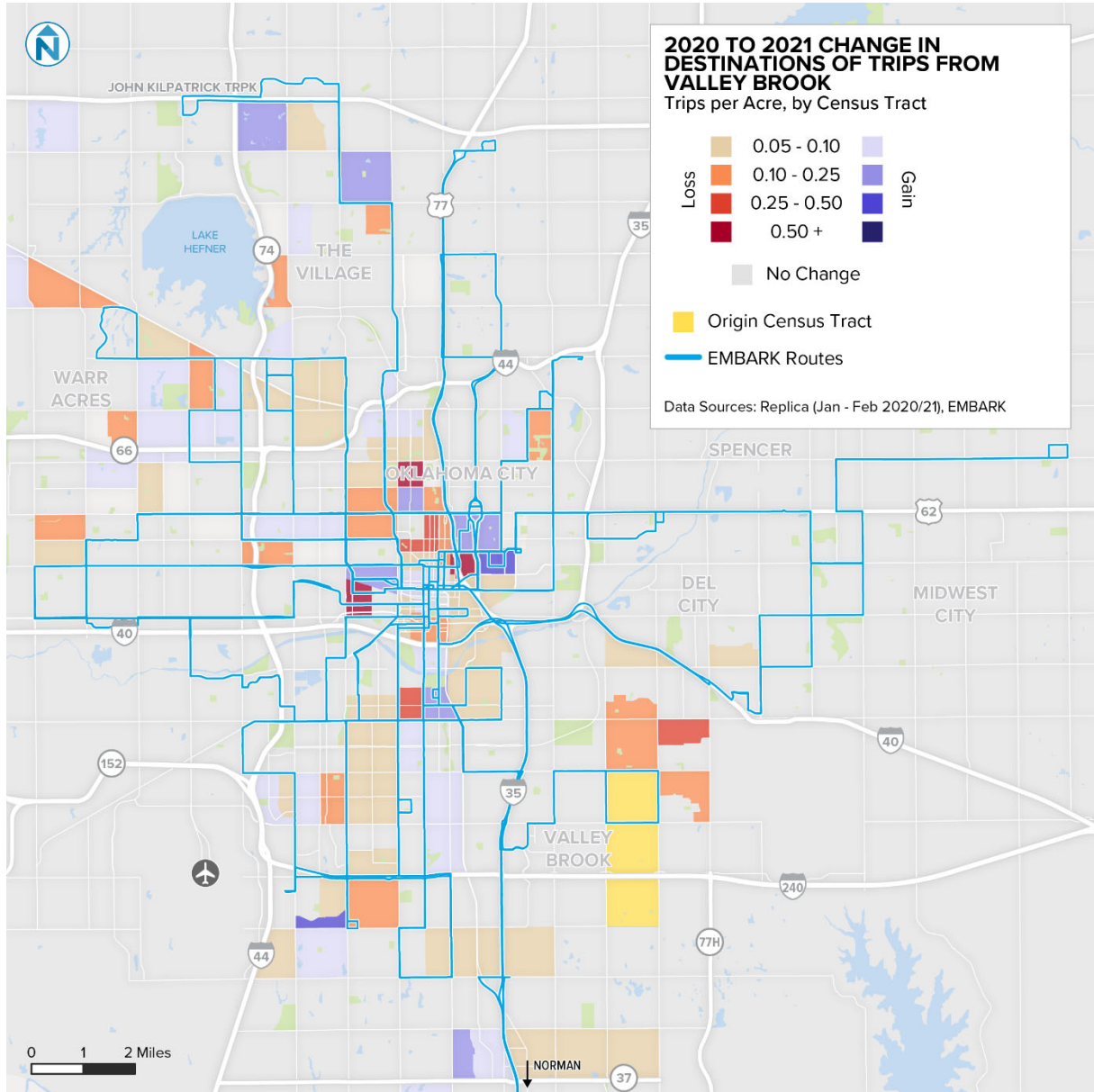
Following the COVID-19 Pandemic, the total volume of trips from this location decreased and the average distance travelled from this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-23. On weekdays in January 2020, an average of 6,899 trips originated at this location compared to an average of 6,756 in January of 2021, a 2% decrease. The average distance traveled from this location was 6.46 miles in January 2020 compared to 6.23 miles in January 2021, a 3% decrease. Areas with the largest decrease in trips include Del City, Automobile Alley, Metro Park, and the Paseo neighborhood.. Areas with the largest increases in trips include Lincoln Terrace, OU Health, and Uptown.

Figure 4-22 Destinations of Trips Beginning near the Valley Brook Area (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-23 Difference in Trips Beginning near the Valley Brook Area between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## DESTINATIONS

### Greenfield Center

Greenfield Center is a large retail destination in west Oklahoma City that includes Westgate Marketplace, Greenfield Business Park, a Walmart Supercenter, and the EMBARK Reno Mini Hub transit center, the 2<sup>nd</sup> highest ridership stop in the EMBARK system. This location was identified as a key destination for regional travel based on the high transit ridership associated with the Reno Mini Hub and the presence of a major retail destination and employment hub. Origins of trips ending at Greenfield Center in January 2020 and January 2021 are shown below in Figure 4-24. Greenfield Center is currently served by Routes 009, 011, 023, and 038.

The most common origins for trips ending at Greenfield Center in 2020 are generally within west Oklahoma City, particularly in census tracts adjacent to the north along NW 16<sup>th</sup> St. Other common origins include:

- The residential area of Del City along SE 29<sup>th</sup> St between S Bryant Ave and S Sunnyslane Rd
- The SE 15<sup>th</sup> Ave Corridor between S Sooner Rd and S Midwest Blvd in Midwest City
- Several neighborhoods in south Oklahoma City including Capitol Hill, Mayridge, and Rancho Village
- The W Hefner Rd & N Western Ave area, including the North Village Apartments

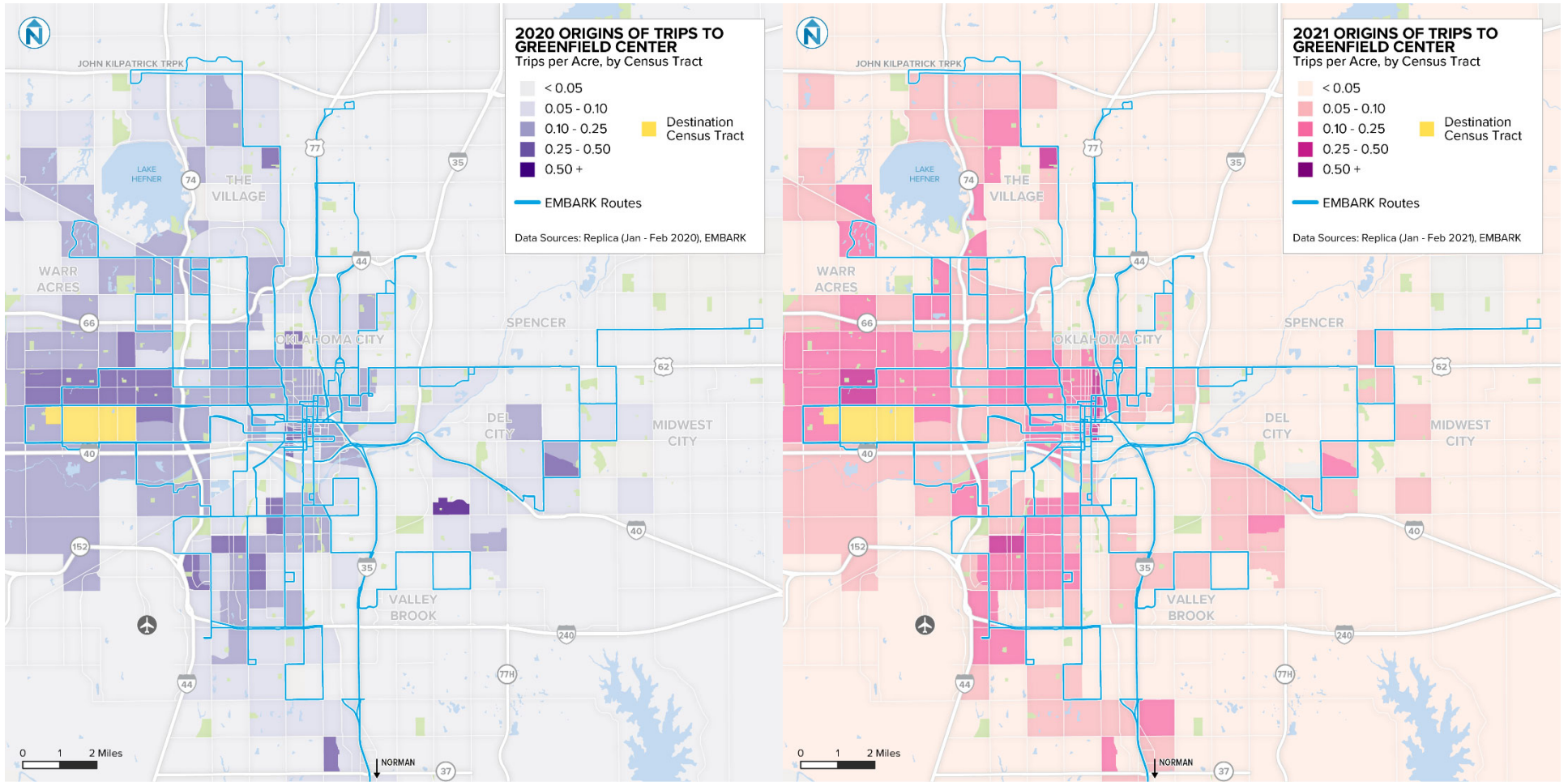
Travel volumes appear to generally decrease in January 2021 while travel patterns continue to be predominantly within the west Oklahoma City area. Other common trip origins include:

- Residential areas throughout south Oklahoma City, particularly between S May Ave, SW 36<sup>th</sup> St, S Pennsylvania Ave, and SW 44<sup>th</sup> St
- The W Hefner Rd & N Western Ave area, including the North Village Apartments
- The Broadway Ave corridor on the eastern side of downtown Oklahoma City

Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-25. On weekdays in January 2020, an average of 15,332 trips ended at this location compared to an average of 7,555 in January of 2021, a 51% decrease. The average distance traveled to this location was 6.70 miles in January 2020 compared to 6.80 miles in January 2021, a 1% decrease. Areas with the largest decrease in trips include the Mayridge neighborhood, Del City, south Oklahoma City, and west Oklahoma City. Areas with the largest increases in trips are spread throughout the service area and include the Airpark and Metro Park neighborhoods, the Bus Hills neighborhood, and the N May Ave corridor north of NW 63<sup>rd</sup> St.

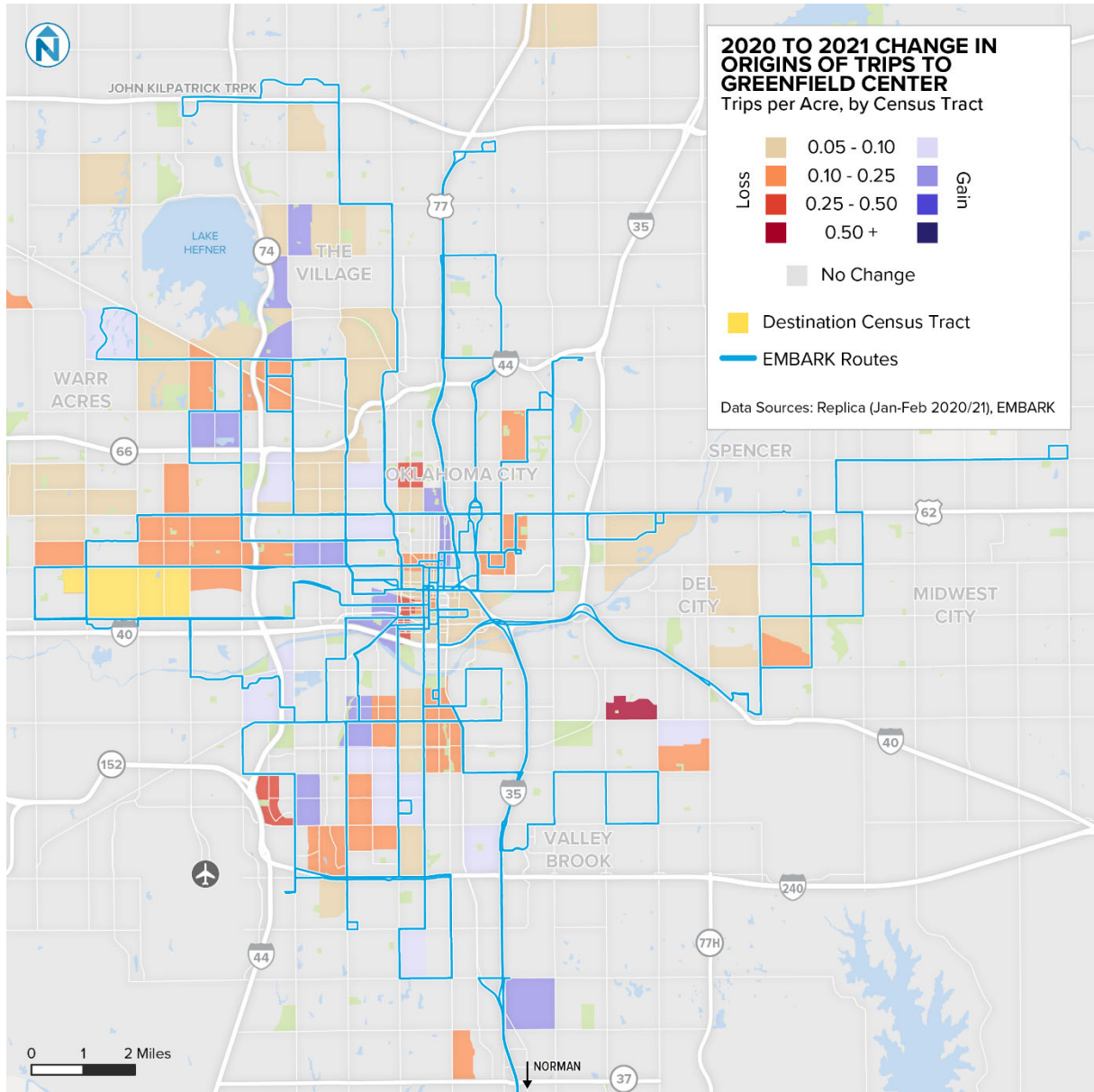


Figure 4-24 Origins of Trips Ending near the Greenfield Center Area (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

Figure 4-25 Difference in Trips Ending near the Greenfield Center Area between Jan 2020 and Jan 2021



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## INTEGRIS Baptist Medical Center

INTEGRIS Baptist Medical Center is located in northwest Oklahoma City at the intersection of NW Expressway & N Independence Ave and was identified as a key destination for this travel pattern analysis based on the high concentration of jobs at this location. This location is currently served by Route 007. Common origins for trips ending at INTEGRIS Baptist Medical Center in January 2020 and January 2021 are shown below in Figure 4-26.

In January 2020, trips ending near INTEGRIS Baptist Medical Center were concentrated in adjacent census tracts, particularly the Highland Hills and Coronado Heights neighborhoods immediately adjacent to the north and west, respectively. Other common origins include:

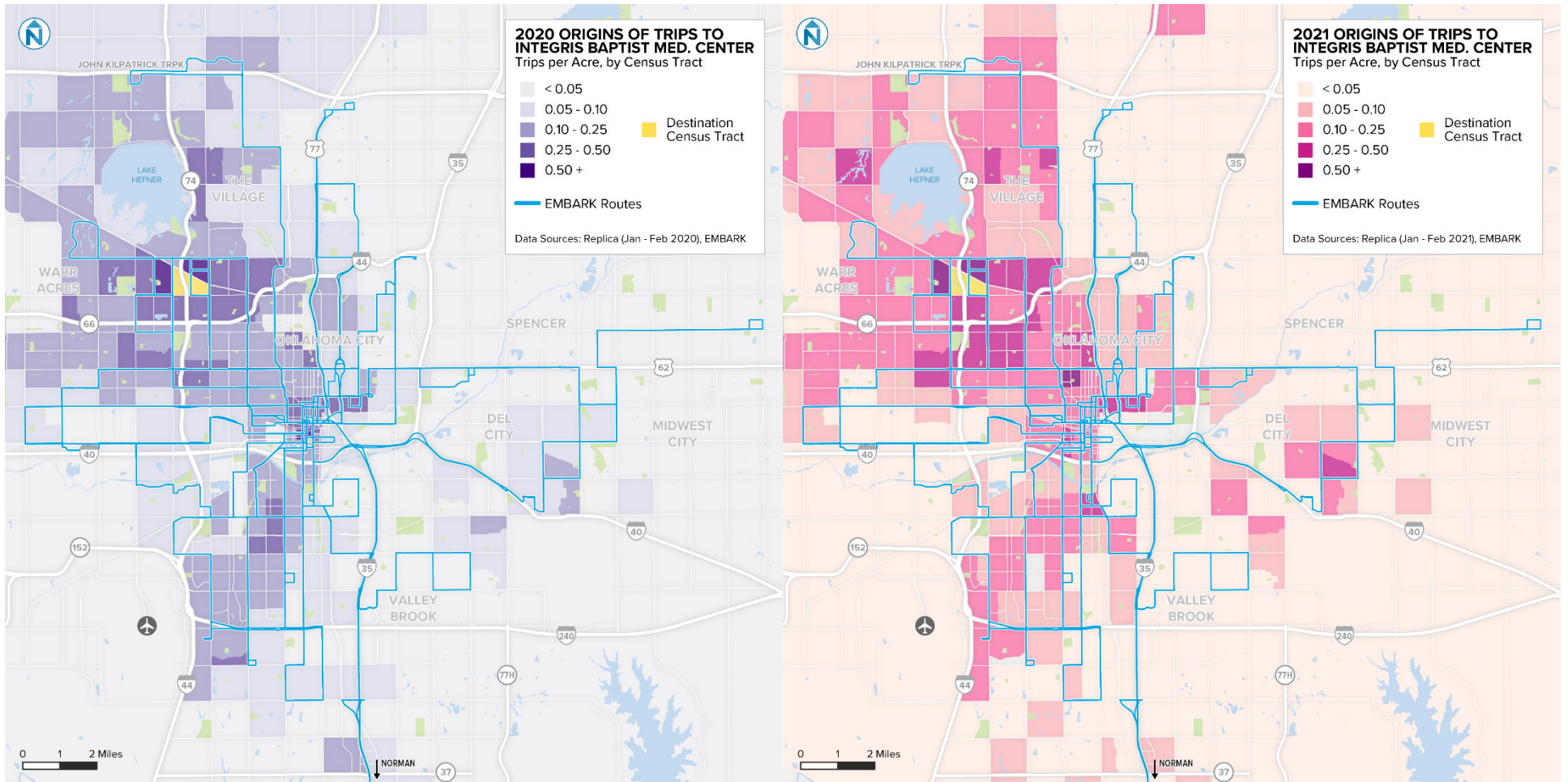
- Downtown Oklahoma City
- INTEGRIS Southwest Medical Center
- OU Health – University of Oklahoma Medical Center

In January 2021, trips ending near INTEGRIS Baptist Medical Center continued to be concentrated in adjacent census tracts, particularly the Highland Hills and Coronado Heights neighborhoods. Trips beginning in several neighborhoods appear to have increased between 2020 and 2021, including:

- The Capitol Hill neighborhood
- The Paseo neighborhood
- The residential areas in central Oklahoma City located to the southeast of the I-44 & Route 66 interchange

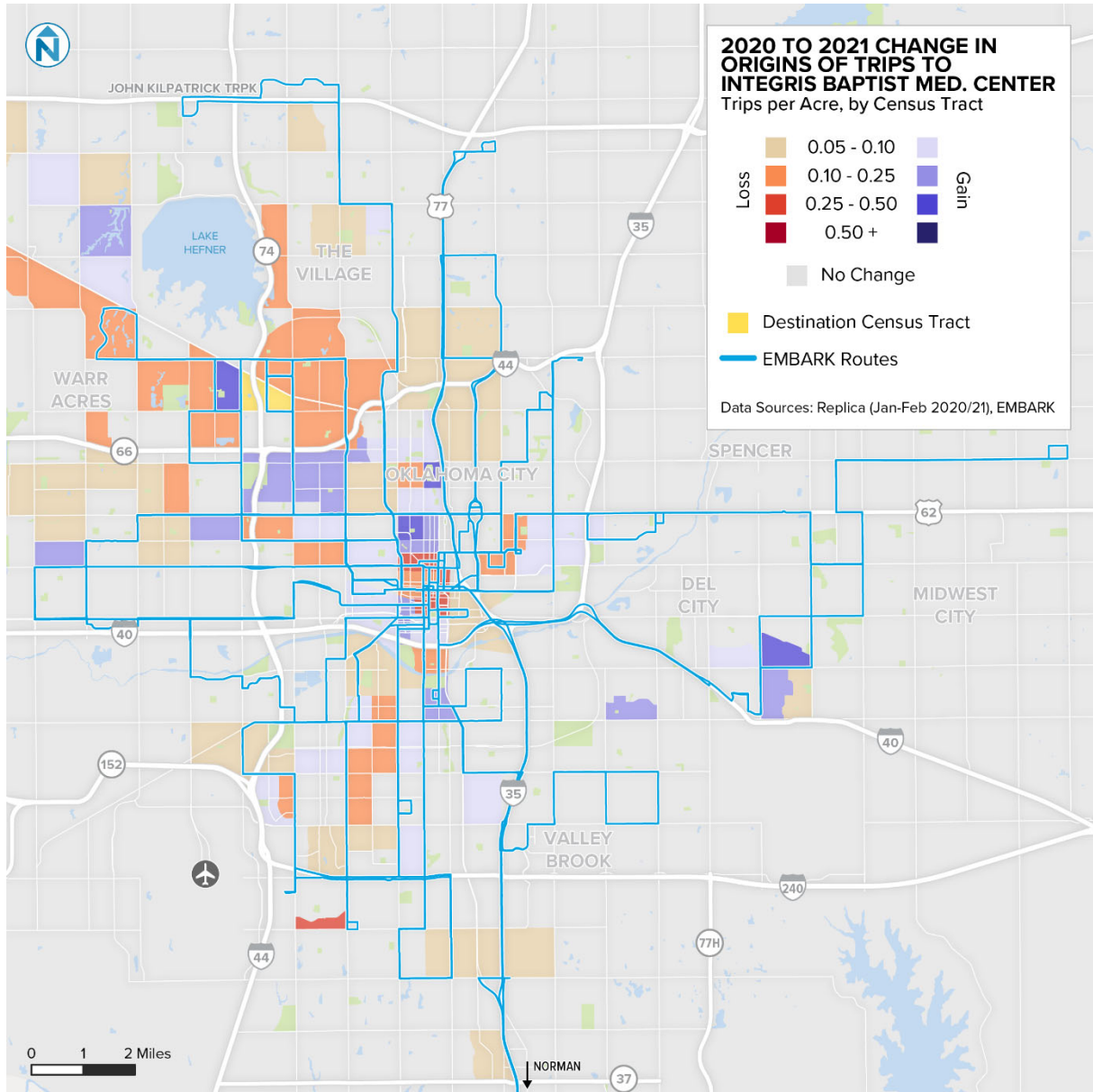
Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-27. On weekdays in January 2020, an average of 16,872 trips ended at this location compared to an average of 11,364 in January of 2021, a 33% decrease. The average distance traveled to this location was 7.34 miles in January 2020 compared to 6.82 miles in January 2021, a 7% decrease. Areas with the largest decrease in trips include downtown Oklahoma City, north Oklahoma City, and along the Northwest Expressway corridor. Areas with the largest increases in trips include the Mesta Park neighborhood, Integris Baptist Medical Center, Midwest City, and the area between N Pennsylvania Ave, NW 23<sup>rd</sup> St, and I-44.

Figure 4-26 Origins of Trips Ending near INTEGRIS Baptist Medical Center (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-27 Difference in Trips Ending near INTEGRIS Baptist Medical Center between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## INTEGRIS Southwest Medical Center

The INTEGRIS Southwest Medical Center is located in south Oklahoma City between S Western Ave, SW 44<sup>th</sup> St, S Douglas Ave, and SW 36<sup>th</sup> St and is an identified employment hub in the region. The medical center is currently served by Route 013. Travel patterns for trips ending near the INTEGRIS Southwest Medical Center in January 2020 and 2021 are shown below in Figure 4-28.

January 2020 travel patterns for trips ending in this location are generally concentrated in south Oklahoma City, common destinations outside of this area include:

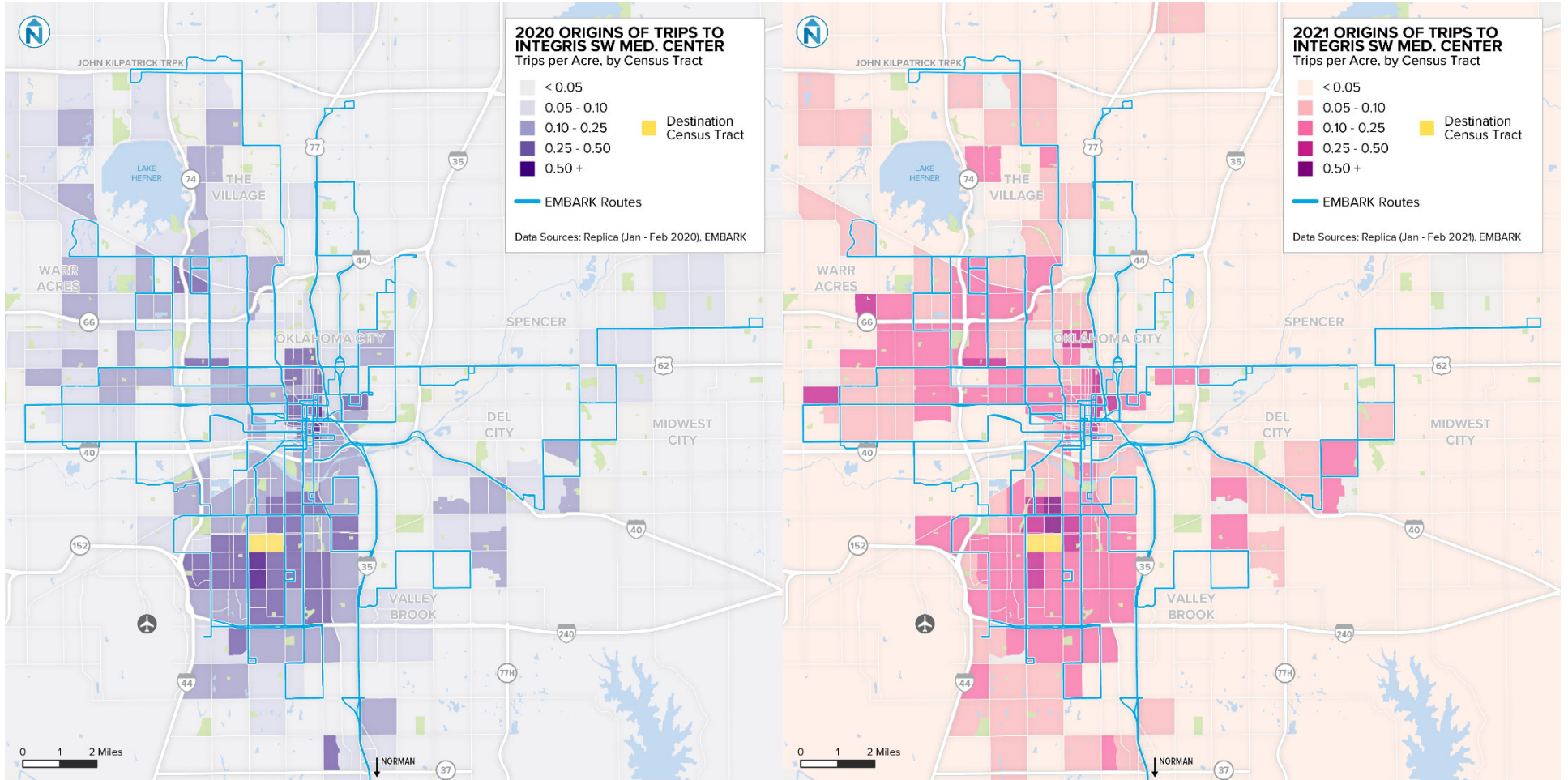
- INTEGRIS Baptist Medical Center
- The Paseo neighborhood
- OU Health – University of Oklahoma Medical Center
- The Broadway Ave corridor on the eastern side of downtown Oklahoma City

Travel volumes appear to generally decrease between 2020 and 2021. Many of the most common origins for trips ending at the INTEGRIS Southwest Medical Center continue to begin in south Oklahoma City for January 2021. However, there are several locations that appear to have increased travel flows to this location, including:

- The Royal Oaks neighborhood located between NW 16<sup>th</sup> St, N Rockwell Ave, NW 10<sup>th</sup> St, and N Council Rd in west Oklahoma City, including several residential areas and the Oklahoma County Department of Human Services – Rockwell office
- Warr Acres between NW 50<sup>th</sup> St, N MacArthur Blvd, Route 66, and N College Ave

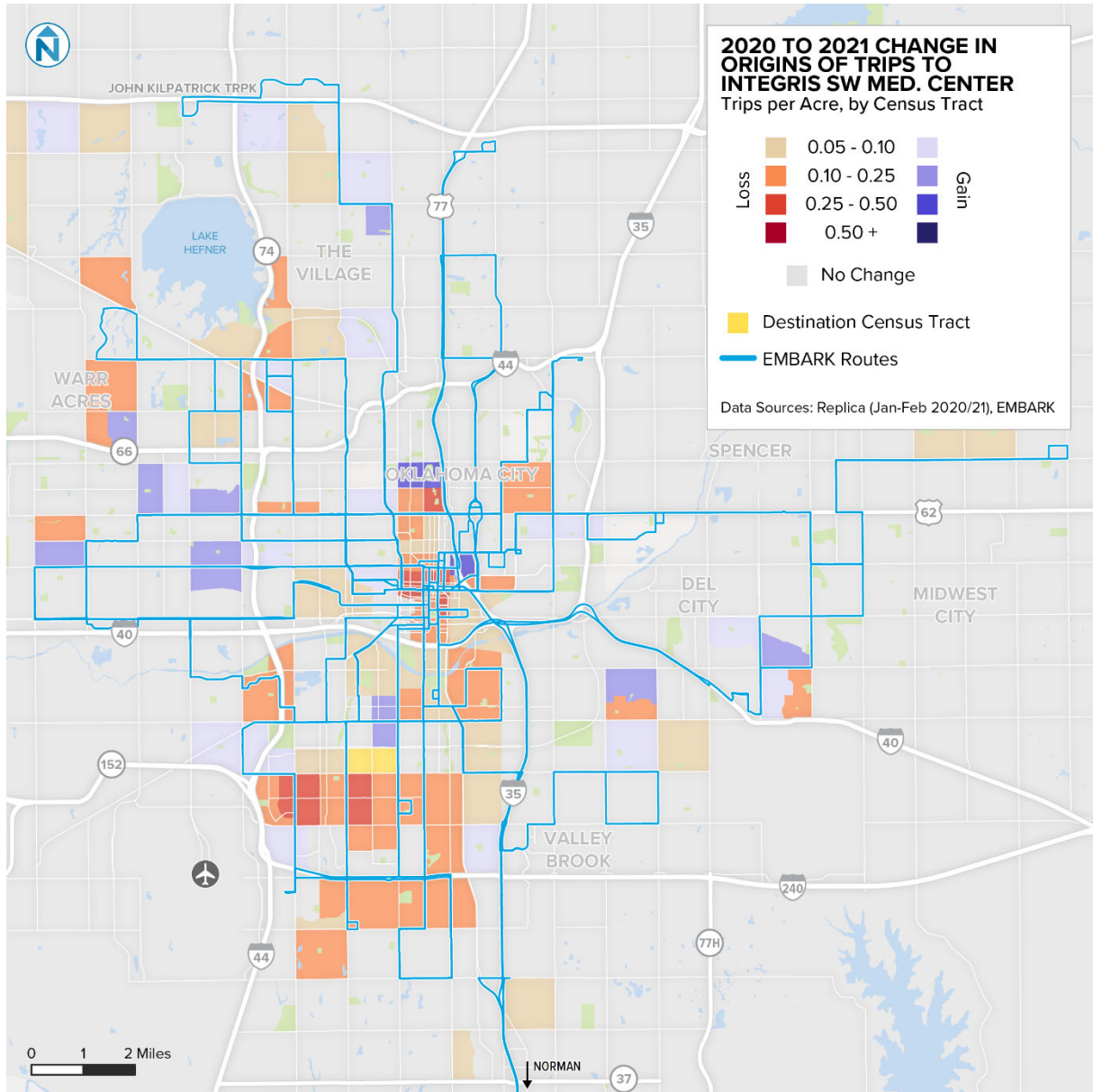
Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location increased slightly. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-29. On weekdays in January 2020, an average of 8,270 trips ended at this location compared to an average of 7,929 in January of 2021, a 4% decrease. The average distance traveled to this location was 6.07 miles in January 2020 compared to 6.13 miles in January 2021, a 1% increase. Areas with the largest decrease in trips are spread throughout the service area and include south Oklahoma City, downtown Oklahoma City, and the Paseo and Jefferson Park neighborhoods. Areas with the largest increases in trips are also spread throughout the service area and include Automobile Alley and Uptown.

Figure 4-28 Origins of Trips Ending near INTEGRIS Southwest Medical Center (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

Figure 4-29 Difference in Trips Ending near INTEGRIS Southwest Medical Center Jan 2020 and Jan 2021



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021



## Mercy Hospital Oklahoma City

Mercy Hospital Oklahoma City was identified as a major employment center in the region and is located in northwest Oklahoma City at the intersection of W Memorial Rd & N Meridian Ave. The hospital is currently served by Route 005. Common origins for trips ending at this location in January 2020 and 2021 are shown below in Figure 4-30.

In January 2020, trip origins are generally concentrated around north Oklahoma City, including:

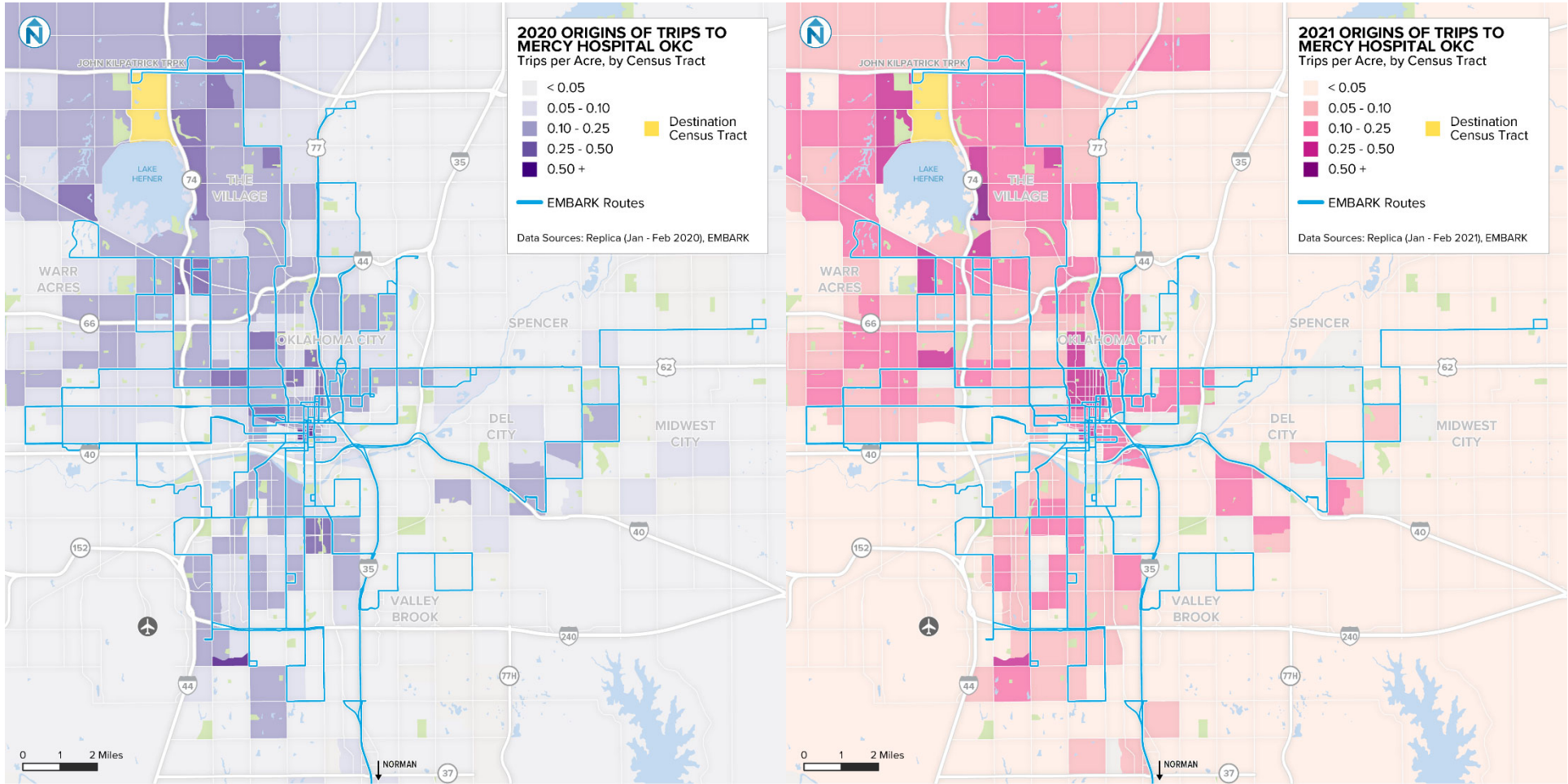
- The N May Ave corridor located east of Lake Hefner, between NW 122<sup>nd</sup> and W Wilshire Blvd
- The area surrounding INTEGRIS Baptist Medical Center
- The Britton Court Yard and Rock Knoll neighborhoods located between NW Expressway, N MacArthur Blvd, W Britton Rd, and N Rockwell Ave
- The Oliver Park neighborhood in south Oklahoma City

In January 2021, a higher concentration of trips appear to begin in the area immediately surrounding Mercy Hospital Oklahoma City, most notably adjacent to the west along MacArthur Blvd. Other areas with an increase in travel to this destination in 2021 include:

- The Midtown, Mesta Park, and Paseo neighborhoods north of downtown Oklahoma City
- The NW 23<sup>rd</sup> St corridor between N Portland Ave and N Meridian Ave
- The Lakeside neighborhood located between NW 63<sup>rd</sup> St, N May Ave, and NW Grand Blvd

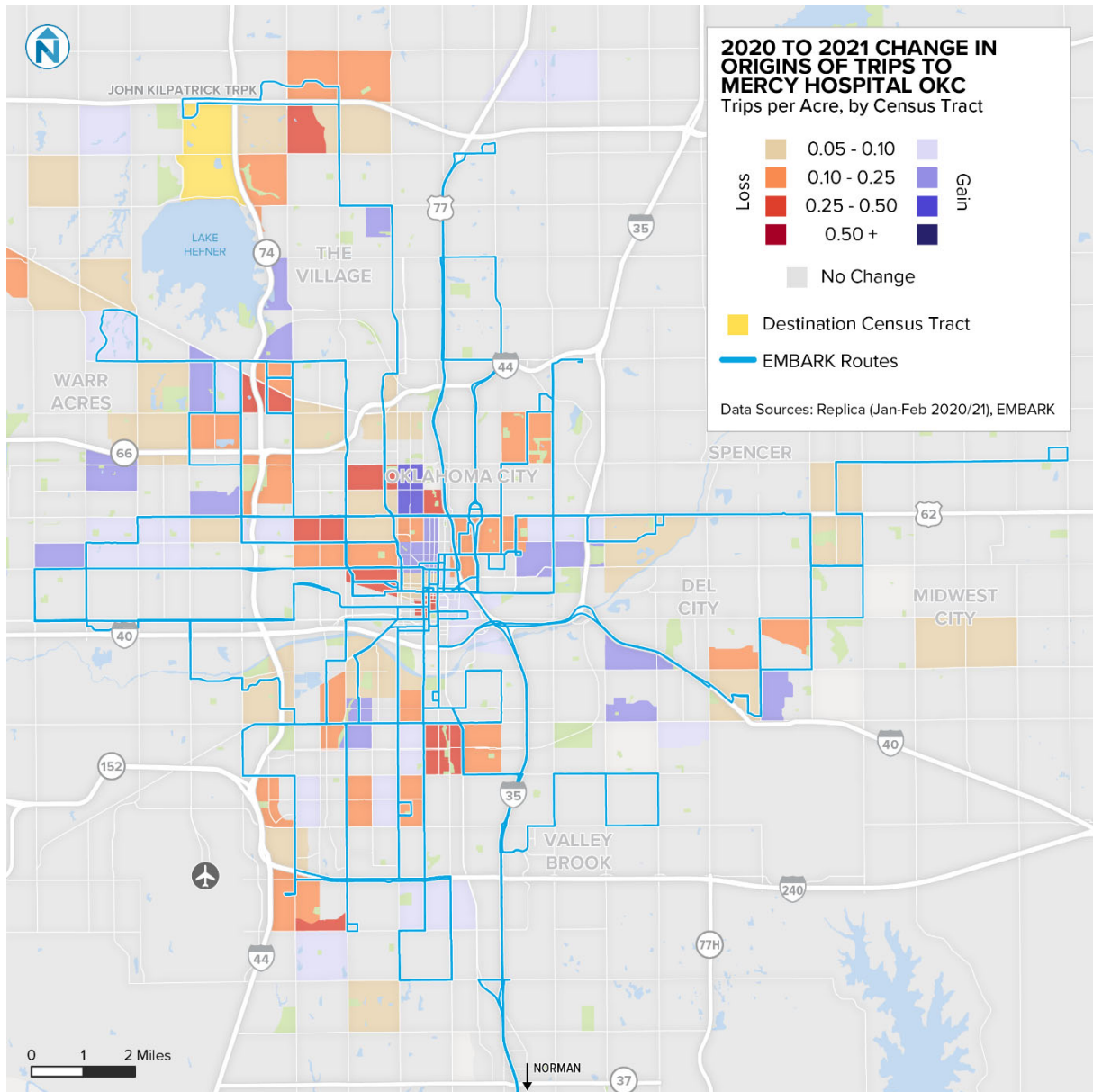
Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-31. On weekdays in January 2020, an average of 16,051 trips ended at this location compared to an average of 7,715 in January of 2021, a 52% decrease. The average distance traveled to this location was 8.45 miles in January 2020 compared to 7.73 miles in January 2021, a 9% decrease. Areas with the largest decrease in trips are spread throughout the service area and include the Capitol Hill neighborhood, central Oklahoma City, Integris Baptist Medical Center, and N Pennsylvania Ave & W Memorial Rd. Areas with the largest increases in trips are also spread throughout the service area and include Uptown, Midtown, and several disparate locations throughout north and west Oklahoma City.

Figure 4-30 Origins of Trips Ending near Mercy Hospital Oklahoma City (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-31 Difference in Trips Ending near Mercy Hospital Oklahoma City between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Mercy Hospital Oklahoma City – South

Mercy Hospital Oklahoma City – South is a smaller facility than Mercy Hospital Oklahoma City but is still considered a major employment hub for the region. Mercy Hospital South is located south of I-240 and east of S Sooner Rd and is not currently served by EMBARK service. Common origins for trips ending at Mercy Hospital South are shown below in Figure 4-32.

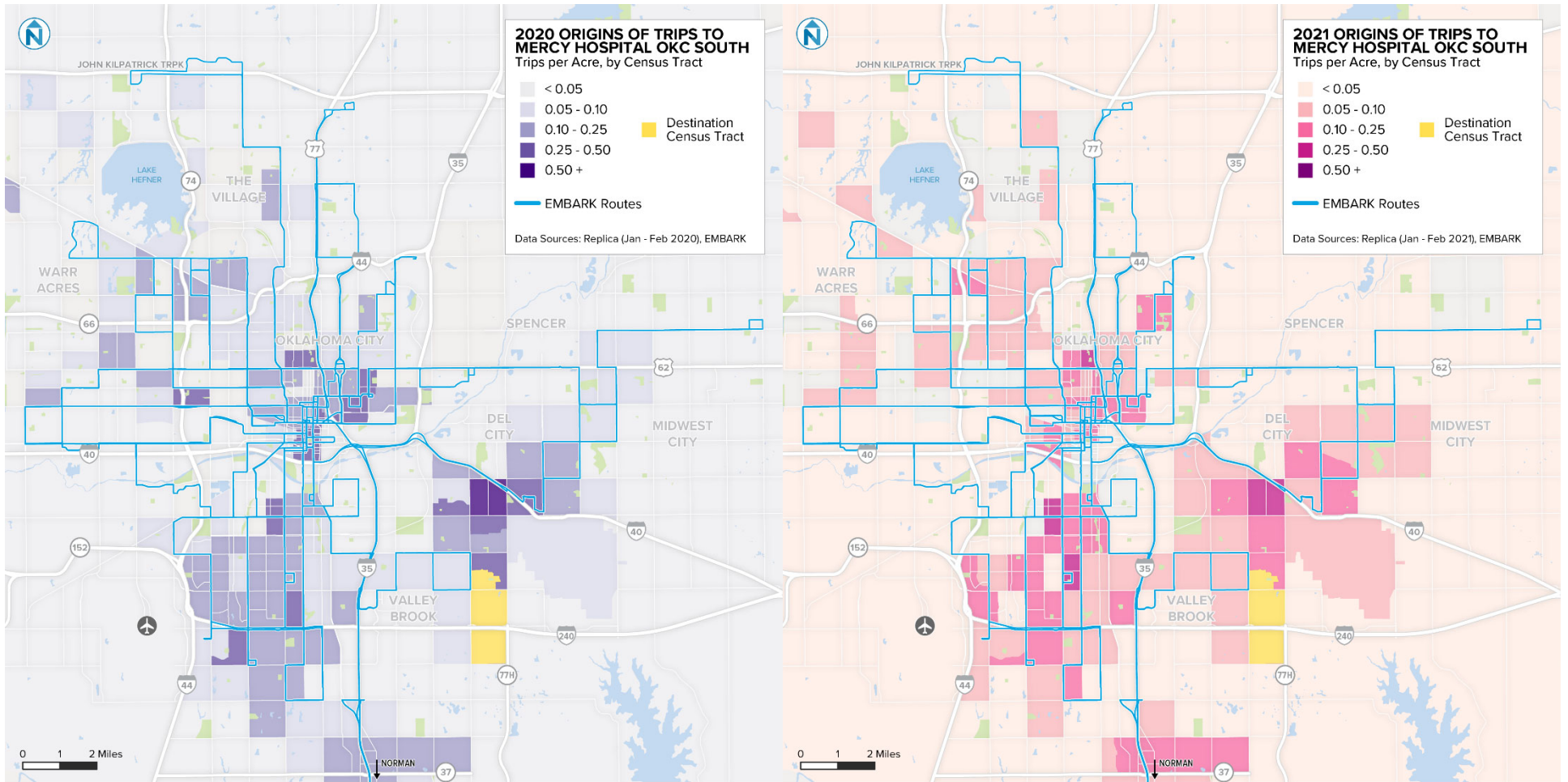
In both January 2020 and 2021, common origins for trips ending at this location are concentrated in south Oklahoma City, Del City, and Midwest City, including:

- Del City between SE 29<sup>th</sup> St, S Sooner Rd, SE 15<sup>th</sup> St, and S Sunnyslane Rd
- The Capitol Hill neighborhood
- The S Western Ave corridor in south Oklahoma City

Travel patterns do not appear to change significantly between 2020 and 2021.

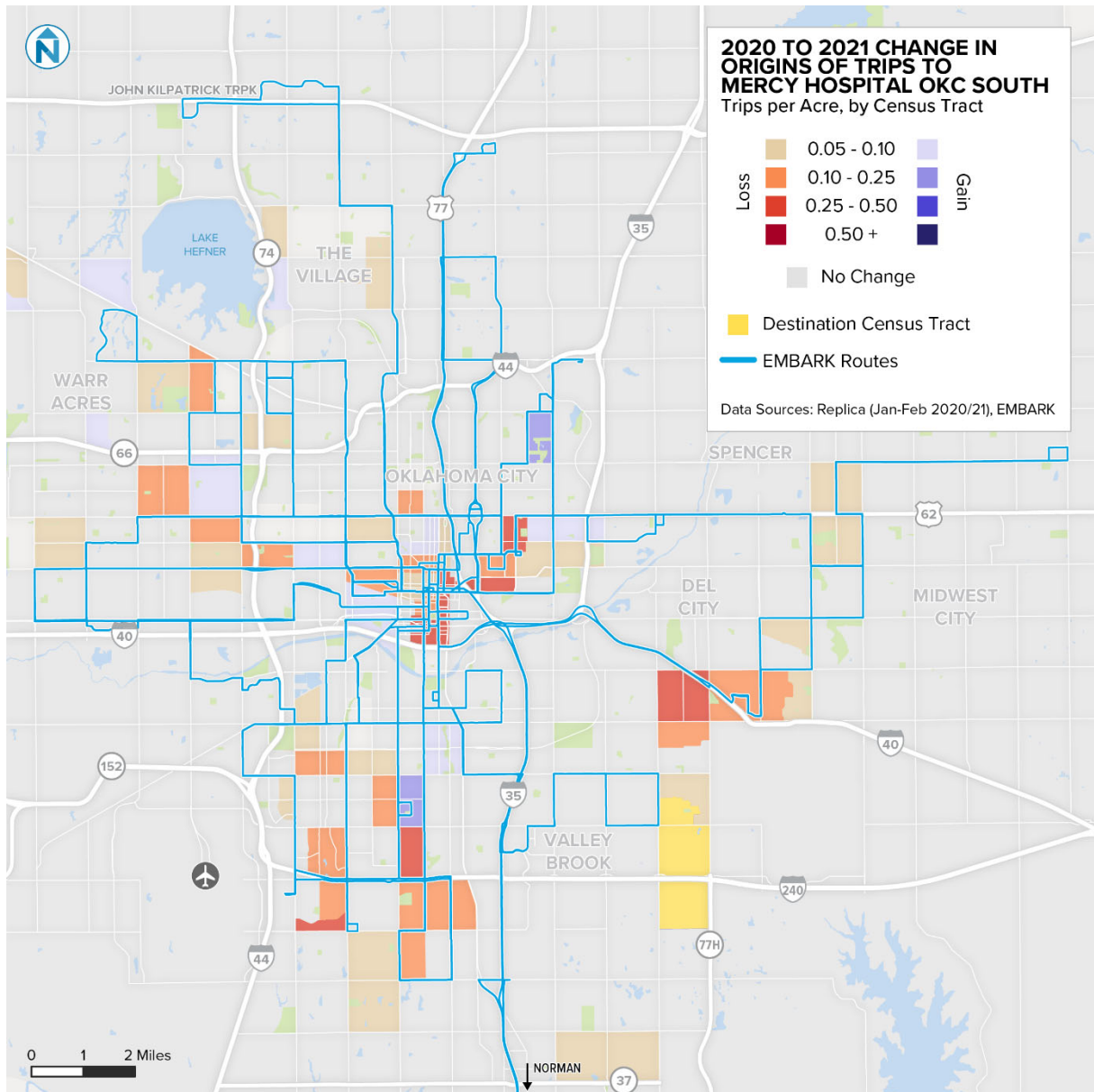
Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-33. On weekdays in January 2020, an average of 7,825 trips ended at this location compared to an average of 4,070 in January of 2021, a 48% decrease. The average distance traveled to this location was 7.53 miles in January 2020 compared to 6.76 miles in January 2021, a 10% decrease. Areas with the largest decrease in trips include downtown Oklahoma City, the Creston Hills neighborhood, south Oklahoma City, and Del City. Areas with the largest increases in trips include the South Walker and South Park Estates neighborhoods.

Figure 4-32 Origins of Trips Ending near Mercy Hospital Oklahoma City – South (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-33 Difference in Trips Ending near Mercy Hospital Oklahoma City – South between Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Oklahoma City Community College

Oklahoma City Community College is located in southwest Oklahoma City at the intersection of SW 74<sup>th</sup> St & S May Ave and is currently served by Routes 012 and 013. Common origins for trips ending at Oklahoma City Community College for January 2020 and January 2021 are shown in Figure 4-34.

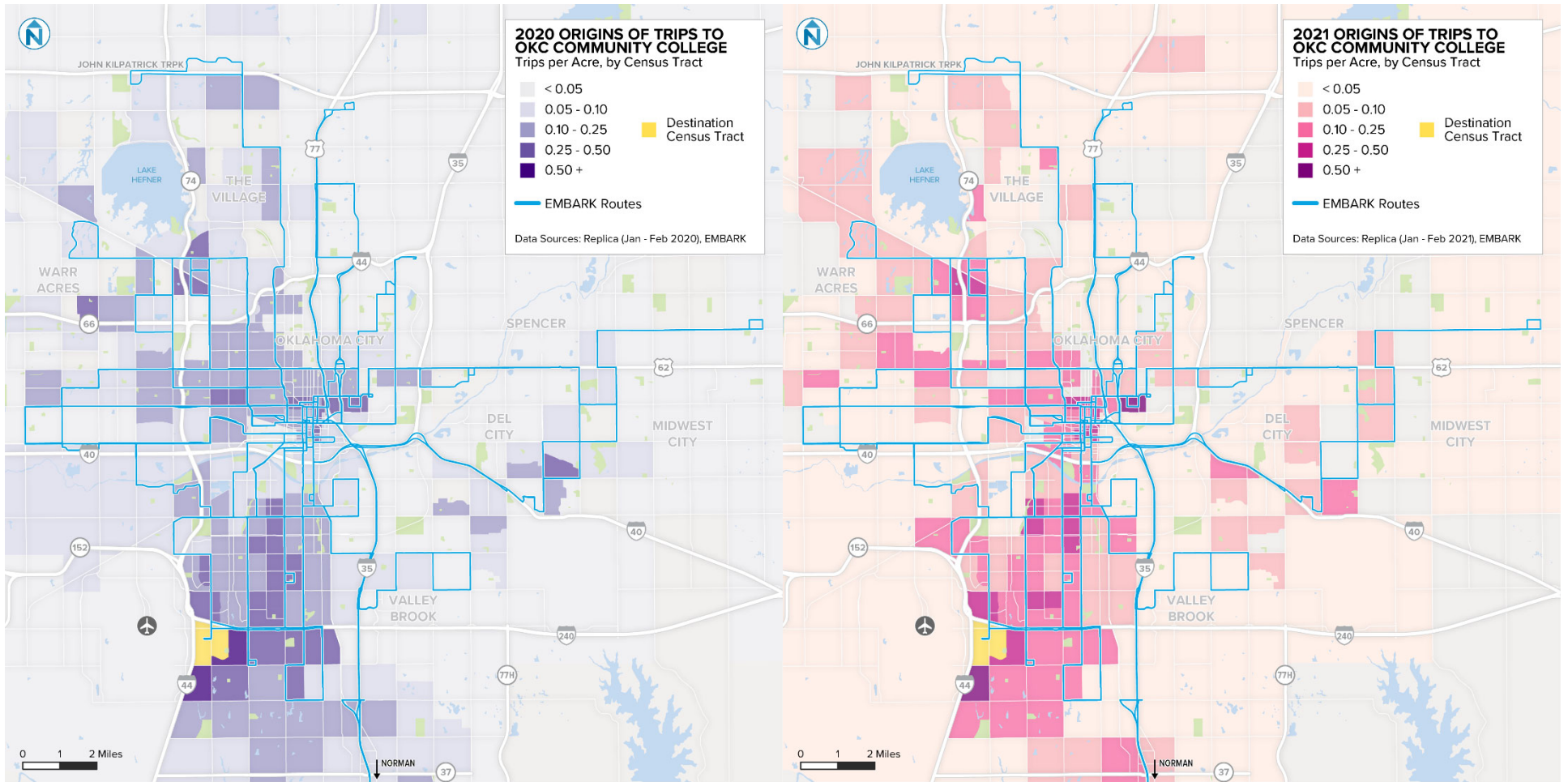
In January 2020, the most common origins are concentrated in south Oklahoma City with a few other locations spread throughout the service area, including:

- The Meadowcliff and Wingspread neighborhoods located adjacent to the east and south of Oklahoma City Community College
- OU Health – University of Oklahoma Medical Center and the surrounding area
- Warr Acres between NW 50<sup>th</sup> St, N MacArthur Blvd, Route 66, and N College Ave
- INTEGRIS Baptist Medical Center

In January 2021, travel patterns appear largely unchanged but with somewhat reduced overall travel volumes. However, trips beginning at OU Health – University of Oklahoma Medical Center appear to have increased between 2020 and 2021.

Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-35. On weekdays in January 2020, an average of 13,530 trips ended at this location compared to an average of 10,471 in January of 2021, a 23% decrease. The average distance traveled to this location was 7.00 miles in January 2020 compared to 6.07 miles in January 2021, a 13% decrease. Areas with the largest decrease in trips are generally in south Oklahoma City and include the SW 74<sup>th</sup> St corridor, Midwest City, and Warr Acres. Areas with the largest increases in trips include downtown Oklahoma City, the Capitol Hill neighborhood, and Coronado Heights.

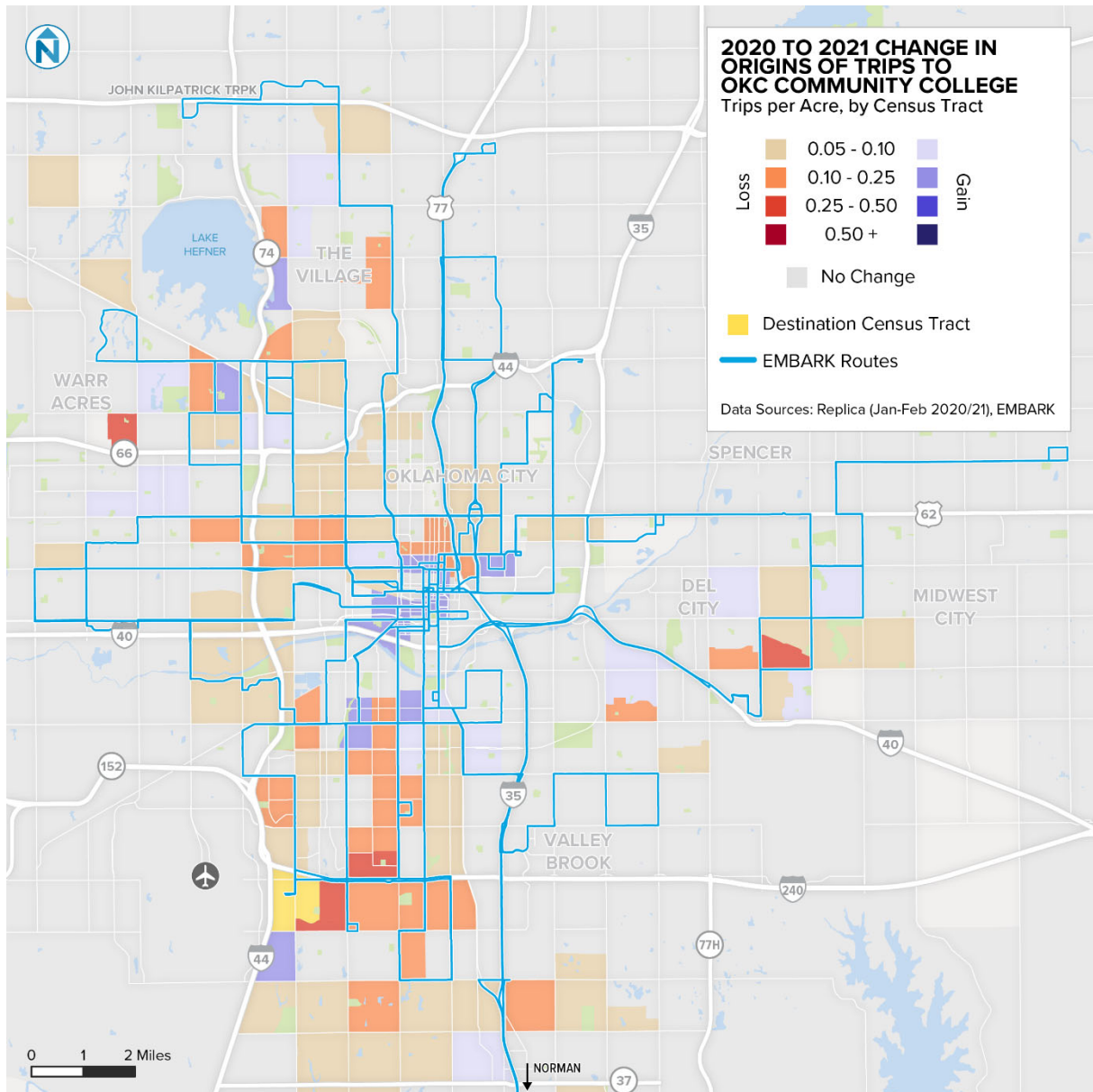
Figure 4-34 Origins of Trips Ending near Oklahoma City Community College (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021



Figure 4-35 Difference in Trips Ending near Oklahoma City Community College between Jan 2020 and Jan 2021



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## OU Health – University of Oklahoma Medical Center

The OU Health – University of Oklahoma Medical Center was identified as a major employment hub in the region and a key destination for regional travel. OU Health is directly served by Routes 002, 003, 018, 023, and 024. Origins for trips ending at OU Health for January 2020 and 2021 are shown below in Figure 4-36.

Trips ending at OU Health in 2020 are generally spread throughout the region but are more concentrated in areas of central Oklahoma City, including:

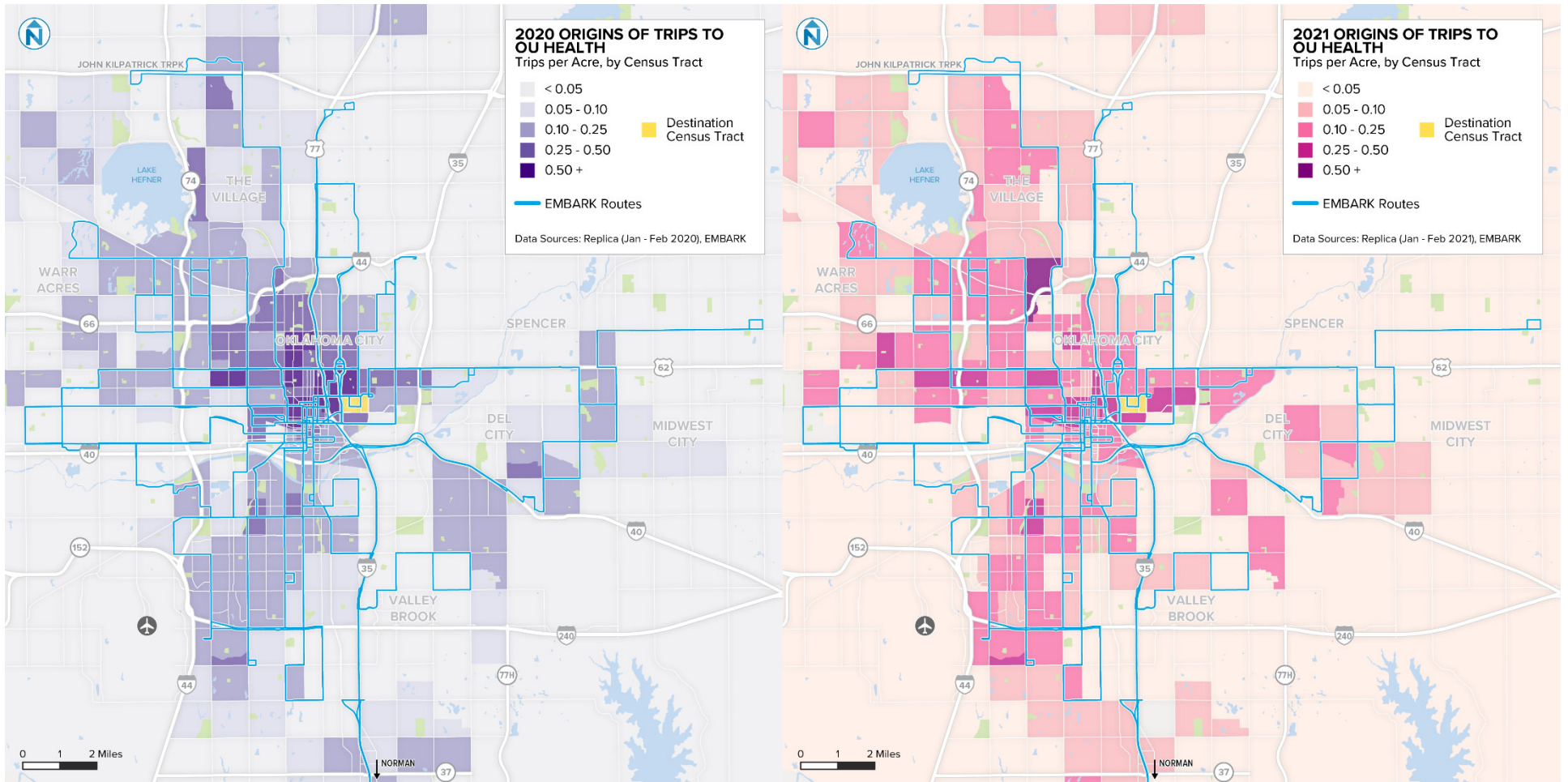
- The state capitol area adjacent to the north
- The Midtown, Mesta Park, and Paseo neighborhoods adjacent to the west

Travel patterns in 2021 appear to become less concentrated in nearby areas and instead appear to increase in other locations within the region, including:

- The Penn Square Mall area
- The 10<sup>th</sup> St corridor between N Western Ave and N Meridian Ave

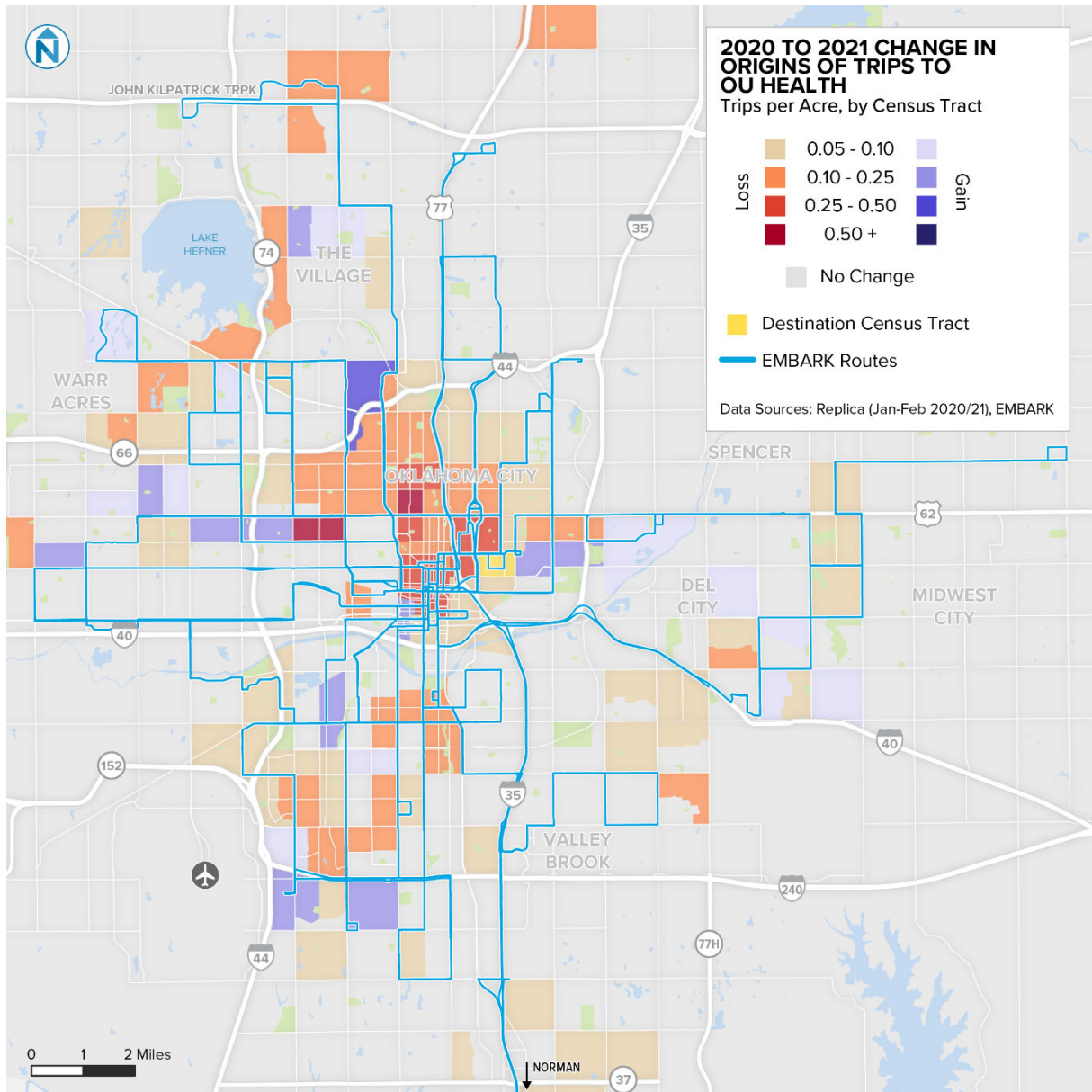
Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location increased slightly. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-37. On weekdays in January 2020, an average of 14,373 trips ended at this location compared to an average of 4,347 in January of 2021, a 70% decrease. The average distance traveled to this location was 7.48 miles in January 2020 compared to 7.63 miles in January 2021, a 2% increase. Areas with the largest decrease in trips include downtown Oklahoma City and areas adjacent to the north of downtown, as well as central Oklahoma City. Areas with the largest increases in trips include Penn Square Mall, south Oklahoma City, and west Oklahoma City.

Figure 4-36 Origins of Trips Ending near the OU Health – University of Oklahoma Medical Center (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

**Figure 4-37 Difference in Trips Ending near the OU Health – University of Oklahoma Medical Center Jan 2020 and Jan 2021**



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## Oklahoma State Capitol

The Oklahoma state capitol area was identified as a major employment hub in the region and a key destination for regional travel. The state capitol is directly served by Routes 002, 003, 018, 023, and 024. Origins for trips ending near the state capitol area for January 2020 and 2021 are shown below in Figure 4-38.

Trips ending at the state capitol are generally spread throughout the region with higher volumes of trips beginning at a few distinct locations, including:

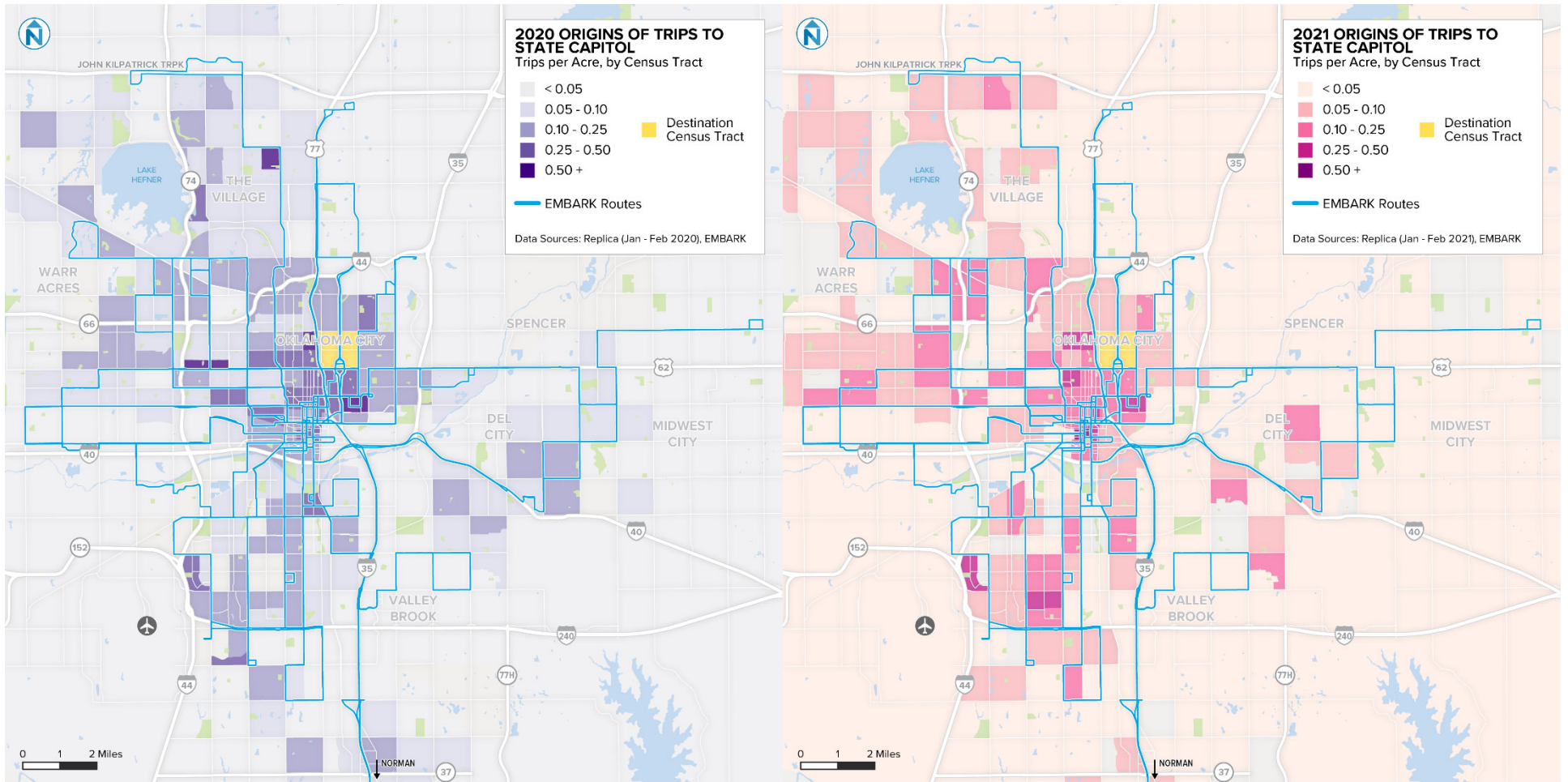
- OU Health – University of Oklahoma Medical Center
- The Paseo neighborhood
- The W Hefner Rd & N Western Ave area
- The NW 23<sup>rd</sup> St corridor between N Grand Blvd and Villa Ave
- The Capitol Hill neighborhood

Trip origins continue to be relatively dispersed in 2021 and with generally lower travel volumes. However there appear to be several locations with higher travel volumes, including:

- The Mayridge neighborhood area
- The SW 59<sup>th</sup> St corridor between S Blackwelder Ave and S Walker Ave

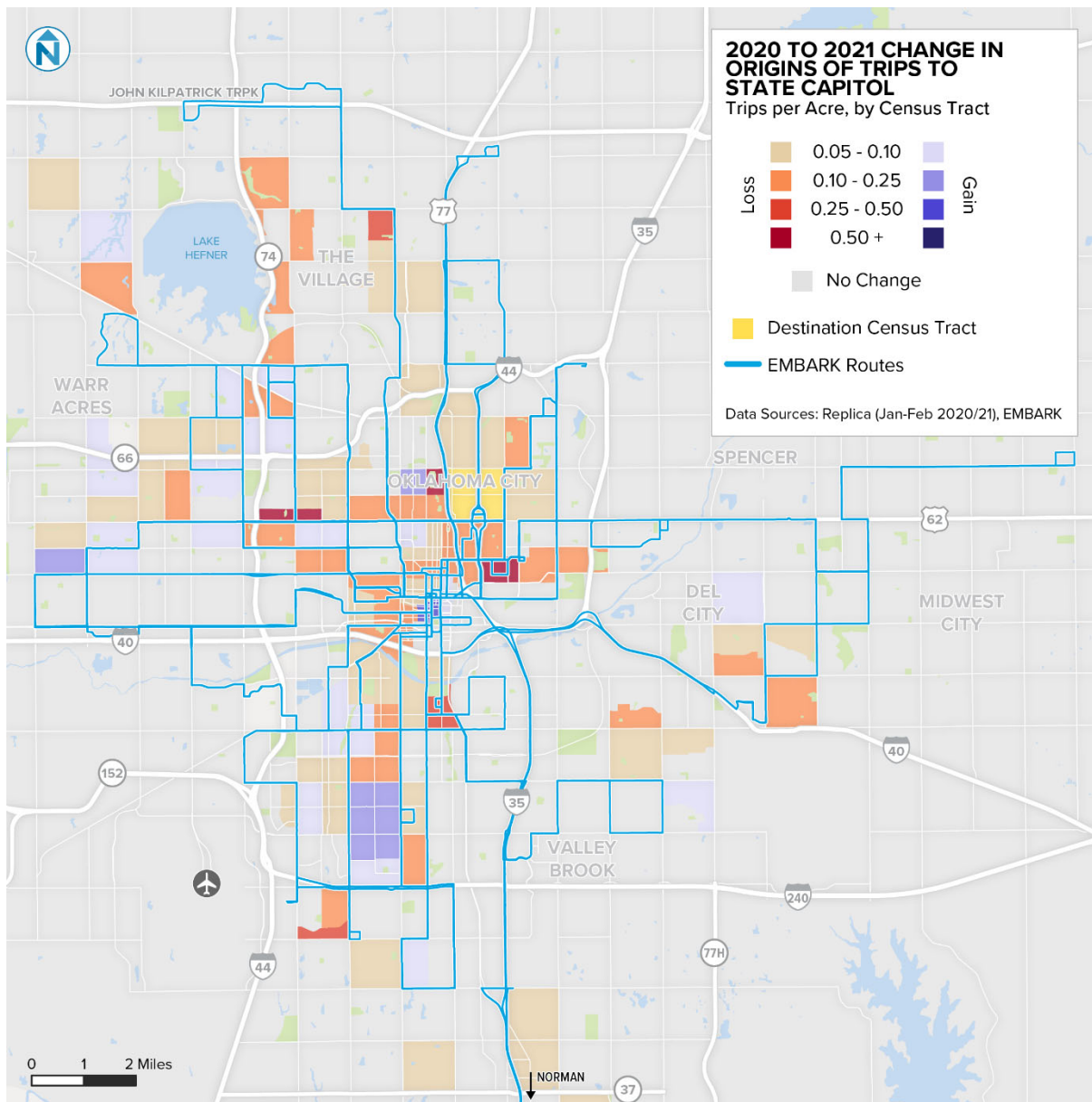
Following the COVID-19 Pandemic, the total volume of trips to this location decreased and the average distance travelled to this location decreased. The difference in travel volumes between January and February 2020 and 2021 are shown below in Figure 4-39. On weekdays in January 2020, an average of 10,760 trips ended at this location compared to an average of 3,359 in January of 2021, a 69% decrease. The average distance traveled to this location was 6.62 miles in January 2020 compared to 6.56 miles in January 2021, a 1% decrease. Areas with the largest decrease in trips are spread throughout the service area and include OU Health, NW 23<sup>rd</sup> St & N May Ave, and Edgemere Park. Areas with the largest increases in trips include south Oklahoma City and the South Walker neighborhood.

Figure 4-38 Origins of Trips Ending near the Oklahoma State Capitol Area (Jan-Feb 2020 and Jan-Feb 2021)



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

Figure 4-39 Difference in Trips Ending near the Oklahoma State Capitol Area between Jan 2020 and Jan 2021



Source: Replica, Jan-Feb 2020 & Jan-Feb 2021

## 5 ROUTE PROFILES

This chapter describes EMBARK's fixed-routes, including alignment characteristics, service span, headway, destinations served, ridership, and schedule adherence. The EMBARK system is comprised of 23 total routes, two late-night only routes, two limited express routes, and 19 standard routes. Most routes end service around 7:00 p.m. on weekdays except for Routes 005, 011, 022, 13N, and 23N, which operate until 12:00 a.m.

Figure 5-1 shows the average daily weekday ridership for each route in the EMBARK system and Figure 5-2 shows boardings per revenue hour for each route.

Figure 5-3 shows the average on-time performance for each route, with early trips being trips that depart over one minute before scheduled departure, late trips being trips that arrive over five minutes after scheduled arrival, and all other trips being considered on-time. A common industry standard for on-time performance is to have 85% of trips arriving on-time. On-time performance is generally low for all EMBARK routes with most routes averaging over 20% of trips arriving late. Because EMBARK currently operates a pulse-based hub and spoke service model, late arrivals can result in missed transfer opportunities that may significantly increase overall travel times for customers who are forced to wait for the next bus.

The average speed required for local Oklahoma City routes to provide on-time service is shown in Figure 5-4. This removes Routes 015, 019, and 024 which operate on freeways or across long distances at substantially faster speeds and focuses only on the local routes operating in Oklahoma City. The average speeds required for on-time service range between 12.5 and 18.1 miles per hour with an average of 14.9 miles per hour. The average speeds for these routes are generally fast, with a typical industry standard of about 12 miles per hour.

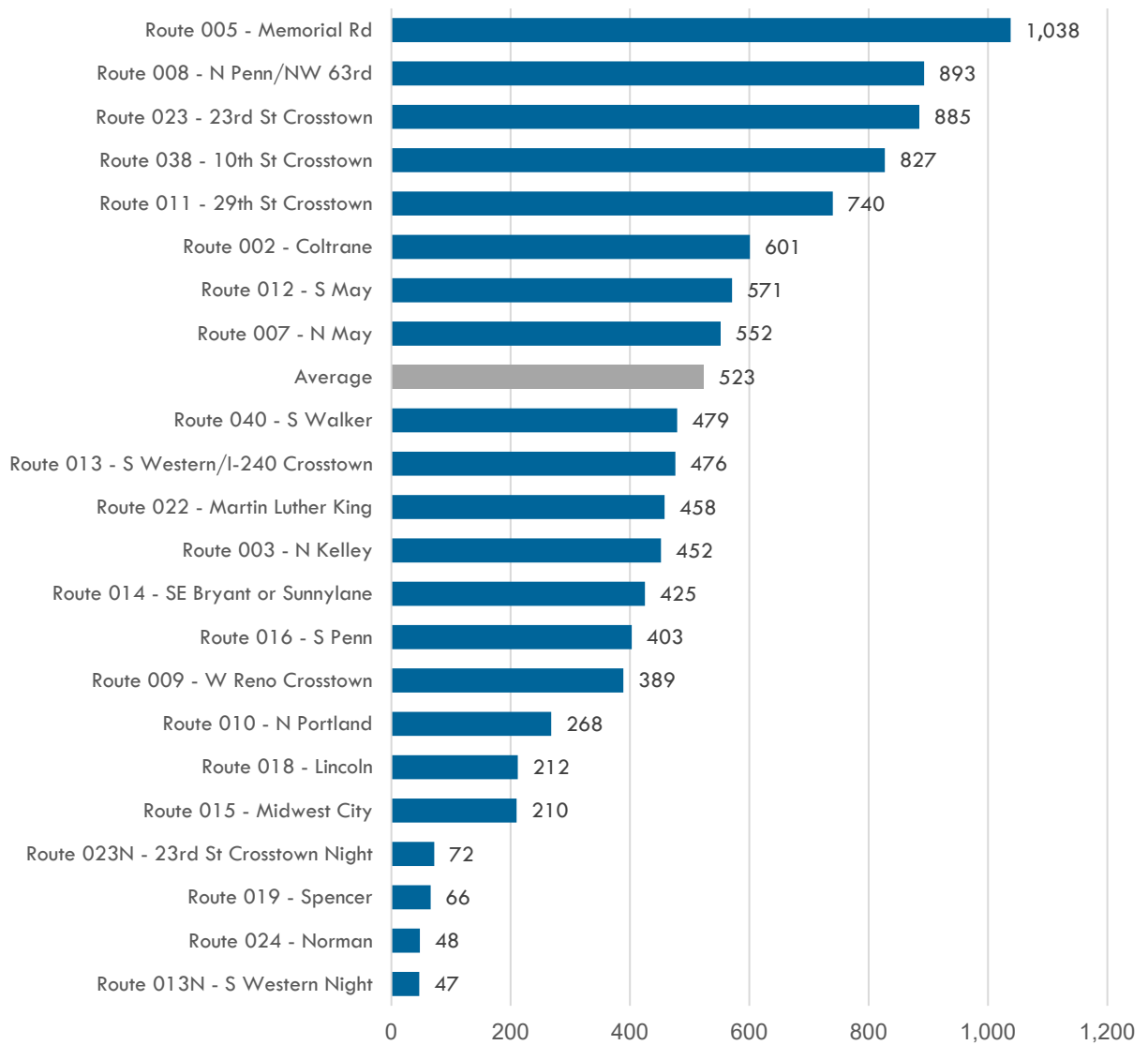
A system map of boardings by stop is shown in Figure 5-5. The average speed required for on-time service ranges between 12.5 and 34.4 miles per hour with a system wide average of 16.6 miles per hour. The fastest average speeds are required more express like service operating on the freeway, like Routes 024 and 015, and Route 019 which travels through long stretches of low-density development with fast travel times.

Stop level ridership maps, segment level productivity, and segment level on-time performance are available in an interactive dashboard at:

[https://nelsonnygaard.shinyapps.io/EMBARC\\_Route\\_Evaluation/](https://nelsonnygaard.shinyapps.io/EMBARC_Route_Evaluation/)

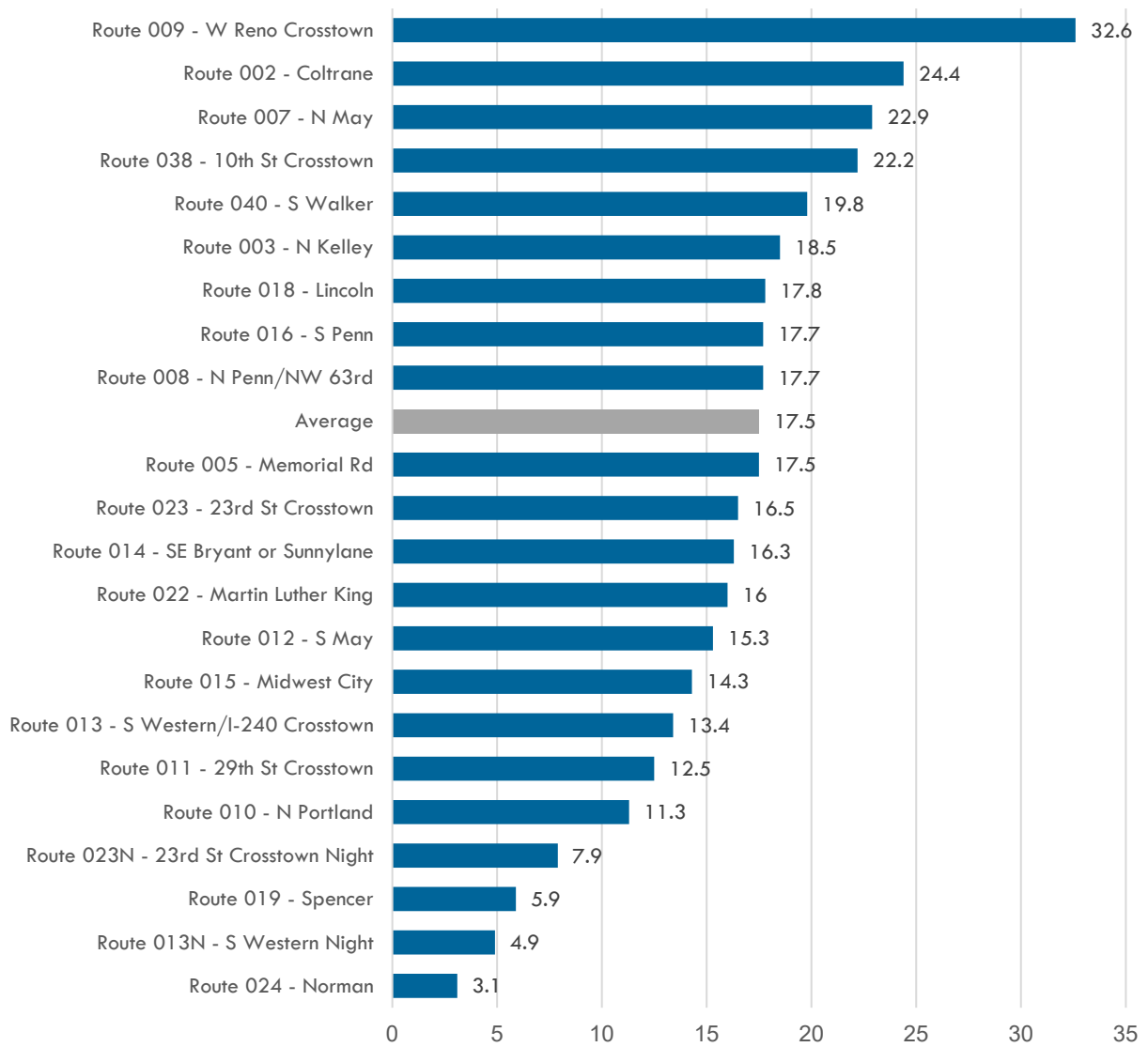


Figure 5-1 Average Weekday Ridership by Route



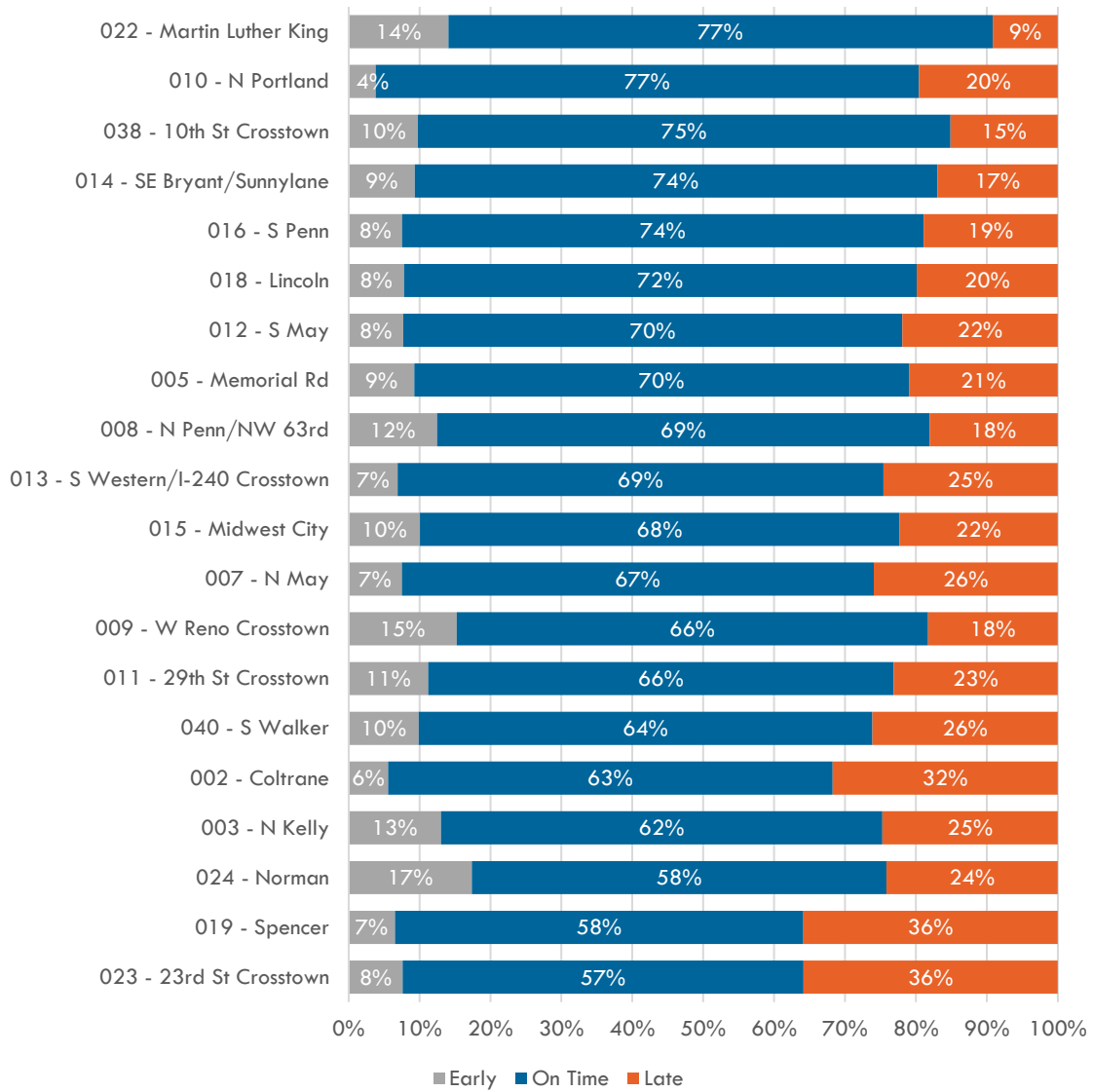
Source: EMBARK APC Data (September – November 2019)

Figure 5-2 Average Weekday Boardings per Revenue Hour



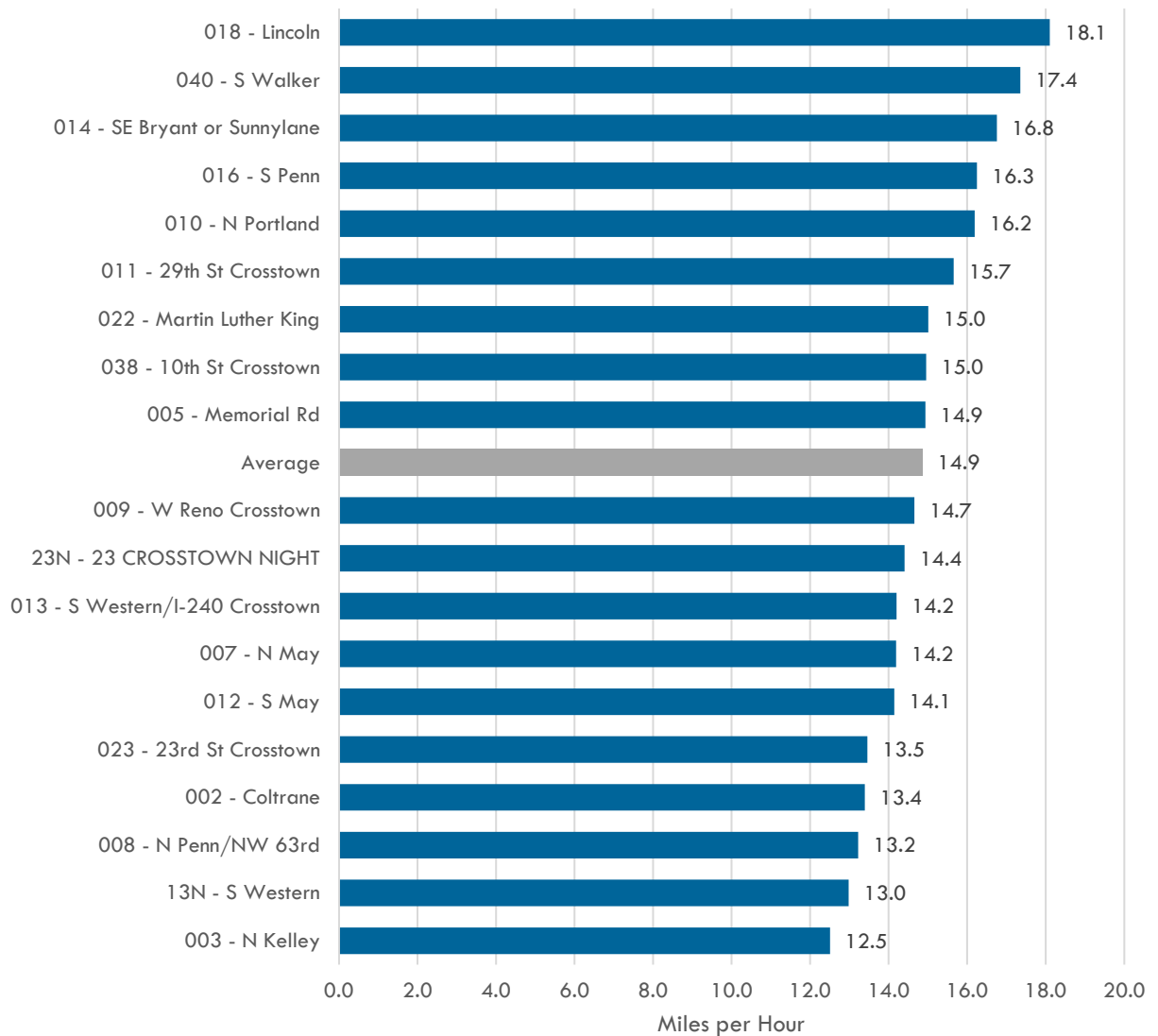
Source: EMBARK APC Data (September – November 2019)

Figure 5-3 Average On-Time Performance by Route



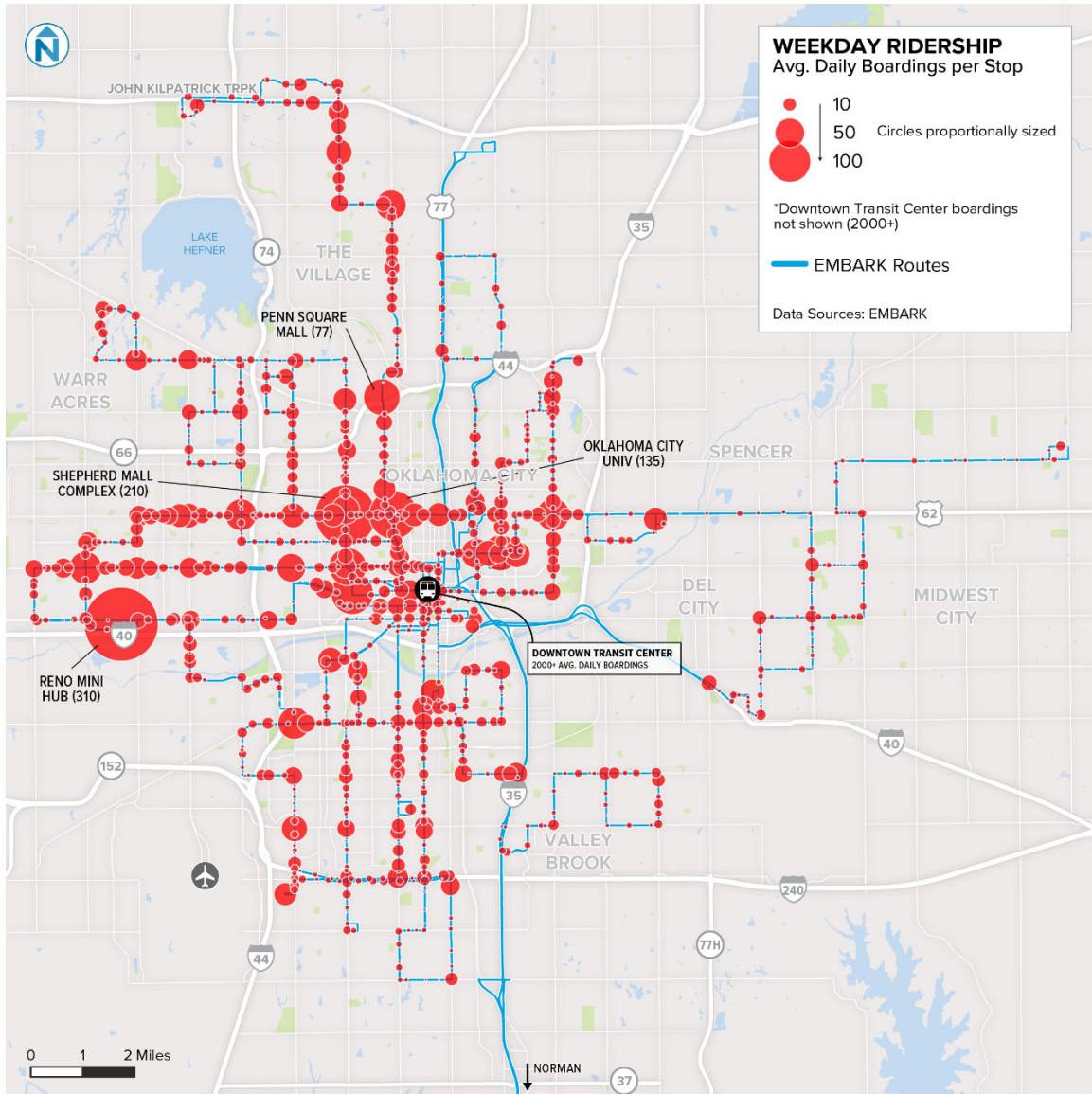
Source: EMBARK APC Data (September – November 2019)

Figure 5-4 Average Local Oklahoma City Routes Miles per Hour Required for On-Time Service



Source: EMBARK APC Data (September – November 2019) and Schedules (June 2021)

Figure 5-5 EMBARK System Ridership, Average Weekday Boardings by Stop



Source: EMBARK APC Data (September – November 2019)

## ROUTE 002 – COLTRANE

Route 002 – Coltrane travels between the Downtown Transit Center in downtown Oklahoma City and N Coltrane Rd on the east side of Oklahoma City. The route alignment, shown in Figure 5-6, operates along N Robinson St, NE 13<sup>th</sup> St, N Lottie Ave, NE 23<sup>rd</sup> St, N Coltrane Rd, NE 16<sup>th</sup> St, and NE Grand Blvd. Route 002 makes an out of direction loop to directly serve McGuire Plaza and the Jeltz Senior Center near the intersection of NE 23<sup>rd</sup> St and N Lottie Ave. The route also operates a clockwise terminal loop along NE 23<sup>rd</sup> St, N Coltrane Rd, NE 16<sup>th</sup> St, and NE Grand Blvd. Route 002 operates along a shared alignment with Routes 003 between the Downtown Transit Center and the intersection of NE 13<sup>th</sup> St & N Kelley Ave. Schedules are offset to provide more frequent service in this segment.

Route 002 operates every 30 minutes on weekdays between 5:35 a.m. and 7:30 p.m. and every 60 minutes on weekends between 6:35 a.m. and 6:30 p.m. Route 002 provides direct transfer opportunities with Routes 003, 018, 019, 022, and 023.

### Major Destinations

- Downtown Transit Center
- OU Health – University of Oklahoma Medical Center
- McGuire Plaza
- Ralph Ellison Library

Route 002 Characteristics		
<b>Weekday</b>		
Start Time	5:35 a.m.	
End Time	7:30 p.m.	
Average Daily Boardings	601 <sup>1</sup>	
Peak Headway (mins) <sup>2</sup>	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	63% <sup>3</sup>
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	

<sup>1</sup> Average daily boardings is drawn from EMBARK APC data during October 2019 and represents pre-COVID-19 Pandemic 'Weekday Riders'.

<sup>2</sup> Peak hours defined as 6:00AM-10:00AM and 3:00PM-7:00PM.

<sup>3</sup> On-time performance (OTP) is drawn from EMBARK provided weekly on-time performance data collected during October 2019.



## Schedule Adherence

Route 002 is a below average on-time performance route, with 63% of trips being on-time, 32% of trips being late, and 6% of trips early. In the outbound direction, on-time performance is lowest along the segment between McGuire Plaza and the intersection of MLK Ave & NE 23<sup>rd</sup> St (35% late). The other segments in the outbound direction are between 23% and 28% late. On-time performance is consistently worse in the inbound direction with trips on all segments averaging between 37% and 45% late. On-time performance fluctuates throughout the day but is generally higher in the early morning, before 7:00 a.m. and is lowest between approximately 2:00 p.m. and 5:00 p.m.

## Summary

Route 002 provides an east-west connection between downtown Oklahoma City and east Oklahoma City along the NE 13<sup>th</sup> St and NE 23<sup>rd</sup> St corridors. Route 002 is an above average ridership route and a high productivity route in the EMBARK system. The route currently operates with 30-minute frequency all day on weekdays and may have sufficient ridership to justify improving service frequency during the highest ridership times of day. Route 002 has below average on-time performance and is consistently late across all segments of the route alignment. Including additional running time into the schedule may reduce traffic congestion related delays. Additionally, reducing out of direction travel and streamlining service may also improve on-time performance.



## ROUTE 003 – N KELLEY

Route 003 – N Kelley provides service between the Downtown Transit Center in downtown Oklahoma City and the Adventure District located in northeast Oklahoma City. The route alignment, shown in Figure 5-7, operates along N Robinson Ave, NW 13<sup>th</sup> St, N Kelley Ave, NE 36<sup>th</sup> St, N Prospect Ave, and ends with a counterclockwise terminal loop around NE 50<sup>th</sup> St, MLK Ave, N Grand Blvd, NE 56<sup>th</sup> St, and Rhode Island Ave.

Route 003 operates along a shared alignment with Route 002 between the Downtown Transit Center and the intersection of NE 13<sup>th</sup> St & N Kelley Ave between the Downtown Transit Center and the intersection of NE 23<sup>rd</sup> St & N Kelley Ave.

Route 003 operates every 30 minutes on weekdays between 5:50 a.m. and 7:45 p.m. and every 60 minutes on weekends between 6:35 a.m. and 6:30 p.m. Route 003 provides direction connections to Routes 002, 018, 022, and 023.

### Major Destinations

- Downtown Transit Center
- OU Health – University of Oklahoma Medical Center
- VA Medical Center
- Science Museum & OKC Zoo
- Wildewood Skilled Nursing & Therapy
- Temple Gardens Senior Apartments
- Sooner Haven Apartments
- Classen School of Advanced Studies (SAS) High School at Northeast
- Uptown at Kelley Apartments
- Oklahoma Department of Human Services

### Ridership

Route 003 averages approximately 452 boardings per weekday, making it a below average ridership route in the EMBARK system. The highest ridership stops include:

- N Lincoln Blvd & NE 13<sup>th</sup> St (OU Health)
- N Kelley Ave & NE 36<sup>th</sup> St (Mt. Olive Senior Cottages)
- N Kelley Ave & NE 26<sup>th</sup> St (Uptown at Kelley Apartments and Oklahoma Department of Human Services)

Route 003 averages 18.5 boardings per revenue hour, making it an above average productivity route in the EMBARK system. Productivity is highest in the outbound direction between the Downtown Transit Center and OU Health (17.5 boardings per hour) and significantly decreases across the other segments (approximately 2.0 – 3.1 boardings per hour). Productivity in the inbound direction ranges from 4.0 – 5.9 boardings per hour with higher productivity in the northernmost segments, decreasing in the segments closer to downtown Oklahoma City.

## Schedule Adherence

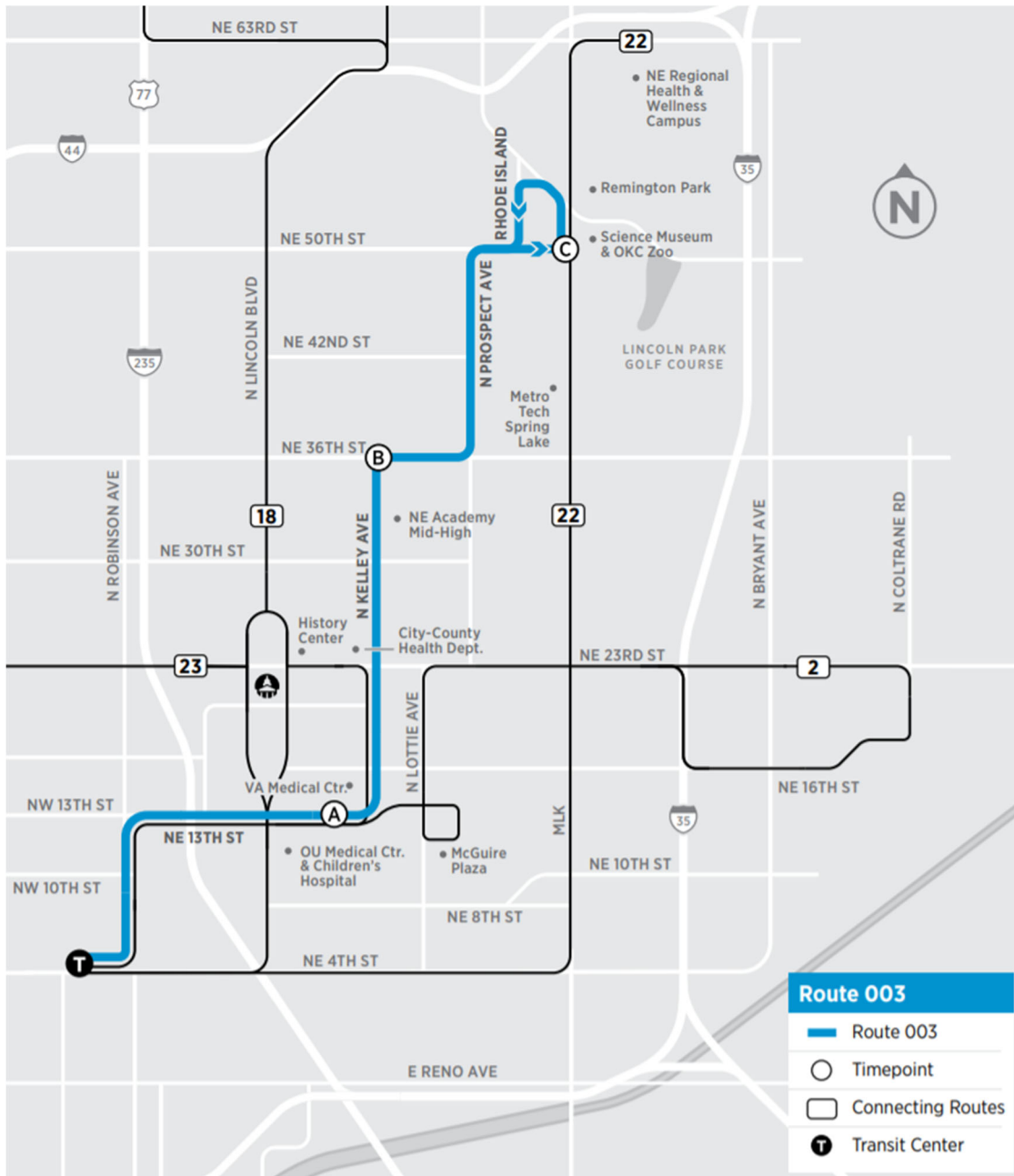
Route 003 is a below average route in terms of on-time performance, being on-time for 62% of trips, early for 13% of trips, and late for 25% of trips. On-time performance for Route 003 is worst in the outbound direction between the Downtown Transit Center and NE 36<sup>th</sup> St (between 34% and 43% late). All other segments of the route in both the inbound and outbound directions are between 16% and 26% late. On-time performance is generally consistent throughout the day but is best during the midday period between approximately 10:00 a.m. and 12:00 p.m. While Route 003 is average compared to other routes in the EMBARK system, there is room for improvement in on-time performance throughout the length of the route’s alignment.

### Summary

Route 003 provides a north-south connection between downtown Oklahoma City and northeast Oklahoma City. The route has below average ridership and above average productivity with the highest productivity occurring between the Downtown Transit Center and OU Health. Route 003 is also a below average on-time performance route in the EMBARK system. The route currently operates every 30 minutes on weekdays and every 60 minutes on weekends.

Route 003 Characteristics		
<b>Weekday</b>		
Start Time	5:50 a.m.	
End Time	7:45 p.m.	
Average Daily Boardings	452	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	62%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	

Figure 5-7 Route Map, Route 003 – N Kelley



## ROUTE 005 – MEMORIAL RD

Route 005 – Memorial Rd provides a north-south connection between the Downtown Transit Center and Mercy Hospital Oklahoma City in northwest Oklahoma City, as shown in Figure 5-8. The route alignment operates along NE 4<sup>th</sup> St, N Classen Blvd, N Western Ave, W Hefner Rd, and N Pennsylvania Ave. The route operates a counterclockwise terminal loop at the northern end of its alignment between N Pennsylvania Ave, NW 140<sup>th</sup> St, Quail Springs Rd, W Memorial Rd, N Meridian Ave, and McAuley Blvd.

Route 005 serves several large shopping centers and apartment complexes along the Classen Blvd corridor and into northwest Oklahoma City. Route 005 provides direct transfer opportunities with Route 010, 023, and 038. Route 005 operates every 30-minutes on weekdays between 5:35 a.m. and 7:05 p.m. before operating hourly service between 7:05 p.m. and 12:05 a.m. The route also operates hourly service on weekends between 5:35 a.m. and 6:35 p.m.

A portion of Route 005 along Classen Blvd between 13<sup>th</sup> St and 47<sup>th</sup> St would be served by the planned Northwest BRT route.

### Major Destinations

- Downtown Transit Center
- Classen Senior Center
- Classen SAS Middle School
- Belle Isle Station Shopping Mall
- Bishop McGuinness High School
- Oklahoma County Juvenile Justice Center
- Chesapeake Energy
- Hoshall Shopping Center
- N Pennsylvania Ave Walmart Supercenter
- Quail Springs Mall
- Chase Plaza Commercial Center
- Mercy Hospital Oklahoma City
- Quail Springs Marketplace
- Several large apartment complexes

Route 005 Characteristics		
<b>Weekday</b>		
Start Time	5:35 a.m.	
End Time	12:05 a.m.	
Average Daily Boardings	1,038	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	60	
Schedule Adherence	On Time	70%
<b>Saturday</b>		
Start Time	5:35 a.m.	
End Time	6:35 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	5:35 a.m.	
End Time	6:35 p.m.	
Headway (mins)	60	

## Ridership

Route 005 is the highest ridership route in the EMBARK system, averaging over 1,000 riders per weekday. Ridership is generally high throughout the route's alignment with a few key higher ridership destinations, including:

- Classen Senior Center, N Classen Blvd & NW 13<sup>th</sup> St
- N Classen Blvd & NW 23<sup>rd</sup> St (transfers with Route 003)
- Belle Isle Station Shopping Mall
- North Village Apartments, N Western Ave & W Hefner Rd
- Quail Springs Mall
- Mercy Hospital Oklahoma City
- Walmart Supercenter
- N Pennsylvania Ave & NW 122<sup>nd</sup> St (Hoshall Shopping Center)

Route 005 averages 17.5 boardings per revenue hour, making it an average productivity route in the EMBARK system. Productivity in the outbound direction is highest between the Downtown Transit Center and NW 23<sup>rd</sup> St, which may be related to high transfer activity between Route 005 and Route 023. In the inbound direction, productivity is highest between W Wilshire Blvd and NW 23<sup>rd</sup> St (between 19.1 – 25.2 boardings per hour).

The highest ridership and productivity segments of Route 005 may be related to transfers with Route 023, another high ridership route in the EMBARK system. Increased frequency on this segment of Classen Blvd between the Downtown Transit Center and NW 23<sup>rd</sup> St may improve transfer opportunities between the two routes.

## Schedule Adherence

Route 005 is an average on-time performance route, arriving on-time for 70% of trips, early for 9% of trips, and late for 21% of trips. On-time performance is generally worse in the inbound direction, with all segments ranging between 17% and 37% of trips arriving late. Inbound service north of W Hefner Rd has a higher percentage of trips arriving late than the remainder of the alignment (31% - 37% of trips arriving late). Outbound service north of W Wilshire Blvd has a lower on-time performance, with between 18% and 26% of trips on these segments arriving late. On-time performance is generally consistent throughout the day but improves during the evening service period, after approximately 7:00 p.m.

There may be opportunities to address on-time performance and late arriving trips by adding time to the schedule along specific segments or realigning service to reduce conflicts in areas with heavy traffic congestion.

## Summary

Route 005 is a high ridership, average productivity route that provides connections between downtown Oklahoma City, several large shopping centers, several large multi-family residential developments, and Mercy Hospital Oklahoma City. There are several potential opportunities to improve service on Route 005, including:

- Realigning service onto N May Ave and NW 122<sup>nd</sup> St to serve several large apartment complexes with more dense residential land uses, instead of continuing to serve the low-density, strip mall development served in the eastbound direction on W Memorial Rd.
- Improving service frequency to provide more convenient transfer opportunities with Route 023 at N Classen Blvd & NW 23<sup>rd</sup> St.
- Adding time to the schedule to improve on-time performance, particularly in the northern portion of the route.
- Significant portions of Route 005 along N Classen Blvd will be replaced by the planned NW BRT route. There may be an opportunity to realign service on Route 005 to better complement the new BRT route, rather than competing for ridership.

Figure 5-8 Route Map, Route 005 – Memorial Rd



## ROUTE 007 – N MAY

Route 007 – N May operates between the Downtown Transit Center in downtown Oklahoma City and INTEGRIS Baptist Medical Center in northwest Oklahoma City. The Route operates along NE 4<sup>th</sup> St, N Western Ave, Linwood Blvd, N Virginia Ave, N Pennsylvania Ave, NW 23<sup>rd</sup> St, N May Ave and operates a counterclockwise terminal loop between N May Ave, NW 59<sup>th</sup> St, N Independence Ave, and NW 50<sup>th</sup> St (Figure 5-9). The route operates on a shared alignment with Route 008 on N Virginia Ave between Linwood Blvd and NW 23<sup>rd</sup> St and with Route 023 on NW 23<sup>rd</sup> St between N Pennsylvania Ave and N May Ave. Route 007 also provides direct transfer opportunities with Routes 008, 010, 023, and 038.

The route operates every 30 minutes on weekdays between 5:50 a.m. and 7:15 p.m. and every 60 minutes on weekends between 6:35 a.m. and 6:30 p.m.

### Major Destinations

- Downtown Transit Center
- Shepherd Center Mall
- Taft Middle School
- Northwest Classen High School
- Mayfair Village
- Centennial Plaza
- INTEGRIS Baptist Medical Center

### Ridership

Route 007 averages approximately 552 boardings per weekday, making it an average ridership route in the EMBARK system. The highest ridership stops along the Route 007 alignment include:

- Centennial Plaza
- Northwest Classen High School
- NW 23<sup>rd</sup> St & N Pennsylvania Ave (Route 023 transfer opportunity)
- N Virginia Ave & NW 10<sup>th</sup> St (Route 038 transfer opportunity)

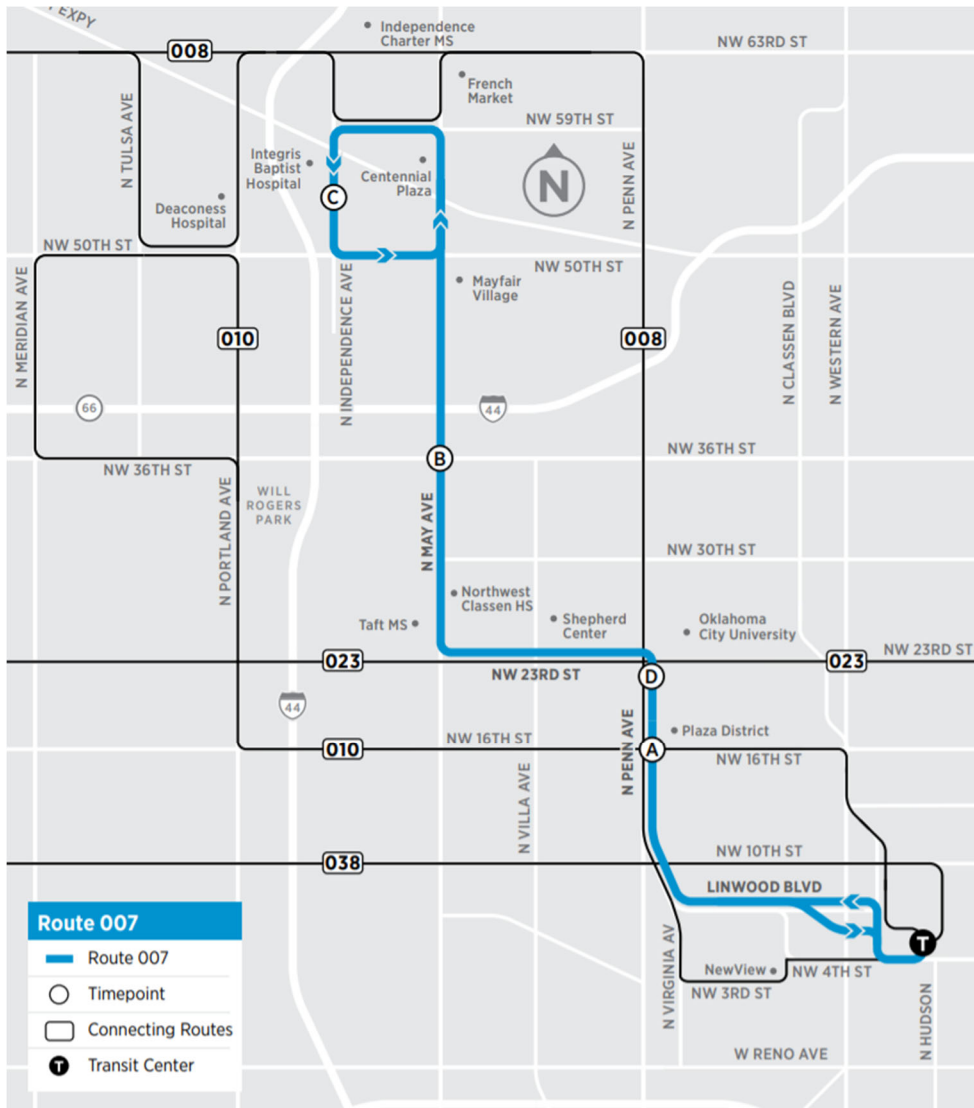
Route 007 Characteristics		
<b>Weekday</b>		
Start Time	5:50 a.m.	
End Time	7:15 p.m.	
Average Daily Boardings	552	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	67%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	



There is moderate ridership along the length of the N May Ave alignment of the route. However, ridership is generally low at INTEGRIS Baptist Medical Center, averaging approximately eight boardings per weekday.

Route 007 averages approximately 22.9 boardings per revenue hour, making it the 3<sup>rd</sup> highest productivity route in the EMBARK system. Productivity in the outbound direction is highest near downtown Oklahoma City, averaging 33.9 boardings per revenue hour between the Downtown Transit Center and N Pennsylvania Ave & NW 16<sup>th</sup> St. In the inbound direction, productivity is highest between INTEGRIS Baptist Medical Center and NW 23<sup>rd</sup> & N Pennsylvania Ave (13.5 – 15.2 boardings per revenue hour).

Figure 5-9 Route Map, Route 007 – N May



## Schedule Adherence

Route 007 is an below average route in terms of on-time performance, with 67% of trips arriving on-time, 7% of trips arriving early, and 22% of trips arriving late. On-time performance declines throughout the route alignment in the outbound direction with 11% late between the Downtown Transit Center and NW 16<sup>th</sup> St, 15% late between NW 16<sup>th</sup> St and NW 36<sup>th</sup> St, and 21% late between NW 36<sup>th</sup> St and INTEGRIS Baptist Medical Center.

On-time performance is notably worst in the inbound direction, with segments ranging between 38% and 52% late. The segment between INTEGRIS Baptist Medical Center and NW 36<sup>th</sup> St has the lowest on-time performance with 52% of trips departing late. The delays associated with this segment may be sufficiently high that they result in additional delays throughout the remainder of the inbound alignment. Adding sufficient time to the schedule through this segment, as well as shortening or straightening the route alignment, may improve on-time performance throughout the route alignment.

On-time performance fluctuates throughout the day but is lowest during the afternoon peak period, between approximately 3:00 p.m. and 5:00 p.m.

## Summary

Route 007 is an average route in terms of ridership and on-time performance but is among the highest productivity routes in the EMBARK system. The highest ridership areas of the route appear to be oriented toward large retail destinations, Northwest Classen High School, and potential transfers between Route 007 and Routes 023 and 038. Outside of these destinations, stops along the N May Ave corridor generate higher ridership than other segments of the route.

On-time performance worsens throughout the route's outbound alignment with the lowest performing segment occurring at the beginning of inbound service. There may be potential to improve on-time performance by adding time to the schedule, particularly through the alignment north of NW 36<sup>th</sup> Ave.

## ROUTE 008 – N PENN/NW 63<sup>RD</sup>

Route 008 – N Penn/NW 63<sup>rd</sup> operates between downtown Oklahoma City and The Pines neighborhood adjacent to Northwest Expressway and Lake Hefner. The route generally operates along NW 4<sup>th</sup> St, N Douglas Ave, NW 3<sup>rd</sup> St, N Virginia Ave, N Pennsylvania Ave, and NW 63<sup>rd</sup> St. Route 008 makes several one-way, out-of-direction deviations including a deviation to Centennial Plaza along N May Ave, NW 59<sup>th</sup> St, and N Independence Ave in the outbound direction only and a deviation to serve Deaconess Hospital along N Tulsa Ave, NW 50<sup>th</sup> St, and N Portland Ave in the inbound direction only. Route 008 also operates a clockwise terminal loop between NW 63<sup>rd</sup> St, Lyrewood Ln, Northwest Expressway, and N MacArthur Blvd (Figure 5-10).

Route 008 operates every 30 minutes on weekdays between about 5:30 a.m. and 7:30 p.m. and hourly on weekends between 6:30 a.m. and 6:30 p.m. Route 008 provides direct transfer opportunities with Routes 007, 010, 023, and 038.

### Major Destinations

- Downtown Transit Center
- Homeless Alliance
- NewView Oklahoma
- Oklahoma City University
- Penn Square Mall
- Centennial Plaza
- Independence Charter Middle School
- Deaconess Hospital
- French Market
- Several large multi-family residential developments along Lyrewood Ln

### Ridership

Route 008 averages approximately 893 boardings per weekday, making it the 2<sup>nd</sup> highest ridership route in the EMBARK system. Ridership is highest at several locations, including:

- NW 3<sup>rd</sup> St & N Virginia Ave (Homeless Alliance)
- NW 10<sup>th</sup> St & N Virginia Ave (Route 038 transfer opportunity)
- NW 23<sup>rd</sup> St & N Virginia Ave (Route 023 transfer opportunity)
- Oklahoma City University
- Goodwill Job Connection Center

Route 008 Characteristics		
<b>Weekday</b>		
Start Time	5:26 a.m.	
End Time	7:30 p.m.	
Average Daily Boardings	893	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	69%
<b>Saturday</b>		
Start Time	6:28 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:28 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	

- Penn Square Mall
- NW 63<sup>rd</sup> St & N Meridian Ave (Multi-family residential developments)
- Lyrewood Ln (Multi-family residential developments)
- Deaconess Hospital
- French Market

The deviations to Centennial Plaza and Deaconess Hospital account for an average of 7 and 26 boardings per weekday, respectively.

Route 008 averages approximately 17.7 boardings per hour, making it an average productivity route. In the outbound direction, productivity is highest on the segment between the Downtown Transit Center and NW 23<sup>rd</sup> (34.8 boardings per hour) and decreases throughout the remainder of the alignment. Productivity is generally higher in the inbound direction, with the highest productivity segments occurring between Northwest Expressway and NW 23<sup>rd</sup> St (20.6 boardings per hour) and between NW 23<sup>rd</sup> St and the Downtown Transit Center (12.7 boardings per hour).

## Schedule Adherence

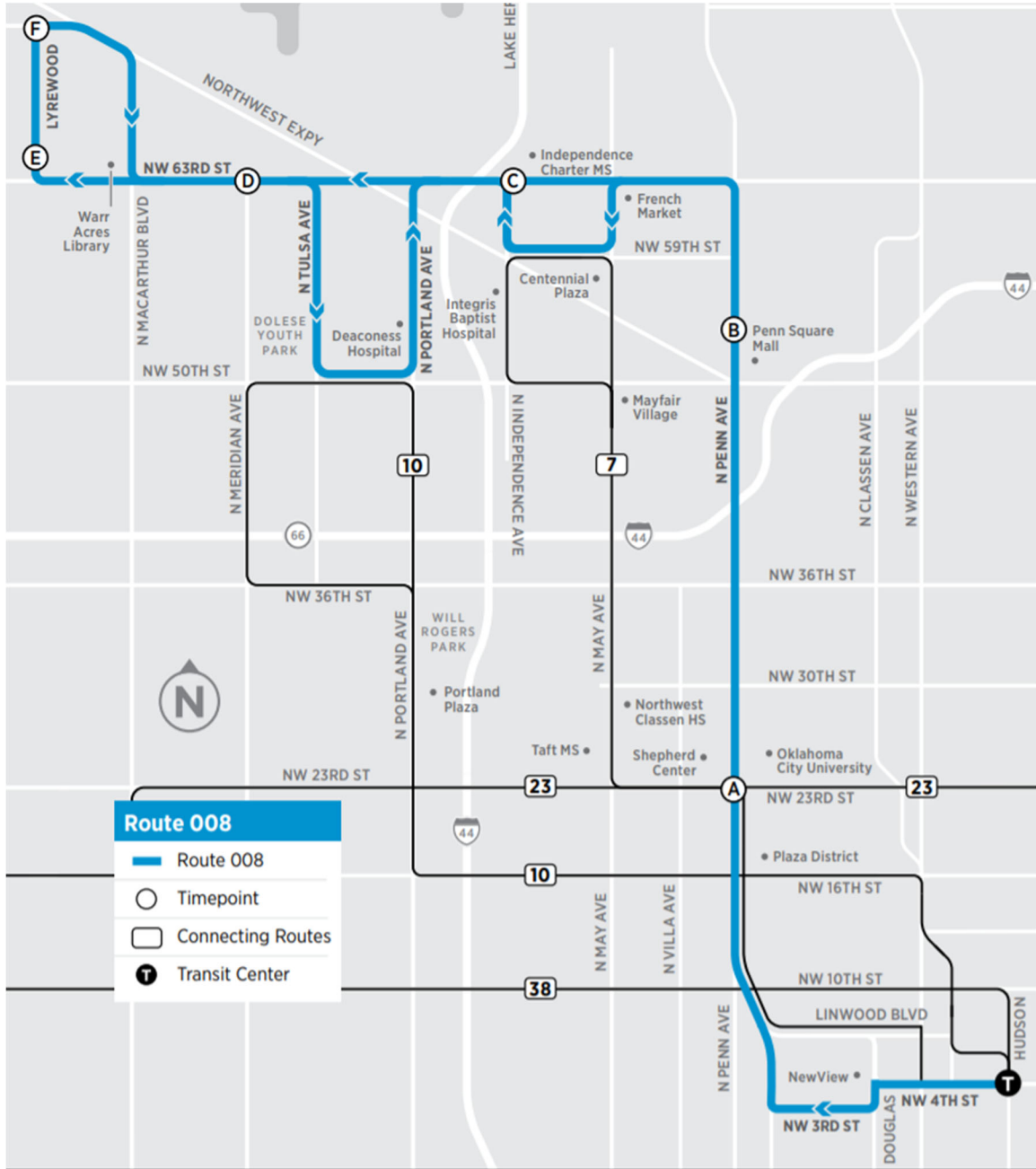
Route 008 is an average route in terms of on-time performance, arriving on-time for 69% of trips, early for 12% of trips, and late for 18% of trips. On-time performance is notably lower in the outbound direction. Specifically, service east of N Meridian Ave is late for between 27% and 33% of trips on these segments, while service west of N Meridian Ave is early for 35% of trips. In the inbound direction, the route is late for between 5% and 13% of trips across the route's alignment and early departures are most common between NW 63<sup>rd</sup> St & N Independence Ave and N Pennsylvania Ave & NW Expressway.

On-time performance is generally consistent in the morning and midday periods but fluctuates throughout the afternoon. Adjusting the schedule for segments with low on-time performance or removing the service deviations may improve on-time performance for the route.

## Summary

Route 008 is a high ridership, average productivity route that serves several key destinations along the Pennsylvania Ave and 63<sup>rd</sup> St corridors, including several social service institutions, large multi-family housing developments, major retail destinations, and medical facilities. Route 008 also provides transfer opportunities with the 10<sup>th</sup> St and 23<sup>rd</sup> St crosstown routes. While the route is average in terms of on-time performance, there may be opportunities to reduce late arrivals and early departures by updating schedules or reducing deviations, particularly the deviation to Deaconess Hospital which would be served with a higher level of service following the implementation of the planned Northwest Expressway BRT route. The route may be able to support later evening service to improve the usefulness of the route for passengers to reach employment opportunities outside of the traditional peak period commute schedule.

Figure 5-10 Route Map, Route 008 – N Penn/NW 63rd



## ROUTE 009 – W RENO CROSSTOWN

Route 009 is an east-west crosstown route that provides connections between the Downtown Transit Center in downtown Oklahoma City and the Reno Mini Hub in west Oklahoma City. The route operates on a one-way couplet southbound on N Hudson Ave and northbound on N Walker Ave between NW 4<sup>th</sup> St and W Main St. The route also operates along W Main St, General Pershing Blvd, N May Ave, Reno Ave, and a clockwise terminal loop along Reno Ave, S MacArthur Blvd, SW 3<sup>rd</sup> St, and Greenfield Center Dr to the Reno Mini Hub (as shown in Figure 5-11).

The Reno Mini Hub is the 2<sup>nd</sup> highest ridership stop in the EMBARK system, providing direct transfer opportunities between Routes 009, 011, 023, and 038 outside of downtown Oklahoma City. Route 009 operates every 30 minutes on weekdays between about 6:00 a.m. and 7:30 p.m. and every 60 minutes between 6:00 a.m. and 6:15 p.m. on weekends.

Prior to August 9, 2020, Route 009 operated every 60 minutes on weekdays and was only recently improved to provide 30-minute service.

### Major Destinations

- Downtown Transit Center
- NewView Oklahoma
- Oklahoma City Fairgrounds
- Walmart Supercenter
- Westgate Marketplace
- Reno Mini Hub
- Greenfield Business Park

## Ridership

Route 009 averages approximately 389 boardings per weekday, making it a below average ridership route in the EMBARK system. Ridership is generally highest between the Downtown Transit Center and the intersection of Reno Ave & N May Ave, with the highest ridership stops including:

- Main St & N Western Ave
- Main St & Brauer Ave
- City Care Pershing Center
- Reno Ave & S May Ave (Carver Transitional Center)
- Walmart Supercenter
- Reno Mini Hub

Route 009 is the highest productivity route in the EMBARK system, averaging approximately 32.6 boardings per revenue hour. Productivity is highest near the beginning of the route in both directions, due to high ridership activity at the Downtown Transit Center and at the Reno Mini Hub. In the outbound direction, productivity decreases along the alignment. In the inbound direction, productivity is highest near the Reno Mini Hub, decreases along the W Reno Ave corridor, and increases again through the General Pershing Blvd and Main St corridors, supported by high ridership at City Care Pershing Center and along Main St. New developments along Main St that may support this productivity include John Rex Elementary School, NorthCare Adult & Family Services, Oklahoma County Crisis Intervention Center, and ReMerge.

During the September-November 2019 timeframe used for this analysis, Route 009 was operating with hourly frequency and was improved to operate every 30 minutes on weekdays. While this change is not reflected in the data, it may result in increased ridership and decreased productivity.

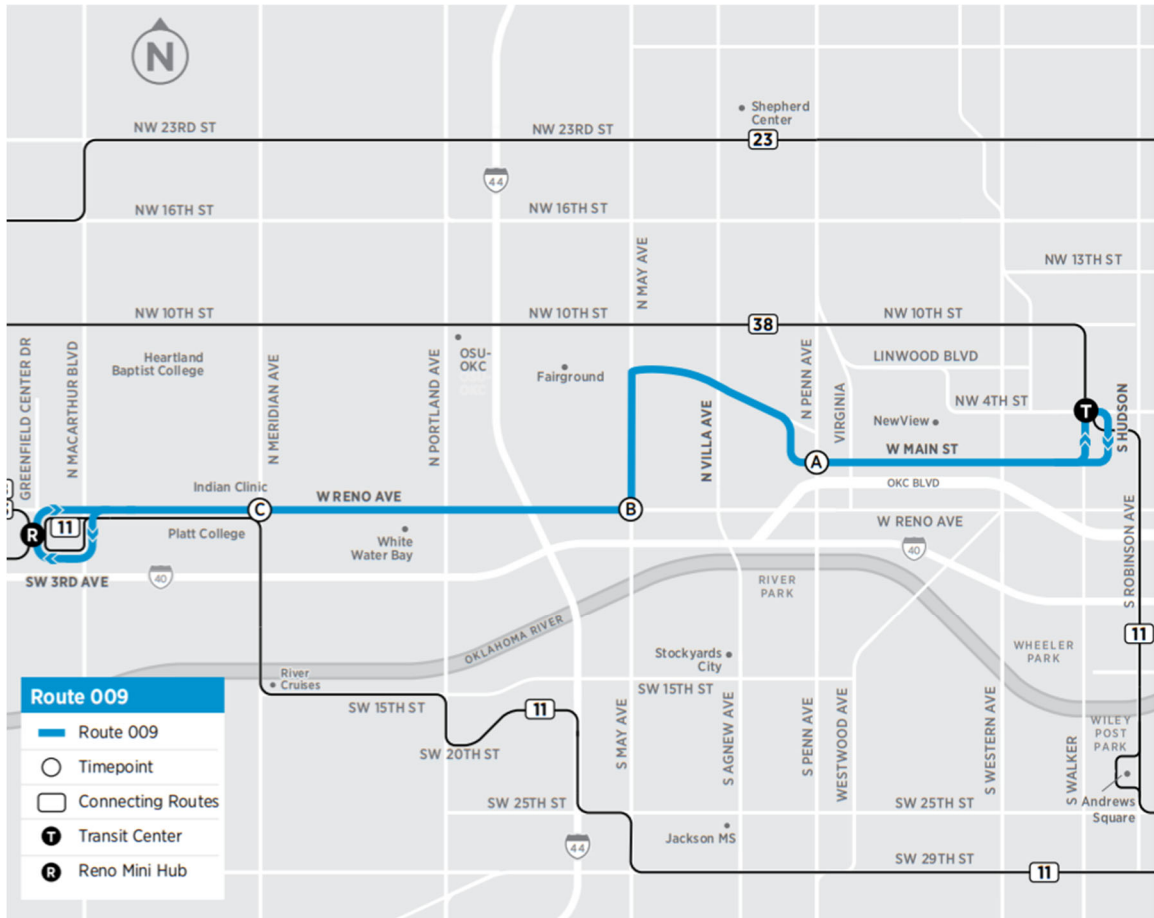
## Schedule Adherence

Route 009 is a below average route in terms of on-time performance, with 66% of trips on-time, 15% of trips early, and 18% of trips late. Late arrivals are concentrated at the beginning of the route in both the inbound and outbound directions, while early departures are most common at the end of the trip. In the outbound direction, 26%-27% of trips arrive late between the Downtown Transit Center and Reno Ave & S Meridian Ave, while 21%-22% of trips arrive late between the Reno Mini Hub and Reno Ave & S

Route 009 Characteristics		
<b>Weekday</b>		
Start Time	5:52 a.m.	
End Time	7:34 p.m.	
Average Daily Boardings	389	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	66%
<b>Saturday</b>		
Start Time	5:56 a.m.	
End Time	6:15 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	5:56 a.m.	
End Time	6:15 p.m.	
Headway (mins)	60	

May Ave in the inbound direction. On-time performance is generally consistent throughout the day. Adjusting schedules to allow more time early in the trip and less time later in the trip may improve on-time performance for Route 009.

Figure 5-11 Route Map, Route 009 – W Reno Crosstown



## Summary

Route 009 is a below average ridership, high productivity route providing east-west connections between the Downtown Transit Center and the Reno Mini Hub along the W Main St and W Reno Ave corridors. The high productivity on the route indicates that it may be capable of supporting higher frequency service. This improvement was made during the summer of 2020, increasing weekday service frequency from 60 minutes to 30 minutes. Adjusting schedules to allow more time early in the trip and less time later in the trip may improve on-time performance for Route 009.



## ROUTE 010 – N PORTLAND

Route 010 – N Portland provides service between the Downtown Transit Center in downtown Oklahoma City and Deaconess Hospital in northwest Oklahoma City. The route alignment, as shown in Figure 5-12, operates along NW 4<sup>th</sup> St, N Classen Ave, NW 16<sup>th</sup> St, N Portland Ave, and makes a clockwise terminal loop between NW 36<sup>th</sup> St, N Meridian Ave, NW 50<sup>th</sup> St, and N Portland Ave.

Route 010 operates along a shared alignment with Route 005 between the Downtown Transit Center and the intersection of N Classen Ave & NW 16<sup>th</sup> St. Route 010 provides direct transfer opportunities with Routes 005, 007, 008, 023, and 038.

On weekdays, the route operates every 30 minutes between 6:05 a.m. and 4:00 p.m. and every 36 minutes between 4:00 p.m. and 7:10 p.m. The route operates hourly on weekends between 6:35 a.m. and 6:30 p.m.

### Major Destinations

- Downtown Transit Center
- Classen SAS Middle School
- The Plaza District
- Portland Plaza
- Deaconess Hospital
- Will Rogers Park Plaza

### Ridership

Route 010 averages approximately 268 boardings per weekday, making it among the lowest ridership routes in the EMBARK system. Ridership is generally low-moderate throughout the length of the route with a few higher ridership stops, including:

- N Meridian Ave & NW 39<sup>th</sup> St (Mt. Vernon Apartments and The Hudson Apartments)
- Springdale Shopping Center
- N Portland Ave & NW 50<sup>th</sup> St
- N Portland Ave & NW 40<sup>th</sup> St (WinCo Foods)
- N Portland Ave & NW 23<sup>rd</sup> St (Route 023 transfer opportunity)
- NW 4<sup>th</sup> St & Shartel Ave (Oklahoma City Court & Oklahoma County Detention Center)

Route 010 Characteristics		
Weekday		
Start Time	6:05 a.m.	
End Time	7:10 p.m.	
Average Daily Boardings	268	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	36	
Evening Headway (mins)	--	
Schedule Adherence	On Time	77%
Saturday		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	
Sunday		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	60	

Route 010 averages approximately 11.3 boardings per revenue hour, making it among the lowest productivity routes in the system. Productivity is highest in the outbound direction near downtown Oklahoma City (27.3 boarding per hour) and drops notably west of N Pennsylvania Ave. Productivity is still low, but moderately higher (6.6 – 13.0 boardings per hour) along the terminal loop alignment. There is higher ridership activity in downtown Oklahoma City and along the N Portland Ave, NW 36<sup>th</sup> St, N Meridian Ave, and NW 50<sup>th</sup> St segments than along NW 16<sup>th</sup> St.

Figure 5-12 Route Map, Route 010 – N Portland



## Schedule Adherence

Route 010 is the second highest route in terms of on-time performance, with 77% of trips on-time, 4% of trips early, and 20% of trips late. In the outbound direction, trips are consistently between 18% and 25% late throughout the route’s alignment. In the inbound direction, a higher percentage of trips (31%) are late on the segment between N

Meridian Ave & NW 50<sup>th</sup> St and N Portland Ave & NW 36<sup>th</sup> St. Inbound on-time performance appears to improve after this segment but is still generally high. On-time performance is generally consistent throughout the day. Adding time to the schedule throughout the outbound alignment and early in the inbound alignment may improve on-time performance for Route 010.

## **Summary**

Route 010 is a low ridership, average productivity route in the EMBARK system. Ridership and productivity are highest near downtown Oklahoma City and on the terminal loop along N Portland Ave, NW 36<sup>th</sup> St, N Meridian Ave, and NW 50<sup>th</sup> St. Ridership on Route 010 may be improved by identifying a stronger anchor destination on the northern end of the route than Springdale Shopping Center and Deaconess Hospital, which collectively account for approximately 24 average daily boardings. Additionally, on-time performance on the route may be improved by adding more time to the schedule, particularly in the outbound direction and in the northern portion of the alignment in the inbound direction.

## ROUTE 011 – 29<sup>TH</sup> ST CROSSTOWN

Route 011 – 29<sup>th</sup> St Crosstown provides an east-west crosstown service along 29<sup>th</sup> St between the Downtown Transit Center and the Reno Mini Hub in west Oklahoma City. However, the route operates along a circuitous alignment and makes several large out-of-direction deviations (Figure 5-13).

The route operates on NE 4<sup>th</sup> Ave and S Robinson Ave, before making a deviation to serve Andrews Square assisted living facility along SW 21<sup>st</sup> St, S Harvey Ave, and SW 23<sup>rd</sup> St in the outbound direction only. Beyond this deviation, Route 011 operates a relatively circuitous alignment on SW 25<sup>th</sup> St, S Central Ave, SE 15<sup>th</sup> St, and S High Ave to serve the Skyline Urban Ministry Food Resource Center, Ambassador Courts apartment complex, and the apartment complex located at the intersection of SE 15<sup>th</sup> St & S High Ave. Route 011 continues to operate on SW 29<sup>th</sup> St, S May Ave, SW 25<sup>th</sup> St, S Grand Blvd, SW 17<sup>th</sup> St, SW 20<sup>th</sup> St, N Portland Ave, SW 15<sup>th</sup> St, S Meridian Ave, and W Reno Ave before operating a terminal loop around S MacArthur Blvd, SW 3<sup>rd</sup> St and Greenfield Center Dr to the Reno Mini Hub.

Route 011 Characteristics		
<b>Weekday</b>		
Start Time	5:27 a.m.	
End Time	12:04 a.m.	
Average Daily Boardings	740	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	60	
Schedule Adherence	On Time	66%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:40 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:40 p.m.	
Headway (mins)	60	

Route 011 provides direct transfer opportunities with Routes 009, 012, 013, 014, 015, 016, 038, 040, and 23N. Route 011 also operates every 30 minutes on weekdays between approximately 5:30 a.m. and 7:00 p.m. and every hour between 7:00 p.m. and 12:00 a.m. The route operates hourly on weekends between 6:35 a.m. and 6:40 p.m.

### Major Destinations

- Downtown Transit Center
- Andrews Square assisted living facility
- Capitol Hill Library
- Several multi-family residential developments along SW 17<sup>th</sup> St
- Westgate Marketplace
- Greenfield Center
- Reno Mini Hub

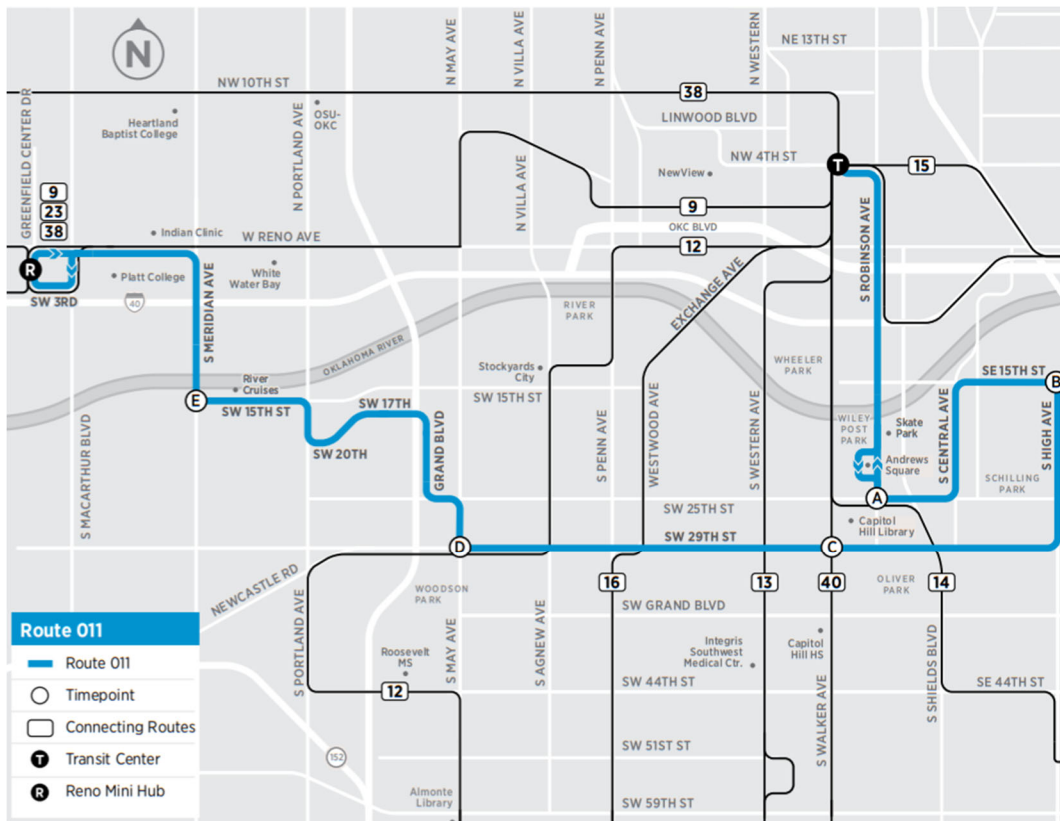
## Ridership

Route 011 averages approximately 740 boardings per weekday, making it among the highest ridership routes in the EMBARK system. Ridership is highest at Andrews Square and the Reno Mini Hub but also generates moderately high ridership along the length of the alignment on SW 29<sup>th</sup> St.

The Skyline Urban Ministry Food Resource Center, Ambassador Courts apartment complex, and the apartment complex located at the intersection of SE 15<sup>th</sup> St & S High Ave also generate notable ridership. However, serving these locations requires significant out-of-direction travel (scheduled at 17 minutes) for passengers boarding at most other locations along the route alignment. Ridership on the route may be improved by streamlining the route, reducing out-of-direction travel, and serving these deviations with other routes in the system.

Route 011 averages approximately 12.5 boardings per revenue hour, making it among the lowest productivity routes in the EMBARK system. Productivity is highest in the outbound direction between the Downtown Transit Center and Andrews Square (20 boardings per hour) and is consistently low (1.9 – 4.8 boardings per revenue hour) for the remainder of the outbound alignment. Productivity is generally higher in the inbound direction, ranging between 4.3 and 17.2 boardings per hour, but still relatively low.

Figure 5-13 Route Map, Route 011 – 29<sup>th</sup> St Crosstown



## Schedule Adherence

Route 011 is a below average on-time performance route with 66% of trips on-time, 11% of trips early, and 23% of trips late. On-time performance is generally low throughout the alignment of the route but is particularly low in the outbound direction between the Downtown Transit Center and Andrews Square (48% late) and between Andrews Square and SE 15<sup>th</sup> St & S High Ave (39% late). In the inbound direction, on-time performance is lowest between the Reno Mini Hub and S Meridian Ave & SW 15<sup>th</sup> St (40% late). On-time performance is generally consistent throughout the morning and midday periods, worsens in the afternoon between about 3:00 p.m. and 5:00 p.m. before improving during the evening service period.

On-time performance may be improved on the route by simplifying the alignment and removing out-of-direction deviations. This reduces the number of turning movements and potential conflicts with traffics for the route. Revising the schedule for the route, particularly early in the outbound alignment, may also improve on-time performance.

## Summary

Route 011 is a high ridership, low productivity, and below average on-time performance route. The route serves several key transit dependent locations along the deviations to Andrew Square and the multi-family residential developments along SE 15<sup>th</sup> St. However, the circuitous alignment of the route results in significant out-of-direction travel and longer travel times for many passengers, making the route less convenient. Ridership and on-time performance may be improved by reducing out-of-direction travel and providing faster, simplified service. Additionally, the high ridership on the route indicates that there may be sufficient demand for transit along the Route 011 alignment to justify increased frequency. Higher frequency may also increase ridership and productivity for the route.

## ROUTE 012 – S MAY

Route 012 – S May provides service between the Downtown Transit Center and Oklahoma City Community College in south Oklahoma City. The route operates along a one-way couplet in downtown Oklahoma City, traveling south on N Hudson Ave in the outbound direction and north on N Western Ave and east on W Main St in the inbound direction. The route also operates along W Reno Ave, S Pennsylvania Ave, Exchange Ave, S Agnew Ave, SW 29<sup>th</sup> St, Newcastle Rd, S Portland Ave, SW 44<sup>th</sup> St, and S May Ave (Figure 5-14).

The alignment on SW 29<sup>th</sup> St, Newcastle Rd, S Portland Ave, and SW 44<sup>th</sup> St west of S May Ave serves several retail corridors, Woodson Park, and Roosevelt Middle School but causes out-of-direction travel and increased travel times for passengers.

Route 012 provides direct transfer opportunities with Routes 009, 011, 013, 014, 016, and 040. The route operates every 30 minutes on weekdays between 5:50 a.m. and 7:15 p.m. and hourly on weekends between 6:35 a.m. and 6:30 p.m.

### Major Destinations

- Downtown Transit Center
- City Rescue Mission
- Farmers Market
- Goodwill Outlet Store
- Stockyards City
- Economy Square Shopping Mall
- Woodson Park
- Roosevelt Middle School
- Almonte Library
- South May Shopping Center
- Oklahoma City Community College

### Ridership

Route 012 is an average ridership route, with approximately 571 average boardings per weekday. Ridership is primarily concentrated at social service locations, large apartment complexes, and several retail locations. Ridership is highest at several locations, including:

- W Reno Ave & S Shartel Ave (City Rescue Mission)
- Exchange Ave & S Youngs Blvd (Food Distribution Center)

Route 012 Characteristics		
<b>Weekday</b>		
Start Time	5:50 a.m.	
End Time	7:15 p.m.	
Average Daily Boardings	571	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	70%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	45	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:30 p.m.	
Headway (mins)	45	

- S May Ave & SW 29<sup>th</sup> St (Economy Square Mall and Route 011 transfer opportunity)
- S May Ave & SW 44<sup>th</sup> St (South May Shopping Center)
- S May Ave & SW 59<sup>th</sup> (several large multi-family housing developments)
- Oklahoma City University

Additionally, the deviation west of S May Ave serves approximately 44 passengers per day in both directions.

Route 012 averages approximately 15.3 boardings per revenue hour, making it a slightly below average productivity route in the EMBARK system. Productivity for Route 012 follows a typical pattern in both the inbound and outbound directions, with productivity highest near the beginning of the route and gradually decreasing along the alignment.

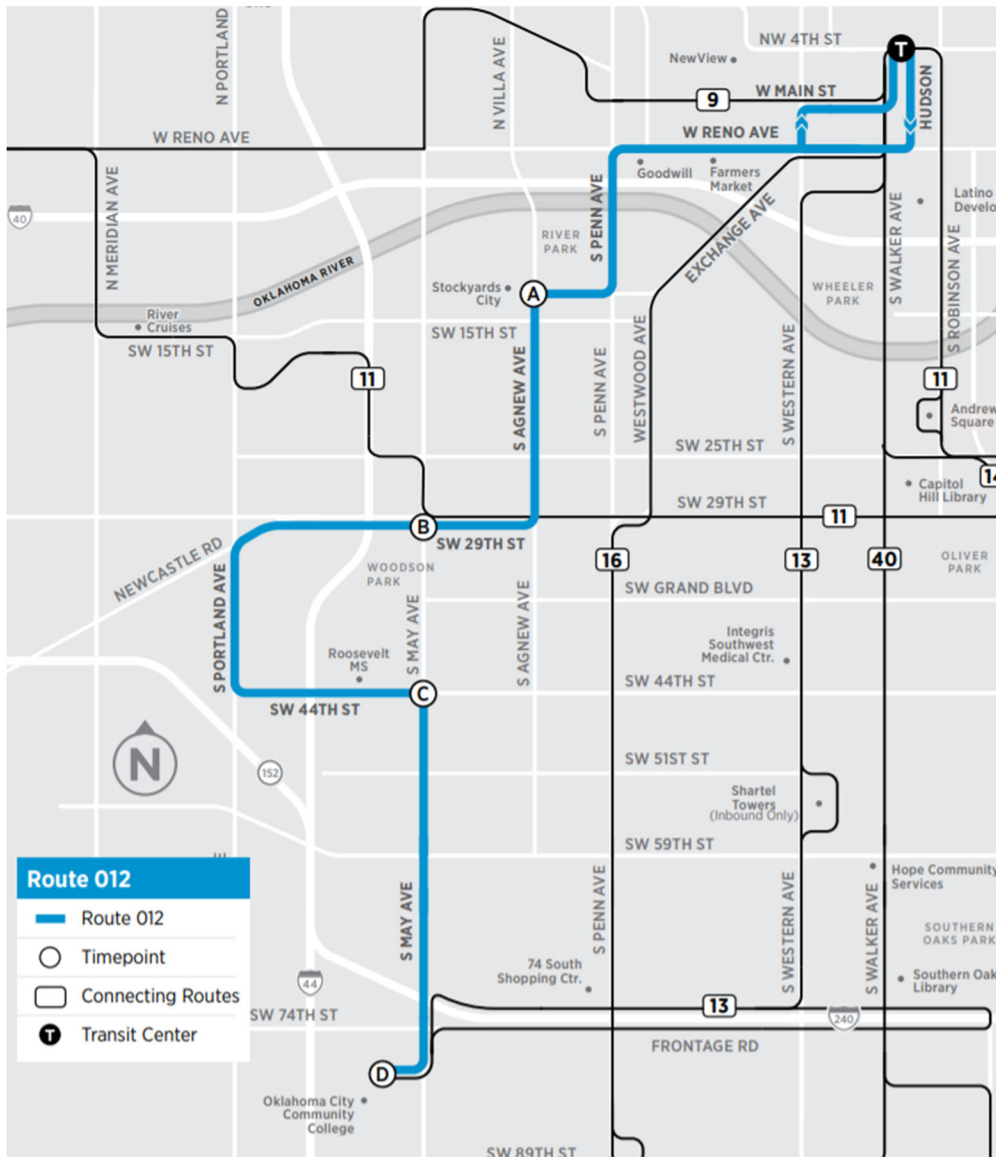
## Schedule Adherence

Route 012 is an average route in terms of on-time performance with 70% of trips on-time, 8% of trips early, and 22% of trips late. In the outbound direction, trips are most commonly late toward the beginning of the route on the segment between the Downtown Transit Center and the intersection of Exchange Ave & S Agnew Ave (43% late). In the inbound direction, trips are also most commonly late toward the beginning of the route, between Oklahoma City Community College and the intersection of S May Ave & SW 44<sup>th</sup> St (40% late) before improving along the remainder of the alignment. On-time performance is generally consistent throughout the day.

There is an opportunity to improve on-time performance by adding more time toward the beginning of the route schedule in both the inbound and outbound directions. This may reduce late arrivals early in the trip alignment and provide sufficient running time to improve on-time performance throughout the route's alignment.



Figure 5-14 Route Map, Route 012 – S May



## Summary

Route 012 is an average ridership route with average on-time performance and slightly below average productivity. The route serves several high transit propensity neighborhoods and provides direct connections to key retail and social service destinations. Given the relatively high needs areas served by this route, improving frequency to every 30 minutes on weekends would make the route more useful for passengers and potentially result in increased ridership and productivity. It would also improve the ability to transfer in downtown and anywhere along the route. There is also an opportunity to improve on-time performance by adding time to the schedule, particularly early in the alignment for both the inbound and outbound directions, or by removing the relatively low ridership deviation west of S May Ave.

## ROUTE 013 – S WESTERN/I-240 CROSSTOWN

Route 013 – S Western/I-240 Crosstown provides service between the Downtown Transit Center in downtown Oklahoma City and Oklahoma City Community College in south Oklahoma City. The route alignment (Figure 5-15) is relatively complicated and includes multiple one-way couplets and deviations. In downtown Oklahoma City, the route operates along a one-way couplet southbound on Hudson Ave and westbound on SW 4<sup>th</sup> St in the outbound direction and operating eastbound on SW 3<sup>rd</sup> St and northbound on Walker Ave in the inbound direction.

Route 013 provides north-south service on Western Ave between SW 4<sup>th</sup> St and SW 74<sup>th</sup> St. However, SW 74<sup>th</sup> St is split into two one-way streets, westbound to the north of I-240 and eastbound to the south of I-240. As such, Route 013 operations are split to the north and south of the freeway. In the outbound direction, the route operates westbound on SW 74<sup>th</sup> St between S Western Ave and S May Ave to Oklahoma City Community College. In the inbound direction, Route 013 operates westbound on SW 74<sup>th</sup> St between S May Ave and S Santa Fe Ave (directly serving the Walmart Supercenter), northbound on S Santa Fe Ave and westbound on SW 74<sup>th</sup> St to S Walker Ave.

Route 013 also deviates onto SW 52<sup>nd</sup> St, S Shartel Ave, and SW 56<sup>th</sup> St in the inbound direction only to serve Shartel Towers.

Route 013 provides direct connections to Routes 011, 012, 014, 016, and 040. The route operates every 30 minutes on weekdays between 5:35 a.m. and 7:00 p.m. and every 45 minutes on weekends between 6:35 a.m. and 6:30 p.m. Late-night service is available every 60 minutes on Route 13N between 7:00 p.m. and 12:00 a.m. which operates on a similar alignment.

### Major Destinations

- Downtown Transit Center
- INTEGRIS Southwest Medical Center
- Walker Square Shopping Center
- Shartel Towers

Route 013 Characteristics		
<b>Weekday</b>		
Start Time		5:35 a.m.
End Time		7:00 p.m.
Average Daily Boardings		476
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		--
Schedule Adherence	On Time	69%
<b>Saturday</b>		
Start Time		6:35 a.m.
End Time		6:30 p.m.
Headway (mins)		45
<b>Sunday</b>		
Start Time		6:35 a.m.
End Time		6:30 p.m.
Headway (mins)		45

- WesternView Shopping Center
- 74 South Shopping Center
- Oklahoma City Community College
- Walmart Supercenter

## Ridership

Route 013 averages approximately 476 boardings per weekday, making it a slightly below average ridership route in the EMBARK system. Ridership is generally low through downtown Oklahoma City and moderate along the SW 74<sup>th</sup> St corridor but is notably higher along the S Western Ave corridor between SW 74<sup>th</sup> St and SW 25<sup>th</sup> St. The highest ridership stops include:

- S Western Ave & SW 44<sup>th</sup> St (INTEGRIS Southwest Medical Center)
- Shartel Towers
- S Western Ave & SW 59<sup>th</sup> St (Village at Oakwood assisted living & Southpointe Apartments)
- Oklahoma City Community College
- S Western Ave & SW 70<sup>th</sup> St (WesternView Shopping Center)

Route 013 averages approximately 13.4 boardings per revenue hour, making it a below average productivity route. In the outbound direction, productivity is highest through downtown Oklahoma City (21.6 boardings per hour) due to the high boardings at the Downtown Transit Center and along S Western Ave between SW 74<sup>th</sup> St and SW 44<sup>th</sup> St (6.4 boardings per hour). In the inbound direction, productivity is highest along the same segment of S Western Ave between SW 74<sup>th</sup> St and SW 44<sup>th</sup> St (12.1 boardings per hour). The ridership and productivity patterns indicate that this segment of S Western Ave has a relatively high demand for transit.

## Schedule Adherence

Route 013 is an average on-time performance route, averaging 69% of trips on-time, 7% of trips early, and 25% of trips late. On-time performance is considerably worse in the outbound direction, with all segments of the route ranging between 34% and 40% late, compared to 11% and 19% late in the inbound direction. On-time performance is generally consistent throughout the day. Adding time to the schedule, specifically in the outbound direction, may improve on-time performance for the route.

Figure 5-15 Route Map, Route 013 – S Western/I-240 Crosstown



## Summary

Route 013 is a below average route in terms of both ridership and productivity. Service along S Western Ave between SW 44<sup>th</sup> St and SW 74<sup>th</sup> St has notably higher ridership and appears to be a key high transit demand location in the Oklahoma City area. Service on SW 74<sup>th</sup> St operates on a one-way couplet split between I-240 and may be confusing to some passengers. There may be an opportunity to improve service by streamlining this alignment to avoid this large one-way couplet and simplify the route, although much of this is driven by one-way streets.

## ROUTE 014 – SE BRYANT OR SUNNYLANE

Route 014 – SE Bryant or Sunnyslane operates between downtown Oklahoma City, south Oklahoma City, and Valley Brook. The route operates along S Walker Ave, SE 25<sup>th</sup> St, S Shields Blvd, SE 44<sup>th</sup> St, I-35, SE 66<sup>th</sup> St, Crossroads Blvd, SE 59<sup>th</sup> St, S Eastern Ave, and operates a counterclockwise terminal loop between S Bryant Ave, SE 59<sup>th</sup> St, S Sunnyslane Rd, and SE 44<sup>th</sup> St. The route alignment (Figure 5-16) includes a deviation onto I-35, SE 66<sup>th</sup> St, Crossroads Blvd, and SE 59<sup>th</sup> St to provide direct service to Plaza Mayor (formerly Crossroads Mall). Plaza Mayor is no longer a functioning mall and may not have sufficient demand to warrant this deviation.

The route operates every 45 minutes on weekdays between 5:20 a.m. and 7:39 p.m. and on weekends between 6:35 and 6:39 p.m. The route provides direct connections to Routes 011, 014, and 040. The route also operates on a shared alignment with Route 040 along S Walker Ave between SE 25<sup>th</sup> St and the Downtown Transit Center.

Route 014 Characteristics		
<b>Weekday</b>		
Start Time	5:20 a.m.	
End Time	7:39 p.m.	
Average Daily Boardings	425	
Peak Headway (mins)	45	
Off-Peak Headway (mins)	45	
Evening Headway (mins)	--	
Schedule Adherence	On Time	74%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:39 p.m.	
Headway (mins)	45	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:39 p.m.	
Headway (mins)	45	

### Major Destinations

- Downtown Transit Center
- Plaza Mayor (formerly Crossroads Mall)
- Metro Tech Bryant Campus
- Oklahoma City Union Station

### Ridership

Route 014 averages approximately 425 boardings per weekday, making it a below average ridership route. Ridership is generally low throughout the route alignment with a few stops with moderately higher ridership, including:

- S Shields Blvd & SW 44<sup>th</sup> St
- SE 44<sup>th</sup> St near I-35 (Smart Saver & Family Dollar Store)
- SE 46<sup>th</sup> St & S Sunnyslane Rd (Mosaic Apartment Homes)
- S Eastern & SE 59<sup>th</sup> St (M Food Store)

Ridership appears to be highest at large apartment complexes and retail locations like grocery stores. Additionally, the deviation to Plaza Mayor accounts for approximately 27 average daily boardings between 20 bus stops combined in the inbound and outbound directions.

Route 014 also averages approximately 16.3 boardings per revenue hour, making it an average productivity route. Productivity is generally low along throughout the route's outbound alignment, with the highest productivity near downtown Oklahoma City, due to the high ridership activity at the Downtown Transit Center, and is lowest along the deviation to Plaza Mayor. Productivity is generally higher in the inbound direction and is highest along the segment between SE 59<sup>th</sup> St & Crossroad Blvd and SE 44<sup>th</sup> St & S High Ave (19.3 boardings per hour). However, ridership is relatively low throughout this segment, with the exception of two high ridership stops before the deviation onto I-35:

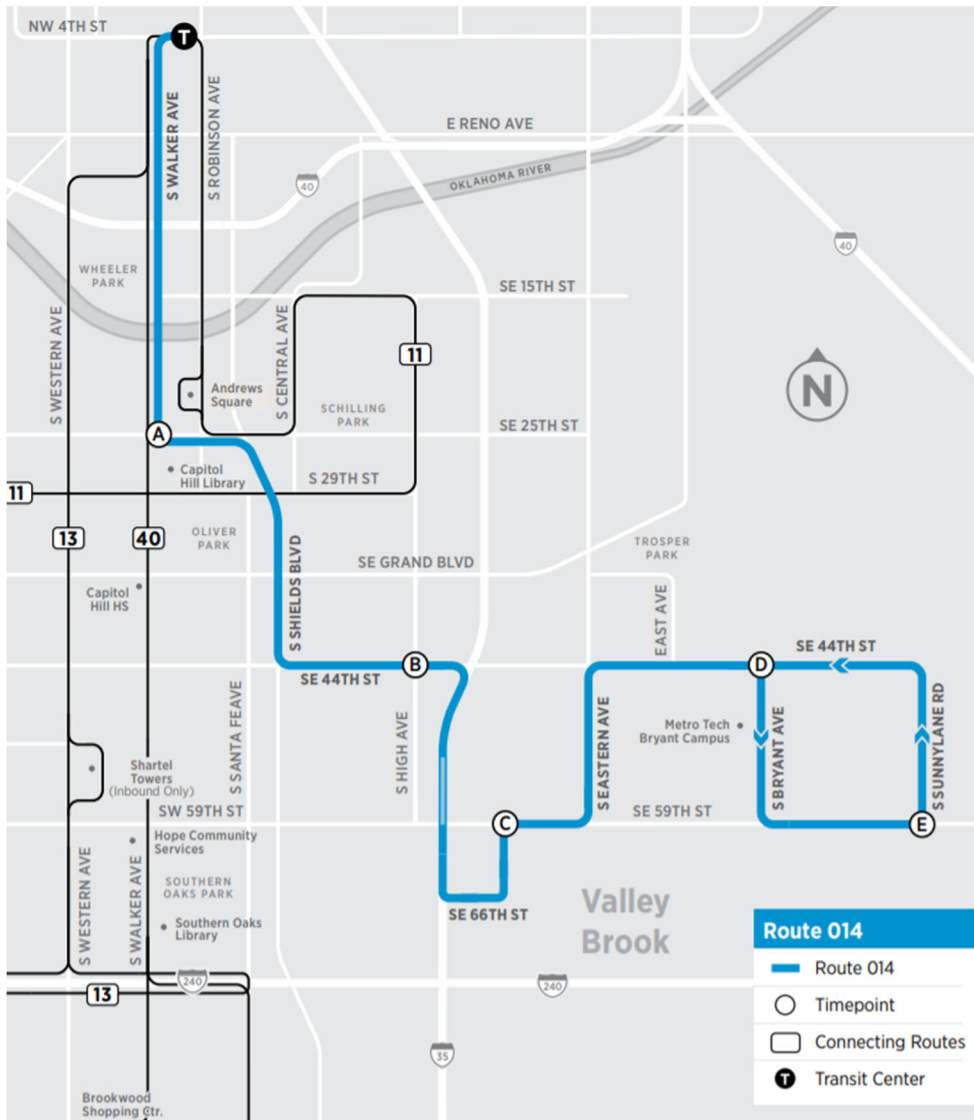
- SE 44<sup>th</sup> St & Zellner Dr – 13.4 boardings per day
- SE 44<sup>th</sup> St & I-35 – 29 boardings per day

Relatively high ridership at these two stops may increase the productivity for the entire segment. The segment of S Sunnyside Rd and SE 44<sup>th</sup> St east of S Bryant Ave, near the beginning of the inbound alignment, also has relatively high productivity (14.5 boardings per hour).

## Schedule Adherence

Route 014 is among the highest on-time performance routes in the EMBARK system, with 74% of trips on-time, 9% of trips early, and 17% of trips late. On-time performance is notably lower in the outbound direction (15%-37% late) than the inbound direction (11%-16% late). On-time performance is generally consistent throughout the day. On-time performance is lowest along the deviation to Plaza Mayor in the outbound direction and may be improved by removing this deviation and reducing potential conflicts with traffic on I-35 and the railroad. On-time performance may also be improved by adding time to the schedule in the outbound direction.

Figure 5-16 Route Map, Route 014 – SE Bryant or Sunnyslane



## Summary

Route 014 is a below average ridership route with average productivity. Ridership is concentrated around several large apartment complexes on S Sunnyslane Rd and at retail locations along the 44<sup>th</sup> St corridor. Ridership may be improved by increasing service frequency to operate every 30 minutes throughout the day, making service more convenient and easier to understand for passengers. Ridership is also relatively low on the deviation to Plaza Mayor, accounting for approximately 6% of average daily boardings, and may not be sufficiently high along this deviation to justify the additional travel time and out-of-direction travel for other passengers. Route 014 is a high on-time performance route in the EMBARK system but may still be improved by adding time to the schedule in the outbound direction and potentially removing the deviation to Plaza Mayor.

## ROUTE 015 – MIDWEST CITY

Route 015 – Midwest City provides a connection between the Downtown Transit Center in downtown Oklahoma City and Midwest City. The route operates on the I-40 and I-235 freeways between downtown Oklahoma City and Rose State College. In the outbound direction, the route operates eastbound on NW 4<sup>th</sup> St, southbound on I-235, and eastbound I-40. In the inbound direction the route operates westbound on I-40 and northbound on S Robinson Ave. Route 015 is paid for through partnerships with Midwest City and Rose State College. Changes to route alignments or service frequency would require input from funding partners.

Route 015 Characteristics		
Weekday		
Start Time	5:20 a.m.	
End Time	7:50 p.m.	
Average Daily Boardings	210	
Peak Headway (mins)	70	
Off-Peak Headway (mins)	80	
Evening Headway (mins)	--	
Schedule Adherence	On Time	68%

In Midwest City, the route serves Rose State College and Midwest City Town Center Plaza by operating on Tinker Diagonal, Hudiburg Dr, Adair Blvd, Har Dr, W Boeing Dr, and S Air Depot Blvd. The route then operates in a figure eight pattern traveling eastbound on SE 15<sup>th</sup> St, northbound on N Midwest Blvd, eastbound on NE 10<sup>th</sup> St, southbound on N Douglas Blvd, westbound on E Reno Ave, and southbound on S Air Depot Blvd (Figure 5-17).

Route 015 operates on weekdays only between 5:20 a.m. and 7:50 p.m. and with low frequency, between 70 and 80 minutes throughout the day. Route 015 provides direct connections to Routes 011, 019, and 022.

### Major Destinations

- Downtown Transit Center
- Rose State College
- Midwest City Town Center Plaza
- Midwest City Library
- Midwest City Regional Hospital

### Ridership

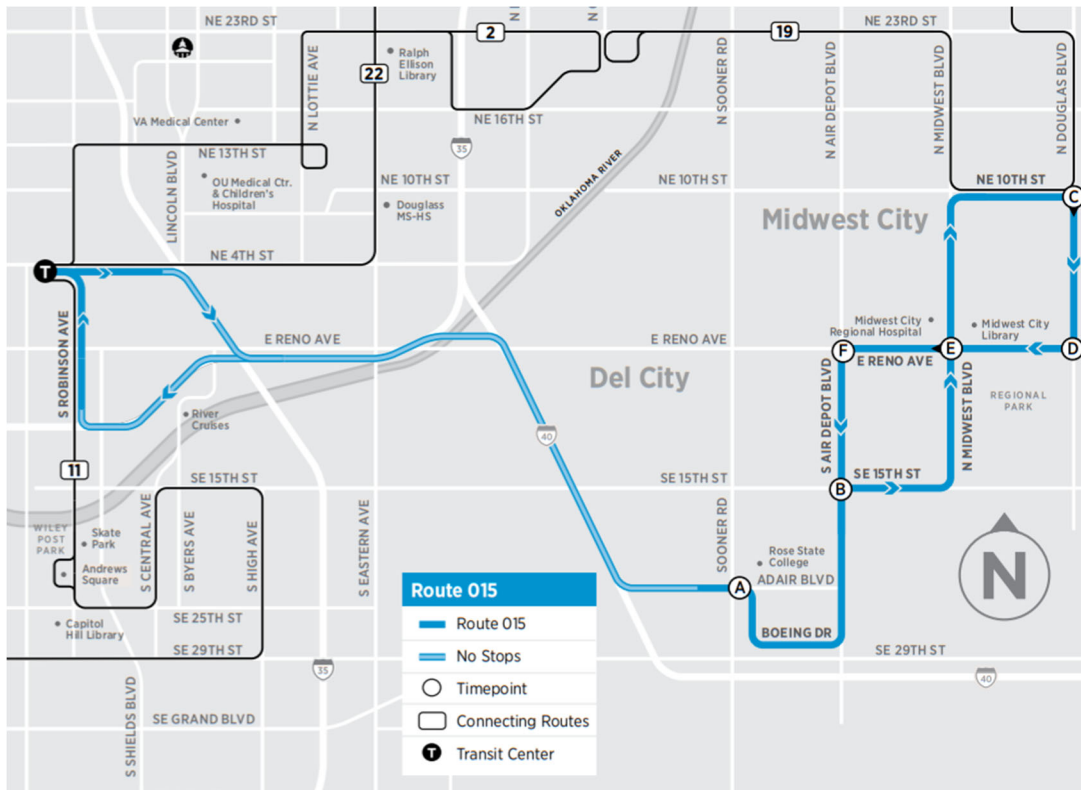
Route 015 is among the lowest ridership routes in the EMBARK system, averaging approximately 210 boardings per weekday. The route is also a below average productivity route, averaging 14.3 boardings per revenue hour. Ridership is generally low throughout the route's alignment but is highest at N Midwest Blvd & NE 10<sup>th</sup> St near several large apartment complexes (9.6 boardings per day) and S Sooner Rd & Tinker Diagonal (6.3 boardings per day).



Outbound productivity is highest near downtown Oklahoma City due to the high ridership at the Downtown Transit Center. Outside of this segment, productivity is also relatively high on the segments between:

- E Reno Ave between N Douglas Blvd and N Midwest Blvd (10.1 boardings per hour)
- SE 15<sup>th</sup> St & S Air Depot Blvd and NE 10<sup>th</sup> St & N Douglas Blvd (9.2 boardings per hour)
- E Reno Ave & N Air Depot Blvd and Rose State College (8.4 boardings per hour)

Figure 5-17 Route Map, Route 015 – Midwest City



## Schedule Adherence

Route 015 is an average route terms of on-time performance, with 68% of trips on-time, 10% of trips early, and 22% of trips late. On-time performance is lower in the inbound direction, ranging from 18%-35% late compared to 11%-29% late in the outbound direction. On-time performance is also lower on service operating through the Midwest City area than service operating on I-40 and I-235. On-time performance is generally consistent throughout the day. Adding time to the schedule, particularly in the inbound direction may also improve on-time performance.

## Summary

Route 015 is a low ridership route with below average productivity. The route operates at a low service frequency, between 70-80 minutes, on weekdays only. Typically service this infrequent provides coverage, but not convenient service. Route 015 also operates a circuitous, figure eight pattern through Midwest City that requires longer travel times and out-of-direction travel for some riders. These two factors may make the route less attractive to some riders. Ridership may be improved by increasing service frequency to operate at least hourly and by simplifying the route alignment to reduce the large loops.

Route 015 is average in terms of on-time performance, with the lowest on-time performance throughout the Midwest City area. Simplifying the route alignment may also improve on-time performance by reducing turning movements. Adding time to the schedule in the inbound direction may also improve on-time performance for the route. Route 015 is paid for through partnerships with Midwest City and Rose State College. Changes to route alignments or service frequency would require input from funding partners.

## ROUTE 016 – S PENN

Route 016 – S Penn provides service between downtown Oklahoma City and south Oklahoma City via the Pennsylvania Ave corridor. The route operates along a one-way couplet in downtown Oklahoma City, traveling eastbound on SW 3<sup>rd</sup> St and northbound on S Walker Ave in the inbound direction and traveling southbound on N Hudson Ave and westbound on W Reno St in the outbound direction. Outside of this couplet, the route operates along Exchange Ave, Westwood Ave, Kentucky Ave, SW 29<sup>th</sup> St, and S Pennsylvania Ave (Figure 5-18). Route 016 also operates a clockwise terminal loop around S Pennsylvania Ave, SW 87<sup>th</sup> St, S Kentucky Ave, and SW 89<sup>th</sup> St.

Route 016 provides direct connections to Routes 011, 012, 013, 014, and 040. The route operates every 30 minutes on weekdays between 6:35 a.m. and 7:12 p.m. and hourly on weekends between 6:35 a.m. and 6:10 p.m.

### Major Destinations

- Downtown Transit Center
- Oklahoma River Cruises
- Will Rogers Courts
- Parkview Village Homes
- U.S. Grant High School
- Walnut Square shopping mall
- 74 South shopping mall
- Hillcrest Shopping Center
- Grant Square Shopping Center

### Ridership

Route 016 is a below average ridership route in the EMBARK system, averaging approximately 403 boardings per weekday. Ridership is generally low along the length of the route with a few key high ridership stops, including:

- S Pennsylvania Ave & SW 60<sup>th</sup> St (Hillcrest Shopping Center)
- S Pennsylvania Ave & SW 44<sup>th</sup> St (Grant Square Shopping Center)

Route 016 Characteristics		
<b>Weekday</b>		
Start Time	6:35 a.m.	
End Time	7:12 p.m.	
Average Daily Boardings	403	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	74%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:10 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:10 p.m.	
Headway (mins)	60	

- S Kentucky Ave & SW 22<sup>nd</sup> St (Parkview Village Homes)
- Will Rogers Courts

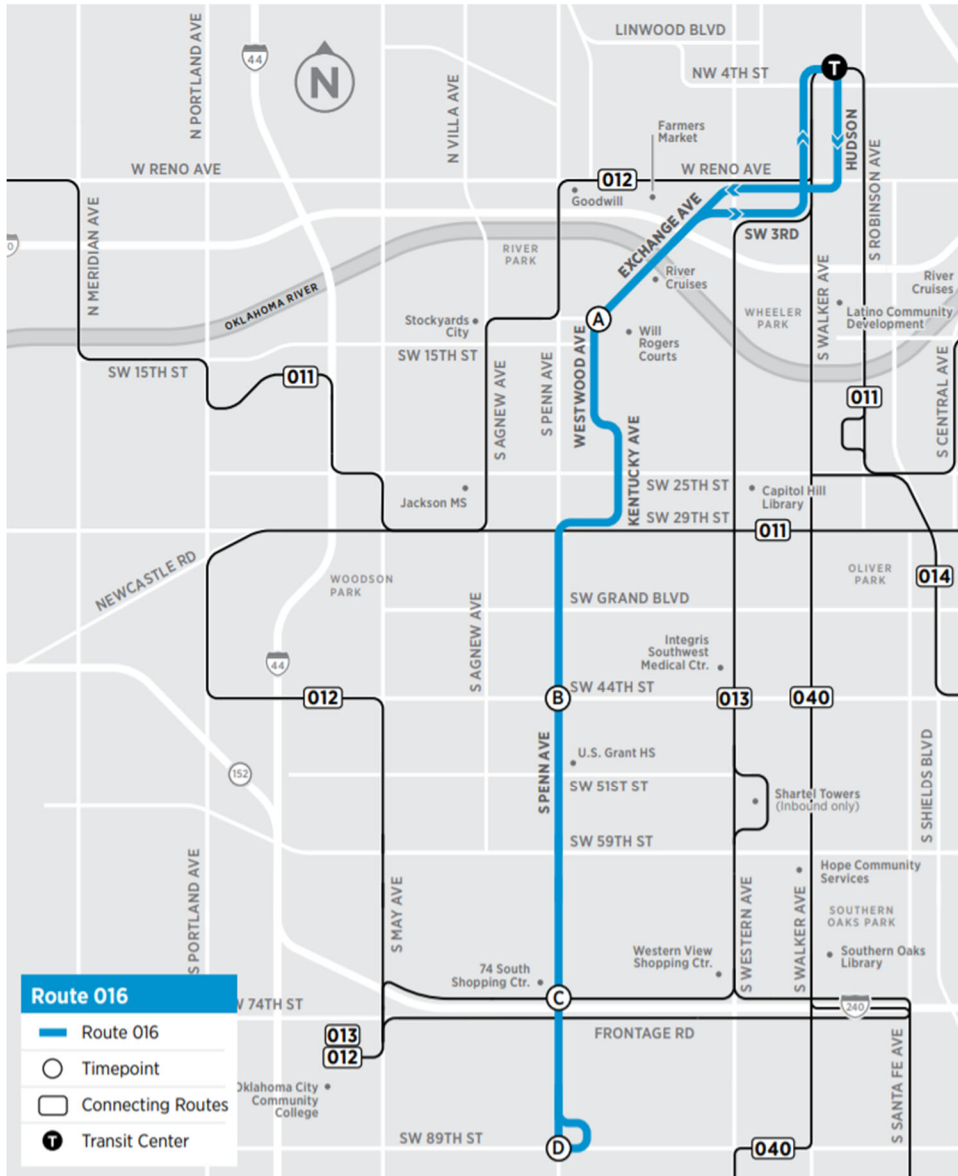
Ridership for Route 016 appears to align most closely with large apartment complexes, low-income housing developments, and retail destinations along the Pennsylvania Ave corridor. The route currently lacks a strong anchor destination at its southern terminus and ridership may be improved with a stronger, destination at the end of the alignment.

Route 016 is an average productivity route in the EMBARK system, averaging 17.7 boardings per revenue hour. In the outbound direction, productivity follows a typical pattern for transit routes, with productivity being the highest near downtown Oklahoma City and gradually decreasing along the route's alignment. In the inbound direction, productivity is highest between SW 74<sup>th</sup> St and Exchange Ave (15.1 – 17.5 boardings per hour).

## **Schedule Adherence**

Route 016 is an above average on-time performance route, with 74% of trips on-time, 8% of trips early, and 19% of trips late. On-time performance is generally consistent throughout the day with lower on-time performance occurring sporadically, around 8:00 a.m. and 2:30 p.m. On-time performance is generally consistent along the route alignment in both the inbound and outbound directions, ranging from 19%-29% late in the outbound direction and from 17%-29% late in the inbound direction. On-time performance may be improved by adding time to the schedule.

Figure 5-18 Route Map, Route 016 – S Penn



## Summary

Route 016 is a relatively low ridership route with average productivity in the EMBARK system. The core ridership market for the route includes low-income residential and retail developments along the S Pennsylvania Ave corridor. The Will Rogers Courts and Parkview Village Homes apartment complex specifically rank among the highest ridership stops on Route 016. There may be an opportunity to improve ridership by identifying a stronger anchor destination at the southern terminus of the route. Route 016 is an above average on-time performance route and has consistent on-time performance along the length of the corridor. There may be potential to further improve on-time performance by adding time to the route’s schedule.

## ROUTE 018 – LINCOLN

Route 018 – Lincoln provides north-south service on the Lincoln Blvd corridor, connecting downtown Oklahoma City, the State Capitol campus area, and northeast Oklahoma City. The route operates along NE 4<sup>th</sup> St, N Lincoln Blvd, I-44, and operates a counterclockwise terminal loop around N Kelley Ave, E Britton Rd, Broadway Ext Service Rd, and NE 63<sup>rd</sup> St, as shown in Figure 5-19.

The route provides direct connections to Routes 002, 003, 022, 023, and 024. Route 018 operates hourly service on weekdays only between 5:35 a.m. and 6:35 p.m. The route does not currently operate on weekends. The FY2022 budget includes improvements to Route 018 that would allow the route to operate with 30 minute service frequency on weekdays and hourly service on weekends.

Route 018 Characteristics		
Weekday		
Start Time	5:35 a.m.	
End Time	6:35 p.m.	
Average Daily Boardings	212	
Peak Headway (mins)	60	
Off-Peak Headway (mins)	60	
Evening Headway (mins)	--	
Schedule Adherence	On Time	72%

### Major Destinations

- Downtown Transit Center
- OU Health – University of Oklahoma Medical Center
- Oklahoma History Center
- Oklahoma State Capitol
- Red Rock Behavioral Health Services
- National Guard Training Institute
- McBride Orthopedic Hospital

### Ridership

Route 018 is among the lowest ridership routes in the EMBARK system, averaging approximately 212 boardings per weekday. Ridership is generally low throughout the route’s alignment but is highest along the Lincoln Ave corridor between the State Capitol and NE 50<sup>th</sup> St. The highest ridership stops include:

- The State Capitol
- Red Rock Behavioral Health Services
- OU Health

Ridership is generally low along the E Britton Rd and Broadway Ext Service Rd segments. There may be an opportunity to remove the service on these segments and streamline the route alignment.

Route 018 is an average productivity route in the EMBARK system, averaging approximately 17.8 boardings per revenue hour. Productivity in the outbound direction follows a typical pattern with productivity being the highest near downtown and gradually decreasing along the route alignment. In the inbound direction productivity is highest along NE 63<sup>rd</sup> St (6.4 boardings per hour) and along N Lincoln Blvd between NW 50<sup>th</sup> St and the State Capitol (21.8 boardings per hour).

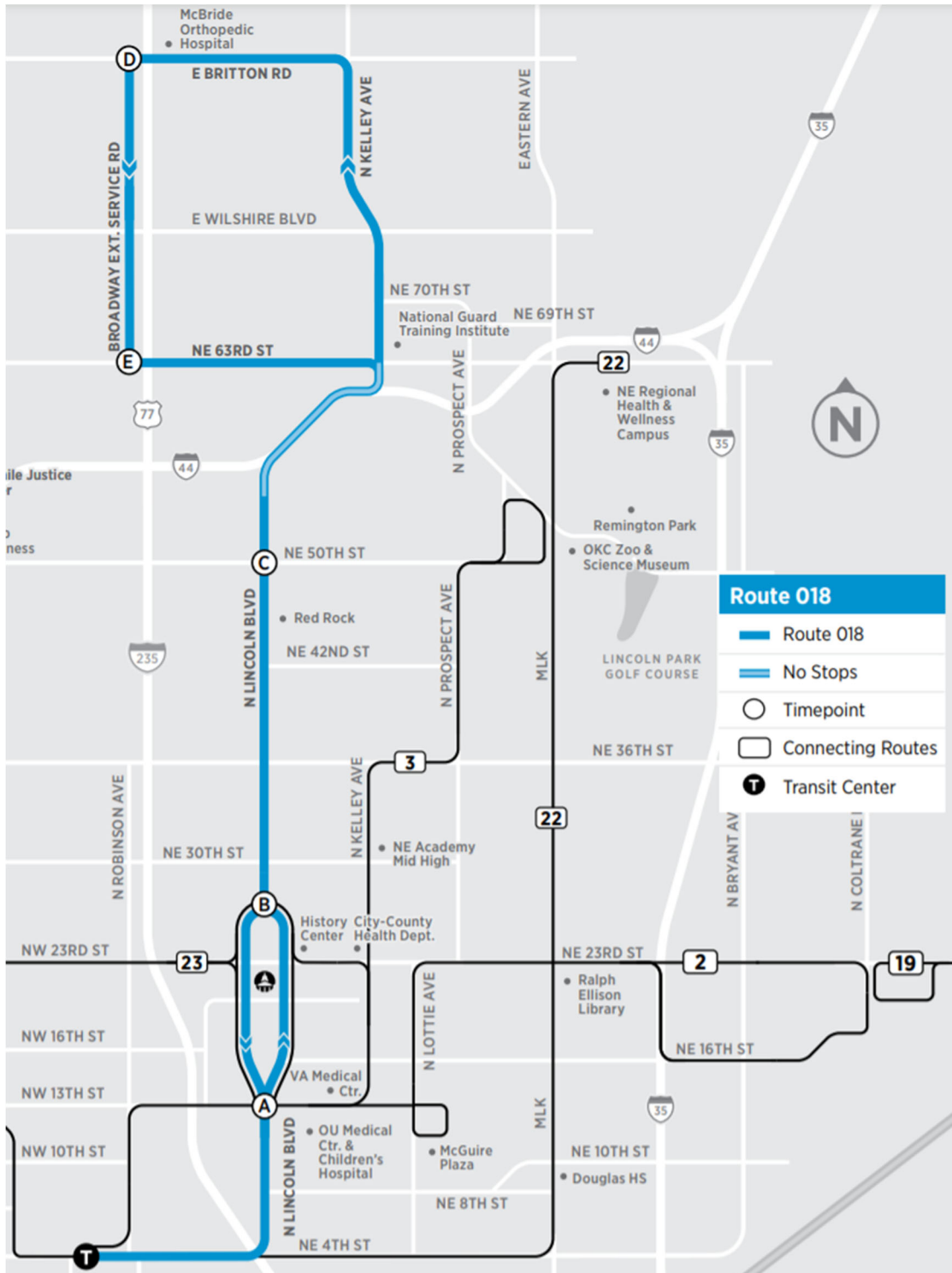
## **Schedule Adherence**

Route 018 is an average on-time performance in the EMBARK system, with 72% of trips on-time, 8% of trips early, and 20% of trips late. On-time performance is generally consistent across the route alignment in both the inbound and outbound direction and throughout the day.

## **Summary**

Route 018 is a low ridership, average productivity route in the EMBARK system. Ridership is generally low throughout the route's alignment, particularly along E Britton Rd and Broadway Ext Service Rd. Ridership may be increased by improving service frequency to operate every 30 minutes rather than every hour, particularly along N Lincoln Blvd south of NW 50<sup>th</sup> St where productivity is generally higher than other segments of the route. Improving frequency to every 30 minutes is scheduled to occur in August 2021. On-time performance is average on Route 018.

Figure 5-19 Route Map, Route 018 – Lincoln





## ROUTE 019 – SPENCER

Route 019 – Spencer operates between the Skyview Nursing Center located near N Coltrane Rd & NE 23<sup>rd</sup> St in east Oklahoma City and the Mary Mahoney Memorial Health Center in Spencer. The route makes several deviations to provide direct service to Star Spencer High School, Walmart, and several large apartment complexes located on N Midwest Blvd, as shown in Figure 5-20. The route operates along NE 23<sup>rd</sup> St, N Midwest Blvd, NE 10<sup>th</sup> St, N Douglas Blvd, Spencer Rd, and NE 36<sup>th</sup> St.

Route 019 also operates counterclockwise terminal loops at both the eastern and western termini of the route. At the western terminus, the route operates on NE 23<sup>rd</sup> St, N Coltrane Rd, NE 20<sup>th</sup> St, and Peachtree Ave. At the eastern terminus, the route operates along NE 36<sup>th</sup> St, N Hiwassee Rd, 39<sup>th</sup> St, and Adair St. Route 019 is partially funded through a partnership with Oklahoma County, changes to route frequency and alignment may require input from funding partners.

Route 019 is one of only two routes that does not serve the Downtown Transit Center, along with Route 023. The route provides direct connections to Routes 002 and 015. The route operates hourly service on weekdays between 5:35 a.m. and 7:32 p.m. with a gap in service between 12:32 p.m. and 3:32 p.m.

Route 019 Characteristics		
Weekday		
Start Time	5:35 a.m.	
End Time	7:32 p.m.	
Average Daily Boardings	66	
Peak Headway (mins)	60	
Off-Peak Headway (mins)	60	
Evening Headway (mins)	--	
Schedule Adherence	On Time	58%

### Major Destinations

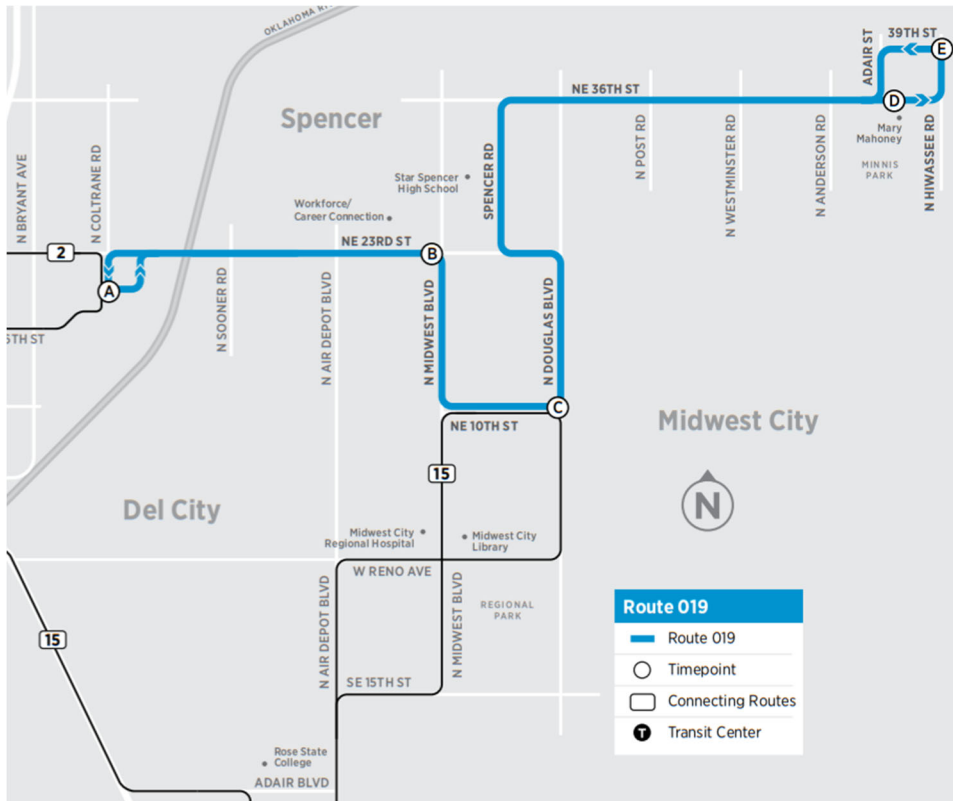
- Skyview Nursing Center
- Mary Mahoney Memorial Health Center
- Fred Factory Garden Apartments
- Star Spencer High School
- Walmart Supercenter

### Ridership

Route 019 is the lowest ridership route in the EMBARK system, averaging approximately 66 boardings per weekday. The low ridership on this route is likely due to several factors, including low service frequency, inconsistent service span throughout the day, and a required transfer to reach downtown Oklahoma City. The development patterns along the route are also generally low and non-transit supportive. Ridership is generally low across the length of the route. The highest ridership stops include Fred Factory Garden Apartments, N Coltrane Rd & NE 20<sup>th</sup> St, Walmart.

Route 019 is also the lowest productivity route in the EMBARK system, averaging 5.9 boardings per revenue hour.

Figure 5-20 Route Map, Route 019 – Spencer



## Schedule Adherence

Route 019 is the second lowest on-time performance route in the system, with 58% of trips on-time, 7% of trips early, and 36% of trips late. On-time performance is highest in the morning and afternoon peak periods but is relatively consistent throughout the day. On-time performance is generally consistent across segments of the route and may be improved by adding time to the schedule, particularly in the westbound direction.

## Summary

Route 019 is the lowest ridership and productivity route in the EMBARK system (excluding express and night services) but serves several key destinations including a low-income housing development, health center, and access to retail and grocery shopping. Ridership may improved by providing service across a consistent span throughout the day, improving service frequency, and providing direct service to downtown Oklahoma City. Route 019 is a low on-time performance route and could be improved by adding time to the schedule, particularly in the westbound direction. Route 019 is partially funded through a partnership with Oklahoma County, changes to route frequency and alignment may require input from funding partners.

## ROUTE 022 – MARTIN LUTHER KING

Route 022 – Martin Luther King provides direct service between the Downtown Transit Center in downtown Oklahoma City and the Northeast Regional Health & Wellness Campus in northeast Oklahoma City. The route provides bi-directional service along NE 4<sup>th</sup> St, N Martin Luther King Ave, and NE 63<sup>rd</sup> St (Figure 5-21).

Route 022 operates every 30 minutes between 5:35 a.m. and 7:05 p.m. and hourly between 7:05 p.m. and 12:00 a.m. on weekdays. The route also operates hourly on weekends between 6:35 a.m. and 6:03 p.m. Route 022 provides direct connections to Routes 002, 003, and 018.

### Major Destinations

- Downtown Transit Center
- Douglass High School
- Ralph Ellison Library
- Metro Tech Spring Lake Campus
- Science Museum and Oklahoma City Zoo
- Remington Park
- NE Regional Wealth & Wellness Campus

Route 022 Characteristics		
<b>Weekday</b>		
Start Time	5:35 a.m.	
End Time	12:00 a.m.	
Average Daily Boardings	458	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	60	
Schedule Adherence	On Time	77%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:03 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:03 p.m.	
Headway (mins)	60	

### Ridership

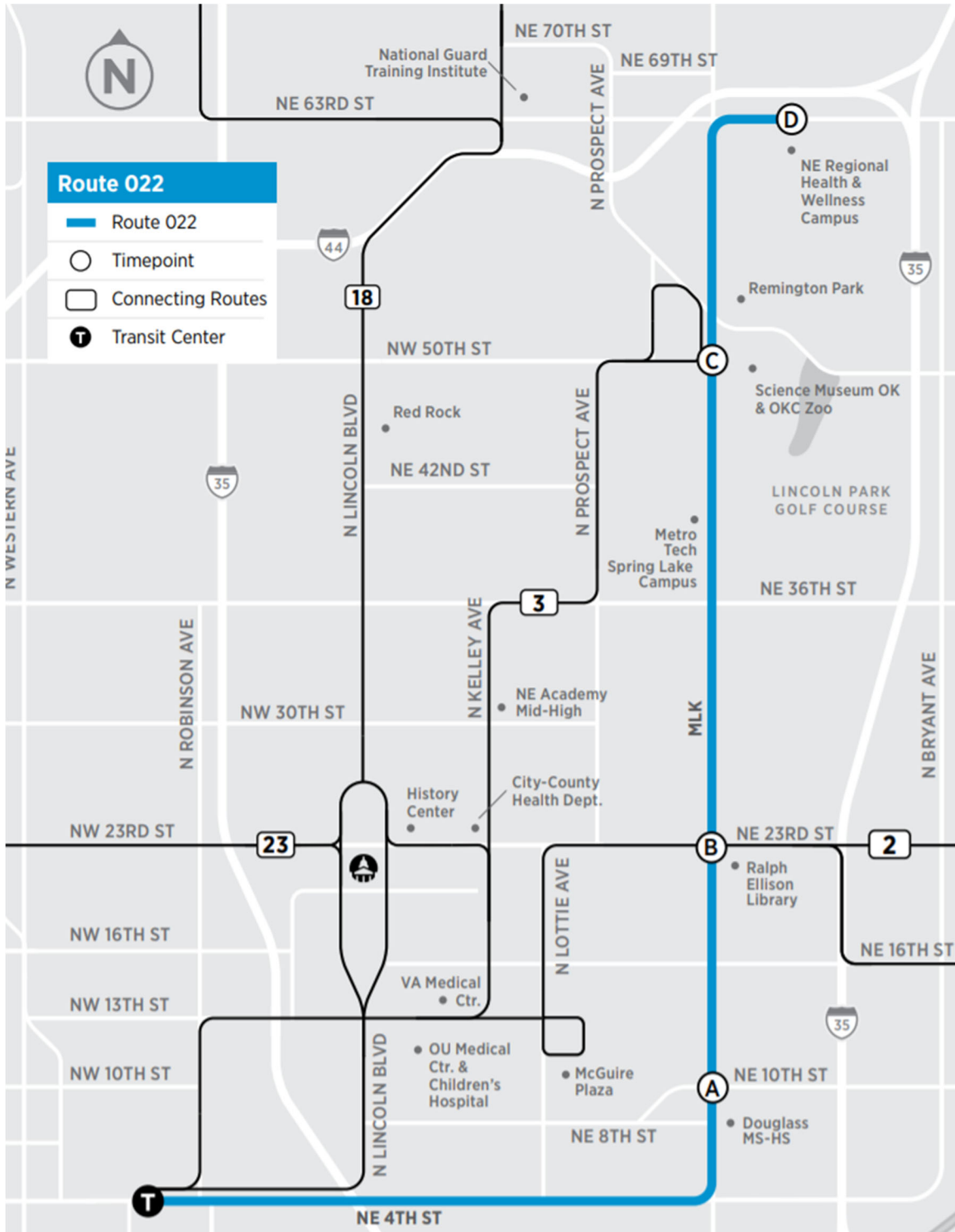
Route 022 is a slightly below average ridership route in the EMBARK system, averaging approximately 458 boardings per weekday. Ridership is relatively low along the NE 4<sup>th</sup> St segment and highest along the Martin Luther King Ave segment, particularly south of NE 26<sup>th</sup> St. The highest ridership stops on the route include:

- Remington Park
- N Martin Luther King Ave & NE 23<sup>rd</sup> St (transfer opportunity with Route 002)
- Kingwood Skilled Nursing & Therapy
- Wildewood Skilled Nursing & Therapy
- Douglass High School

Route 022 is also a slightly below average productivity route, averaging 16.0 boardings per revenue hour. Outbound productivity is highest near downtown Oklahoma City and gradually decreases along the route alignment. The same is generally true for the

inbound direction, except for the segment of N Martin Luther King Ave between NE 23<sup>rd</sup> St and NE 8<sup>th</sup> St, which is the highest productivity segment in the inbound direction (16.0 boardings per hour).

Figure 5-21 Route Map, Route 022 – Martin Luther King



## Schedule Adherence

Route 022 has the best on-time performance in the EMBARK system, with 77% of trips on-time, 14% of trips early, and 9% of trips late. On-time performance is generally consistent throughout the day. There is little room for improvement in on-time performance for this route.

## Summary

Route 022 is a slightly below average ridership and productivity route. Ridership is highest along the N Martin Luther King Ave corridor, particularly south of NE 26<sup>th</sup> St and near Remington Park and both the Wildewood and Kingwood Skilled Nursing & Therapy facilities. Ridership may be increased by improving service frequency along the high ridership segments of N Martin Luther King Ave. However, there may not be sufficient demand for transit to warrant higher frequency service across the entire alignment of Route 022. The route also has the highest on-time performance in the EMBARK system.

## ROUTE 023 – 23<sup>RD</sup> ST CROSSTOWN

Route 023 – 23<sup>rd</sup> St Crosstown provides east-west service between the Reno Mini Hub in west Oklahoma City and the State Capitol and OU Health area, primarily operating along the 23<sup>rd</sup> St corridor. Route 023 is one of two routes that do not serve the Downtown Transit Center. Route 023 operates along N Rockwell Ave, NW 16<sup>th</sup> St, N MacArthur Blvd, and NW 23<sup>rd</sup> St, as shown in Figure 5-22. The route also operates two terminal loops at the eastern and western termini. At the western terminus, the route operates a clockwise loop around W Reno Ave, Greenfield Center Dr, SW 3<sup>rd</sup> St, and N Rockwell Ave. At the eastern terminus, the route operates a counterclockwise loop around Lincoln Blvd, NE 13<sup>th</sup> St, N Kelley Ave, and NE 23<sup>rd</sup> St.

The route provides direct connections to Routes 002, 003, 005, 007, 008, 009, 010, 011, 018, and 038. The route operates every 30 minutes on weekdays between 5:50 a.m. and 7:20 p.m. and every 60 minutes on weekends between 5:50 a.m. and 6:50 p.m.

### Major Destinations

- Oklahoma State Capitol
- OU Health – University of Oklahoma Medical Center
- City-County Health Department
- Oklahoma City University
- Shepherd Mall
- Reno Mini Hub
- Francis Tuttle Tech Center

### Ridership

Route 023 is the 3<sup>rd</sup> highest ridership route in the EMBARK system and the highest ridership crosstown route, averaging approximately 885 boardings per weekday. Ridership is generally high throughout the alignment of Route 023 and is notably higher at transfer locations with north-south routes and a few other high ridership stops, including:

Route 023 Characteristics		
<b>Weekday</b>		
Start Time	5:00 a.m.	
End Time	7:20 p.m.	
Average Daily Boardings	885	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	57%
<b>Saturday</b>		
Start Time	5:50 a.m.	
End Time	6:50 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	5:50 a.m.	
End Time	6:50 p.m.	
Headway (mins)	60	

- OU Health – University of Oklahoma Medical Center
- Oklahoma State Capitol
- N Robinson Ave
- N Lee Ave
- N Classen Blvd (transfer opportunity with Route 005)
- Shepherd Mall
- N May Ave (transfer opportunity with Route 007)
- N Portland Ave (transfer opportunity with Route 010)
- N Sterling Ave
- N Purdue St
- N MacArthur Blvd
- N Rockwell Ave & NW 16<sup>th</sup> St
- Reno Mini Hub

In addition to the key transfer locations, some of these high ridership stops include retail destinations, employment hubs, and large multi-family residential developments. Route 023 appears to serve a large market for transit across the Oklahoma City area. Ridership on Route 023 may be increased by improving service frequency to operate every 15 minutes. This would improve transfer timing with other routes and reduce the potential wait times.

Route 023 is an average productivity route, averaging approximately 16.5 boardings per revenue hour. Productivity is moderate to high throughout the length of the route's alignment and is highest near the Reno Mini Hub in the eastbound direction (23.7 boardings per hour) and near OU Health in the westbound direction (23.3 boardings per hour).

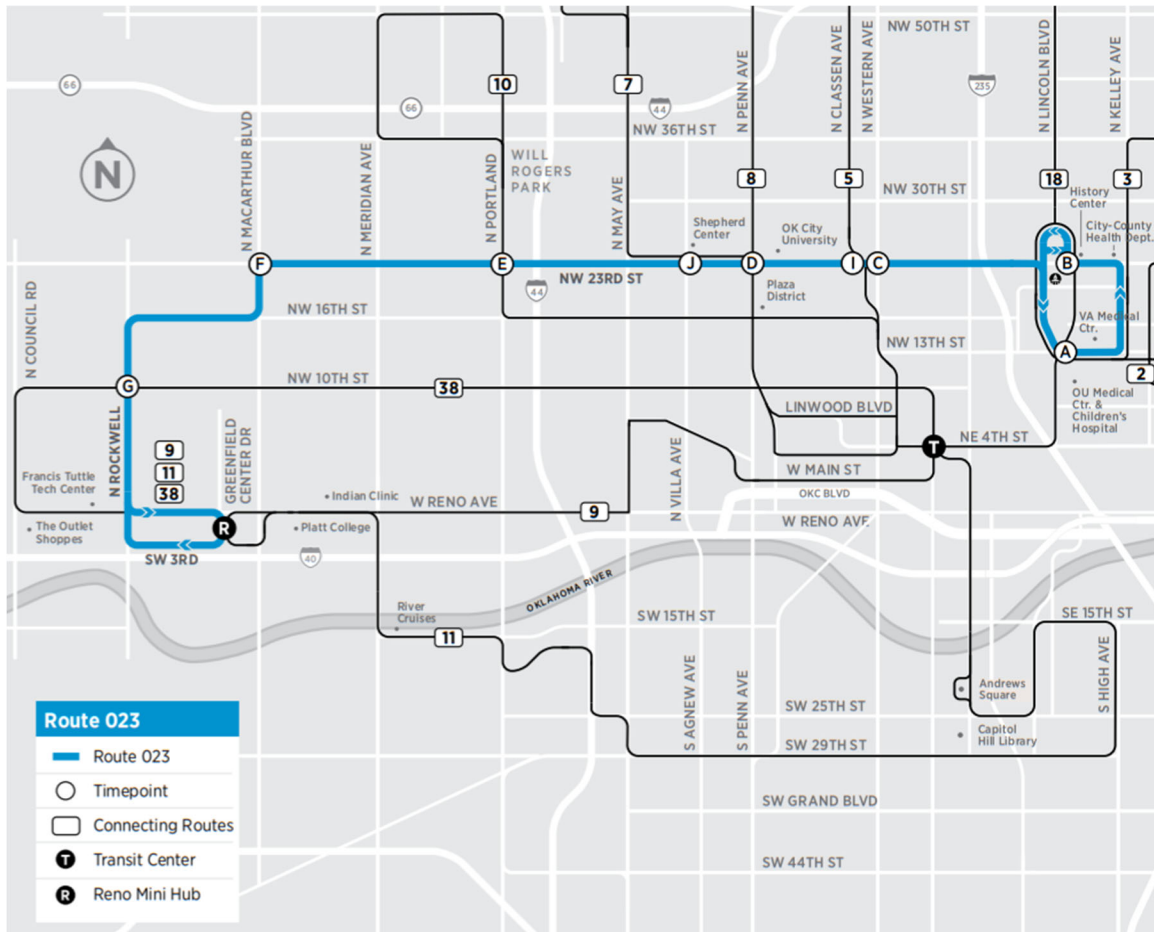
## Schedule Adherence

Route 023 has the lowest on-time performance in the EMBARK system, with 57% of trips on-time, 8% of trips early, and 36% of trips late. On-time performance is consistently low across the route alignment and is generally lower in the westbound direction. On-time performance is also lower in the westbound direction along NW 23<sup>rd</sup> St between N Portland Ave and N Youngs Blvd and the eastbound direction between the Reno Mini Hub and NW 23<sup>rd</sup> St & N MacArthur Blvd. On-time performance is lowest in the midday period and the afternoon peak period, between 10:00 a.m. – 11:00 a.m. and between 4:00 p.m. – 6:00 p.m. In August 2020, frequency on Route 023 was reduced from 25 minutes to 30 minutes to improve on-time performance and transition the route to clockface headways.

Given the severity of the on-time performance issues with Route 023, a series of strategies would be necessary to achieve significant improvements in on-time performance. Potential strategies may include adding time to schedules or capital

improvements like transit signal priority, bus only lanes, and queue jumps to reduce conflicts and delays associated with traffic congestion.

Figure 5-22 Route Map, Route 023 – 23<sup>rd</sup> St Crosstown



## Summary

Route 023 is a core high ridership route in the EMBARK system providing east-west crosstown service between OU Health, the State Capitol, and the Reno Mini Hub. Route 023 is the 3<sup>rd</sup> highest route in the system and may have sufficient ridership to justify increased service frequency to operate every 15 minutes. This frequency improvement would better facilitate transfers with north-south routes, reducing transfer wait times and making transfers more convenient. Route 023 is also the lowest on-time performance route in the EMBARK system. A series of potential improvements would be necessary to improve on-time performance. These improvements include strategies like adding time to schedules and capital improvements to reduce conflicts with traffic, including queue jumps, transit signal priority, and bus only lanes.



## ROUTE 024 – NORMAN

Route 024 is an express route operating between downtown Oklahoma City, OU Health, the State Capitol, and the City of Norman. The route operates a relatively circuitous alignment through the downtown Oklahoma City area, serving several employment hubs and operates along the I-35 corridor to a park-and-ride lot in north Norman, downtown Norman, the University of Oklahoma, and Brooks Street Transfer Station. Route 024 provides direct connections to several routes in both the EMBARK Oklahoma City and EMBARK Norman networks, including 002, 003, 008, 023, 110, 111, 112, 120, and 121.

Route 024 operates nine round trips per day with somewhat irregular frequencies between 5:30 a.m. and 7:16 p.m. Route 024 was previously operated by Cleveland Area Rapid Transit (CART), housed within the University of Oklahoma.

### Major Destinations

- Downtown Transit Center
- OU Health – University of Oklahoma Medical Center
- Oklahoma State Capitol
- Homeland Park-and-Ride
- Downtown Norman
- University of Oklahoma
- Brooks Street Transfer Station

### Ridership

Route 024 averages approximately 48 boardings per weekday, with the highest ridership stops including:

- Brooks Street Transfer Station
- Downtown Transit Center
- Homeland Park-and-Ride
- Robinson Ave & NW 4<sup>th</sup> St
- Robinson Ave & NW 7<sup>th</sup> St
- Norman High School

Productivity for express routes like Route 024 are typically shown as boardings per trip, rather than boardings per revenue hour, to account for the long segments without stops that would lower boardings per revenue hour. Route 024 has low productivity, averaging 5.3 boardings per trip. This is a low level of utilization for an express service. Ridership may be improved by providing faster, more direct service between Norman and Oklahoma City by removing deviations to other locations and focusing service between the Downtown Transit Service, the Homeland Park-and-Ride, downtown Norman and OU.

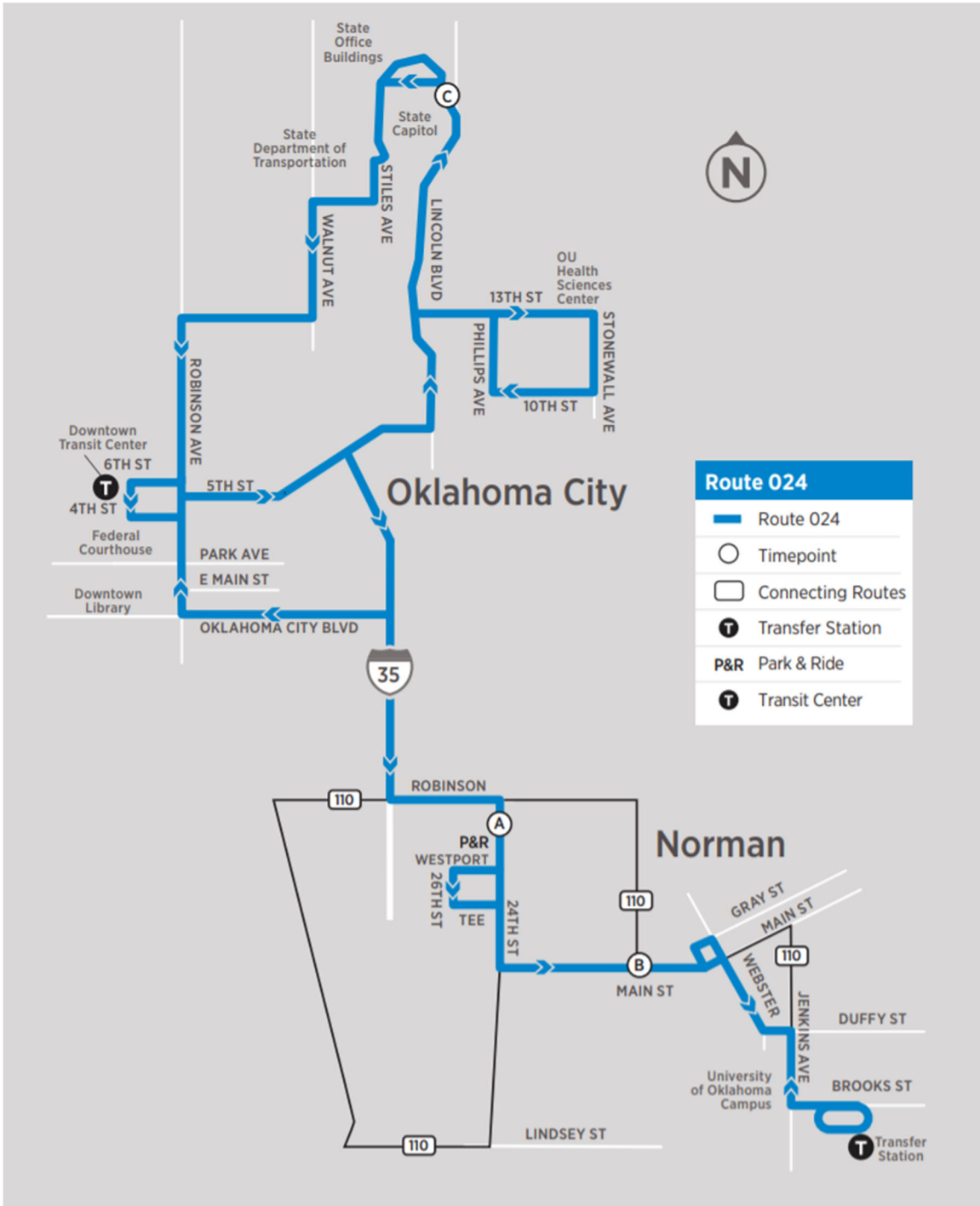
## Schedule Adherence

On-time performance is high along the segments of Route 024 operating along I-35 and is lower on the segments operating through downtown Norman and downtown Oklahoma City, specifically in the outbound direction traveling toward the City of Norman. Adding time to the schedule for these segments operating within the cities may improve on-time performance for the route.

## Summary

Route 024 provides weekday only express service between Oklahoma City and the City of Norman, operating nine round trips throughout the day at irregular frequencies. The route has low ridership and productivity, averaging approximately 48 boardings per weekday and 5.3 boardings per trip. Ridership and productivity on Route 024 may be improved by making the service faster and more direct. This could be achieved by removing local deviations throughout Oklahoma City and Norman to reduce travel times and out-of-direction travel. The route may also be improved by adding later evening service, and operating at more consistent, clockface service frequency.

Figure 5-23 Route Map, Route 024 – Norman



## ROUTE 038 – 10<sup>TH</sup> ST CROSSTOWN

Route 038 – 10<sup>th</sup> St Crosstown provides east-west crosstown service between the Downtown Transit Center and the Reno Mini Hub, primarily operating along the 10<sup>th</sup> St corridor. The route operates along NW 10<sup>th</sup> St, N Council Rd, and W Reno Ave and includes service on two one-way couplets at the route’s eastern and western termini. Near the Downtown Transit Center, the route operates southbound on N Walker Ave in the inbound direction and northbound on N Hudson Ave in the outbound direction. Near the Reno Mini Hub, Route 038 operates eastbound on W Reno Ave in the outbound direction and operates westbound on SW 3<sup>rd</sup> St in the inbound direction.

Route 038 provides direct connections to Routes 005, 007, 008, 009, 010, 011, and 023. The route operates every 30 minutes on weekdays between 5:35 a.m. and 7:30 p.m. and every 60 minutes on weekends between 6:35 a.m. and 6:32 p.m.

### Major Destinations

- Downtown Transit Center
- SSM Health St. Anthony Hospital
- Salvation Army Center of Hope
- OKC Fairgrounds
- Oklahoma State University – Oklahoma City Campus
- OKC Outlets
- Francis Tuttle Tech Center
- Westgate Marketplace
- Reno Mini Hub

### Ridership

Route 038 is the 4<sup>th</sup> highest ridership route in the EMBARK system, averaging approximately 827 boardings per weekday. Ridership is high throughout the route alignment, particularly along NW 10<sup>th</sup> St between N Council Rd and N MacArthur Blvd in west Oklahoma City. Other high ridership stops include:

- NW 10<sup>th</sup> St & N Pennsylvania Ave (transfer opportunity with Route 008)
- NW 10<sup>th</sup> St & N May Ave (Grocery store and OKC Fairgrounds)
- NW 10<sup>th</sup> St & N Meridian Ave

Route 038 is also the 4<sup>th</sup> highest productivity route in the EMBARK system, averaging approximately 22.4 boardings per revenue hour. Productivity is lowest in the outbound direction along the segment of NW 10<sup>th</sup> St between N Pennsylvania Ave and N Portland

Route 038 Characteristics		
<b>Weekday</b>		
Start Time	5:35 a.m.	
End Time	7:30 p.m.	
Average Daily Boardings	827	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	75%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:32 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:32 p.m.	
Headway (mins)	60	

Ave but increases throughout the corridor west of N Portland Ave. Productivity follows a typical pattern in the inbound direction, with the highest productivity near the Reno Mini Hub and along the westernmost segments of NW 10<sup>th</sup> St. Inbound productivity gradually decreases throughout the alignment as it gets closer to downtown Oklahoma City.

The high ridership and productivity on Route 038 indicate that there may be sufficient demand for transit along the corridor to support higher service frequency. Increasing frequency to operate every 15 minutes would make the route more convenient for passengers and improve transfer opportunities without routes by reducing potential wait times for transfers. There may also be an opportunity to provide later evening service on the route to continue providing access to transit along this high ridership corridor.

Figure 5-24 Route Map, Route 038 – 10<sup>th</sup> St Crosstown



## Schedule Adherence

Route 038 is a high on-time performance route, with 75% of trips on-time, 10% of trips early, and 15% of trips late. Late trips are concentrated along the westernmost portion of the alignment in both directions, near the Reno Mini Hub and along NW 10<sup>th</sup> St west of N MacArthur Blvd. Conversely, early trips are most common near downtown Oklahoma City in the inbound direction. On-time performance is generally consistent throughout the

day. There may be an opportunity to improve on-time performance by optimizing schedule timing on these segments.

## Summary

Route 038 is a key, high ridership route providing east-west service along the NW 10<sup>th</sup> St corridor. Ridership and productivity are sufficiently high that the route may be able to support high frequency service, every 15 minutes, to improve convenience and better facilitate transfers with other routes. The route also has relatively high on-time performance, which may be further improved with schedule adjustments. The route may be able to support later evening service to improve the usefulness of the route for passengers to reach employment opportunities outside of the traditional peak period commute schedule.

## ROUTE 040 – S WALKER

Route 040 – S Walker provides north-south service between downtown Oklahoma City and the Brookwood shopping center in south Oklahoma City. The route operates on a one-way couplet in downtown Oklahoma City, operating southbound on N Hudson St and westbound on SW 4<sup>th</sup> St in the outbound direction and northbound on N Walker Ave in the inbound direction. The route operates along S Walker Ave from SW 4<sup>th</sup> St to SW 74<sup>th</sup> St and operates a counterclockwise terminal loop between S Walker Ave, SW 89<sup>th</sup> St, S Western Ave, SW 104<sup>th</sup> St, S Santa Fe Ave, and SW 74<sup>th</sup> St.

Route 040 provides direct connections with Routes 011, 012, 013, 014, and 016. The route operates along a shared alignment with Route 014 between the Downtown Transit Center and the intersection of S Walker Ave & SW 25<sup>th</sup> St. The route operates every 30 minutes on weekdays between 5:50 a.m. and 7:27 p.m. and every 60 minutes between 6:35 a.m. and 6:10 p.m. on weekends.

### Major Destinations

- Downtown Transit Center
- Latino Community Development Agency
- Capitol Hill Library
- Capitol Hill High School
- Pete White Health & Wellness Center
- Hope Community Services
- Southern Oaks Library
- Brookwood Shopping Center

### Ridership

Route 040 is an average ridership route in the EMBARK system, averaging approximately 479 boardings per weekday. Ridership is relatively low through the downtown Oklahoma City area and is highest along S Walker Ave south of SW 25<sup>th</sup> St. Ridership is highest at several stops, including:

- The S Santa Fe Ave Walmart
- S Walker Ave & SW 25<sup>th</sup> St (transfer opportunity with Route 014)

Route 040 Characteristics		
<b>Weekday</b>		
Start Time	5:50 a.m.	
End Time	7:27 p.m.	
Average Daily Boardings	479	
Peak Headway (mins)	30	
Off-Peak Headway (mins)	30	
Evening Headway (mins)	--	
Schedule Adherence	On Time	64%
<b>Saturday</b>		
Start Time	6:35 a.m.	
End Time	6:10 p.m.	
Headway (mins)	60	
<b>Sunday</b>		
Start Time	6:35 a.m.	
End Time	6:10 p.m.	
Headway (mins)	60	

- S Walker Ave & SW 59<sup>th</sup> St (Hope Community Services)

Route 040 is an above average productivity route, averaging approximately 19.8 boardings per revenue hour. Productivity follows a typical pattern in the outbound direction with the highest productivity near downtown and gradually decreasing throughout the route alignment. In the inbound direction, productivity is highest along the segment between S Santa Fe Ave & SE 89<sup>th</sup> St and S Walker Ave & SW 44<sup>th</sup> St, decreasing gradually toward downtown Oklahoma City.

## Schedule Adherence

Route 040 is a below average route in terms of on-time performance, with 64% of trips on-time, 10% of trips early, and 26% of trips late. On-time performance is generally consistent across the route alignment, but is lower in the inbound direction, particularly along the high ridership and productivity segment between S Santa Fe Ave & SE 89<sup>th</sup> St and S Walker Ave & SW 44<sup>th</sup> St. This lower on-time performance may be due to increased dwell time at higher ridership locations or general conflicts with traffic near the I-240 interchange. On-time performance is generally consistent throughout the day but is somewhat lower during the afternoon peak period, between approximately 3:00 p.m. and 5:00 p.m.

## Summary

Route 040 – S Walker is an average ridership, above average productivity route providing north-south connections along the S Walker Ave corridor. The route provides access to several key high transit propensity neighborhoods and social service facilities in south Oklahoma City. The route may be able to support later evening service to improve the usefulness of the route for passengers to reach employment opportunities outside of the traditional peak period commute schedule.



Figure 5-25 Route 040 – S Walker



## ROUTE 13N – S WESTERN NIGHT

Route 13N – S Western is a late-night only route, operating every 60 minutes on weekdays only between 7:00 p.m. and 12:00 a.m. Route 13N provides a similar service as a combination of Routes 013 and 040. The route operates on a one-way couplet in downtown Oklahoma City, southbound on N Hudson Ave and westbound on SW 4<sup>th</sup> St in the outbound direction and eastbound on SW 3<sup>rd</sup> St and northbound on N Walker Ave in the inbound direction. Route 13N also operates on S Western Ave, SW 74<sup>th</sup> St, and S May Ave to Oklahoma Community College in the outbound direction. Inbound, the route operates along S May Ave, SW 74<sup>th</sup> St, and replicates the loop served by Route 040 on S Walker Ave, SE 89<sup>th</sup> St, S Western Ave, SW 104<sup>th</sup> St, S Santa Fe Ave, and SW 74<sup>th</sup> St. Route 13N also makes the deviation to serve Shartel Towers, made by Route 013.

Route 13N provides direct connections with Route 011.

### Major Destinations

- Downtown Transit Center
- INTEGRIS Southwest Medical Center
- Shartel Towers
- Brookwood Shopping Center
- Oklahoma City Community College

### Ridership

Route 13N is a low ridership and productivity route, averaging approximately 47 boardings per weekday and 4.9 boardings per revenue hour. The route only operates on weekdays between 7:00 p.m. and 12:00 a.m. when demand for transit is relatively low compared to other times of day. Ridership and productivity are consistent across the route alignment with moderately higher ridership at Walmart and the intersection of SW 59<sup>th</sup> St & S Western Ave, near the Southwestern Plaza Shopping Center and Southpointe Apartments.

### Schedule Adherence

Route 13N is a high on-time performance route, with 75% of trips on-time, 4% of trips early, and 21% of trips late. On-time performance is notably worse in the outbound direction, ranging between 24%-43% late, compared to 0%-12% late in the inbound direction. On-time performance is generally consistent throughout the service span of the route. Adding time to the schedule in the outbound direction may improve on-time performance for the route.

### Summary

Route 13N is a late-night only service that operates along a similar alignment as Routes 013 and 040. Due to the lower demand for transit at night, ridership and productivity are

low for the route. Providing consistent late-night service on Routes 013 and 040 instead of a standalone hybrid late-night route may make the service easier to understand and more useful for passengers. The route ranks highly in terms of on-time performance but is more commonly late in the outbound direction. Adding time to the outbound schedule may improve on-time performance.

## ROUTE 23N – 23 CROSSTOWN NIGHT

Route 23N – 23 Crosstown Night is a late-night only route, operating every 60 minutes on weekdays between 7:00 p.m. and 12:00 a.m. Route 23 N operates along a similar alignment as Route 023 but does not serve the Oklahoma State Capitol loop around N Lincoln Blvd and instead operates along NE 23<sup>rd</sup> Blvd, N Kelley Ave, NW 13<sup>th</sup> St, N Broadway Ave, and NW 4<sup>th</sup> St to the Downtown Transit Center. Because late-night service is limited to only a few routes in the EMBARK service, the extension to the Downtown Transit Center is imperative to improve connections to other routes on Route 023. Route 23N also operates along NW 23<sup>rd</sup> St, N MacArthur Blvd, NW 16<sup>th</sup> St, N Rockwell Ave, SW 3<sup>rd</sup> St, Greenfield Center Dr, and Reno Ave.

Route 23N provides direct connections with Routes 005 and 011.

### Major Destinations

- Downtown Transit Center
- OU Health – University of Oklahoma Medical Center
- City-County Health Department
- Oklahoma City University
- Shepherd Mall
- Francis Tuttle Tech Center
- Reno Mini Hub

### Ridership

Route 23N is a low ridership and productivity route, averaging 72 boardings per weekday and 7.9 boardings per revenue hour. The route only operates on weekdays between 7:00 p.m. and 12:00 a.m. when demand for transit is relatively low compared to other times of day. Ridership and productivity are consistent across the route alignment with moderately higher ridership at several stops, including:

- NW 23<sup>rd</sup> St & N Classen Blvd (transfer opportunity with Route 005)
- N Rockwell Ave & NW 10<sup>th</sup> St
- NW 23<sup>rd</sup> St & N Kelley Ave

### Schedule Adherence

Route 23N is a below average on-time performance route, with 62% of trips on-time and 38% of trips late, despite only operating in the evening and late-night periods when traffic congestion is typically lower. On-time performance is generally lower in the westbound direction than the eastbound direction and may be improved by adding time to the schedule in this direction. On-time performance is consistent throughout the service span of the route. Similar transit priority capital improvements as those suggested for Route 023 may also improve on-time performance for the route.

## Summary

Route 023 is a late-night only route operating on weekdays between 7:00 p.m. and 12:00 a.m. The route operates along a similar alignment as Route 023 but extends to the Downtown Transit Center to better facilitate transfers with other late-night routes. Ridership and productivity are generally low on the route due in part to the late-night only operations when demand for transit is typically lower and limited transfer opportunities after most routes in the system have stopped operating. The route is below average in terms of on-time performance and may be improved by adding time to the schedule, particularly in the westbound direction, or by investing in transit priority capital improvements similar to those identified for Route 023.

## 6 PHASE I PUBLIC OUTREACH SUMMARY

This chapter provides an overview of the key themes and takeaways identified during Phase I of outreach for the *OKC Moves Bus Study* comprehensive operational analysis. Phase I outreach is intended to identify aspects of the EMBARK system that are working well, that are not working well, and priorities for service improvements.

The findings of the Phase I outreach are intended to supplement the findings of the recently completed user and non-user surveys.

### KEY FINDINGS

- Improving service frequency, weekend service, and later evening service are the top priorities for existing EMBARK customers.
- Commonly identified unserved destinations include Will Rogers Airport and several major employers like the Amazon Fulfillment Center, Paycom, and Hobby Lobby Headquarters.
- EMBARK staff identified improving service reliability, improving weekend service, and later evening service as the highest priority improvements.

### EMBARK STAFF ENGAGEMENT

#### Staff Workshop

Two workshop sessions were held on Saturday, March 27, 2021 to engage with EMBARK staff. Vehicle operators, maintenance, planning, and administrative staff were all invited to attend. Between the two workshops, 12 EMBARK staff members participated and were shown a brief presentation detailing the project background and process and were asked to provide feedback on aspects of service and operations that are working well or not working well.

Major themes identified during these workshops include:

- Traffic congestion and on-time performance reliability are concerns, particularly on Routes 009, 011, and 023.
- There is a general need to add more time to route schedules and provide more layover time for operators.

- Since the closure of the Crossroads Mall/Plaza Mayor, there is no longer a need to continue serving this deviation on Route 014.
- Service to large employers, medical facilities, and the airport are priorities.

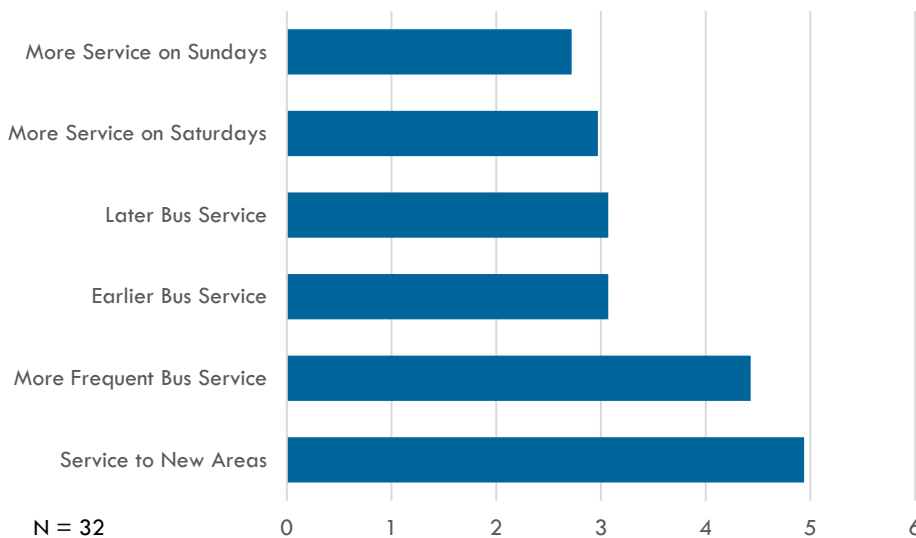
## Online Staff Survey

An online survey was developed and open for EMBARK staff between March 15, 2021 and April 15, 2021 and received 67 unique responses from a range of positions including:

- Fixed-route and paratransit operators
- Supervisors
- Dispatchers
- Planners
- Maintenance
- Administration

Survey respondents were asked to rank several potential service priorities in order of importance, with 1 being the highest and 7 being the lowest priority. The scores for each improvement were averaged to determine the highest and lowest priority improvements. The results, shown in Figure 6-1, suggest that improvements to weekend service and service span are the highest priorities for EMBARK staff. While improving service frequency and expanding service to new areas were relatively low priorities.

Figure 6-1 Service Investment Priorities – EMBARK Staff



Survey respondents were also asked to provide specific service improvements, with responses including:

- Extend Route 014 to serve Mercy Hospital South at I-240 & Sooner Rd
- Consider removing the deviation to Crossroads Mall on Route 014

- Extend Route 005 to Rockwell
- Improve frequency on Route 018 and Route 015
- Provide weekend service on Route 024
- Consider replacing Route 019 with microtransit or on-demand service

## EMBARK BOARD WORKSHOP

The project team conducted an interactive workshop with the EMBARK board on April 22, 2021 that included a presentation of the project background, preliminary existing conditions analysis findings, and an overview of tradeoffs and considerations in transit planning. An anonymous survey was administered to gauge the board's priorities regarding specific transit service tradeoffs, including:

- A preference for higher service frequency and shorter service span.
- A preference for higher service frequency and less extensive coverage.
- An even split between prioritizing weekday and weekend service.
- An even split between requiring more transfers with higher frequency service and requiring fewer transfers with lower frequency service.
- A preference for more direct service that may require longer walking distances to access the service.
- A preference for faster service with fewer bus stops spaced further apart.

## STAKEHOLDER ENGAGEMENT

Three stakeholder meetings were conducted between May 5, 2021 and May 18, 2021. Stakeholders were split into three groups based on their area of expertise, including social services, government agencies, and businesses. Specific organizations that were invited to participate in these stakeholder meetings are shown in Figure 6-2.



**Figure 6-2 Stakeholder Organizations**

<b>Government Agencies</b>	<b>Social Services</b>	<b>Businesses</b>
Association of Central Oklahoma Governments	Department of Rehabilitation Services	Hispanic Chamber
Oklahoma City Council	Oklahoma City Housing Authority	South Oklahoma City Chamber
Institute for Quality Communities	Salvation Army	Greater Oklahoma City Chamber
Neighborhood Alliance	Homeless Alliance	The Alliance for Economic Development
Oklahoma City Schools	United Way	FAA Mike Monroney Aeronautical Center
Oklahoma DOT	Sunbeam	Paycom
Oklahoma City Planning Department	ReMerge	Sonic Corp
Oklahoma City Traffic Management & Public Works	Palomar	Love's Travel Stops & Country Stores
Oklahoma State University – Oklahoma City	Lynn Institute	
UCO	NE Oklahoma City Healthy Community Collaborative	
OCU	Northcare	
City of Norman	New View	
Oklahoma County Social Services	Oklahoma County Social Services Department	
City of Midwest City	Catholic Charities	
Oklahoma City Community College	Diversion Hub	
Rose State College	City Care	
Francis Tuttle	Areawide	
Oklahoma City Economic Development Office	Paralyzed Veterans of America	
	United Access	
	Oklahoma Employment & Training Alliance	
	Goodwill	

During each stakeholder meeting, participants were given a brief presentation including context, project background, and preliminary findings from the existing conditions analysis. Participants were then asked to provide input about how the current system is meeting their needs, what is working well, and where there are opportunities for improvement. Specific feedback received includes:

- An identified need to serve non-typical work trips that are outside of the 9-5 commute period.
- Expanded service span, including both earlier and later service.
- Expanding service to areas with higher needs, including Warr Acres, retail corridors near Northwest Expressway, and providing more service in southwest Oklahoma City.
- Ensuring access to grocery stores particularly in low-income areas.
- Improving service frequency on higher ridership routes.
- Providing school-related transportation outside of typical school hours to allow for extracurricular activities.

## PUBLIC TOWN HALL

Two virtual public town halls were conducted on April 15, 2021 at 12:00 p.m. and 6:30 p.m. Central Time. Participants were able to directly join the Zoom webinar. The webinar was also live streamed on EMBARK's Facebook page. Participation fluctuated throughout the presentations but included approximately 12 attendees on Zoom and 17 attendees on Facebook Live. Following the town halls, the recording of both webinars were available for the public to view on EMBARK's Facebook page and on the *OKC Moves Bus Study* project website. These recordings have received over 400 views on the EMBARK Facebook page.

The town halls consisted of a brief presentation including project background and preliminary findings from the existing conditions analysis. Participants were then asked to provide feedback, comments, or questions using the chat function or question and answer function in Zoom or by directly commenting on the Facebook live stream. Key themes of the feedback received includes:

- Improving service reliability is a high priority.
- Providing later evening service on more routes is a high priority.
- Several key unserved destinations include large employers like Paycom, Hobby Lobby Headquarters and warehouses, Xerox as well as the airport.

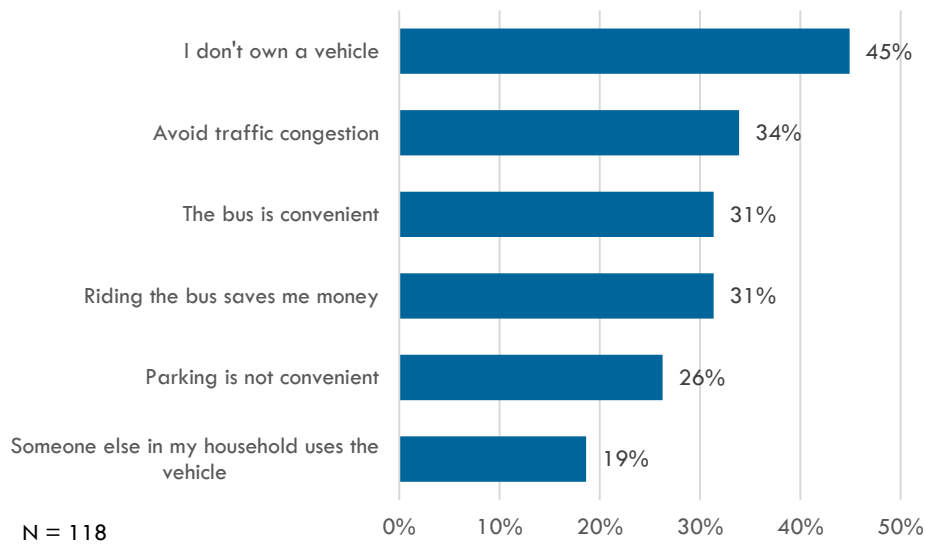
## ONLINE COMMUNITY SURVEY

The online community survey was open between April 1, 2021 and May 24, 2021 and received 202 unique responses. Survey respondents were asked several questions about their experience with EMBARK, including information about their ridership habits, satisfaction with service, priority improvements, and demographic information.

### Overall Results

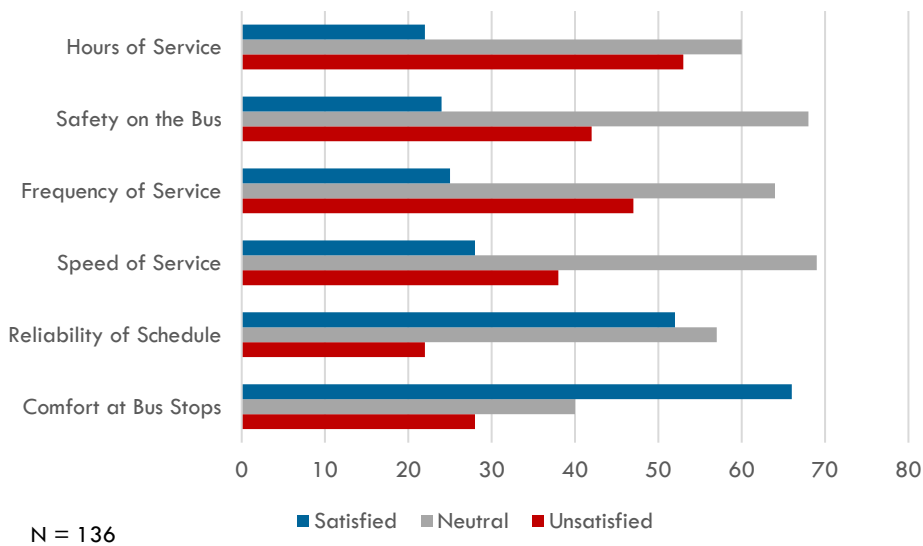
When respondents were asked why they ride the bus, the most common response was that they don't own a vehicle (45%) followed by avoiding traffic congestion (34%), as shown in Figure 6-3. This indicates that more people use EMBARK service out of necessity than for convenience.

Figure 6-3 Why Do You Ride the Bus? – All Respondents



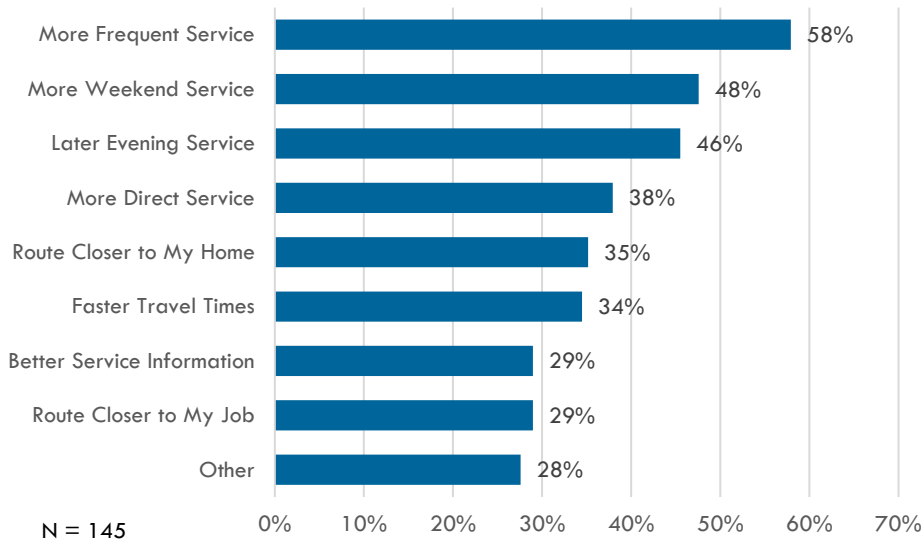
When asked to whether they were satisfied, neutral, or unsatisfied with various elements of EMBARK service (Figure 6-4) respondents were the least satisfied with service span, feeling safe on the bus, and service frequency. Respondents were also most satisfied with feeling comfortable at bus stops and schedule reliability.

Figure 6-4 Satisfaction with EMBARK Service – All Respondents



When asked what improvements would make them more likely to ride the bus or use the bus more often, over half of respondents (58%) identified more frequent service as a priority improvement. More weekend service (48%) and later evening service (46%) were also commonly selected service improvements, as shown in Figure 6-5.

Figure 6-5 Priority Service Improvements – All Respondents



## Transit Riders vs. Non-Transit Riders

An analysis was performed based on respondents' who have ridden EMBARK service within the past 12 months and those who have not. For the purposes of this analysis, respondents who have ridden EMBARK in the past 12 months are considered "transit riders" and those who have not are considered "non-transit riders." Also, given the small sample size, these findings are at a lower confidence level than the others. In terms of satisfaction with EMBARK service (Figure 6-6 and Figure 6-7), both riders and non-riders have low satisfaction with service span (hours of service) and service frequency. Non-riders also have a much lower satisfaction with safety on the bus than riders. Both groups are most satisfied with comfort at bus stops, reliability of schedules, and speed of service.

Figure 6-6 Satisfaction with EMBARK Service – Transit Riders

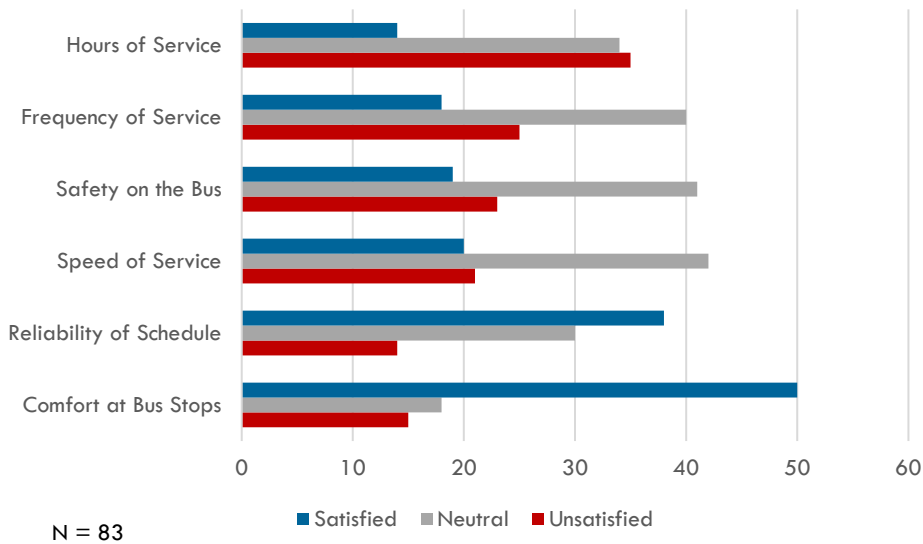


Figure 6-7 Satisfaction with EMBARK Service – Non-Transit Riders

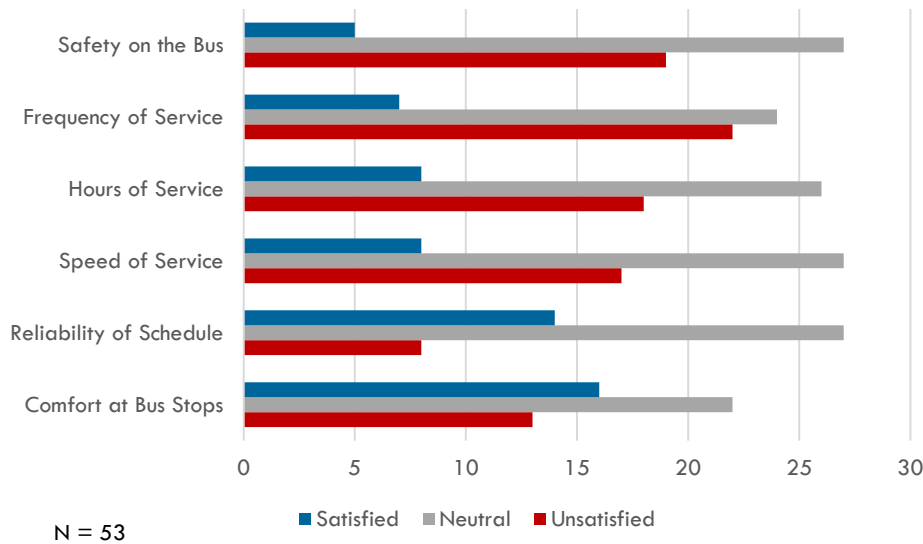
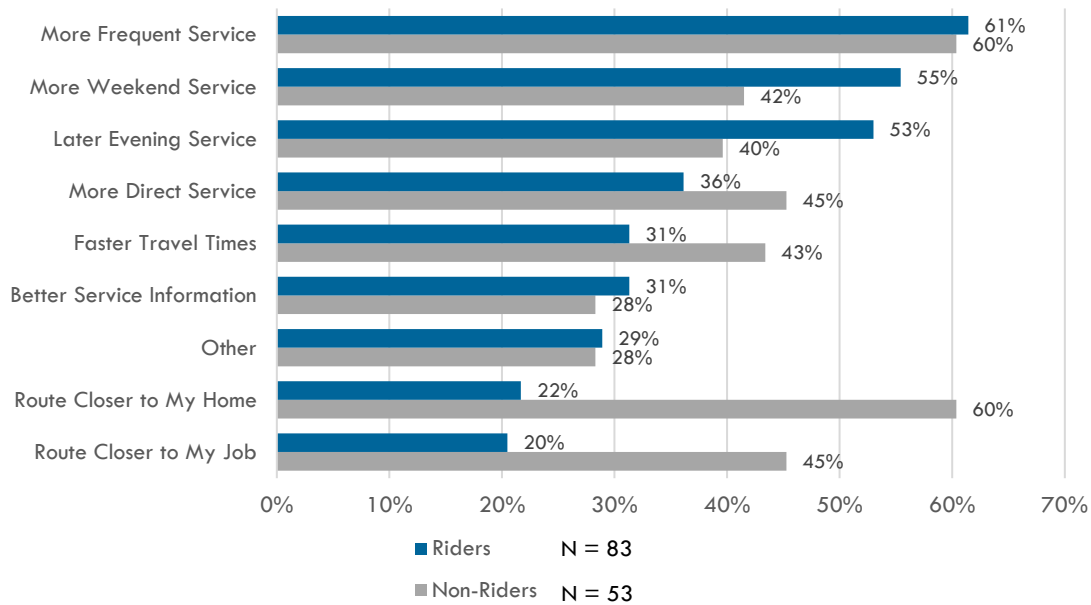


Figure 6-8 shows the priority service improvements for both transit riders and non-transit riders. More frequent service is the most commonly selected improvement for both groups, indicating that this is a universally high priority improvement for the EMBARK system. Transit riders placed a higher priority on improving weekend service and providing later evening service than non-riders, while non-riders were more likely to prioritize service closer to their homes and jobs, more direct service, and faster travel times.

Figure 6-8 Priority Service Improvements – Transit Riders and Non-Transit Riders



## Open-Ended Comments

Survey respondents were given the opportunity to provide open ended comments throughout the survey. The verbatim comments from the survey are included in Appendix B of this report. When asked to identify locations that EMBARK should serve that it does not currently serve, common responses included:

- Will Rogers Airport
- The Amazon Fulfillment Center on Portland Ave
- More intercity connections to Norman, Edmond, and Moore
- More service on Northwest Expressway

When asked for any other comments or suggestions for improving EMBARK service, common responses included:

- Sidewalk improvements to enhance accessibility
- Interest in higher service levels
- Weekend evening service improvements
- Infrastructure improvements like bus lanes

## DECEMBER 2020 RIDER AND NON-RIDER SURVEY

In addition to the online community survey, the *OKC Moves Bus Study* utilized feedback received as a part of EMBARK's December 2020 Rider and Non-Rider Survey to identify priority service improvements. The top priority service improvements for both riders and non-riders are shown below in Figure 6-9 and Figure 6-10, respectively. The top priorities for existing EMBARK riders include:

- Improving service reliability (buses arriving on time)
- Improving service frequency
- Availability of accessible bus stops

Priorities for non-riders are improvements that may make them more likely to ride transit in the future, and include:

- Transit stops located closer to home/work
- Faster or more frequency service
- Employer provided incentives to ride transit



Figure 6-9 December 2020 Rider Survey – Priority Service Improvements

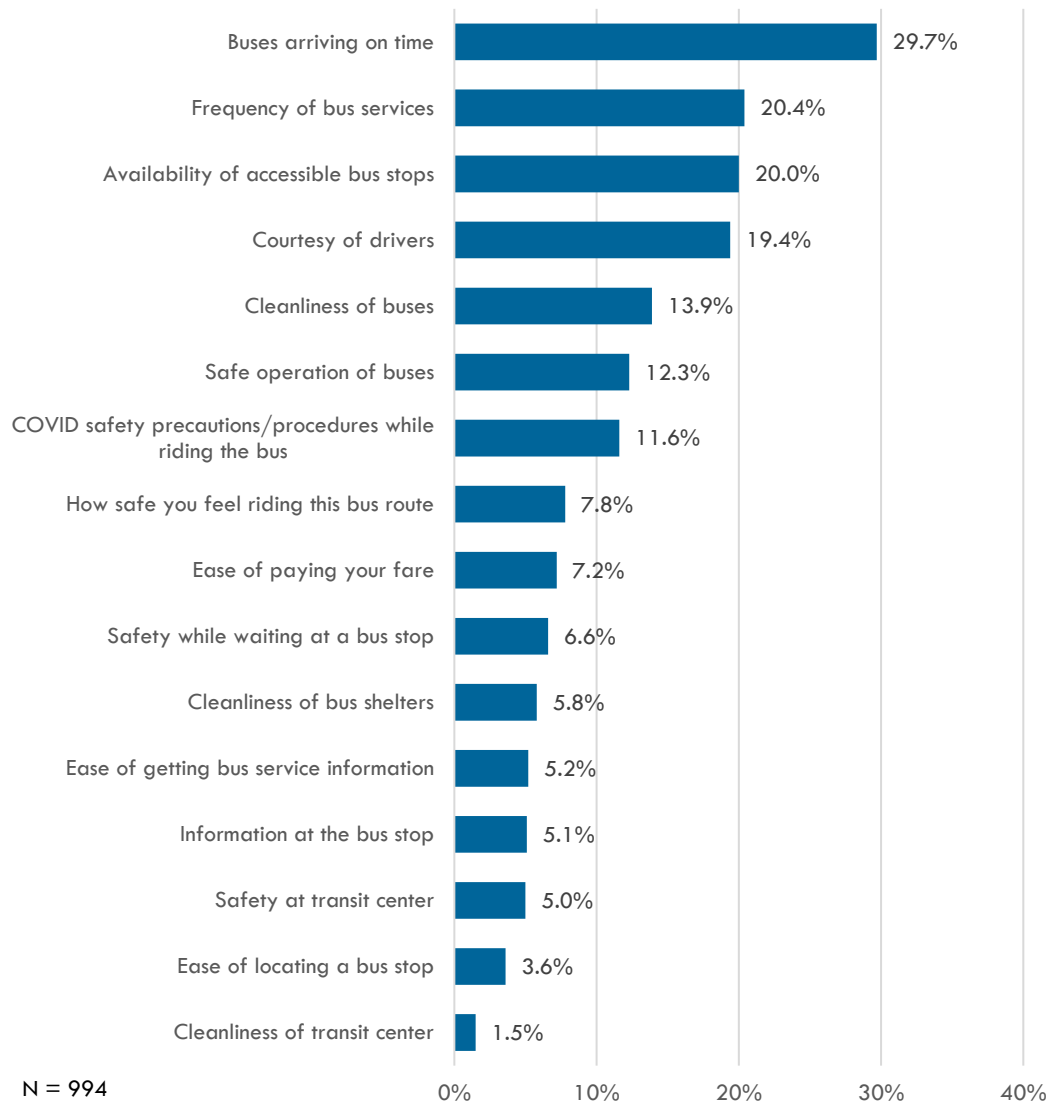
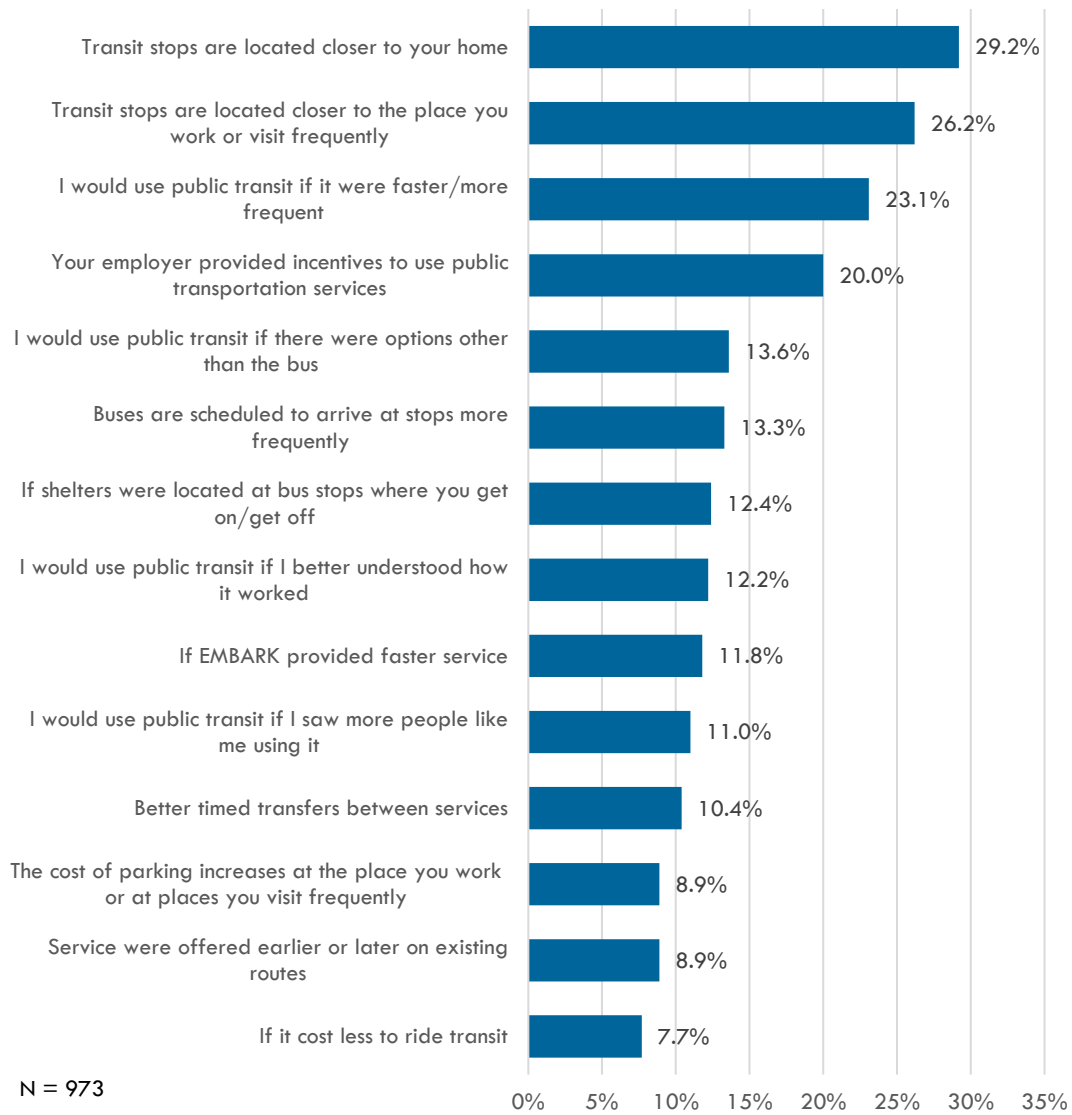


Figure 6-10 December 2020 Non-Rider Survey – Priority Service Improvements



## 7 SERVICE SCENARIOS AND PHASE II PUBLIC OUTREACH

Convenient and cost-effective transit service requires an appropriate balance of coverage, frequency, and service span. As detailed in the preceding chapters, *OKC Moves* assessed existing ridership patterns, on-time performance, travel patterns, and demographic data. Public meetings and an online survey indicated that improving service frequency, adding more weekend service, and providing later evening service are some of the highest priority improvements for members of the community. The public and project stakeholders also identified several key unserved destinations, including Will Rogers Airport and the warehouse and fulfillment center employment centers near Council Rd. Based on these findings, three long-term scenarios were developed to show potential visions for the future of transit in the Oklahoma City area.

### PRELIMINARY SERVICE SCENARIOS

Building upon the feedback received during Phase I of public outreach, three preliminary service scenarios were developed to improve and expand the EMBARK transit system, including:

- **Grid Scenario** – This scenario emphasizes direct service along major north-south and east-west streets to create a stronger grid network with more connections outside of downtown Oklahoma City.
- **Radial Scenario** – This scenario emphasizes service into and out of downtown Oklahoma City and would continue to have most transfers taking place in the downtown area.
- **Hybrid Scenario** – This scenario combines several elements from the Grid and Radial Scenarios by adding several north-south and east-west routes while continuing to emphasize downtown service.

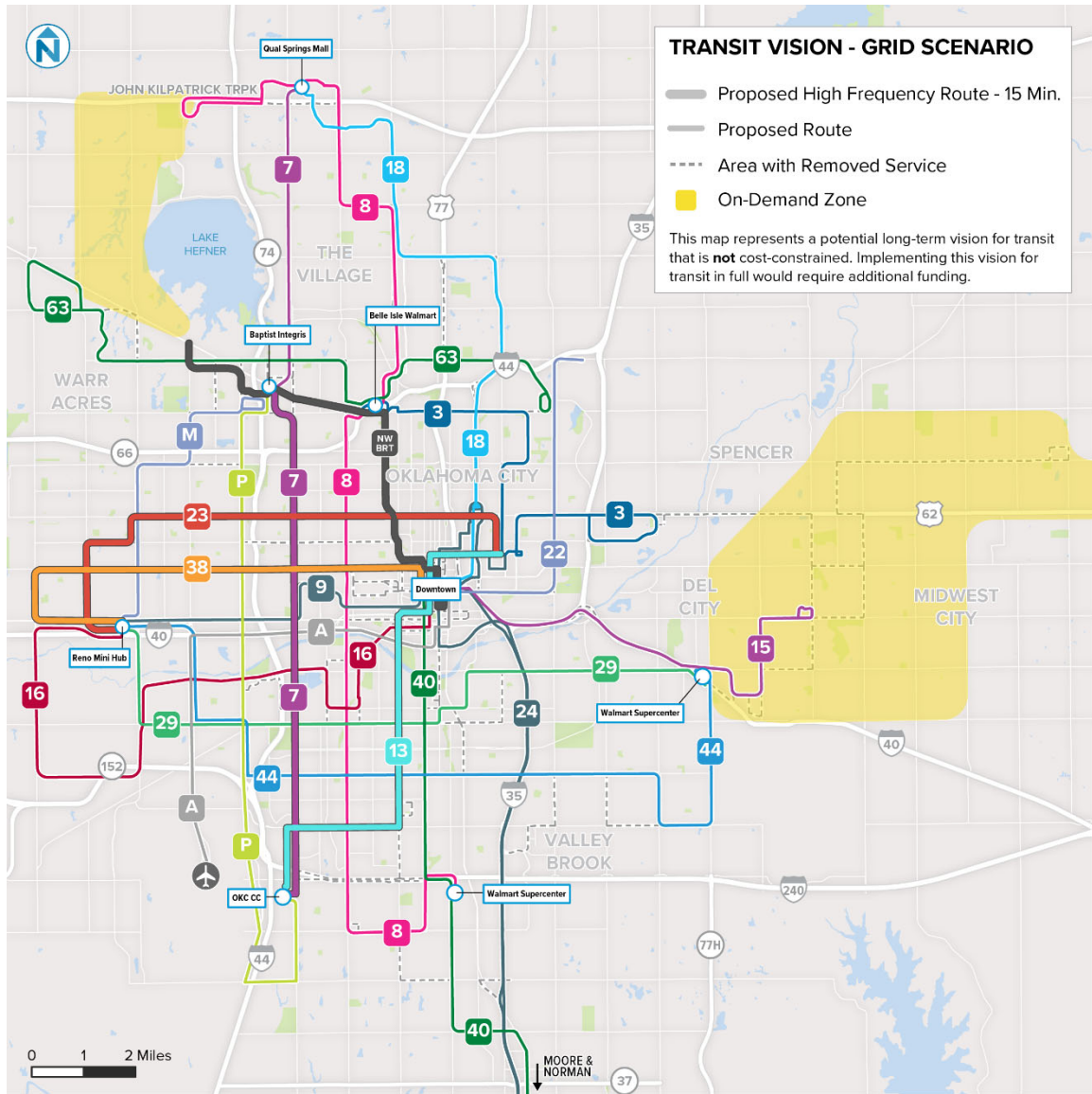
In addition to route changes, each scenario assumed that service would operate at least every 30 minutes on weekdays and Saturdays. Service would also operate until midnight on weekdays and Saturdays and until 10 p.m. on Sundays, addressing the regional need for later evening service.

All three scenarios were developed to be cost unconstrained and represent potential long-term visions for transit in Oklahoma City. All would require significant additional investments in both capital and operating dollars.

## Grid Scenario

The Grid Scenario, shown in Figure 7-1, emphasizes direct service along major north-south and east-west streets to create a stronger grid network with more connections outside of downtown Oklahoma City. Most routes would continue to serve downtown Oklahoma City but there is a lower focus on transfers in the downtown area in this scenario and more transfers would take place outside of the downtown area.

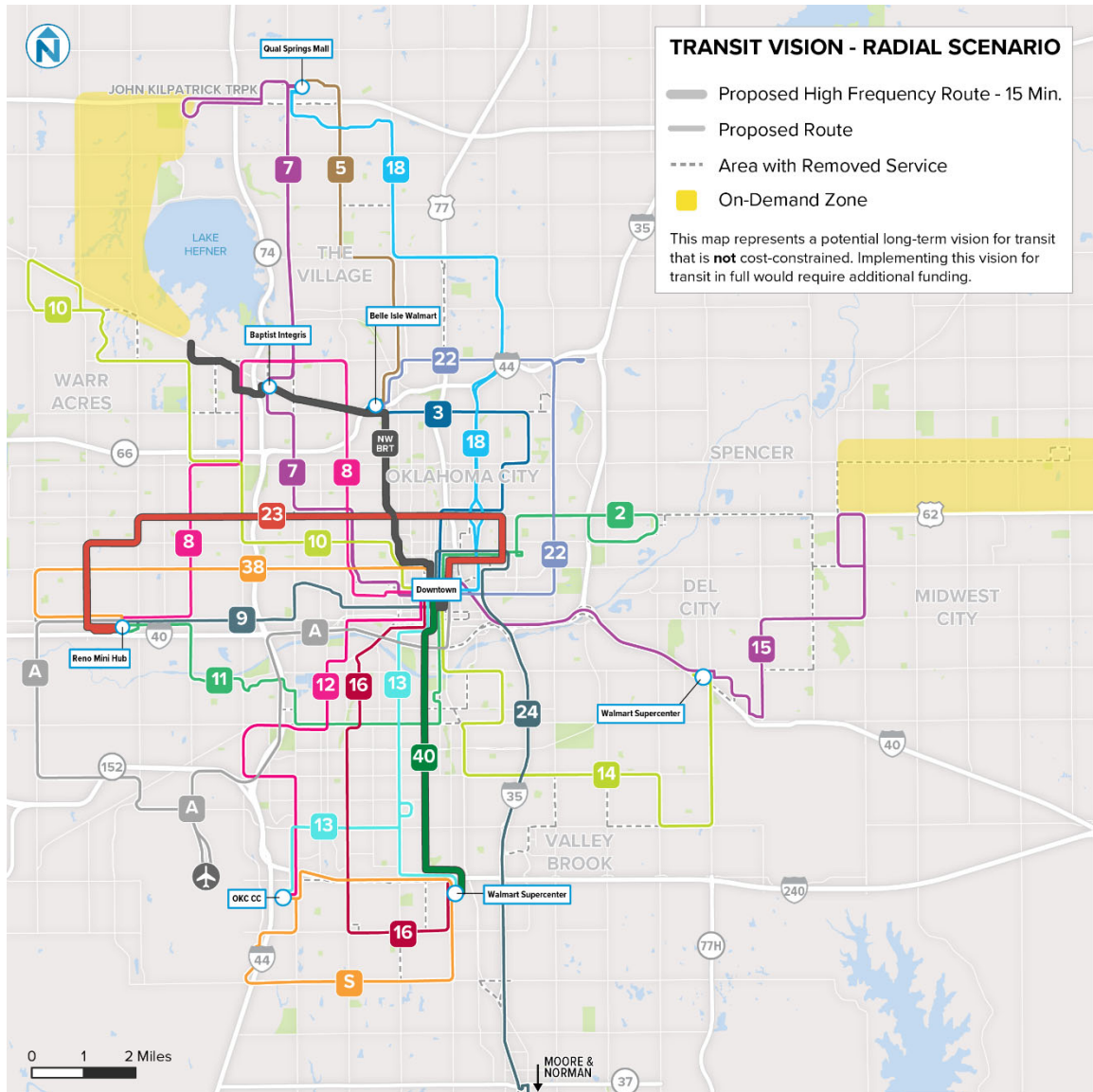
Figure 7-1 Grid Scenario System Map



## Radial Scenario

The Radial Scenario, shown in Figure 7-2, emphasizes service into and out of downtown Oklahoma City and would continue to have most transfers taking place in the downtown area. Multiple routes would be extended to serve identified growth areas in the region. This scenario covers almost all of the current service area and provides better connections to northeast Oklahoma City.

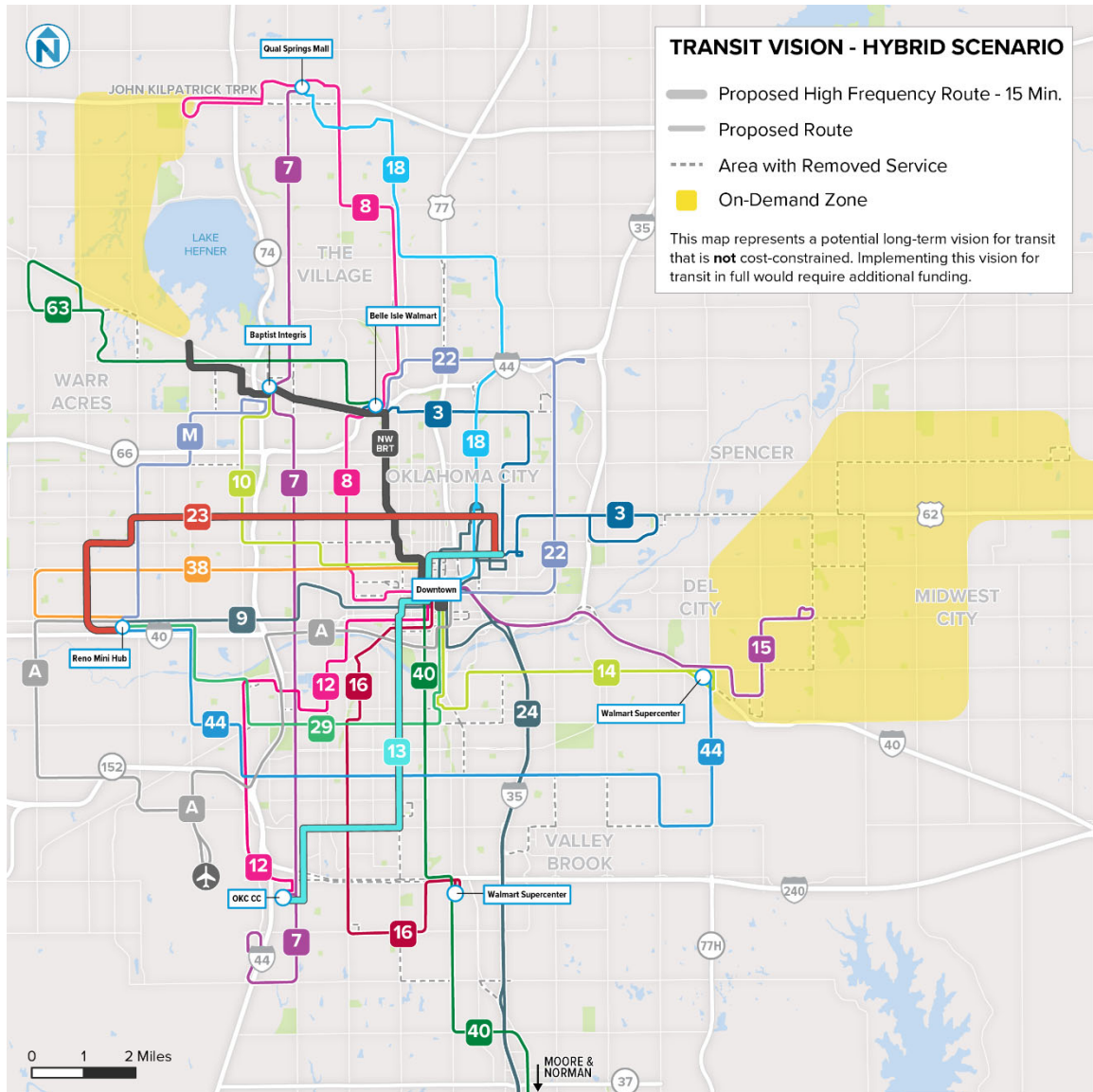
Figure 7-2 Radial Scenario System Map



## Hybrid Scenario

The Hybrid Scenario, shown in Figure 7-3, combines several elements from the Grid and Radial Scenarios by adding several north-south and east-west routes while continuing to emphasize downtown service. This Hybrid Scenario includes improved connections in northeast Oklahoma City and south Oklahoma City and includes a high-speed express route between downtown Oklahoma City and Will Rogers Airport.

Figure 7-3 Hybrid Scenario System Map



## PHASE II PUBLIC OUTREACH SUMMARY

The second phase of public involvement was designed to solicit feedback on the three preliminary service scenarios. In general, community members and existing EMBARK customers were asked to describe what they did or did not like about each scenario and specific routes in each scenario. Input was also collected on improvement prioritization to inform future phasing of projects and improvements and ensure service enhancements align with community needs and values. Input collected from the community informed the development of the preferred alternative, described in Chapter 8.

Key themes emerging from Phase II outreach include:

- There is strong support in the community to transition to a **grid-oriented network**
- The highest priority improvements are **later evening service, improved weekend service**, and **higher frequency service** on key corridors
- There is also support for providing service to **new areas** like Moore and providing **more direct** crosstown service

## Virtual Town Hall

Two online town halls were held on Tuesday October 12, 2021 at 11:30 a.m. and 5:30 p.m. Generally, this kind of town hall would be held as an in-person event. However, due to the ongoing impacts of the COVID-19 Pandemic and public health recommendations, the town hall was held virtually. The town hall was advertised on the *OKC Moves* project website, EMBARK social media channels, through flyers posted on-board vehicles and at the downtown transit center, and through established stakeholder networks.

The town hall was conducted through a Zoom webinar function and live streamed to EMBARK's Facebook page. A recording of the webinar was made available on the project website and the EMBARK Facebook page. The two webinar sessions included 8 attendees directly on Zoom and 11 attendees on Facebook Live and the two recordings have received a combined for over 230 views on Facebook.

Key service priorities identified in the discussion include:

- Improved weekend service and evening service
- Extending service to Moore
- Improved frequency and service span in Midwest City

## Transit Center Pop-Up

In addition to the two virtual town halls, the project team also set up a pop-up outreach event at the downtown transit center in Oklahoma City. This event included printed poster boards with project background information, system maps for the three scenarios, and specific improvements identified for each scenario. Participants were walked through the proposed service changes, given an opportunity to ask questions, and given

three sticky dots which were used to identify their top three priority improvements. Over 100 individual members of the public participated in the pop-up outreach event.

Key themes from this event include:

- Later evening service is a top priority
- Expanded weekend service is also a high priority
- Support for improved frequency on key routes
- Support for a May Ave crosstown route

## Stakeholder Interviews

In addition to the two virtual town halls, the project team also led three group interviews with key project stakeholders on Thursday October 7, 2021, Monday October 11, 2021, and Tuesday October 12, 2021. The same organizations invited to participate in Phase I outreach (Chapter 6) were invited for Phase II outreach and included representatives from government agencies, the business community, non-profit organizations, social services providers, and elected officials. Specific agencies and organizations that participated in the interviews are shown in Figure 7-4.

Major themes from the discussion include:

- Interest in more direct service in the Grid Scenario
- Priority for high frequency service
- Recognition that the Hybrid Scenario may be an intermediate step to reaching to Grid Scenario

**Figure 7-4 Stakeholder Organizations Participating in Phase II Interviews**

Government Agencies	Social Services	Businesses
Association of Central Oklahoma Governments	Areawide Aging Agency	Downtown OKC Partnership
Oklahoma City Council	United Way	Greater Oklahoma City Chamber
Institute for Quality Communities		The Alliance for Economic Development
Spokies Bike Share		
Oklahoma State House of Representatives		
City of Norman		
Oklahoma City Planning Department		
Oklahoma City Economic Development Office		
City of Moore		



## Operator Focus Group

An operator focus group was held on Saturday October 16, 2021 in which attending operators were given a brief presentation including a project overview and a summary of the three preliminary service scenarios. The highest priorities identified by operators included improving reliability and on-time performance, improving travel times, supporting express service to Moore, and general support for the Grid Scenario.

## Board Engagement

On Tuesday November 16, 2021, the project team provided the EMBARK board with an update presentation on the progress of the evaluation, including a summary of the three preliminary service scenarios, preliminary findings from Phase II public engagement, and initial recommendations for short-term and long-term improvements. Key themes identified in this presentation include:

- Develop routes and infrastructure that allows travel without going through downtown
- Frequency, later evening service, and weekend service are priorities
- Service to new destinations is desired, particularly for job access
- Improve reliability

These key findings and themes were then used to develop the short-term and long-term preferred alternative improvements, discussed in Chapter 8.

## Online Community Survey

The online community survey was open for public comment from Monday October 4, 2021 until Sunday November 7, 2021. The online survey was advertised on the project website, through established stakeholder networks, through promoted EMBARK social media posts, during the virtual town hall events, and through paper flyers on-board vehicles and at the downtown transit center. A gift card raffle for participants was also used as an incentive to increase participation in the online survey. Ninety-six unique responses were collected during the surveying period.

This survey was not designed to collect a statistically valid representation of EMBARK riders or the Oklahoma City community. However, the feedback provides insights into the public perceptions of benefits and tradeoffs associated with the three service scenarios in the community. The survey presented the three scenarios and asked respondents to identify which scenario they preferred, their perceptions of each individual scenario and each route within each scenario, rank the improvements for each scenario in terms of high and low priority, and were given the opportunity to provide open-ended comments on each scenario and route.

## Scenario Perceptions

When asked how they felt about the changes included in each scenario, 92% of respondents indicated support for the Grid Scenario, compared to 84% for the Hybrid Scenario and 64% for the Radial Scenario (Figure 7-5). Respondents were also asked to rank the three scenarios by in order of which best represented their priorities (1 being the highest and 3 being the lowest). The average ranking is shown below in Figure 7-6 and indicates that the Grid Scenario is most aligned with public priorities, followed by the Hybrid Scenario, and that the Radial Scenario is least aligned with public priorities.

Figure 7-5 Community Survey Scenario Perceptions

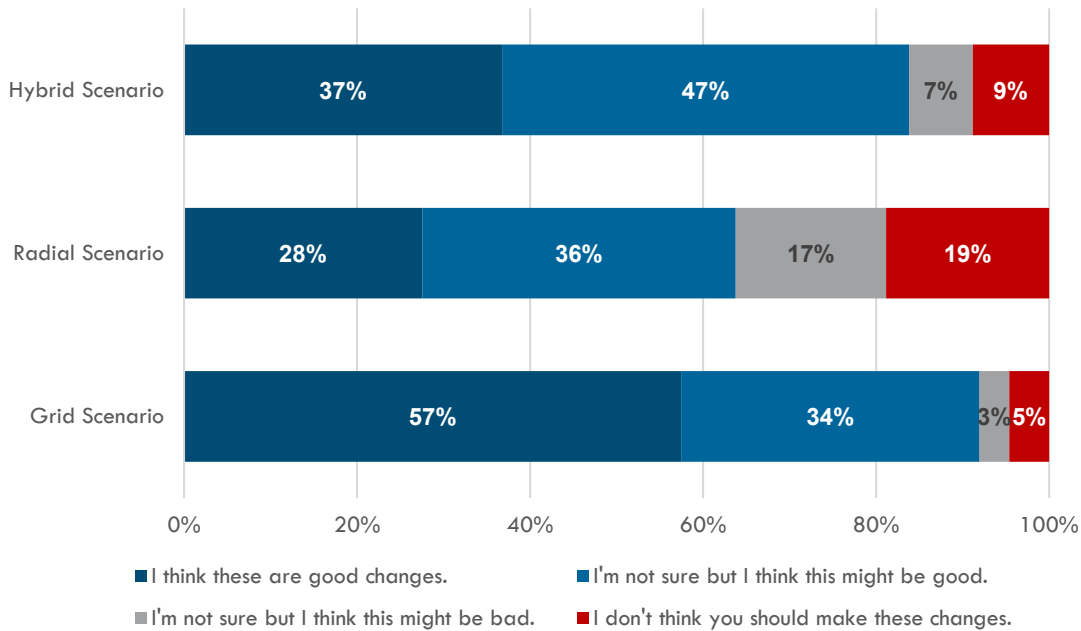
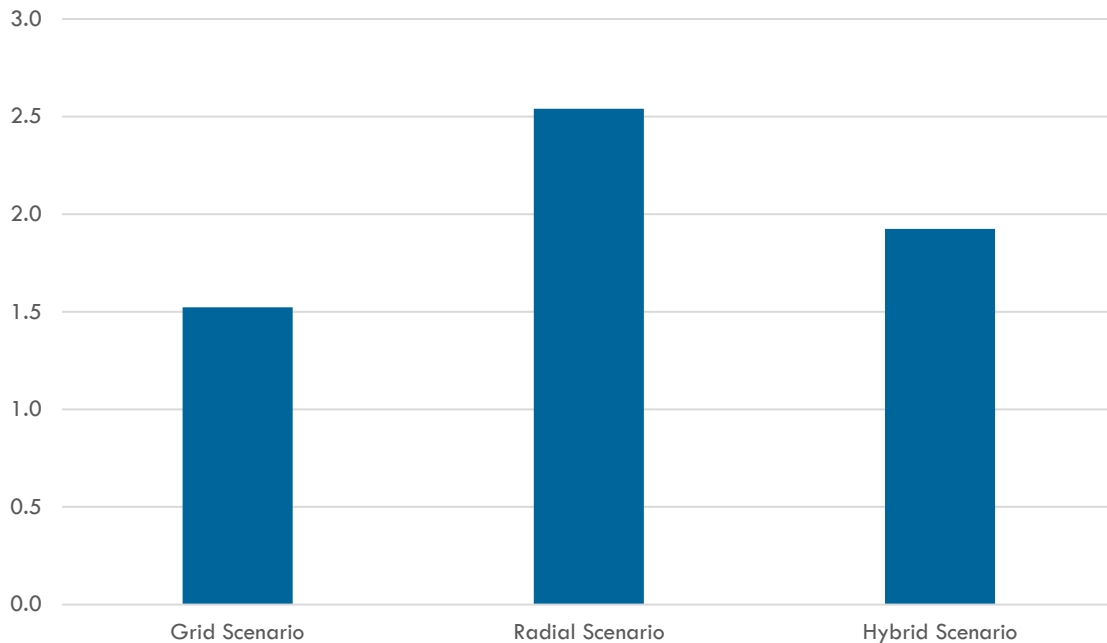


Figure 7-6 Community Survey Average Scenario Ranking



### Improvement Priorities

For each scenario, respondents were asked to rank their top five improvements in order of highest priority to lowest priority. For all three scenarios (Figure 7-7, Figure 7-8, and Figure 7-9), improvements to service frequency on 23<sup>rd</sup> Street, 10<sup>th</sup> Street, and in south Oklahoma City were consistently the highest priority improvements. More direct service on key corridors like 44<sup>th</sup> St, 63<sup>rd</sup> St, and May Ave were also frequently high ranked priorities. On-demand service zones were consistently the lowest ranked priority improvements.

Several improvements were included in all three scenarios and respondents were also asked to rank these improvements. For these shared improvements (Figure 7-10) the top four improvements include:

- Improving on-time performance
- Later evening service on weekdays
- Integrating NW BRT with other bus routes
- New high frequency service corridors

Figure 7-7 Grid Scenario Improvement Priorities

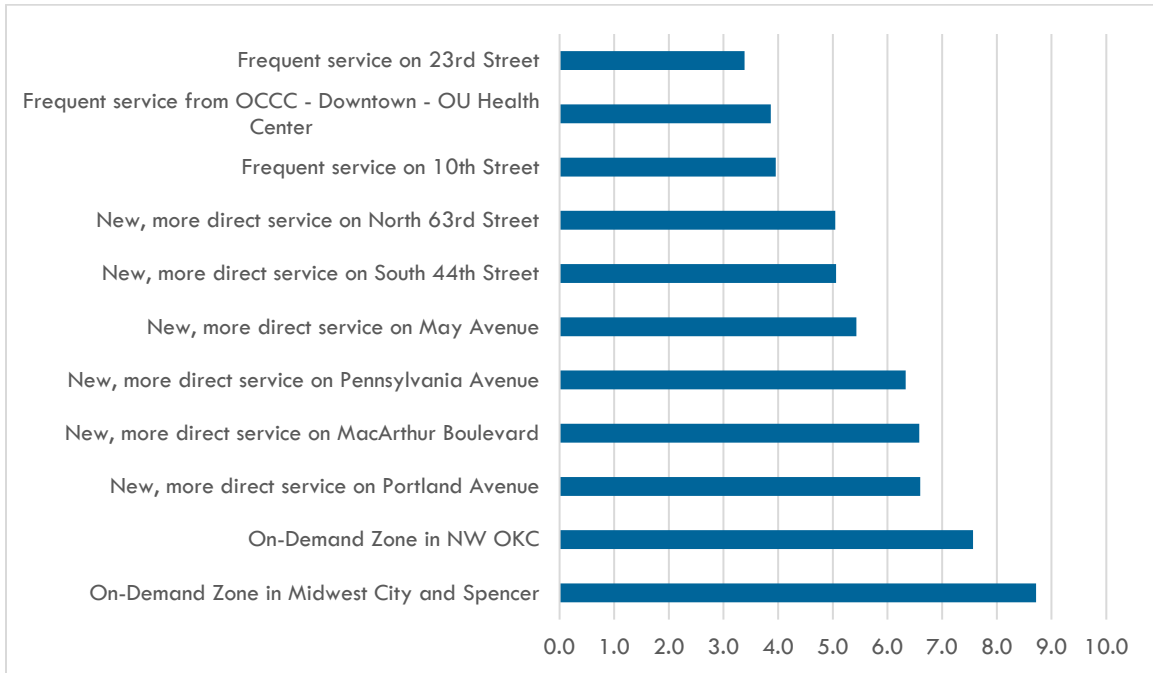


Figure 7-8 Radial Scenario Improvement Priorities

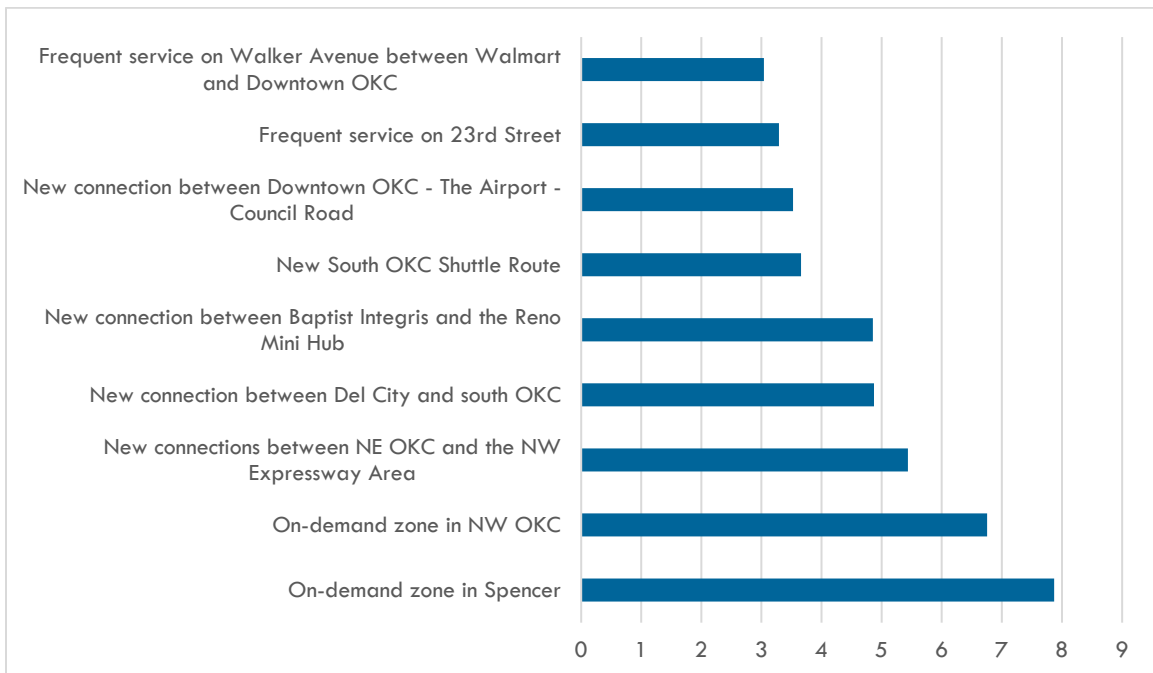


Figure 7-9 Hybrid Scenario Improvement Priorities

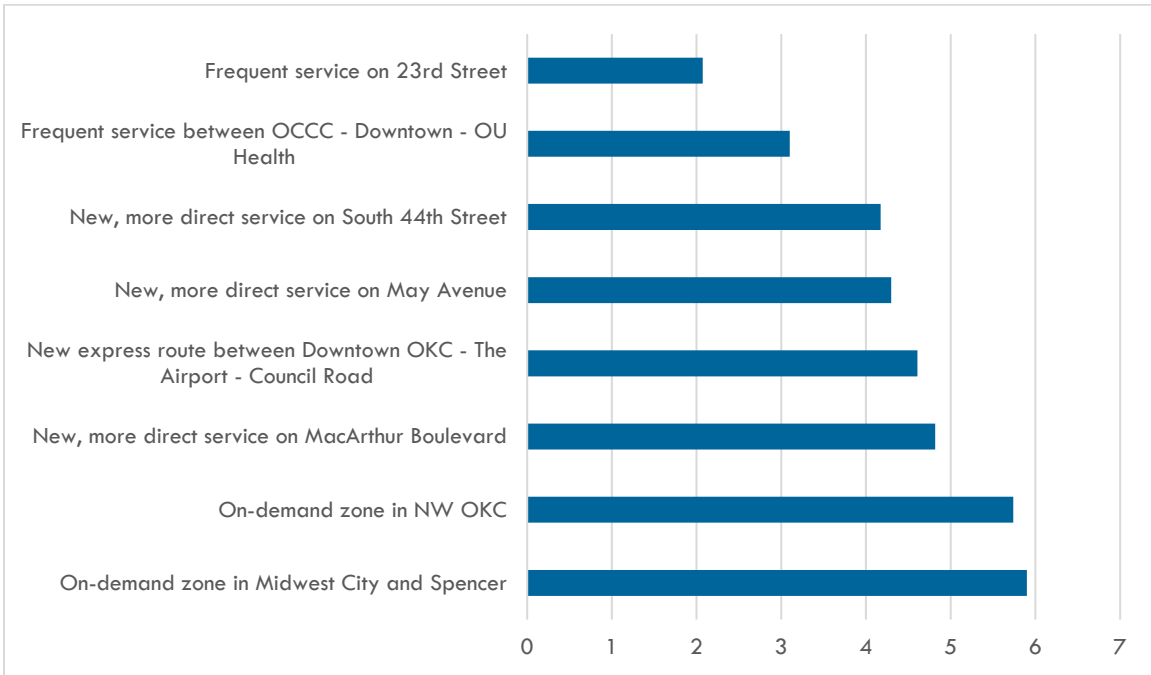
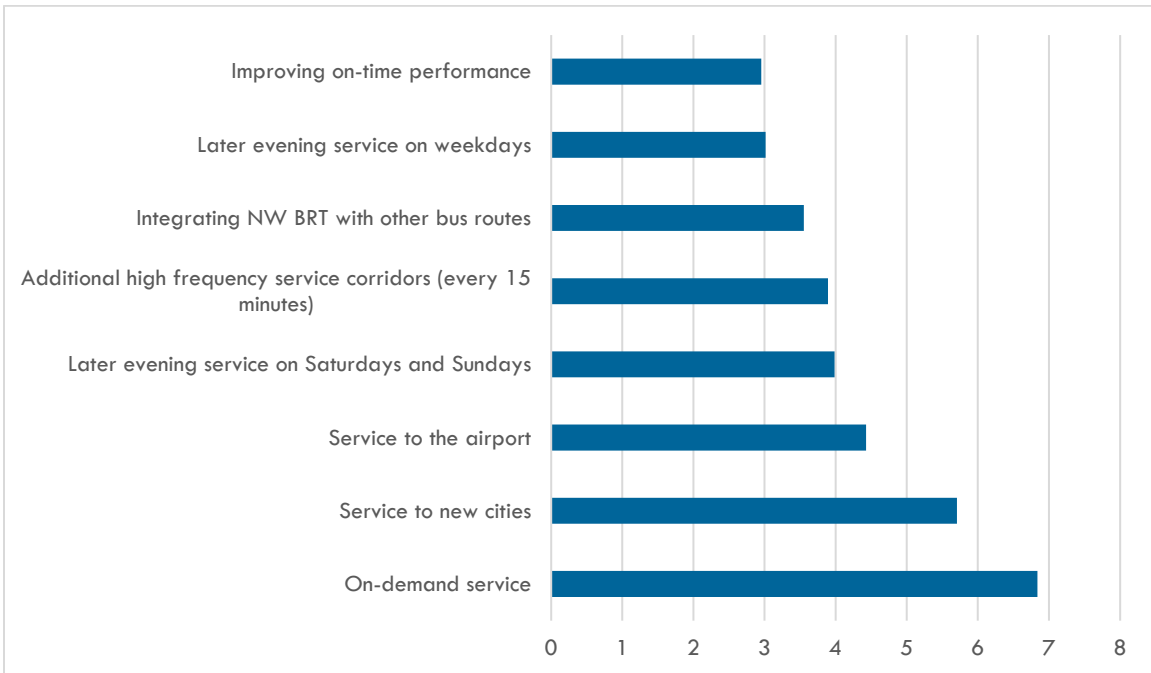


Figure 7-10 Improvement Priorities Shared between Scenarios



### Open-Ended Comments

Respondents were given the opportunity to provide open-ended comments related to all three scenarios as well as individual routes. Nearly 300 unique open-ended comments

were recorded as a part of this online survey effort. The verbatim comments are included in Appendix B of this report. Key themes include:

- Support for faster, more direct service included in the Grid and Hybrid Scenarios
- Support for more frequent service in all three scenarios
- Support for more connections outside of downtown in the Grid Scenario
- Supportive of airport service concepts
- Some support for on-demand zones to attract new riders

## Respondent Demographics

Survey respondents were asked a series of demographic questions. The majority of respondents (64%) indicated that they are current EMBARK riders (Figure 7-11).

Survey respondents were fairly evenly distributed across adult ages. About 1/3 of respondents are each below 35, between 35 and 54, and 55 or older (Figure 7-12). No respondents were below age 18.

Nearly half of respondents (46%) have a household income over \$50,000, as shown in Figure 7-13. Respondents were relatively evenly split between the remaining income bands lower than \$50,000.

When asked about occupational status, 62% of respondents reported being employed with a full-time job, 16% reported being retired and 11% each were unemployed or employed part-time (Figure 7-14).

Figure 7-11 Are You a Current EMBARK Rider?

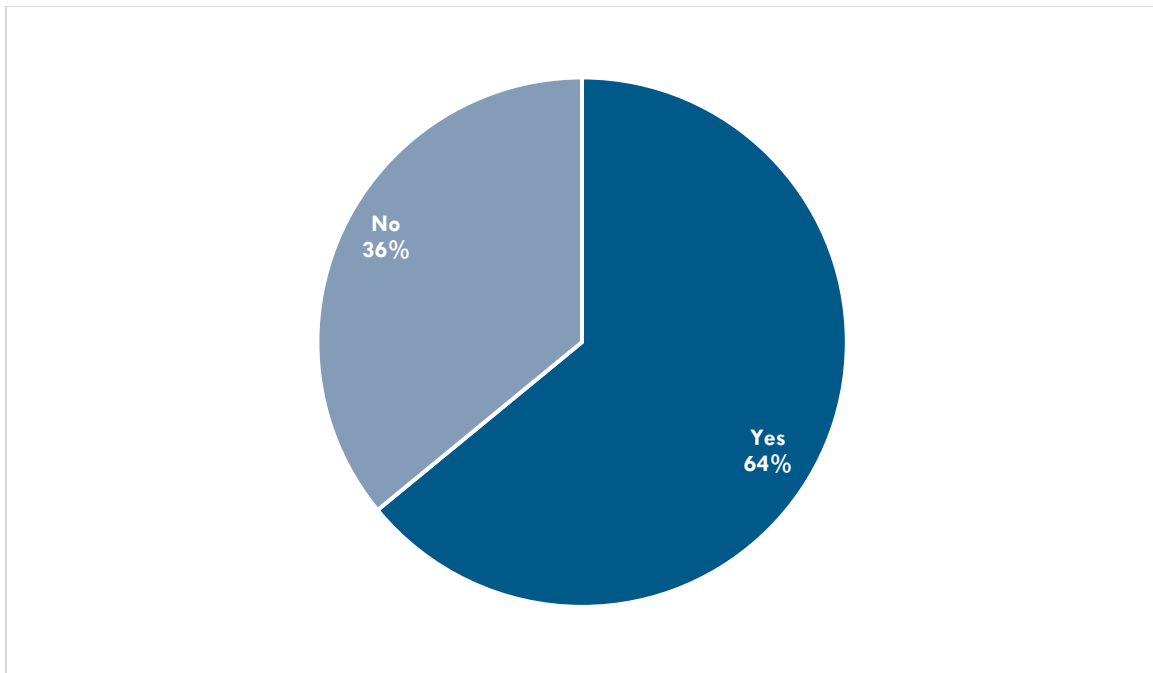


Figure 7-12 What is Your Age?

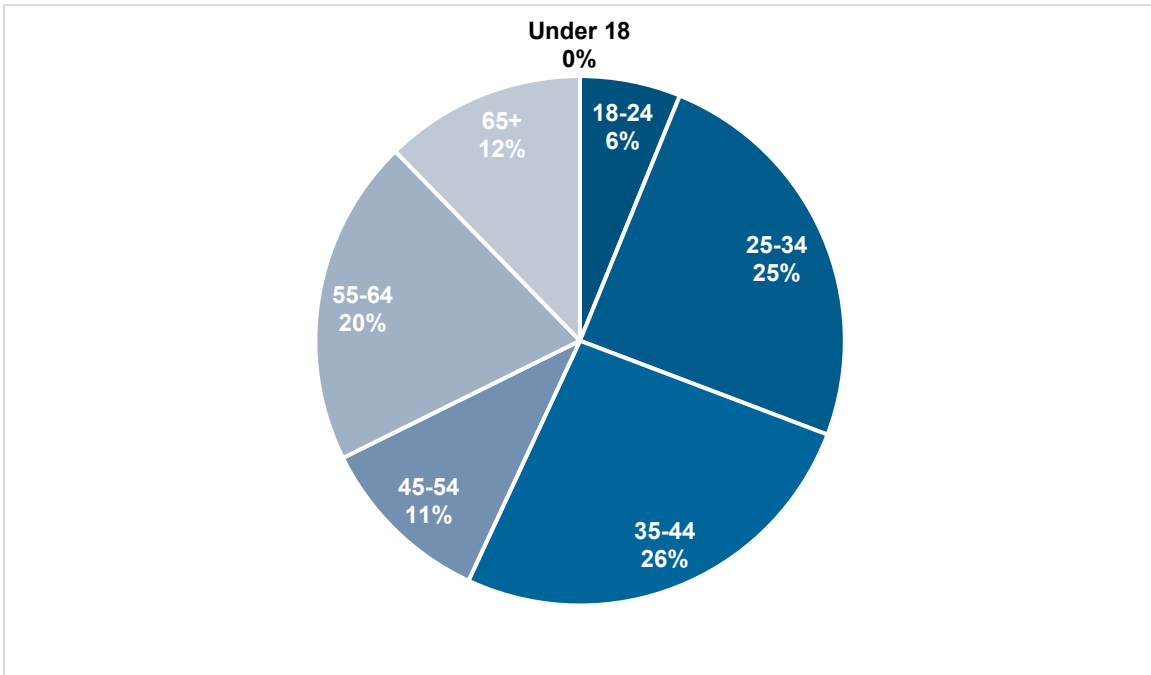


Figure 7-13 What is Your Household Income?

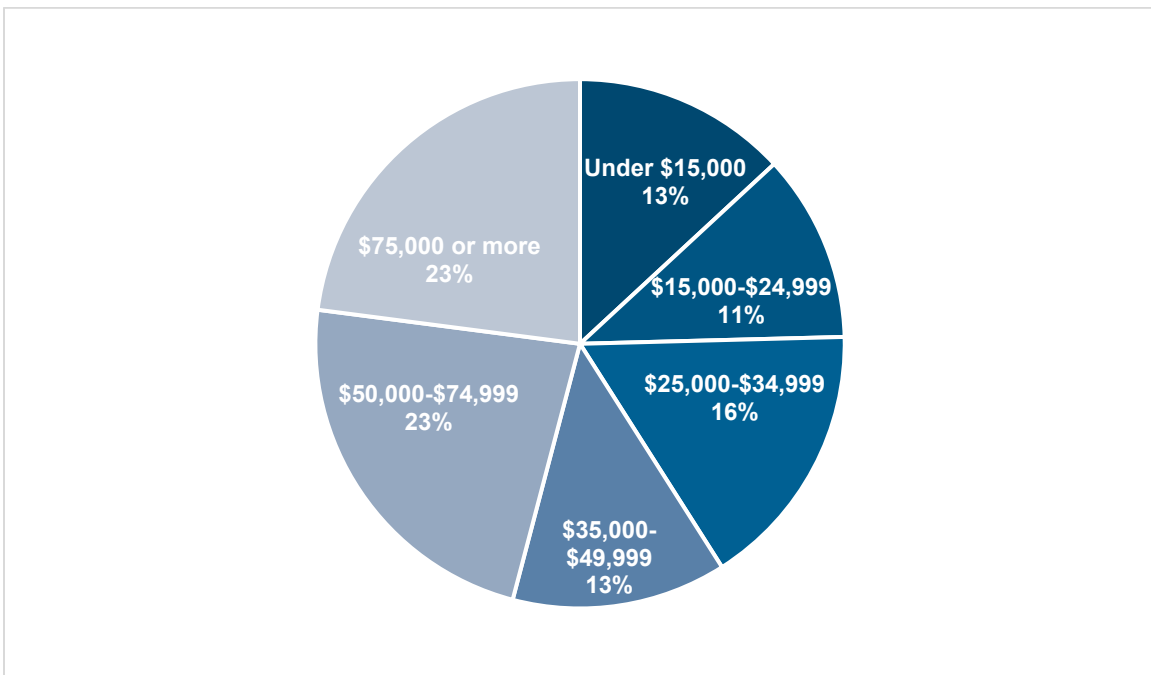
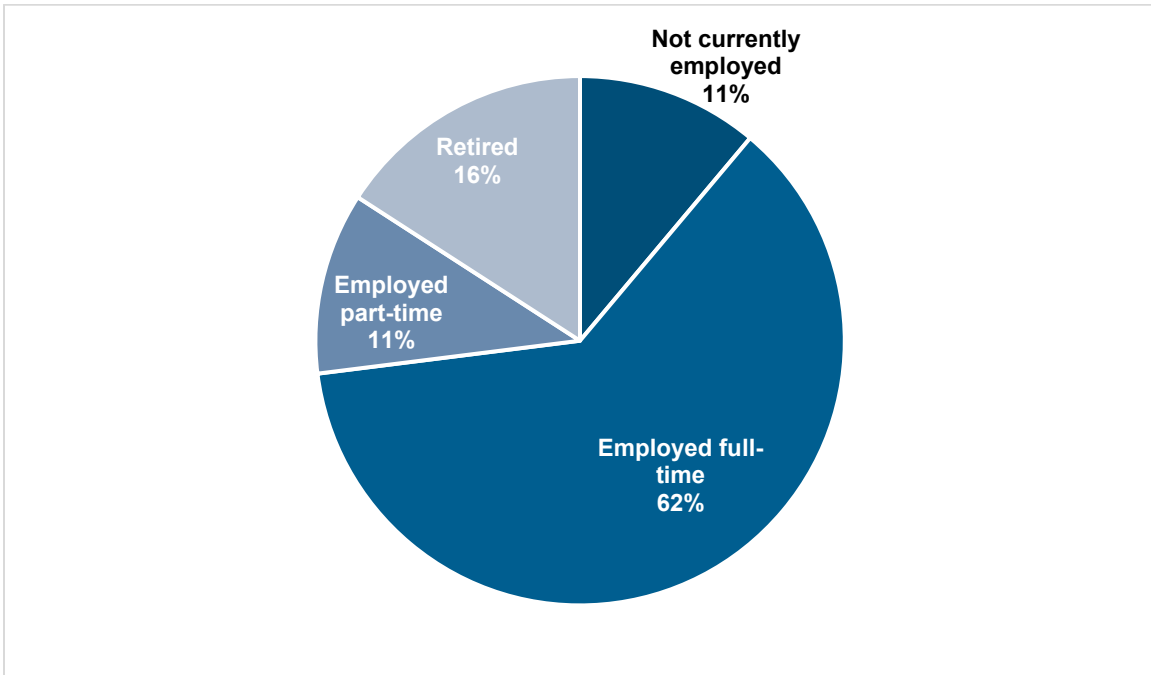


Figure 7-14 What is Your Employment Status?





## 8 SERVICE RELIABILITY ANALYSIS

Service reliability is a key component for evaluating the performance and effectiveness of a transit system. Routes with a higher level of reliability are able to better meet the needs and expectations of customers, provide more competitive travel times, and better facilitate timed transfers. The two primary factors for determining reliability are on-time performance and travel time variability. Improving the on-time performance and reducing variability in travel times can significantly improve the customer experience for transit riders.

This assessment evaluates both reliability and variability and makes specific recommendations to ensure routes are operating on-time and to make travel times more consistent and reliable throughout the day. Recommendations may include changes to route alignments, segment level schedules, and potential for Transit Signal Priority improvements. This analysis is based on an evaluation of segment level travel times and schedules, shown in more detail in Appendix C of this report.

### LIST OF TERMS

- **On-Time Performance (OTP)** – A measure of the percentage of trips that operate early, late, and on-time based on the difference between actual and scheduled arrival or departure times at specific timepoints along a route alignment.
- **Transit Signal Priority (TSP)** – A type of infrastructure improvement intended to improve travel time reliability for transit service at specific intersections. TSP may extend green lights, shorten red lights, or provide separate signal phases for transit vehicles to allow buses to travel through intersections faster and more reliably.
- **Overscheduled** – When there is too much time allocated between two timepoints in a transit schedule.
- **Underscheduled** – When there is not enough time allocated between two timepoints in a transit schedule.
- **Timepoints** – Major bus stops that are used to set schedules and evaluate on-time performance along a route's alignment.

## KEY THEMES AND FINDINGS

**Most routes have adequate running time to complete trips.** However, running time is not distributed well between timepoints. With some segments overscheduled and others underscheduled, routes may be departing earlier or later than scheduled on certain segments. By better balancing the distribution of running time to generally provide tighter schedules early in the routes alignment and looser schedules during the last segment, routes are more likely to operate on-time more consistently and have flexibility at the end of the route to make up time for potential late running routes so that transfers at the route termini are not missed.

**Travel time variability issues are concentrated in a few specific locations.**

Generally, there are not widespread reliability issues across the EMBARK system. Rather, there are a few key segments and intersections with higher travel time variability that may impact reliability for several routes throughout the day. These locations may be candidates for TSP improvements to reduce variability and ensure more consistent travel times throughout the day on routes traveling through these locations.

**Routes should operate on clockface headways where possible.** In some instances, it may be necessary to add time to a route's schedule to provide sufficient time to complete a trip. When this is the case, it is recommended to continue operating on clockface headways, rather than shifting the scheduled service frequency to accommodate this additional time. Clockface headways provide a consistent, reliable schedule for passengers and are considered a best practice in transit operations.

**Most routes, when they do fall significantly behind schedule, have no way of recovering.** Almost all EMBARK routes have only 5 minutes of recovery time at the transit center. If buses are more than 5 minutes late to the transit center, the next trip starts out late, leading to a cascading reliability effect.

## ON-TIME PERFORMANCE

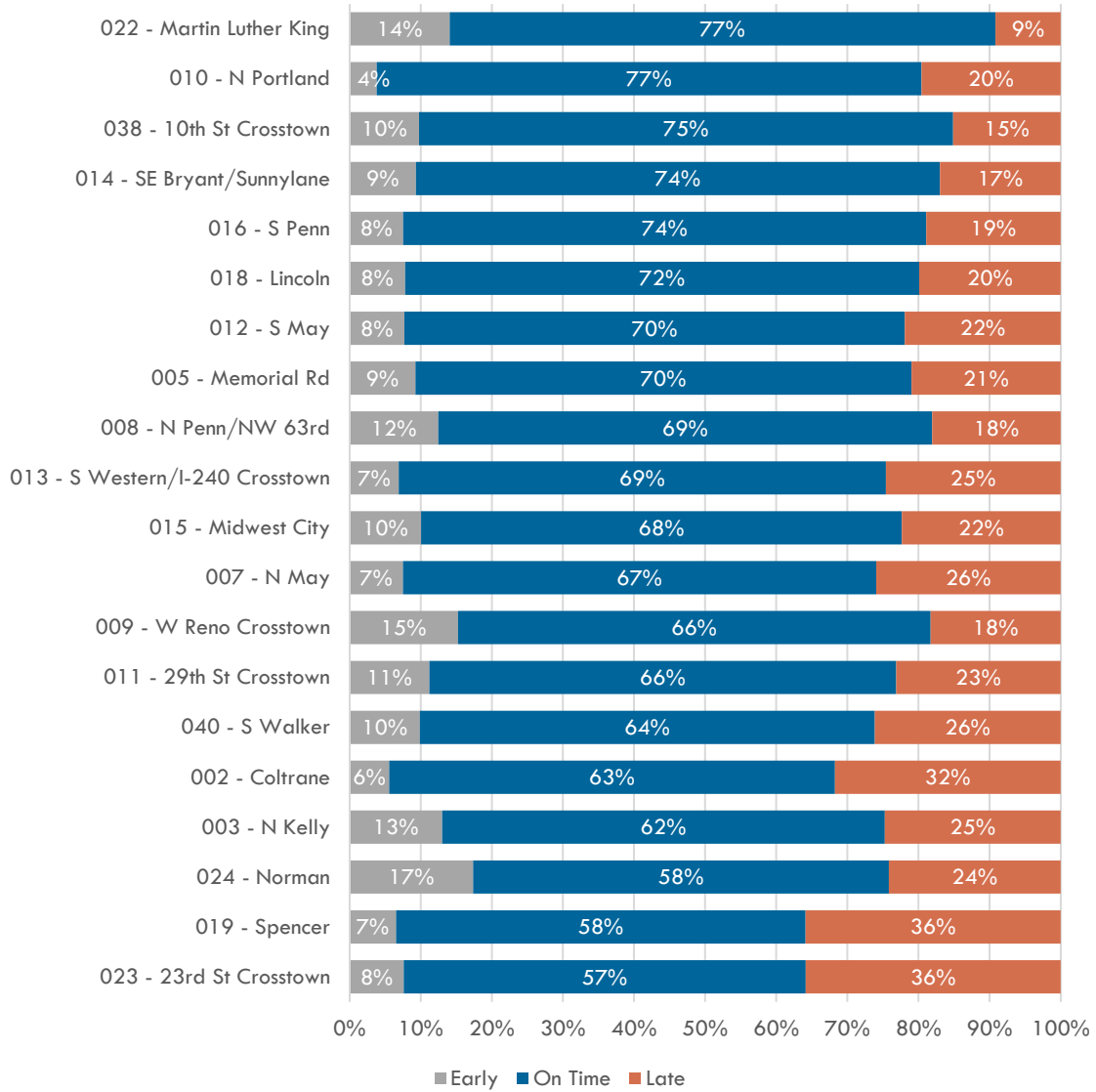
On-time performance is a measure of the percentage of trips that operate early, late, and on-time. In this analysis, these on-time performance thresholds are defined as:

- **Early** – Departing from a timepoint more than one minute before scheduled
- **Late** – Departing from a timepoint more than five minutes after scheduled
- **On-Time** – Departing from a timepoint within one minute before scheduled and five minutes after scheduled

While it is impossible for routes to operate with 100% on-time performance due to unpredictable variations in operating conditions, routes with higher on-time performance are considered more reliable than routes with lower on-time performance. Arriving and departing from bus stops at the scheduled arrival and departure times helps passengers more effectively plan their trips. Early departures may result in passengers missing their bus and being forced to wait for the next trip, while late arrivals may result in passengers missing their timed transfers to other routes as well as being late to work, appointments, or other time sensitive travel needs.

On-time performance at the route level for the EMBARK system is shown below in Figure 8-1. Routes with low on-time performance may be improved by adjusting the scheduled departure times along specific segments to more accurately reflect travel times throughout the day. Routes with a high percentage of late arrivals may need additional time added to the schedule, while routes with a high percentage of early departures may need to have time removed from the schedule.

Figure 8-1 Route Level On-Time Performance



Source: EMBARK APC Data (September – November 2019)

## TRAVEL TIME VARIABILITY

While OTP represents how frequently a route is operating early, late, and on-time, it is also important to recognize that travel times may vary on specific trips or at certain times throughout the day. For instance, the morning and afternoon peak periods typically have higher levels of traffic congestion, which may result in more late arrivals during these time periods. On the other hand, traffic congestion is often lower during the early morning and late evening time periods, which may allow routes to operate faster than other times during the day.

This travel time variability analysis takes a detailed approach, evaluating the reliability of service for each segment of every route in the EMBARK system in both the inbound and outbound directions. Using Automated Vehicle Locator (AVL) data from the months of September, October, and November 2019, this chapter evaluates the scheduled run-time, average run-time, 85<sup>th</sup> percentile run-time, and 95<sup>th</sup> percentile run-time to determine how consistent running times are for each segment throughout the day and whether those running times are routinely faster or slower than the scheduled run-times. A summary of this analysis is shown in Figure 8-3.

This analysis identifies how the actual travel times for each segment compare to the scheduled travel times and identifies several challenges and opportunities for each route, including:

- Where on-time performance issues may be occurring along the route alignment
- Which segments may need schedule adjustments to better reflect actual operating conditions
- What specific opportunities exist to improve on-time performance and travel time variability

## TRANSIT SIGNAL PRIORITY

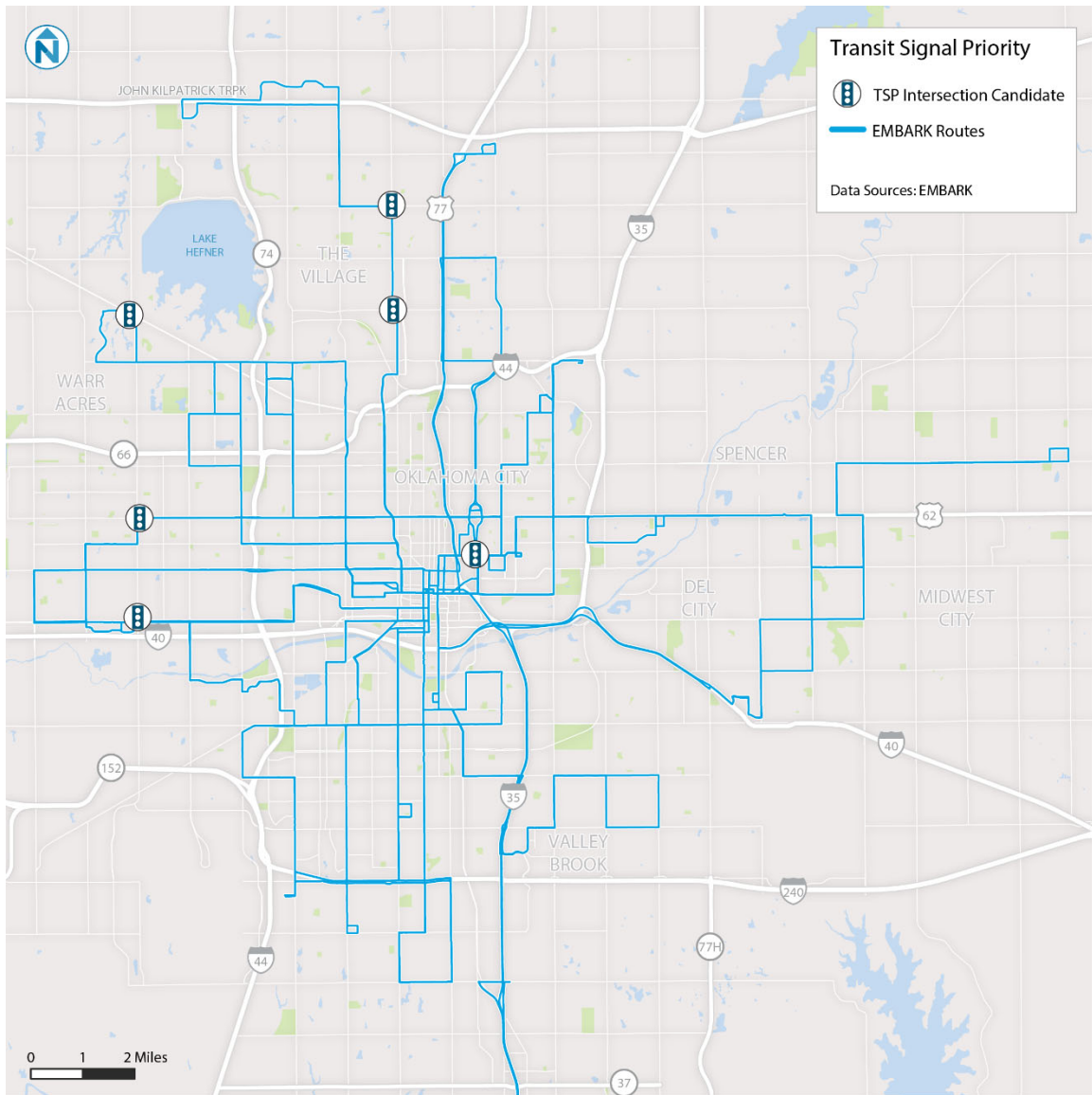
Transit Signal Priority represents an intersection level infrastructure improvement that can be used to reduce travel time variability and enable transit service to operate more reliably throughout the day. TSP works by utilizing traffic signals that can be programmed to provide preferential treatment for buses at intersections, modifying standard signal times to ensure that buses have minimal delays. This can be done in two ways. The most common is to either extend a green light until an approaching bus passes through an intersection or to shorten a red light to reduce the time a bus waits at an intersection. The second is to provide a separate signal phase for transit vehicles, usually to allow buses to shift lanes and to avoid conflicts with turning vehicles.

In this analysis, travel time variability was evaluated for each route segment and used to identify intersections that may be strong candidates for TSP improvements. High travel time variability indicates that traffic congestion is likely to worsen at certain times of day, resulting in delays and reliability issues for transit that may be improved with TSP treatments. This evaluation represents a high-level approach to identifying potential locations for TSP improvements, each of these intersections requires further evaluation to identify feasibility, engineering requirements, and specific TSP improvements.

Specific intersections identified in this analysis that may be candidates for TSP improvements are shown in Figure 8-2 and include:

- 13<sup>th</sup> & Lincoln near OU Health (Routes 002, 003, 018, 023, 024)
- Western & Wilshire (Route 005)
- Western & Hefner (Route 005)
- NW Expressway & Wilshire (Route 008)
- NW Expressway & MacArthur (Route 008)
- Reno & MacArthur (Routes 009, 011)
- 23<sup>rd</sup> & MacArthur (Route 023)

Figure 8-2 Transit Signal Priority Candidate Intersections



The seven intersections discussed above are based on travel time variability observations from existing route alignments. As recommendations from the OKC Moves Bus Study are implemented, several new intersections that are currently unserved may become candidates for TSP improvements. Key future intersections for evaluation include:

- NW Expressway & Belle Isle Blvd (Routes 003, 005)
- Lyrewood & Wilshire (Route 008)

## IMPLEMENTATION

- This evaluation identifies several different types of recommendations, including alignment changes, schedule revisions, and potential TSP improvements. Each of these recommendations may be implemented during different timeframes.
- **Schedule revisions** represent cost neutral improvements that may be implemented prior to the Short-Term Recommendations. These changes include shifting time between timepoints in the existing route schedules and may be made with no additional resources.
- **Alignment changes** that reduce a routes length, allowing for more recovery and allowing a route to stay on time. The alignment changes found in the Short-Term Recommendations are typically cost-neutral and do not require additional resources.
- **TSP Improvements** may require further study and additional capital resources to implement. The locations identified as candidates for TSP improvements should be further evaluated for the potential for implementation and associated financial implications. Capital improvements like queue jumps and roadway configuration changes should be evaluated as potential alternatives in future studies.

In addition to these recommendations, EMBARK is also evaluating several operation changes including scheduling practices, run cutting, and schedule optimization that may also improve on-time performance. One aspect of these operational changes includes evaluating on-street supervision to help address some on-time performance issues. As EMBARK grows and BRT is added, additional street supervisors will be added that can assist in maintaining reliable service.

Figure 8-3 Reliability Analysis Summary

Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
Route 002	56%	<ul style="list-style-type: none"> <li>Variability differs across the route with longer travel times at different times of day depending on the segment.</li> <li>Coltrane &amp; NE 20<sup>th</sup> to NE 23<sup>rd</sup> &amp; MLK is underscheduled and has longer travel times in the midday between 9:00 am and 12:00 pm.</li> <li>NE 23<sup>rd</sup> &amp; MLK to Health Sciences Center is well scheduled but has higher variability on select afternoon trips, at 2:30 pm and 5:00 pm.</li> </ul>	<ul style="list-style-type: none"> <li>Higher variability than inbound direction.</li> <li>Notably longer travel times between 11:00 am and 2:30 pm between Transit Center and Health Sciences Center.</li> <li>Segment between NE 23<sup>rd</sup> &amp; MLK to Coltrane &amp; NE 20<sup>th</sup> may be overscheduled but does allow time for operators to catch up. This segment also has higher travel times between 4:00 pm and 5:00 pm.</li> </ul>	<ul style="list-style-type: none"> <li>Route 002 is a low OTP route in the EMBARK system that has high levels of variability on different segments at different times of day.</li> <li>TSP may be a valuable tool in reducing travel time variability throughout the day.</li> <li>Reliability may also be improved by serving the senior center at McGuire Plaza in the inbound direction only and stopping at 13<sup>th</sup> &amp; Lottie in the outbound direction, reducing travel times in that direction.</li> <li>Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>Transit Center to Health Sciences – Remove 1 min</li> <li>23rd/MLK to Coltrane &amp; 20<sup>th</sup> – Remove 1 min</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>Health Sciences – Transit Center – Add two mins</li> </ul>
Route 003	73%	<ul style="list-style-type: none"> <li>Some variability in the afternoon on segment between Kelley &amp; 36<sup>th</sup> and Health Sciences Center. This segment is also overscheduled.</li> <li>Segment between Health Sciences Center and Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Higher variability than inbound direction, particularly between Transit Center and Health Sciences Center where travel times are longer in the morning and afternoon.</li> <li>Outbound service is generally appropriately scheduled, may consider adding time between Transit Center and Health Sciences Center to accommodate higher variability.</li> </ul>	<ul style="list-style-type: none"> <li>Route 003 is an average OTP route that has moderate levels of variability with most variation between the Transit Center and the Health Sciences Center in the morning and afternoon.</li> <li>Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>Transit Center to Health Sciences – Remove 1 min</li> <li>Health Sciences to 36<sup>th</sup> &amp; Kelley – Remove 2 mins</li> </ul> <p><b>Inbound</b></p>



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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<ul style="list-style-type: none"> <li>▪ MLK &amp; 50th to 36th &amp; Kelley – Remove 1 min</li> <li>▪ 36th &amp; Kelley to Health Sciences – Remove 1 min</li> <li>▪ Health Sciences to Transit Center – Add 5 mins</li> </ul>
Route 005	72%	<ul style="list-style-type: none"> <li>▪ High variability on segment between Mercy Hospital and Penn &amp; Memorial between 7:35 am and 1:35 pm. Segment is underscheduled.</li> <li>▪ High variability between Western &amp; Hefner and Western &amp; Wilshire, longer travel times in early afternoon and evening with shorter travel times in early afternoon.</li> <li>▪ The remaining segments appear generally well scheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Segment between Transit Center &amp; 23<sup>rd</sup> &amp; Classen is overscheduled by 3-4 minutes.</li> <li>▪ Segment between Western &amp; Wilshire and Hefner &amp; Western is underscheduled and has moderate variability throughout the day.</li> <li>▪ Segment between 140<sup>th</sup> &amp; Penn and Mercy Hospital is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 005 is an average OTP route that has moderate levels of variability along the alignment with the highest variability occurring near Mercy Hospital and between Western &amp; Hefner and Western &amp; Wilshire.</li> <li>▪ TSP may be an applicable solution on the segment between Western &amp; Wilshire and Hefner &amp; Western where variability is high throughout the day.</li> <li>▪ Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to 23<sup>rd</sup> &amp; Classen – Remove 4 mins</li> <li>▪ 23<sup>rd</sup> &amp; Classen to Classen &amp; Belle Isle – Remove 1 min</li> <li>▪ 140<sup>th</sup> &amp; Penn to Mercy – Add 2 minutes</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Penn &amp; Memorial to Western &amp; Hefner – Remove 1 min</li> <li>▪ Western &amp; Hefner to Western &amp; Wilshire – Remove 1 min</li> <li>▪ 23<sup>rd</sup> &amp; Classen to Transit Center – Add 5 min</li> </ul>
Route 007	78%	<ul style="list-style-type: none"> <li>▪ Generally longer travel times in the afternoon between 4:00 p.m. and 6:00 p.m.</li> <li>▪ Segment between Baptist Integris and May * 36<sup>th</sup> is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Segment between Transit Center and Penn &amp; 16<sup>th</sup> is overscheduled, consider reducing scheduled travel time.</li> <li>▪ Segment between 36<sup>th</sup> &amp; May and Baptist Integris is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 007 is an above average OTP route with moderate variability in the inbound direction.</li> <li>▪ Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
		<ul style="list-style-type: none"> <li>Segment between Penn &amp; 23<sup>rd</sup> and Penn &amp; 16<sup>th</sup> is overscheduled.</li> <li>Segment between Penn &amp; 16<sup>th</sup> and Transit Center is underscheduled.</li> </ul>		<ul style="list-style-type: none"> <li>Transit Center to Penn &amp; 16<sup>th</sup> – Remove 2 mins</li> <li>36<sup>th</sup> &amp; May to Baptist Integris – Add 1 min</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>Baptist Integris to May &amp; 36<sup>th</sup> – Add 1 min</li> <li>May &amp; 36<sup>th</sup> to Penn &amp; 23<sup>rd</sup> – Remove 1 min</li> <li>Penn &amp; 23<sup>rd</sup> to Penn &amp; 16<sup>th</sup> – Remove 1 min</li> <li>Penn &amp; 16<sup>th</sup> to Transit Center – Add 2 mins</li> </ul>
Route 008	75%	<ul style="list-style-type: none"> <li>High variability throughout the day on segment between Wilshire &amp; Lyrewood and 63<sup>rd</sup> &amp; Meridian.</li> <li>Both segments from Penn &amp; Belleview to Penn &amp; 23<sup>rd</sup> and from Penn &amp; 23<sup>rd</sup> to Transit Center are underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Segment from Transit Center to Penn &amp; 23<sup>rd</sup> is overscheduled.</li> <li>Longer travel times in the afternoon from 63<sup>rd</sup> &amp; Independence to 63<sup>rd</sup> &amp; Meridian.</li> <li>High variability throughout the day on segment between Wilshire &amp; Lyrewood and 63<sup>rd</sup> &amp; Meridian.</li> </ul>	<ul style="list-style-type: none"> <li>Route 008 is an average OTP route with high variability on the westernmost segment of the route in both directions.</li> <li>Segment between Wilshire &amp; Lyrewood and 63<sup>rd</sup> &amp; Meridian may be a candidate for TSP to reduce variability throughout the day.</li> <li>Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>Transit Center to 23<sup>rd</sup> – Remove 2 mins</li> <li>Penn &amp; 23<sup>rd</sup> to Penn Square – Remove 1 min</li> <li>Penn Square to 63<sup>rd</sup> &amp; Independence – Add 1 min</li> <li>63<sup>rd</sup> &amp; Independence to 63<sup>rd</sup> &amp; Meridian – Remove 1 min</li> <li>63<sup>rd</sup> &amp; Meridian to Wilshire &amp; Lyrewood – Add 2 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>63<sup>rd</sup> &amp; Meridian to 63<sup>rd</sup> &amp; Independence – Remove 1 min</li> <li>63<sup>rd</sup> &amp; Independence to Penn &amp; Belleview – Remove 1 min</li> <li>Penn &amp; Belleview to Penn &amp; 23<sup>rd</sup> – Add 1 mins</li> <li>Penn &amp; 23<sup>rd</sup> to Transit Center – Add 2 mins</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
Route 009	72%	<ul style="list-style-type: none"> <li>Moderate variability between Greenfield Center and Reno &amp; May. Segment between Greenfield Center and Reno &amp; Meridian appears overscheduled.</li> <li>Segment from Main &amp; Penn to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Low variability in the outbound direction.</li> <li>The segment from Transit Center to Penn &amp; Main is overscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Route 009 is an average OTP route with low variability aside from the moderate variability on the inbound segments between Greenfield Center and Reno &amp; May.</li> <li>Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>Transit Center to Main &amp; Penn – Remove 1 min</li> <li>Reno &amp; May to Reno &amp; Meridian – No change</li> <li>Reno &amp; Meridian to Reno Hub – Add 1 min</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>Reno Hub to Reno &amp; Meridian – Remove 1 min</li> <li>Reno &amp; Meridian to Reno &amp; May – Remove 1 min</li> <li>Main &amp; Penn to Transit Center – Add 2 mins</li> </ul>
Route 010	78%	<ul style="list-style-type: none"> <li>Low variability on all segments. Most segments appear well scheduled.</li> <li>Segment from 16<sup>th</sup> &amp; Penn to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Travel times are generally higher in the afternoon between 3:00 pm and 5:30 pm particularly between Transit Center and Portland &amp; 16<sup>th</sup>.</li> <li>Schedule may need to be fine-tuned from Transit Center to 16<sup>th</sup> &amp; Penn to reduce scheduled travel times during the morning and early afternoon.</li> <li>Segment from Portland &amp; 16<sup>th</sup> to Portland &amp; 36<sup>th</sup> is overscheduled and segment from Portland &amp; 36<sup>th</sup> 50<sup>th</sup> &amp; Meridian is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Route 010 is an above average OTP route with low variability aside from the longer afternoon travel times on some segments in the outbound direction.</li> <li>Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>Transit Center to 16<sup>th</sup> &amp; Penn – Remove 1 min</li> <li>Portland &amp; 16<sup>th</sup> to Portland &amp; 36<sup>th</sup> – Remove 1 min</li> <li>Portland &amp; 36<sup>th</sup> to 50<sup>th</sup> &amp; Meridian – Add 1 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>Portland &amp; 36<sup>th</sup> to 16<sup>th</sup> &amp; Portland – Remove 1 min</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
Route 011	66%	<ul style="list-style-type: none"> <li>▪ High variability on segment from Greenfield Center to Meridian &amp; 15<sup>th</sup>, with longer travel times from 7:30 am – 9:00 am, 10:30 am – 1:00 pm, and 3:00 pm – 5:00 pm.</li> <li>▪ Moderate variability from Meridian &amp; 15<sup>th</sup> to 29<sup>th</sup> &amp; May.</li> <li>▪ Longer afternoon travel times between 3:00 pm and 6:00 pm from 29<sup>th</sup> &amp; May to 29<sup>th</sup> &amp; Walker</li> <li>▪ Given variability, segments are generally scheduled well except for segment from Robinson &amp; 25<sup>th</sup> to Transit Center which is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Segment from Transit Center to 25<sup>th</sup> &amp; Robinson is slightly underscheduled between 6:00 am and 5:30 pm.</li> <li>▪ Segments from 25<sup>th</sup> &amp; Robinson to High &amp; 15<sup>th</sup> and from High &amp; 15<sup>th</sup> to 29<sup>th</sup> &amp; Walker are both overscheduled.</li> <li>▪ Segment from 29<sup>th</sup> &amp; Walker to May &amp; 29<sup>th</sup> is underscheduled.</li> <li>▪ Segment between Meridian &amp; 15<sup>th</sup> and Greenfield Center is underscheduled. This segment also has higher variability in the late morning and afternoon periods.</li> </ul>	<ul style="list-style-type: none"> <li>▪ 16<sup>th</sup> &amp; Penn to Transit Center – Add 2 min</li> <li>▪ Route 011 is a low OTP route with high variability along some segments, most notably between Greenfield Center and Meridian &amp; 15<sup>th</sup>.</li> <li>▪ This segment may be a strong candidate for TSP improvements.</li> <li>▪ Reliability may also be improved by serving Andrews Towers directly in the inbound direction only and by operating on 25<sup>th</sup> instead of 20<sup>th</sup> between May and Grand to reduce at grade rail crossings and lower travel times.</li> <li>▪ Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to 25<sup>th</sup> &amp; Robinson – No change</li> <li>▪ 25<sup>th</sup> &amp; Robinson to High &amp; 15<sup>th</sup> – Remove 1 min</li> <li>▪ High &amp; 15<sup>th</sup> to 29<sup>th</sup> &amp; Walker – Remove 1 min</li> <li>▪ Meridian &amp; 15<sup>th</sup> to Reno Hub – Add 2 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Meridian &amp; 15<sup>th</sup> to 29<sup>th</sup> &amp; May – Remove 1 min</li> <li>▪ 29<sup>th</sup> &amp; Walker to 15<sup>th</sup> &amp; High – Remove 1 min</li> <li>▪ Robinson &amp; 25<sup>th</sup> to Transit Center – Add 2 mins</li> </ul>
Route 012	74%	<ul style="list-style-type: none"> <li>▪ The segment between OCCC and 44<sup>th</sup> &amp; May appears appropriately scheduled but does have some longer travel times in the morning between 7:30 am and 8:30 am.</li> </ul>	<ul style="list-style-type: none"> <li>▪ The segment between the Transit Center and SW 29<sup>th</sup> &amp; May is underscheduled. There is a fair amount of variability on this segment, making scheduling difficult.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 012 is an average OTP route with moderate variability</li> <li>▪ Reliability may be improved by realigning service to operate on Exchange between Agnew and Reno and Walker and Reno</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
		<ul style="list-style-type: none"> <li>Segment from 29<sup>th</sup> &amp; May to Transit Center may be underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Segment between 29<sup>th</sup> &amp; May and May &amp; 44<sup>th</sup> is overscheduled, less variable than other segments.</li> <li>Segment between May &amp; 44<sup>th</sup> and OCCC is underscheduled. Adding more time to this segment would provide flexibility for operators.</li> </ul>	<p>instead of Western and Main to operate on a more direct alignment and reduce travel times.</p> <ul style="list-style-type: none"> <li>Adjusting travel times is recommended:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>29<sup>th</sup> &amp; May to May &amp; 44<sup>th</sup> – Remove 1 mins</li> <li>May &amp; 44<sup>th</sup> to OCCC – Add 1 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>44<sup>th</sup> &amp; May to 29<sup>th</sup> &amp; May – Remove 2 mins</li> <li>29<sup>th</sup> &amp; May to Transit Center – Add 2 mins</li> </ul>
Route 013	65%	<ul style="list-style-type: none"> <li>Moderate variation between OCCC and 74<sup>th</sup> &amp; Santa Fe. Segment is also overscheduled.</li> <li>Segment from Western &amp; 74<sup>th</sup> to Western &amp; 44<sup>th</sup> is underscheduled.</li> <li>May be able to add another time to segment from Western &amp; 29<sup>th</sup> to Transit Center.</li> </ul>	<ul style="list-style-type: none"> <li>Segment from Transit Center to Western &amp; 29<sup>th</sup> is overscheduled.</li> <li>Afternoon travel times are generally longer from Western &amp; 29<sup>th</sup> to Western &amp; 44<sup>th</sup>, consider updating scheduled travel times to correspond with actual travel times.</li> <li>Segment from 74<sup>th</sup> &amp; Western to OCCC is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Route 013 is a low OTP route with moderate variability.</li> <li>Reliability may be improved by operating along Walker and Reno instead of on 3<sup>rd</sup> and 4<sup>th</sup> to provide more direct service with lower travel times.</li> <li>OTP may be improved by adjusting schedules to more closely align with observed changes throughout the day, including longer afternoon travel times, and by balancing scheduled time between timepoints, as follows:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>Transit Center to Western &amp; 29<sup>th</sup> – Remove 1 min</li> <li>74<sup>th</sup> &amp; Western to OCCC – Add 1 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>OCCC to 74<sup>th</sup> &amp; Santa Fe – Remove 3 mins</li> <li>Western &amp; 74<sup>th</sup> to Western &amp; 44<sup>th</sup> – Add 1 min</li> <li>Western &amp; 44<sup>th</sup> to Western &amp; 29<sup>th</sup> – Remove 1 min</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<ul style="list-style-type: none"> <li>Western &amp; 29<sup>th</sup> to Transit Center – Add 3 mins</li> </ul>
Route 014	86%	<ul style="list-style-type: none"> <li>Some variability from Sunnyside &amp; 59<sup>th</sup> to 44<sup>th</sup> &amp; Bryant. Segment may be overscheduled.</li> <li>Some variability between 44<sup>th</sup> &amp; Bryant and Crossroads &amp; 59<sup>th</sup>. Segment is overscheduled.</li> <li>Segment from Crossroads &amp; 59<sup>th</sup> to High &amp; 44<sup>th</sup> is underscheduled.</li> <li>Segment from Walker &amp; 25<sup>th</sup> to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Slightly longer travel times in the afternoon between 25<sup>th</sup> &amp; Walker and 44<sup>th</sup> &amp; High.</li> <li>Segment from 44<sup>th</sup> &amp; High to 59<sup>th</sup> &amp; Crossroads is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Route 014 is a high OTP with low amounts of variability, most notably in the inbound direction.</li> <li>OTP may be further improved on the route by adjusting schedules to better balance scheduled travel times between timepoints, as follows: <b>Outbound</b> <ul style="list-style-type: none"> <li>25<sup>th</sup> &amp; Walker to 44<sup>th</sup> &amp; High – Remove 2 mins</li> <li>44<sup>th</sup> &amp; High to 59<sup>th</sup> &amp; Crossroads – Add 2 mins</li> <li>59<sup>th</sup> &amp; Crossroads to Bryant &amp; 44<sup>th</sup> – Remove 1 min</li> <li>Bryant &amp; 44<sup>th</sup> to Sunnyside &amp; 59<sup>th</sup> – Remove 1 min</li> </ul> <b>Inbound</b> <ul style="list-style-type: none"> <li>Sunnyside &amp; 59<sup>th</sup> to 44<sup>th</sup> &amp; Bryant – Remove 1 min</li> <li>44<sup>th</sup> &amp; Bryant to Crossroads &amp; 59<sup>th</sup> – Remove 1 mins</li> <li>Crossroads &amp; 59<sup>th</sup> to High &amp; 44<sup>th</sup> – Add 1 min</li> <li>Walker &amp; 25<sup>th</sup> to Transit Center – Add 3 mins</li> </ul> </li> </ul>
Route 015	75%	<ul style="list-style-type: none"> <li>Moderate variability, generally longer travel times between 8:00 am – 10:00 am and 3:00 pm – 6:00 pm.</li> <li>Segment from Douglas &amp; Reno to Reno &amp; Midwest is overscheduled.</li> <li>Segment from Rose State College to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Moderate variability, generally longer travel times between 8:00 am – 10:00 am and 3:00 pm – 6:00 pm.</li> <li>Segment from Transit Center to Rose State College is overscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>Route 015 is an average OTP route with longer travel times during the morning and afternoon peak periods.</li> <li>OTP on the route would be improved by adjusting schedules to account for longer travel times during these periods.</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
			<ul style="list-style-type: none"> <li>▪ Segments from Rose State College to 15<sup>th</sup> &amp; Air Depot and from 15<sup>th</sup> &amp; Air Depot to 10<sup>th</sup> &amp; Douglas are both underscheduled.</li> <li>▪ Segment from 10<sup>th</sup> &amp; Douglas to Douglas &amp; Reno is underscheduled</li> </ul>	<ul style="list-style-type: none"> <li>▪ OTP may be further improved by adjusting scheduled travel times to better align with observed travel conditions and provide more flexibility at the end of the route, as follows:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to Rose State College – Remove 4 mins</li> <li>▪ Rose State College to 15<sup>th</sup> &amp; Air Depot –Add 1 min</li> <li>▪ 15<sup>th</sup> &amp; Air Depot to 10<sup>th</sup> &amp; Douglas – Add 1 mins</li> <li>▪ 10<sup>th</sup> &amp; Douglas to Douglas &amp; Reno – Add 1 min</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Douglas &amp; Reno to Reno &amp; Midwest – No Change</li> <li>▪ Reno &amp; Midwest to Air Depot &amp; Reno – No change</li> <li>▪ Air Depot &amp; Reno to Rose State College – No change</li> <li>▪ Rose State College to Transit Center – Add 1 min</li> </ul>
Route 016	86%	<ul style="list-style-type: none"> <li>▪ Low variability, generally consistent travel times.</li> <li>▪ Segment from Penn &amp; 89<sup>th</sup> to Penn &amp; 74<sup>th</sup> is overscheduled.</li> <li>▪ Segment from Exchange &amp; Westwood to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Slightly higher variability than inbound, but generally low overall.</li> <li>▪ Segment from Penn &amp; 74<sup>th</sup> to Penn &amp; 89<sup>th</sup> is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 016 is a high OTP route with low variability.</li> <li>▪ Reliability may be improved by operating along Walker and Reno instead of on 3<sup>rd</sup> and 4<sup>th</sup> to provide more direct service with lower travel times.</li> <li>▪ OTP may be further improved by adjusting scheduled travel times between timepoints to better align with observed travel conditions and to provide more flexibility at the end of the route, as follows:</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to Westwood &amp; Exchange – No Change</li> <li>▪ Westwood &amp; Exchange to Penn &amp; 44<sup>th</sup> – Add 1 min</li> <li>▪ Penn &amp; 44<sup>th</sup> to Penn &amp; 74<sup>th</sup> – Remove 1 min</li> <li>▪ Penn &amp; 74<sup>th</sup> to Penn &amp; 89<sup>th</sup> – No change</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Penn &amp; 89<sup>th</sup> to Penn &amp; 74<sup>th</sup> – Remove 1 min</li> <li>▪ Penn &amp; 74<sup>th</sup> to Penn &amp; 44<sup>th</sup> – No change</li> <li>▪ Penn &amp; 44<sup>th</sup> to Exchange &amp; Westwood – No change</li> <li>▪ Exchange &amp; Westwood to Transit Center – Add 1 min</li> </ul>
Route 018	89%	<ul style="list-style-type: none"> <li>▪ Generally low variability.</li> <li>▪ Segment from Broadway &amp; Britton to 63<sup>rd</sup> &amp; Broadway may be slightly overscheduled.</li> <li>▪ Segment from Lincoln &amp; 13<sup>th</sup> to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Generally low variability.</li> <li>▪ Segment from Transit Center to Lincoln &amp; 13<sup>th</sup> may be slightly overscheduled.</li> <li>▪ Segment from Lincoln &amp; 50<sup>th</sup> to Broadway &amp; Britton is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 018 has good OTP with low variability.</li> <li>▪ OTP may be further improved by adjusting scheduled travel times between timepoints to better align with observed travel conditions and to provide more flexibility at the end of the route, as follows:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to Lincoln &amp; 13<sup>th</sup> – Remove 1 min</li> <li>▪ Lincoln &amp; 13<sup>th</sup> to State Capitol – Remove 1 min</li> <li>▪ State Capitol to Lincoln &amp; 50<sup>th</sup> – No change</li> <li>▪ Lincoln &amp; 50<sup>th</sup> to Broadway &amp; Britton – Add 1 min</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Broadway &amp; Britton to 63<sup>rd</sup> &amp; Broadway – No change</li> </ul>



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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<ul style="list-style-type: none"> <li>▪ 63<sup>rd</sup> &amp; Broadway to Broadway &amp; Lincoln – No change</li> <li>▪ Lincoln &amp; 50<sup>th</sup> to State Capitol – No change</li> <li>▪ State Capitol to Lincoln &amp; 13<sup>th</sup> – No change</li> <li>▪ Lincoln &amp; 13<sup>th</sup> to Transit Center – Add 1 min</li> </ul>
Route 019	77%	<ul style="list-style-type: none"> <li>▪ Route does not travel downtown, this section discusses westbound service.</li> <li>▪ Segment from 39<sup>th</sup> &amp; Hiwasee to 36<sup>th</sup> &amp; Adair is underscheduled</li> <li>▪ Afternoon travel times are longer on segment from 10<sup>th</sup> &amp; Douglas to 23<sup>rd</sup> &amp; Social Services, consider adding time after 4:00 pm.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route does not travel downtown, this section discusses eastbound service.</li> <li>▪ Generally high variation on segment from Coltrane &amp; 20<sup>th</sup> to 23<sup>rd</sup> &amp; Social Services. Segment is scheduled well despite variability.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 019 has above average OTP, and has some variability on certain segments.</li> <li>▪ OTP may be improved slightly by minor rescheduling:</li> </ul> <p><b>Westbound</b></p> <ul style="list-style-type: none"> <li>▪ 39<sup>th</sup> &amp; Hiwasee to 36<sup>th</sup> &amp; Adair – Add 1 min</li> <li>▪ 36<sup>th</sup> &amp; Adair to 10<sup>th</sup> &amp; Douglas – No change</li> <li>▪ 10<sup>th</sup> &amp; Douglas to 23<sup>rd</sup> &amp; Social Services – No change</li> <li>▪ 23<sup>rd</sup> &amp; Social Services to Coltrane &amp; 20<sup>th</sup> – Remove 1 min</li> </ul> <p><b>Eastbound</b></p> <ul style="list-style-type: none"> <li>▪ Coltrane &amp; 20<sup>th</sup> to 23<sup>rd</sup> &amp; Social Services – No change</li> <li>▪ 23<sup>rd</sup> &amp; Social Services to 10<sup>th</sup> &amp; Douglas – No change</li> <li>▪ 10<sup>th</sup> &amp; Douglas to Mary Mahoney – No change</li> <li>▪ Mary Mahoney to 39<sup>th</sup> &amp; Hiwasee – No change</li> </ul>
Route 022	96%	<ul style="list-style-type: none"> <li>▪ Moderate variability on segment from County Health and Wellness to MLK &amp; 50<sup>th</sup> but segment is well scheduled.</li> <li>▪ Segment from MLK &amp; 8<sup>th</sup> to Transit Center may be slightly underscheduled, adding scheduled travel time would provide more flexibility for the route.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Segment from Transit Center to MLK &amp; 10<sup>th</sup> is overscheduled.</li> <li>▪ Segment from MLK &amp; 23<sup>rd</sup> to MLK &amp; 50<sup>th</sup> is overscheduled.</li> <li>▪ Segment from MLK &amp; 50<sup>th</sup> to County Health and Wellness is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 022 has the best OTP in the EMBARK system and has generally low variability.</li> <li>▪ There is little room for improvement, but OTP may be further improved by adjusting scheduled travel times between timepoints to better align with observed travel conditions</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<p>and to provide more flexibility at the end of the route, as follows:</p> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to MLK &amp; 10<sup>th</sup> – Remove 2 mins</li> <li>▪ MLK &amp; 10<sup>th</sup> to MLK &amp; 23<sup>rd</sup> – Remove 1 min</li> <li>▪ MLK &amp; 23<sup>rd</sup> to MLK &amp; 50<sup>th</sup> – Remove 2 mins</li> <li>▪ MLK &amp; 50<sup>th</sup> to County Health – Add 2 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ County Health to MLK &amp; 50<sup>th</sup> – Add 1 min</li> <li>▪ MLK &amp; 50<sup>th</sup> to MLK &amp; 23<sup>rd</sup> – Remove 2 mins</li> <li>▪ MLK &amp; 23<sup>rd</sup> to MLK &amp; 8<sup>th</sup> – Add 1 min</li> <li>▪ MLK &amp; 8<sup>th</sup> to Transit Center – Add 3 mins</li> </ul>
Route 023	50%	<ul style="list-style-type: none"> <li>▪ Route does not travel downtown, this section discusses eastbound service.</li> <li>▪ Moderate-high variability along the entire route but highest from 10<sup>th</sup> &amp; Rockwell to 23<sup>rd</sup> &amp; MacArthur and from State Capitol to Health Sciences Center.</li> <li>▪ Segment from Reno Hub to 10<sup>th</sup> &amp; Rockwell is has too much time.</li> <li>▪ Segment from 23<sup>rd</sup> &amp; McArthur to 23<sup>rd</sup> &amp; Penn is has too much time.</li> <li>▪ Segment from State Capitol to Health Sciences Center does not have enough time to recover for next trip.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route does not travel downtown, this section discusses westbound service.</li> <li>▪ Variability is not as bad as in the eastbound direction, highest from Health Sciences Center to 23<sup>rd</sup> &amp; Classen and from 23<sup>rd</sup> &amp; Portland to MacArthur &amp; 16<sup>th</sup>.</li> <li>▪ Afternoon travel times are routinely longer, beginning around 3:00 pm. Consider adding time in the afternoon.</li> <li>▪ Segment from MacArthur &amp; 16<sup>th</sup> to Reno Hub does not have enough time to recover for next trip..</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 023 has the worst OTP in the system.</li> <li>▪ There is moderate-high variability along the entire route alignment but is worst from 10<sup>th</sup> &amp; Rockwell to 23<sup>rd</sup> &amp; MacArthur and around the Health Sciences Center. These areas may benefit from TSP improvements to reduce variability.</li> <li>▪ Travel times are generally higher in the afternoon and OTP may be improved by scheduling longer travel times during those periods.</li> <li>▪ Reliability may be improved by realigning the route to avoid some of the most congested areas around the State Capitol complex and by serving the stop at Lincoln &amp; 26<sup>th</sup> near the department of education but no longer operating the loop on 24<sup>th</sup> located to the south, reducing travel times.</li> <li>▪ OTP may also be improved by adjusting scheduled travel time between timepoints to</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<p>provide more flexibility toward the end of the route alignment, as follows:</p> <p><b>Eastbound</b></p> <ul style="list-style-type: none"> <li>▪ Reno Hub to 10<sup>th</sup> &amp; Rockwell – Remove 1 mins</li> <li>▪ 10<sup>th</sup> &amp; Rockwell to 23<sup>rd</sup> &amp; MacArthur – No change</li> <li>▪ 23<sup>rd</sup> &amp; MacArthur to 23<sup>rd</sup> &amp; Portland – Remove 1 min</li> <li>▪ 23<sup>rd</sup> &amp; Portland to 23<sup>rd</sup> &amp; Penn – No change</li> <li>▪ 23<sup>rd</sup> &amp; Penn to 23<sup>rd</sup> &amp; Western – No change</li> <li>▪ 23<sup>rd</sup> &amp; Western to State Capitol – Remove 2 min</li> <li>▪ State Capitol to Health Sciences – Add 2 mins</li> </ul> <p><b>Westbound</b></p> <ul style="list-style-type: none"> <li>▪ Health Sciences to 23<sup>rd</sup> &amp; Classen – No change</li> <li>▪ 23<sup>rd</sup> &amp; Classen to Shepherd Mall &amp; Flynn – Remove 1 min</li> <li>▪ Shepherd Mall &amp; Flynn to 23<sup>rd</sup> &amp; Portland – No change</li> <li>▪ 23<sup>rd</sup> &amp; Portland to MacArthur &amp; 16<sup>th</sup> – No change</li> <li>▪ MacArthur &amp; 16<sup>th</sup> to Reno Hub – Add 3 min</li> </ul>
Route 024	58%	<ul style="list-style-type: none"> <li>▪ This section describes southbound trips.</li> <li>▪ Scheduled travel times are not consistent between trips. Schedule adjustments vary by time of day.</li> </ul>	<ul style="list-style-type: none"> <li>▪ This section describes northbound trips.</li> <li>▪ Scheduled travel times are not consistent between trips. Schedule adjustments vary by time of day.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 024 is a low OTP express route with significant variation throughout the day.</li> <li>▪ OTP may be improved by adjusting scheduled timepoints throughout the day to better align with changing traffic conditions and to realign service to provide more direct</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<p>service with fewer out of direction deviations through traffic.</p> <p><b>Southbound</b></p> <ul style="list-style-type: none"> <li>▪ Downtown Transit Center – Homeland Park-and-Ride – add 5 mins to second trip, remove 3 mins from third trip, remove 1 min from fourth trip</li> <li>▪ Homeland Park-and-Ride to Brooks Street – Add 5 mins to second, third, and fourth trips</li> </ul> <p><b>Northbound</b></p> <ul style="list-style-type: none"> <li>▪ Brooks Street to Homeland Park-and-Ride – remove 2 minutes from first two trips</li> <li>▪ Homeland Park-and-Ride to Robinson &amp; Main – Remove 2 mins from first trip</li> <li>▪ Robinson &amp; Main to NE 13<sup>th</sup> &amp; Lincoln – Add 2 mins to all trips</li> <li>▪ NE 13<sup>th</sup> &amp; Lincoln to Transit Center – Add 2 mins to first trip, add 3 mins to second trip, add 5 mins to third trip</li> </ul>
Route 038	82%	<ul style="list-style-type: none"> <li>▪ Segment from Greenfield Center to 10<sup>th</sup> &amp; Council is overscheduled.</li> <li>▪ Segment from 10<sup>th</sup> &amp; Virginia to Transit Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Segment from Transit Center to 10<sup>th</sup> &amp; Penn is overscheduled.</li> <li>▪ Travel times from 10<sup>th</sup> &amp; Penn to 10<sup>th</sup> &amp; Portland are notably longer in the afternoon between 3:30 pm and 5:30 pm.</li> <li>▪ Segment from Council &amp; 10<sup>th</sup> to Greenfield Center is underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 038 has above average OTP route with generally low amounts of variability.</li> <li>▪ The highest variability is in the outbound direction from 10<sup>th</sup> &amp; Penn to 10<sup>th</sup> &amp; Portland in the afternoon. There is an opportunity to add time to this segment in the afternoon to improve reliability.</li> <li>▪ OTP may also be improved by adjusting scheduled travel time between timepoints to provide more flexibility toward the end of the route alignment, as follows:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to 10<sup>th</sup> &amp; Penn – Remove 2 mins</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<ul style="list-style-type: none"> <li>▪ 10<sup>th</sup> &amp; Penn to 10<sup>th</sup> &amp; Portland – Add 1 min</li> <li>▪ 10<sup>th</sup> &amp; Portland to 10<sup>th</sup> &amp; MacArthur – Remove 1 min</li> <li>▪ 10<sup>th</sup> &amp; MacArthur to Council &amp; 10<sup>th</sup> – No change</li> <li>▪ Council &amp; 10<sup>th</sup> to Reno Hub – Add 2 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Reno Hub to 10<sup>th</sup> &amp; Council – Remove 1 min</li> <li>▪ 10<sup>th</sup> &amp; Council to 10<sup>th</sup> &amp; MacArthur – Remove 1 min</li> <li>▪ 10<sup>th</sup> &amp; MacArthur to 10<sup>th</sup> &amp; Portland – Remove 1 min</li> <li>▪ 10<sup>th</sup> &amp; Portland to 10<sup>th</sup> &amp; Virginia – No change</li> <li>▪ 10<sup>th</sup> &amp; Virginia to Transit Center – Add 3 mins</li> </ul>
Route 040	73%	<ul style="list-style-type: none"> <li>▪ Segment from Santa Fe &amp; 104<sup>th</sup> to Santa Fe &amp; 89<sup>th</sup> is overscheduled.</li> <li>▪ Segment from Santa Fe &amp; 89<sup>th</sup> to Walker &amp; 44<sup>th</sup> is underscheduled, particularly in the midday and afternoon periods between 10:00 am and 4:00 pm.</li> <li>▪ Segments from Walker &amp; 44<sup>th</sup> to Walker &amp; 25<sup>th</sup> and from Walker &amp; 25<sup>th</sup> to Transit Center are both underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Segment from Transit Center to Walker &amp; 25<sup>th</sup> is overscheduled.</li> <li>▪ Segment from Walker &amp; 25<sup>th</sup> to Walker &amp; 44<sup>th</sup> is overscheduled in the morning and midday, before 2:00 pm.</li> <li>▪ Segments from Walker &amp; 44<sup>th</sup> to 89<sup>th</sup> &amp; Walker and from 89<sup>th</sup> &amp; Walker to Santa Fe &amp; 104<sup>th</sup> are both underscheduled.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Route 040 has average OTP with low variability. However, some segments have higher travel times in the afternoon. There may be an opportunity to improve OTP by adjusting schedules to align with changes in travel times by time of day.</li> <li>▪ OTP may also be improved by adjusting scheduled travel time between timepoints to provide more flexibility toward the end of the route alignment, as follows:</li> </ul> <p><b>Outbound</b></p> <ul style="list-style-type: none"> <li>▪ Transit Center to Walker &amp; 25<sup>th</sup> – Remove 1 min</li> <li>▪ Walker &amp; 25<sup>th</sup> to Walker &amp; 44<sup>th</sup> – Remove 1 min</li> <li>▪ Walker &amp; 44<sup>th</sup> to 89<sup>th</sup> &amp; Walker – No change</li> </ul>

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Route	OTP	Inbound Summary	Outbound Summary	Opportunities & Challenges
				<ul style="list-style-type: none"> <li>▪ 89<sup>th</sup> &amp; Walker to Santa Fe &amp; 104<sup>th</sup> – Add 1 mins</li> </ul> <p><b>Inbound</b></p> <ul style="list-style-type: none"> <li>▪ Santa Fe &amp; 104<sup>th</sup> to Santa Fe &amp; 89<sup>th</sup> – Remove 1 min</li> <li>▪ Santa Fe &amp; 89<sup>th</sup> to Walker &amp; 44<sup>th</sup> – Add 1 min</li> <li>▪ Walker &amp; 44<sup>th</sup> to Walker &amp; 25<sup>th</sup> – No change</li> <li>▪ Walker &amp; 25<sup>th</sup> to Transit Center – Add 1 min</li> </ul>

## 9 PREFERRED ALTERNATIVE

The results of Phase II outreach show that the community was supportive of transitioning to a grid system with high frequency corridors, later evening service, and expanded weekend service. Additionally, making improvements to address on-time performance issues, improve service reliability, and provide better connections to northeast Oklahoma City emerged as priorities.

Fully transitioning to a grid system would require a significant expansion of service over existing levels of investment and is best implemented in a phased approach. As such, this Preferred Alternative is divided into two sections:

- **Short-Term Recommendations** – Include service changes that integrate the Northwest Bus Rapid Transit line with local service, address on-time performance, and extends service to new destinations. These improvements may be implemented in the next several years.
- **Long-Term Recommendations** – Include a series of cost-unconstrained improvements that would require additional funding and may be implemented over approximately 10 years. Individual improvements in the Long-Term Recommendations are costed separately so that specific priorities may be implemented and phased independently.

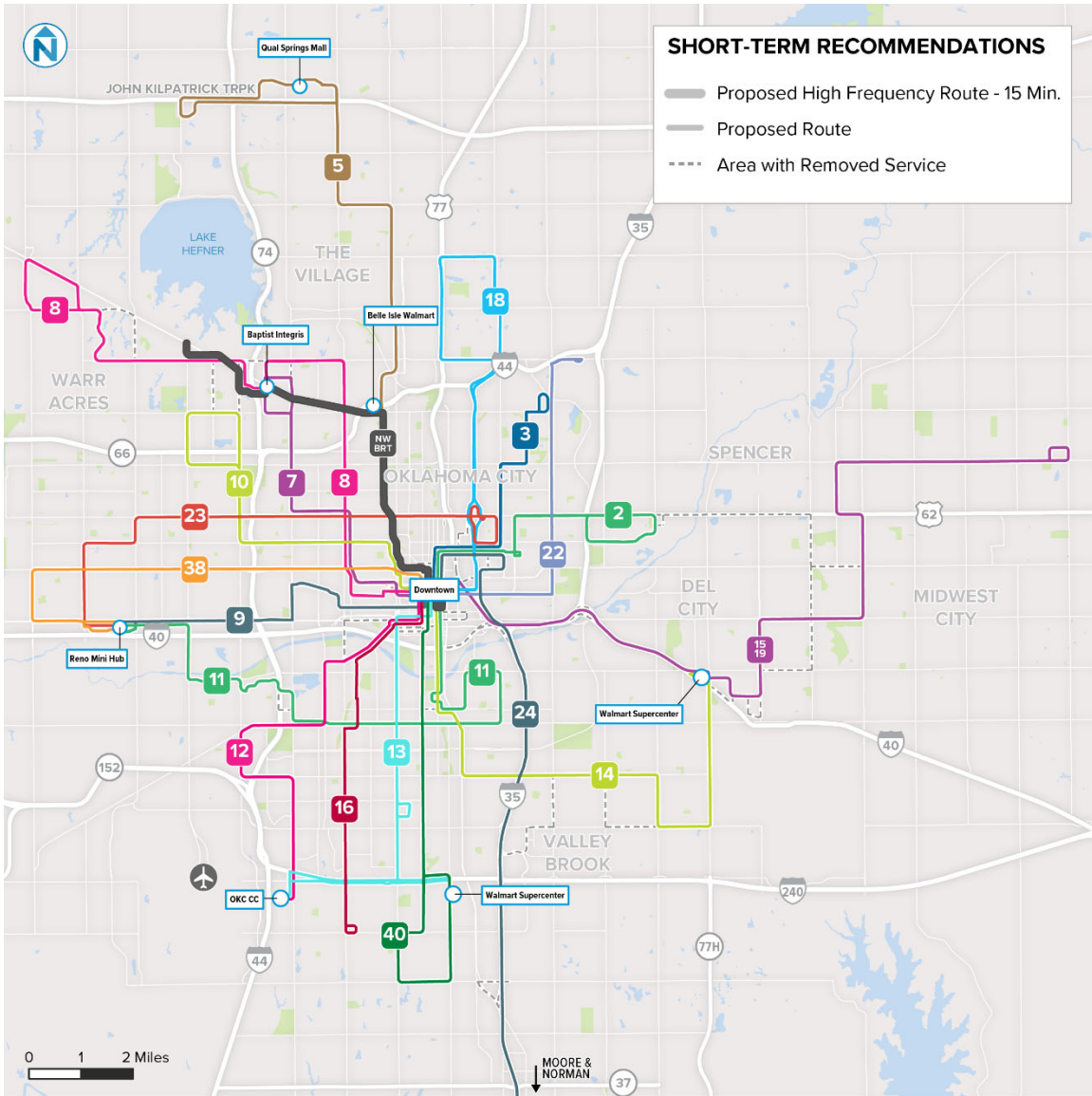
### SHORT-TERM RECOMMENDATIONS

The improvements included in the Short-Term Recommendations are intended to accomplish several key goals, including:

- Integrate the NW BRT into the existing fixed-route network
- Extend service to new destinations
- Address on-time performance issues
- Better connect northeast Oklahoma City to jobs and services
- Standardize frequency on routes to improve daily transfers

A system map displaying the Short-Term Recommendations is shown in Figure 9-1. In the Short-Term Recommendations, the service span of all routes would be unchanged and service frequency would be changed for a few routes. Route 014 would operate hourly seven days per week, Route 015/019 would operate hourly on weekdays only, Route 038 would operate hourly on weekends, and Route 024 would operate more consistently every two hours on weekdays only. Specific details on frequency and alignment changes at the route level are discussed below.

Figure 9-1 Short-Term Recommendations System Map





## Route Level Changes

This section includes specific changes for each route that are included in the Short-Term Recommendations. Detailed maps showing these route level changes are included in Appendix D. Only routes with proposed changes are included here, all other routes would be unchanged.

### Route 002

Route 002 has among the worst on-time performance of any EMBARK route. In order to address this, Route 002 should be shortened to keep service on time.

Outbound Route 002 should skip the McGuire Plaza deviation and instead use the stop at Lottie Ave & NE 13<sup>th</sup> St. Front door service to McGuire Plaza would continue to be provided by inbound Route 002 trips.

All areas currently served by Route 002 would continue to have service, this change would provide more direct service over a shorter alignment to alleviate on-time performance issues.

This improvement addresses on-time performance issues and would constitute an operational change.

### Route 005

Route 005 currently serves Classen Blvd between downtown and NW Expressway. Most of this segment will be served by the NW BRT starting in October 2023. In order to reduce duplication with the NW BRT, Route 005 should be shortened to serve only the segment between Belle Isle and Mercy Hospital. Transfers between Route 005 and NW BRT would take place at the Blackwelder Station. Route 005 would continue to operate with the same span and frequency as today. This improvement is tied to the implementation of the NW BRT route and would not be implemented until the Fall of 2023.

This improvement integrates the NW BRT into the existing fixed-route network and would constitute a major service change.

### Route 008

Route 008 should be changed to simplify the alignment, extend to new destinations, and integrate with the NW BRT. Route 008 should operate on a consistent bi-directional alignment using NW 63<sup>rd</sup> St, Independence Ave, NW 56<sup>th</sup> St, and Portland Ave to serve Baptist Integris directly as well as to serve the NW BRT stations on NW 56<sup>th</sup> St,

### OKC Greyhound Station

The Greyhound Station is located in a low-density area on Reno Ave over 1.6 miles from any existing EMBARK routes. We do not recommend serving the Greyhound Station in the short-term because of the distance to other routes, the relative lack of any destinations between an existing route and the station, and the fact that there are only four buses arriving/departing during EMBARK operating times. Ridership from the station would be limited, require an additional bus and over \$400,000 annually to operate a limited schedule.

Independence Ave, and NW 63<sup>rd</sup> St. The one-way deviations on NW 59<sup>th</sup> St and Tulsa Ave would be discontinued.

Route 008 would also be extended further west to Silver Springs Pointe Shopping Center and Walmart, including bi-directional service along NW 63<sup>rd</sup> St and Lyrewood Lane, and a clockwise terminal loop along Wilshire Blvd, Council Rd, NW Expressway, and Rockwell Ave. The segments of Wilshire Blvd east of Lyrewood Lane, NW Expressway between Wilshire Blvd and MacArthur Blvd, and MacArthur Blvd between NW Expressway and NW 63<sup>rd</sup> St would no longer be served. This extension serves an identified regional employment hub, improving accessibility to employment and shopping opportunities. This improvement is tied to the implementation of the NW BRT route and would not be implemented until the Fall of 2023.

This improvement extends service to new destinations, integrates the NW BRT into the existing fixed-route network, and would constitute a major service change.

## **Route 011**

Route 011 would be realigned to serve SW 20<sup>th</sup> St and S May Ave, instead of staying on S Grand Blvd between SW 20<sup>th</sup> St and SW 25<sup>th</sup> St. The route would continue to serve SW 29<sup>th</sup> St and S Robinson Ave into downtown Oklahoma City, deviating directly to serve Andrew's Square. All other areas currently served by Route 011 would continue to be served.

This improvement addresses on-time performance issues and would constitute an operational change.

## **Route 012**

The alignment of Route 012 would be realigned to focus service on larger, faster arterials to reduce delays and improve on-time performance. The route would no longer operate on a one-way pair through downtown Oklahoma City on Western Ave, Main St, Hudson St, and Reno Ave. Instead, the route would operate bi-directionally along Walker Ave and Reno Ave to enter and exit downtown Oklahoma City. Route 012 would also no longer operate along Pennsylvania Ave or Reno Ave west of Klein Ave. Instead, the route would operate along Reno Ave, Klein Ave, and Exchange Ave.

This improvement addresses on-time performance issues and would constitute a major service change.

## **Route 013**

Route 013 is among the lowest on-time performance routes in the EMBARK system and would be improved to make service easier to understand and faster by operating on a larger arterial corridor through downtown to reduce on-time performance issues. Most of the Route 013 alignment would be unchanged. Service into and out of downtown Oklahoma City would operate bi-directionally along Reno Ave and Hudson Ave, rather than on two one-way couplets along SW 3<sup>rd</sup> St, Walker Ave, Hudson Ave, and SW 4<sup>th</sup> St.

This improvement addresses on-time performance issues and would constitute a minor service change.

## Route 014

Several changes are proposed for Route 014 to make service faster and more direct, while extending the route to serve new destinations. Route 14 would no longer operate the deviation to Crossroads Mall along I-35, SE 66<sup>th</sup> St, Crossroads Blvd, SE 59<sup>th</sup> St, and Eastern Ave. Crossroads Mall is no longer a destination and has few riders. Instead, the route would provide more direct service along SE 44<sup>th</sup> St between Shields Blvd and Sunnyslane Rd. The route would also no longer operate the counterclockwise terminal loop around Bryant Ave, SE 59<sup>th</sup> St, Sunnyslane Rd, and SE 44<sup>th</sup>. Instead, Route 014 would operate bi-directionally along SE 44<sup>th</sup> St, Sunnyslane Rd, SE 59<sup>th</sup> St, and Sooner Rd. Route 014 would be extended further north, terminating at the Del City Walmart near Tinker Diagonal, SE 15<sup>th</sup> St, and Sooner Rd. This would also serve the Walmart neighborhood market on Sooner Road.

Route 014 would also now operate into and out of downtown Oklahoma City on Robinson Ave instead of Walker Ave. The segment of SE 25<sup>th</sup> St between Walker Ave and Robinson Ave would no longer be served but there would continue to be service on both Robinson Ave and Walker Ave.

Route 014 would operate hourly instead of every 45 minutes to accommodate the longer route alignment. This will make transfer patterns consistent at the downtown Transit Center and ensure that the schedule is easy to remember.

This improvement extends service to new destinations, addresses on-time performance issues, standardizes frequency on routes to improve daily transfers, and would constitute a major service change.

## Route 015

Routes 015 and 019 would be combined into one route that provides faster, more frequent service for residents of the Mid-Del area and that would provide a one-seat ride into downtown Oklahoma City for residents of Spencer. These changes would simplify service and make it easier to understand for passengers by providing bi-directional service along the length of the route's alignment, rather than operating two one-way loops in Midwest City.

The route would operate bi-directionally along I-235 and I-40 to Del City and would then operate along SE 15<sup>th</sup> St, Sooner Rd, Will Rogers Rd, Hudiburg Dr, Adair Blvd, Air Depot Blvd, Reno Ave, Douglas Blvd, NE 23<sup>rd</sup> St, Spencer Rd, NE 36<sup>th</sup> St, and operate a terminal loop along NE 36<sup>th</sup> St, Hiwassee Rd, NE 39<sup>th</sup> St, and Adair St.

In Oklahoma City, service would no longer be provided on I-40 west of I-235 or along Robinson Ave, though Robinson Ave would continue to be served by other routes in the system. In Midwest City, service would no longer operate on Harr Dr, Boeing Dr, Air Depot Blvd south of Adair Blvd, SE 15<sup>th</sup> east of Air Depot Blvd, Midwest Blvd, or NE 10<sup>th</sup> St.

Service frequency on the route would be improved to operate hourly, which would better facilitate transfers and improve the usefulness of the route for residents of Del City, Midwest City, and Spencer. This is an improvement for all existing Route 015 riders.

This change would require concurrence of the County, Midwest City, and Spencer before being implemented.

This improvement addresses on-time performance issues, standardizes frequency on routes to improve daily transfers, and would constitute a major service change.

## **Route 016**

Route 016 would be simplified to reduce travel times and improve on-time performance. The route would no longer operate on one-way couplets into and out of downtown Oklahoma City and would instead provide bi-directional service on Reno Ave and Walker Ave. Route 016 would no longer serve SW 3<sup>rd</sup> St or Hudson Ave.

This improvement addresses on-time performance issues and would constitute a minor service change.

## **Route 019**

Routes 015 and 019 would be combined into one route that provides faster, more frequent service for residents of the Mid-Del area and that would provide a one-seat ride into downtown Oklahoma City for residents of Spencer. These changes would simplify service and make it easier to understand for passengers by providing bi-directional service along the length of the route's alignment, rather than operating two one-way loops in Midwest City.

This combined Route 015/019 would operate bi-directionally along I-235 and I-40 to Del City and would then operate along SE 15<sup>th</sup> St, Sooner Rd, Will Rogers Rd, Hudiburg Dr, Adair Blvd, Air Depot Blvd, Reno Ave, Douglas Blvd, NE 23<sup>rd</sup> St, Spencer Rd, NE 36<sup>th</sup> St, and operate a terminal loop along NE 36<sup>th</sup> St, Hiwassee Rd, NE 39<sup>th</sup> St, and Adair St.

The new combined Route 015/019 would no longer provide a connection with Route 002, instead it would provide a direct ride into downtown Oklahoma City and provide connections with Route 014 in Del City. The existing alignment east of Spencer Rd would be unchanged. However, there would no longer be service on Midwest Blvd or on NE 23<sup>rd</sup> St west of Spencer Rd.

Service frequency on the route would be improved to operate hourly, which would better facilitate transfers and improve the usefulness of the route for residents of Del City, Midwest City, and Spencer. The route would also operate consistently throughout the day and would no longer have a gap in service during the midday period.

This change would require concurrence of the County, Midwest City, and Spencer before being implemented.

This improvement addresses on-time performance issues, standardizes frequency on routes to improve daily transfers, and would constitute a major service change.

## Route 023

Route 023 is among the lowest on-time performance routes in the EMBARK system. These improvements would shorten the route to improve on-time performance for the Route. Route 023 would no longer serve the two stops on NE 24<sup>th</sup>, south of the Oklahoma State Department of Education. The stop to the north of the Oklahoma State Department of Education on Capitol Service Rd would continue to be served, which is 800 feet away. This recommendation continues to provide access to the State Capitol area but frees up additional time in the schedule to improve reliability across the entire alignment. All areas currently served by Route 023 would continue to be served.

This improvement addresses on-time performance issues and would constitute a minor service change.

## Route 024

The alignment of Route 024 would be simplified within Oklahoma City to provide simpler, more direct service to the highest ridership destinations along the route. It would also allow for a two-hour cycle time, which can facilitate transfers in both Norman and in Oklahoma City.

The recommended route would exit I-235 onto Lincoln Blvd and serve the OU Health Center and the Downtown Transit Center along NE 10<sup>th</sup> St, Stonewall Ave, NE 13<sup>th</sup> St, Robinson Ave, and NW 4<sup>th</sup> St. This simplified alignment would remove the out of direction deviations to the State Capitol and other areas of downtown, instead focusing service on the OU Health Center and Downtown Transit Center.

Frequency on Route 024 would also be improved to operate consistently every 2 hours, rather than at irregular intervals throughout the day.

This improvement addresses on-time performance issues, standardizes frequency on routes to improve daily transfers, and would constitute a minor service change.

## Route 038

The alignment for Route 038 would be unchanged. However, the frequency would be changed to operate consistently every 60 minutes on weekends instead of the irregular frequency every 45-50 minutes that the route currently operates. On weekends, Route 038 would be interlined with Route 008. This service change makes the route schedule easier to understand and better facilitates transfers at the Downtown Transit Center and the Reno Mini Hub.

This improvement standardizes frequency on routes to improve daily transfers and would constitute an operational change.

## Routes 13N and 23N

Routes 13N and 23N would continue to operate as they do today in the Short-Term Recommendations. As service changes are made in the Long-Term Recommendations, there is an opportunity to remove the night-only alignments and operate Routes 013 and

023 consistently throughout the day and evening. Specifically, after extending the service span for Route 040 until 12:00 a.m. would allow Route 013 to operate its standard alignment until 12:00 a.m. as well and extending either, or both, the service spans of Routes 002 and 003 until 12:00 a.m. would allow Route 023 to operate a consistent alignment until 12:00 a.m.

**Figure 9-2 Cost-Constrained Short-Term Recommendations Span and Frequency Summary**

Short-Term Recommendations	Weekday	Saturday & Sunday	Weekday	Saturday & Sunday
	<i>Frequency (day/night)</i>		<i>Span</i>	
Route 002	30	60	5:30 am – 7:30 pm	6:30 pm – 6:30 pm
Route 003	30	60	6:00 am – 7:30 pm	6:30 am – 6:30 pm
Route 005	30/60	60	6:00 am – 12:00 am	6:30 am – 6:30 pm
Route 007	30	60	6:00 am – 7:30 pm	6:30 am – 6:30 pm
Route 008	30	60	5:30 am – 7:30 pm	6:30 am – 6:30 pm
Route 009	30	60	6:00 am – 7:30 pm	6:00 am – 6:30 pm
Route 010	30	60	6:00 am – 7:00 pm	6:30 am – 6:30 pm
Route 011	30/60	60	5:30 am – 12:00 am	6:30 am – 6:30 pm
Route 012	30	60	6:00 am – 7:00 pm	6:30 am – 6:30 pm
Route 013	30/60	60	5:30 am – 12:00 am	6:30 am – 6:30 pm
Route 014	60	60	5:30 am – 7:30 pm	6:30 am – 6:30 pm
Route 015/019	60	--	5:30 am – 8:00 pm	--
Route 016	30	60	6:30 am – 7:00 pm	6:30 am – 6:00 pm
Route 018	30	60	5:30 am – 6:30 pm	6:30 am – 6:30 pm
Route 022	30/60	60	5:30 am – 12:00 am	6:30 am – 6:00 pm
Route 023	30/60	60	5:00 am – 12:00 am	6:00 am – 7:00 pm
Route 024	120	--	5:30 am – 7:00 pm	--
Route 038	30	60	5:30 am – 7:30 pm	6:30 am – 6:30 pm
Route 040	30	60	6:00 am – 7:00 pm	6:30 am – 6:00 pm

## Reliability Improvements

Due to alignment changes, primarily strategic route shortening, six routes have reduced operating speed requirements. Only one route, Route 024, which operates primarily on I-35, has a slightly longer alignment. Shorter routes increase the ability for operators to keep their trips within the existing schedule and stay on time. Reliability should improve as a result.

**Figure 9-3 Cost-Constrained Short-Term Recommendations Route Length and Speeds**

Route	Round Trip Route Length (miles)		Round Trip Speed (mph)	
	Existing	Recommended	Existing	Recommended
Route 002	13.2	12.9	13.2	12.9
Route 005	29.7	22.3	14.9	14.9
Route 008	26.3	30.9	13.2	12.4
Route 012	21	20.2	14.0	13.5
Route 013	20.3	20.3	13.5	13.5
Route 014	24.8	27.4	16.5	13.7
Route 015	26.8	38.6	20.1	19.3
Route 016	16.8	16.8	16.8	16.8
Route 019	26.4	-	26.4	-
Route 023	24.7	24.1	12.4	12.1
Route 024	53	51.2	24.8	25.6

## Bus Stop Changes

The proposed route changes will require EMBARK to remove some existing stops and to add new stops. Approximately 116 existing stops would need to be removed and approximately 91 new stops would be installed.

New stops must be ADA compliant. Every new stop must have a pad as well as a bus stop. If no sidewalk is available, then a new sidewalk may need to be constructed. This could be an issue on N Council Road, N Rockwell Ave, Wilshire Blvd, Sooner Road, SE 59<sup>th</sup> Street, and others.

## Implementation Considerations

Short-Term Recommendations require different processes and inputs for implementation, discussed in more detail in Chapter 10 of this report. Improvements to address on-time performance issues may be implemented at any time, extending service to new destinations may also happen at any time but requires agreement with funding partners, and integrating services with NW BRT should be implemented in a coordinated package of improvements in conjunction with BRT implementation in 2023.

Each improvement included in the Short-Term Recommendations may be categorized as a different type of service change within EMBARK’s service standards and be subject to different requirements for analysis and approval. These types of service changes for each improvement classification are shown below in Figure 9-4. Most improvements are classified as either minor service changes or operational service changes. However, some integration with NW BRT may be considered a major service change, specifically due to the truncation of Route 005.

Figure 9-4 Short-Term Improvements by Type of Service Change

Short-Term Improvement	Type of Service Change
NW BRT integration	Major service change
Extend service to new destinations	Major service change
Address on-time performance issues	Major, minor, or operational change
Better connect NE Oklahoma City	Major service change
Standardize frequency on routes	Operational change

## Phase II Short-Term Recommendations

There is an additional improvement opportunity for Route 003 that would better integrate the local network with the NW BRT route and improve access to northeast Oklahoma City. This improvement would require additional operating costs to implement and is discussed below and shown in Figure 9-5.

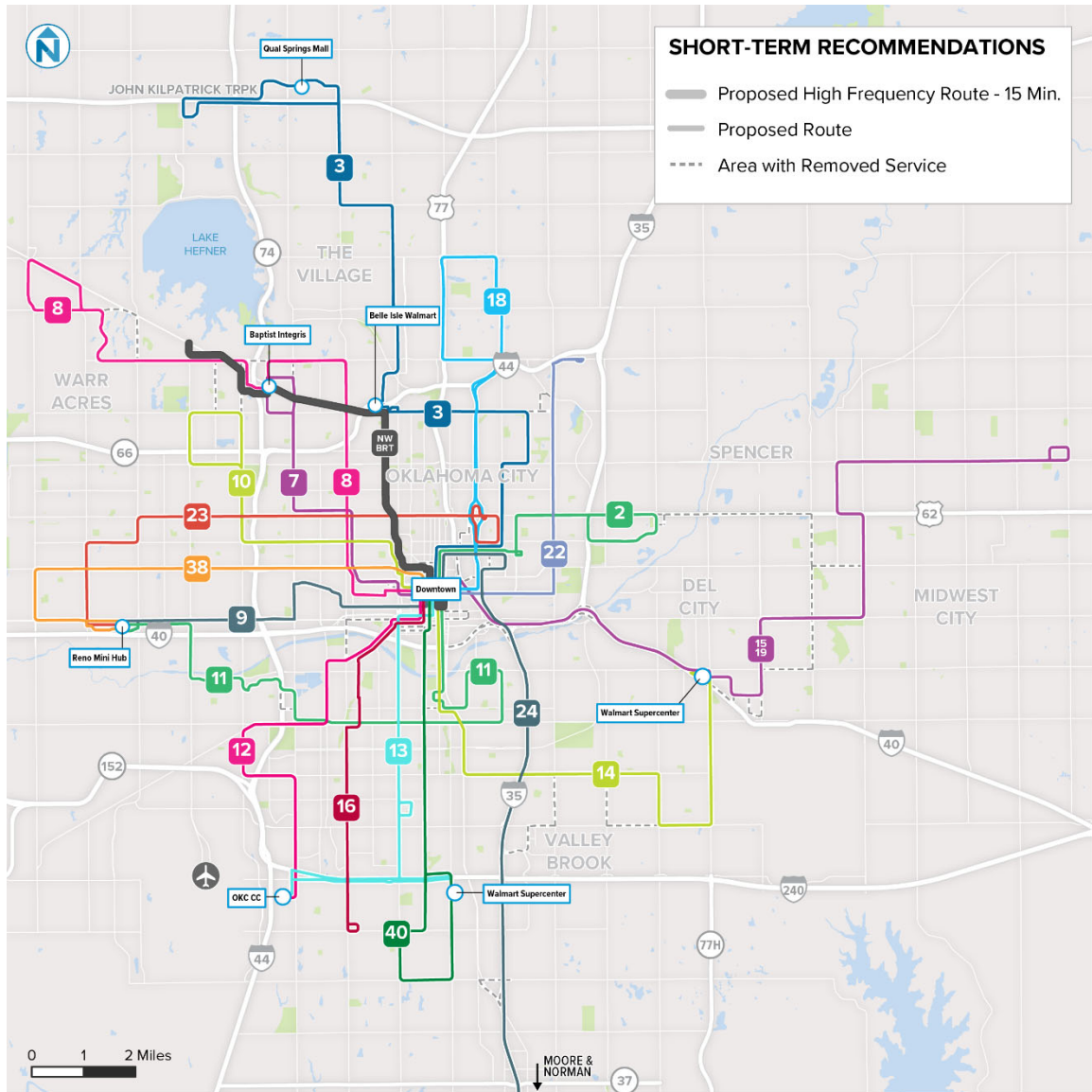
### Route 003

The alignment of Route 003 would be revised to operate further west and north to expand job and shopping access for Northeast Oklahoma City residents. The route would no longer serve the Adventure District or on NE 50<sup>th</sup> St east of Prospect Ave. Instead, Route 003 would be extended west on NE 50<sup>th</sup> St to the Belle Isle Walmart, Penn Square Mall, and Classen Curve area along NE 50<sup>th</sup> St, NW Expressway, Belle Isle Blvd, and would also operate a deviation onto Western Ave, NW 51<sup>st</sup> St, and Classen Circle in the northbound direction only. Route 003 would continue operating further north along Classen Blvd, Western Ave, Hefner Rd, and Pennsylvania Ave, to Quail Springs Mall. The route would operate a counterclockwise terminal loop along NW 140<sup>th</sup> St, Quail Springs Pkwy, W Memorial Rd, N Meridian Ave, McAuley Blvd, and W Memorial Rd, replacing service currently provided by Route 005.



This recommendation better connects northeast Oklahoma City to jobs and services and integrates the NW BRT with the existing fixed-route network. It will require an additional peak bus and approximately 3,400 annual hours to operate.

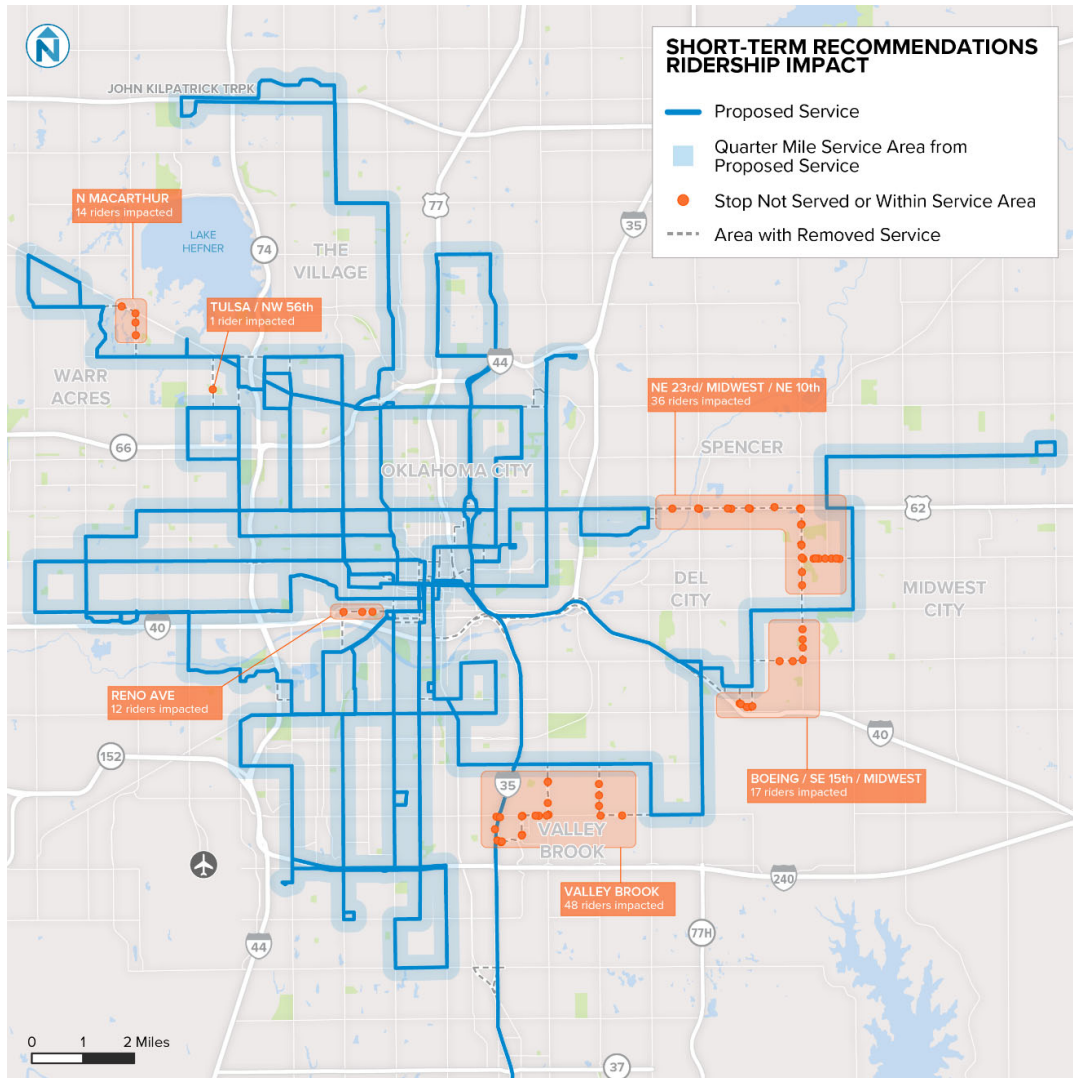
Figure 9-5 Short-Term Recommendations Phase II System Map



## Riders Impacted by Short-Term Recommendations

The alignment changes associated with the Short-Term Recommendations are intended to extend service to improve access to employment opportunities and improve travel times for the majority of passengers by providing faster, more direct service on larger arterials. As a result of these changes, some areas would no longer be served by EMBARK fixed-route service. In the short-term, 116 existing bus stops would no longer be directly served by EMBARK service. Of these, approximately 69 stops would no longer be within ¼ mile of transit service. These stops, shown in Figure 9-6, account for approximately 128 average daily riders on weekdays. Nelson\Nygaard anticipates that the short-term recommendations will lead to overall ridership increases, more than offsetting existing riders that may have to walk longer to service.

Figure 9-6 Short-Term Recommendations Removed Stops



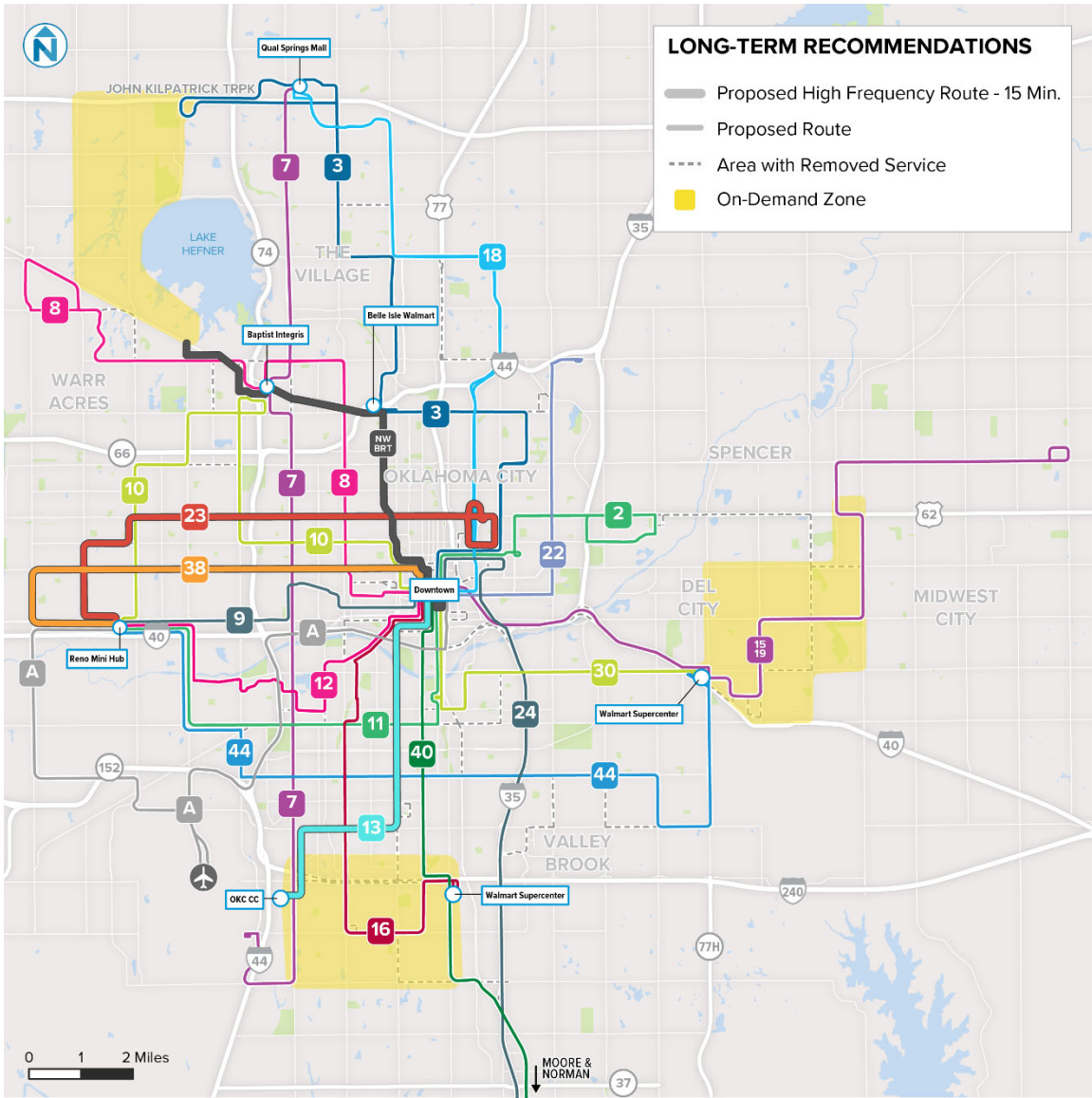
## LONG-TERM RECOMMENDATIONS

The Long-Term Recommendations outline a 10-year vision that addresses regional growth, supports economic development, and responds to public priorities. The improvements included in the Long-Term Recommendations are not cost constrained and will require additional resources and capital investments to implement and operate. Key goals and improvements contained within the Long-Term Recommendations include:







- Addressing additional on-time performance challenges
- Re-focusing service away from downtown Oklahoma City
- Improving service frequency on key corridors
- Operating later evening service
- Better weekend service
- Focusing on improving access to employment opportunities
- Expanding regional access to transit
- Developing new service delivery alternatives to expand service coverage

A system map displaying the Long-Term Recommendations is shown in Figure 9-7. The recommendations and planning level annual hours estimates and the number of additional vehicles required is show in Figure 9-8. Detailed recommendations follow.

Figure 9-7 Long-Term Recommendations System Map



**Figure 9-8 Long-Term Recommendations Summary**

Service Improvement	Recommendations	Est. Additional Annual Operating Hours	Estimated New Buses (with spares)
 <b>Improved Frequency of Service</b>	<ul style="list-style-type: none"> <li>▪ Create four route frequent transit network that operates 7 days a week</li> <li>▪ Provide 30-minute service on almost all Saturday routes</li> </ul>	81,000	17
 <b>Improved Span of Service</b>	<ul style="list-style-type: none"> <li>▪ Provide service until midnight on weekdays and Saturdays</li> <li>▪ Provide service until 10 p.m. on Sundays</li> </ul>	39,000	0
 <b>Keep Buses On Time</b>	<ul style="list-style-type: none"> <li>▪ Budget for schedule maintenance for four routes</li> </ul>	22,000	5
 <b>Service to New Areas</b>	<ul style="list-style-type: none"> <li>▪ Downtown to Airport &amp; 44<sup>th</sup>/Council</li> <li>▪ 44<sup>th</sup> Street Crosstown</li> <li>▪ SE 15<sup>th</sup> Street Route</li> <li>▪ May Avenue Crosstown</li> <li>▪ NE OKC to Quail Springs</li> <li>▪ Baptist Integris to Reno Hub</li> <li>▪ Service to Moore</li> <li>▪ Better south OKC service</li> </ul>	150,000	32
 <b>On-Demand Zones</b>	<ul style="list-style-type: none"> <li>▪ Improve coverage in growing areas three on-demand zones</li> </ul>	14,000	4
 <b>Secondary Transfer Hubs</b>	<ul style="list-style-type: none"> <li>▪ New secondary transfer hubs are recommended at Quail Springs Mall, Oklahoma City Community College, Reno Hub, Santa Fe Walmart, and at the Del City Walmart.</li> </ul>	None	Cost varies from \$500k to \$5M per facility

## Improve Frequency of Service



Improving frequency means providing EMBARK service that comes more often. More frequent service is more convenient, and therefore attracts and retains more riders. Currently, most EMBARK routes operate every 30 minutes on weekdays. But they operate with reduced frequency during evenings and weekends, reducing the attractiveness of the service.

### Long-Term Recommendations

Two improvements are recommended.

- **Develop a frequent transit network that operates 7 days a week.** Routes 013, 023, and 038 should operate every 15 minutes seven days a week. These routes will complement the NW BRT and Streetcar in having high-quality service all day, every day.
- **Provide 30-minute all-day service on Saturdays.** This is achieved by adding trips during Saturdays to create a more robust network.

Developing a high frequency network and providing 30-minute service on Saturdays results in an additional 81,000 estimated annual service hours. Note that frequency costs do not reflect proposed span improvements. An additional 17 new buses would be required for Routes 013, 023, and 038, which currently operate at 30-minute headways.

Proposed changes to weekday, Saturday, and Sunday frequency are indicated in bold in the tables below.

Figure 9-9 Proposed Long-Term Frequencies

Route	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
	Existing Frequency (daytime/night)			Proposed Frequency (daytime/night)		
Route 002	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 003	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 005	30/60	60	60	--	--	--
Route 007	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 008	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 009	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 010	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 011	30/60	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 012	30	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>
Route 013	30/60	60	60	<b>15/30</b>	<b>15/30</b>	<b>15/30</b>
Route 014	60	60	60	<b>30/60</b>	<b>30/60</b>	<b>60/60</b>

Route	Weekday	Saturday	Sunday	Weekday	Saturday	Sunday
	Existing Frequency (daytime/night)			Proposed Frequency (daytime/night)		
Route 015/019	60	--	--	60	60	60
Route 016	30	60	60	30/60	30/60	60/60
Route 018	30	60	60	30/60	30/60	60/60
Route 022	30/60	60	60	30/60	30/60	60/60
Route 023	30/60	60	60	15/30	15/30	15/30
Route 024	120	--	--	120	--	--
Route 038	30	60	60	15/30	15/30	15/30
Route 040	30	60	60	30/60	30/60	60/60

## Improve Span of Service



Improving span of service means extending EMBARK’s operating hours during evenings and weekends. An extended span of service will help EMBARK serve more employment types and tap into new markets. Later services will provide mobility for non-commute trips and people with different work schedules and provide customers the ability to utilize EMBARK for non-work evening purposes.

The current span of service provided by EMBARK is oriented to serve peak-hour commute trips and does not support all employment types and potential trip markets. There is strong public support for improving span of service. During the OKC Moves community outreach process, adding service during evenings, weekends, and mornings were among the top community priorities.

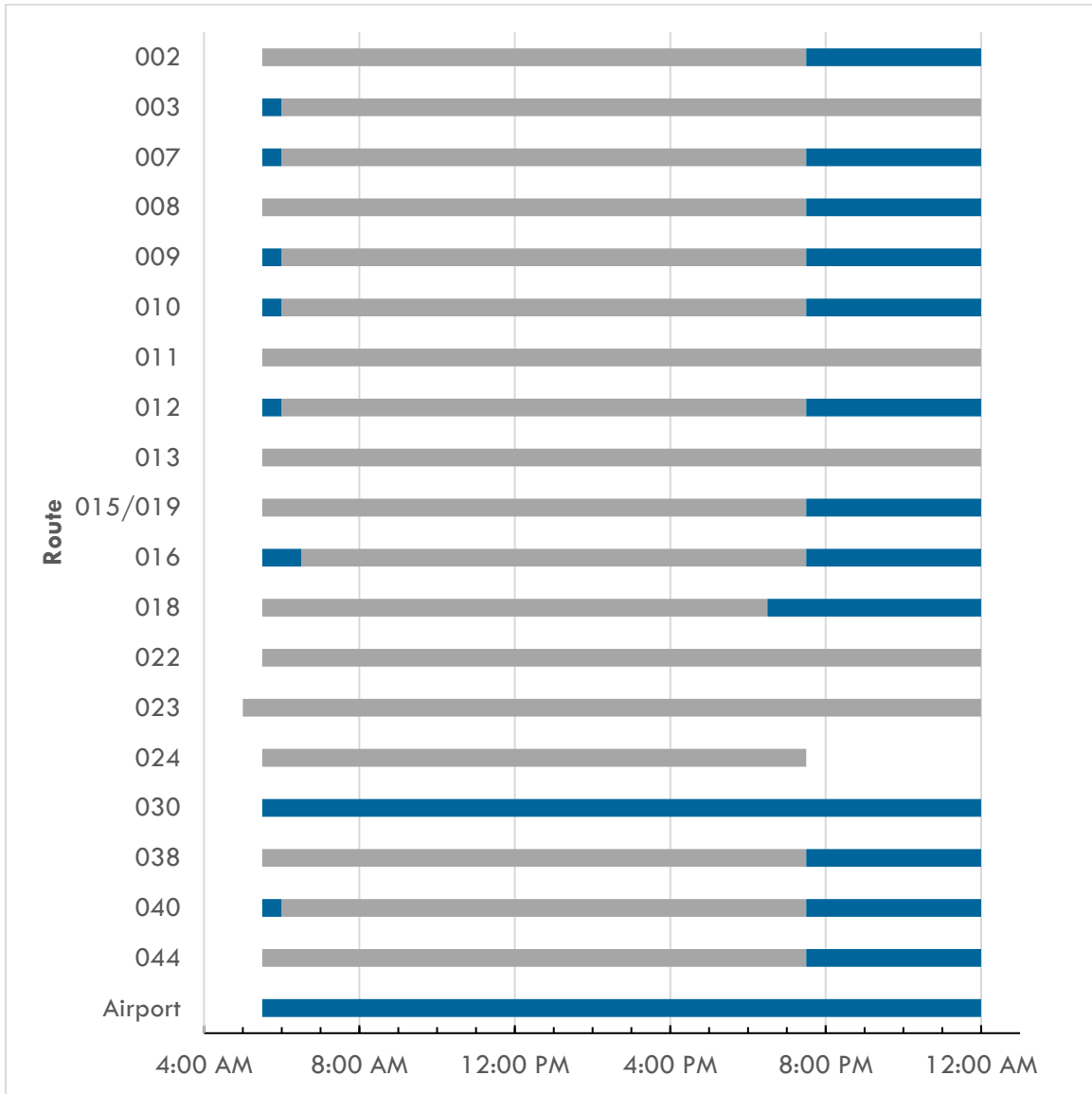
## Long-Term Recommendations

**The primary long-range recommendation is to operate all local routes until midnight weekdays and Saturdays and until 10 p.m. on Sundays.** Only five weekday routes currently operate until midnight – Routes 005, 011, 013, 022, and 023 – and most routes end by 7:00 p.m.

Continuing to operate hourly service into the evening while increasing the span of service on weekdays, Saturdays, and Sundays results in an additional 39,000 estimated annual service hours. Figure 9-10, Figure 9-11, and Figure 9-12 show the proposed existing and proposed service spans for weekdays, Saturdays, and Sundays, respectively. Existing service spans are shown in gray while proposed new service spans are shown in blue.

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**Figure 9-10 Proposed Weekday Span**

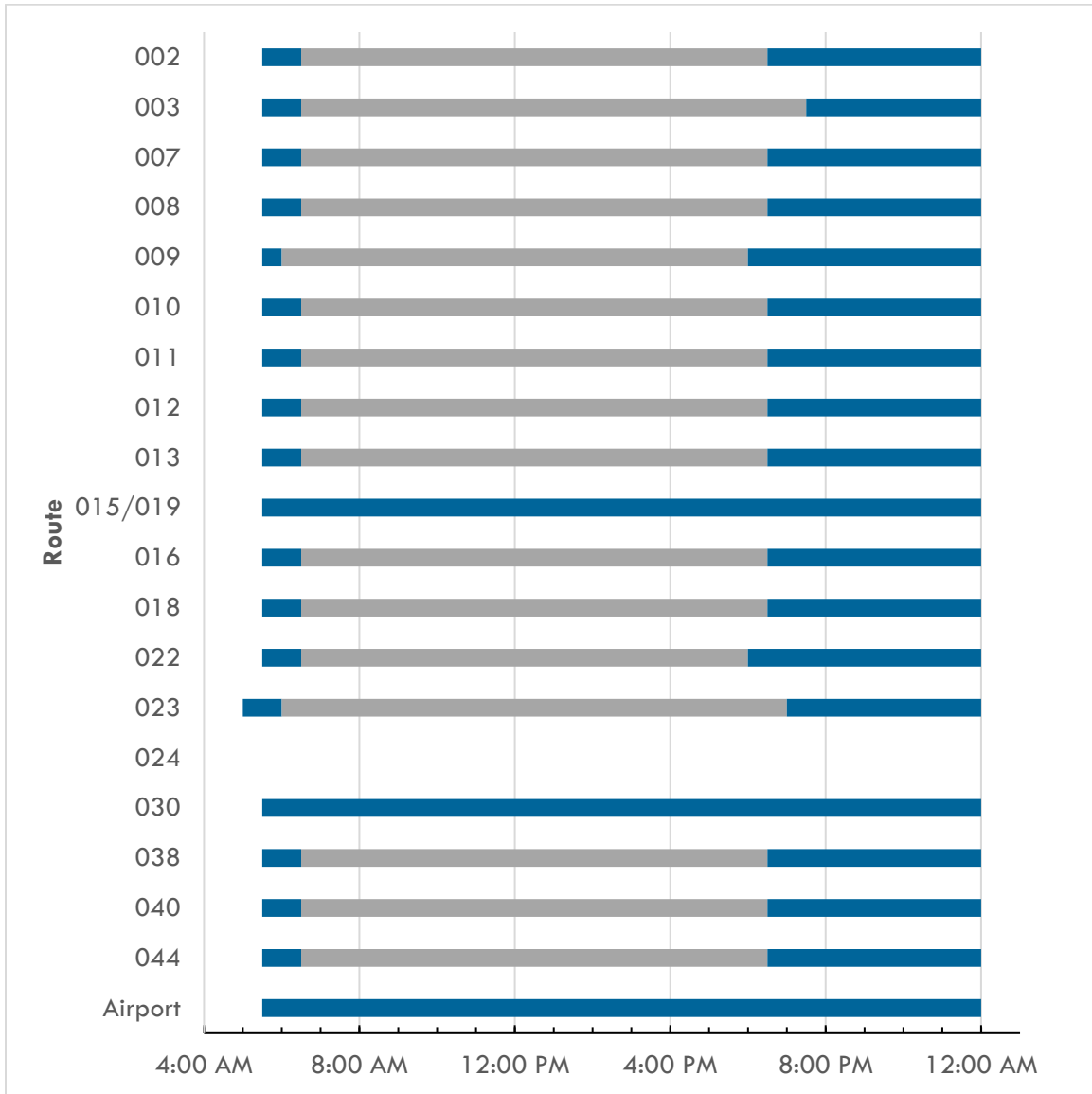


New operating hours are illustrated in blue and current hours are shown in gray.



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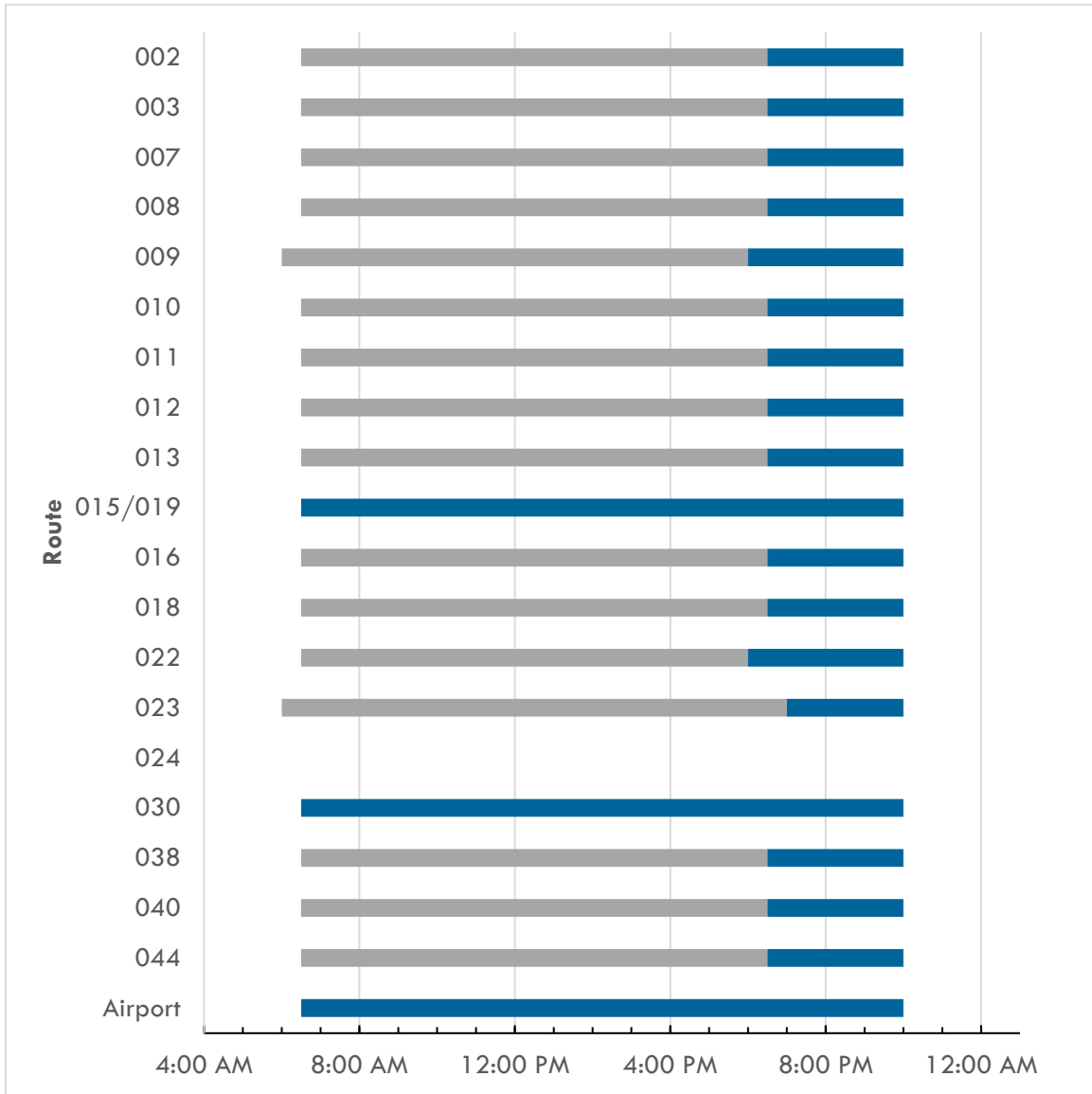
Figure 9-11 Proposed Saturday Span



New operating hours are illustrated in blue and current hours are shown in gray.

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Figure 9-12 Proposed Sunday Span



New operating hours are illustrated in blue and current hours are shown in gray.

## Keep Buses on Time



In an environment of worsening traffic congestion, agencies must actively plan for increases in travel times, as increased travel times can require additional resources. Multiple EMBARK routes are operating faster than what is normal, giving very little margin for error when traffic incidents occur. EMBARK on-time performance is not good as a result.

Increasing traffic congestion in the future will lead to increasing delays for transit vehicles. EMBARK can plan ahead for growing travel times by budgeting for schedule maintenance on routes that are operating fast and are regularly late.

### Long-Term Recommendations

**It is recommended that EMBARK reschedule Routes 008, 009, 012, and 015 to allow for more reasonable running times.** Planning ahead for schedule maintenance will encourage fiscal sustainability while ensuring that service remains reliable for customers. Approximately 22,000 annual hours should be allocated for schedule maintenance.

## Service to New Areas



Growth is adding new destinations that are unserved by the current transit network. Multiple areas have been identified for potential services in the long-range plan:

Employment and commercial clusters have occurred just outside the existing service area, including on Memorial Rd, Northwest

Expressway, and in the municipalities of Moore, The Village, and Del City.

Job growth has been explosive in warehouse-distribution, yet EMBARK does not serve these areas.

The airport was consistently identified as an unmet need by the public and stakeholders. EMBARK does not currently serve the airport.

In addition to regional growth, EMBARK's service structure is predominantly focused on downtown Oklahoma City. While that is a major destination, many if not most residents have origins and destinations outside of downtown Oklahoma City and could be more directly served by routes not going into downtown.

### Long-Term Recommendations

Recommendations are made for 14 routes. Detailed maps showing these route-level changes are included in the attachments. Only routes with proposed changes are included here, all other routes would be unchanged. Implementing all route improvements listed would require an additional 160,000 annual hours.

## Route 003

The alignment of Route 003 would be revised slightly from the alignment shown in the Phase II Short-Term Recommendations to provide more direct service to The Village. Instead of providing east-west service on Hefner Rd, Route 003 would now operate on Britton Rd. The segment of Western Ave north of Britton Rd would continue to be served by a revised Route 018.

## Route 007

Route 007 would be extended to provide a north-south crosstown service along May Ave that facilitates new, more direct connections on the west side of Oklahoma City without requiring passengers to travel to downtown and make a transfer and would improve access to employment centers and retail opportunities at Quail Springs Mall, Integris Baptist, OCCC, Crest Foods, Walmart, and Amazon.

The route would now operate between Quail Springs Mall in north Oklahoma City, Integris Baptist, OCCC, and the Amazon Fulfillment Center on Portland Ave in south Oklahoma City. From Quail Springs Mall, the route would operate along NW 138<sup>th</sup> St, May Ave, deviate to serve Integris Baptist along NW 59<sup>th</sup> St, Independence Ave, and NW 50<sup>th</sup> St. Route 007 would continue south on May Ave, deviate to directly serve OCC, and continue to SW 104<sup>th</sup> St and Portland Ave, terminating at the Amazon Fulfillment Center.

Route 007 would no longer operate along May Ave between NW 50<sup>th</sup> St and NW 59<sup>th</sup> St. Route 007 would no longer serve downtown Oklahoma City, service would be removed from NW 23<sup>rd</sup> St, Pennsylvania Ave, Linwood Blvd, Western Ave, and NW 4<sup>th</sup> St. All of these areas except Linwood Blvd and Western Ave would continue to be served by other routes.

## Route 010

Route 010 would be extended to provide direct access to Integris Baptist, MacArthur Blvd, and the Reno Mini Hub. The alignment east of Portland Ave would be unchanged but the route would no longer operate a terminal loop between Portland Ave, NW 50<sup>th</sup> St, Meridian Ave, and NW 36<sup>th</sup> St. Instead, Route 010 would now provide bi-directional service along Portland Ave, NW 56<sup>th</sup> St, Independence Ave, NW 50<sup>th</sup> St, Meridian Ave, NW 36<sup>th</sup> St, and MacArthur Blvd, terminating at the Reno Mini Hub.

This alignment maintains coverage in high ridership areas in west Oklahoma City and extends the route to provide more direct access to employment hubs and facilitating additional transfers with NW BRT, Route 007, and Route 008 at Integris Baptist as well as with Routes 009, 011, 012, 023, 038, and the Airport Route at the Reno Mini Hub.

## Route 011

Route 011 would be simplified to provide faster, more direct service between downtown Oklahoma City and the Reno Mini Hub along the SW 29<sup>th</sup> St corridor. The route would no longer deviate onto SE 25<sup>th</sup> St, Central Ave, SE 15<sup>th</sup> St, and High Ave to serve the

Ambassador Courts apartment complex. Service would continue to be provided along SE 25<sup>th</sup> St, Central Ave, and SE 15<sup>th</sup> St by the new Route 030. High Ave and SE 25<sup>th</sup> St between Central Ave and High Ave would no longer be served.

Route 011 would also no longer operate the deviation onto May Ave, SW 25<sup>th</sup> St, Grand Blvd, SW 17<sup>th</sup> St, SW 20<sup>th</sup> St, and SW 15<sup>th</sup> St. This service would now be provided by a revised Route 012. Instead, Route 011 would now operate more direct service along the 29<sup>th</sup> St corridor between Robinson Ave and Meridian Ave. The route would continue operating along Meridian Ave and Reno Ave to the Reno Mini Hub.

## **Route 012**

Route 012 would be realigned to provide additional coverage service currently provided by Route 011. East of Agnew Ave, the route would operate the same as in the Short-Term Recommendations. However, west of Agnew Ave, the route would now operate along SW 25<sup>th</sup> St, May Ave, SW 20<sup>th</sup> St, Grand Blvd, SW 17<sup>th</sup> St, SW 20<sup>th</sup> St, Portland Ave, SW 15<sup>th</sup> St, Meridian Ave, and Reno Ave to the Reno Mini Hub.

Route 012 would no longer operate on SW 29<sup>th</sup> St, Portland Ave, SW 44<sup>th</sup> St, and May Ave to OCCC. These segments would now be served by a combination of the revised Routes 007, 011, 013 and the new Route 044. All areas served by Route 012 in the Short-Term Recommendations would continue to be served in the Long-Term Recommendations.

## **Route 013**

Route 013 would become a high-frequency corridor in the Long-Term Recommendations, operating every 15 minutes seven days a week, and directly addressing feedback received during public involvement for a high frequency corridor in south Oklahoma City. This high frequency service would improve the transfer experience for passengers by reducing the average wait times for the route.

The route would also be streamlined to provide faster, more direct service between downtown Oklahoma City and OCCC. The route would operate along Hudson Ave, Reno Ave, Western Ave, SW 59<sup>th</sup> St, and May Ave to OCCC. The route would no longer deviate to serve Shartel Towers but would continue to operate within approximately 1/3 of a mile from the existing stop.

Route 013 would also no longer operate on Western Ave south of SW 59<sup>th</sup> St or along the SW 74<sup>th</sup> St frontage roads along I-240. This area would continue to be served by a new on-demand service zone. Service to the Santa Fe Ave Walmart would continue to be provided by both Route 016 and Route 040.

## **Route 014 – Renamed as Route 044**

Route 014 would be removed and replaced with a new Route 044 that would provide more direct crosstown service along the 44<sup>th</sup> St corridor. This would provide faster, more direct access to employment and retail opportunities for residents in south Oklahoma City, Del City, and Midwest City.

Route 044 would operate along the same alignment as Route 014 in the Short-Term Recommendations east of Shields Blvd but would continue operating further west on 44<sup>th</sup> St, Portland Ave, SW 29<sup>th</sup> St, Meridian Ave, and Reno Ave to the Reno Mini Hub. Service on Shields Blvd that would be provided by Route 014 in the Short-Term Recommendations would no longer be served. All other areas would continue to have service in the Long-Term Recommendations.

## **Route 016**

This route would be extended further east to the Santa Fe Ave Walmart, serving a stronger destination at the southern terminus of the route and improving access to retail opportunities for residents in south Oklahoma City. The route extension would operate along Pennsylvania Ave, SW 89<sup>th</sup> St, Walker Ave, SW 74<sup>th</sup> St, and Santa Fe Ave. The existing terminal loop at SW 87<sup>th</sup> St and S Kentucky Ave would no longer be served with fixed-route service but would continue to be served by a new on-demand service zone. All other areas served by Route 016 in the Short-Term Recommendations would continue to be served.

## **Route 018**

Route 018 would be extended further north to improve access to retail and employment opportunities for northeast Oklahoma City and facilitate transfers with Routes 003 and 007 at Quail Springs Mall. The extension would operate along Britton Rd, Western Ave, and Highland Park Dr to serve St. Anthony Healthplex, the shopping center along Highland Park Dr, and Quail Springs Mall. Service currently provided by Route 018 on Santa Fe Ave and NE 63<sup>rd</sup> St would no longer be served.

## **Route 023**

Route 023 is the highest ridership route in the EMBARK system and would become a high-frequency corridor in the Long-Term Recommendations, operating every 15 minutes seven days a week. This improvement directly addresses feedback received in both phases of public involvement and would better facilitate additional transfers along the route alignment that would occur during a transition to a grid-oriented network. The route would serve as a key anchor route providing high frequency east-west service between several high ridership areas of the system.

The route would also be streamlined to provide faster, high frequency service between the OU Health Center, the State Capitol, and the Reno Mini Hub along the 23<sup>rd</sup> St corridor. The route would operate along the same alignment as shown in the Short-Term Recommendations.

## **Route 030**

Route 030 would be a new route providing direct service between downtown Oklahoma City and Del City along the SE 15<sup>th</sup> St corridor, providing more direct access to retail and employment opportunities in Del City and Midwest City. The route would operate along NE 4<sup>th</sup> St, Robinson Ave, deviate to serve Andrews Square, continue on SE 25<sup>th</sup> St,

Central Ave, and SE 15<sup>th</sup> St to the Sooner Rd Walmart. This route would cover some areas currently served by Route 011.

### **Route 038**

Route 038 would become another east-west high-frequency corridor, operating every 15 minutes seven days a week, and throughout the day on weekdays. In addition to NW BRT, Route 013, and Route 023, this route would complete the core high-frequency service grid for the EMBARK system in the long-term. This network of high-frequency routes enables transfers to be made outside of the downtown area without significant wait times due to the high frequency service.

The route would also be streamlined to provide faster, high frequency service between downtown Oklahoma City and the Reno Mini Hub along the 10<sup>th</sup> St corridor. The route would operate along the same alignment as shown in the Short-Term Recommendations.

### **Route 040**

Route 040 would be extended further south to serve the City of Moore, addressing a key goal identified in public outreach to expand service to other cities in the region. The route would operate further south along Santa Fe Ave, NW 27<sup>th</sup> St, Shields Blvd, Broadway St, SW 19<sup>th</sup> St, and Fritts Blvd, providing service to downtown Moore and the shopping centers along SW 19<sup>th</sup> St near I-35. This improvement expands access to transit in the region and serves additional employment hubs.

The segments of SW 89<sup>th</sup> St and Walker Ave currently served by Route 40 would continue to be served by Route 016 in the Long-Term Recommendations. However, the segments on Western Ave and SW 104<sup>th</sup> St would no longer be served.

This improvement includes full expansion of service, with 30-minute service frequency operating seven days per week. Initial service levels may be lower which would lead to lower costs in the intermediate term.

### **Route A**

Route A would be a new route that provides a direct connection to several key unserved destinations identified in public outreach, including operating between downtown Oklahoma City, Bricktown, the Amtrak Station, and the Airport, operating along NW 4<sup>th</sup> St, Gaylord Blvd, Shields Blvd, I-40, I-44, Hwy 152, and Meridian Ave. The route would continue from the airport along SW 54<sup>th</sup> St, MacArthur Blvd, SW 44<sup>th</sup> St, Council Rd, and Reno Ave to serve the fulfillment center and warehouse employment hubs, including Amazon and Hobby Lobby, and terminate at the Reno Mini Hub.

Route A would operate hourly service, seven days per week and improve regional accessibility to the airport and additional employment hubs that are currently unserved.

## On-Demand Zones



On-Demand zones use online platforms to dynamically generate on-demand routes within a zone. They can be operated by the transit agency, third party operators, or private companies such as Lyft and Uber. The services can vary, and may include demand-response shuttles, seasonal or special event shuttles, or mobility software. Benefits of these innovative service zones include:

- Maintain or enhance mobility in low-density areas
- Enhance travel options during hours when transit service is limited
- First/last mile supplement can extend the reach of fixed-route transit service
- Can lower the cost per trip

## Long-Term Recommendations

**Three areas are recommended for implementing on-demand zones, in South Oklahoma City, Northwest Oklahoma City, and in Midwest City.**

EMBARK would be expanding coverage in areas that are growing and/or have high needs but low density. As these markets evolve, EMBARK could provide on-demand service to those areas until demand is large enough to warrant fixed-route services.

The cost to provide on-demand zones varies based on the number and size of zones and who is operating the service. Each zone is less than 9 square miles, which is the upper limit that one vehicle could provide service to with acceptable wait times.

Three on-demand are recommended, which will require approximately 14,000 annual hours to operate.

## Secondary Transfer Hubs



Currently, most EMBARK transfers are made either at the downtown Transit Center or to a lesser extent, at the Reno Hub. As service extents grow and more routes that are not focused on downtown are implemented, additional locations are necessary where transfers may be safely made. In addition, secondary transfer hubs may include off-street waiting areas such as pull-outs, which allows buses to have recovery at the route ends, which improves route reliability. Secondary transfer hubs can range from enhanced shelters to a dedicated facility with restrooms. Transfer locations with amenities improves the customer experience and helps attract and retain riders.

## Long-Term Recommendations

To complement the anticipated transition to a more grid-like bus network, **five secondary transfer hubs are recommended** at Quail Springs Mall, Oklahoma City Community College, Reno Hub, Santa Fe Walmart, and at the Del City Walmart. Each of these locations is the end of the line for multiple routes and a major customer



destination. These locations are shown as labeled features in the Long-Term Improvements map included in Figure 9-7.

Transfer hubs can range in costs from less than \$500,000 for an enhanced shelter and amenities to \$5,000,000 for a dedicated facility with off street bays, temperature-controlled waiting areas, and operator rest rooms.

## Operating Speed Requirements

Due to alignment changes, route extensions, route consolidations, and new crosstown routes, 16 routes have changes to operating speed requirements in the long-term. In most cases, particularly for routes with identified on-time performance issues, the operating speed requirements are reduced to improve reliability. The extensions for Routes 003 and 007 would extend the route alignments through some segments of low-density development density and high travel speeds, which result in a slight increase in operating speed requirements. This change would not result in reliability issues and is in line with expected travel times for the operating environment.

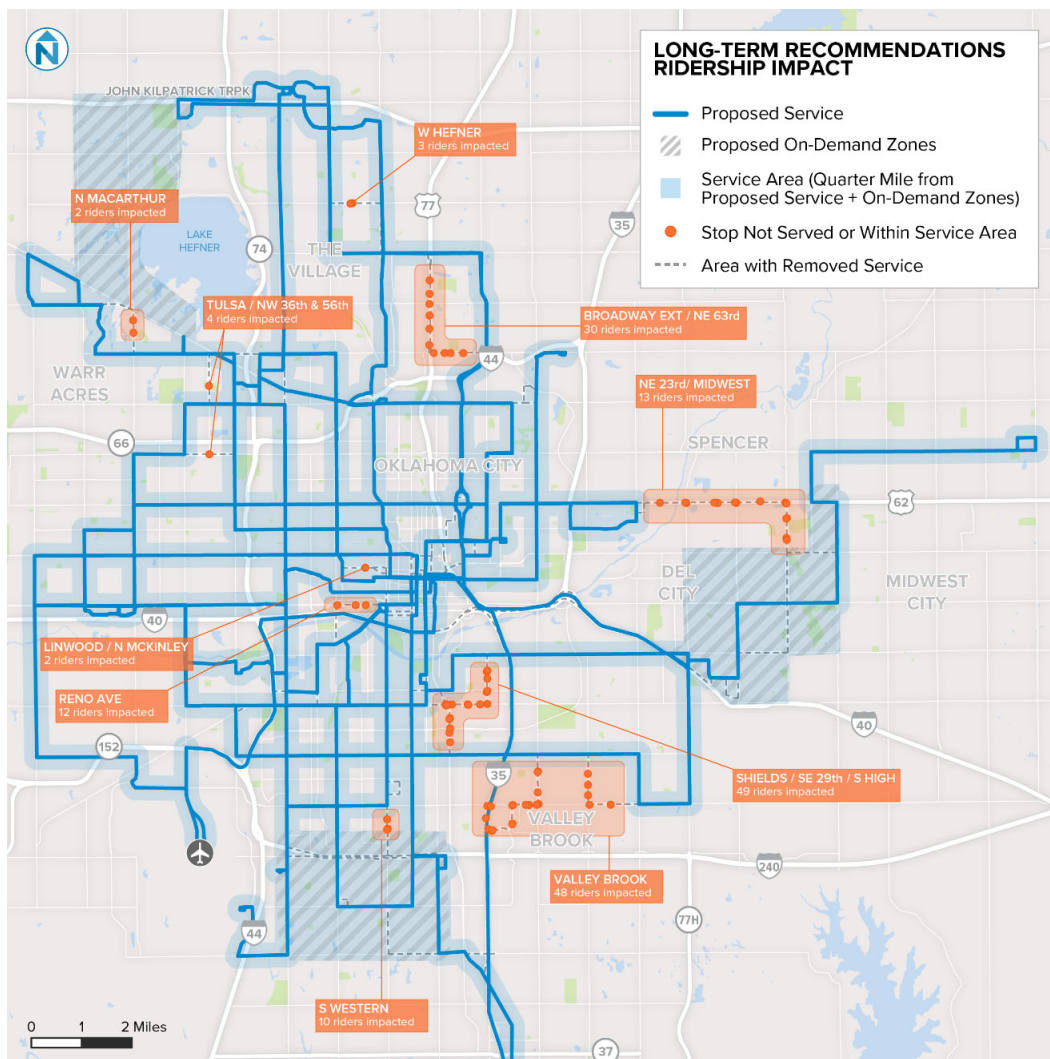
**Figure 9-13 Cost-Constrained Long-Term Recommendations Route Length and Speeds**

Route	Round Trip Route Length (miles)		Round Trip Speed (mph)	
	Existing	Recommended	Existing	Recommended
Route 003	12.4	39.8	12.4	13.3
Route 007	14.2	54.2	14.2	15.5
Route 008	26.3	30.9	13.2	10.3
Route 009	14.6	15	14.6	10.0
Route 010	16.0	31.6	16.0	10.5
Route 011	31.3	23.4	15.7	11.7
Route 012	21.0	19.8	14.0	9.9
Route 013	20.3	19.2	13.5	11.0
Route 015/019	26.8	40.2	20.1	20.1
Route 016	16.8	23.4	16.8	11.7
Route 018	17.9	29.6	17.9	14.8
Route 030	--	18.8	--	12.5
Route 038	21.8	23.4	14.5	11.7
Route 040	17.3	25.8	17.3	12.9
Route 044	24.8	39.8	16.5	11.4
Route A	--	43.6	--	21.8

## Riders Impacted by Long-Term Recommendations

The alignment changes associated with the Long-Term Recommendations are intended to extend service to improve access to employment opportunities, improve travel times for the majority of passengers by providing faster, more direct service on larger arterials, and incorporate new on-demand services to further extend the EMBARK service network. As a result of these changes, some areas would no longer be served by EMBARK fixed-route service. In the long-term, 135 existing bus stops would no longer be directly served by EMBARK service. Of these, approximately 80 stops would no longer be within ¼ mile of transit service. These stops, shown in Figure 9-14, account for approximately 178 average daily riders on weekdays. Nelson\Nygaard anticipates that the long-term recommendations will lead to overall ridership increases, more than offsetting existing riders that may have to walk longer to service.

Figure 9-14 Long-Term Recommendations Removed Stops



# 10 IMPLEMENTATION

The Short-Term Recommendations identified in Chapter 9 of this report are designed to complement the implementation of the NW Bus Rapid Transit line and improve reliability. These recommendations may be implemented within the first year of adopting the plan. However, the Long-Term Recommendations would require additional resources and phasing to implement over the 10-year planning horizon of the *OKC Moves Bus Plan*.

## SHORT-TERM RECOMMENDATIONS

The improvements included in the Short-Term Recommendations are intended to accomplish several key goals, including:

- Integrate the NW BRT into the existing fixed-route network
- Extend service to new destinations
- Address on-time performance issues
- Better connect northeast Oklahoma City to jobs and services
- Standardize frequency on routes to improve daily transfers

The Short-Term Recommendations require unique approaches and lead times for implementation. Some improvements may be implemented within the first year of plan adoption, others require additional discussions with funding partners, and some are specifically intended to be implemented in coordination with the NW BRT route in 2023.

## Reliability Improvements

Reliability improvements and frequency standardization (as discussed in Chapter 9) are recommended for several routes, including Routes 002, 012, 013, 016, 023, 024, and 038. These improvements generally include minor modifications to route alignments and schedules to reduce travel times or increase average operating speeds, ultimately improving on-time performance and service reliability. The reliability improvements are cost neutral and can be implemented without additional resources. As such, these improvements may be implemented within the first year of plan adoption.

## Extend Service to New Destinations

The Short-Term Recommendations also include route alignment extensions and frequency changes for Routes 014, 015, and 019 which would operate outside of the Oklahoma City limits in Midwest City, Del City, Spencer, and Oklahoma County. The existing service agreement includes a funding partnership to provide these services outside of Oklahoma City. Any changes to these services would require discussions and agreements with funding partners in Midwest City, Del City, Spencer, and Oklahoma County prior to implementation. These improvements may be made at any time following an agreement with funding partners.

## BRT Integration

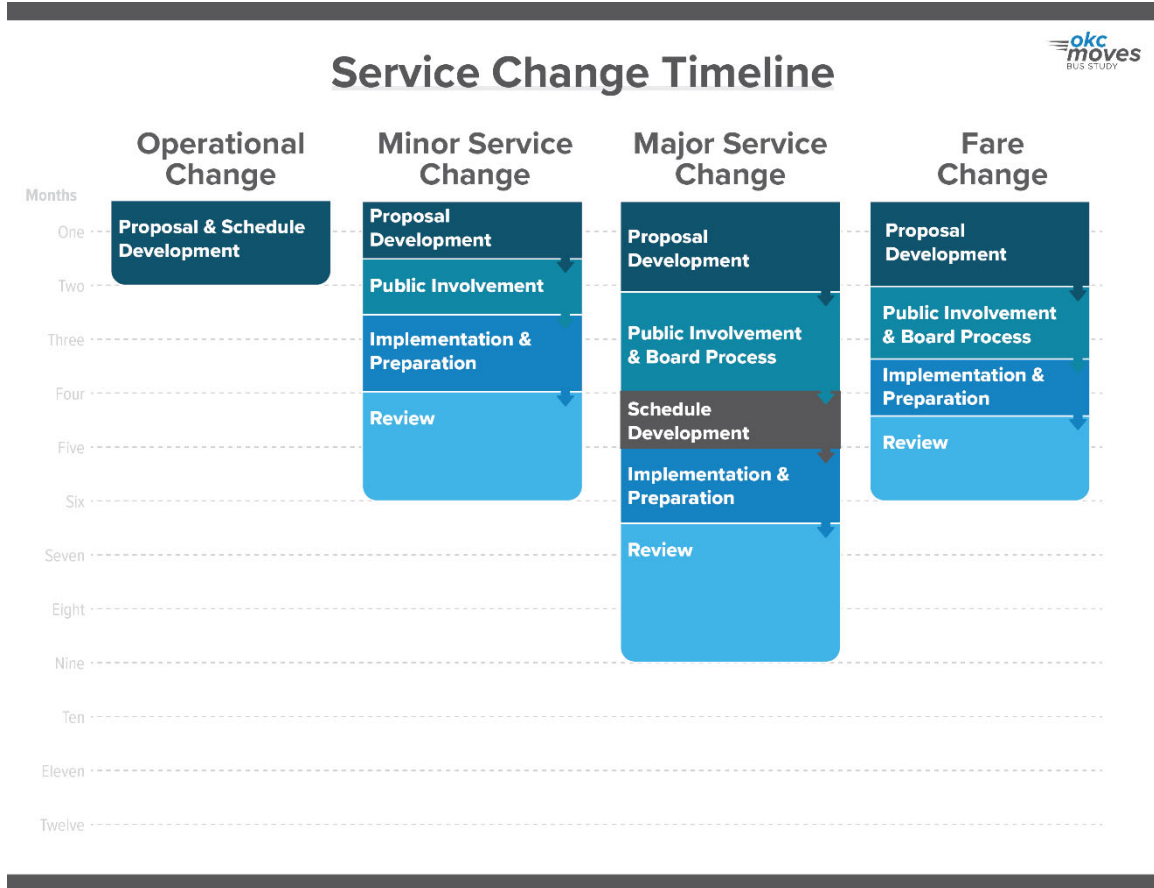
A key component of the Short-Term Recommendations is to realign the local service network to better integrate with the NW BRT route. This improvement includes an initial truncation of Route 005 and a realignment and extension of Route 008. These improvements should be coordinated with the implementation of the NW BRT and implemented as a single package of improvements in 2023.

Following this initial implementation, there is an opportunity to replace Route 005 with an extended alignment of Route 003. This would improve access to jobs and services from northeast and further enhance integration with NW BRT. *This improvement, however, would require additional resources for implementation and should be prioritized after the initial integration improvements.*

## Implementation Process

The specific steps required for implementation of the Short-Term Recommendations vary based on the type of service change, between operational changes, minor changes, and major changes. The general timelines for each type of service change are shown in Figure 10-1. Timelines for service change implementation range between 1-2 months for operational changes, up to six months for minor service changes, and up to 9 months for major service changes. However, because the recommendations included in this plan have already gone through the proposal development and public involvement processes, implementation may occur on a faster timeline.

Figure 10-1 EMBARK Service Change Timeline



### Operational Changes

Operational changes have the most straightforward implementation process and may be implemented at any time following approval of the OKC Moves Bus Study plan. These include generally minor changes impacting less than ¼ mile of an existing route alignment and do not require board approval, Title VI analysis, or extensive public outreach.

To implement these changes, EMBARK may need to develop new rider information including updated route maps and schedules and communicate service changes to riders. If applicable, EMBARK may also need to install or remove bus stop signage and associated infrastructure before implementation.

### Minor Service Changes

Minor service changes require more detailed implementation steps than operational changes and represent larger service changes, generally impacting less than 25% of a route’s boardings, miles, or revenue hours. Implementing minor service changes may take between 1-3 months to implement depending on the level of public engagement undergone in the implementation process.

To implement these changes, EMBARK would need to develop new rider information including updated route maps and schedules. EMBARK may also conduct additional public engagement to effectively communicate service changes to riders and seek additional feedback for possible service revisions prior to implementation. Finally, EMBARK would also need to install or remove bus stop signage and associated infrastructure before implementation.

## **Major Service Changes**

Major service changes require the most involved implementation process, the detailed timeline for which is shown in Figure 10-2. Following Board approval, EMBARK may begin preparations for the next service change window, typically in August/September and January/February. Specific steps in this process include:

- Agreement with funding partners
- Title VI analysis
- Update rider information
- Perform rider outreach
- Install new bus stops
- Implement recommended route network

### **Agreement with Funding Partners**

Prior to implementation for select recommendations, it will be necessary to complete discussions and reach an agreement with funding partners regarding service changes in jurisdictions outside of Oklahoma City. These partners include Midwest City, Del City, Spencer, Moore, and Norman. Discussions with partners should be focused on specific service changes within each jurisdiction, including costs, benefits, and tradeoffs associated with the recommended service changes to ensure all parties have a strong understanding of the proposed service change and potential impacts.

### **Title VI Analysis**

Following agreement with funding partners and potential revisions to service changes, a Title VI service equity analysis will be necessary to ensure compliance with Federal Transit Administration regulations and the Civil Rights Act of 1964. Any disparate impacts or disproportionate burdens identified in accordance with EMBARK's Title VI policy must be reported. Any potential impacts or burdens must then either be mitigated with additional service changes or EMBARK must provide a justification for the proposed service change including a demonstration that there are no alternatives that would have less of an impact on minority and/or low-income populations and still accomplish the program goals of the service change.

### **Update Rider Information**

Following the Title VI analysis, EMBARK may begin to update existing, or develop new, materials for rider information including system maps, route maps and schedule books, rider guides, and other media for both print and web. These materials can be used as tools to engage with riders and the community to communicate these service changes in the near-term and will be necessary as ongoing documentation to help customers navigate the system after the service changes have been fully implemented.

### **Perform Rider Outreach**

In conjunction with updating rider information, EMBARK should begin advertising the upcoming service changes to the public. Engaging in outreach early and often ensures that the public is informed about the service changes well in advance of implementation, is able to ask questions, and can better understand what the changes mean for them prior to implementation. This helps create a seamless implementation process and makes the adjustment process easier for customers.

### **Install New Bus Stops**

Following any potential adjustments to service from earlier implementation stages, EMBARK may begin developing and installing new bus stop infrastructure for routes operating in new locations. Depending on the location, this may include bus stop posts and signs, concrete landing pads, benches, shelters, trash receptacles, street lighting, bicycle racks, and ADA-compliant sidewalk connections. The specific infrastructure improvements for each bus stop location differs on a case-by-case basis.

### **Implement Recommended Route Network**

At the end of this implementation process the recommended service change will have been agreed upon by partners, evaluated for equity impacts, effectively communicated to the public, and is ready for full implementation into operations. EMBARK should make a concerted effort to continue communicating the service change to the community and providing open channels to receive and respond to feedback as the new service changes take effect.

Additionally, more significant route changes may require operator training to qualify certain operators to begin serving these routes. This would include a review of both changes to route alignments and schedules to ensure operators have a robust understanding of the service changes prior to full implementation. This may be necessary for the recommended service changes to Routes 005 and 008 and should be completed prior to scheduling and runcutting.


Figure 10-2 Short-Term Recommendations Implementation Process for Major Service Changes

Action	2022							2023				
	M	A	M	J	J	A	S	O	N	D	J	F
Board meeting approval	•											
Agreement with funding partners												
Title VI Analysis												
Update rider information												
Perform rider outreach												
Install new bus stops												
Implement recommended route network												•



## LONG-TERM RECOMMENDATIONS




This section summarizes the individual improvements included in the Long-Term Recommendations, identifies potential lead times required for implementation, and prioritizes specific groups of recommendations for phased implementation. These recommendations represent a menu of options that may be reprioritized for implementation as priorities and operating conditions evolve over the 10-year planning horizon. Individual recommendations are broken out from the larger service improvement categories identified in Chapter 9 to create smaller, implementable recommendations that may be prioritized independently, as shown in Figure 10-3.

Figure 10-3 Long-Term Recommendations Summary

Service Improvement	Recommendations	Est. Additional Annual Operating Hours	Estimated New Buses (with spares)
 <b>Improved Frequency of Service</b>	<ul style="list-style-type: none"> <li>Route 023 – Improve service frequency to every 15 minutes, 7 days per week. Route would operate with 30-minute service in the early morning and at night.</li> </ul>	23,000	6
	<ul style="list-style-type: none"> <li>Route 038 – Improve service frequency to every 15 minutes, 7 days per week. Route would operate with 30-minute service in the early morning and at night.</li> </ul>	23,000	6



Service Improvement	Recommendations	Est. Additional Annual Operating Hours	Estimated New Buses (with spares)
	<ul style="list-style-type: none"> <li>▪ Route 013 – Improve service frequency to every 15 minutes, 7 days per week. Route would operate with 30-minute service in the early morning and at night.</li> </ul>	19,000	5
	<ul style="list-style-type: none"> <li>▪ Improve Saturday service frequency to every 30 minutes for all other routes</li> </ul>	13,000	0
	<ul style="list-style-type: none"> <li>▪ Add Saturday and Sunday service to Route 015/019</li> </ul>	3,000	0
 <b>Improved Span of Service</b>	<ul style="list-style-type: none"> <li>▪ Provide hourly service until 10 p.m. on weekdays for Routes 003, 008, 010, 012, 038, and 040. Routes would operate with 30-minute service until 7:00 p.m.</li> </ul>	6,000	0
	<ul style="list-style-type: none"> <li>▪ Provide hourly service until 10 p.m. on weekdays for Routes 002, 007, 009, 014, 015, 016, and 018. Routes would operate with 30-minute service until 7:00 p.m.</li> </ul>	7,000	0
	<ul style="list-style-type: none"> <li>▪ Provide service until midnight on weekdays for all routes</li> </ul>	8,000	0
	<ul style="list-style-type: none"> <li>▪ Provide service until midnight on Saturdays</li> <li>▪ Provide service until 10 p.m. on Sundays</li> </ul>	12,000	0
	 <b>Keep Buses On Time</b>	<ul style="list-style-type: none"> <li>▪ Route 009 – Add one vehicle on weekdays and Saturdays to improve reliability. Frequency would not improve.</li> </ul>	11,000
<ul style="list-style-type: none"> <li>▪ Route 008 – Add one vehicle seven days per week to improve reliability. Frequency would not improve.</li> </ul>			

Service Improvement	Recommendations	Est. Additional Annual Operating Hours	Estimated New Buses (with spares)
	<ul style="list-style-type: none"> <li>▪ Route 012 – Add one vehicle seven days per week to improve reliability. Frequency would not improve.</li> <li>▪ Route 015 – Add one vehicle seven days per week to improve reliability. Frequency would not improve.</li> </ul>	11,000	3
 <b>Service to New Areas</b>	<ul style="list-style-type: none"> <li>▪ Airport Route</li> </ul>	13,000	2
	<ul style="list-style-type: none"> <li>▪ Route 044 Crosstown</li> </ul>	38,000	8
	<ul style="list-style-type: none"> <li>▪ Route 007 Crosstown</li> </ul>	28,000	6
	<ul style="list-style-type: none"> <li>▪ Route 030 Crosstown</li> </ul>	17,000	4
	<ul style="list-style-type: none"> <li>▪ Route 010 Extension</li> </ul>	21,000	5
	<ul style="list-style-type: none"> <li>▪ Route 018 Extension</li> </ul>	11,000	2
	<ul style="list-style-type: none"> <li>▪ Route 040 Extension</li> </ul>	11,000	3
	<ul style="list-style-type: none"> <li>▪ Route 016 Extension</li> </ul>	11,000	2
 <b>On-Demand Zones</b>	<ul style="list-style-type: none"> <li>▪ Improve coverage in growing areas with three on-demand zones</li> </ul>	14,000	4 (small vehicles)
 <b>Secondary Transfer Hubs</b>	<ul style="list-style-type: none"> <li>▪ New secondary transfer hubs are recommended at Quail Springs Mall, Oklahoma City Community College, Reno Hub, Santa Fe Walmart, and at the Del City Walmart.</li> </ul>	None	Cost varies from \$500k to \$5M per facility

Each of the service improvement strategies addresses specific needs identified. For instance, “Improved Frequency” increases ridership the most, has the most public support, but also requires the most new capital investment. Given the significant investments associated with any one of these strategies, a balance of costs and benefits must be considered (Figure 10-4).

**Figure 10-4 Long-Term Recommendations Costs and Benefits Summary**

<b>Service Improvement</b>	<b>Increases Ridership</b>	<b>Public Support</b>	<b>Improves Coverage</b>	<b>Requires Expanded Base</b>
Improve on-time performance	✓	✓✓✓	✓	✓✓
Improved frequency	✓✓✓✓✓	✓✓✓✓✓	✓	✓✓✓✓
Later service	✓✓✓	✓✓✓✓	✓✓✓	✓
More weekend service	✓✓	✓✓✓✓	✓✓✓	✓
Serve new areas	✓✓✓	✓✓✓	✓✓✓✓	✓✓✓
On-demand service	✓	✓	✓✓✓✓✓	✓✓

## LONG-TERM PRIORITIZATION

Recognizing that the Long-Term Recommendations require additional operating funding, and in some cases, investments in new or expanded capital facilities, it is necessary to prioritize individual improvements for implementation. Each Long-Term Recommendation identified above was evaluated and prioritized based on alignment with community values, overall benefit to the public and the transit network, lead time required for implementation, and additional required costs for implementation.

A key consideration in implementation phasing is the required lead time for new services. Any recommendation that requires additional vehicles cannot be implemented until the existing maintenance facility is expanded to provide the additional capacity necessary to store and maintain a larger fleet. Additionally, EMBARK will typically need two years of lead time to place a purchase order and receive any vehicles. These lead times are noted, where relevant, so EMBARK can accurately account for necessary steps to implement these specific improvements.

Figure 10-5 shows individual service improvements, ranked in order of implementation, that would require additional funding to implement. This prioritization approach attempts to balance the community priorities identified during Phase I and Phase II of public outreach, including extended service span, improved weekend service, and higher frequency service. It also establishes a framework for future route extensions and additions by prioritizing lower investment improvements initially, enabling EMBARK to invest in new secondary transfer hubs and the expanded maintenance facility earlier in the planning horizon.

Figure 10-5 Long-Term Recommendation Prioritization

Priority	Improvement	Requires Expanded Facility & Lead Time	Est. Additional Annual Operating Hours	Est. Operating Costs (2021 \$) <sup>1</sup>	Est. Capital Cost (2021 \$)
1	<ul style="list-style-type: none"> <li>Provide hourly service until 10 p.m. on weekdays for Routes 003, 008, 010, 012, 038, and 040. Routes would operate with 30-minute service until 7:00 p.m.</li> </ul>	No	6,000	\$788,000	None
2	<ul style="list-style-type: none"> <li>New secondary transfer hubs at Reno Mini Hub and Oklahoma City Community College</li> </ul>	No	None	None	\$1 - \$10 million

<sup>1</sup> Estimated 2021 Operating Costs were determined using FY20-21 revenue hours and FY20-21 operating expenses as provided by EMBARK

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Priority	Improvement	Requires Expanded Facility & Lead Time	Est. Additional Annual Operating Hours	Est. Operating Costs (2021 \$) <sup>1</sup>	Est. Capital Cost (2021 \$)
3	<ul style="list-style-type: none"> <li>▪ Improve Saturday service frequency to every 30 minutes for all routes</li> </ul>	No	13,000	\$1,707,000	None
4	<ul style="list-style-type: none"> <li>▪ Route 023 – Improve frequency to every 15 minutes</li> </ul>	Yes	23,000	\$3,019,000	\$3,300,000
5	<ul style="list-style-type: none"> <li>▪ New Airport Route</li> </ul>	Yes	13,000	\$1,707,000	Vehicles - \$1,100,000 Stops - \$330,000
6	<ul style="list-style-type: none"> <li>▪ On-time performance improvements for Routes 009 and 012</li> </ul>	Yes	11,000	\$1,444,000	\$1,100,000
7	<ul style="list-style-type: none"> <li>▪ Route 013 – Improve frequency to every 15 minutes</li> </ul>	Yes	19,000	\$2,494,000	\$2,750,000
8	<ul style="list-style-type: none"> <li>▪ Provide service until 10 p.m. on weekdays for Routes 002, 007, 009, 014, 015, 016, and 018</li> </ul>	No	7,000	\$919,000	None
9	<ul style="list-style-type: none"> <li>▪ Provide hourly service until midnight on weekdays for all routes. Routes would operate with 30-minute service until 7:00 p.m.</li> </ul>	No	8,000	\$1,050,000	None
10	<ul style="list-style-type: none"> <li>▪ Route 038 – Improve frequency to every 15 minutes</li> </ul>	Yes	23,000	\$3,019,000	\$3,300,000
11	<ul style="list-style-type: none"> <li>▪ On-time performance improvements for Routes 008 and 015</li> </ul>	Yes	11,000	\$1,444,000	\$1,650,000
12	<ul style="list-style-type: none"> <li>▪ Provide service until midnight on Saturdays</li> <li>▪ Provide service until 10 p.m. on Sundays</li> </ul>	No	12,000	\$1,575,000	None
13	<ul style="list-style-type: none"> <li>▪ New secondary transfer hubs at Quail Springs Mall and Santa Fe Walmart</li> </ul>	No	None	None	\$1 – 10 million
14	<ul style="list-style-type: none"> <li>▪ New Route 007 Crosstown</li> </ul>	Yes	28,000	\$3,676,000	Vehicles - \$3,300,000 Stops - \$525,000

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Priority	Improvement	Requires Expanded Facility & Lead Time	Est. Additional Annual Operating Hours	Est. Operating Costs (2021 \$) <sup>1</sup>	Est. Capital Cost (2021 \$)
15	▪ New secondary transfer hub at Del City Walmart	No	None	None	\$500k - \$5 million
16	▪ New Route 044 Crosstown	Yes	38,000	\$4,988,000	Vehicles - \$4,400,000 Stops - \$450,000
17	▪ Route 016 extension to Santa Fe Walmart	Yes	11,000	\$1,444,000	Vehicles - \$1,100,000 Stops - \$75,000
18	▪ Route 040 extension to Moore	Yes	11,000	\$1,444,000	Vehicles - \$1,650,000 Stops - \$300,000
19	▪ Route 018 extension to Quail Springs Mall	Yes	11,000	\$1,444,000	Vehicles - \$1,100,000 Stops - \$300,000
20	▪ Route 010 extension Reno Mini Hub	Yes	21,000	\$2,757,000	Vehicles - \$2,750,000 Stops - \$240,000
21	▪ New Route 030 Crosstown	Yes	17,000	\$2,232,000	Vehicles - \$2,200,000 Stops - \$180,000
22	▪ Add Saturday and Sunday service to Route 015/019	No	3,000	\$394,000	None
23	▪ Improve coverage in growing areas three on-demand zones	Yes	14,000	\$1,838,000	\$400,000

Note – Estimated Capital Costs include additional vehicles, bus stops, infrastructure, and other capital improvements that are necessary for implementation

## Implementation Process

The process for implementing the Long-Term Recommendations is the same as for Short-Term Recommendations with the key exception that Long-Term Recommendations require additional resources to implement, including increased operating costs, additional vehicles, an expanded maintenance and operations facility, and site planning/engineering requirements for additional transit hub locations. Additional funding must be secured for each of these improvements, either on an ongoing basis for operating costs or for one-time capital acquisitions.

Capital acquisitions typically require a lead time to order, purchase, and receive. For example, it typically takes two years to receive a vehicle once the order has been placed. As such, a timeline for Long-Term Recommendations implementation is shown below in Figure 10-6. Any improvement requiring additional vehicles has a longer implementation period and is predicated on EMBARK completing an expanded maintenance and operations facility. The additional implementation stages required for these Long-Term Recommendations is discussed below.

### Expanded Maintenance and Operations Facility

The existing maintenance and operations facility for EMBARK is effectively at capacity. Any improvement requiring additional vehicles cannot be implemented until EMBARK expands its existing facility or constructs a new one to accommodate this growth in vehicles and operating capacity. This expansion is being evaluated separately from the OKC Moves Bus Study and is not included in this Final Report.

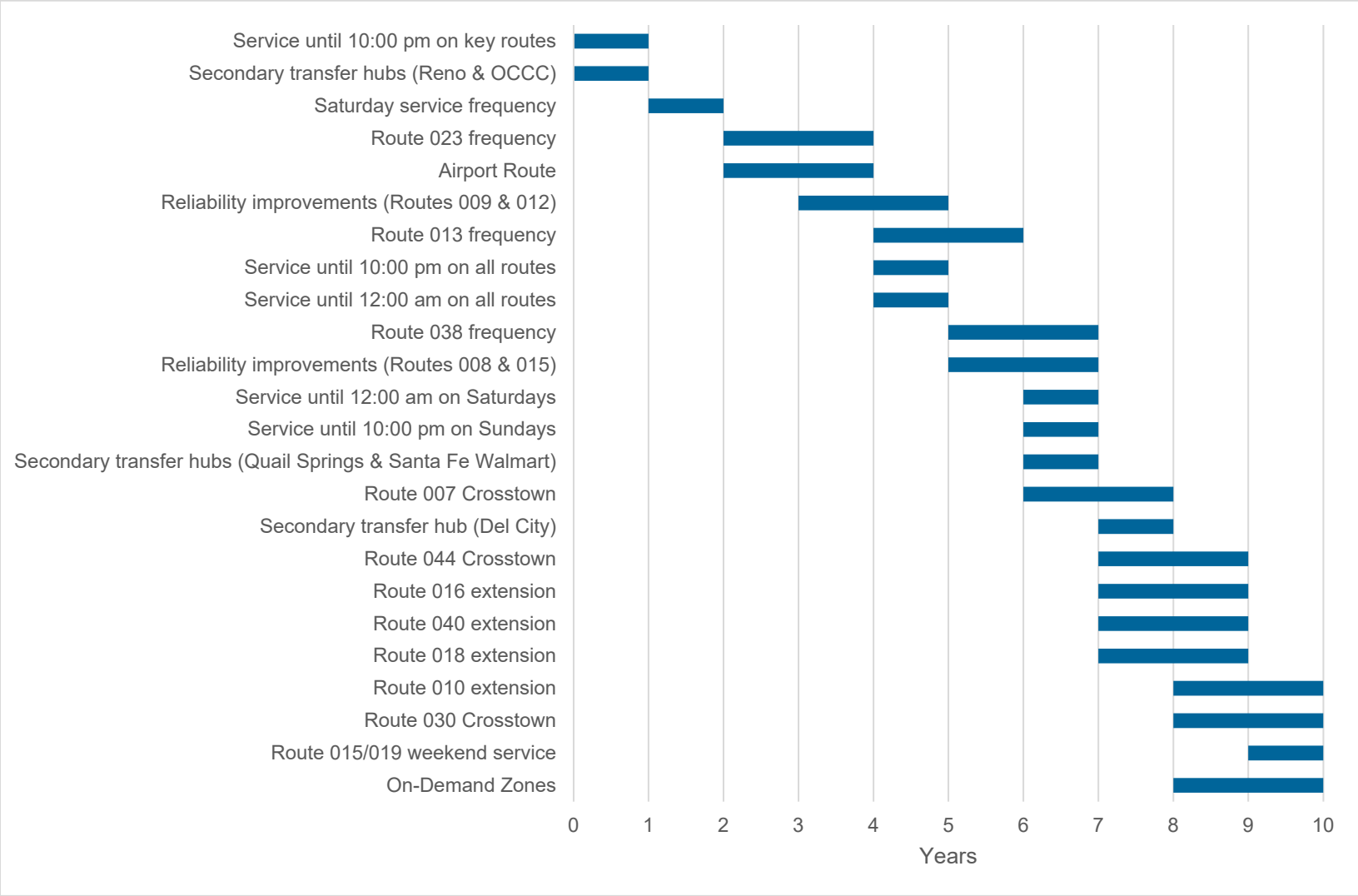
### Additional Vehicle Acquisition

Following an expansion of the maintenance and operations facility to accommodate additional vehicles, EMBARK may begin to acquire the additional vehicles necessary to operate new services and more frequent service on key routes. Purchasing new vehicles is anticipated to take approximately two years to receive from the time of order and must be planned well in advance of implementation. Aside from this lead time, the implementation process remains the same as that discussed for the Short-Term Recommendations.

### Site Planning/Engineering

While the bus stop improvements for many routes are generally straightforward, the five secondary transfer hub facilities included in the Long-Term Recommendations may require additional site planning or engineering work. These secondary transfer hubs may be developed with a range of infrastructure improvements including as little as several transit shelters, similar to the existing Reno Mini Hub, or as larger facilities with space for multiple vehicles to layover, and indoor facilities and restrooms for customers and operators. While not required for smaller transfer hub investments, the additional time and cost requirements to complete these planning and engineering tasks should be accounted for when implementing these facilities.

**Figure 10-6 Long-Term Recommendation Implementation Timeline**





## **FUTURE STUDIES**

In addition to the specific improvements identified in this chapter, there are several future studies that may be beneficial for EMBARK to explore to refine potential service and facility recommendations as well as to enhance the policy direction of the agency and its coordination with other regional entities.

### **Operations**

#### **Scheduling and Runcutting**

Implementation of the service changes recommended in the OKC Moves Bus Study requires EMBARK to upgrade their scheduling capability. Currently EMBARK uses an older version of the Trapeze FX scheduling system. Scheduling and runcutting are performed without the aid of key system modules resulting in inefficient manual processing and the inability to test different scenarios. In addition, EMBARK wishes to revise and reconfigure bus operator assignments to achieve objectives such as adding meal breaks, reducing overtime and reducing split runs to make operator assignments more attractive. To address these objectives, an upgraded scheduling system is required.

EMBARK staff has not had the level of formal training required to support a transit system that is expected to change and grow in the future.

It is recommended that EMBARK secure assistance to upgrade the scheduling function. This assistance could be phased over the next several years to address EMBARK's needs.

#### **Immediate Term**

- Training for scheduling and planning staff.
- Consultation on scheduling system upgrades and possibly procuring a new scheduling system.
- Assistance with implementation of initial COA recommendations, such as running time adjustments.

#### **Medium Term**

- Assistance with mark ups, including preparing for NW BRT implementation. The NW BRT is expected to be implemented in October 2023 but work on the mark up (scheduling and runcutting) needs to begin by the end of calendar 2022.
- COA implementation assistance.

#### **Longer Term**

- Evaluate adding meal breaks and pre-shift meetings; assistance with implementation.
- Reconfigure runs to reduce overtime, split runs, etc.

## On-Demand Transit Service

As EMBARK moves toward implementation of the on-demand service zones identified in the Long-Term Recommendations, there will be a need to identify a specific service model prior to implementation. Potential service models include:

- **In-House** – Agency provides and manages vehicles, drivers, brand, payment system, marketing, customer service, etc. EMBARK would also be responsible for procuring a mobile application and dispatch software for the service. This provides the most agency control but has the highest capital and staff costs and may take longer to implement.
- **Turnkey Model** – A contractor provides dedicated vehicles, drivers, mobile applications, dispatch software, branding, payment system, and customer service. This has lower capital and staff costs for the agency and may have better software optimization but has less agency control over the service.
- **Hybrid Model** – Agency provides and manages vehicles, drivers, brand and marketing, and customer service. Partner provides off-the-shelf application, dispatch software, and payment system. This provides a higher level of agency control than the Turnkey Model but continues to have higher capital and staff costs.
- **TNC Partnership Model** – Non-dedicated transportation network company (TNC) like Lyft or Uber serves rides meeting agency criteria and invoices the agency based on an agreed-upon subsidy structure. TNC provides the application and dispatch software, brand, payment system, and customer service. This approach has the lowest capital and staff costs and is the fastest to launch but has the least agency control over the service.

Further study would be required by EMBARK to determine the best operator model to meet their needs and to procure service contractors or partners.

## Facilities

### Secondary Transfer Hubs

As discussed above in the implementation process section, there is a range of infrastructure improvements available to develop secondary transfer hubs between constructing several standard transit shelters to a full off-street layover facility with indoor waiting and restrooms. These options should be evaluated in a future study to determine the most appropriate approach for each recommended transfer hub. In this process, additional study may be required to partner with neighboring businesses, acquire land, conduct site planning and engineering, and develop a full transfer hub.

## **Policies**

In addition to the specific operations and facilities studies identified above, there are a few more general policy studies that may be helpful as EMBARK continues to grow and develop its transit network over the next ten years.

### **Transit Design Guideline**

Transit Design Guidelines are planning documents that identify specific standards, policies, and practices for transit agencies to design their services, facilities, and infrastructure. This type of document may be used to ensure consistency in how bus stops are sited, BRT stations are designed, or to provide consistent wayfinding and branding for customers. Transit Design Guidelines may be developed in partnership with other organizations or government actors to ensure consistency with regional goals and priorities.

### **Transit-Oriented Development Policy and Guide**

Transit service and local land use are highly interrelated. Dense, mixed-use development generally supports higher levels of transit service and vice versa. Coordinating local land use policy set by the Oklahoma City Planning Department with EMBARK's transit service enhancements can make these service changes more impactful for the community. This may be done by developing a Transit-Oriented Development (TOD) Policy or a Transit Supportive Design Guide in coordination with the planning department. This policy may be used to establish specific areas of the city that are designated for higher densities or mixed land uses that can work in conjunction with high frequency transit service, like the NW BRT route, to maximize the benefits of public transit within the community.

### **System Accessibility Policy**

Many transit systems across the country are making concerted efforts to achieve 100% ADA accessibility at bus stops. A common approach is to ensure all new bus stops are designed to be accessible. However, existing bus stops must be evaluated and improved where necessary to reach this accessibility goal. There is an opportunity for EMBARK to establish a formal policy for where and when to evaluate existing bus stops to determine the existing accessibility status and program them for improvements. This may involve specific policy direction, conducting a bus stop inventory and field review, and programming additional capital expenditures to reach this target. Future study to identify the best approach for meeting EMBARK's goals within agency resources would be necessary to develop and refine this policy and approach.

# Appendix A Peer Agency Analysis

No two transit agencies operate identically; however, most agencies share some characteristics with others, and those common characteristics can form a basis for comparison. Comparing service practices and performance among a group of peer agencies helps identify strengths and opportunities and facilitates best practices amongst the group of peers.

This peer agency analysis compares EMBARK with seven other transit systems throughout the county. The purpose of the review is to determine where EMBARK performs well and where there are opportunities to learn from other transit providers. This review uses data from the National Transit Database (NTD) for 2019. It focuses on fixed-route transit operations, not demand response services (e.g. Dial-A-Ride or paratransit).

## KEY FINDINGS

- **EMBARK appears to invest less in transit service per capita than other peer agencies.** EMBARK provides the second fewest revenue hours and revenue miles per service area capita and is below the peer agency average in percent of the Urbanized Area (UZA) served by transit. Increasing investments in transit would bring EMBARK closer in line with other peer agencies. To reach the peer agency average for revenue hours and revenue miles per capita, EMBARK would need to provide an additional 132,400 annual revenue hours and 1,626,000 annual revenue miles of service.
- **EMBARK and Rock Region Metro are the only peer agencies without a dedicated funding source.** All other peer agencies use a dedicated sales tax or property tax levy to fund transit operations. The lack of a dedicated funding source requires EMBARK to rely more heavily on discretionary funds and makes planning for long term service expansion more difficult.
- **EMBARK provides roughly half the annual revenue hours and one third the annual passenger trips as ABQ Ride,** despite having similar service area population and service area size. ABQ Ride also provides 15-minute service frequency on key transit corridors, which may contribute to higher ridership for the agency.
- **EMBARK is generally consistent with peer agencies in terms of overall performance indicators, excluding ABQ Ride and KCATA.** ABQ Ride and KCATA provide notably higher service levels, in terms of annual revenue hours and annual revenue miles, than the other peer agencies. Both of these agencies provide much higher annual passenger trips than the other peer agencies and KCATA has a much larger service area population, which may contribute to the higher ridership.
- **EMBARK is generally consistent with peer agencies in terms of passenger trips per revenue hour,** 8% below the peer agency average and within two

boardings per hour of MMT, Rock Region Metro, MTTA, and DCTA. ABQ Ride and KCATA are notably more productive than the other peer agencies.

- **EMBARK is above the peer agency average in both operating cost per revenue hour and operating cost per revenue mile.** This suggests that while EMBARK is consistent with peer agencies in terms of total annual operating expenses, service is less cost effective than peer agencies on a per mile and a per hour basis. The cost effectiveness of service can be impacted by a number of factors, including local differences in labor costs, scheduling practices, fleet age and the associated prevalence of vehicle breakdowns and related maintenance costs.

## PEER AGENCIES

Peer agencies were initially identified through a list of transit agencies with similar operating characteristics including location, service area size, service area population, annual ridership, and annual revenue hours. This list was shared with EMBARK staff and some adjustments were made based on their knowledge and experience.

The resulting peer agencies include:

- City of Albuquerque Transit (ABQ Ride); Albuquerque, NM
- Mountain Metro (MMT); Colorado Springs, CO
- Rock Region Metro; Little Rock, AR
- Metropolitan Tulsa Transit Authority (MTTA); Tulsa, OK
- Kansas City Area Transportation Authority (KCATA); Kansas City, MO
- Transit Authority of Omaha (Metro); Omaha, NE
- Denton County Transit Authority (DCTA), Denton County, TX

The peer agencies and their service area statistics are shown below in Figure 1.

Figure 1 Peer Agency Service Area Statistics

System Name	City	Service Area Population	Service Area Square Miles	Population Density Persons per Square Miles
<b>EMBARK</b>	<b>Oklahoma City, OK</b>	<b>650,211</b>	<b>244</b>	<b>2,665</b>
ABQ Ride	Albuquerque, NM	661,629	235	2,815
MMT	Colorado Springs	527,294	257	2,052
Rock Region Metro	Little Rock, AR	171,264	102	1,679
MTTA	Tulsa, OK	508,282	254	2,001
KCATA	Kansas City, MO	788,748	456	1,730
Metro	Omaha, NE	561,920	178	3,157
DCTA	Denton County, TX	608,520	284	2,143

Source: NTD 2019

## Peer Agency Profiles

Peer agencies were generally selected based on similarities in operating characteristics, service area characteristics, and location. However, each agency operates with their own unique policies, funding sources, and operating environments. These agency profiles provide context on operating characteristics including the number of routes operated, general service frequency and service span, and availability of late night and Sunday service. The profiles also include available information on funding sources, particularly whether agencies have access to a dedicated funding source or rely more heavily on discretionary sources.

### EMBARK

EMBARK operates 22 fixed bus routes, EMBARK Plus paratransit service, the Oklahoma City Streetcar, and the Oklahoma River Cruises ferry service. Bus service operates seven days a week, with weekday service generally running between 4:30 am and 7:30 pm and late-night service operating between 7:00 pm and 12:00 am on a limited number of routes. Weekend and holiday services generally operate from 6:30 am to 6:30 pm. Most routes operate every 30 minutes on weekdays and every 60 minutes on weekends and holidays. Sunday service is also provided on a limited number of routes.

The majority of EMBARK funding is discretionary, with 84% of funding derived from the city's general fund in FY2020. The remaining operating funds for the agency come from directly generated revenue associated with the public transportation and parking fund (ie. public transit fares, parking revenue, and parking fines).

## **City of Albuquerque (ABQ Ride)**

ABQ Ride operates within the cities of Albuquerque and Rio Rancho and areas of unincorporated Bernalillo County, NM. ABQ Ride operates 40 fixed bus routes including several commuter routes and three rapid bus lines that operate every 8-15 minutes between 5:30 am and 11:00 pm on weekdays and Saturdays and between 6:00 am and 7:00 pm on Sundays. Local routes operate every 30-60 minutes between 5:30 am and 7:00 pm on weekdays and every 60 minutes between 10:00 am and 5:00 pm on weekends. ABQ Ride also provides Sun Van paratransit service to most addresses in Albuquerque and Bernalillo County.

ABQ Ride is partially funded by a ¼ cent sales tax dedicated to transportation and infrastructure in the city of Albuquerque, accounting for approximately 22% of the department's funding in ABQ Ride's FY2019 annual budget. Other funding sources include directly generated revenues like fares and advertising, grants, interfund revenues, and transfers from the city general fund.

ABQ Ride was identified as a peer agency for EMBARK due to their similar service area population, service area size, and service area population density. These two agencies provide a close comparison in terms of service area characteristics.

## **Mountain Metro Transit (MMT)**

MMT operates 30 fixed bus routes with service frequency ranging between every 15 minutes to every 60 minutes Monday through Sunday as well as Metro Rides paratransit service. Service span varies by route but generally operates between 5:30 am and 9:30 pm on weekdays, between 6:30 am and 9:30 pm on Saturdays, and between 7:30 am and 5:30 pm on Sundays.

MMT is funded by three primary sources, a 1% sales tax collected and distributed by the Pikes Peak Rural Transit Authority, grant appropriations, and transfers from the city of Colorado Springs general fund. The 1% dedicated sales tax is collected between the member jurisdictions of Colorado Springs, Manitou Springs, Green Mountain Falls, Rama, and El Paso County. These sales tax distributions accounted for approximately 43% of MMT's FY2019 annual budget.

MMT was identified as a peer agency for EMBARK due to the similar level of investment in terms of revenue hours. This allows for a direct comparison between the agencies to determine how similar investments in transit may yield different outcomes in different operating environments.

## **Rock Region Metro**

Rock Region Metro operates 15 fixed bus routes, two streetcar lines, Metro Connect microtransit, and Metro Links paratransit service. Fixed route bus service generally operates between 5:30 am and 8:30 pm on weekdays, between 5:30 am and 7:30 pm on Saturdays every 30 to 60 minutes. Sunday service is provided on select routes between 9:00 am and 4:30 pm every 60 minutes.

Rock Region Metro is funded through a partnership in which each partner jurisdiction supports Rock Region METRO through a formula that allocates expenses based on bus route miles operated within each jurisdiction. METRO Streetcar is an equal partnership among Little Rock, North Little Rock and Pulaski County. Additional revenue sources include federal formula funds, the Arkansas Public Transit Trust Fund, rider fares and miscellaneous income streams. A proposed dedicated ¼ cent sales tax to fund transit operations was rejected by voters in 2016.

Rock Region Metro was identified as a peer agency for EMBARK due to its relatively high ridership and investment in transit, despite its relatively small service area population. This comparison can be used to identify characteristics that are conducive to transit ridership in a region with a smaller population.

### **Metropolitan Tulsa Transit Authority (MTTA)**

MTTA operates 21 fixed bus routes and The Lift paratransit service. Fixed route bus service generally operates between 5:00 am and 8:00 pm on weekdays, between 6:00 am and 7:30 on Saturdays. Sunday and late night service is provided on select routes, generally between 8:00 am and 7:00 pm on Sundays and from 8:00 pm to 12:00 am on late night routes. Routes generally operate every 30-60 minutes on weekdays and every 60 minutes on weekends and during late night service.

In April 2016, Tulsa voters approved an ordinance setting a permanent sales tax levy of 0.085% to begin January 1, 2017 for the purpose of providing revenue for the support of street maintenance, traffic, and public transportation functions of the City of Tulsa. Approximately 54% of the funds generated by this sales tax were attributed to MTTA in FY2018.

MTTA was identified as a peer agency for EMBARK because they both operate in the state of Oklahoma and thus operate within a similar policy context. This may provide a framework for viewing differences in agency characteristics through a similar statewide policy lens.

### **Kansas City Area Transportation Authority (KCATA)**

KCATA provides 83 routes including local, express, BRT, streetcar, flex, paratransit, and microtransit services. The MAX BRT routes generally operate every 15-30 minutes between 5:30 am and 1:00 am on weekdays and Saturdays and between 5:30 am and 12:30 am on Sundays. Local fixed route service generally operates every 30-60 minutes between 5:00 am and 12:00 am on weekdays and between 5:30 am and 10:00 pm on Saturdays and Sundays.

KCATA is funded by a dedicated ½ cent sales tax which began in 1971 and was made permanent in 2015. This sales tax revenue accounted for 23% of the agency's funding in FY2019, with an additional 52% coming from federal assistance, 10% from federal capital grants, and 9% from other local revenues and fares.

KCATA was identified as a peer agency for EMBARK to serve as an aspirational peer. The agency is generally larger with a higher population, higher ridership, and higher



level of investment in transit. KCATA serves as an example of a potential outcome for EMBARK given increased population growth and investment in transit.

## **Omaha Metro**

Omaha Metro operates 28 fixed bus routes, including one BRT route and seven express routes, and MOBY paratransit service. Service generally operates between 4:30 am and 11:00 pm on weekdays, between 6:30 am and 10:00 pm on Saturdays, and between 7:00 am and 7:00 pm on Sundays. Service generally operates every 30-60 minutes on weekdays and Saturdays and every 60 minutes on Sundays. BRT service operates every 10-20 minutes between 4:30 am and 12:00 am on weekdays, every 15-20 minutes between 5:00 am and 11:30 pm on Saturdays, and every 15-20 minutes between 6:00 am and 9:00 pm on Sundays.

Local funding for Omaha Metro is currently provided through property taxes from the city of Omaha and service contracts with Council Bluffs, Bellevue, Ralston, La Vista, and Papillion. The current property tax levy dedicated to transit in Douglas County is 0.05101 per \$1,000 of assessed value, split 50-50 between the county and the city. Under state law, this levy is only allowed to grow 2.5 percent per year. An additional one percent can be added with county and city approval. In FY2019, 59% of revenue was derived from these property taxes.

Omaha Metro was identified as a peer agency for EMBARK due to their similar service area population and ridership. This allows for a comparison between different levels of investment and ability to attract and retain ridership for two similarly sized agencies.

## **Denton County Transportation Authority (DCTA)**

DCTA operates 23 fixed bus routes in Denton, Highland Village, Lewisville, and through the North Texas University campus and Access paratransit service. Service varies by route but generally operates every 40 to 60 minutes between 5:00 am and 9:00 pm on weekdays, between 8:00 am and 7:00 pm on Saturdays. DCTA also operates the A-Train commuter rail line connecting Dallas County and Denton County.

DCTA has a dedicated funding source of a one-half percent sales tax in member cities of Denton, Highland Village and Lewisville. In FY2019, this sales tax funded accounted for approximately 43% of the agency's budget. Federal Grants (13%) and cash and investments (31%) comprised the bulk of the remaining revenue sources.

DCTA was identified as a peer agency for EMBARK due to similarities in service area size and population.

## **FUNDING SOURCES**

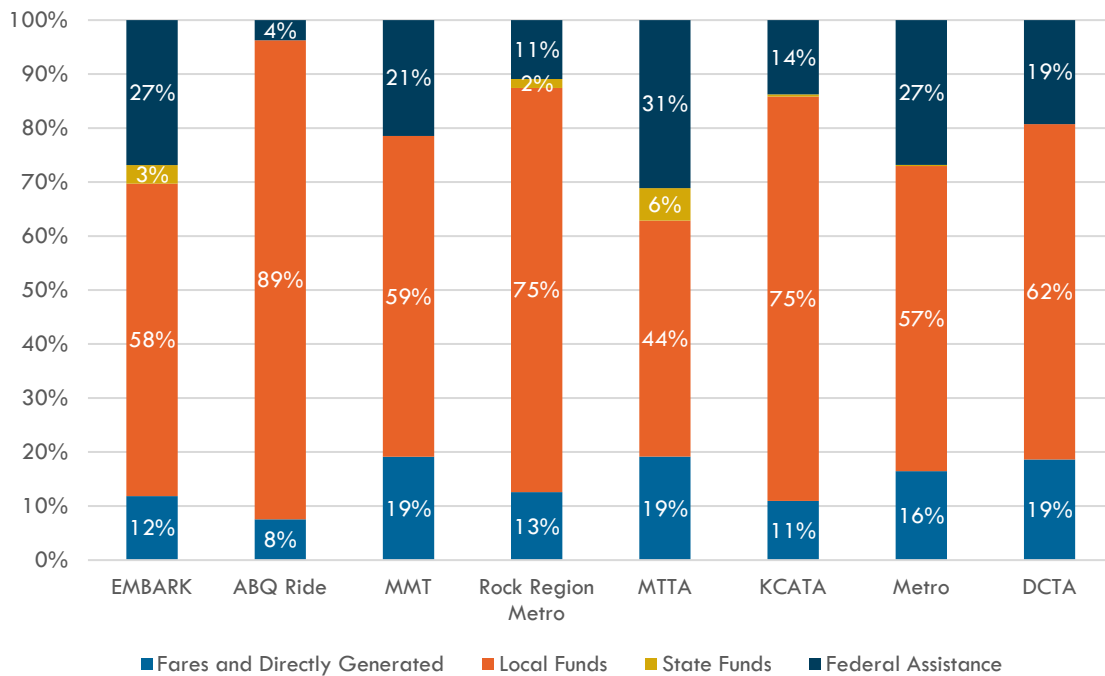
Transit agencies often receive funding from numerous sources, some of which may be dedicated funding sources, like a local sales tax, and some may be non-dedicated or discretionary, like state or federal funding assistance or discretionary funding from a municipal general fund. A higher proportion of funding from dedicated sources generally

makes an agency's finances more stable and enables long-term planning for service improvements or expansions. While less stable discretionary funding requires agencies to be more flexible and focus on year-to-year funding levels rather than long-term expansions. EMBARK and Rock Region Metro are the only peer agencies without a dedicated funding source.

## Operating Revenue

The source of operating funds for the peer agencies, as reported by NTD, is generally split into four categories: Local, State, Federal, and Fares and other directly generated revenue (Figure 2).

Figure 2 Peer Agency Source of Operating Funds (2019)



Source: NTD 2019

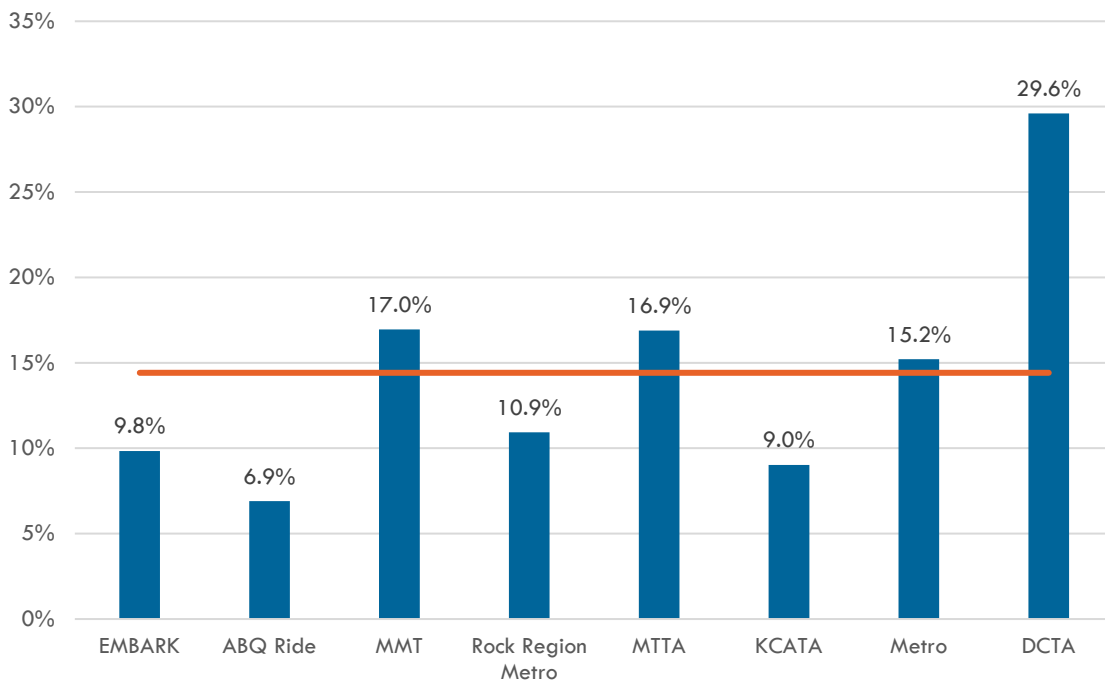
EMBARK appears generally consistent with other peer agencies in terms of reliance on local funding sources. However, ABQ Ride, Rock Region Metro, and KCATA all receive at least 75% of their operating funds from local sources, notably higher than other peer agencies. EMBARK and MTTA are both more heavily reliant on state and federal funding than the other peer agencies, despite MTTA's dedicated local sales tax. This may be a result of the Oklahoma Department of Transportation (ODOT) Public Transit Revolving Fund which may be used for local share or matching funds for federal capital and operating grants. EMBARK also receives relatively low levels of fares and directly generated revenue compared to the other peer agencies, along with ABQ Ride and KCATA.

## Farebox Recovery

Farebox recovery ratio is a measure of the percentage of operating expenses that are met by the fares paid by passengers. In addition to the relatively low fares and directly generated revenue, EMBARK, ABQ Ride, and KCATA also rank lowest in terms of farebox recovery ratio (Figure 3). All three of these agencies have farebox recovery ratios below 10% compared to a peer agency average of 14.4%. DCTA has a notably higher farebox recovery than the other peers at 29.6%, over double the peer agency average. DCTA provides more long-distance commuter service with higher fares than the other peer agencies that have a larger focus on local service, which may contribute to the notably high farebox recovery for the agency. KCATA and ABQ Ride have higher than average annual operating costs, which may explain their relatively low farebox recovery ratios.

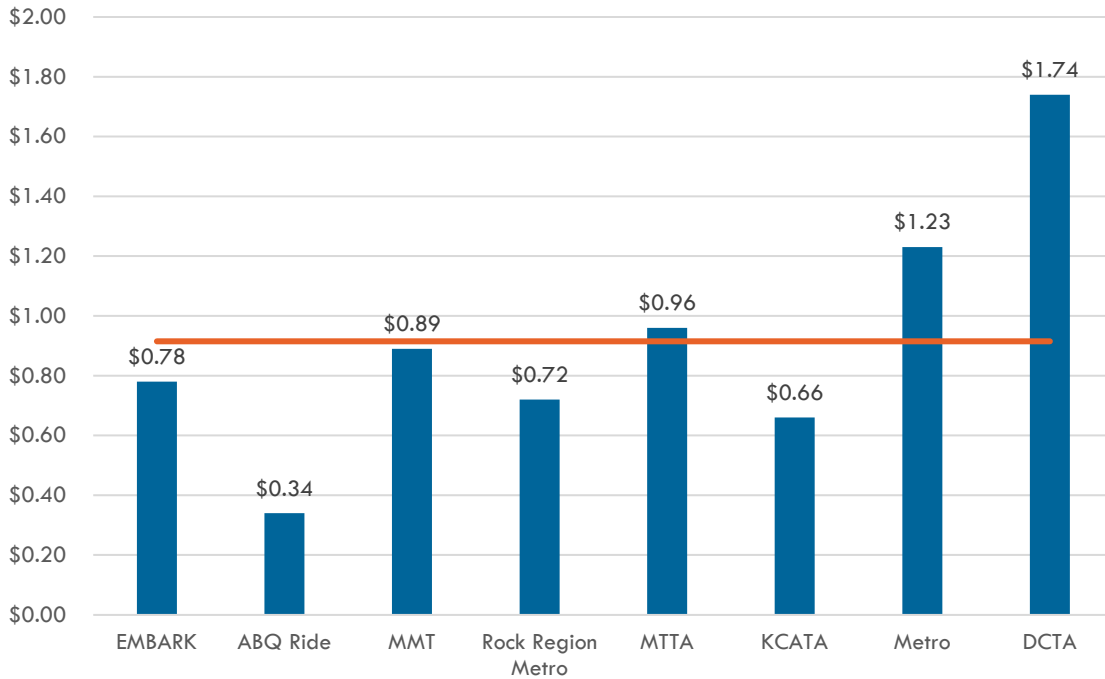
A detailed breakdown of reduced fare ridership was not available for all peer agencies, but a 2016 study found that 33% of EMBARK riders paid with a reduced fare. Increasing the number of passengers may increase the farebox recovery ratio for EMBARK. The average fare paid per trip (Figure 4) provides additional detail regarding the revenue collected per trip for each agency. EMBARK is slightly below the peer agency average but is consistent with several peers, including Mountain Metro, Tulsa Transit, and Rock Region Metro. DCTA collects nearly double the peer agency average, which may contribute to the agency's high farebox recovery.

Figure 3 Peer Agency Farebox Recovery Ratio (2019)



Source: NTD 2019

Figure 4 Peer Agency Average Fare Paid (2019)

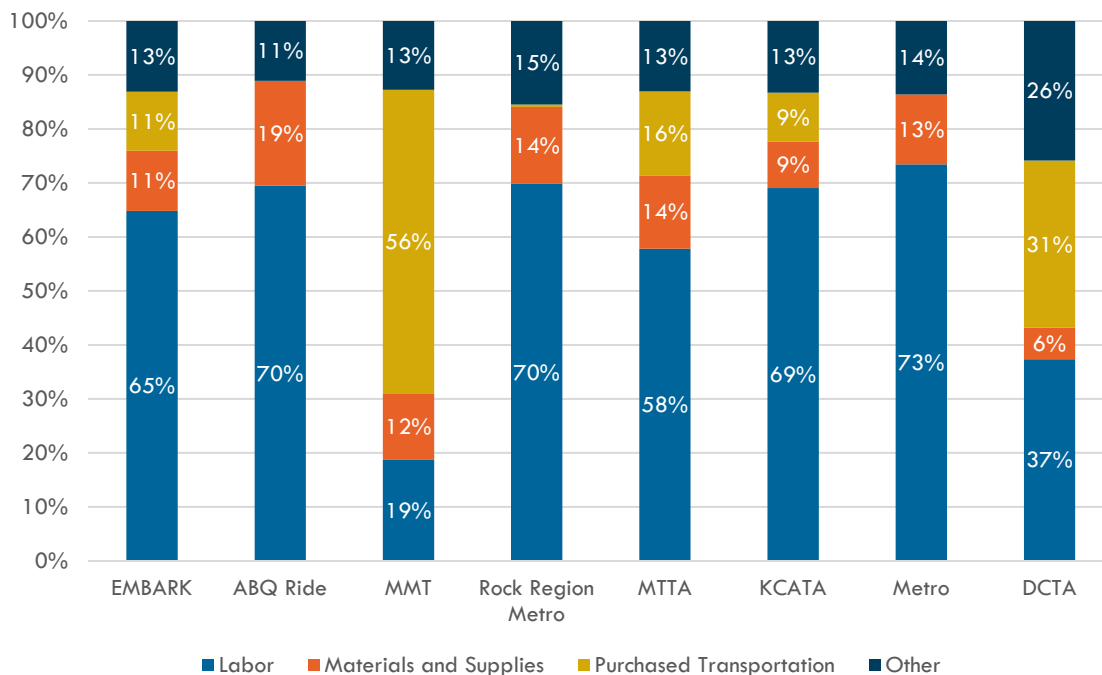


Source: NTD 2019

## Operating Expenses

Operating expenses, as reported by NTD, are split into four general categories between Labor, Materials and supplies, Purchased transportation, and Other (Figure 5). The largest differences between the peer agencies appears to be the amount spent on labor and purchased transportation, which amounts to a tradeoff between directly operating service and contracting service. The combined expenditures on labor and purchased transportation are generally consistent between the peer agencies, ranging between 68% and 78% of operating expenses. EMBARK's operating expenses for materials and supplies and other expenses also appears consistent with the peer agencies.

Figure 5 Peer Agency Operating Expenses by Source (2019)



Source: NTD 2019

## SERVICE STATISTICS

### Per Capita Service Statistics<sup>1</sup>

One metric to identify how well a transit agency’s service covers their community is to assess the level of service per capita. This can be done through several metrics including:

- Percent of urbanized area served
- Revenue miles per capita
- Revenue hours per capita

Recognizing that not all areas within the urbanized area (UZA) have access to public transportation, calculating the difference in the reported service area population and urbanized area population shows the percentage of the urbanized area that is actually

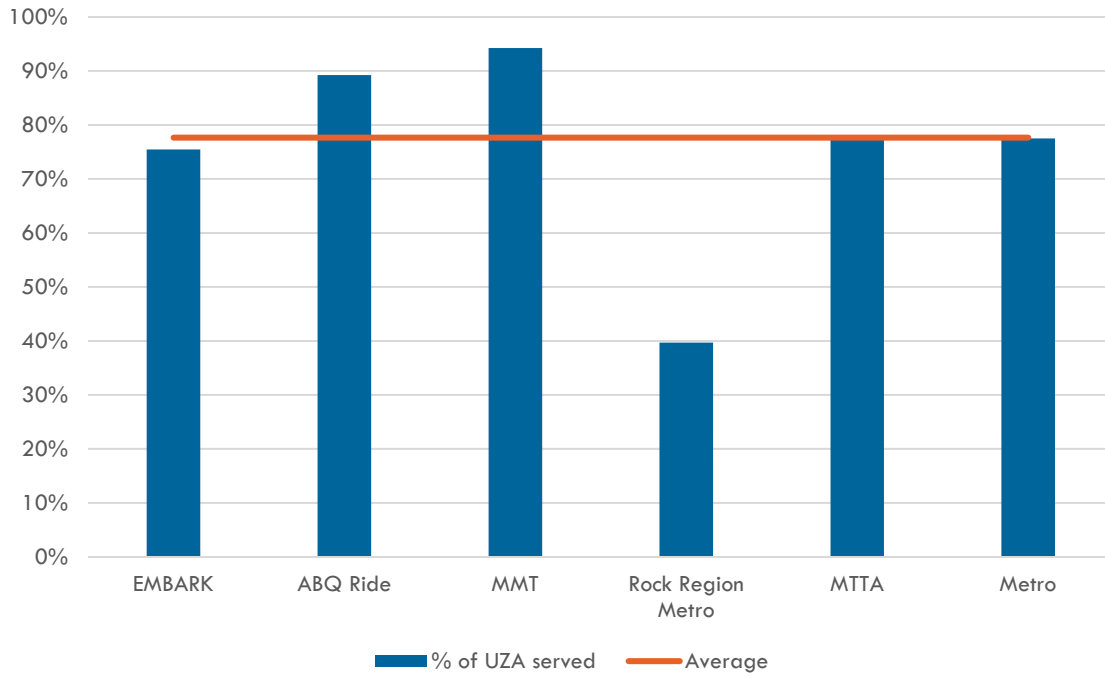
<sup>1</sup> Per Capita Service Statistics are reported for fixed-route service only, consistent with NTD data. EMBARK does provide paratransit service throughout and beyond the existing UZA.

served with public transit. Additionally, metrics like revenue miles and revenue hours per service area capita provide a benchmark for service investments across the peer agencies. This analysis (Figure 6 - Figure 8) provides insight into the level of investment per capita provided by each agency.

Two peer agencies have unique operating circumstances regarding their UZA service. KCATA has multiple service providers operating within their UZA, which appears to lower the percent of the UZA served by transit. Conversely, DCTA operates within multiple UZAs, which appears to increase the percent of the UZA served by transit as reported by NTD. To account for these differences, KCATA and DCTA were removed from the percent of UZA served by transit section of the peer analysis.

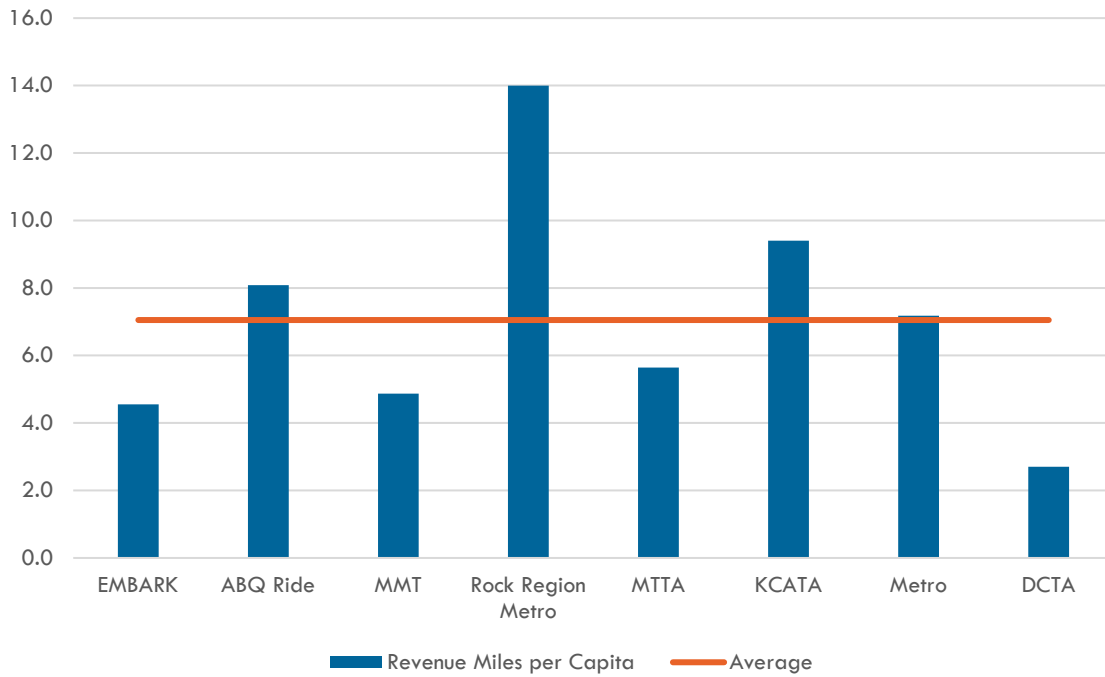
- EMBARK appears to invest less in transit service per capita than other peer agencies.
- EMBARK provides both the second fewest revenue miles per capita and revenue hours per capita of the peer agencies. This suggests that other peer agencies are investing in more transit service relative to their population size. To reach the peer agency average for revenue hours and revenue miles per capita, EMBARK would need to provide an additional 132,400 annual revenue hours and 1,626,000 annual revenue miles of service.
- The percent of the UZA served by EMBARK is below the peer agency average but is consistent with MTTA and Omaha Metro.
- ABQ Ride and MMT are above the peer agency average, serving 89% and 94% of their respective UZAs. Rock Region Metro provides notably less service to their UZA than the other peer agencies and appears to concentrate their service in the urban core, rather than to the outlying, more suburban areas of the UZA.
- Rock Region Metro provides notably more revenue hours and revenue miles per service area capita than other peer agencies but serves a much smaller percentage of the UZA than other peer agencies. This suggests that Rock Region Metro has invested in higher levels of transit service within a smaller portion of the UZA.

Figure 6 Percent of Urbanized Area Served Excluding KCATA and DCTA (2019)



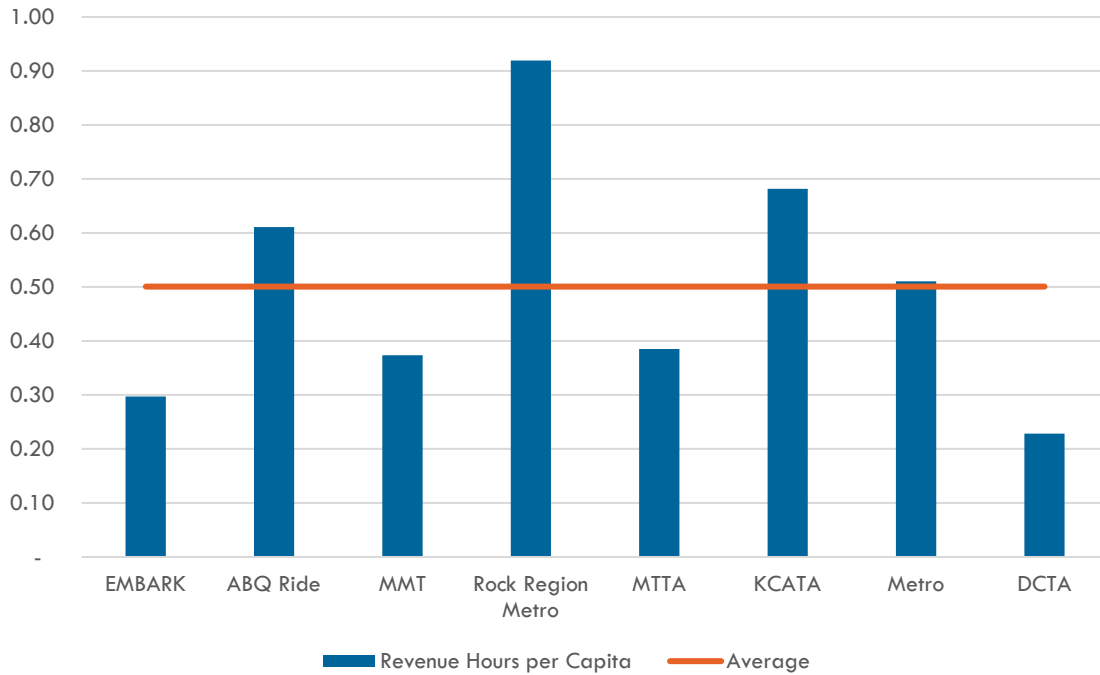
Source: NTD 2019

Figure 7 Revenue Miles per Service Area Capita (2019)



Source: NTD 2019

Figure 8 Revenue Hours per Service Area Capita (2019)



Source: NTD 2019

## Performance Indicators

Performance indicators are overall measures of a system's investment in transit and performance, including passenger trips, revenue hours, revenue miles, and total operating expense. EMBARK's performance indicators in relation to the other peer agencies are shown in Figure 9. EMBARK is between 36% and 19% below the peer agency average for these selected performance indicators. However, ABQ Ride and KCATA provide notably more service than the other peer agencies. So much so that the five other peer agencies are all below the peer agency average for the four performance indicators, except Omaha Metro's revenue hours and revenue miles of service.



**Figure 9 Peer Agency Performance Indicators (2019)**

Performance Measure	EMBARC	Peer Min	Peer Max	Peer Average	EMBARC % from Average
Passenger Trips	2,921,065	2,340,157	10,867,925	4,592,545	-36%
Revenue Hours	193,233	138,881	537,616	263,872	-27%
Revenue Miles	2,959,988	1,643,943	7,416,079	3,654,272	-19%
Operating Expense	\$23,217,593	\$13,838,874	\$79,154,425	\$29,309,493	-21%

Source: NTD 2019

To account for these significant differences in transit investment, ABQ Ride and KCATA were removed from the analysis and an adjusted peer agency average was calculated. Removing ABQ Ride and KCATA from the peer agency averages reveals that EMBARK is much more consistent with the remaining five peer agencies, as shown in Figure 10.

**Figure 10 Peer Agency Performance Indicators, Adjusted without ABQ Ride and KCATA (2019)**

Performance Measure	EMBARC	Adjusted* Peer Min	Adjusted* Peer Max	Adjusted* Peer Average	EMBARC % from Average
Passenger Trips	2,921,065	2,340,157	3,267,845	2,785,454	5%
Revenue Hours	193,233	138,881	286,765	194,853	-1%
Revenue Miles	2,959,988	1,643,943	4,033,246	2,744,825	8%
Operating Expense	\$23,217,593	\$13,838,874	\$26,325,528	\$18,471,335	26%

Source: NTD 2019

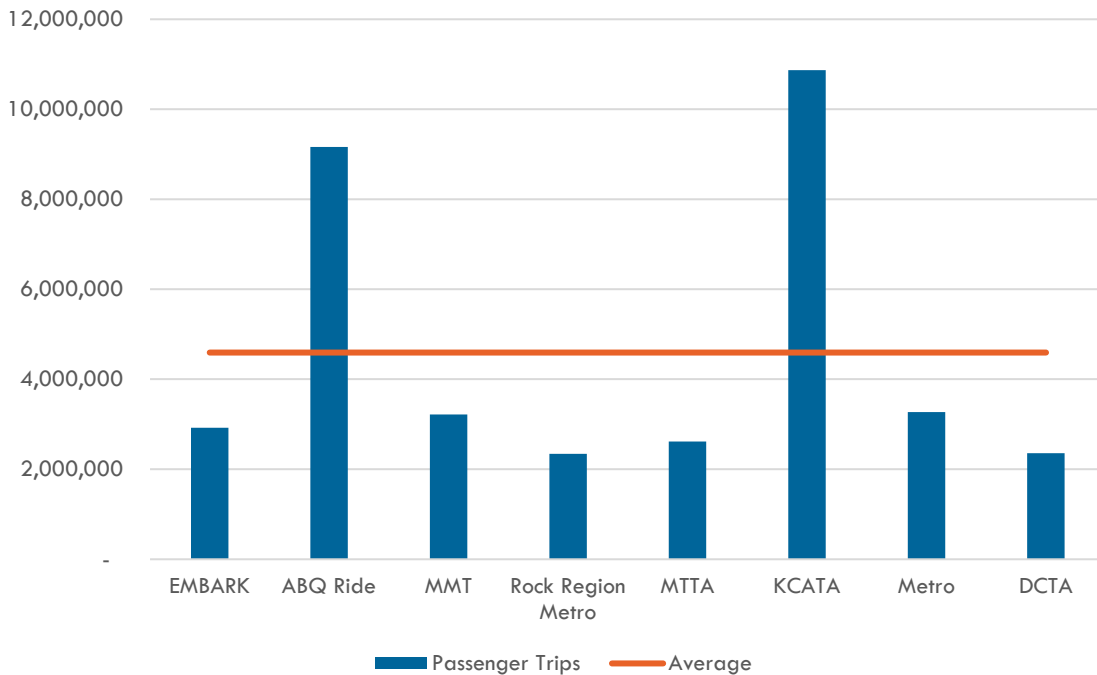
\*Adjusted indicates that ABQ Ride and KCATA were removed from the analysis.

The following figures (Figure 11 – Figure 14) illustrate EMBARK’s performance in relation to each peer agency.

- Despite having similar service area population and service area size, ABQ Ride provides roughly double the annual revenue hours and triple the annual passenger trips as EMBARK.
- Annual revenue hours on EMBARK (Figure 12) are again lower than ABQ Ride and KCATA but consistent with other peer agencies, 1% lower than adjusted peer agency average.

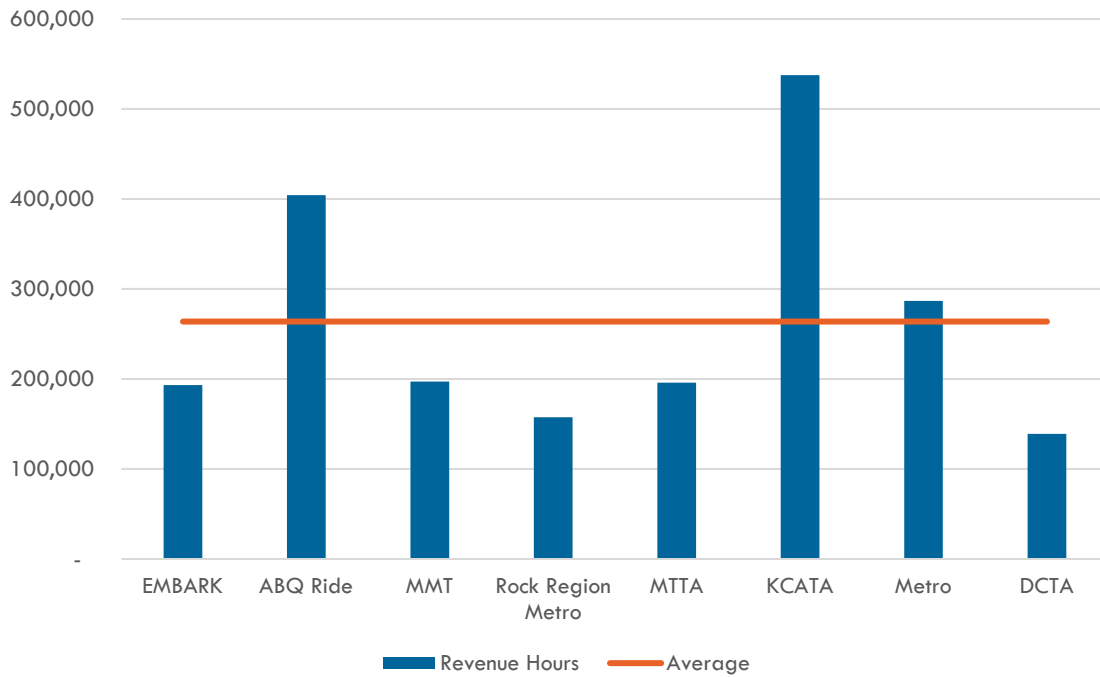
- Annual revenue miles on EMBARK (Figure 13) are lower than ABQ Ride and KCATA but consistent with other peer agencies, 8% higher than the adjusted peer agency average. EMBARK ranks second highest among adjusted peers, behind only Omaha Metro, indicating that EMBARK may run longer routes or operate over a generally larger service area than other peers.
- Omaha Metro stands out as the only other agency besides ABQ Ride and KCATA that is higher than the peer agency average for revenue hours and revenue miles.
- EMBARK's annual operating expense (Figure 14) is lower than ABQ Ride and KCATA but is relatively high compared to the remaining peer agencies, 26% higher than the adjusted peer agency average and second highest behind Omaha Metro.

Figure 11 Passenger Trips (2019)



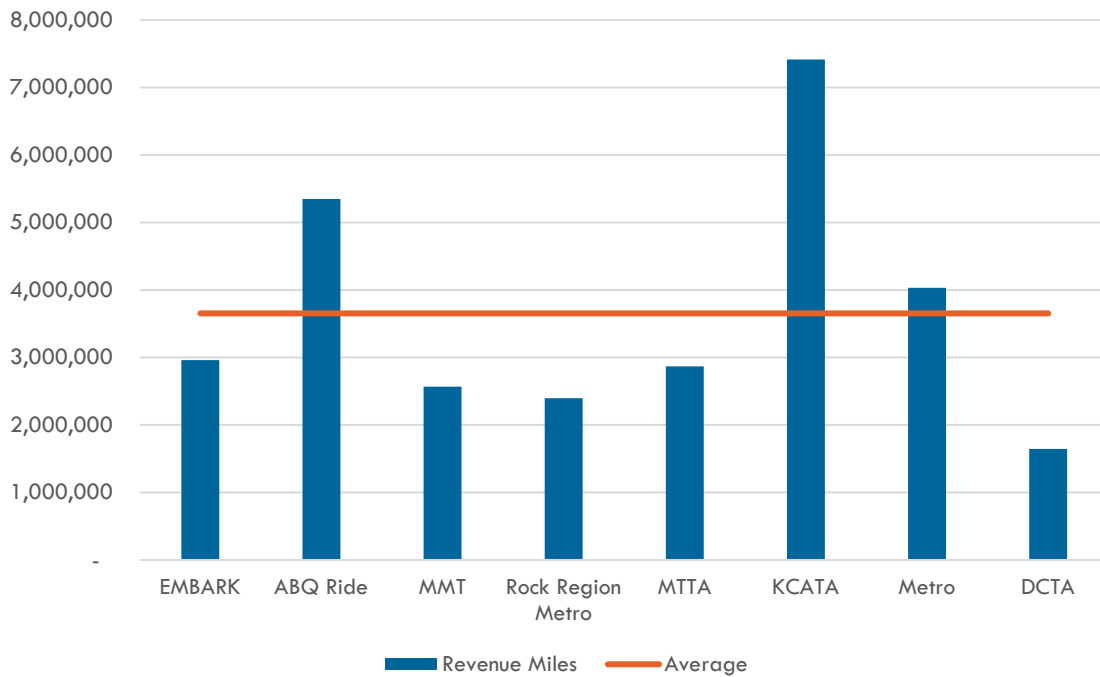
Source: NTD 2019

Figure 12 Revenue Hours (2019)



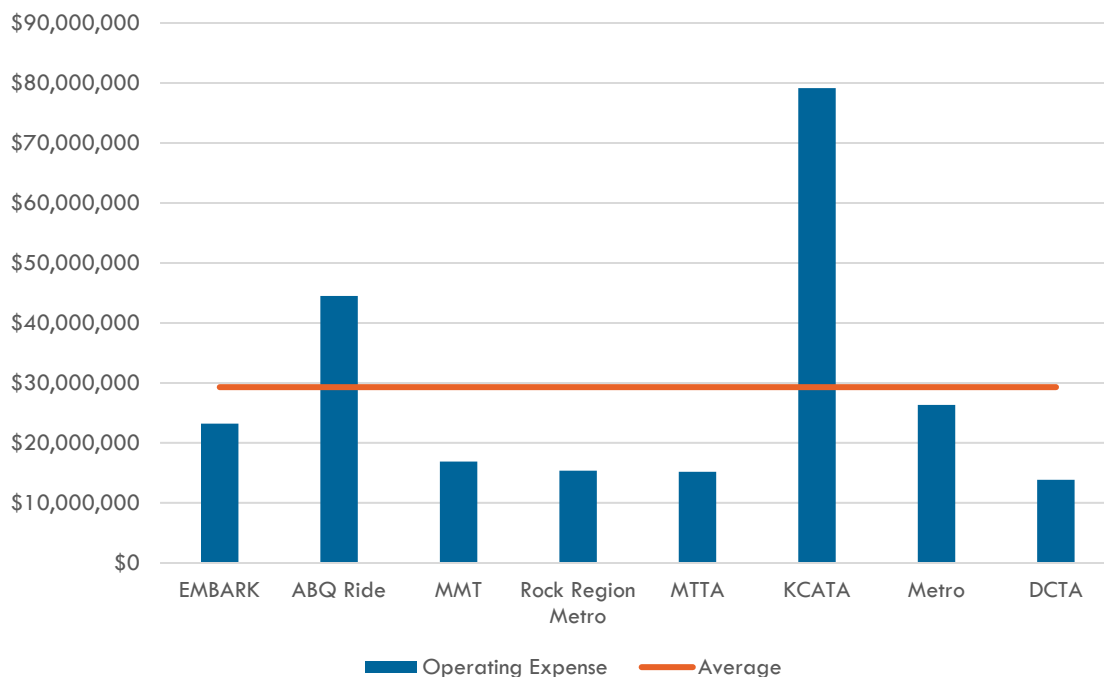
Source: NTD 2019

Figure 13 Revenue Miles (2019)



Source: NTD 2019

Figure 14 Operating Expense (2019)



Source: NTD 2019

## Effectiveness Indicators

Effectiveness indicators are a general measure of efficiency and effectiveness in providing transit service. These indicators move beyond the overall performance indicators and explore productivity in terms of passengers per hour and passengers per mile and efficiency in terms of cost per hour and cost per mile. While performance indicators denote how much service an agency provides, effectiveness indicators show how effective agencies are at providing that service. Specific effectiveness measures include:

- **Passenger trips per revenue hour** describes the number of transit boardings taken relative to the amount of service, in hours, an agency provides.
- **Passenger trips per revenue mile** describes the number of transit boardings taken relative to the amount of service, in miles, an agency provides.
- **Operating expense per revenue hour** describes how much it costs to run one bus-hour of service.
- **Operating expense per revenue mile** describes how much it costs to run one bus-mile of service.

**Figure 15 Peer Agency Effectiveness Indicators (2019)**

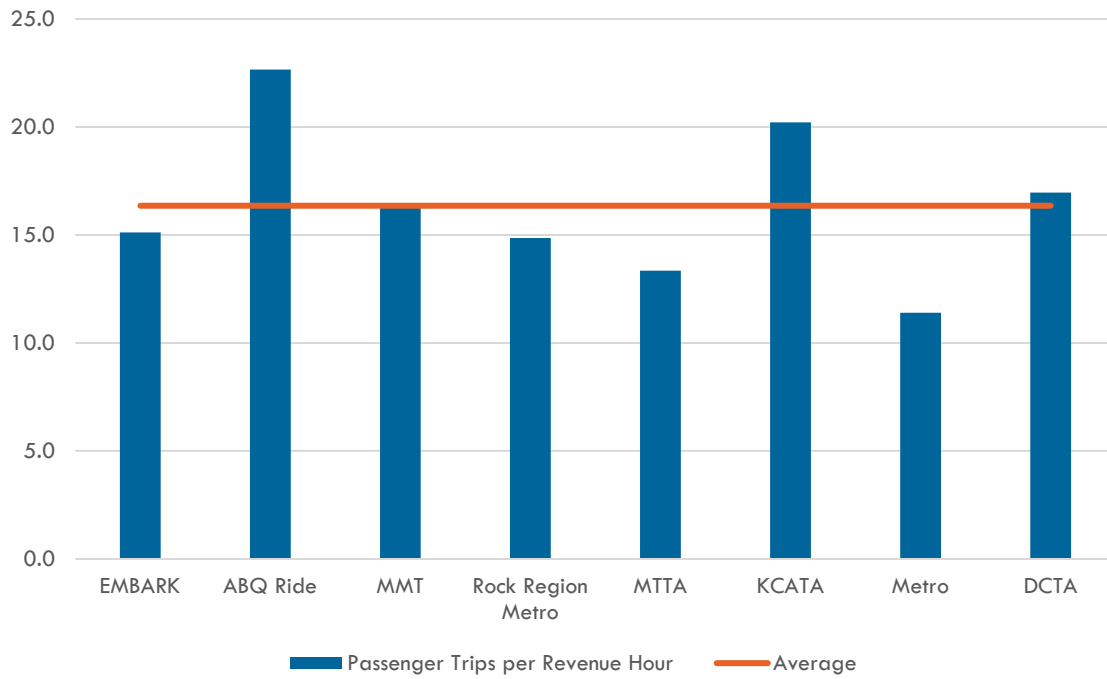
<b>Effectiveness Measure</b>	<b>EMBARK</b>	<b>Peer Min</b>	<b>Peer Max</b>	<b>Peer Average</b>	<b>EMBARK % from Average</b>
Passenger Trips per Revenue Hour	15.1	11.4	22.7	16.4	-8%
Passenger Trips per Revenue Mile	1.0	0.8	1.7	1.2	-17%
Operating Expense per Revenue Hour	\$120.15	\$77.58	\$147.23	\$103.72	16%
Operating Expense per Revenue Mile	\$7.85	\$5.29	\$10.67	\$7.51	4%

Source: NTD 2019

The following figures (Figure 16 – Figure 19), illustrate EMBARK’s effectiveness measures in relation to each peer agency.

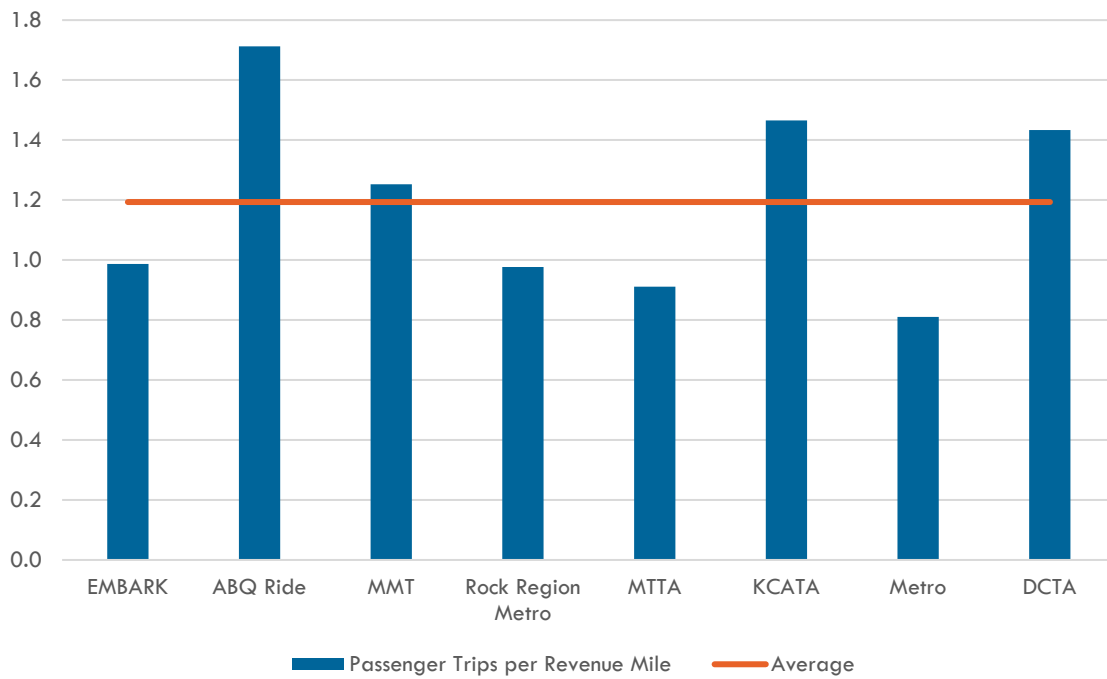
- EMBARK is generally consistent with the other peer agencies in terms of passenger trips per revenue hour, 8% below the peer agency average and within two boardings per hour of MMT, Rock Region Metro, MTTA, and DCTA. ABQ Ride and KCATA are notably more productive than the other peer agencies.
- EMBARK is generally consistent with peer agencies in terms of passenger trips per revenue mile. While EMBARK provides 17% fewer trips per revenue mile than the peer agency average, it is ahead of Rock Region Metro, MTTA, and Omaha Metro.
- In January 2019, EMBARK began operating late night and Sunday service. New services generally take up to two years to fully attract ridership. While these additional revenue hours would be included in the 2019 NTD data, ridership for the services may not have fully matured, reducing the passenger trips per revenue hour and passenger trips per revenue mile.
- EMBARK is above the peer agency average in both operating cost per revenue hour and operating cost per revenue mile.

Figure 16 Passenger Trips per Revenue Hour (2019)



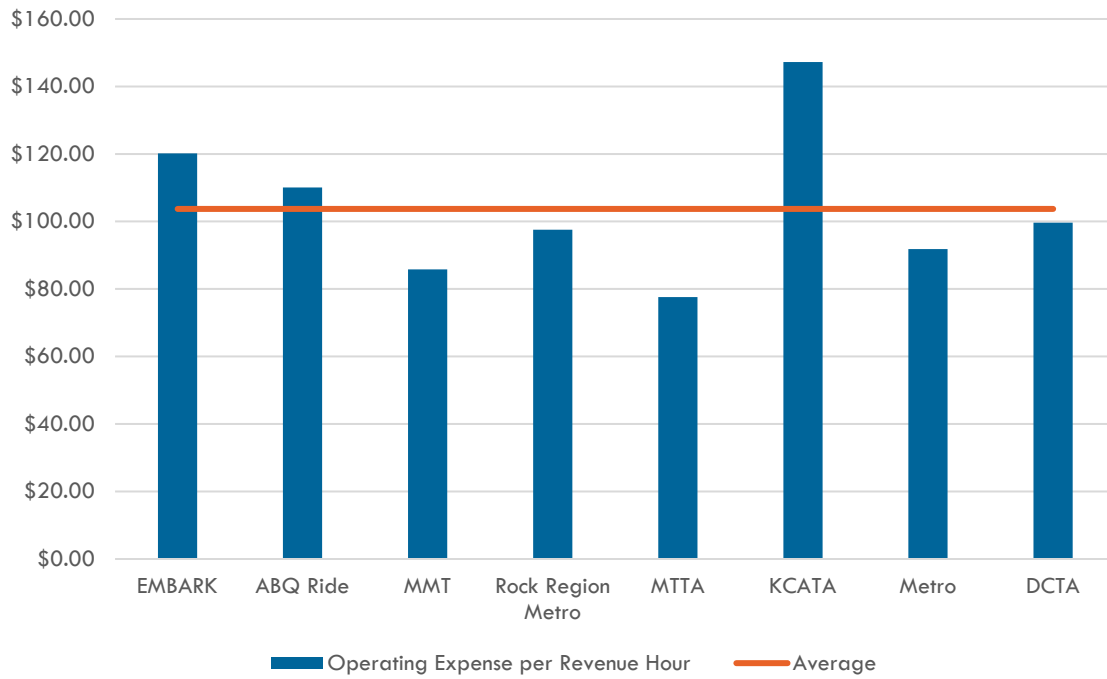
Source: NTD 2019

Figure 17 Passenger Trips per Revenue Mile (2019)



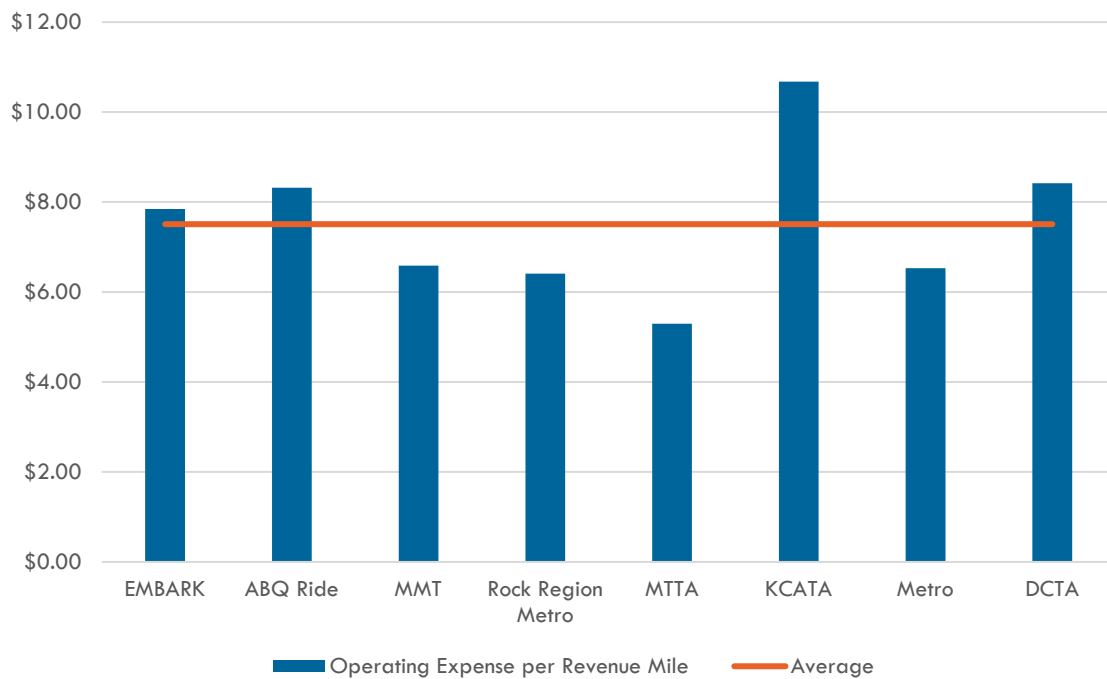
Source: NTD 2019

Figure 18 Operating Expense per Revenue Hour (2019)



Source: NTD 2019

Figure 19 Operating Expense per Revenue Mile (2019)



Source: NTD 2019

# Appendix B Survey Comments

## PHASE I OUTREACH - ONLINE COMMUNITY SURVEY

Are there any places that EMBARK should serve that it does not serve today?
I have never ridden the bus
Amazon 9201 S. Portland Ave OKC, OK
no
yes may and 122, hefner and may,
Amazon @ 9201 S Portland Ave, OKC OK
choctaw
I would like to see it serve Harrah and Choctaw communities.
Park and ride from Edmond, Mustang, Yukon.
I live in Yukon. I'm not sure if there is a bus route from Yukon to midtown.
End of Hefner Parkway (ie. Crossings Church), and Amazon warehouse @ 9201 S Portland Ave
Amazon 9201 S Portland Ave, OKC, OK
Amazon 9201 S Portland Ave, OKC, OK
Past OKC metro area; rural/remote areas in Oklahoma to come into OKC area.
Amazon 9201 S Portland Ave, OKC, OK
AMAZON!
Amazon, 9201 S Portland Ave., OKC, OK
Amazon 9201 S Portland Ave. OKC, OK
Amazon 9201 S Portland Ave, OKC, OK
Yes - No stop near Amazon 9201 S Portland Ave, OKC, OK and also the South VA Clinic 7919 Mid America BLVD 73135
late night and weekend service
9201 S Portland Ave, OKC, OK Amazon
SERVICE NEAR TINKER AFB ON DOUGLAS BLVD. MOST OF OUR VISITORS CANNOT USE EMBARK DUE TO LACK OF AVAILABILITY
Village area, Mid Del,
Bus Rapid Transit on N 23rd St and N 10th St, commuter service to far north Oklahoma City/NE 122nd St
Not that I can think of.
more on the north eastside side of the city. Stops closer together
Del City, Oklahoma Moore, Oklahoma Yukon, Oklahoma
I wish Route 24 would serve heart of OU campus instead of just transfer station at Duck Pond. It's not that far, but kind of prohibitive to add another 15 minute walk to campus offices/classrooms after a 40 minute bus ride.
No
OKC Will Rogers Airport



<b>Are there any places that EMBARK should serve that it does not serve today?</b>
Airport, Southeast side, far south side
Better transit between Norman and OKC including Moore.
more places in the city
Northwest Library
They need more bus routes into Moore than going to Norman to downtown and vise versa
Meridian Ave especially between NW 39th and NW 10th
A route along 50th (from the zoo to Dolese Park area) would be nice. Also a route to and from the airport from somewhere central.
South Western and Southwest 119th
Northwest OKC. West of route 5
Rail service between Edmond, OKC and Norman
I'm answering based on the streetcar not the bus, but the streetcar should stretch in to other districts and should have two way travel, so it's not an entire hour round trip back to your starting place just in travel. It's definitely faster to walk, so I've stopped using the streetcar and walk now.
My cousin works at the Amazon center, and she hates walking under the highway to get to her stop at the CC. If there were a stop at May and 89th, her knees would be much healthier.
We spent millions on the streetcars and they benefit no one. They would've better served our city if the were installed up town and not downtown. People who work downtown don't even use them so what is the point? This could've been a feasible form of transportation for those who need it most, but with them located exclusively downtown/bricktown you've encouraged people to get overly intoxicated because instead of walking back to their cars they can take the streetcar to their parking spot and then proceed to drive dangerously to their homes. It rewards bad behavior when in reality this could've been a powerful tool for individuals who do not have access to a car.
North side OKC. Basically, you should have direct services fun the depot to any main hospital in Oklahoma City
Paseo and Western Ave District. A bus along Shartel would be great.
airport
Yes.
El, Reno, Shawnee, Moore, Guthrie, Mustang. Having a shuttle bus that would go to Frontier City during the summer.
Just more. Especially within the city, and it'd be great if there were busses between OKC and Edmond around UCO
NW Expressway corridor and north of it, NW 39th Street
I don't know where EMBARK goes. I have a car, and I have heard that EMBARK is not a convenient mode of transportation. However, I moved to OKC from a city where I regularly used public transportation. I look forward to using public transport in OKC, especially if the system improves.
Edmond
Not sure
Airport

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<b>Are there any places that EMBARK should serve that it does not serve today?</b>
THE PASEO
I am not sure. I think the city is mostly covered but that can include some long walks that not everyone can do
Other townships inside OKC City Limits (Bethany, Warr Acres, et al.
Yes - connecting from outer suburbs is appalling : 1. NW OKC (Council/Hefner etc) 2. Mustang 3. Yukon
Not that I know of
Expand streetcar footprint to connect more "districts" with high concentrations of people and businesses. Ex: Plaza, 23rd, Western, Classen Curve.
There should be routes through every major artery of the metro. For example, service is non-existent on Penn on the north side because of the village and Nichols Hills. This needs to change. Additionally, there currently is no bus route from my part of town (63rd and May) that would go directly to the north and northeast. You would have to make a long trip south and then come north.
Moore, Yukon
Okc area on the edge of Edmond. 33rd and Coltrane.
All of okc.....east west north and south
Paseo, Perle Mesta Park, Western between Asian District and NW 63rd St., Lake Hefner, May ave north past 63rd. Hefner west of Broadway
The cowboy Hall of Fame, it would nice if the street car when there.
I would like a route out towards wiley post
Should have busses on major streets
Yes, you should serve east Edmond.
SW 89th and May and I-44 and 104th street
Del City, parts of Midwest City, and Tinker AFB
Yes, NW 50th and Western or Shartel to downtown would be great. You have to walk all the way down to Classen, which is a busy, loud, dangerous road. Go through neighborhoods where people actually live.
Blanchard Norman Moore Edmond Yukon Spencer choctaw
The streetcar goes no place useful. It is a toy.
Greyhound bus station
Northwest Expressway and Council area - potentially out to County Line as more housing grows. And more access to Senior Centers, such as the one on Hefner and Rockwell. Seniors in the area have no public transit to get there.
Bethany
Airport
North Western Ave
South OKC near Moore is not served that well.
Will Rogers Airport, 39th Street to Bethany, Classen to Penn Square corridor
Expand the streetcar
The OKC airport!

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<b>Are there any places that EMBARK should serve that it does not serve today?</b>
Route Idea: N Robinson > Paseo (via NW30) > NW 39th to Ann Arbor / Meridian (I'd like to see better service toward NW 39 Expressway AND Paseo, and one route might accomplish both.)
Will Rogers Airport.
yes a route to the airport and sw 44th and council RD
North MacArthur Avenue. There is no bus that serves that street from NW 23rd to the north to 63rd.
Airport, Paseo
Sooner road between se59th and se74th
Airport, Zoo/Remington park area. Further northwest OKC to Rockwell and NW expressway, A stop in front of or within 1/4 mile of every community college or tech school would also be nice.
Hobby Lobby and businesses behind Cracker Barrel
No many places to name.
Eastern Oklahoma County
Bethany, airport
Edmond Moore N May Beyond 63 City Lakes ETC .....
N/A
Further out Northwest Expressway, more routes in the Mid-Del area, May and Penn north of 63rd. Also, Transit Center to Mid-Del should start earlier and end later.
Airport?
Will Rogers World Airport and Mike Monroney Aeronautical Center
Paseo, Chisolm Creek should be more directly served (it's a pain walking over from Penn), AIRPORT (at least to the car rental center, then we can take the shuttle to the terminal). The Bethany/Warr Acres area. You probably ought to start pushing services farther north and farther south now that you have services/work centers people need to access there. For example, the senior wellness center at SW 134/Penn, the Amazon warehouses, the wellness center at 122nd/Rockwell, or the Social Security office (I know rt 44 covers that but it needs the frequency normalized).
Will Rogers World Airport and Yukon along Rt 66
Routes closer to Amazon, hobby lobby, and the other major warehouses south of I40
Northwest Expressway; Edmond; SE 29th shopping corridor between Midwest Blvd & Air Depot, MWC; Yukon?
Farther north on May Avenue. Farther west on Expressway
North May Ave between NW 63rd Street & Memorial Road, Will Rogers World Airport, Greyhound bus station, and NW Oklahoma City between NW Expressway & Memorial and Rockwell & County Line Road

<b>Do you have comments or suggestions for improving EMBARK service?</b>
I have never ridden the bus
no

**DRAFT Final Report | OKC Moves**  
EMBARK

<b>Do you have comments or suggestions for improving EMBARK service?</b>
running 24 hours a day , adding more stop on the north may
having more so the buses dont fill up
If it were available in Choctaw/Harrah area, I would use it.
Park and ride options available from Edmond, Mustang, Yukon to downtown.
Park and Ride would be great, I used that in Albany, NY and loved it.
Serve the major industries in OKC and surrounding areas
I work with homeless Veterans who sometimes have a hard time getting employment near job sites that don't have bus stops near them. More stops would be highly beneficial.
Get a stop at Amazon!
expand routes
Extending service to high employment areas - such as warehouse locations
More bus stops - especially near Amazon 9201 S Portland Ave, OKC, OK and also the South VA Clinic 7919 Mid America BLVD 73135
I would be more apt to ride if stops were well lit and offered rides after 10pm and weekends.
Just drop off at Amazon
I would not ride the bus. It is not safe.
LARGER SERVICE AREA TO ALL OF OKC AND LATER TIMES WOULD HELP
Biggest barrier for me using it consistently is hours of service. It's sucks that the frequency drops in the evening and then isn't an option all together after 7p. Retail and service workers don't work a 9-5 schedule and that seems to be what the us is built for.
weekend service to Midwest City would be wonderful
Extend the hours of service on weekends/holidays to at least 9pm ideally 10pm. Add 15 minute frequency on weekdays for the main routes and 30 minute frequency on weekends for the main routes.
EMBARK has made so many improvements. Max out the high frequency on the best performing routes, like 23rd. Intuitive straight-line routes that really stick to the grid system would be great. If the downtown circulating bus shuttle came back into service, it would be interesting to think about using this bus as a streetcar extender. For example, the shuttle could transfer at one or two streetcar stops but then go up Walker with stops at 23rd Street and 30th to get to Uptown/Paseo. Weekend and evening option for Route 24/Sooner Express. Many students on Norman campus don't have cars, but like to go to OKC for weekend activities/specialty shopping.
You should have a receptionist answer the Norman phone especially if they have never used these services before and people do not like recording because some people get confused on what they need to push I know this for a fact because I used to work for OU when it was the cart system I just thought I had to bring that up for consideration thank you
More linear frequent service in both OKC and Norman
Better blind friendly
There needs to be a loop or something to connect routes. Too many transfers and trips across town can take two hours. It is not for people on a schedule or who like to arrive anywhere on time.
no

<b>Do you have comments or suggestions for improving EMBARK service?</b>
Make buses 9 and 23 meet at the same time so they don't delay my trip because I pay 50 a month and sometimes can't get home because 23 leaves as soon as 9 is about to approach the mini hub it's not convenient at all
Empty buses and streetcars serve no one! Concentrate on times and areas that need and use reliable Embark services. Embark does not need to be global and the cost of trying is enormous.
More stops
More shelter for bus stops and ADA approved sidewalks
Later routes, DRIVERS WITH BETTER ATTITUDES
More covered bus stops.
Streetcar Rides go around. Transportation goes both ways. You are forced to go one way on Rides.
I think the bus system is well run, but a lack of sidewalks keeps me from using it. There isn't a safe/walkable route from where I live to the nearest stop.
Newer drivers need more time with older drivers. Make them stop stomping brakes for a smoother ride. Security on the bus. It's scary sometimes because of high or drunk people
Expand rail service
No
Considering who will benefit from it, and if its people who already have reliable transportation then it's doing no good. OKC is turning into an inhospitable city for anyone near or below the poverty line.
Teach your drivers not to almost run over cyclists. We have 3 feet laws in OKC y'all
Improve walkability to bus stops, increase frequency, get routes closer to homes/neighborhoods instead of strictly on busy commercial roads.
Yes! A direct, express bus, all day on weekdays, that just cycles from the OKC transit center to UCO. Could be rolled out in partnership with the U, uses existing stops, and would make it so, so much more practical for students, staff, and faculty to use the transit system to get to campus. (Even one bus could be at the stops on the hour and half-hour, ensuring that you could get to/from campus on an hour round trip.)
more frequent service is probably the most important thing
Outstanding effort! Carry on.
There needs to be a speed limit based bus schedule that way the bus drivers couldn't stop in the middle of the bus route because they think they are too early. The bus schedules then would become erratic and make the bus drivers drive the speed limit and only slow down and come to a stop if they saw somebody waiting at a bus stop. On rainy days the buses like to go slowly even though the main part of the traffic seems to be going the speed limit. Every bit of traffic needs to be going the same speed including the buses. My proposed plan would eliminate stopping along the bus route for unnecessary reasons and force the drivers to drive the speed limit and only stop if someone is waiting at a bus stop or an emergency situation.
Because of my work hours, most of my travel has to be done on weekends. Route 23 (which is my main route) only runs once every hour. Combine that with limited service on connecting routes and it limits how much I can accomplish.

<b>Do you have comments or suggestions for improving EMBARK service?</b>
I use Embark plus and it is late 2-3 days a week and that means I am late for my dialysis chair. This is a real problem!
I would like signage at the stops to indicate how close a bus is to my stop and to have this real time information in the app. Love the buses though, love the free WiFi and love the staff.
More routes where people are densely populated direct to other densely populated area.
I really like our bus service and hope to use more frequently. It is a little expensive (transfers should not cost) and I would like the weekend routes every half hour
Just more, please. And better clean up service at stops.
1. Work with city council to ensure footpaths (paved and lit) from every apartment complex/housing development to the nearest bus stop (and that such a path become a planning requirement for all new developments). 2. Work with state/county/(Greyhound?) to provide weekly in/out service to communities in the 30-50 mile radius - allowing the non-mobile to enjoy OKC's shops, sports, museums, cafes and libraries.
23rd street needs a dedicated bus lane in my opinion. Traffic holds up buses. Slows them down. I also see nice bus stops where people never ride the bus and just benches where people do ride the bus. Why/how did that happen?
See above
I think being able to sign up for a text service along a route would be ideal
7 stopping time is way to early. I can't get off work, get home and then go run any errands because by the time I take the hour to get home from work, I can't get anywhere and back before service ends. There either needs to be more midnight buses or the whole system needs to run later. especially on weekends.
Yes, please provide evening service in the weekend. And make the weekend service once every 30 minutes, not once an hour. And the tell the bus drivers to be nicer and friendly!
Improved frequency of routes.....actually running all routes would be a good start
Real-time streetcar locations on mobile device (haven't rode on streetcar since pandemic, so not sure if this is available yet). Like many, I would love to ride the bus to work, to entertainment districts and to run small errands, but the service is too inconsistent with locations and timing. Also have to consider 8-9 months of the year the weather is brutal (hot, cold or severe) and walking more than a half-to-full mile or greater to reach a bus stop is unrealistic.
Open the information center on weekends
Not that I can think of
B nice if the drivers were friendly
Get services in east Edmond
I believe that Embark should offer more late night services with well lit bus stops so that people without vehicles can get to and from work safely without being stranded.
I know you all do great with the funding that you have and I appreciate all you do.
Improve bus stops, add sidewalks around bus stops, 15 min between buses, dedicated bus lanes so buses run faster than traffic.
Go 24 hours every 10 mins like Seattle does and get a light rail soon!!!
Stop the streetcar service. Huge waste of money.

<b>Do you have comments or suggestions for improving EMBARK service?</b>
Please Please clean the interior of the busses!! Been riding the off and on since I was 7 yesterday old and those seats have never been cleaned. Do you guys monitor your drivers?? Numerous times a bus pulls off late because driver smoking cigarettes and/or making phone calls.
Repeating this: And more access to Senior Centers, such as the one on Hefner and Rockwell. Seniors in the area have no public transit to get there. My 86yo mother has no way to get there as transit services do not come into neighborhoods past NW Hwy and Council. If she could get out of her Harvest Hills neighborhood at NWExpy & Council - she could get out and go anywhere, not just out of the neighborhood to find Embark transportation. This is not a new addition (45+yrs old), just not serviced.
Better connections to other cities (Edmond, etc.) and an additional transfer center.
Run more times
Bus lanes. More buses. The new BRT should have complete bus lanes in the median (take over the turning lanes for stations, and look at Cleveland's BRT) with articulated buses. Call Amtrak Joe!
Implement ZipZones (i.e., ride share style services) in less dense areas to cover more regions of city. Conversely, offer ZipZones in denser areas with high job density, but no local stops (e.g. innovation district / OU Medical Center)
Expand the streetcar
Would love to see a downtown/transit center to airport direct route
Add service to Will Rogers Airport.
please ask
Not that I can think of at the moment.
More routes in southeast OKC
No
Yes the customer service of drivers and supervisors needs to greatly improve.
We need mass transit with outlying counties (Canadian, Logan, Cleveland, and Lincoln) and the multiple cities within Oklahoma County (Moore, Midwest/Del City, Forest Park, Jones, Nicoma Park/Choctaw)
Bus stops & buses in traffic look miserable to me. I used buses extensively in Houston, in Europe & Japan, and somewhat in other US metros. (Also sub/surface rail) --but OKC buses look inconvenient, with unsafe/exposed stops, no space to avoid vagabonds/malingers, and routes that are not obvious or obviously useful.
In person ?? Public comment nope
For people that don't live down town a couple more hours would help people with jobs expsally later evening service NW side of the city
Nothing more than already noted.
N/A
Start weening away from hub-and-spoke more. Have a mini-hub in the north so you reach more services without such long transit times to the transit center. Add more routes from the reno mini hub up to Bethany/Warr acres, etc.

**Do you have comments or suggestions for improving EMBARK service?**

Make sure that the brake lights and turn signals are cleaned daily because some of the buses on Reno Ave and 23rd St have enough dirt on their lights that the brake lights and turn signals cannot be seen that or the lights are broken and need to be fixed. Airing out the interior of the buses would make them more user friendly.

I would probably sell my car and ride exclusively through transit if the 10 line went through the night. Very optimistic if there was a service that connected the suburbs

Design flaw on terminal bldg and surrounding bay structures whereby rain and melting snow and ice drip/pour onto outdoor seating, rendering them useless to sit on because they're wet, plus standing or sitting near these structures is perilous when large chunks of ice fall from the roofs when melting happens. Nobody wants to be injured by falling ice plus... potential liability. It's dangerous for riders, plus annoying when all the outdoor seats are wet. More outdoor seats. Better security...too many men hassling me at terminal...hitting on me, asking for money. I'm there to ride the bus... it's not a dating site and I'm not ATM for men trying to scam people. Women's restroom layout...stalls are too close to sinks. Please re-open indoor seating soon and re-open terminal on the weekend. Thanks for free days. Most bus drivers are nice. A couple are just jerks.

## PHASE II OUTREACH – ONLINE COMMUNITY SURVEY

**Overall, what do you think about the Grid Scenario?**

I live on northwest side of north macarthur and nw 16th. I think it would be a hood idea to add more stops and runs on streets that does not have bus lines connections.

More access and benefit for a greater degree of the population. This plan has the best future impact on the most people.

I have been catching a bus on the outskirts of Moore for years and have wanted extended service into Moore for a long time.

not everyone needs to go downtown.

transportation to jobs and work hours available more for people, a walking distance to bus stops

Service to outlying areas beyond S. Okc metro area. Service should be like that in Las Vegas



Overall, what do you think about the Grid Scenario?
<p>This is better than current but come on this is NOT a grid system. For example, why does route 8 to to Penn Square deviating from Penn? If it goes to Penn Square then it should return back to Penn and continue North instead of deviating to Classen avoiding The Village and NH. Classen should have it's own bus, going it's length. Why does 63 drop down to PS instead of having a transfer to bus 8 at Penn? A true grid system would have bus going the length of major arterials N-S and E-W with special buses connecting from downtown to amenities. 29 should go the entire length of 29th, if you need a bus on 15th then add a 15 route instead of having "15" going from MWC to Downtown (should be a different number). Your "grid" map is missing the grid buses - I'd recommend from Sooner to Sarah Rd, N 164 to Indian Hills. Not saying every artery should have its own route but most should in a grid system, esp within the outer loop. Bus routes within the city should be obvious number for the E-W street they go down, with routes to suburbs being 1XX, express bus being 2XX, commuter bus to downtown being 3XX, and Special Trip bus (OSU, OU, major event) being 4XX. Why is there no commuter bus to Shawnee via Del City, El Reno via Yukon, Guthrie via Edmond, Purcell via Norman? These would build ridership on the preferred rail alignment while providing options today. Commuter Bus could run during rush hours.</p>
<p>I think the area around health will help I had a stroke and this will be better service in my area stroke</p>
<p>I live on the border of the village and okc The bus stop is too far when it is dark or weather is bad</p>
<p>I don't like the removal of the routes to the Mid-Del area. Ideally, expansion to the Southside would be great if maintaining the Mid-Del service can also be available.</p>
<p>The transportation is very good and can make people more convenient.</p>
<p>Many good changes but long-term a mistake to continue to under serve business districts directly (e.g. Plaza, Paseo, Western, Capitol Hill/25th, Bethany main street, )</p>
<p>We still need more direct service on I-240 Service Rd and 59th street</p>
<p>I am not close to any route but would be better able to drive to one of these routes. I do not want to have to go downtown to change buses.</p>
<p>I like he idea of more reach throughout the metro. We need more coverage but if walks become to long in the downtown people will not want to use the service. Need last mile policy work.</p>
<p>This scenario, of the three presented, seems most logical and best. There is one suggestion. Somehow in your plans provide a bus between NW 10th at Meridian and North on Meridian to the 23rd Street. I am not a magical wizard to know how to plan. I am just saying, apartments on 10th Street have to travel all the way to Rockwell and if the buses connect to the 23 crosstown to stop at Crest or anything thereabouts and back around again as time allows. The apartments up and down Meridian between NW 10th and NW 23rd have to walk half mile. No transit service convenient. Use God given legs or ...?</p>
<p>We need bus service from airport for sure. Many people are shocked to find there is no transportation to downtown.</p>
<p>Grid routes are easier to understand and use. It seems to have better coverage and give more people options to ride and use the bus</p>
<p>Feels like an awful lot of routes to remove.</p>

<b>Overall, what do you think about the Grid Scenario?</b>
This would make getting across town East-West possible. Much better than everything going downtown.
Well it would be a great start to transforming EMBARK to a better transit system. Try not to remove any areas while improving the EMBARK system.
I like that this plan recognizes people who need bus service but currently don't have access.
I'm unsure how a full grid works to the system's benefit in this scenario. Also, I lose access to my usual stops on Western Ave at 100th and on Santa Fe at 104th/NW 27th.
Being within walking distance of a 15-minute route is crucial for both work and school scheduling.
Glad there are multiple route options north toward Quail Springs, but no routes accessing Plaza
Most buses are still centered downtown. It is unclear how transfers/connections will be improved.
I like the additional direct routes that don't go downtown. I also like the additional high frequency routes.
Routes 11 and 12 aren't visible in this scenario. I take these routes to food banks and pantries that significantly impact me.
generally, I think OKC should gravitate towards the Grid Scenario. It may be worth it to transition to grid over time utilizing the hybrid scenario for a few years. Selfishly, I wish there was a route that more easily connected 23rd st to Downtown. It's quicker for me to walk than take the bus
Anything is better than the current layout
There needs to be a bus stop closer to Britton and I-35 to service the inmates at Clara Waters Community Corrections Center.
Improving the connectivity/connectedness of our transit system will help us do the most with our limited transit resources. A gridded network offers the most opportunity for connection. I think there are a lot more improvements that can be made to this scenario to make it more gridded, less complex, and more connected, but of the three scenarios, I think this one does the most good and is the right "first step" toward getting a more useful transit system in OKC.
This scenario appears to make it easier for more people to get to more areas of town. Sacrificing low ridership routes for better frequency on extremely high ridership routes makes a tremendous amount of sense.
My daily route would be slightly negative impacted.

<b>When ranking the Grid Scenario priorities, why did you select these priorities? Please be as specific as possible.</b>
I feel it will benefit more use for transit services in these areas and help people to get their destination alot faster with added bus lines. I like this tobefirst priorities. Good scenarios.

When ranking the Grid Scenario priorities, why did you select these priorities? Please be as specific as possible.
NW OKC IS a part of OKC and, despite it's size deserves to be served. There is an enormous population of workers there. Second, Portland and OCCC services provides better access to healthcare and mental health services, particularly for veterans. 10th and 44th provide a good cross section of access when combined with the Portland route for a cross section of transit that impacts my priorities for underserved residential areas with general lack of reliable transportation that impacts their ability to work or receive health services. It's an as I see it understanding.
Close to home and work
They are the closest ones to my house.
of where i travel.
It would give the most comprehensive transportation for the metro
These changes would afford more utilization of the embark system
I'm a college student
It is where I live and jobs are more available on this route and requires nights and weekends
I feel the need for more consistent public transportation in the heavily populated areas.
Had trouble prioritizing routes due to poor survey process
Because people should get around
it's as close to a grid as you've given us but there should be a priority on the frequent amenity bus routes as well as the not-so grid routes
I'm in those area
I would love to be able to schedule pickup rather than taking lyft or uber
If on-demand is at a reasonable price, then I like the idea of service being available in Mid-Del and NW corridor.
Very important for riders to have these services
Penn, may, 23rd always busy buses
Can be more convenient
Greatest impact to me for commuting to work, though I would have ranked the airport route high if you hadn't forgotten it on this list.
They are the areas I frequent already
We need alot of these changes, but there are some I do not agree with.
I live north of Spencer. I am concerned about routes and services in the eastern part of the county.
This is the way we can give 15 minute service
I think May and Penn have lots of businesses and residential. It could benefit the most.

When ranking the Grid Scenario priorities, why did you select these priorities? Please be as specific as possible.
Actually, I would have to see the time coordination for this bus being where and how long to wait for the next bus going another direction. You guys have a difficult figuring out. OCCC because they need for any health care concerns. The rest was picked upon my usage and how I figure my walking where the bus don't come or even my walking when the bus is too late, damn walk to make the connection bus, quicker that way especially when the bus has it's reasons for being off schedule.
23rd Street and May Avenue are very important and I like the frequency and directness of the proposal for those corridors. The OCCC - Downtown - Health Center route is really intriguing.
The tend to serve more underrepresented constituents. (P.S. We need bus service to Will Rogers World Airport. Many travelers are looking for low-cost transportation to & from that destination, especially to downtown and the new convention center.)
personal preference and needs
the number 1 choice to to help the folks in the MWC area
I think routes where more people live/work and closer to downtown should be a priority. Running buses to suburbs seems like a "nice to have" but not a "need to have". Get the buses linked up with other transit options as well - streetcar, bikeshare etc
be able to tranverse city
Personal preference with considering to putting priorities of the working class communities over the privileged and affluent.
Because there is not enough service on those streets
i just did
People need to get to the hospital and the South 44th street because that is where Amazon Warehouse is for people to work
it was largely because those sounded like the best option for the most people.
I felt on demand zones could be done at a later point.
i work on 63rd and live by st anthony
Don't care about any
To be honest, the first priority is the only one that I'm super excited about, and that's because I know how under-served Mid-Del is.
I live at NW 150th b/t May and Penn
I live closest to 23rd St., and I think on-demand service has great potential to draw new users (and thus support) to the bus system
Areas most frequently accessed.
I think the East side needs better service. I also think service frequency on major corridors would be key to increasing ridership.

**When ranking the Grid Scenario priorities, why did you select these priorities? Please be as specific as possible.**

I live near NW 63rd & May and would like more service from NW 63rd to near Memorial Road and Quail Springs Mall along May Avenue as well as route to the airport for everyone including visitors.

I live on the NW side of the city near North May Avenue but it would be nice to better access between NW 63rd and Memorial Road near Quail Springs Mall.

More frequent service on route 23 is always good.

This is what our City needs.

Improved frequency is probably the most crucial element to making a transit system useful, thus anything we can do to improve frequency on the most number of routes is good. System comprehensibility (i.e., simplicity) is another key factor in making transit useful, so reducing the number of deviation and overall circuitousness of routes is an improvement. The more routes like 7, 8, and 63 follow May, Penn, and 63rd Street, the easier it is to understand how the network works and which routes take you where.

Again, high-ridership routes should be prioritized with frequency. OCCC-DT-OU connection is of increasing importance. South 44th Street is important for workforce transportation.

Need service to areas on the northside

my daily weekend travel needs

More direct and bus running longer are my priorities

**Overall, what do you think about the Radial Scenario?**

Glad to hear and know good changes is coming.

I don't like the downtown focus because it doesn't represent growth toward access of major employers and services. We need to extend service North (Paycom) South (Amazon) East (Tinker) and think about getting workers that need transportation to jobs, not just giving those who want to reduce their carbon emissions in upper-class areas access to jobs they never had trouble getting anyways. Nor should bus access focus on Tourism for this city. Not until unless it becomes our primary revenue driver.

It sounds good.

I think it's important for OKC to choose a business center (DTOKC) and decide where our density will be concentrated, so more people will actually use public transportation instead of cars.

it is getting cold and lighting is not to good where i live and would be dangerous to walk to nearest bus stop

I would like service like that in Las Vegas

<b>Overall, what do you think about the Radial Scenario?</b>
a true grid with special amenity routes to-from downtown is best. it would enable transfers and reliability that's missing in both of your proposals. You're also missing commuter and express routes which should be named 3XX and 2XX respectfully (instead of 24 for the Norman-OKC route for example). You need an Airport-Downtown Express route in addition to the A shuttle that stops everywhere. Why no connection on A shuttle to the FAA academy? Instead of A shuttle I'd name it '101 Airport/FAA Academy - Downtown' and the Express bus route (on I-40 then I-44 non-stop) would be '201 Airport - Downtown'.
Love the idea of the system headed South, although I feel it is a bit sacrificial to the Mid-Del area.
The route is too complicated and inconvenient.
several good coverage improvements, but without significant investment in more buses, I just think our city is too big to be able to keep up using this method (radial only vs grid or hybrid)
Less support for eastern OK County. Makes riding bus useless for me.
I think getting more service to more areas is always good.
Worst of the three scenarios.
Generally good, but routes remain less intuitive than the grid scenario.
I thin
Grid plan is better
Transferring via downtown doesn't make sense for most people
I don't mind the new 40, but this adds a new transfer to get to downtown.
This scenario seems more touristy. The focus seems to be connecting major shopping areas, which I think is a lower priority than education and work.
Glad airport is involved
Many buses still focus on downtown. Areas are hard to access without long bus rides with transfers.
I think the service improvement to the North and East are good, but especially like the circulator in the South and the airport route.
This is better than what we currently have but I feel it would be better for our city to move to a more grid focused plan
I like the south shuttle, but not everything needs to go downtown.
There needs to be a bus stop closer to Britton and I-35 to service the inmates at Clara Waters Community Corrections Center.
While an improvement over the current system, I do not think this scenario achieves the best outcomes for delivering a useful transit system to OKC.
Not as many frequency improvements; Still relying on Downtown transfers is not ideal.
I like this plan the most. It actually makes my personal day to day better.

When ranking the Radial Scenario priorities, why did you select these priorities? Please be as specific as possible.
I think it would benefit people to get them to their destinations faster.
They reflect moving toward the above stated ideas the most, if this plan was chosen.
Na
I like improvement to the south side of Oklahoma City and Moore
I loved being able to use RTD rail downtown to access the airport in denver. Getting people downtown to affordable groceries quickly and effectively is important.
because of where I travel
More accessible by a great amount of high traffic areas
These changes will make it easier for low income people to navigate the city
I'm a college student
walking distance to bus stop and job opportunities
You would be able to move the greatest amont of people.
What I would like not specified. Would like service like that in Las Vegas
serves the most pax
I think these are good
I rated these in the way that I felt would provide the most benefits to those who rely upon public transit most often. I tried to envision what I would use if I didn't have access to a private vehicle.
Good changes
Busy buses
It can facilitate transportation.
Some of these coverage areas are really needed
Bus service to airport is long overdue
Higher ranking supports my personal requirements - Spencer/NE OK County. I can also take advantage of southeastern OK County.
Every city I go to I take transit from the airport. It is pathetic that we do not have this service. Light rail to airport should be in 30 year plan and connect with the greater system of rail planned for the next 40 years.
I didn't select any because this scenario is outside my knowledge. Out of the three presented and without further knowledge, this is the least.
Maximum frequency of 23rd Street is the top priority. NE to NW connections also important.
More underpriveleged constituents are served. Travelers into and out of Will Rogers World Airport will finally be served and with a low-cost alternative to taxi's or rental cars. South OKC has been the bastard stepchild for many years and they will be getting the service they need.

<b>When ranking the Radial Scenario priorities, why did you select these priorities? Please be as specific as possible.</b>
Prioritizing downtown connections and routes
i just did
People need to get to hospital
Again, I do like the 40 proposal other than the need for a transfer at Walmart where one did not exist.
I like the additional connection to South OKC. The rest I don't have strong feelings towards.
I live closest to 23rd St., and I think on-demand service has great potential to draw new users (and thus support) to the bus system
Areas of frequent use.
I think these circulators help tie together a lot of the routes and help with non-commuting trips.
Because you did not let me select south shuttle.
Improved frequency is probably the most crucial element to making a transit system useful, thus anything we can do to improve frequency on the most number of routes is good. The new connections to the airport could be useful, but having to go downtown first makes it less so. Connecting NE OKC and NW Expressway is really more of an equity issue.
Connecting NE OKC to other parts of the city is vitally important for workforce transport. Airport connection seems most important in this arrangement.
no more taxi to airport job! & access to del city mercants
Route 10 looks so much better this way

<b>Overall, what do you think about the Hybrid Scenario?</b>
Good changes indeed.
I appreciate the hybrid approach, but still do not prefer it. A downtown hub focus doesn't actually represent our city's geographical dispersion of residents and employers and doesn't need to be preserved.
Better opportunities for jobs and shopping
I want to connect with whatever buses I need to take as if I were driving myself.
a hybrid is recommended but how does this differ from your "grid" proposal? Your "Express Route" to the airport is NOT an Express since it goes through neighborhoods. A true express route would go on the freeway whereas a local would go through the neighborhoods. I think OKC needs both, this is why the former Airport route failed - took way too long to/from the airport and no option for employees. You need both Express and Local airport, as I've mentioned: "101 Airport/FAA Academy - Downtown" for local and "201 Airport - Downtown Express" running on I-40/I-44 as the Express route operating M-F 4am-11pm, SS 6am-6pm.
The route is too long and inconvenient for people to pass
Not sure how hybrid this is with only 2 15 minute routes



<b>Overall, what do you think about the Hybrid Scenario?</b>
Better than Radial Plan.
This scenario looks good on paper. Witness it actual, I will go with the grid scenario and see how it is actually implemented.
Has a bit of the grid system elements but takes into account how OKC developed and where work places and people are
Gris is better
Of the 3 this combines some of both.
More emphasis on daily needs stops than radial, but still not as much as grid.
Can't tell with map displayed, but hopefully Plaza is serviced
best option for now as it moves us in right direction without alienating as many current riders
There needs to be a bus stop closer to Britton and I-35 to service the inmates at Clara Waters Community Corrections Center.
While an improvement over the current system, I do not think this scenario achieves the best outcomes for delivering a useful transit system to OKC.
Looks at the newer part of town and the downtown area
This would make me a car commuter again

<b>When ranking the Hybrid Scenario priorities, why did you select these priorities? Please be as specific as possible.</b>
Love the changes. More and other routes are being added
These new initiatives represent a better step in the right direction of offering geographical spread to residents that need transportation to employment opportunities and health care.
Na
No particular reason
Opens up to more users and a bigger areas
I'm asthmatic and I go to the allergy and asthma clinic
better opportunities to jobs and shopping
This offers the greatest amount of people moving thru the metro.
Nothing that addresses what I'd REALLY like
Because the more it helps the better
The on-demand would have to be pushed for this system to be successful. It will take a lot of public education to break down how on-demand works, but it could be done.
This will improve ridership.
It is convenient for people to pass through.

<b>When ranking the Hybrid Scenario priorities, why did you select these priorities? Please be as specific as possible.</b>
Airport is needed, though it won't work without proper marketing at the airport itself, otherwise focused on things beneficial to my habits
This survey sucks. I should be able to see the individual Route scenarios b4 being forced to rank priorities. Maps are worthless.
Higher priorities support NE OK County.
Y'all have the better stats on who rides where. I am not singling out South Toiwn, like we used to call it. Yes, lots of fun down in South Town and a lot of people with chips on their shoulder. So South 44th Street may need attention. Just haven't been there in a few years. Maybe an expansion on Bus allowing us all to share more better is a good thing.
The airport is a hub for first-time visitors to OKC (and returning ones) but currently, their only transportation alternatives are taxis, Uber/Lyft or an (impossible to find) rental car.
Better MWC service
i just did
People need to get to hospital and airport for additional trips
A faster route to OU health would benefit south side residents.
On-demand in Midwest City is a desperately needed service.
I live closest to 23rd St., and I think on-demand service has great potential to draw new users (and thus support) to the bus system
Frequency of service and most used areas.
I like the way this one makes connection to MWC and Del City. Also I think express service to the airport is a good idea.
More frequent service on N 23rd street is always good.
You need to keep the south shuttle with this one.
Improved frequency is probably the most crucial element to making a transit system useful, thus anything we can do to improve frequency on the most number of routes is good. Improving system legibility through reduced complexity is also important to creating a useful system, thus the more routes like 7 and 44 can follow May and South 44th St, the easier it is to comprehend the system and for riders to know which routes will take them where.
airport connection very important
These are areas now serve very well
CONVENIENT access to occc from home
I don't like this plan

When ranking priorities shared between the scenarios, why did you select these priorities? Please be as specific as possible.
Good changes
The NW BRT needs to be the highest priority. Low wage earners have the most to loose if they can't get home from work after non traditional shifts (think restaurant, janitorial, retail workers) especially on the weekends. They also have the most to loose if unreliable service causes them to be late to work. Their families are the most impacted if they have to spend an extra 30 minutes to an hour waiting on transportation services! Improving performance and having more stop frequency is important. If the system isn't reliable and usable, it might as well not be there.
Work related
They are important to me
Time is our greatest commodity and can only be spent. No need to spend it waiting.
Better Job opportunities with longer hours and shopping
This is better equipped for those who need public transportation.
Want to take bus routes that operate n/s and e/w at every major street. IE: up and down. May, Penn, Western, walker etc. 89th, 74th, 59th, 44th, 29th etc.
Because it is very much needed
Timeliness and availability were my priorities. Most people who need access to the airport, in my opinion, use private transportation and not necessarily Embark.
These changes will increase ridership.
Can be more convenient for people.
This is a tough one because we need all of these things. But I think later service allows more people who work or are active late to use the service.
Expanded evening service across the board. However not all need midnight service 10 pm would be fine on most days.
Better than Radial plan but still not great.
The BRT plan you drafted will not work. Listen to feedback and do not waste our limited funding for transit.
The inner city, OKC is what you need to focus on. Expand your horizons when the demand presents itself. Focus on improving an employer knows public transport will deliver an employee on time.
Firstly, access to the Airport should be an option in a growing city like OKC. Otherwise, increasing the reliability and consistency of quality transportation services, through on-time and more frequent service, would benefit OKC better than implementing new features (i.e. on-demand).
Airport service is a symbolic improvement, but service and frequency improvements are more essential for the system's convenience and functionality. People who fly are simply used to taking Ubers and Lyfts from airports unless the airport transit is incredibly frequent and more efficient than renting a car/ride (i.e., to avoid traffic, which we don't have.)
it might make it easier for folks working weekends and it could also help better serve MWC

<b>When ranking priorities shared between the scenarios, why did you select these priorities? Please be as specific as possible.</b>
Better frequency is good
Airport service is key for being a destination city for
i just did
I like all of them, but am most excited for airport service which was present in my hometown.
ALL of these are really important, but having timely transportation that's available both before, during, and after work is by far the most important.
Service has to be exceptional to maintain riders
Reliability and ease of use is top priority. Airport service would be beneficial. New cities seems least important for OKC.
I think frequency and limited hours are the biggest problems with our current system.
Later evening service on weekdays AND weekends would be great. Even if fare prices were higher.
high frequency is the only way to go
That is what is needed to improve.
Improved frequency is probably the most crucial element to making a transit system useful, thus anything we can do to improve frequency on the most number of routes is good. Improved on-time performance increases system reliability, which increases usefulness. Longer service hours make the system more useful by allowing riders to get to more places when they want to be there. Finally, in order for the NW BRT to succeed, it must integrate into the broader transit system (this is one of the failures of the downtown streetcar).
love the idea of on-demand service to reduce large bus miles. Easier to use alternative fuels in smaller vehicles. Airport service, BRT connections, and as many high-frequency corridors as possible should be the focus.
ease headaches of taking bus where needed
Okc residents should have the bus service run all day.

<b>When ranking the three scenarios, why did you rank them this way? Please be as specific as possible.</b>
Good changes are coming to bus transportation where it is needed.
OKC is big. We need to give more opportunities to more residents, not better ones to the same. It typically costs less to live outside of the downtown hubs. We need to prioritize access to those who are more likely to have unreliable transportation and living in an affordable area. The idea that there are more employment opportunities or residents downtown than anywhere else is a ridiculous bias of those that work there. These services should be based on accessibility and services first and ecological initiatives second. Providing access to those who simply don't want to drive to jobs/healthcare should be secondary to those that can't.
Meeting more people's needs

When ranking the three scenarios, why did you rank them this way? Please be as specific as possible.
Sounds best
I put them in order of how the most people that utilize the service would be served according to your data.
more connections outside downtown, maintains coverage, better connections
With the sheer size of the metro the hybrid offers the best service for those who need it.
These routes would be the most useful to the greatest # of riders. HATE having to connect in downtown and then having to backtrack to nearly the same area I came from
still need connections into downtown without every bus terminating there. Opens up transfers, which will enable reliable, timely frequencies.
Na
On-demand has potential. If it is successfully implemented, then I have no issues with Downtown taking priority. The radial seems to give the best coverage to both Mid-Del and Southside, with a mix of on-demand and routes that can cover people in both locations.
In order of importance to riderso
I feel this positioning will make people more accessible.
We'll be able to grow best with grid. Changing to meet the demands of a growing city will be lest drastic with grid.
I'm a rider already. This scenario fits my needs best
I don't like to go downtown to change busses. Grid supports my needs better, though I can't catch a bus easily and probably won't be able to use On Demand service because of my location.
Grid network focusses on the major corridors with many connectors - these corridors will be the site of BRT routes. Hybrid is what you have already decided upon but has a good mix of both so I am trying to get on board with it. Radial is no good because it is not easy to follow for passengers and since your frequency is so low you need to focus on the needs of the many and areas of interest. not everyone can have transit. Focus to on apartments if going outside city because they will be more likely to need a ride.
Our bus system should not focus around downtown. Those in the low to moderate income range cannot afford to live downtown and most do not work downtown.
The grid scenario works well with OKC's development pattern and creates more useful routes for more neighborhoods.
Most cities with successful bus service have more service area with less wait times. Currently, riders have to walk a long way to find a bus in many cases which precludes them from utilizing this service.
I want to make it a better more timely service to MWC
Grid scenario seems like a good base transit system, it can build and attached to other modes of transit and is simpler for people to use and work through individual routes
i just did

<b>When ranking the three scenarios, why did you rank them this way? Please be as specific as possible.</b>
Of the 3 I prefer the hybrid because it combines some of both grid and radial scenarios.
2 of the 3 plans eliminate service to the Homeless Alliance/Day Shelter area at NW 3rd and Virginia
Grid really emphasizes the daily needs of individuals by drastically increasing how many people are within walking distance of a frequent bus route and creating more direct routes to work and school.
Better, more frequent service from far north OKC
Hybrid seems to have better route coverage, but hard to tell differences between three maps when it comes to nuances.
May Ave. access.
I like the Grid's extra high frequency, but I do think the circulators could be good.
My two greatest priorities are more frequent service on route 23, and later evening service on weekdays and weekends.
Because we need to stop going downtown and improve connections in other places.
The grid scenario offers the most high-frequency service and has the most legibility of the three scenarios. I would like to see further improvements to make the bus lines follow the street grid better, which would make it even easier to use, but the grid scenario is a good start. The other scenarios do not deliver the most useful transit system, therefore I do not recommend them, however, since the hybrid is the least compromised of the two non-grid scenarios, it comes in second.
Grid slightly higher than hybrid due to the high-frequency corridors. Hybrid head and shoulders above Radial due to better NE and S OKC connections.
Why I think the grid offers more streets being covered. The hybrid could hold the key to the ever changes to our city
Grid scenario uses common sense hybrid solution is acceptable compromise ... radial scenarion will make things MUCH WORSE
Grid was the best. Hybrid model personally made me convert back to car commuting.

<b>Are there any other improvement priorities that should be included in these scenarios? Please be specific.</b>
No. This sounds great. Eat a great state we live in. Yes indeed.
As the plan grows, it needs to continue to offer a minimum standard of safety, reliability and frequency. We can't sacrifice those metrics to growing the infrastructure faster or it won't be utilized enough to justify continued growth.
Making bus stops more covered
No
none seen at this time

<b>Are there any other improvement priorities that should be included in these scenarios? Please be specific.</b>
None
Make North/South routes intersect with east/west routs along major streets like Penn, may, western, 10th, 29th, 44th, etc. Make routs a truly grid operation
As I mentioned, please implement commuter bus and express bus service to the suburbs from downtown. Implement a naming system where end to end, via (if necessary) destinations are in the name and Local Bus XX, Local Bus to Suburbs or Amenities 1XX, Express Bus to/from Downtown 2XX, Express Bus to/from other hubs/suburbs 3XX, Commuter Bus to/from Downtown 4XX. Examples: "410 OKC - Shawnee", "101 FAA Academy via Airport - Downtown", "201 Airport - Downtown Express", "123 OCC - OHC via Downtown", "23 OWL - Crosstown", "29 - Crosstown", "9 - May Avenue Crosstown", "Line A (BRT) Hefner TC - Downtown", "444 Norman - OKC via Moore", "344 Norman - OKC Express"
I would love a bus stop on west britton and waverly
Prioritize on-demand and extended times. The on-demand will not be as successful as necessary if the main routes are not ran for extended hours with a great on-time percentage. Failure of availability and timeliness will make on-demand pointless.
On time service
Shorter routes, better transportation, better lines,
I didn't rank it particularly high but service to more cities is pretty important for the region. Bethany, Warr Acres, etc. Are we going to have to do this again as each new BRT comes online? Are we/should we factor in those other BRT routes in this design? Lastly, I can say enough that I think it's a mistake to not interconnect major economic corridors, such as the major business districts.
More service between Norman Edmond Midwest city and OKC
Provide parking at ends of routes for people who have to drive to get there.
Hourly frequency to airport from downtown.
No cost bus service!
Directness and intuitiveness with routes that get closer to not relying on a map or schedule.
You can't cover all of OKC, so where buses do stop/run give those people multiple options to transfer easier to other routes. Build the strong base, then expand or adjust as needed
Bus lanes in places other than NW Expressway, preferably center lanes like in Boston. And center bus lanes at NW Expressway would be great, with the stops in the median.
More frequency
Adding food pantries to all embark maps.
don't do anything to take way from housing
I would love to see a bus stop at every community college, state university, and CareerTech campus. Connection to education is the #1 way we can elevate the lives of our most vulnerable populations.
Extend a bus line to 150th Street

**Are there any other improvement priorities that should be included in these scenarios?  
Please be specific.**

<p>I think there should be loop or partial loop routes that would allow transfers outside of the downtown core. I live in Uptown/Paseo region, and I getting to Plaza, Western/63rd St. corridor, directly downtown without having to go all the way to Classen is not an option with the busses. I know the Uptown/Paseo region is more affluent and a heavy walking area, but there are lots of young people who would use public transportation over driving if given the opportunity. There should also be more attention on NE 36th St. Homeland that just opened up. That would be a good area to have multiple routes meet, especially with the demand for groceries. I know I mentioned Plaza earlier, but that is a location no one ever wants to drive to and should not be ignored by the bus route. Even having one of the 23rd St. lines deviate through the Plaza Distirct via Classen and Penn would be welcomed and I would definitely use that route.</p>	
<p>More connections and less reliance on downtown hub.</p>	
<p>Their needs to be a coordianted effort to better connect the bus stops with other modes of transportation like sidewalks.</p>	
<p>Your ridership are far more likely to have need to get to community services for medical, food pantries , schools and other services. Please keep access to these services in mind when revising your routes. Perhaps a map of food pantries, free or reduced medical clinics, etc. would be helpful.</p>	
<p>I think Downtown, uptown, plaza district, 30th/harvey, sw 25th, britton district, western ave and other walkable districts should be more explicitly connected. If we connect walkable places with other walkable places, people are more likely to leave the car at home.</p>	
<p>South shuttle and other small shuttles should be included in all scenarios.</p>	
<p>There needs to be a bus stop closer to Britton and I-35 to service the inmates at Clara Waters Community Corrections Center.</p>	
<p>Yes! We should remove even more deviations and circuitousness from the lines of the grid scenario, which would improve system legibility and allow us to shift even more resources to improving frequency on even more lines of the system. More connectivity, more simplicity, and more frequency are what will make OKC's transit system the most useful to its citizens.</p>	
<p>Which scenario better supports EMBARK's commitment to CNG or electric busses by 2025?</p>	
<p>Include areas with places for wheelchair people to get on at the stop and make sure the wheelchair can get off curve</p>	
<p>no</p>	
<p>All okc schools should have bus stops nearby to convert students to bus commuters</p>	

**Route specific comments**

Route 007	<ul style="list-style-type: none"> <li>▪ Extending 07 to Memorial is a good thing.</li> </ul>
Route 008	<ul style="list-style-type: none"> <li>▪ The NW 63rd route really needs to go to Classen Curve.</li> <li>▪ Maintains service to the Homeless Alliance area</li> </ul>



Route specific comments	
Route 010	<ul style="list-style-type: none"> <li>▪ I'm picking a random scenario here because my only real point is that route 10 travels by Will Rogers Park, and I would like to keep that as an option in any scenario. I honestly wouldn't mind more bus routes going more clearly by parks in the city.</li> </ul>
Route 015	<ul style="list-style-type: none"> <li>▪ 015 should travel Reno instead of highway to open access to Greyhound and improve reliability</li> </ul>
Route 018	<ul style="list-style-type: none"> <li>▪ There needs to be a bus stop closer to Britton and I-35 to service the inmates at Clara Waters Community Corrections Center.</li> </ul>
Route 023	<ul style="list-style-type: none"> <li>▪ Should have options to deviate to Plaza and/or Paseo and Asian District. Going straight east-to-west doesn't do anything for us who live in Uptown and Paseo. Yes, it is much more affluent area, but it also has young people who would use public transit if option was available. But it does me no good walking to 23rd St., waiting up to 15 mins, only to have to walk another 3/4ths of a mile to either district (especially during hot summers, cold winters, storm season).</li> </ul>
Route 024	<ul style="list-style-type: none"> <li>▪ Need more and later weekday service with some service on Saturday.</li> <li>▪ No significant change was shown for this route. An evening option could increase usage.</li> </ul>
Route A	<ul style="list-style-type: none"> <li>▪ I like that it has airport service. It is difficult to use public transit when there are no stops available</li> <li>▪ Many travelers are looking for low-cost transportation to &amp; from WRWA, especially to downtown and the new convention center. (I assist passengers daily at the airport and this is a complaint that I receive often.)</li> </ul>
On-Demand Zones	<ul style="list-style-type: none"> <li>▪ How will this provide equitable service and accessibility?</li> <li>▪ The NW On-Demand zone stops at Rockwell, but I believe it would equally benefit those as far as Council.</li> <li>▪ This would resolve many challenges the city faces with the sprawl/rural sections. I hope Embark invests and makes this work - has great potential!</li> </ul>

# Appendix C Reliability Analysis Route Run-Time Charts

## Route 002

### Inbound

Figure 1 Runtime Chart – Route 002 Inbound, Coltrane & NE 20<sup>th</sup> to NE 23<sup>rd</sup> & MLK

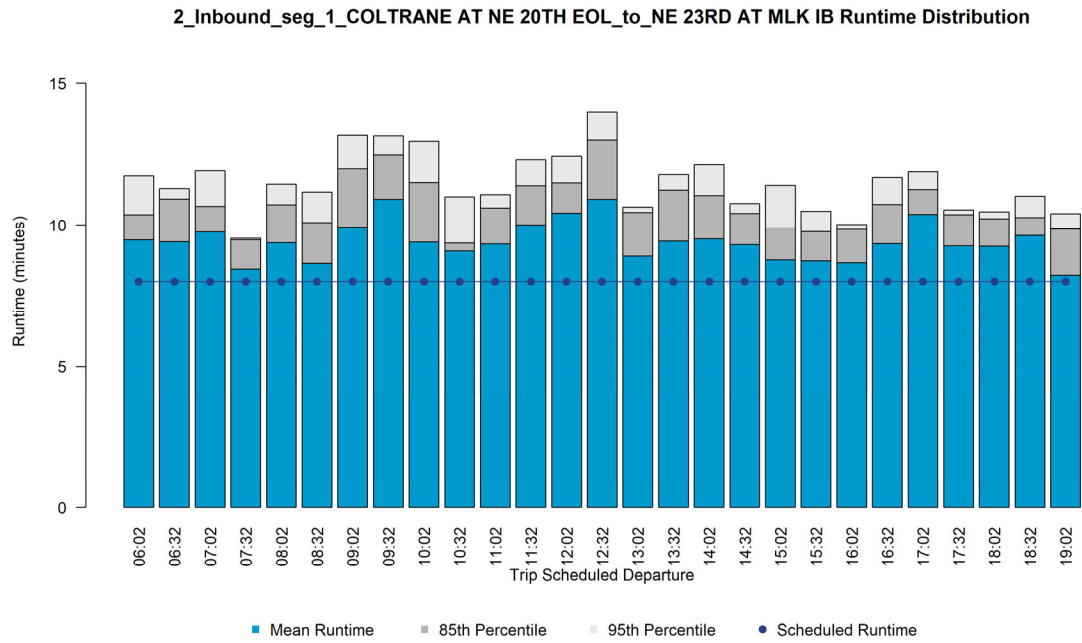


Figure 2 Runtime Chart – Route 002 Inbound, NE 23<sup>rd</sup> & MLK to Health Sciences Center

2\_Inbound\_seg\_2\_NE 23RD AT MLK IB\_to\_HEALTH SCIENCES CENTER Runtime Distribution

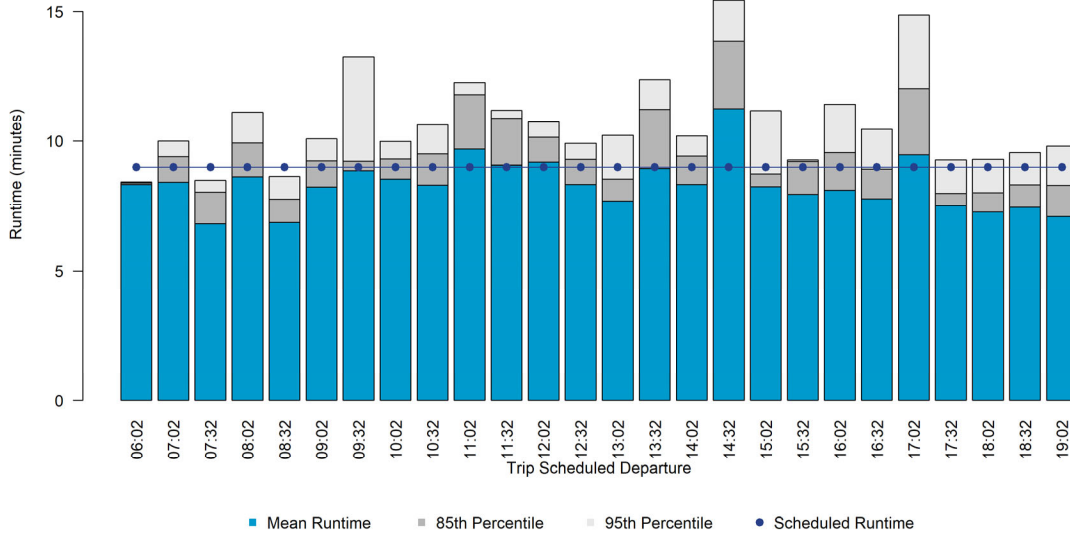
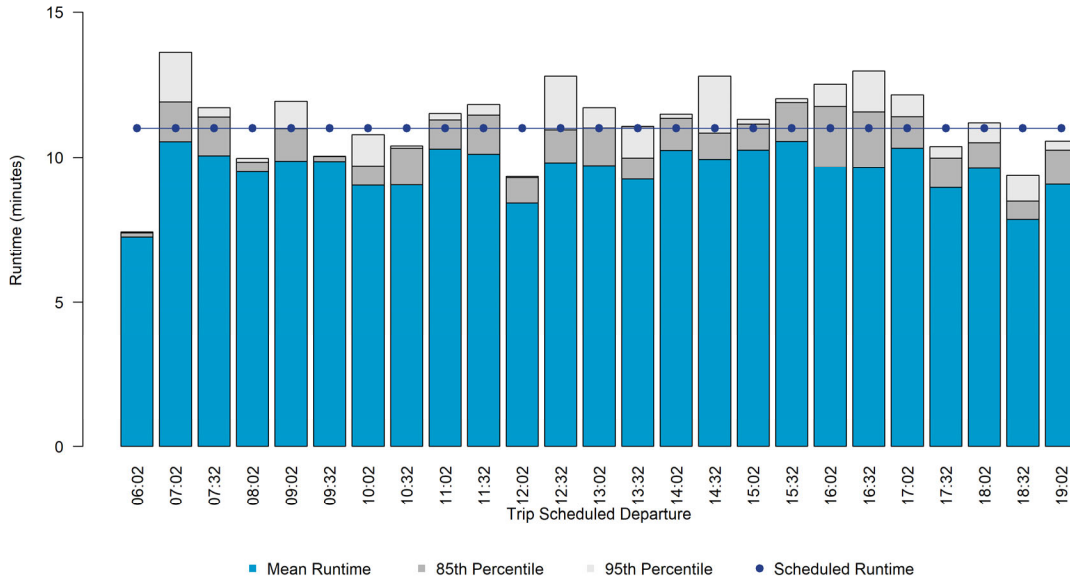


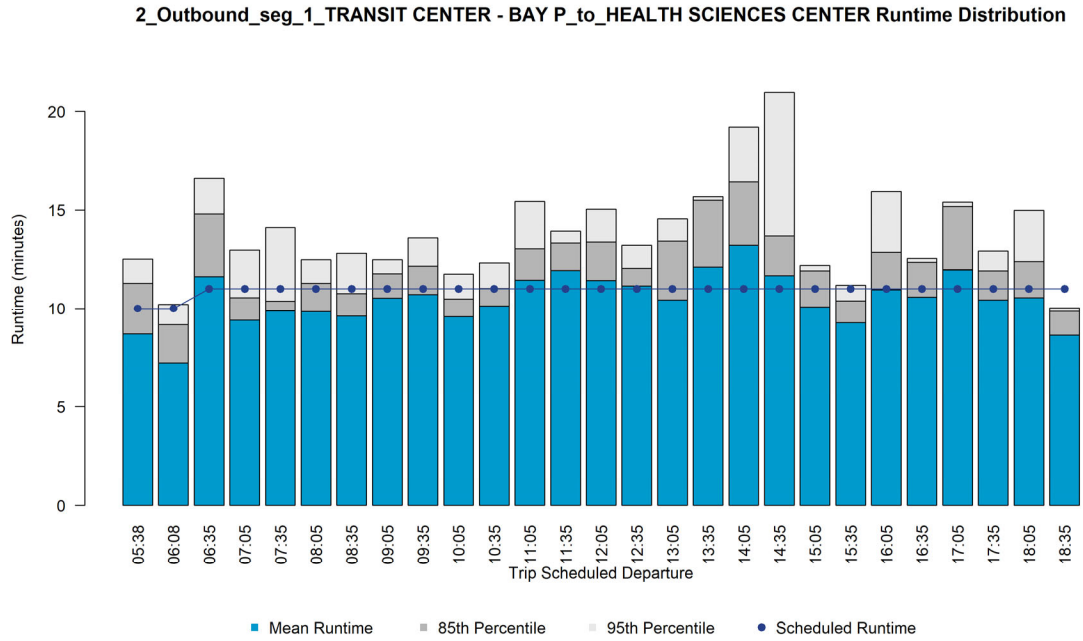
Figure 3 Runtime Chart – Route 002 Inbound, Health Sciences Center to Downtown Transit Center

2\_Inbound\_seg\_3\_HEALTH SCIENCES CENTER\_to\_TRANSIT CENTER - BAY P Runtime Distribution



**Outbound**

**Figure 4 Runtime Chart – Route 002 Outbound, Downtown Transit Center to Health Sciences Center**



**Figure 5 Runtime Chart – Route 002 Outbound, Health Sciences Center to NE 23<sup>rd</sup> & MLK**

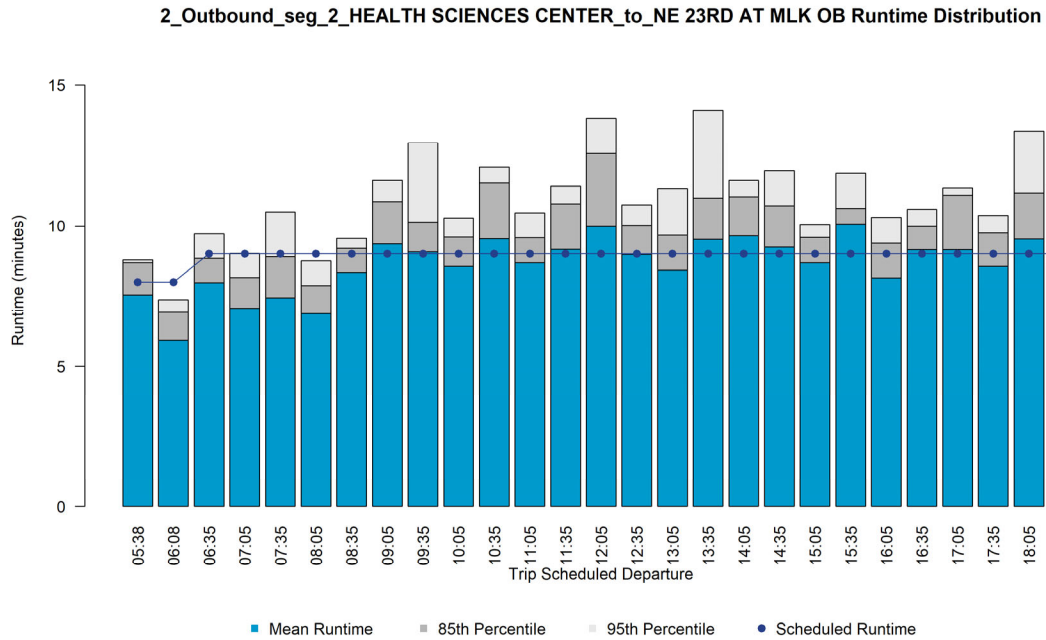
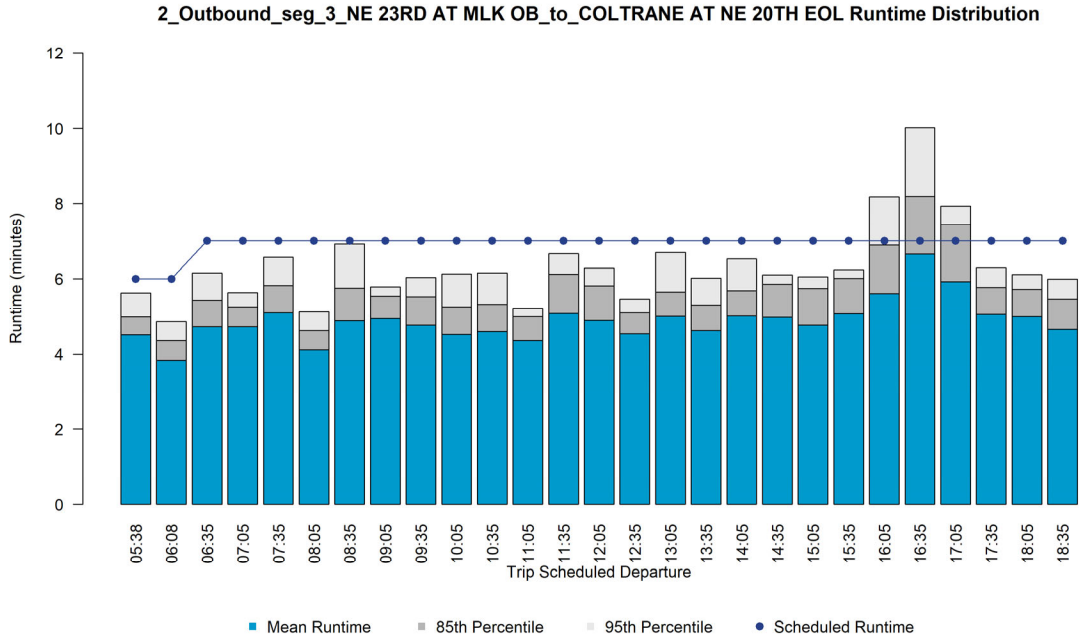


Figure 6 Runtime Chart – Route 002 Outbound, NE 23<sup>rd</sup> & MLK to Coltrane & NE 20<sup>th</sup>



## Route 003

### Inbound

Figure 7 Runtime Chart – Route 003 Inbound, MLK & NE 50<sup>th</sup> to Kelley & NE 36<sup>th</sup>

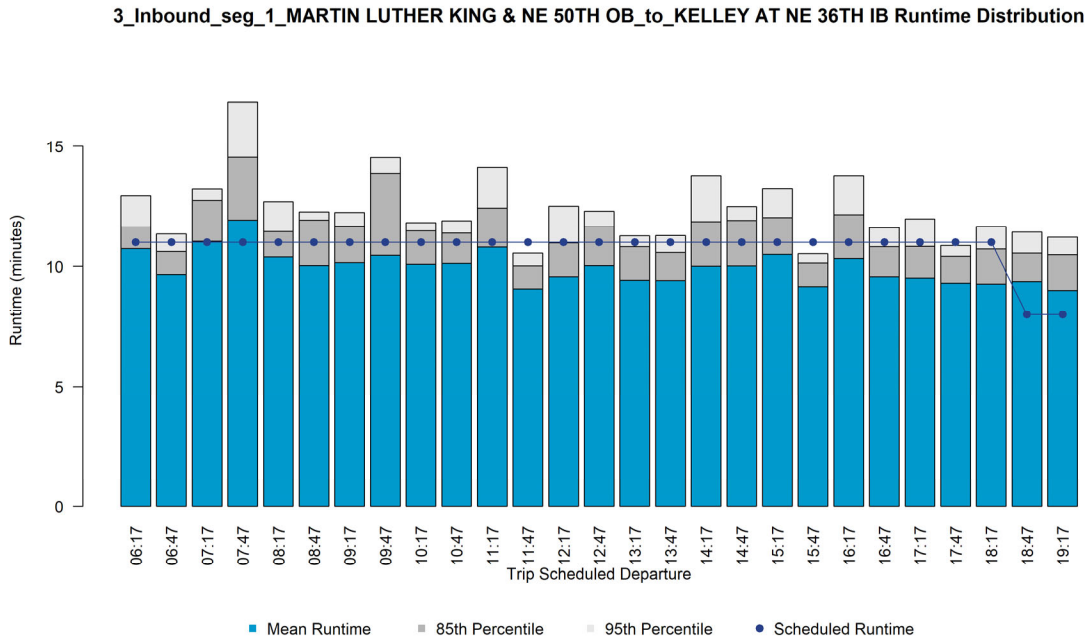


Figure 8 Runtime Chart – Route 003 Inbound, Kelley & NE 36<sup>th</sup> to Health Sciences Center

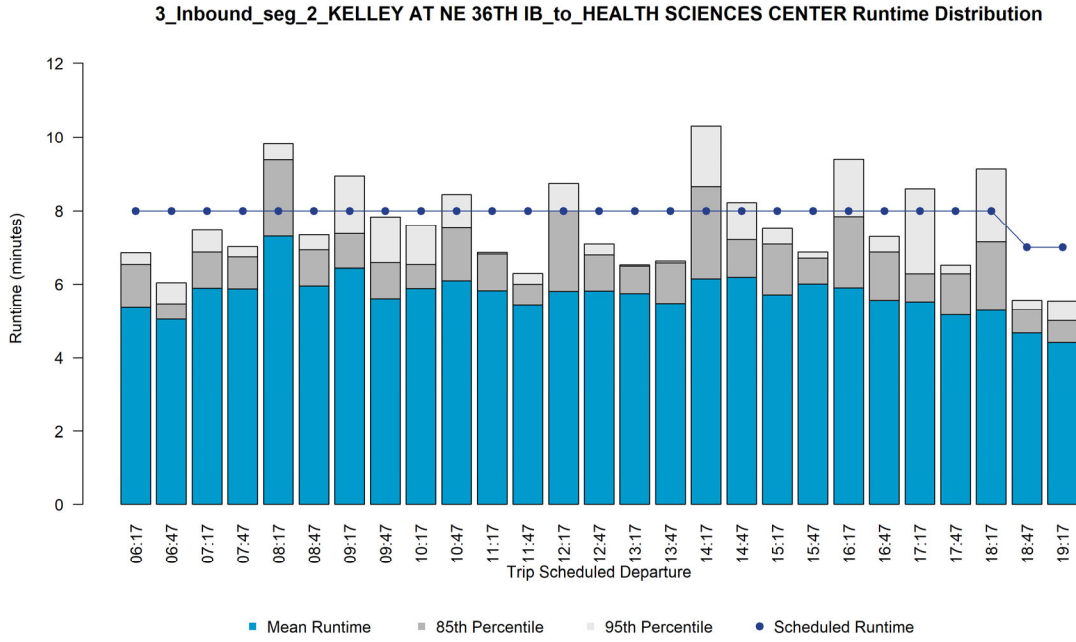
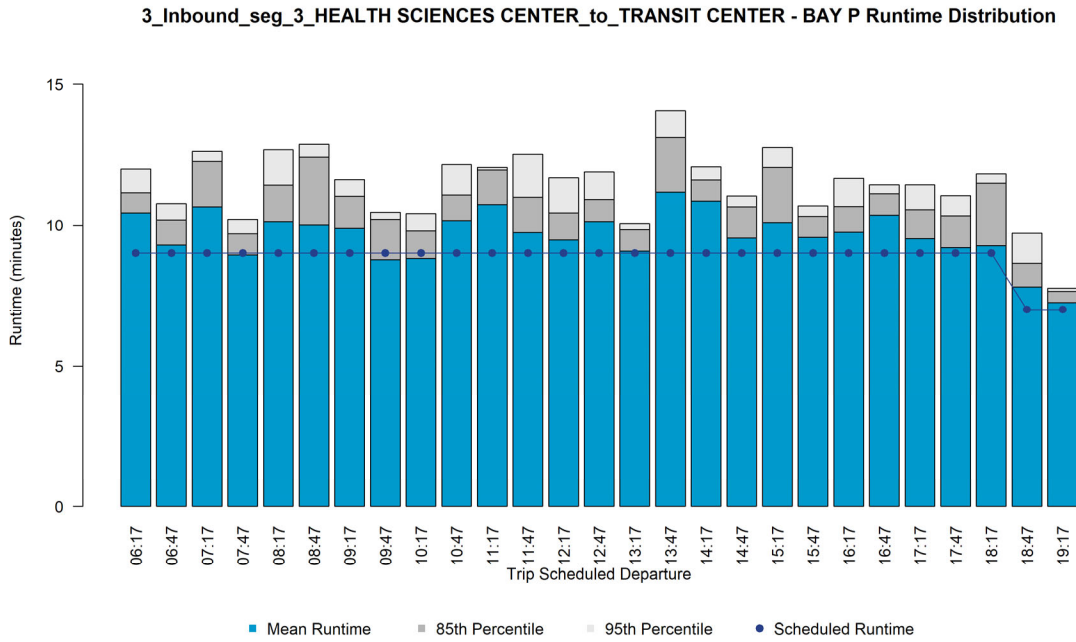
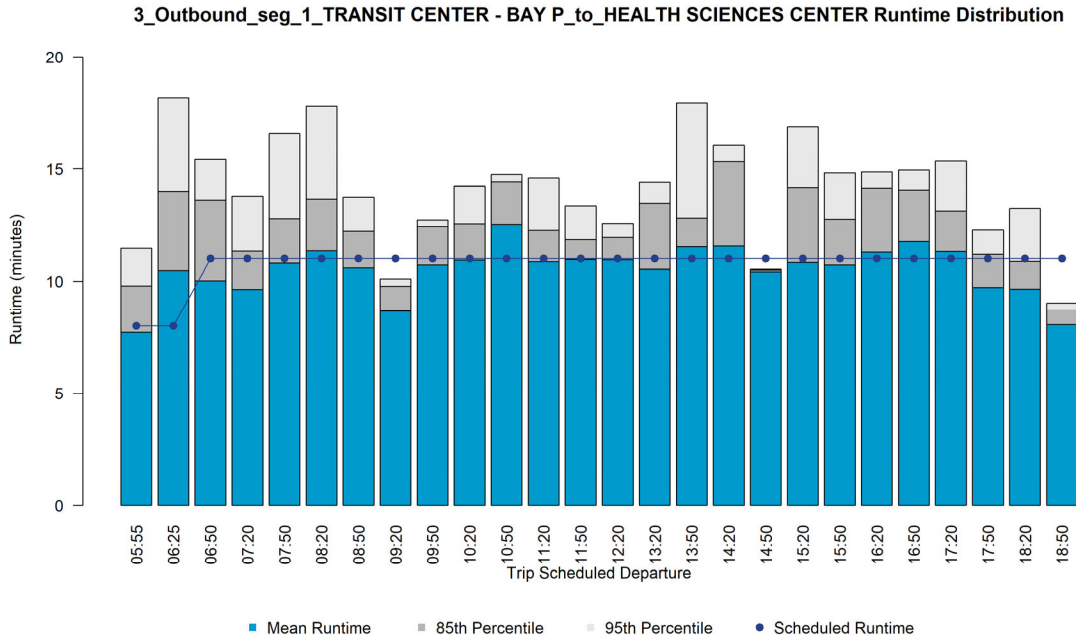


Figure 9 Runtime Chart – Route 003 Inbound, Health Sciences Center to Downtown Transit Center



**Outbound**

**Figure 10 Runtime Chart – Route 003 Outbound, Downtown Transit Center to Health Sciences Center**



**Figure 11 Runtime Chart – Route 003 Outbound, Health Sciences Center to NE 36<sup>th</sup> & Kelley**

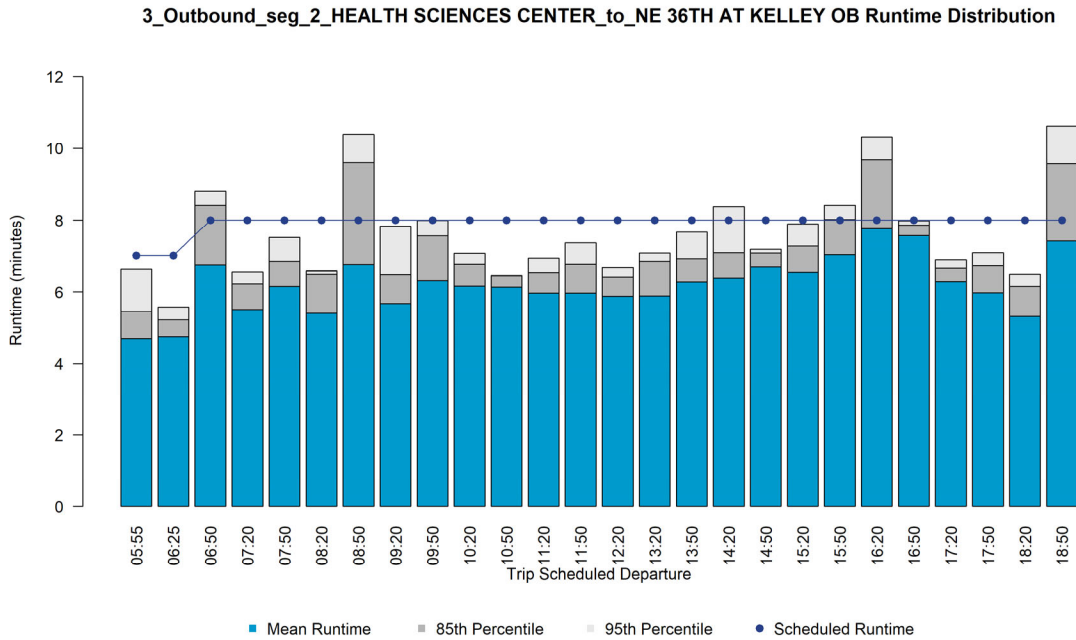
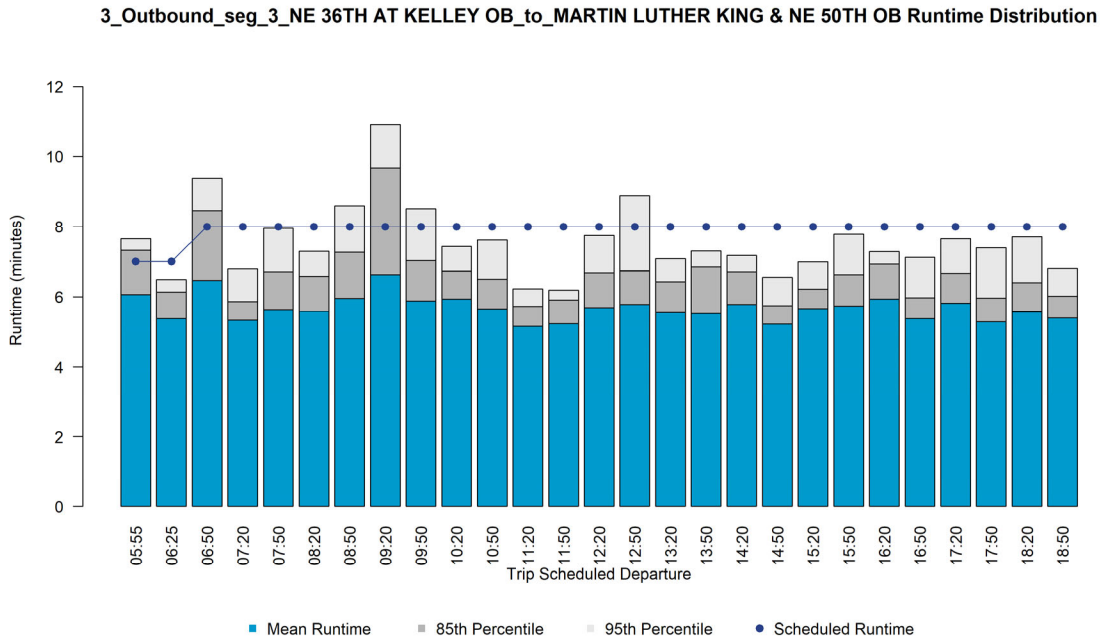


Figure 12 Runtime Chart – Route 003 Outbound, NE 36<sup>th</sup> & Kelley to MLK & NE 50<sup>th</sup>



## Route 005

### Inbound

Figure 13 Runtime Chart – Route 005 Inbound, Mercy Hospital to Penn & Memorial

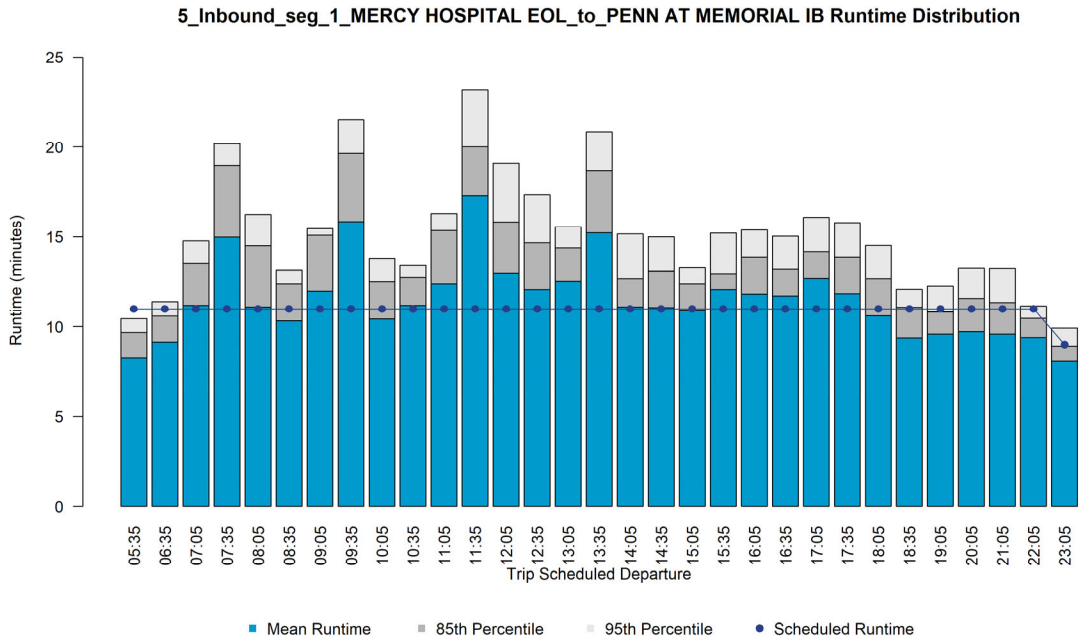




Figure 14 Runtime Chart – Route 005 Inbound, Penn & Memorial to Western & Hefner

5\_Inbound\_seg\_2\_PENN AT MEMORIAL IB\_to\_WESTERN AT HEFNER IB Runtime Distribution

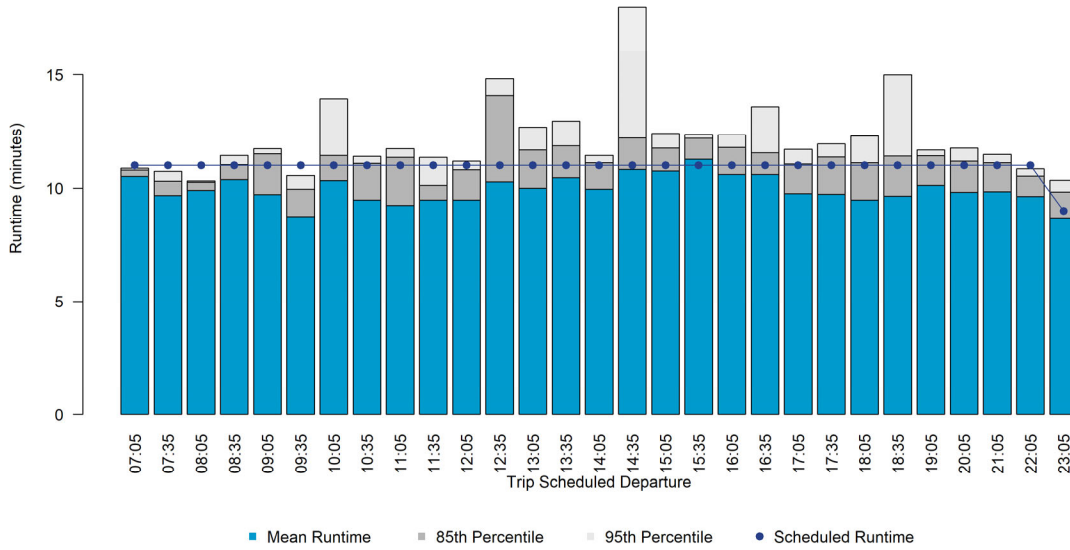


Figure 15 Runtime Chart – Route 005 Inbound, Western & Hefner to Western & Wilshire

5\_Inbound\_seg\_3\_WESTERN AT HEFNER IB\_to\_WESTERN AT WILSHIRE IB Runtime Distribution

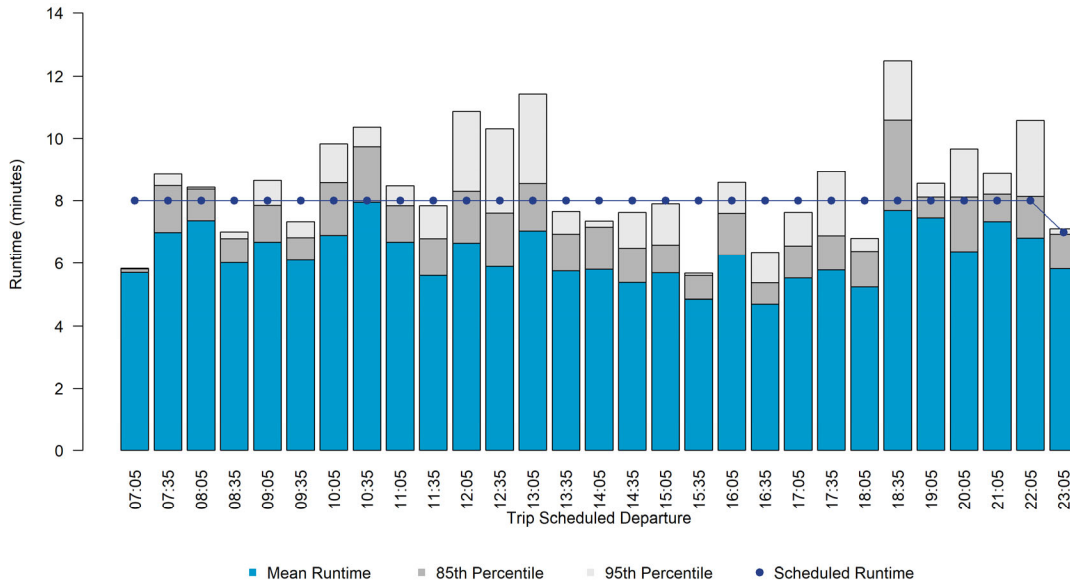


Figure 16 Runtime Chart – Route 005 Inbound, Western & Wilshire to Classen & Belle Isle

5\_Inbound\_seg\_4\_WESTERN AT WILSHIRE IB\_to\_CLASSEN AT BELLE ISLE IB Runtime Distribution

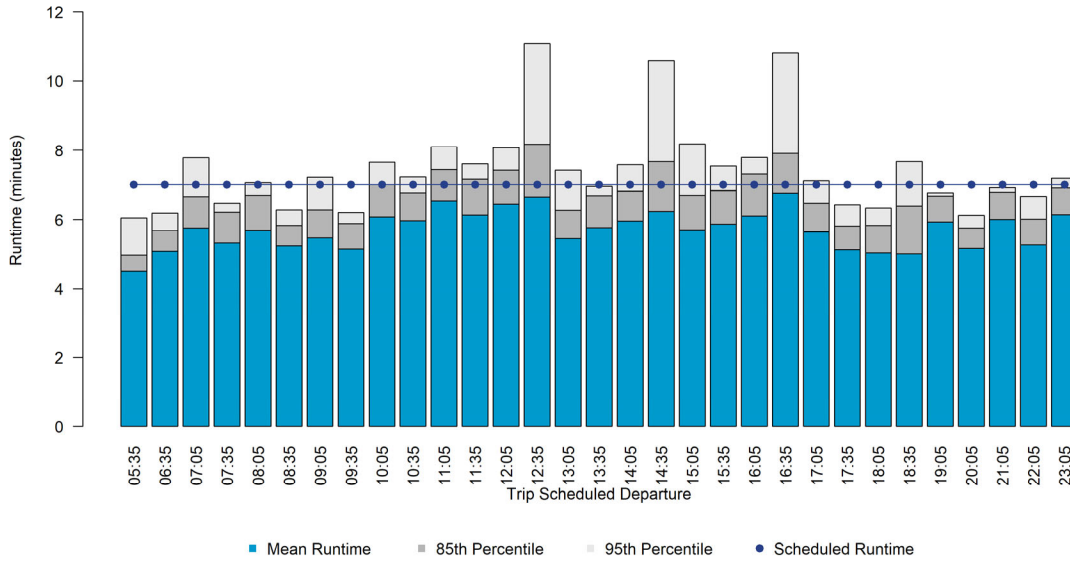


Figure 17 Runtime Chart – Route 005 Inbound, Classen & Belle Isle to Classen & NW 23<sup>rd</sup>

5\_Inbound\_seg\_5\_CLASSEN AT BELLE ISLE IB\_to\_CLASSEN AT NW 23RD IB Runtime Distribution

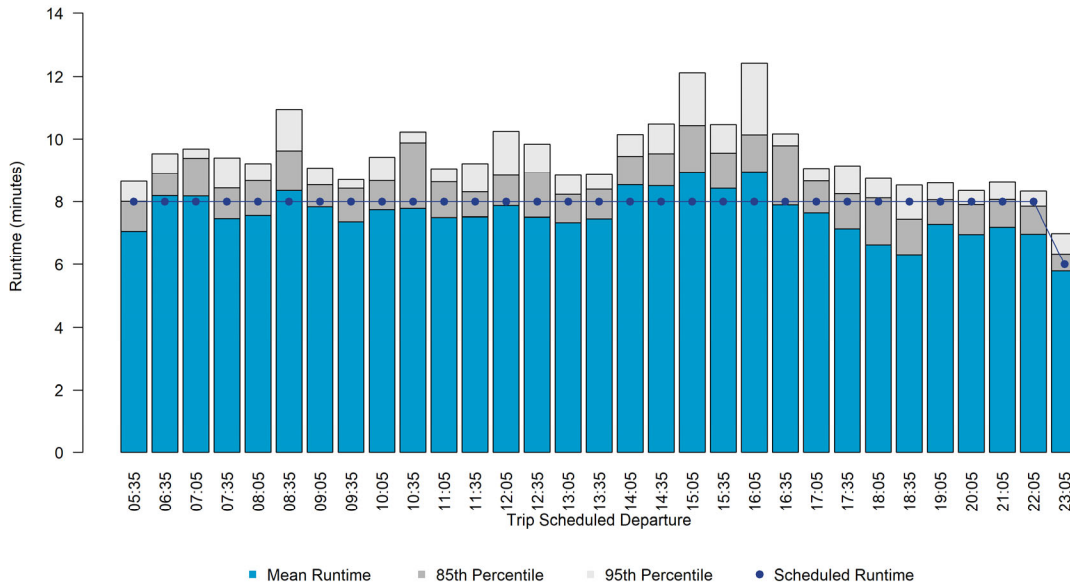
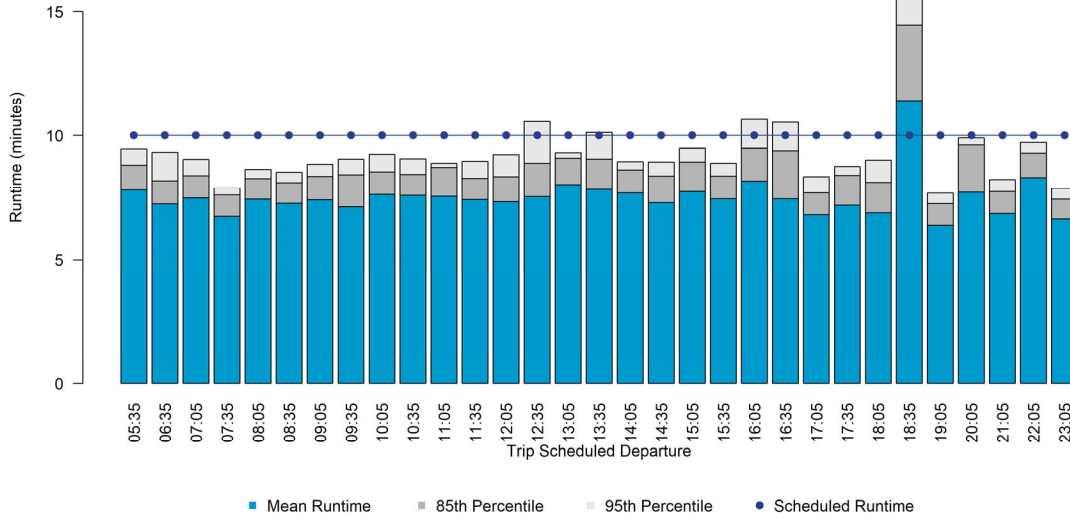


Figure 18 Runtime Chart – Route 005 Inbound, Classen & NW 23<sup>rd</sup> to Downtown Transit Center

5\_Inbound\_seg\_6\_CLASSEN AT NW 23RD IB\_to\_TRANSIT CENTER - BAY N Runtime Distribution



**Outbound**

Figure 19 Runtime Chart – Route 005 Outbound, Downtown Transit Center to NW 23<sup>rd</sup> & Classen

5\_Outbound\_seg\_1\_TRANSIT CENTER - BAY N\_to\_NW 23RD AT CLASSEN OB Runtime Distribution

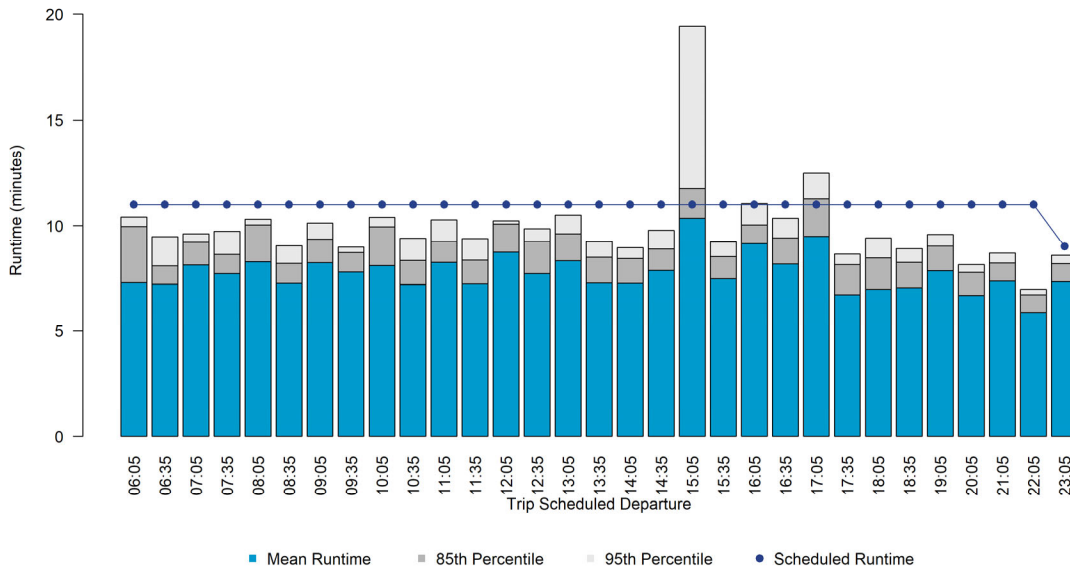


Figure 20 Runtime Chart – Route 005 Outbound, NW 23<sup>rd</sup> & Classen to Classen & Belle Isle

5\_Outbound\_seg\_2\_NW 23RD AT CLASSEN OB\_to\_CLASSEN AT BELLE ISLE OB Runtime Distribution

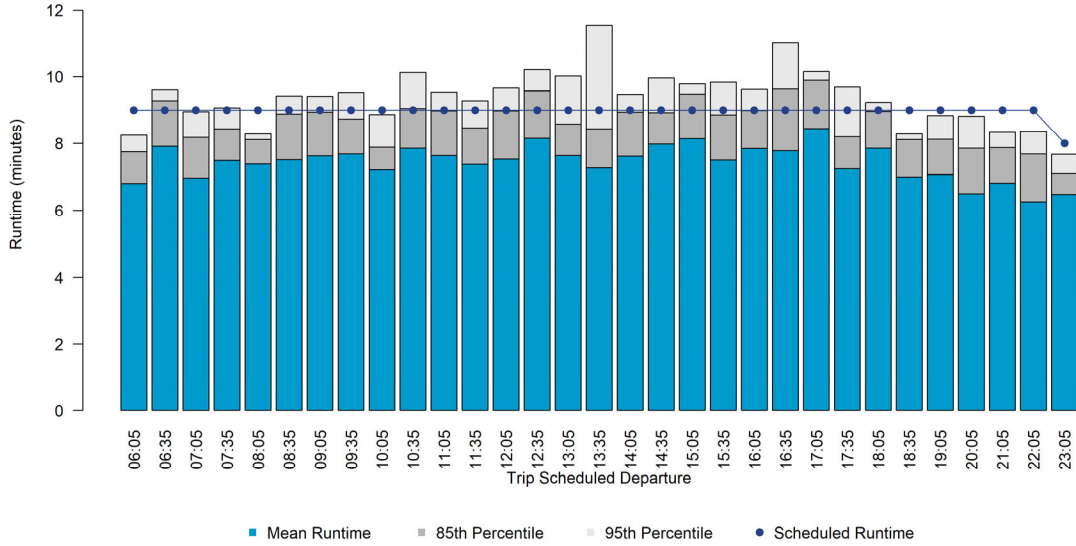


Figure 21 Runtime Chart – Route 005 Outbound, Classen & Belle Isle to Western & Wilshire

5\_Outbound\_seg\_3\_CLASSEN AT BELLE ISLE OB\_to\_WESTERN AT WILSHIRE OB Runtime Distribution

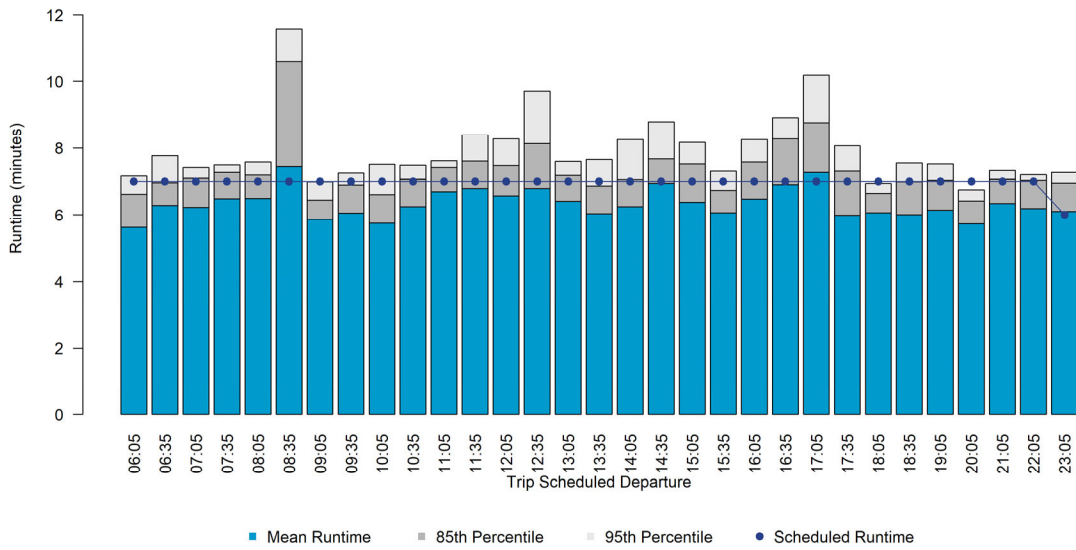


Figure 22 Runtime Chart – Route 005 Outbound, Western & Wilshire to Hefner & Western

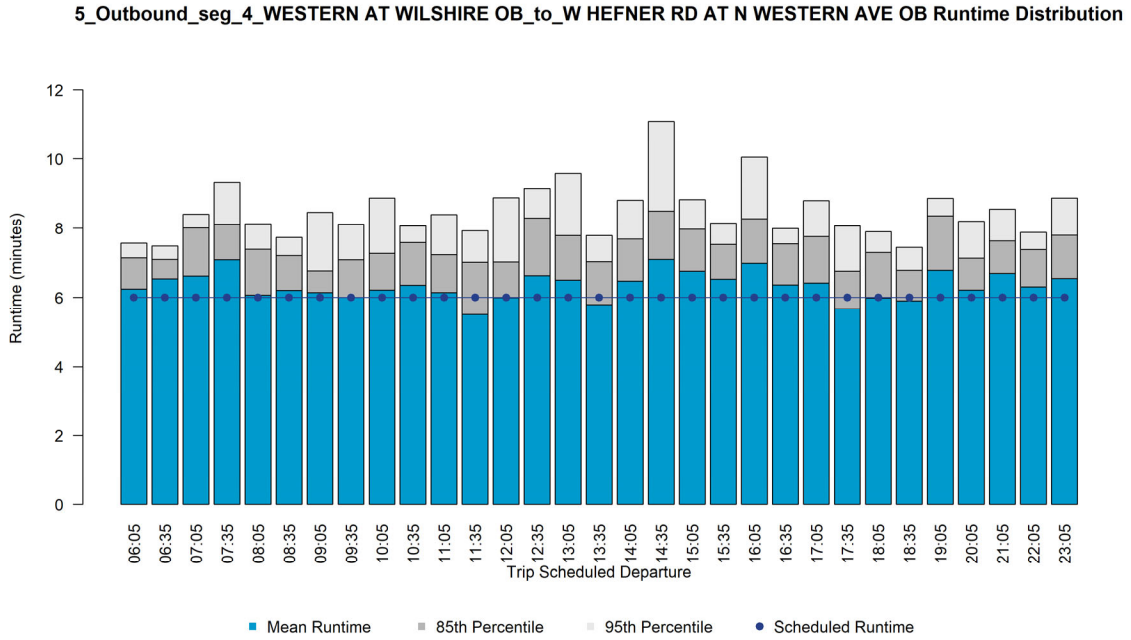


Figure 23 Runtime Chart – Route 005 Outbound, Hefner & Western to NW 140<sup>th</sup> & Penn

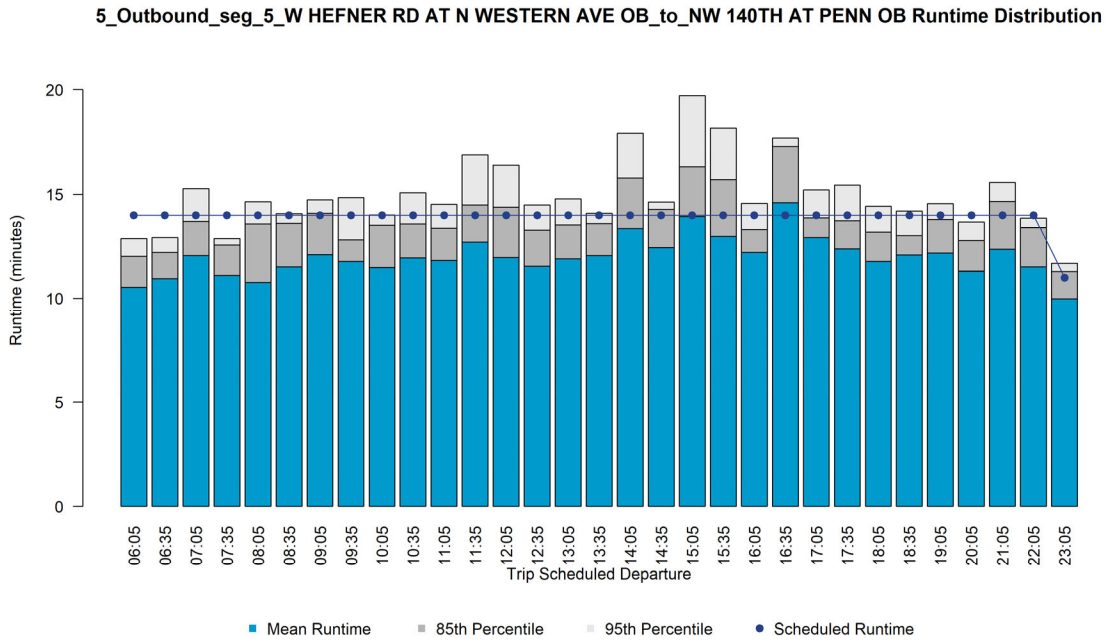
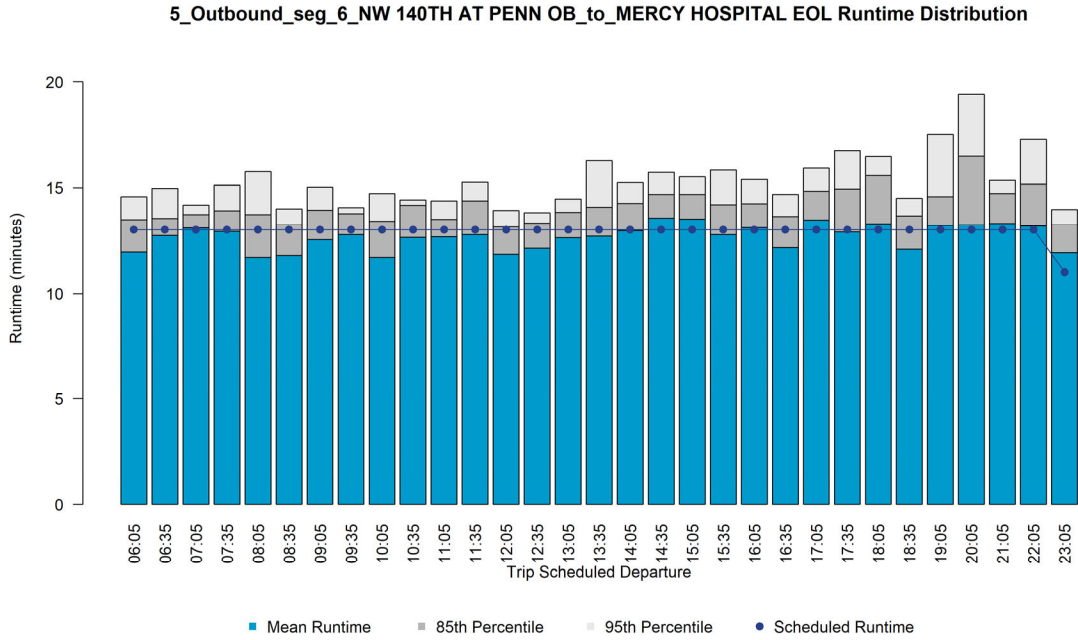


Figure 24 Runtime Chart – Route 005 Outbound, NW 140<sup>th</sup> & Penn to Mercy Hospital



## Route 007

### Inbound

Figure 25 Runtime Chart – Route 007 Inbound, Baptist Integris Hospital to May & NW 36<sup>th</sup>

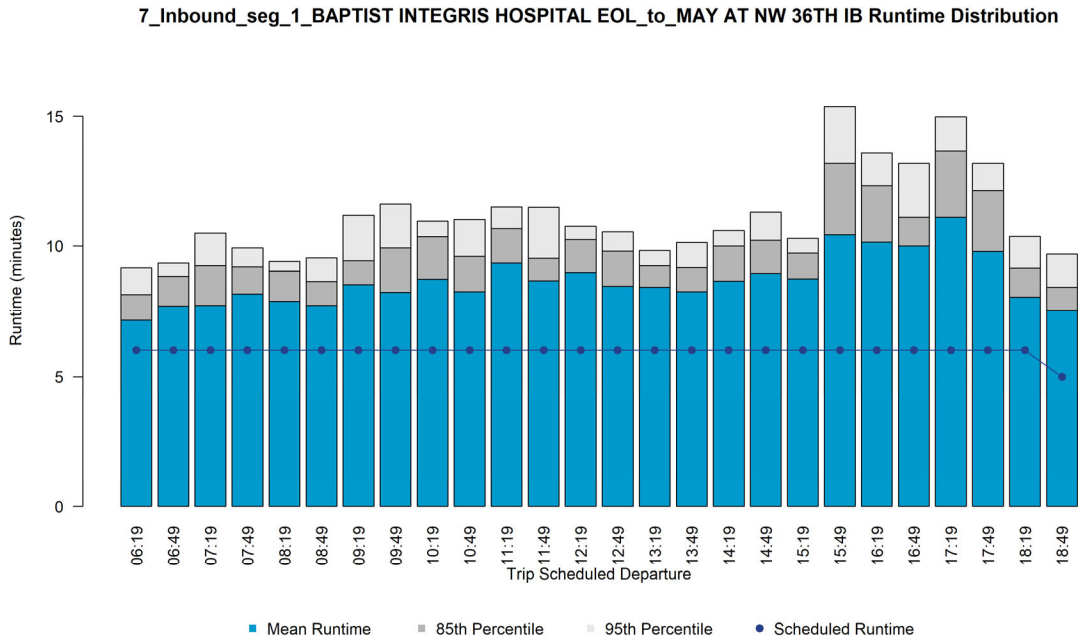


Figure 26 Runtime Chart – Route 007 Inbound, May & NW 36<sup>th</sup> to Penn & NW 23<sup>rd</sup>

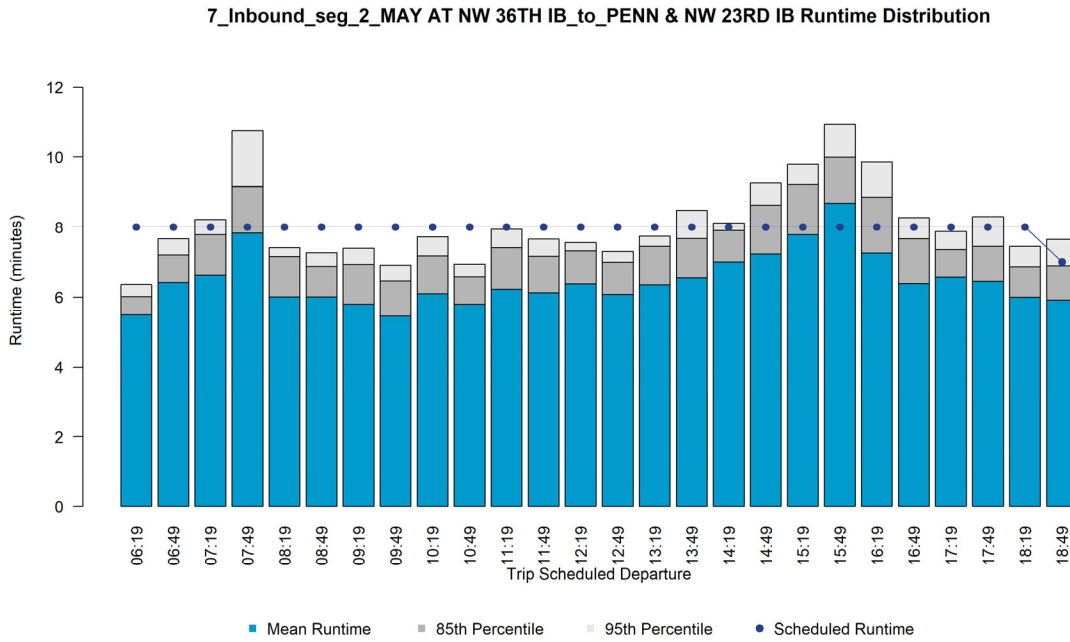


Figure 27 Runtime Chart – Route 007 Inbound, Penn & NW 23<sup>rd</sup> to Penn & NW 16<sup>th</sup>

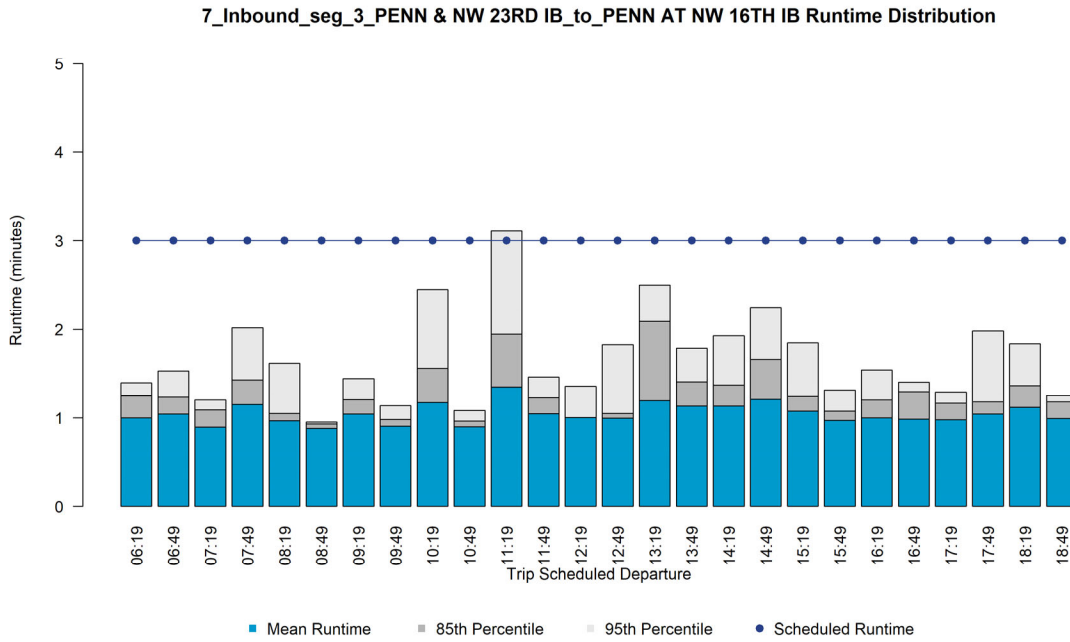
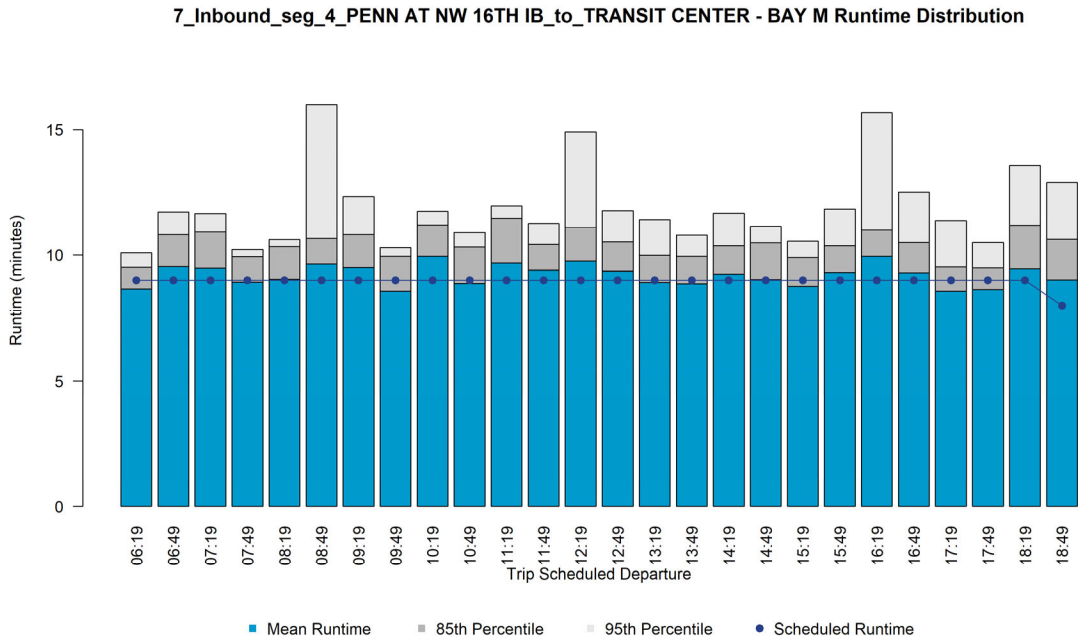


Figure 28 Runtime Chart – Route 007 Inbound, Penn & NW 16<sup>th</sup> to Downtown Transit Center



**Outbound**

Figure 29 Runtime Chart – Route 007 Outbound, Downtown Transit Center to Penn & NW 16<sup>th</sup>

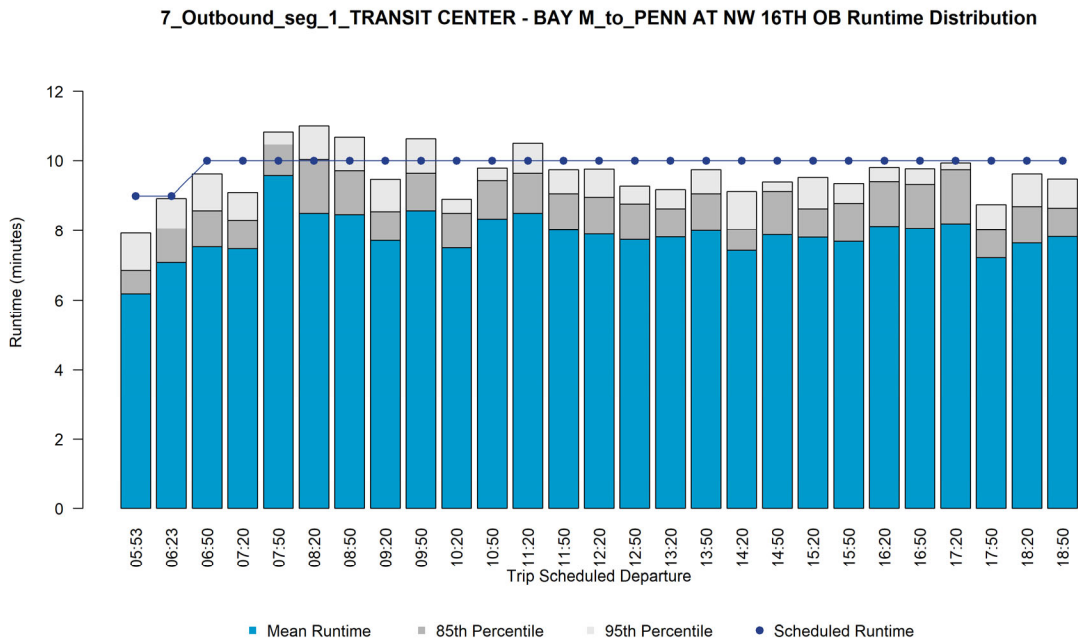




Figure 30 Runtime Chart – Route 007 Outbound, Penn & NW 16<sup>th</sup> to NW 36<sup>th</sup> & May

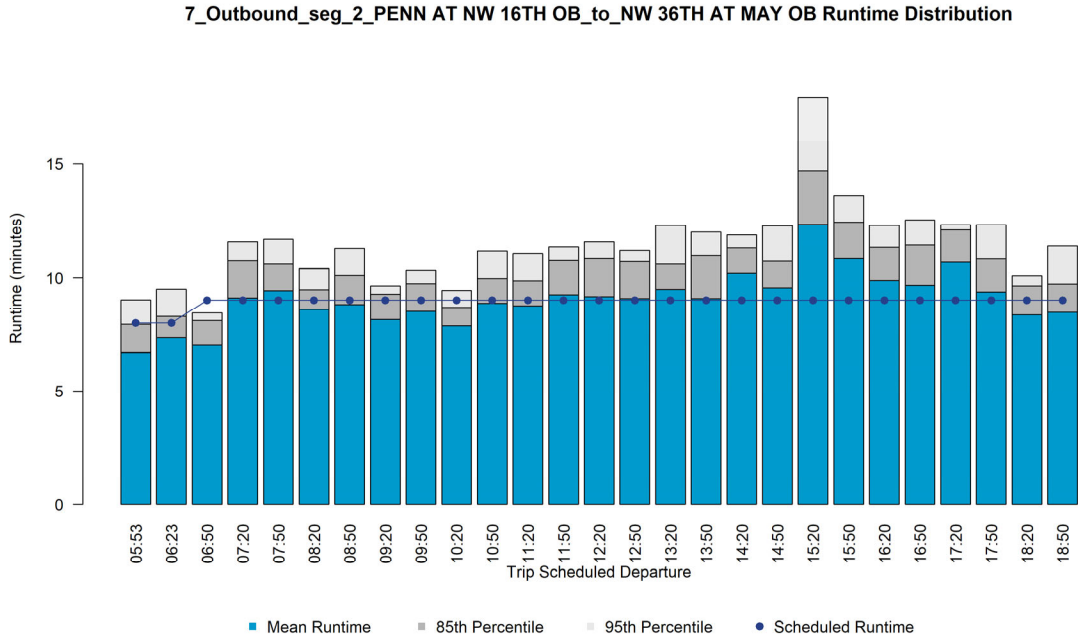
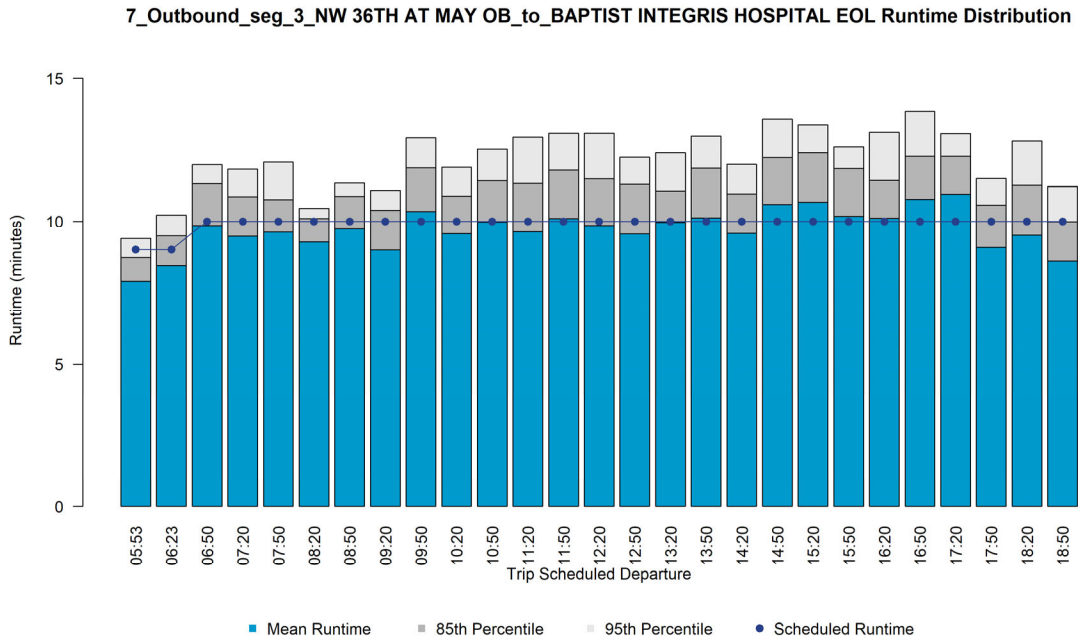


Figure 31 Runtime Chart – Route 007 Outbound, NW 36<sup>th</sup> & May to Baptist Integris Hospital



## Route 008

### Inbound

Figure 32 Runtime Chart – Route 008 Inbound, Wilshire & Lyrewood to NW 63<sup>rd</sup> & Meridian

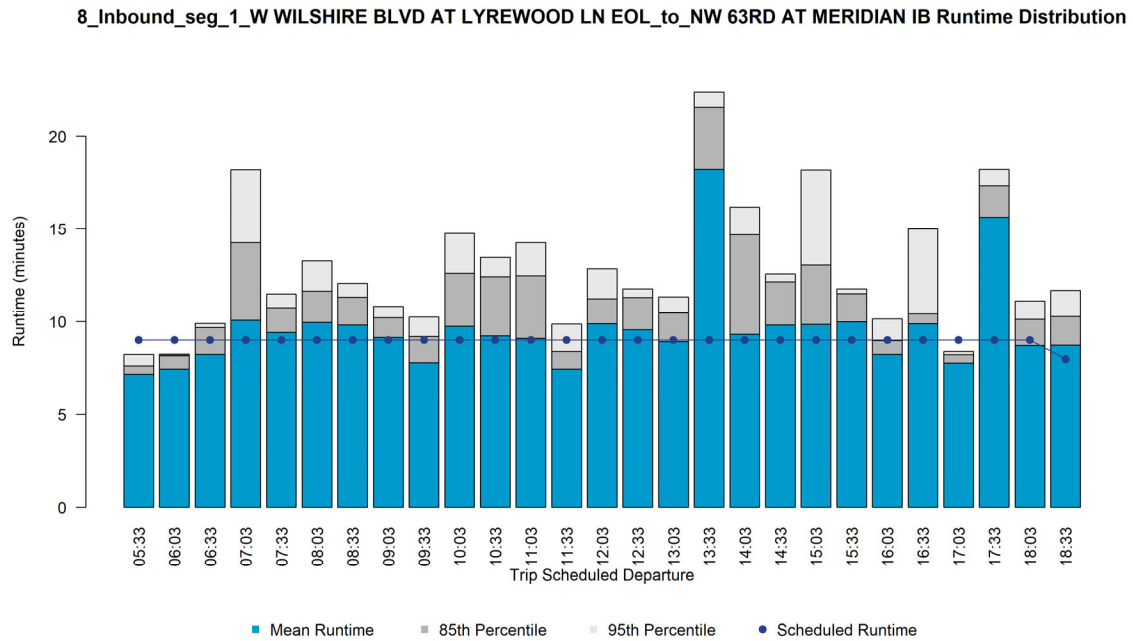


Figure 33 Runtime Chart – Route 008 Inbound, NW 63<sup>rd</sup> & Meridian to NW 63<sup>rd</sup> & Independence

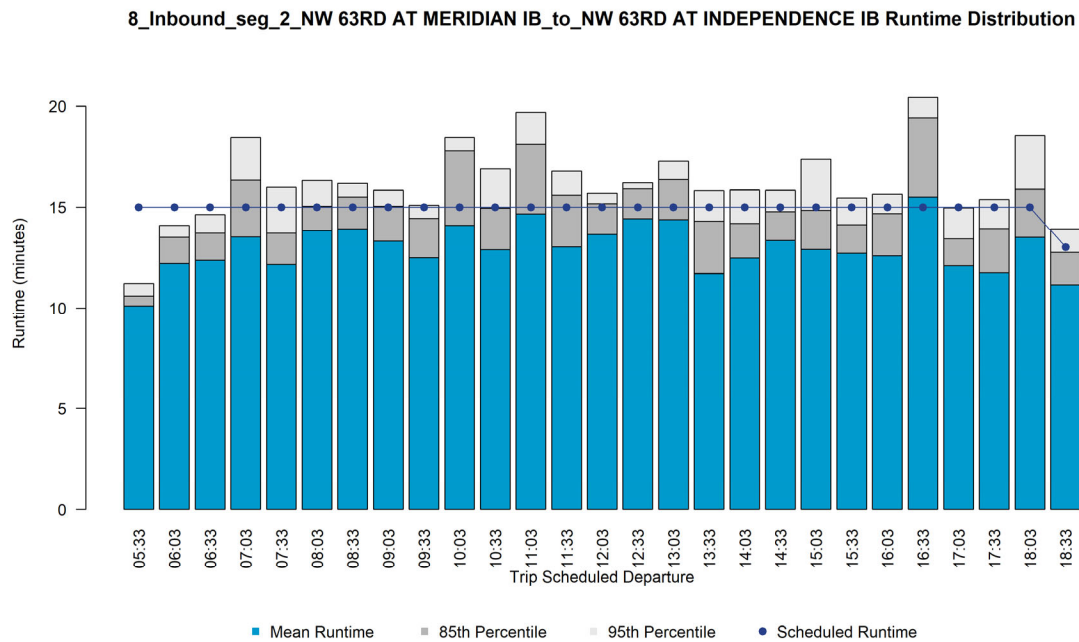


Figure 34 Runtime Chart – Route 008 Inbound, NW 63rd & Independence to Penn & Bellevue

8\_Inbound\_seg\_3\_NW 63RD AT INDEPENDENCE IB\_to\_PENNSYLVANIA & BELLEVUE DR IB Runtime Distribution

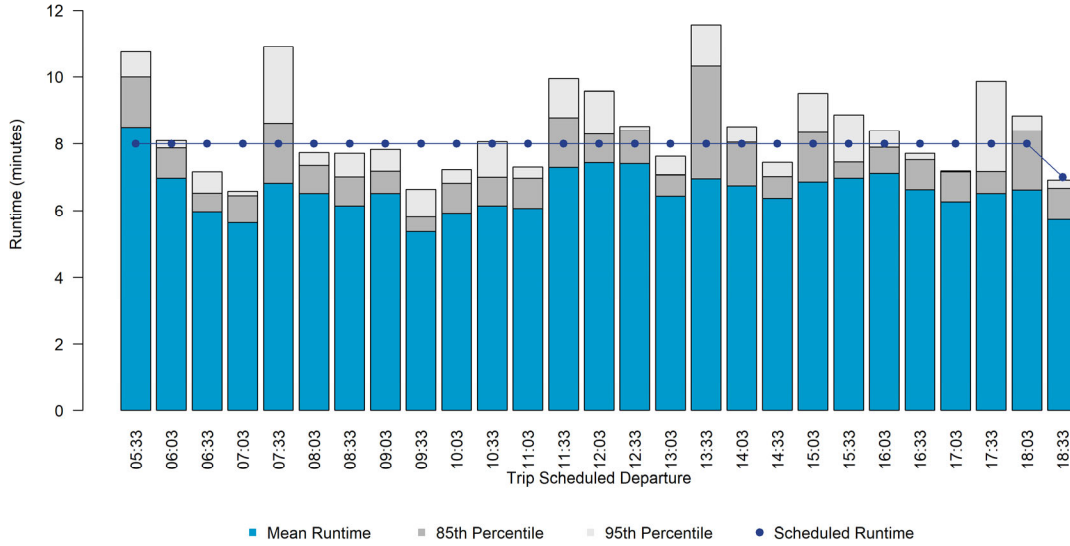


Figure 35 Runtime Chart – Route 008 Inbound, Penn & Bellevue to Penn & NW 23rd

8\_Inbound\_seg\_4\_PENNSYLVANIA & BELLEVUE DR IB\_to\_PENN & NW 23RD IB Runtime Distribution

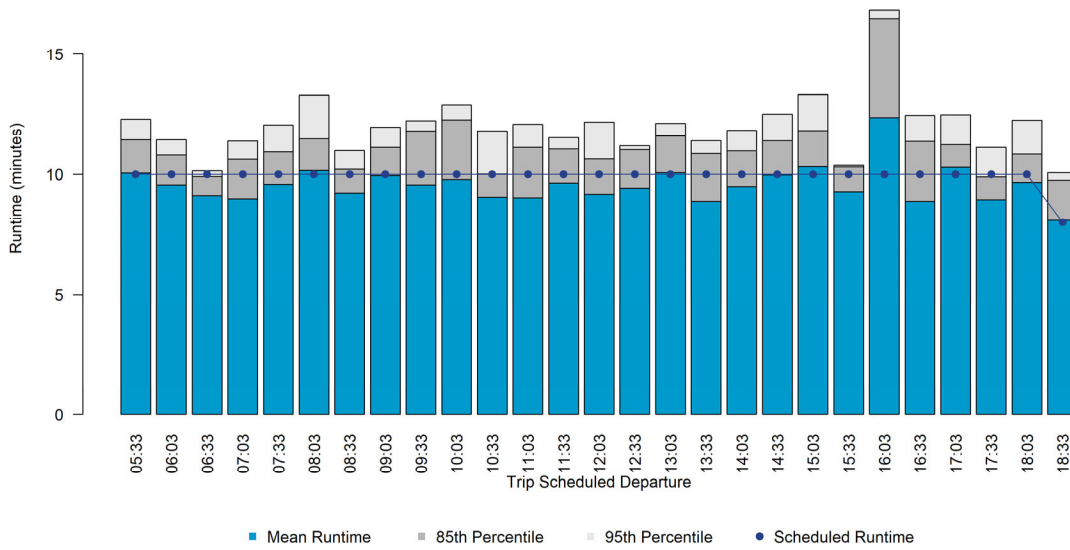
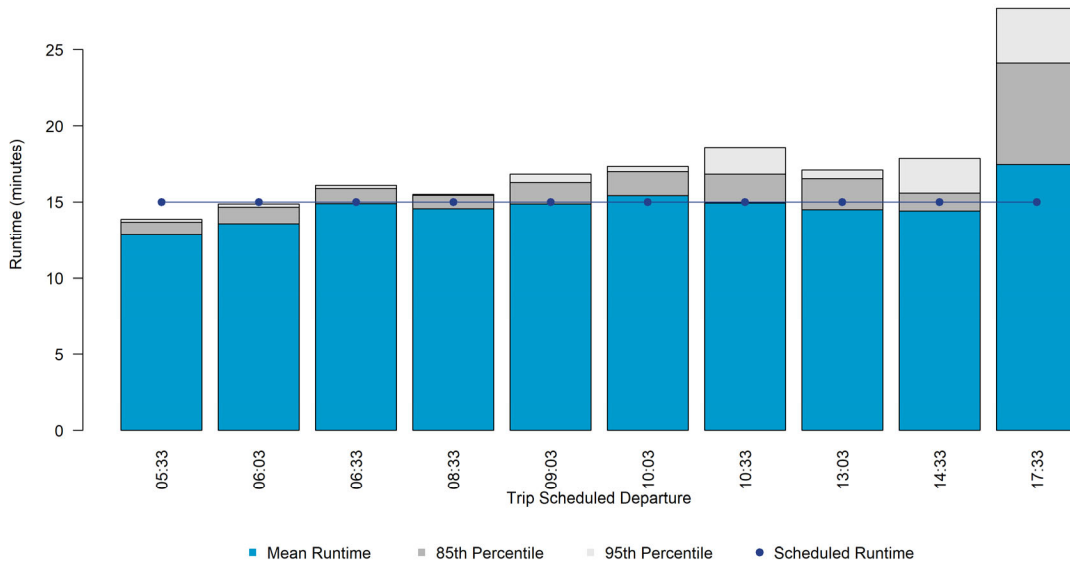


Figure 36 Runtime Chart – Route 008 Inbound, Penn & NW 23<sup>rd</sup> to Downtown Transit Center

8\_Inbound\_seg\_5\_PENN & NW 23RD IB\_to\_TRANSIT CENTER - BAY F Runtime Distribution



**Outbound**

Figure 37 Runtime Chart – Route 008 Outbound, Downtown Transit Center to Penn & NW 23<sup>rd</sup>

8\_Outbound\_seg\_1\_TRANSIT CENTER - BAY F\_to\_PENN AT NW 23RD OB Runtime Distribution

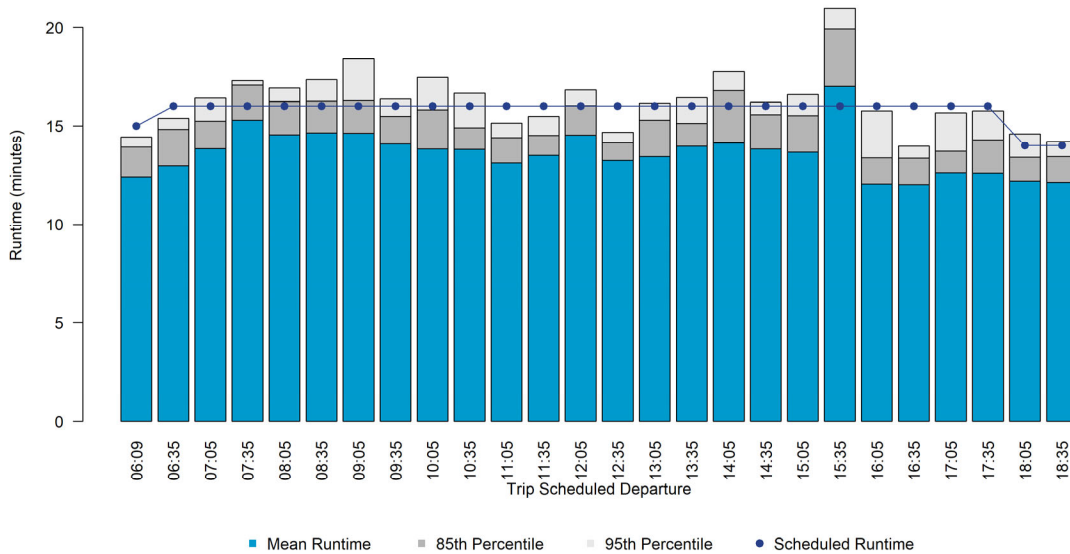


Figure 38 Runtime Chart – Route 008 Outbound, Penn & NW 23<sup>rd</sup> to Penn Square Mall

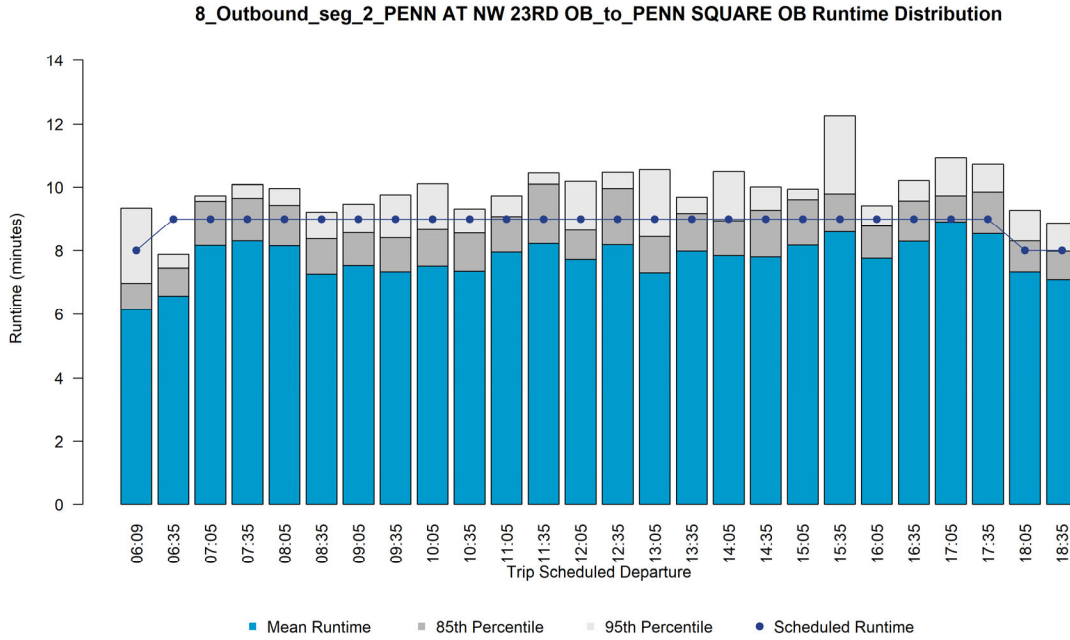


Figure 39 Runtime Chart – Route 008 Outbound, Penn Square Mall to NW 63<sup>rd</sup> & Independence

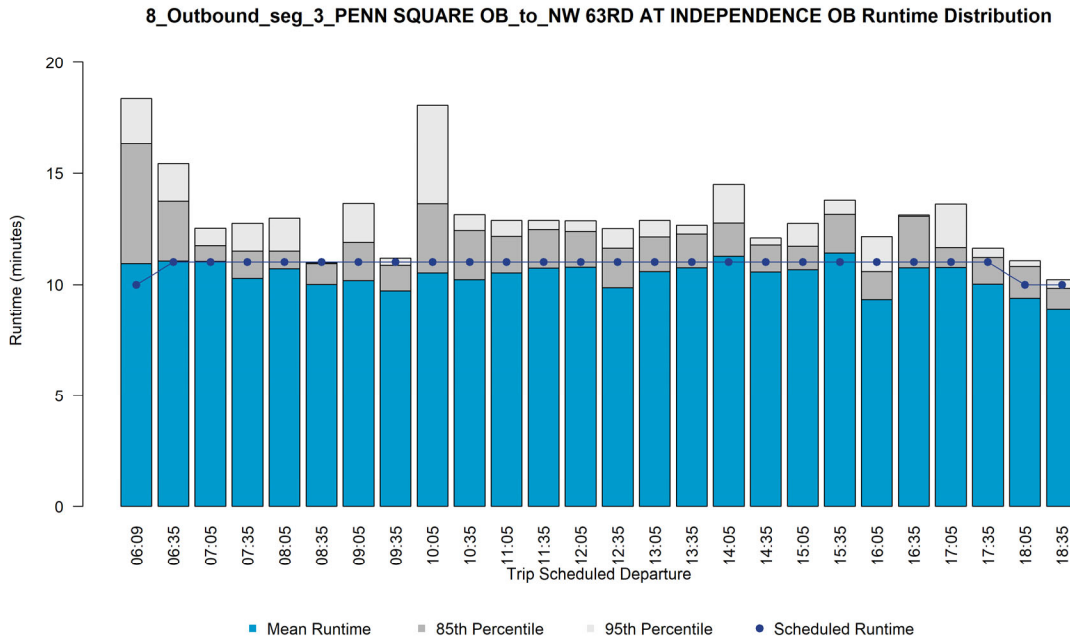


Figure 40 Runtime Chart – Route 008 Outbound, NW 63rd & Independence to NW 63rd & Meridian

8\_Outbound\_seg\_4\_NW 63RD AT INDEPENDENCE OB\_to\_NW 63RD AT MERIDIAN OB Runtime Distribution

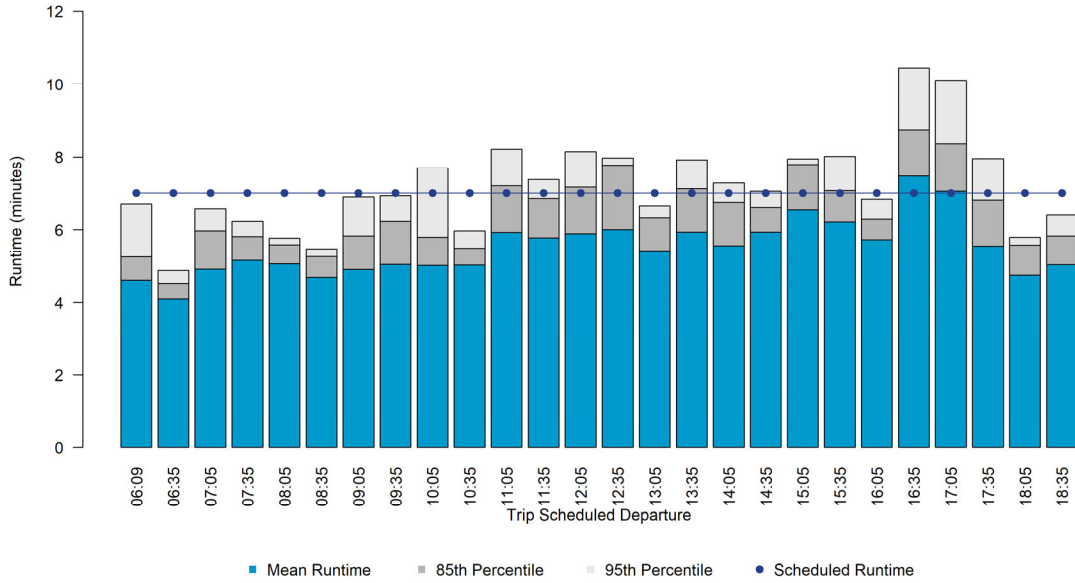
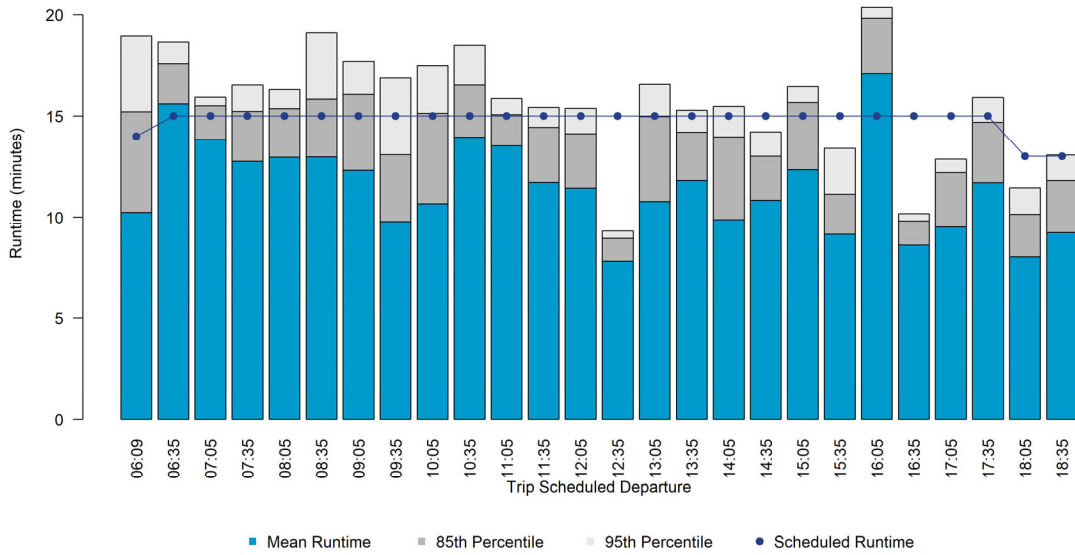


Figure 41 Runtime Chart – Route 008 Outbound, NW 63rd & Meridian to Wilshire & Lyrewood

8\_Outbound\_seg\_5\_NW 63RD AT MERIDIAN OB\_to\_W WILSHIRE BLVD AT LYREWOOD LN EOL Runtime Distribution



## Route 009

### Inbound

Figure 42 Runtime Chart – Route 009 Inbound, Reno Mini Hub to Reno & Meridian

9\_Inbound\_seg\_1\_GREENFIELD CENTER DR EOL\_to\_RENO & MERIDIAN IB Runtime Distribution

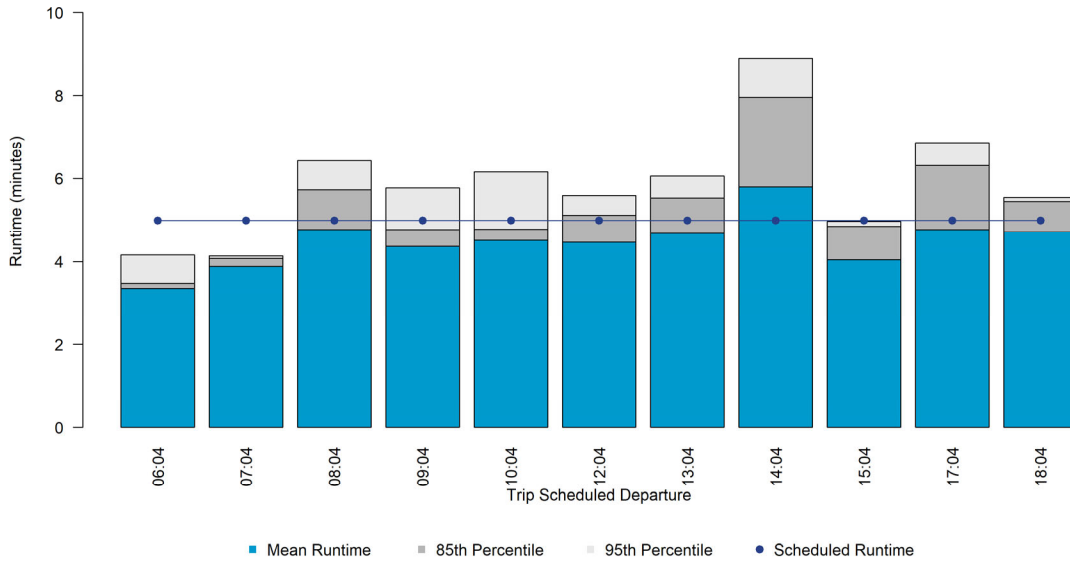


Figure 43 Runtime Chart – Route 009 Inbound, Reno & Meridian to Reno & May

9\_Inbound\_seg\_2\_RENO & MERIDIAN IB\_to\_RENO & MAY IB Runtime Distribution

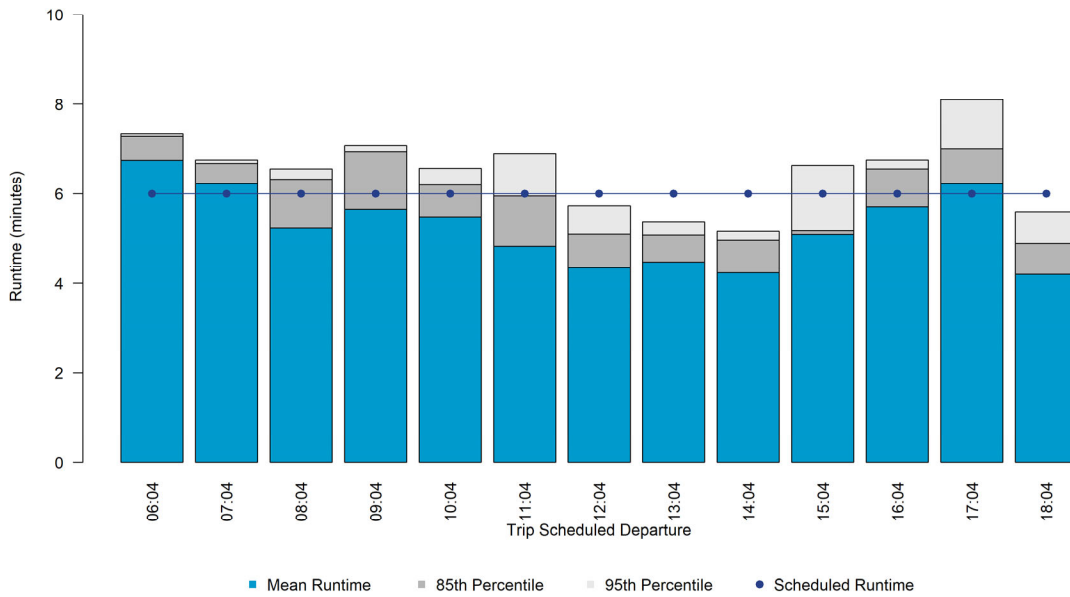


Figure 44 Runtime Chart – Route 009 Inbound, Reno & May to Main & Penn

9\_Inbound\_seg\_3\_RENO & MAY IB\_to\_MAIN AT PENNSYLVANIA IB Runtime Distribution

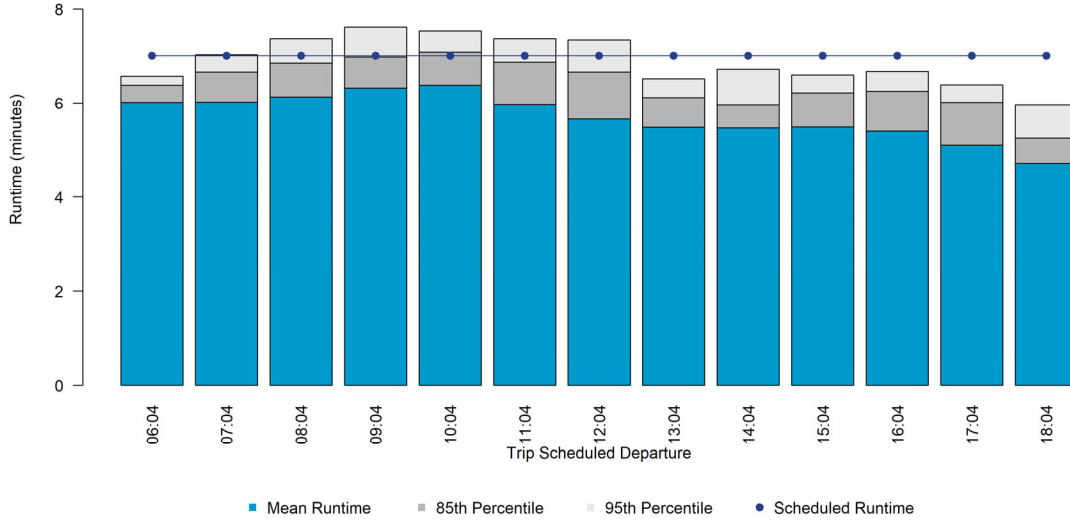
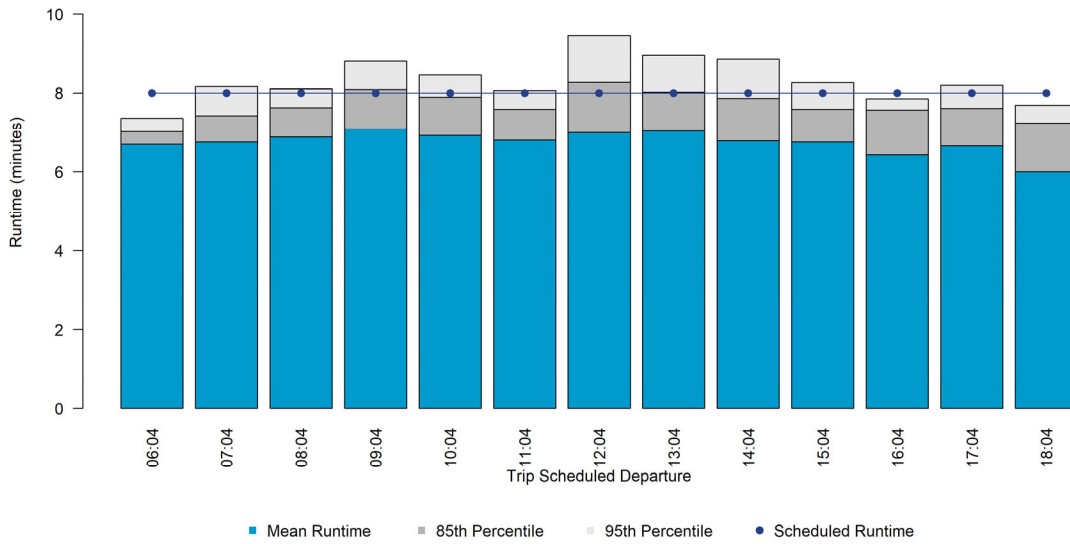


Figure 45 Runtime Chart – Route 009 Inbound, Main & Penn to Downtown Transit Center

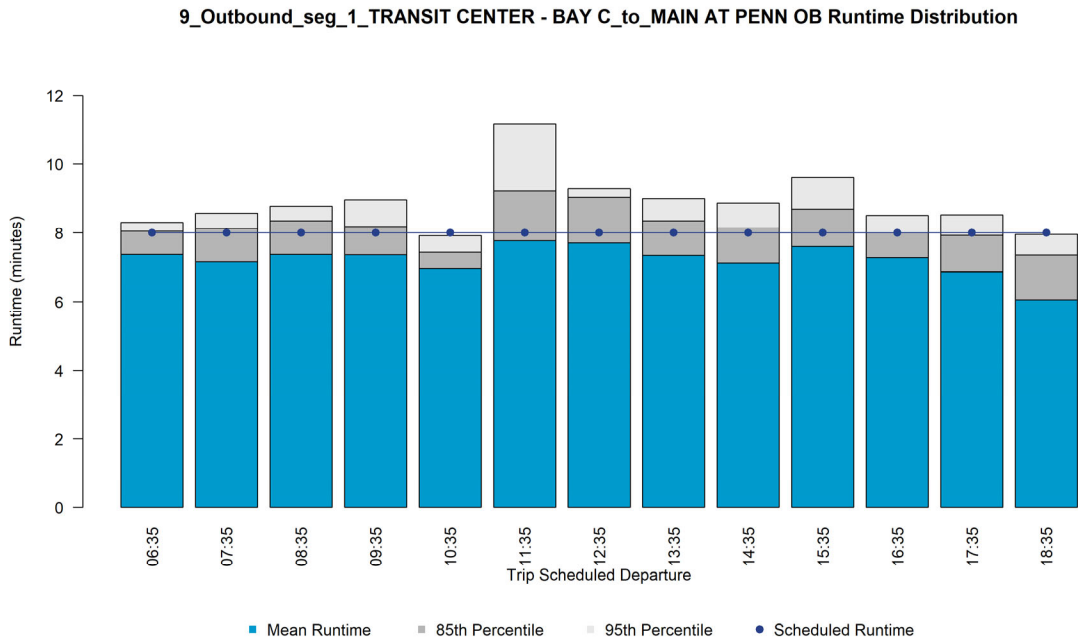
9\_Inbound\_seg\_4\_MAIN AT PENNSYLVANIA IB\_to\_TRANSIT CENTER - BAY C Runtime Distribution





**Outbound**

**Figure 46 Runtime Chart – Route 009 Outbound, Downtown Transit Center to Main & Penn**



**Figure 47 Runtime Chart – Route 009 Outbound, Main & Penn to Reno & May**

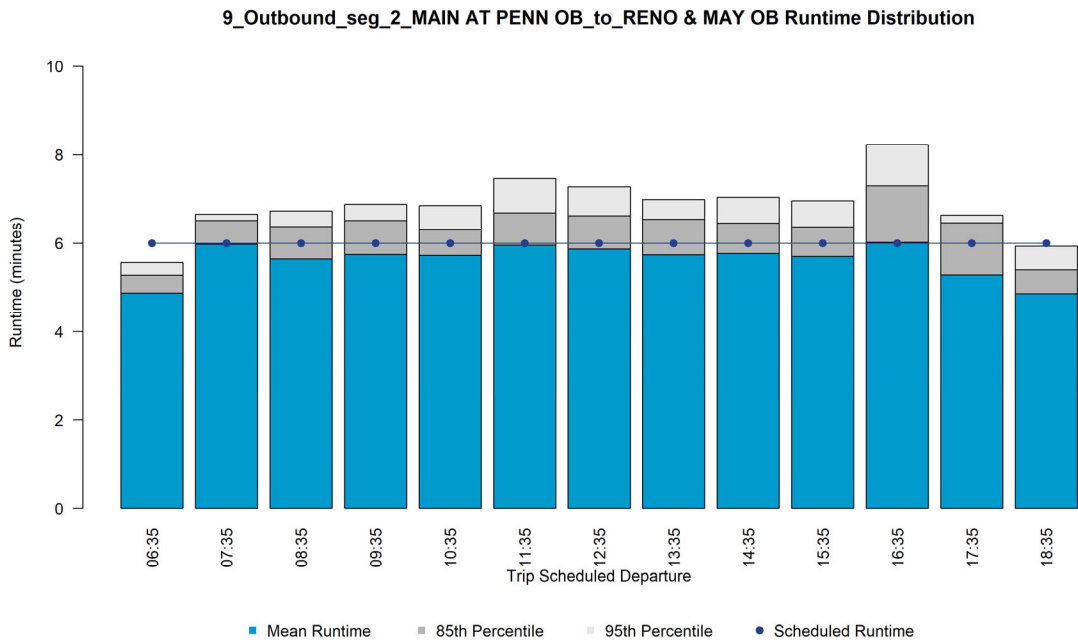


Figure 48 Runtime Chart – Route 009 Outbound, Reno & May to Reno & Meridian

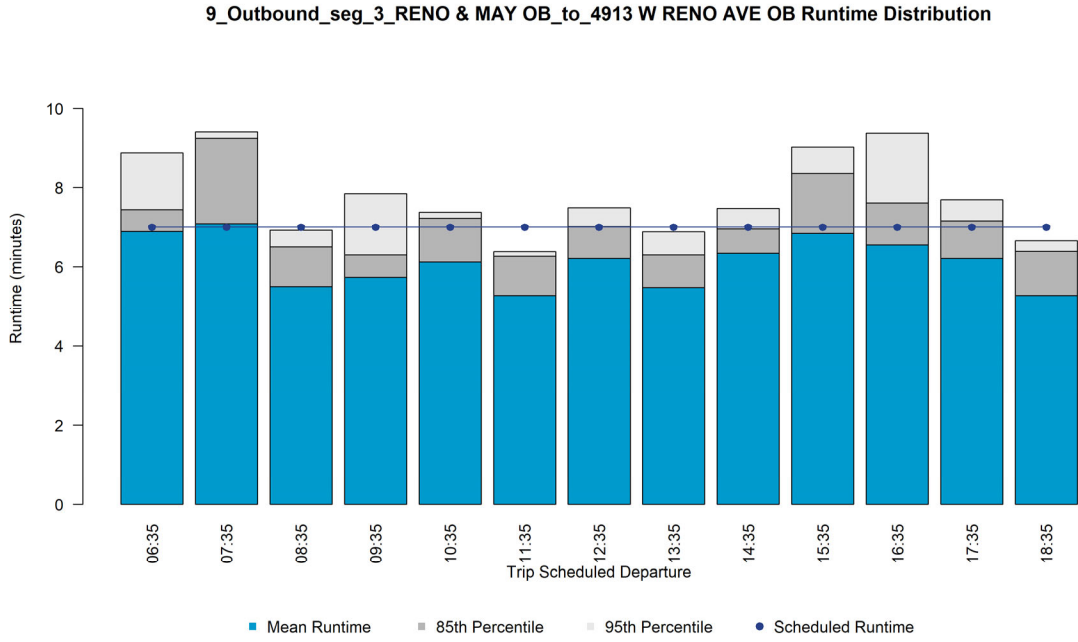
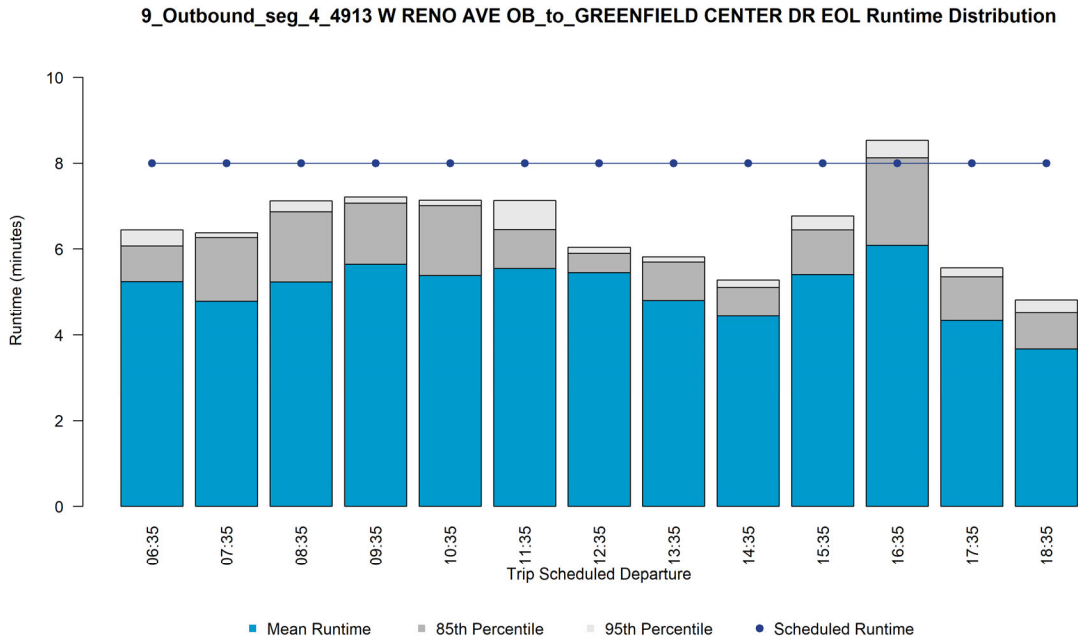


Figure 49 Runtime Chart – Route 009 Outbound, Reno & Meridian to Reno Mini Hub



## Route 010

### Inbound

Figure 50 Runtime Chart – Route 010 Inbound, NW 50<sup>th</sup> & Meridian to Portland & NW 36<sup>th</sup>

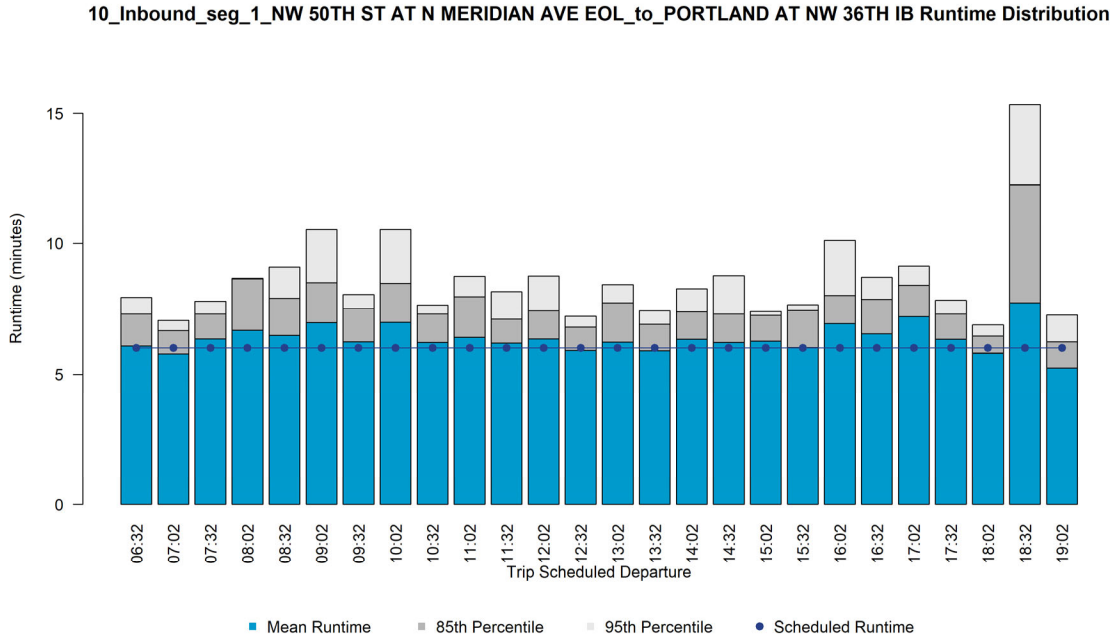


Figure 51 Runtime Chart – Route 010 Inbound, Portland & NW 36<sup>th</sup> to NW 16<sup>th</sup> & Portland

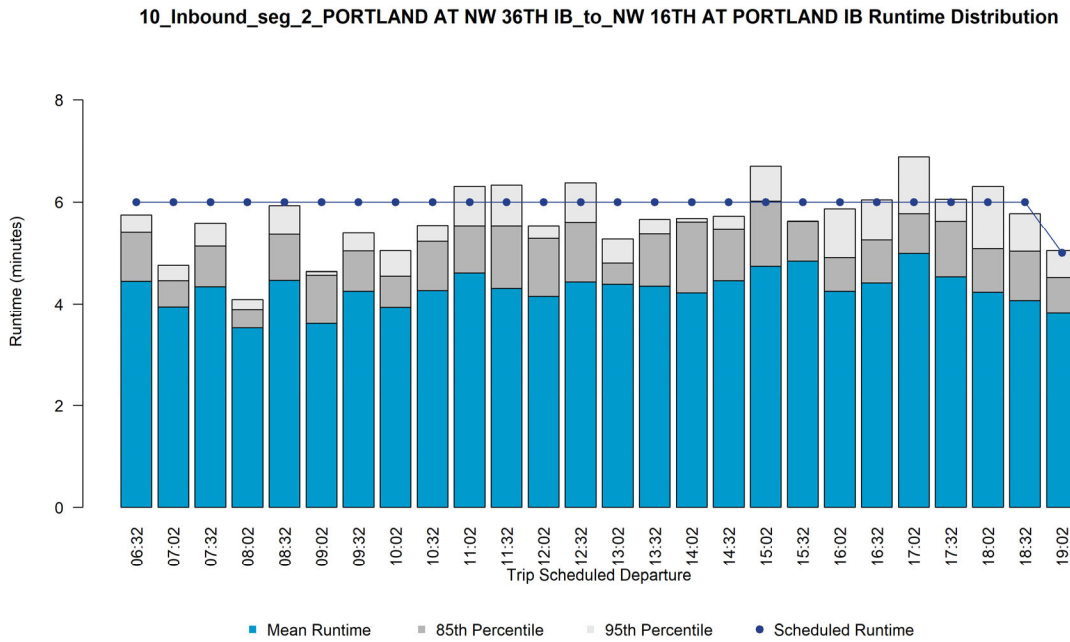


Figure 52 Runtime Chart – Route 010 Inbound, NW 16<sup>th</sup> & Portland to NW 16<sup>th</sup> & Penn

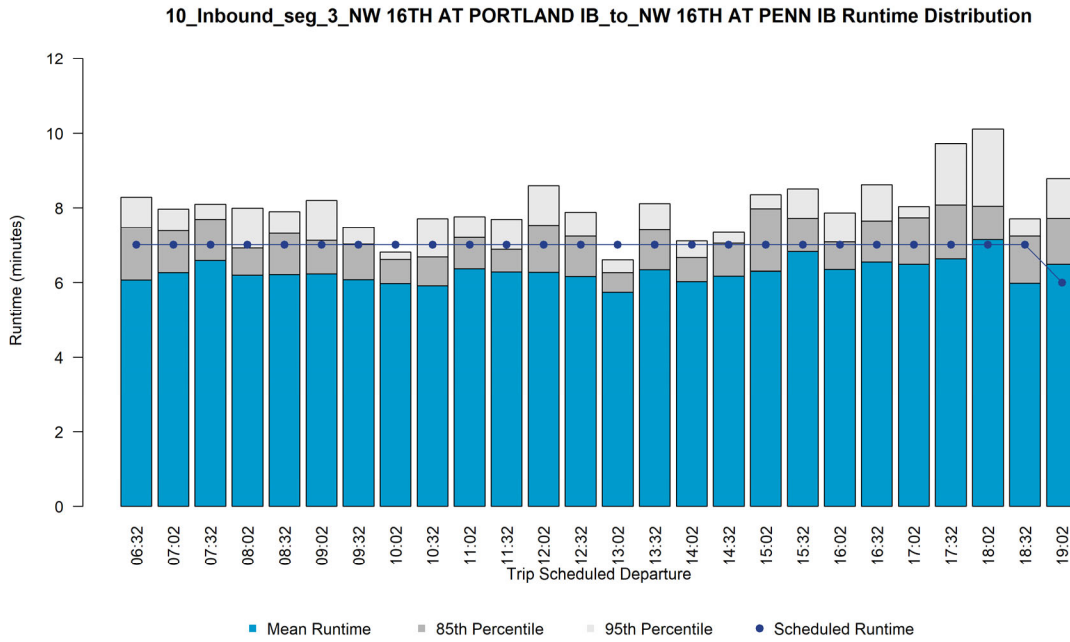
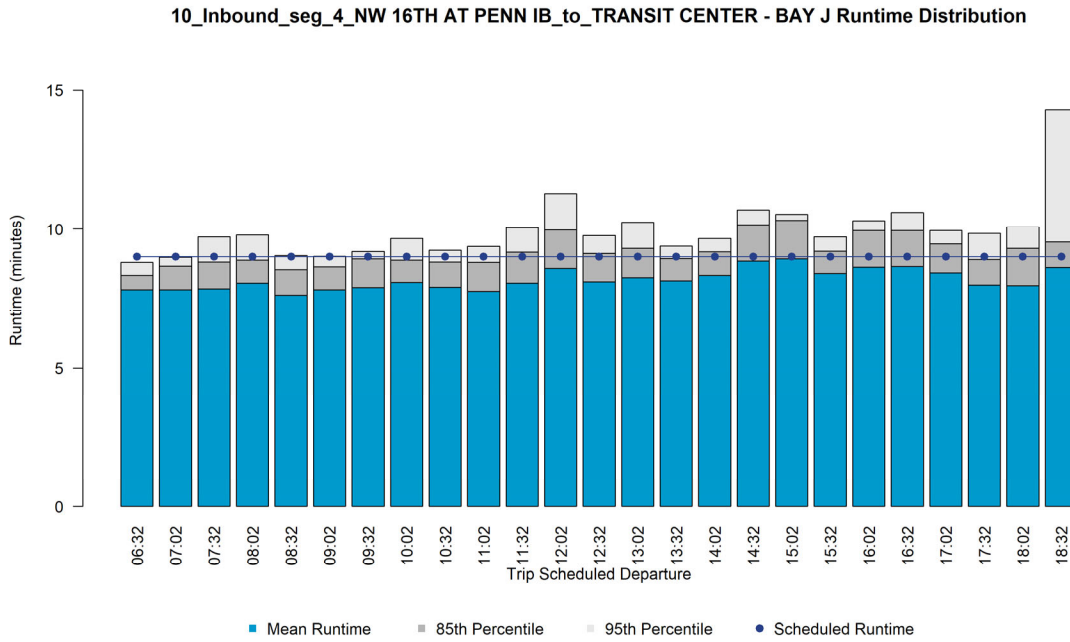


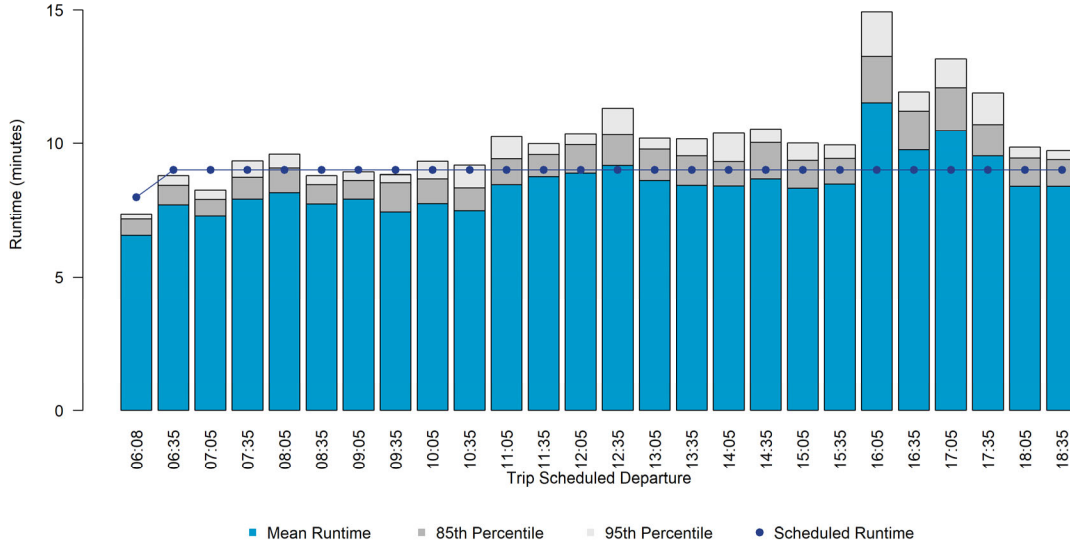
Figure 53 Runtime Chart – Route 010 Inbound, NW 16<sup>th</sup> & Penn to Downtown Transit Center



**Outbound**

**Figure 54 Runtime Chart – Route 010 Outbound, Downtown Transit Center to NW 16<sup>th</sup> & Penn**

10\_Outbound\_seg\_1\_TRANSIT CENTER - BAY J\_to\_NW 16TH AT PENN OB Runtime Distribution



**Figure 55 Runtime Chart – Route 010 Outbound, NW 16<sup>th</sup> & Penn to Portland & NW 16<sup>th</sup>**

10\_Outbound\_seg\_2\_NW 16TH AT PENN OB\_to\_PORTLAND AT NW 16TH OB Runtime Distribution

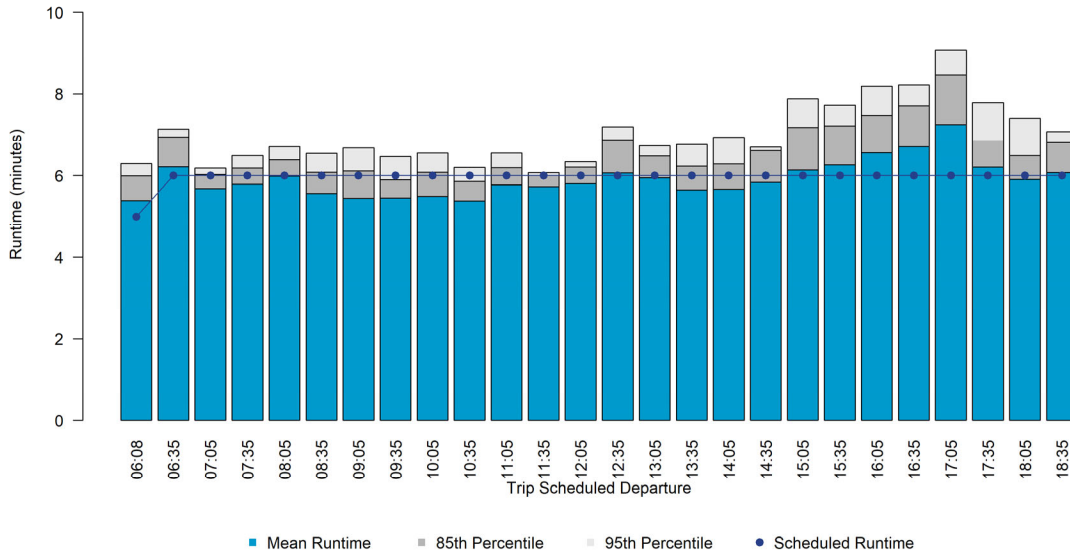


Figure 56 Runtime Chart – Route 010 Outbound, Portland & NW 16<sup>th</sup> to Portland & NW 36<sup>th</sup>

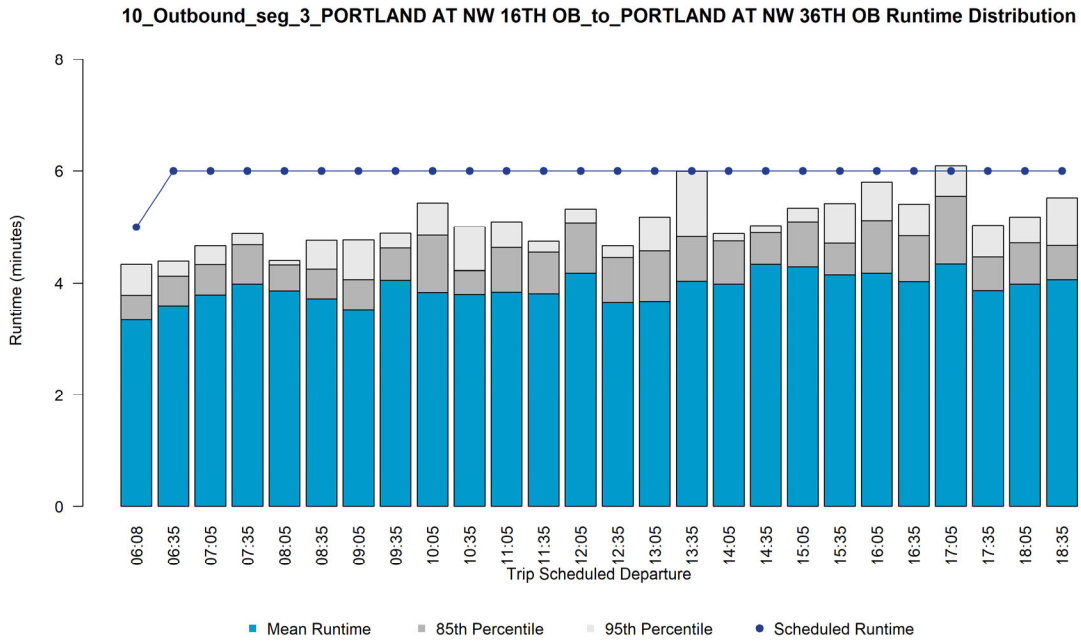
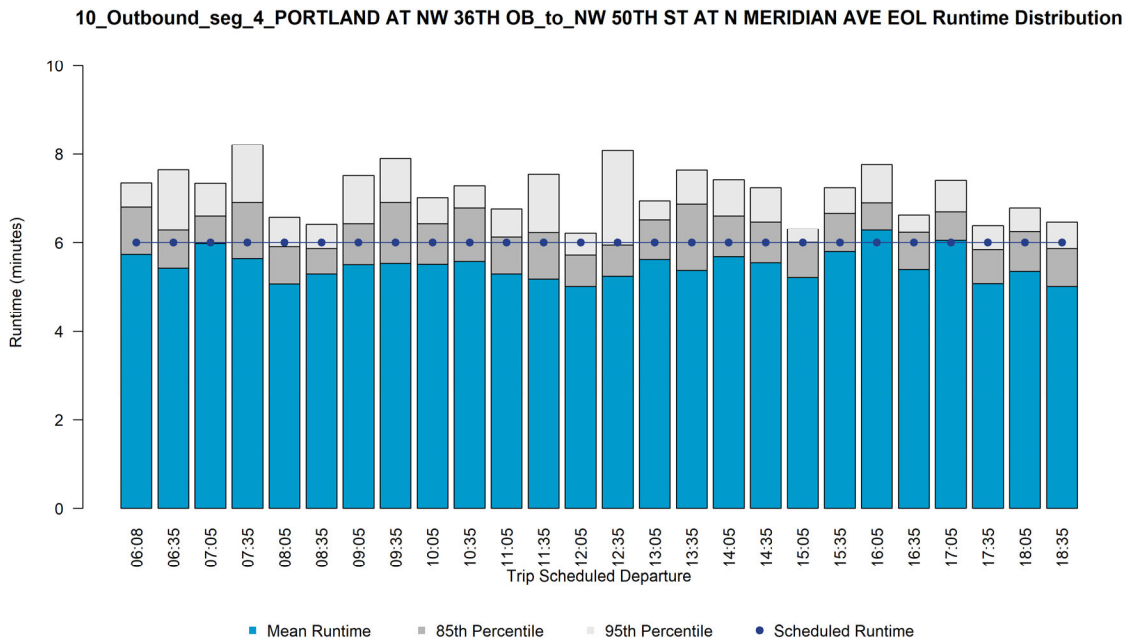


Figure 57 Runtime Chart – Route 010 Outbound, Portland & NW 36<sup>th</sup> to NW 50<sup>th</sup> & Meridian



## Route 011

### Inbound

Figure 58 Runtime Chart – Route 011 Inbound, Reno Mini Hub to Meridian & SW 15<sup>th</sup>

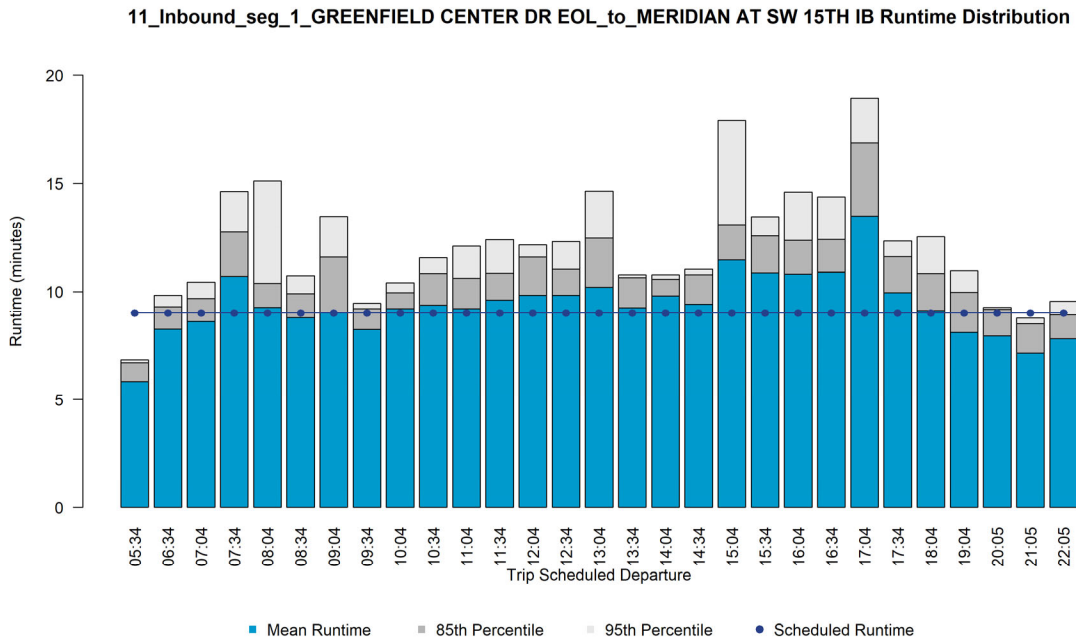


Figure 59 Runtime Chart – Route 011 Inbound, Meridian & SW 15<sup>th</sup> to SW 29<sup>th</sup> & May

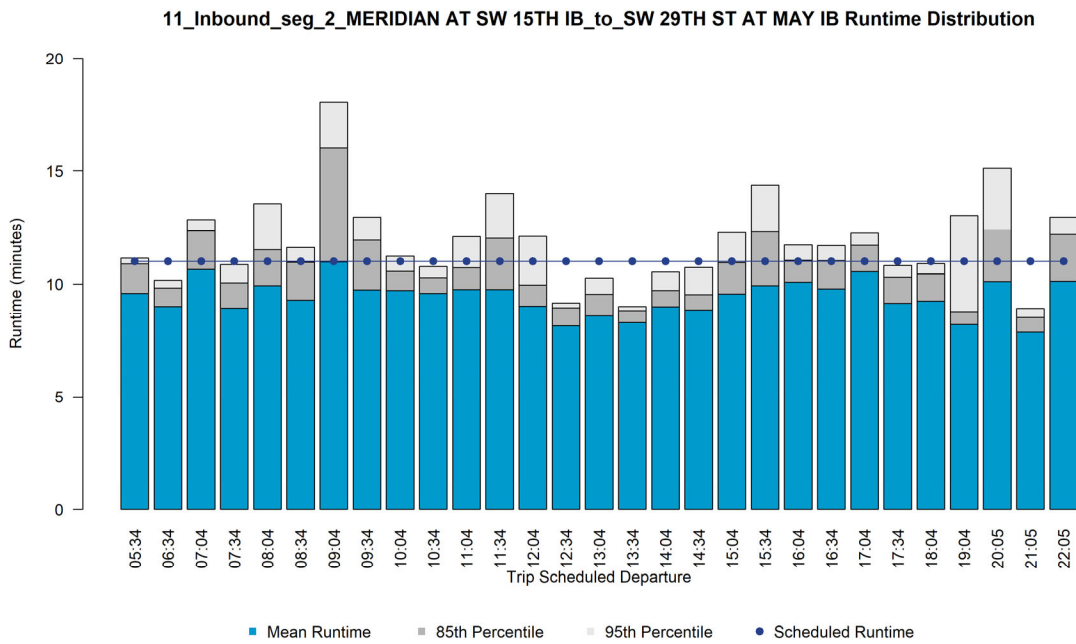


Figure 60 Runtime Chart – Route 011 Inbound, SW 29<sup>th</sup> & May to SW 29<sup>th</sup> & Walker

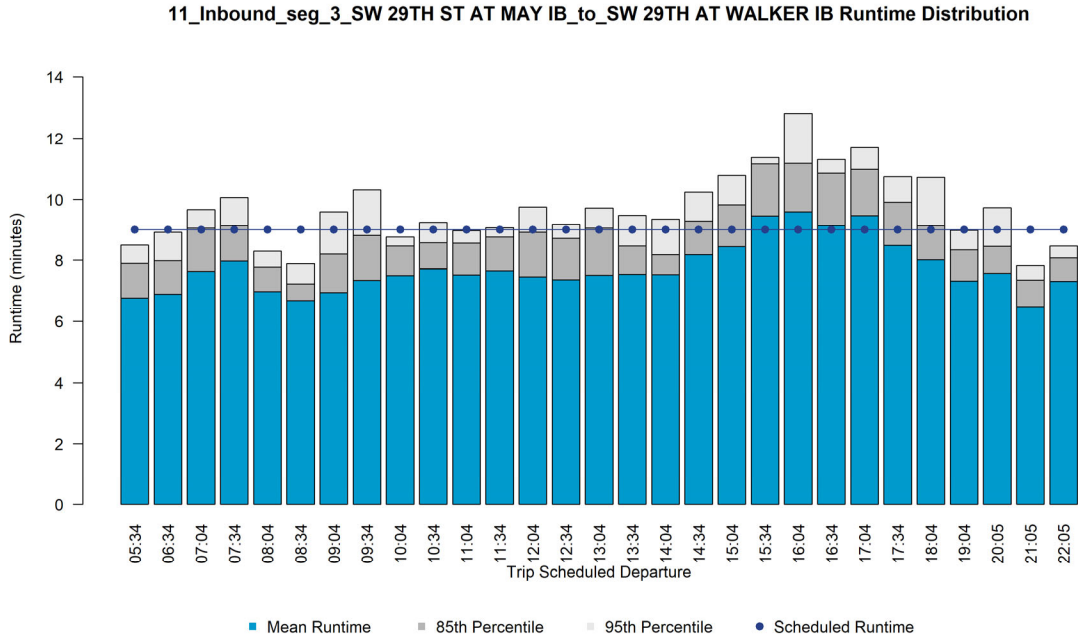


Figure 61 Runtime Chart – Route 011 Inbound, SW 29<sup>th</sup> & Walker to SE 15<sup>th</sup> & High

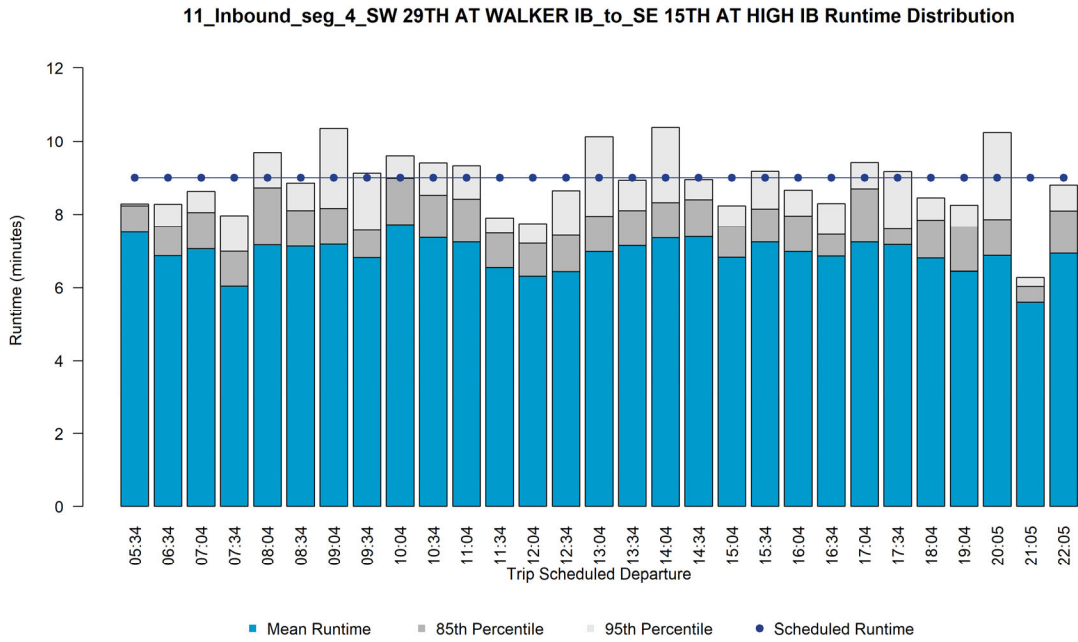




Figure 62 Runtime Chart – Route 011 Inbound, SE 15<sup>th</sup> & High to Robinson & SW 25<sup>th</sup>

11\_Inbound\_seg\_5\_SE 15TH AT HIGH IB\_to\_SOUTH ROBINSON AT SW 25 IB Runtime Distribution

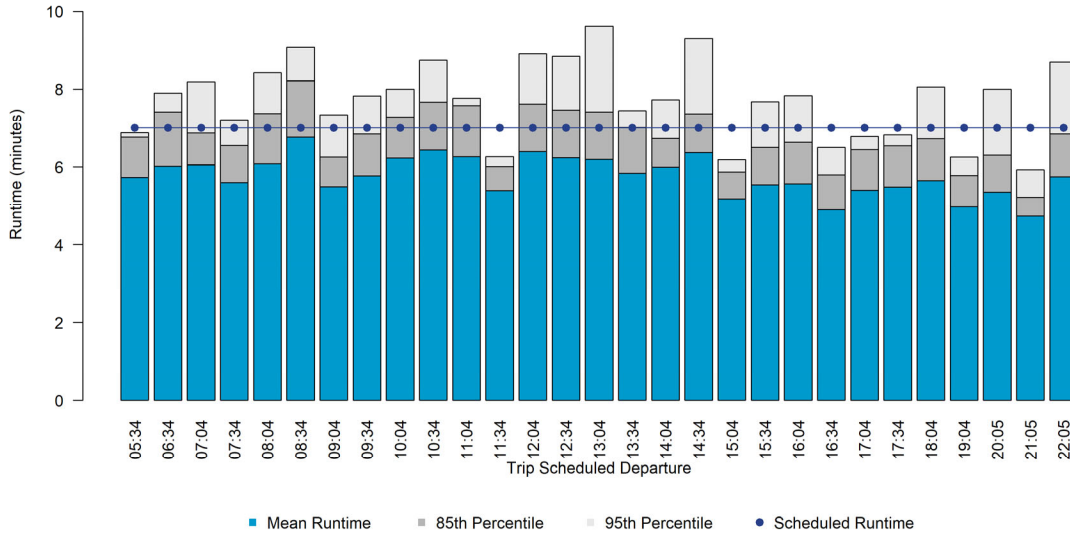
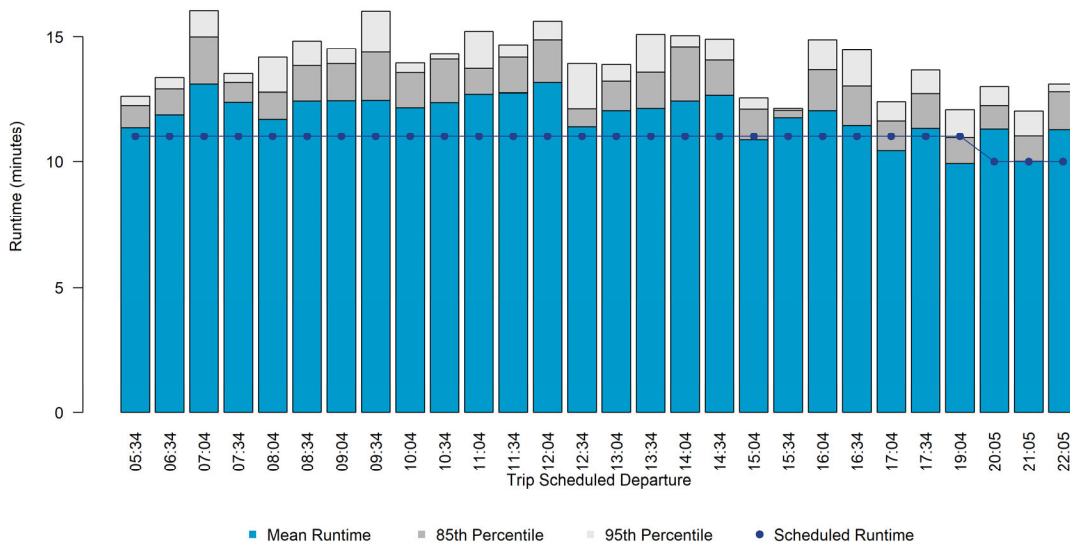


Figure 63 Runtime Chart – Route 011 Inbound, Robinson & SW 25<sup>th</sup> to Downtown Transit Center

11\_Inbound\_seg\_6\_SOUTH ROBINSON AT SW 25 IB\_to\_TRANSIT CENTER - BAY G Runtime Distribution



Outbound

Figure 64 Runtime Chart – Route 011 Outbound, Downtown Transit Center to SW 25<sup>th</sup> & Robinson

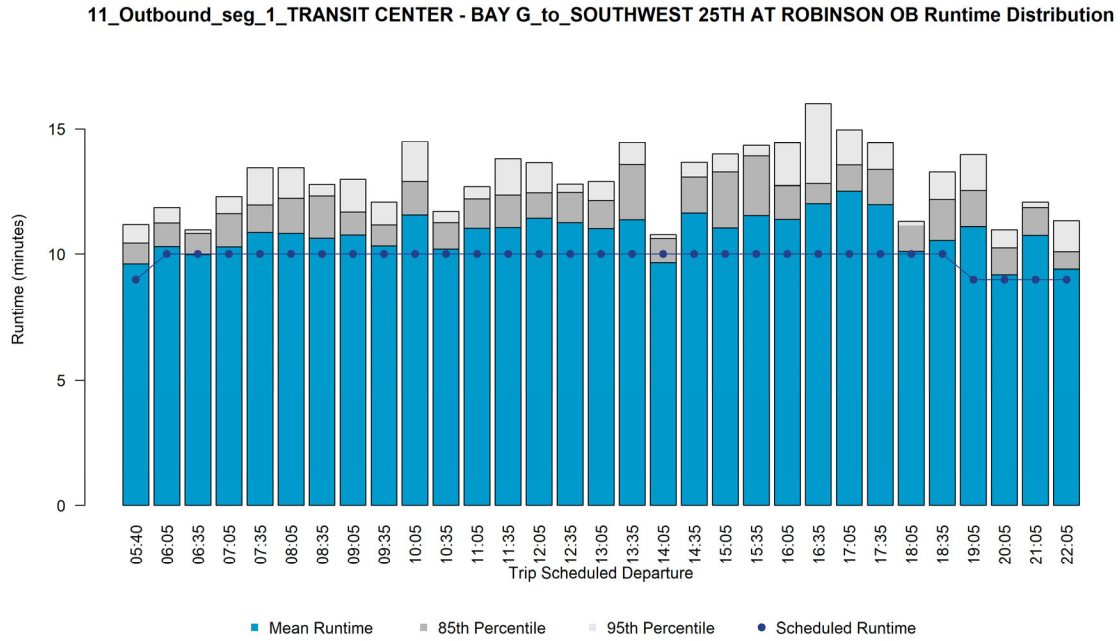


Figure 65 Runtime Chart – Route 011 Outbound, SW 25<sup>th</sup> & Robinson to High & SE 15<sup>th</sup>

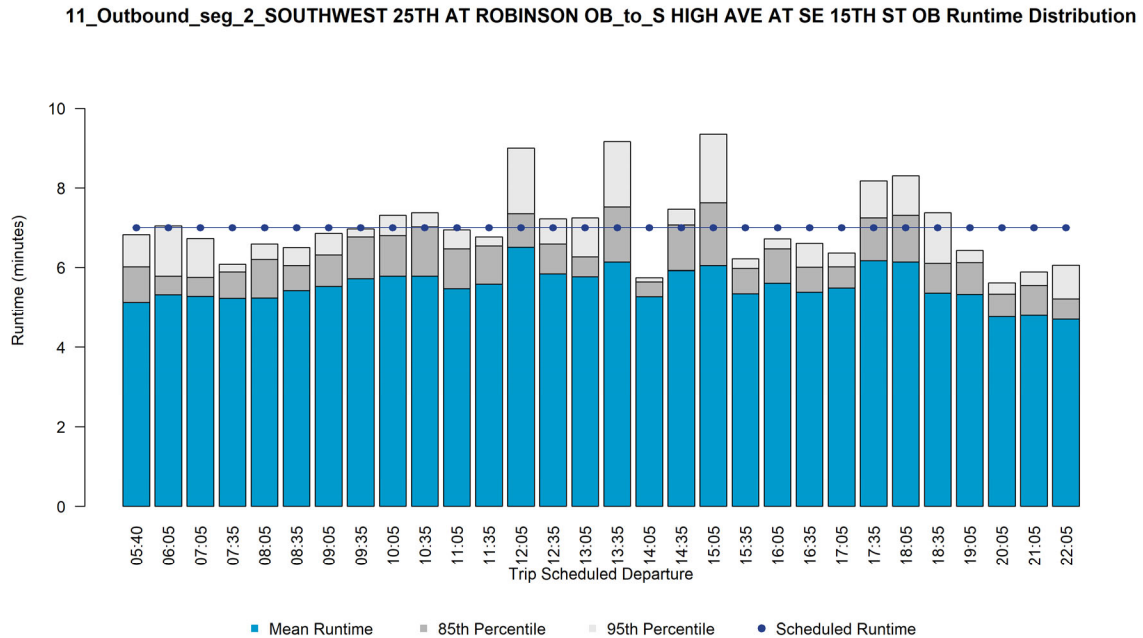


Figure 66 Runtime Chart – Route 011 Outbound, High & SE 15<sup>th</sup> to SW 29<sup>th</sup> & Walker

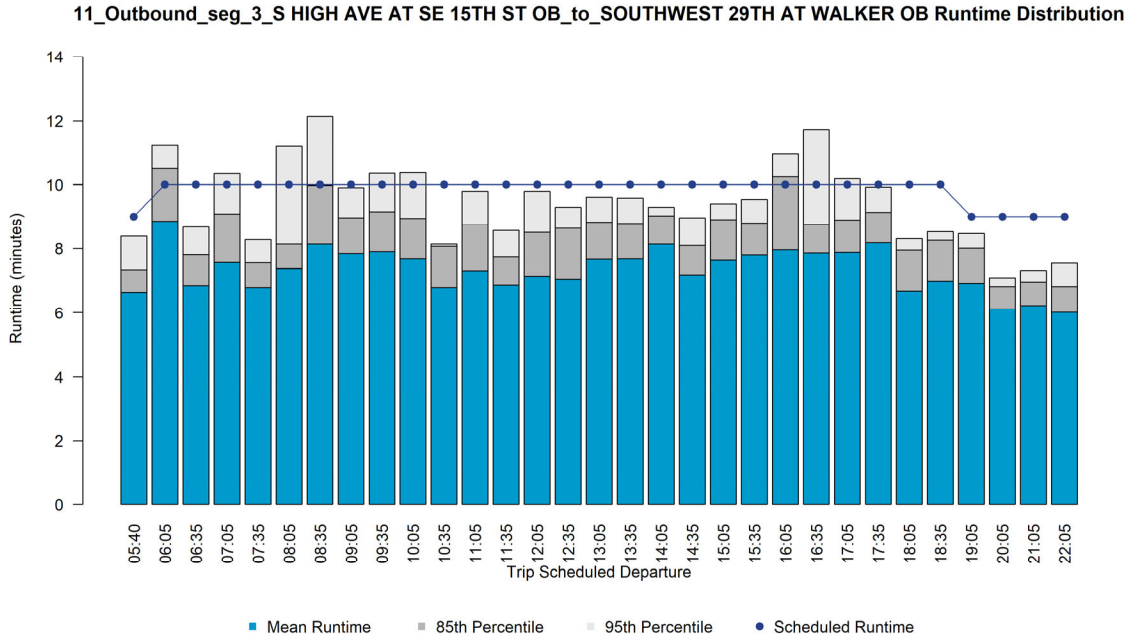


Figure 67 Runtime Chart – Route 011 Outbound, SW 29<sup>th</sup> & Walker to May & SW 29<sup>th</sup>

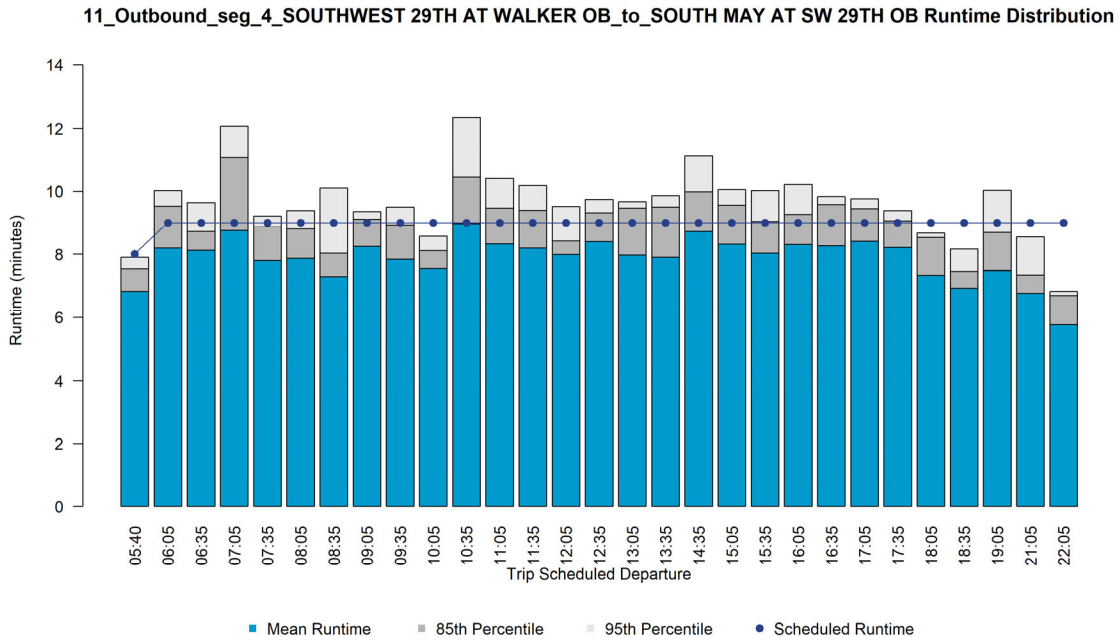


Figure 68 Runtime Chart – Route 011 Outbound, May & SW 29<sup>th</sup> to Meridian & SW 15<sup>th</sup>

11\_Outbound\_seg\_5\_SOUTH MAY AT SW 29TH OB\_to\_S MERIDIAN AT SW 15TH OB Runtime Distribution

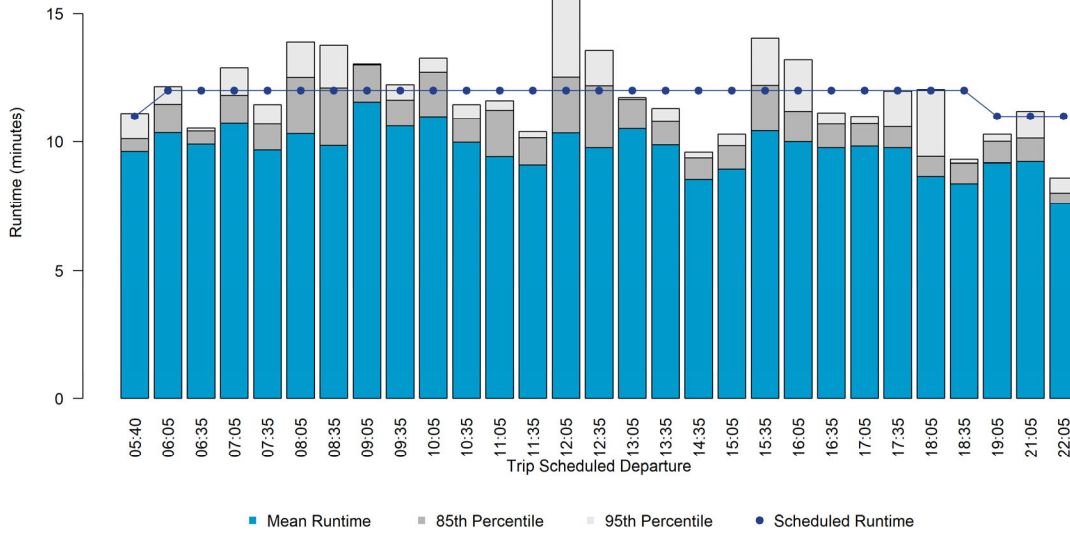
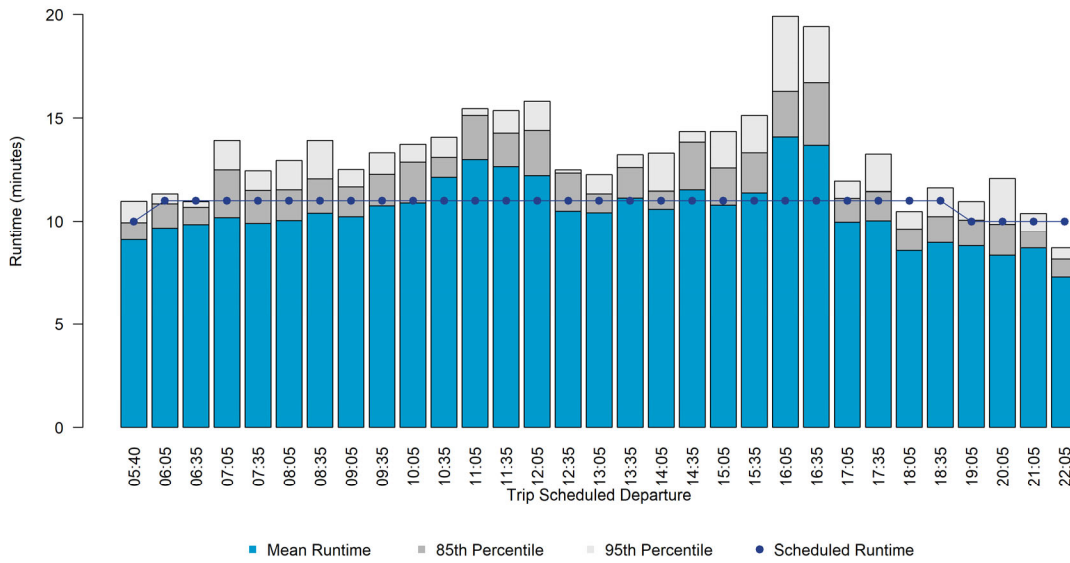


Figure 69 Runtime Chart – Route 011 Outbound, Meridian & SW 15<sup>th</sup> to Reno Mini Hub

11\_Outbound\_seg\_6\_S MERIDIAN AT SW 15TH OB\_to\_GREENFIELD CENTER DR EOL Runtime Distribution



## Route 012

### Inbound

Figure 70 Runtime Chart – Route 012 Inbound, OCCC to SW 44<sup>th</sup> & May

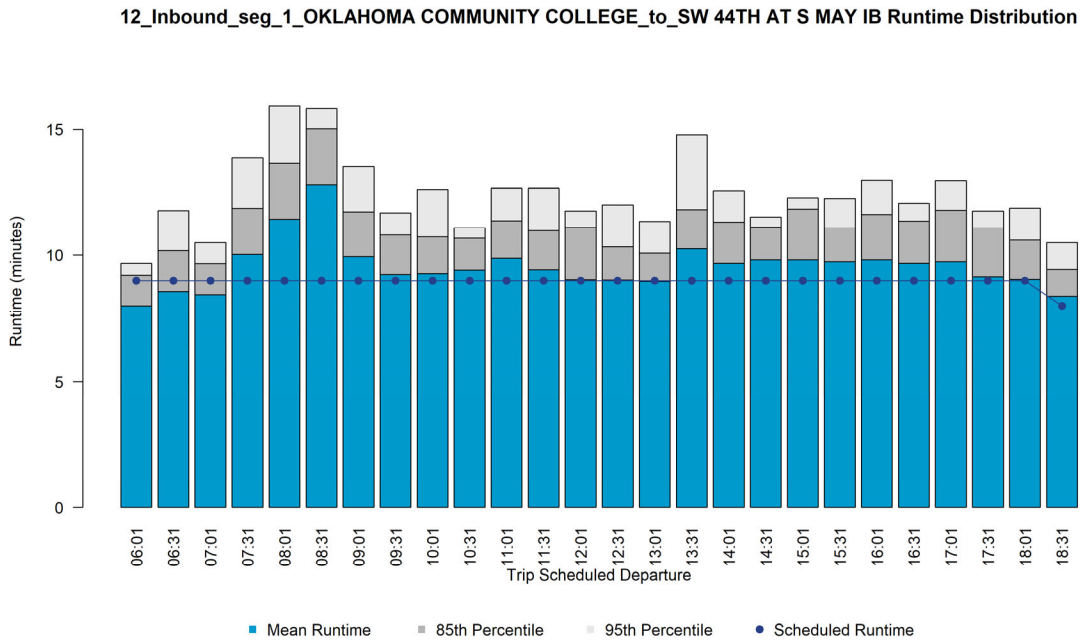


Figure 71 Runtime Chart – Route 012 Inbound, SW 44<sup>th</sup> & May to SW 29<sup>th</sup> & May

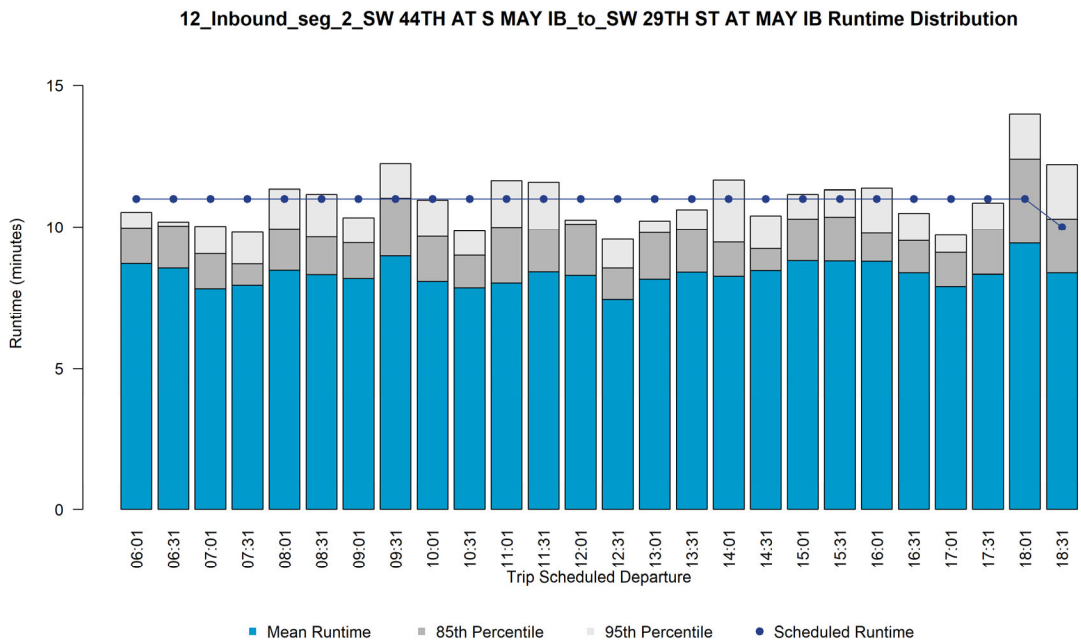
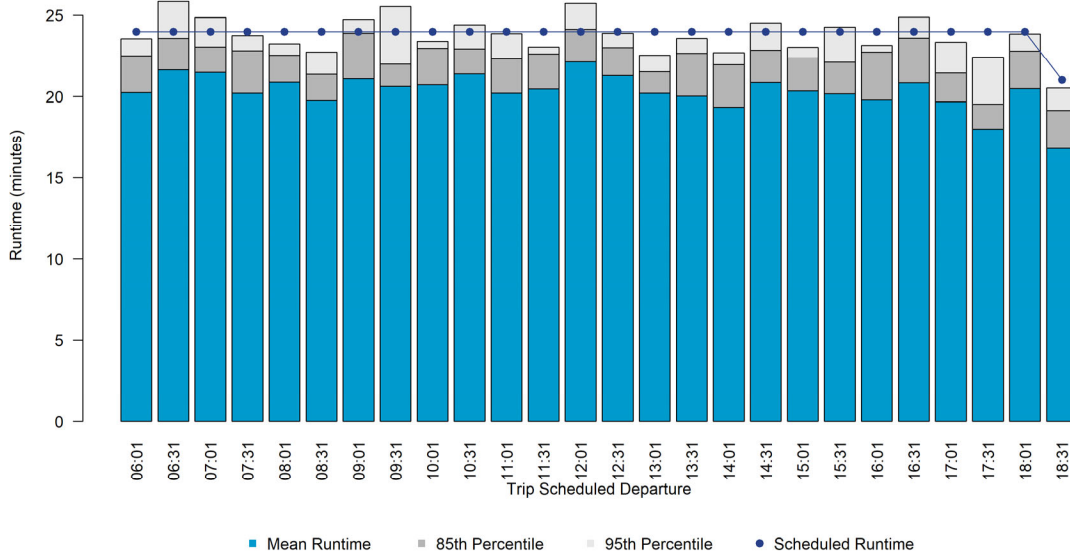


Figure 72 Runtime Chart – Route 012 Inbound, SW 29<sup>th</sup> & May to Downtown Transit Center

12\_Inbound\_seg\_3\_SW 29TH ST AT MAY IB\_to\_TRANSIT CENTER - BAY L Runtime Distribution



**Outbound**

Figure 73 Runtime Chart – Route 012 Outbound, Downtown Transit Center to SW 29<sup>th</sup> & May

12\_Outbound\_seg\_1\_TRANSIT CENTER - BAY L\_to\_SW 29TH AT MAY OB Runtime Distribution

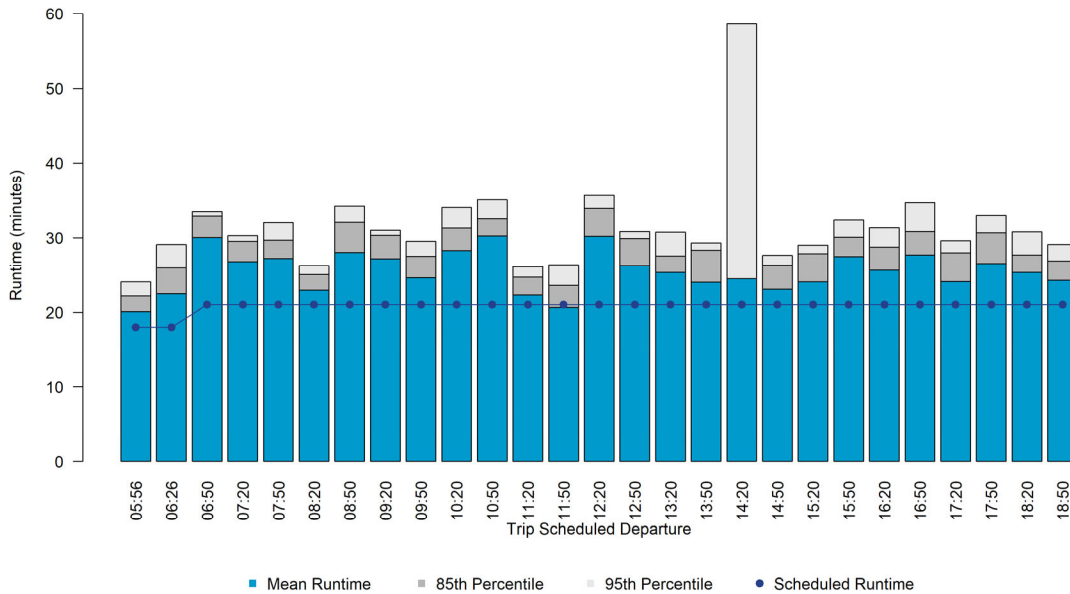


Figure 74 Runtime Chart – Route 012 Outbound, SW 29<sup>th</sup> & May to May & SW 44<sup>th</sup>

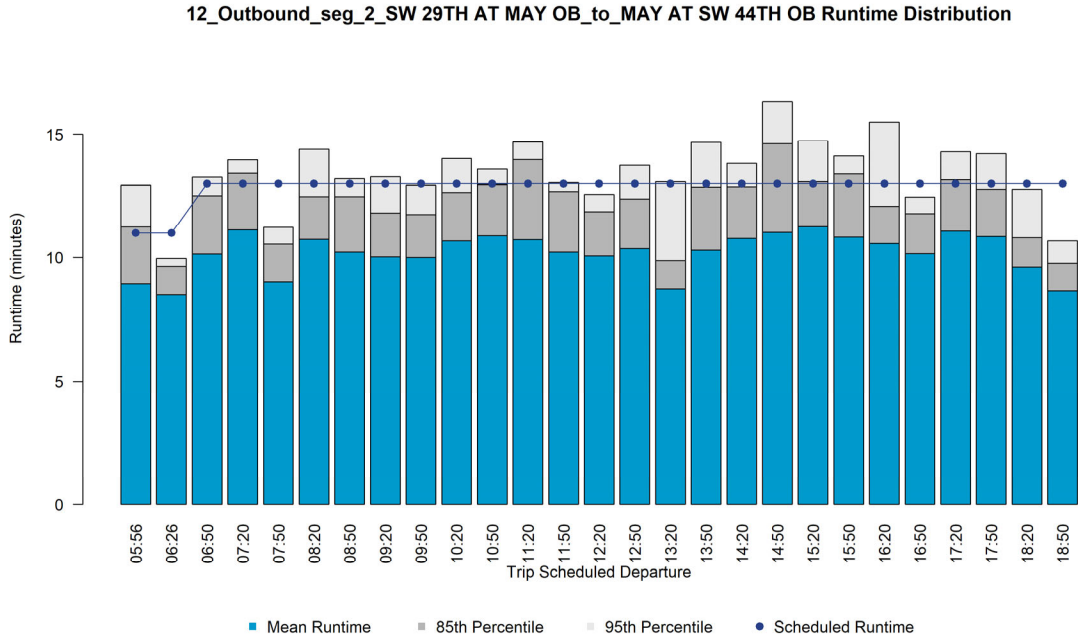
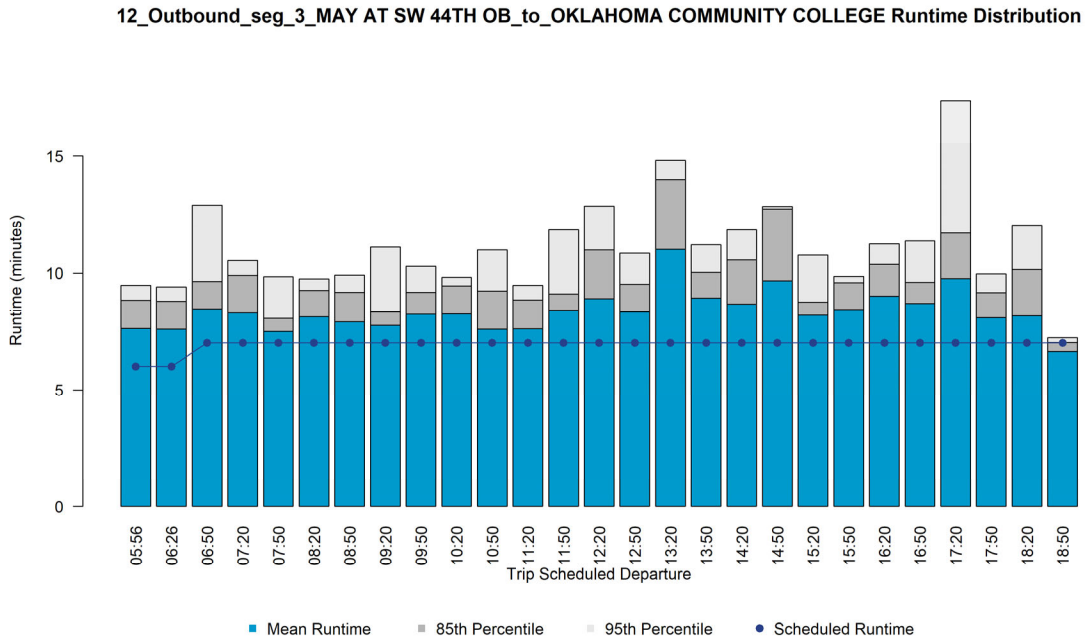


Figure 75 Runtime Chart – Route 012 Outbound, May & SW 44<sup>th</sup> to OCCC



## Route 013

### Inbound

Figure 76 Runtime Chart – Route 013 Inbound, OCCC to SW 74<sup>th</sup> & Santa Fe

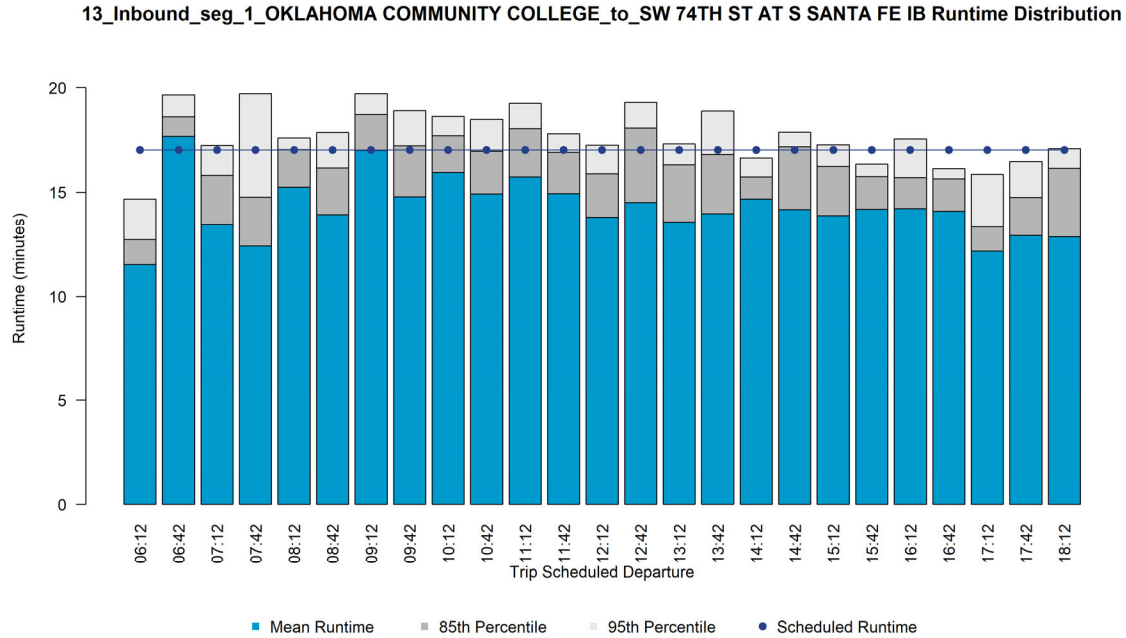


Figure 77 Runtime Chart – Route 013 Inbound, SW 74<sup>th</sup> & Santa Fe to Western & SW 74<sup>th</sup>

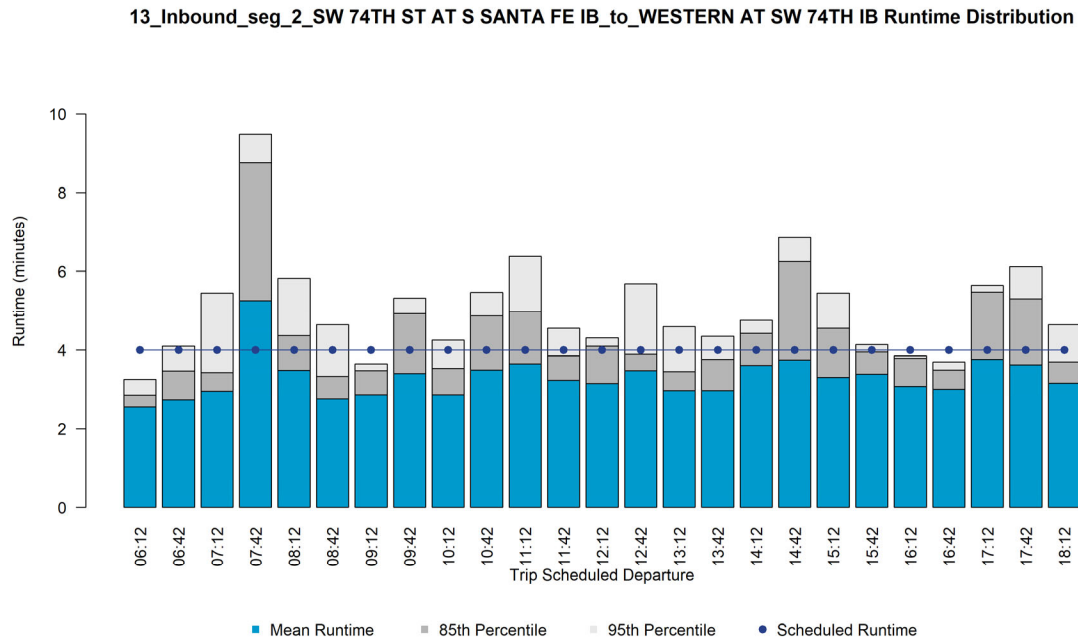




Figure 78 Runtime Chart – Route 013 Inbound, Western & SW 74<sup>th</sup> to Western & SW 44<sup>th</sup>

13\_Inbound\_seg\_3\_WESTERN AT SW 74TH IB\_to\_WESTERN AT SW 44TH IB Runtime Distribution

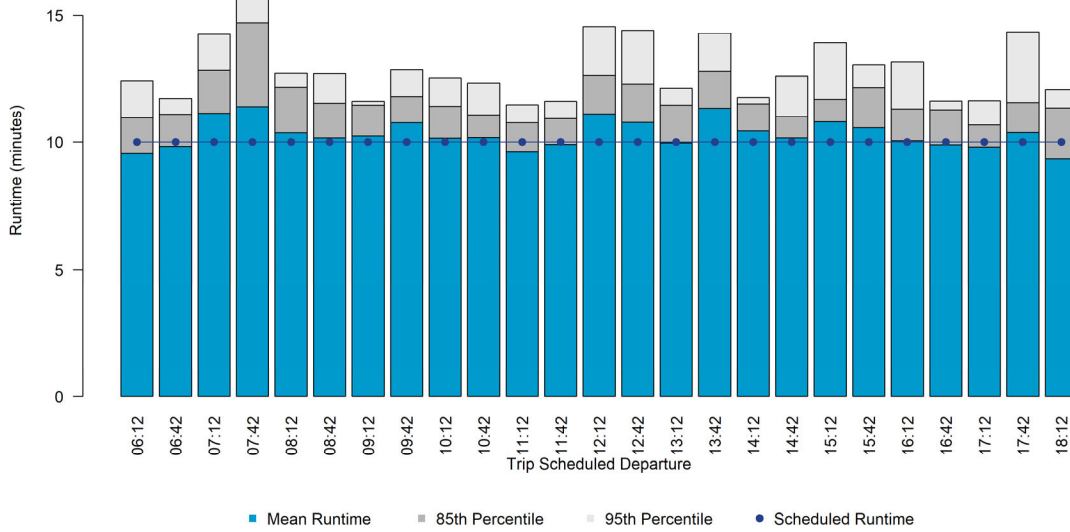


Figure 79 Runtime Chart – Route 013 Inbound, Western & SW 44<sup>th</sup> to Western & SW 29<sup>th</sup>

13\_Inbound\_seg\_4\_WESTERN AT SW 44TH IB\_to\_WESTERN AT SW 29TH IB Runtime Distribution

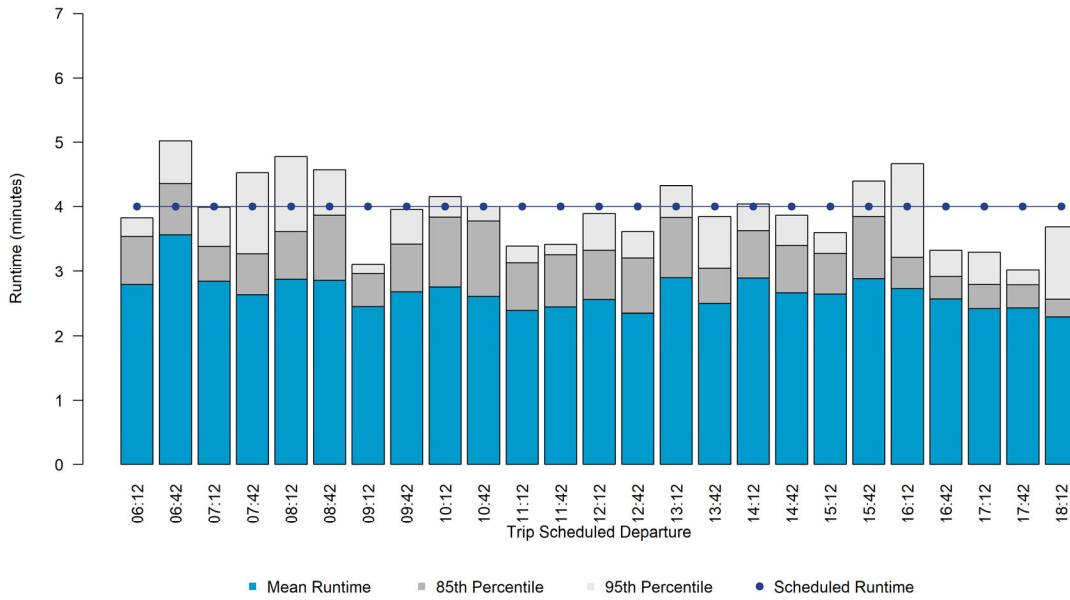
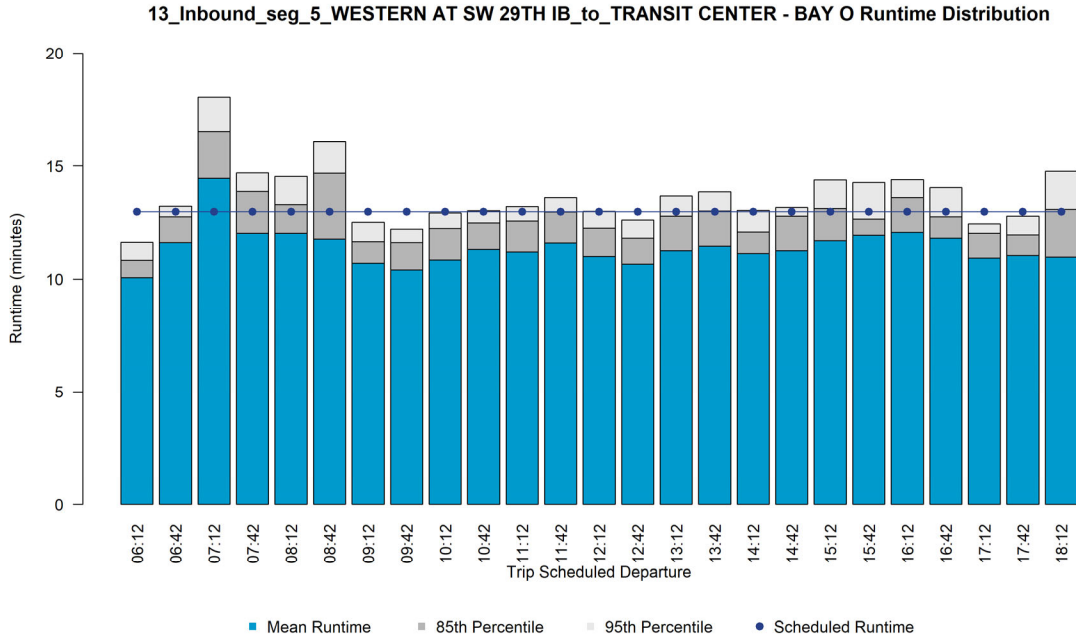


Figure 80 Runtime Chart – Route 013 Inbound, Western & SW 29<sup>th</sup> to Downtown Transit Center



**Outbound**

Figure 81 Runtime Chart – Route 013 Outbound, Downtown Transit Center to Western & SW 29<sup>th</sup>

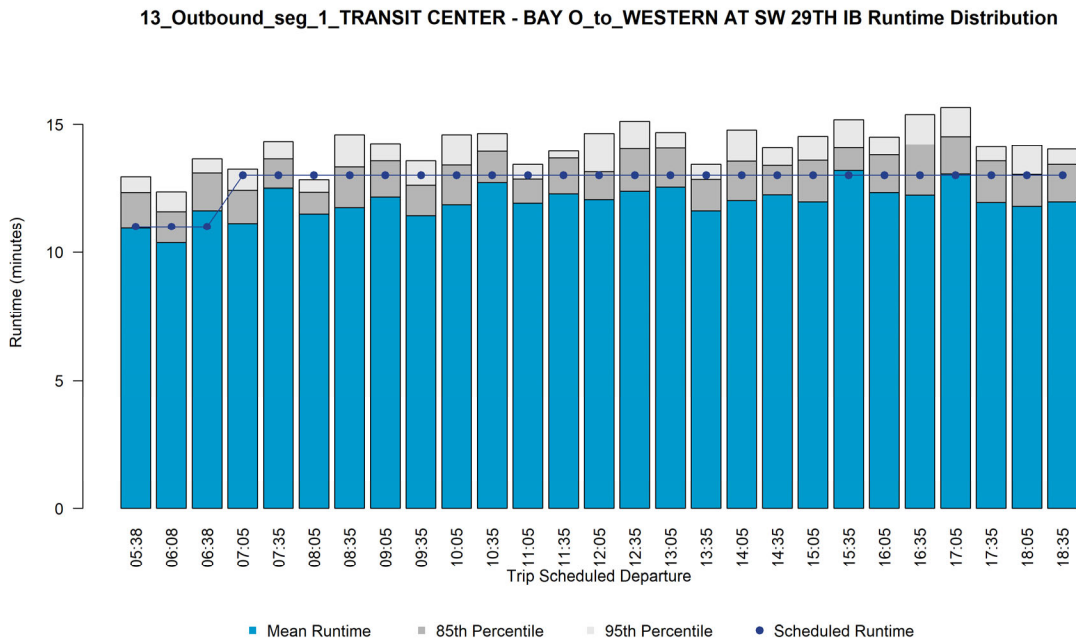


Figure 82 Runtime Chart – Route 013 Outbound, Western & SW 29<sup>th</sup> to Western & SW 44<sup>th</sup>

13\_Outbound\_seg\_2\_WESTERN AT SW 29TH IB\_to\_WESTERN AT SW 44TH OB Runtime Distribution

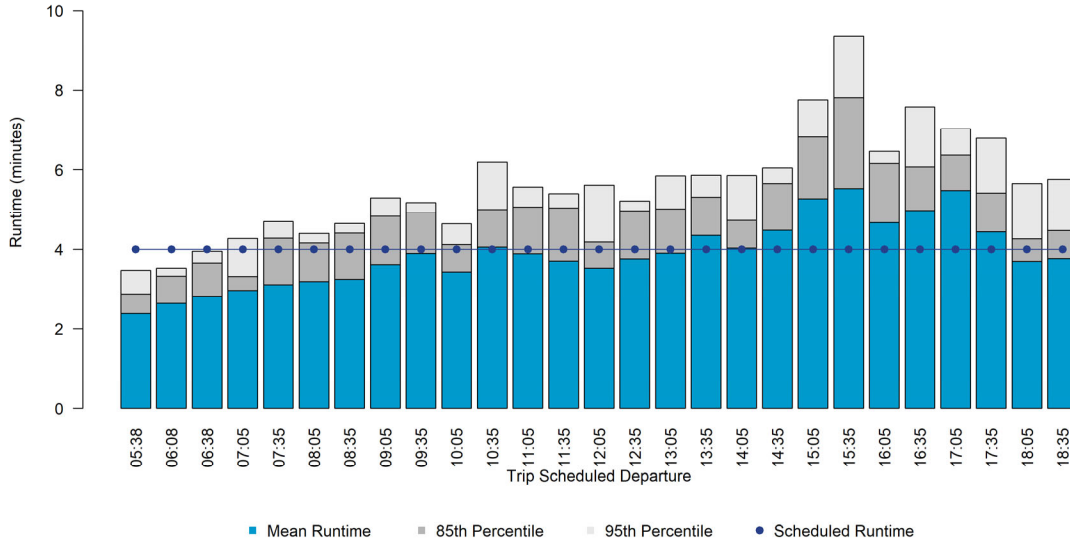


Figure 83 Runtime Chart – Route 013 Outbound, Western & SW 44<sup>th</sup> to SW 74<sup>th</sup> & Western

13\_Outbound\_seg\_3\_WESTERN AT SW 44TH OB\_to\_SW 74TH AT WESTERN OB Runtime Distribution

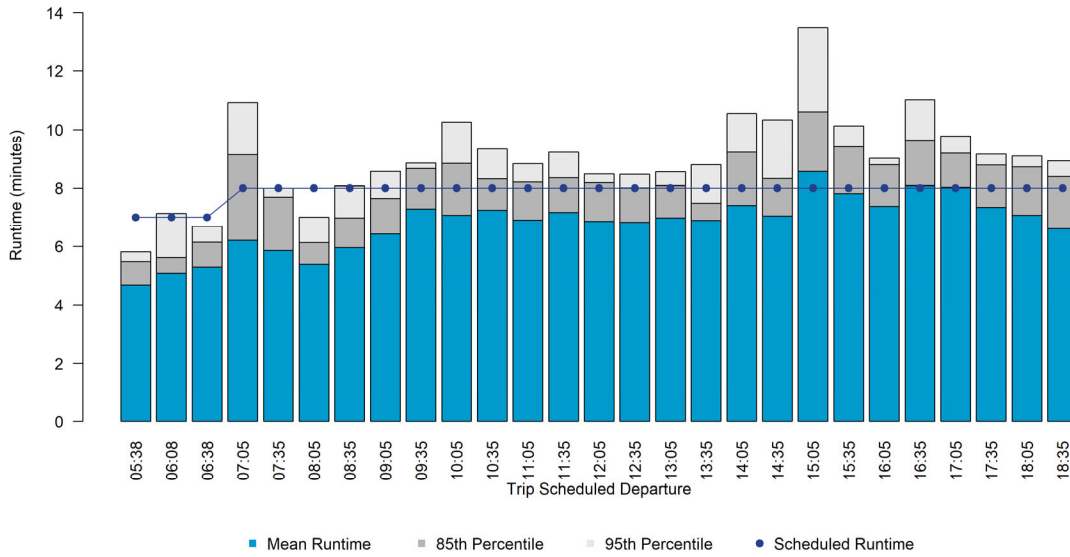
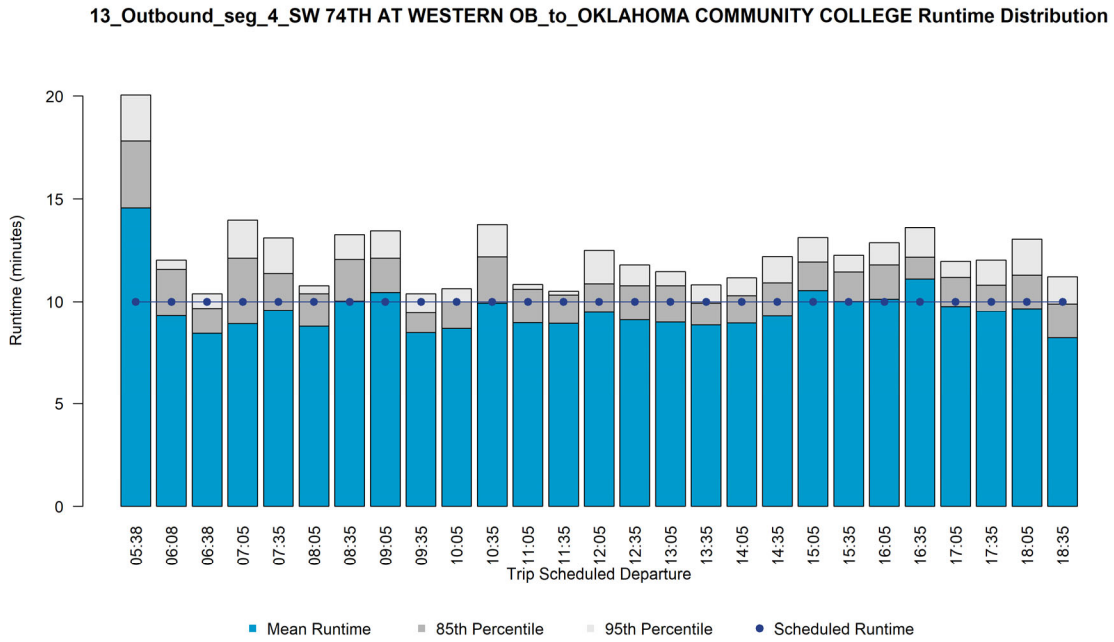


Figure 84 Runtime Chart – Route 013 Outbound, SW 74<sup>th</sup> & Western to OCCC



## Route 014

### Inbound

Figure 85 Runtime Chart – Route 014 Inbound, Sunnyslane & SE 59<sup>th</sup> to SE 44<sup>th</sup> & Bryant

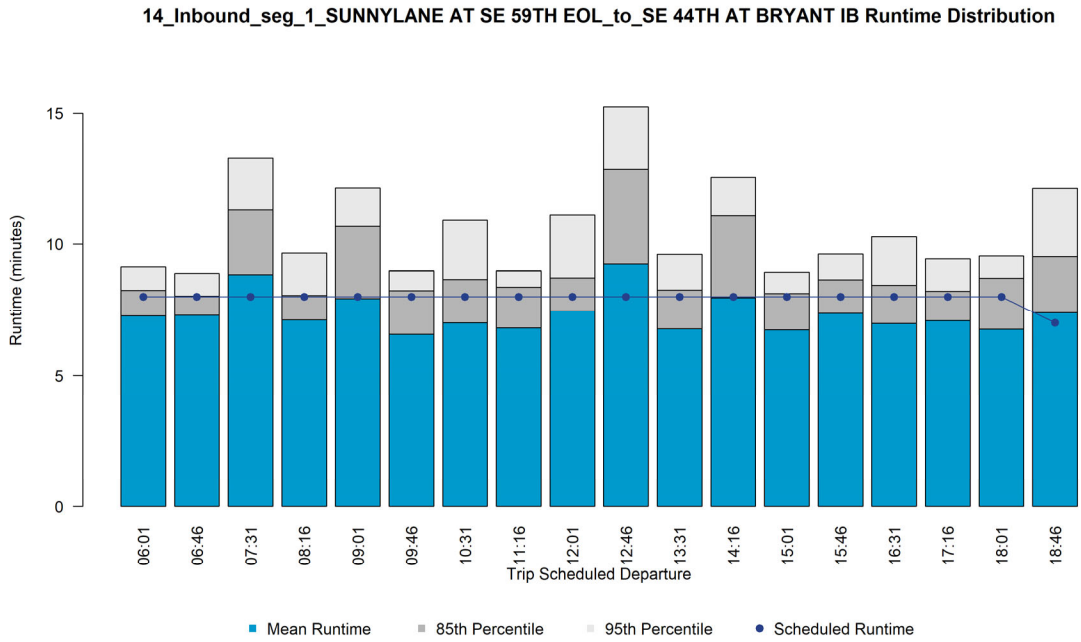


Figure 86 Runtime Chart – Route 014 Inbound, SE 44<sup>th</sup> & Bryant to Crossroads & SE 59<sup>th</sup>

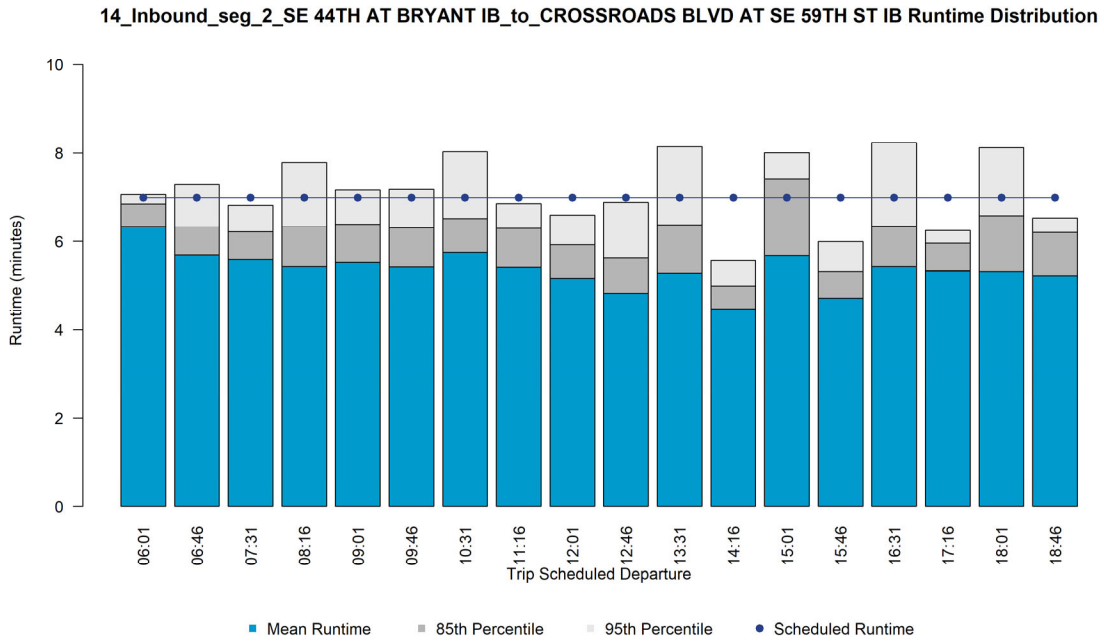


Figure 87 Runtime Chart – Route 014 Inbound, Crossroads & SE 59<sup>th</sup> to High & SE 44<sup>th</sup>

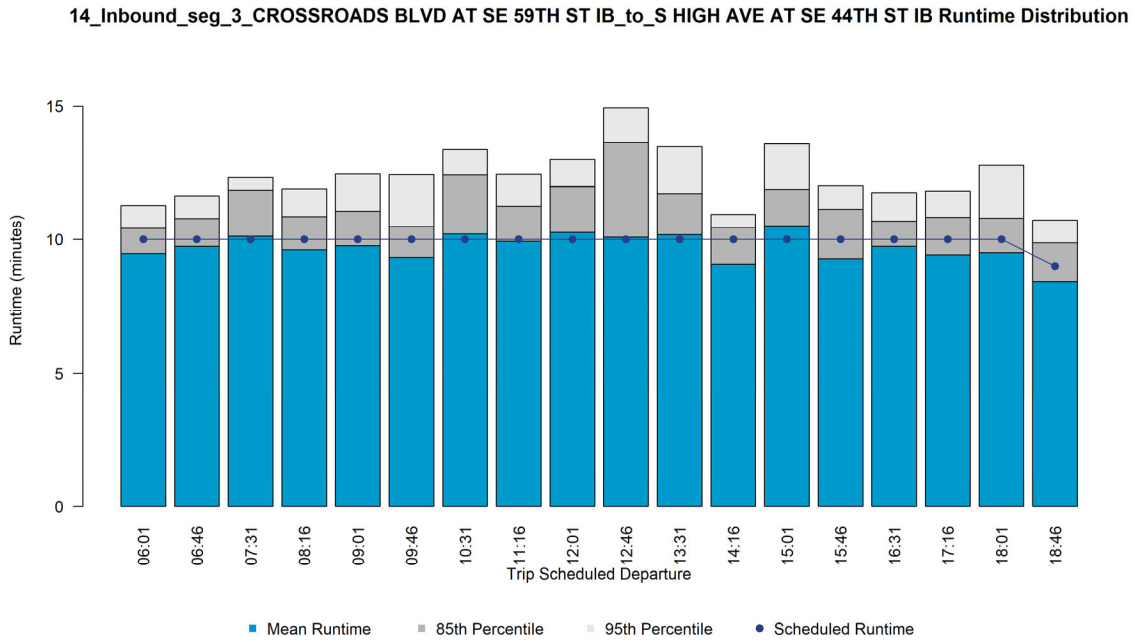


Figure 88 Runtime Chart – Route 014 Inbound, High & SE 44<sup>th</sup> to Walker & SW 25<sup>th</sup>

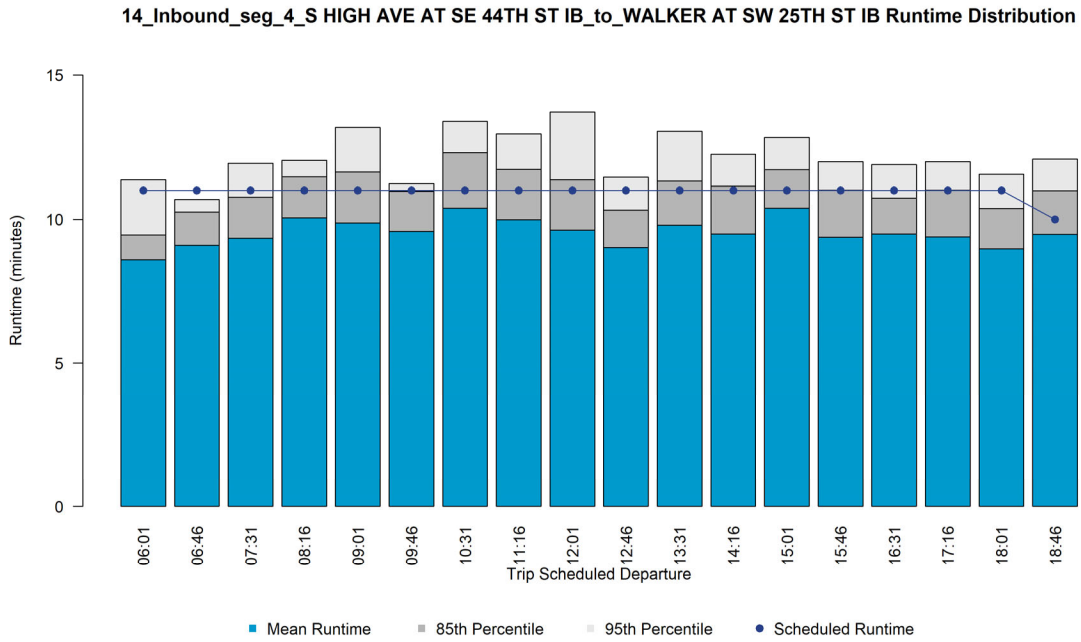
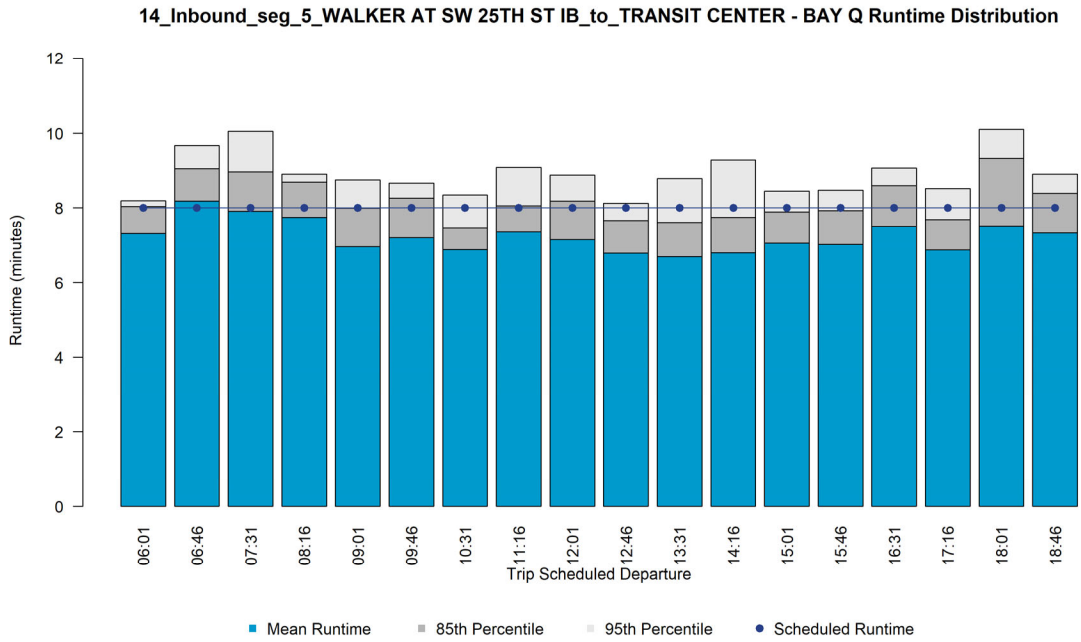


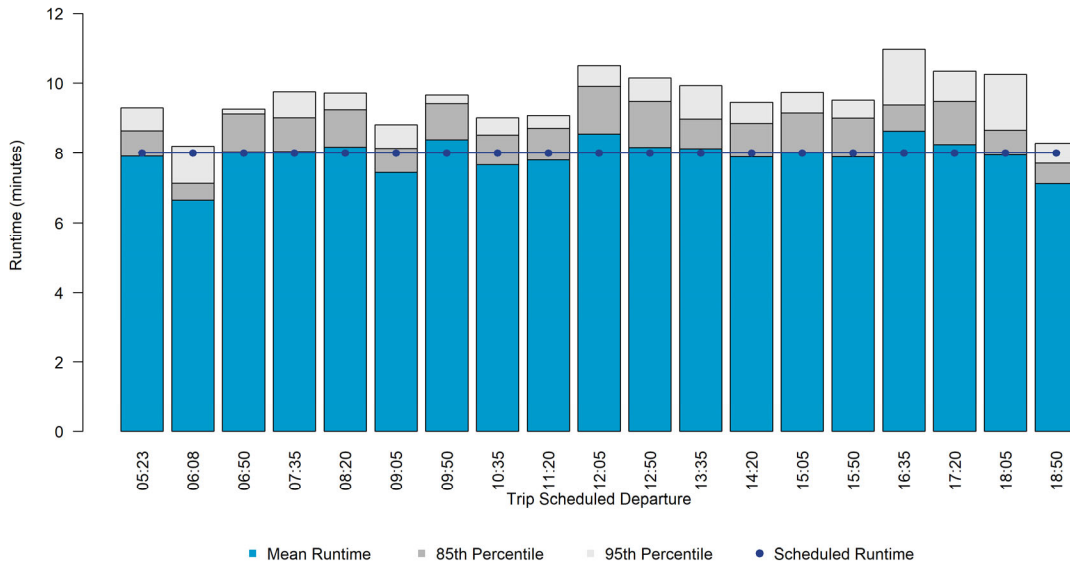
Figure 89 Runtime Chart – Route 014 Inbound, Walker & SW 25<sup>th</sup> to Downtown Transit Center



**Outbound**

**Figure 90 Runtime Chart – Route 014 Outbound, Downtown Transit Center to SW 25<sup>th</sup> & Walker**

14\_Outbound\_seg\_1\_TRANSIT CENTER - BAY Q\_to\_SW 25TH ST AT WALKER OB Runtime Distribution



**Figure 91 Runtime Chart – Route 014 Outbound, SW 25<sup>th</sup> & Walker to SE 44<sup>th</sup> & High**

14\_Outbound\_seg\_2\_SW 25TH ST AT WALKER OB\_to\_SE 44TH AT HIGH OB Runtime Distribution

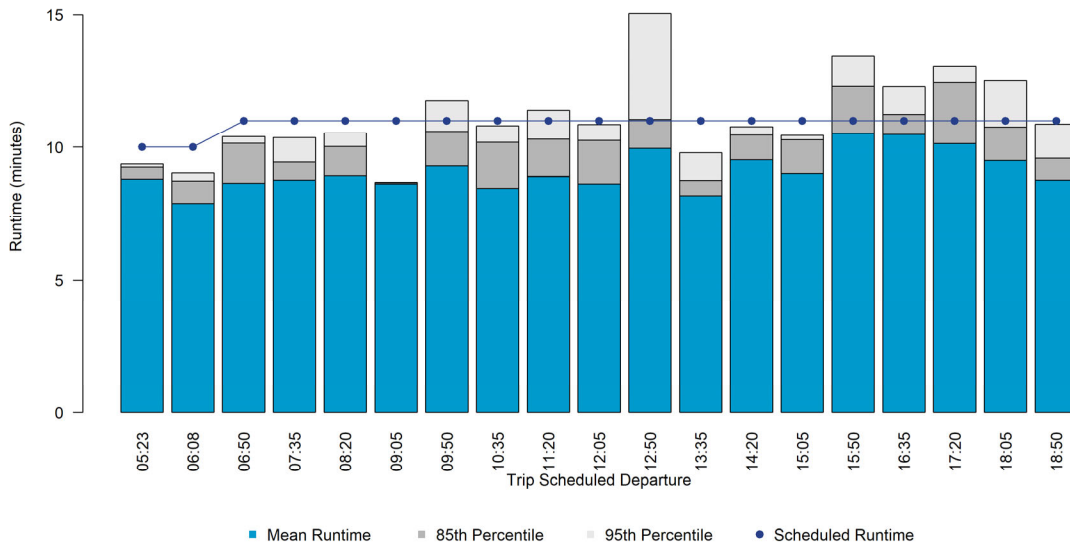


Figure 92 Runtime Chart – Route 014 Outbound, SE 44<sup>th</sup> & High to SE 59<sup>th</sup> & Crossroads

14\_Outbound\_seg\_3\_SE 44TH AT HIGH OB\_to\_SE 59TH STREET AT CROSSROADS BLVD OB Runtime Distribution

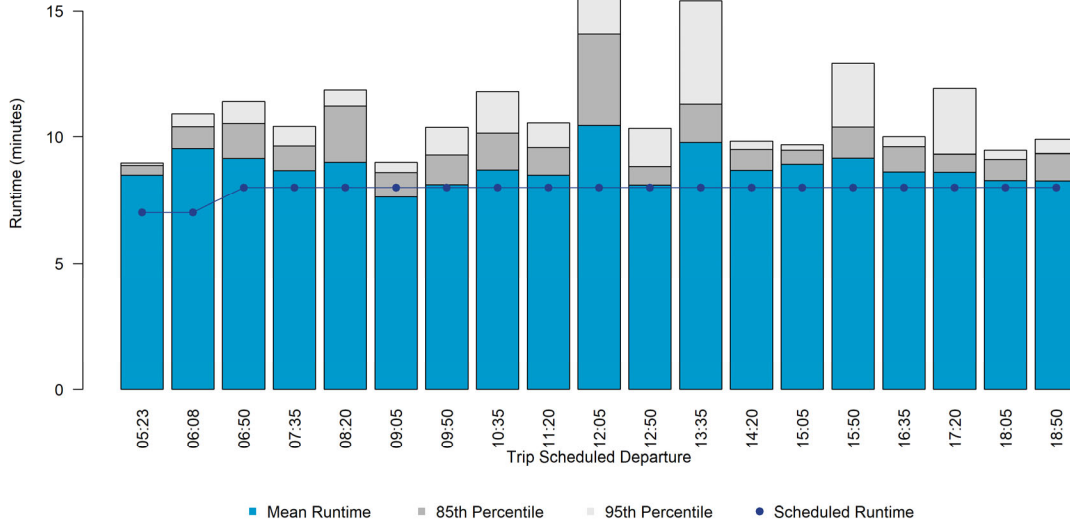


Figure 93 Runtime Chart – Route 014 Outbound, SE 59<sup>th</sup> & Crossroads to Bryant & SE 44<sup>th</sup>

14\_Outbound\_seg\_4\_SE 59TH STREET AT CROSSROADS BLVD OB\_to\_BRYANT AT SE 44TH ST OB Runtime Distribution

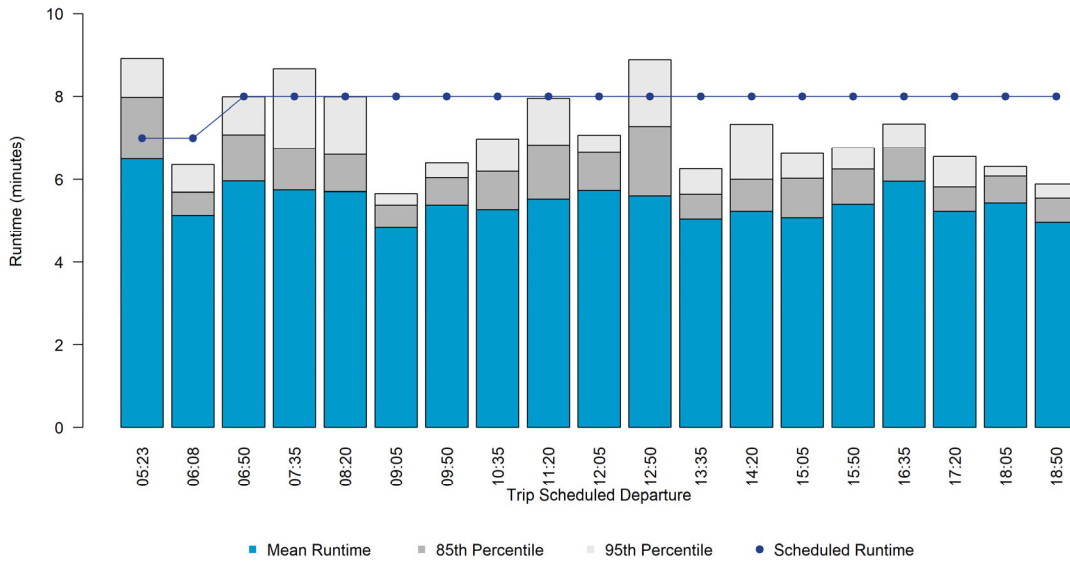
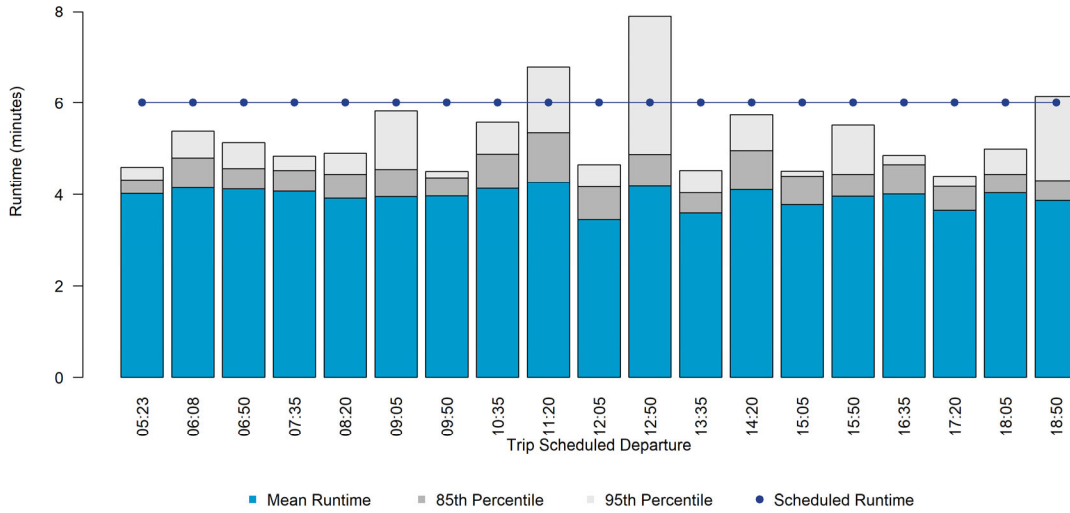




Figure 94 Runtime Chart – Route 014 Outbound, Bryant & SE 44<sup>th</sup> to Sunnyslane & SE 59<sup>th</sup>

14\_Outbound\_seg\_5\_BRYANT AT SE 44TH ST OB\_to\_SUNNYLANE AT SE 59TH EOL Runtime Distribution



## Route 015

### Inbound

Figure 95 Runtime Chart – Route 015 Inbound, Douglas & Reno to Reno & Midwest

15\_Inbound\_seg\_1\_N DOUGLAS BLVD AT RENO EOL\_to\_RENO AT MIDWEST BLVD IB Runtime Distribution

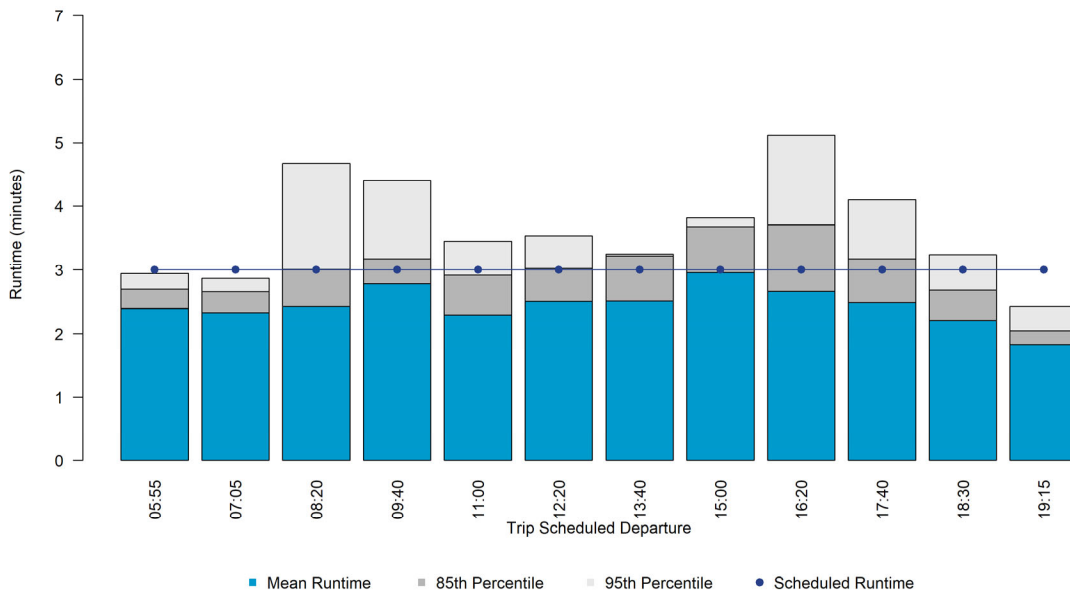


Figure 96 Runtime Chart – Route 015 Inbound, Reno & Midwest to Air Depot & Reno

15\_Inbound\_seg\_2\_RENO AT MIDWEST BLVD IB\_to\_AIR DEPOT AT RENO IB Runtime Distribution

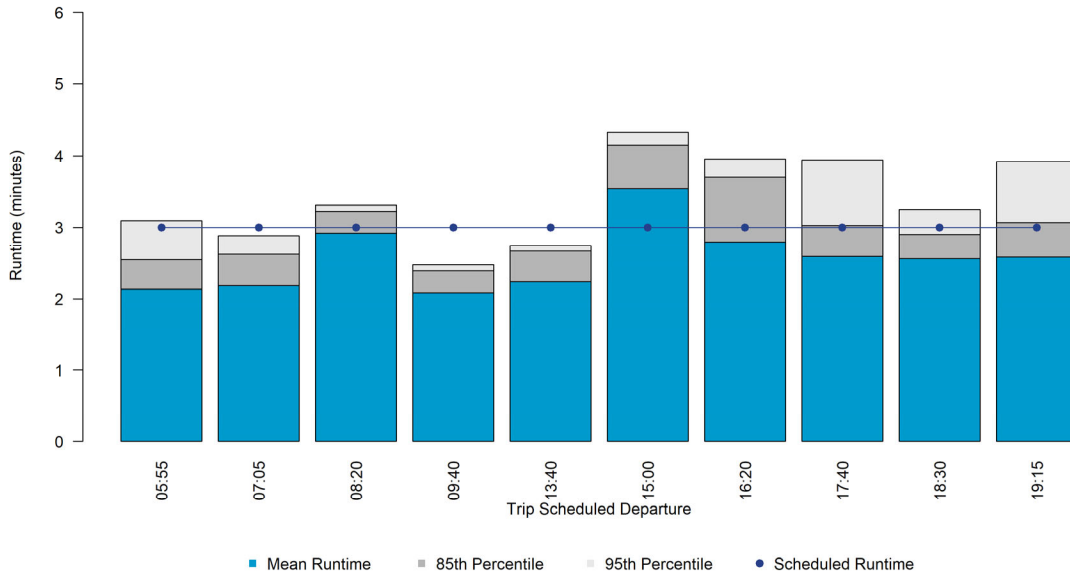


Figure 97 Runtime Chart – Route 015 Inbound, Air Depot & Reno to Rose State College

15\_Inbound\_seg\_3\_AIR DEPOT AT RENO IB\_to\_ROSE STATE COLLEGE IB Runtime Distribution

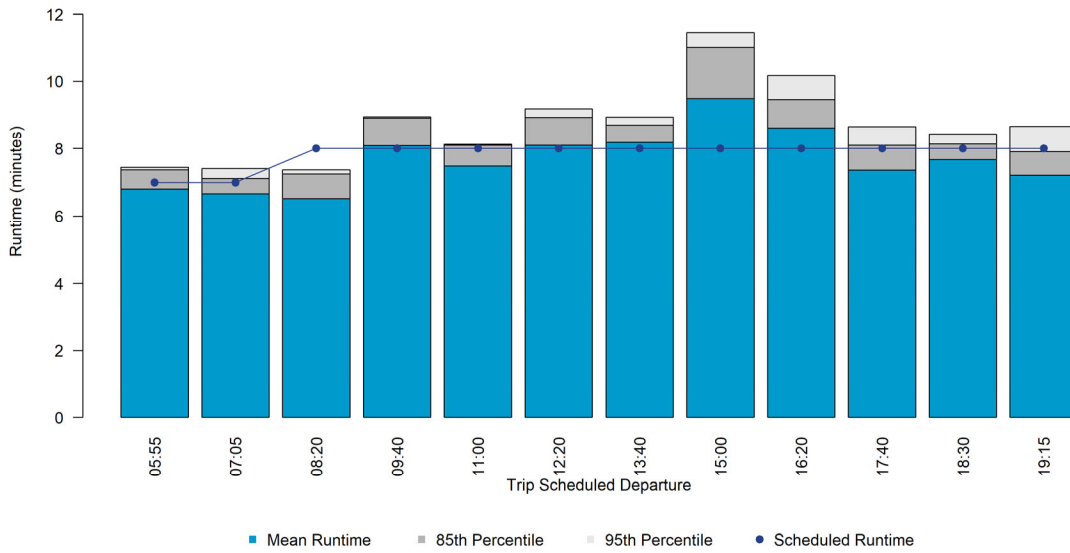
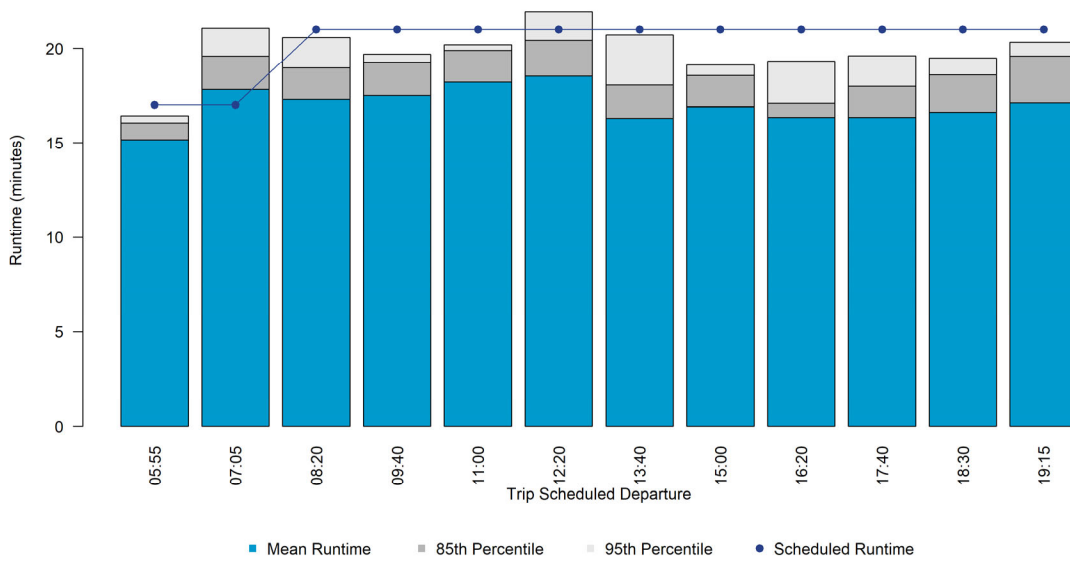


Figure 98 Runtime Chart – Route 015 Inbound, Rose State College to Downtown Transit Center

15\_Inbound\_seg\_4\_ROSE STATE COLLEGE IB\_to\_TRANSIT CENTER - BAY H Runtime Distribution



**Outbound**

Figure 99 Runtime Chart – Route 015 Outbound, Downtown Transit Center to Rose State College

15\_Outbound\_seg\_1\_TRANSIT CENTER - BAY H\_to\_ROSE STATE COLLEGE OB Runtime Distribution

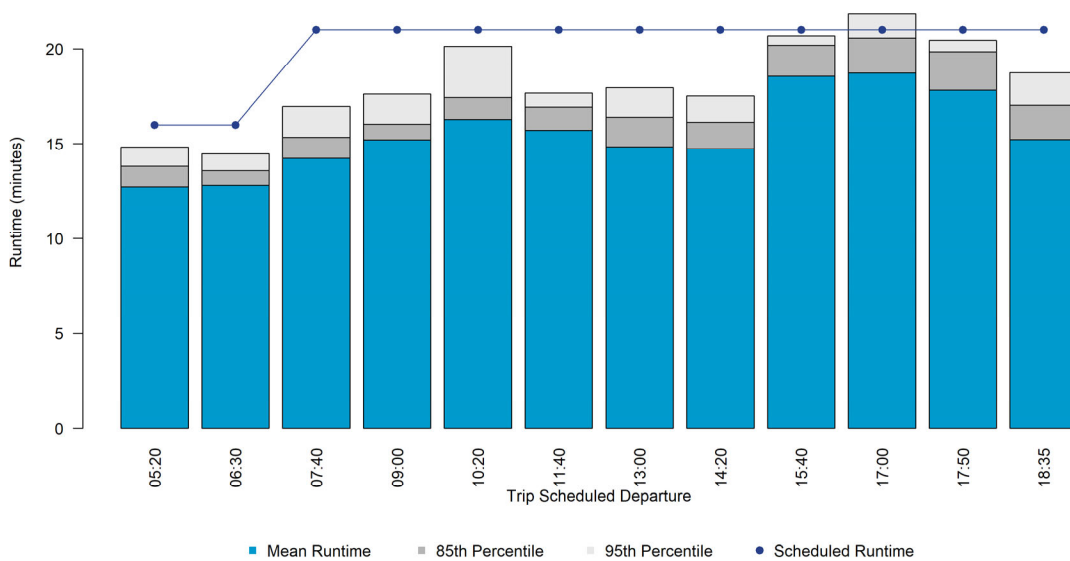


Figure 100 Runtime Chart – Route 015 Outbound, Rose State College to SE 15<sup>th</sup> & Air Depot

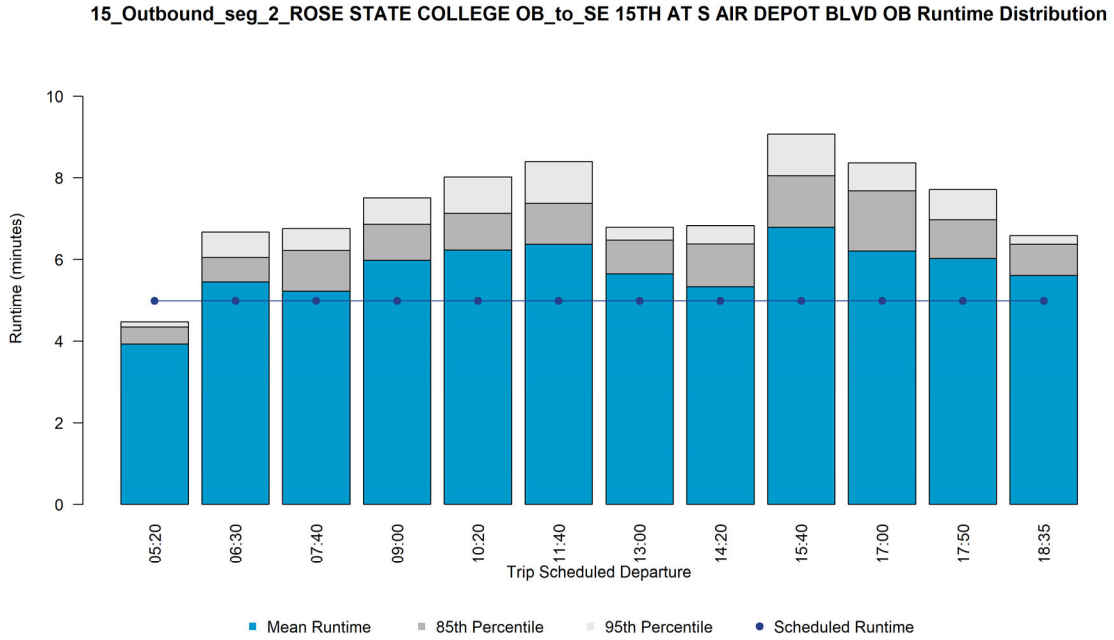


Figure 101 Runtime Chart – Route 015 Outbound, SE 15<sup>th</sup> & Air Depot to NE 10<sup>th</sup> & Douglas

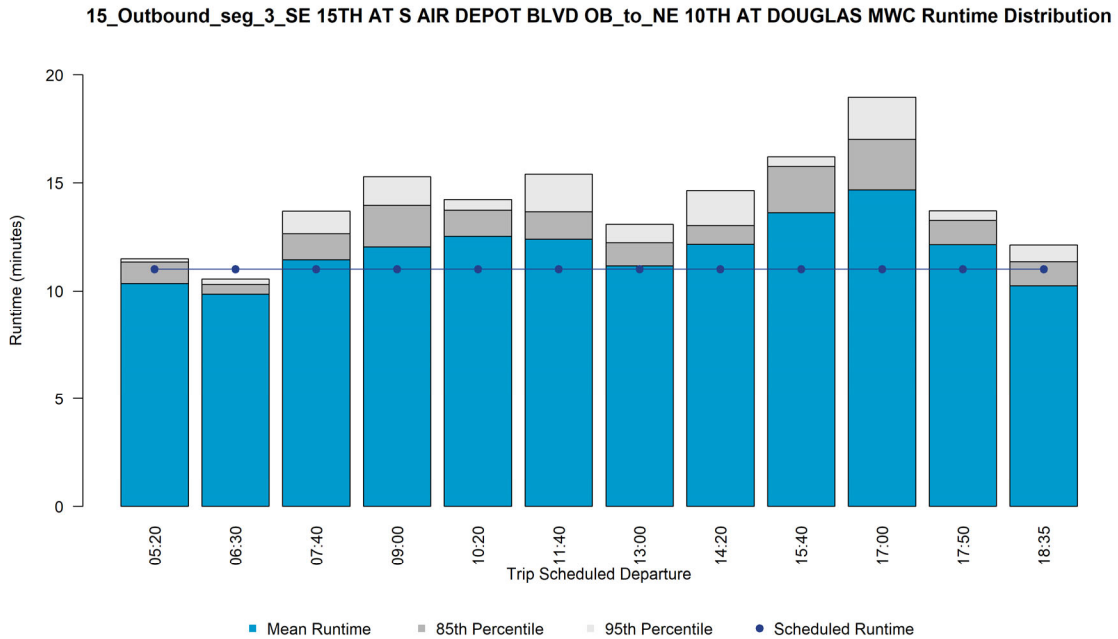
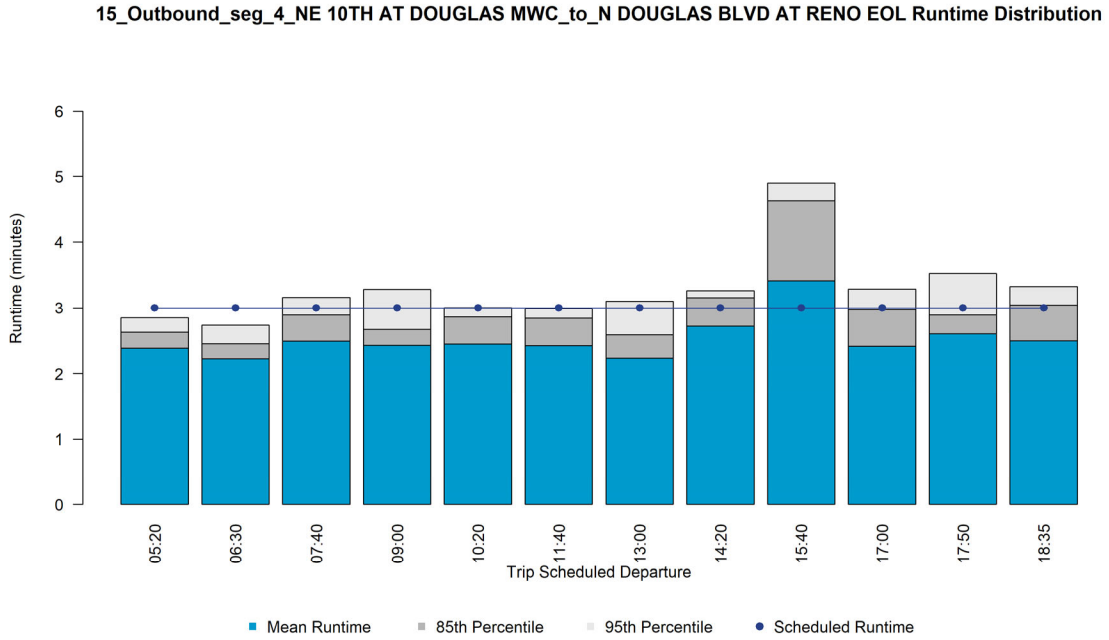


Figure 102 Runtime Chart – Route 015 Outbound, NE 10<sup>th</sup> & Douglas to Douglas & Reno



## Route 016

### Inbound

Figure 103 Runtime Chart – Route 016 Inbound, Penn & SW 89<sup>th</sup> to Penn & 74<sup>th</sup>

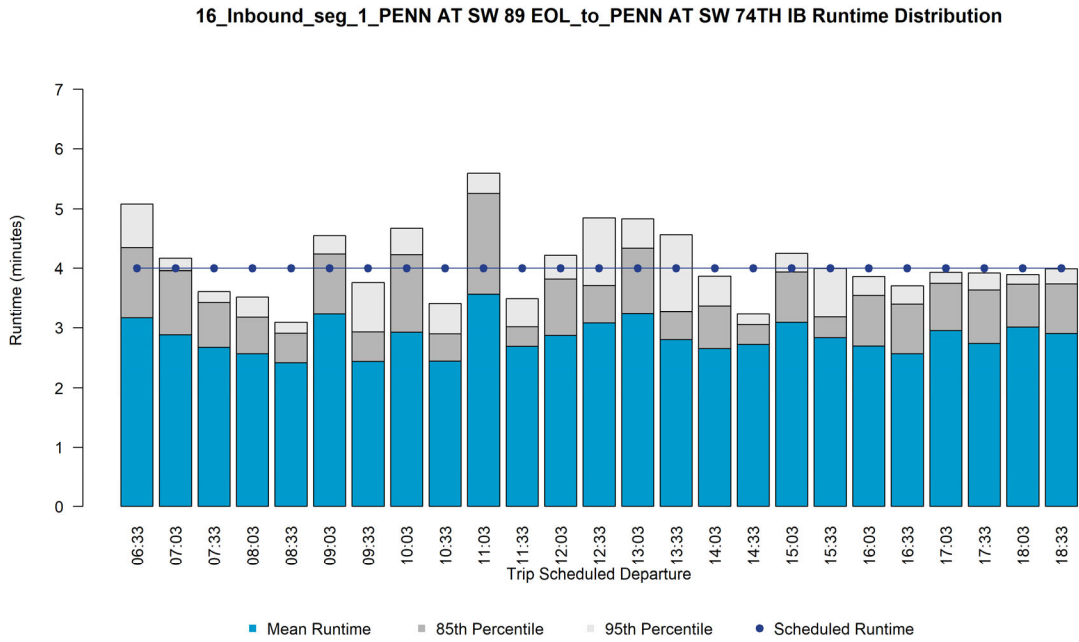


Figure 104 Runtime Chart – Route 016 Inbound, Penn & SW 74<sup>th</sup> to Penn & SW 44<sup>th</sup>

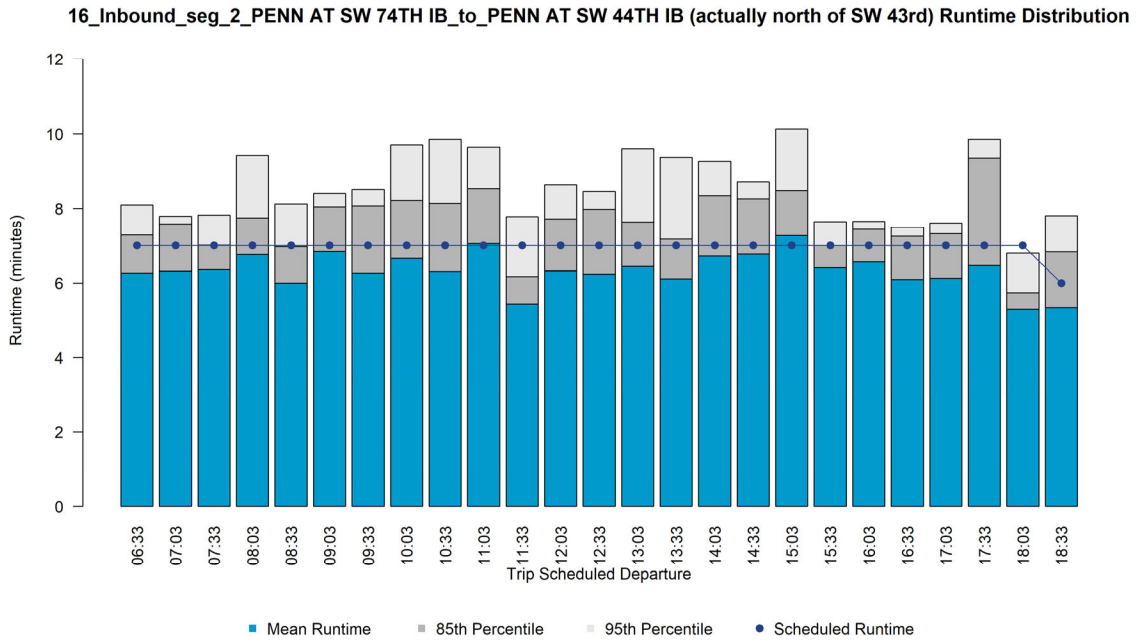


Figure 105 Runtime Chart – Route 016 Inbound, Penn & SW 44<sup>th</sup> to Exchange & Westwood

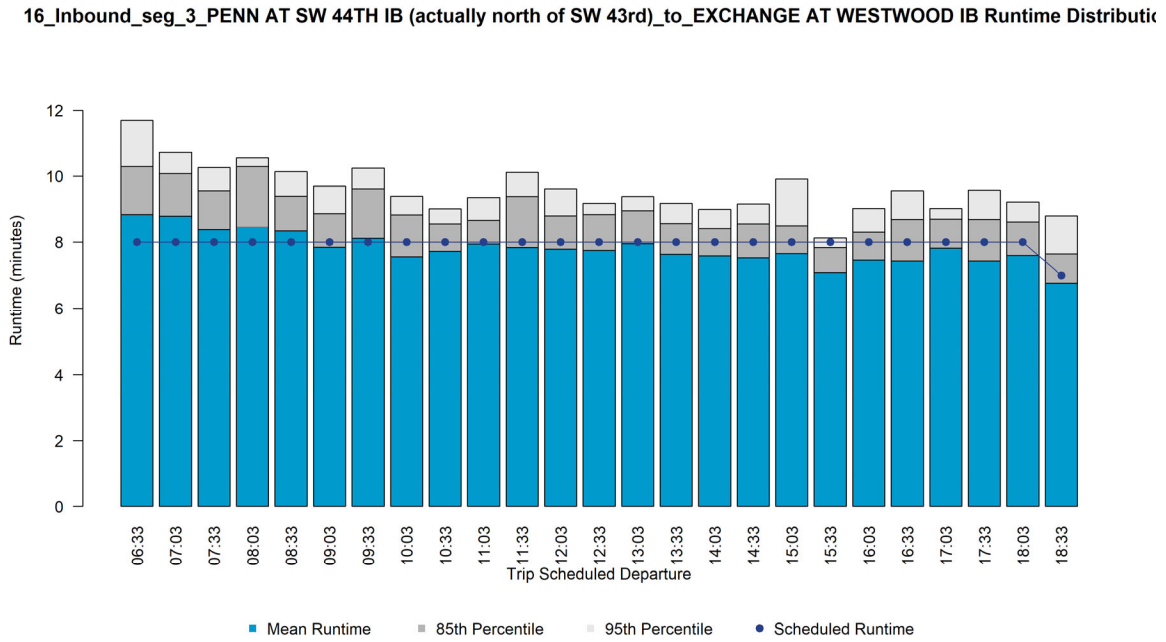
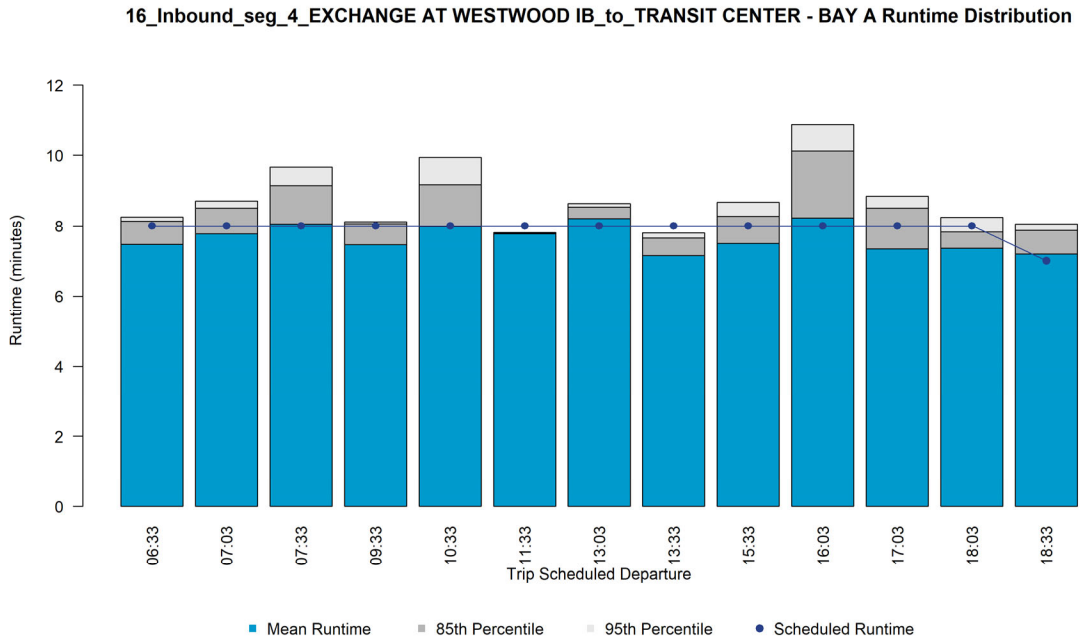


Figure 106 Runtime Chart – Route 016 Inbound, Exchange & Westwood to Downtown Transit Center



**Outbound**

Figure 107 Runtime Chart – Route 016 Outbound, Downtown Transit Center to Westwood & Exchange

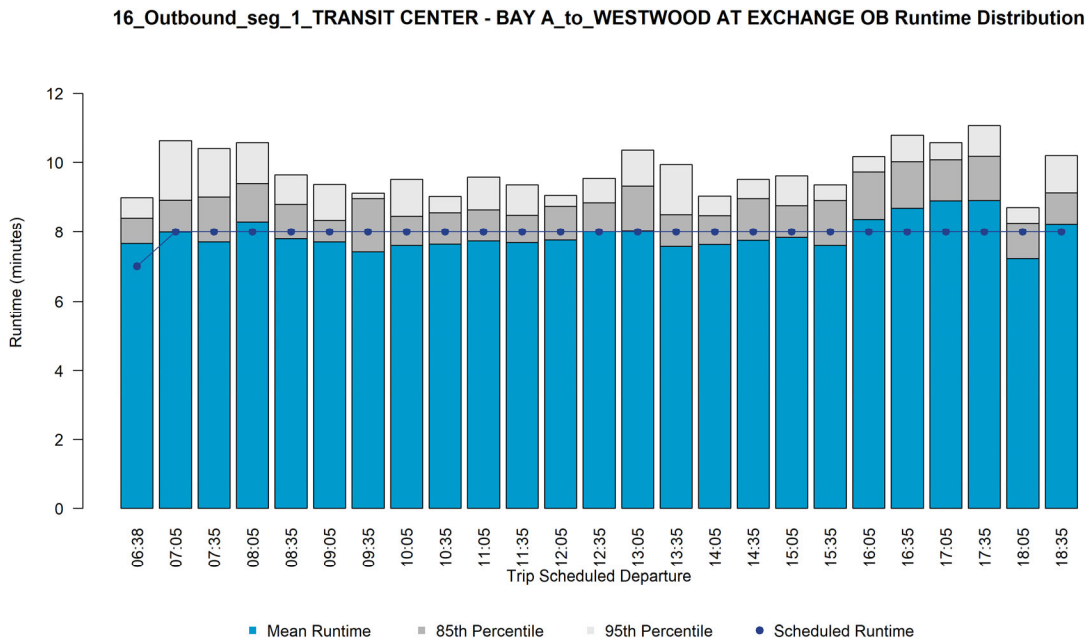


Figure 108 Runtime Chart – Route 016 Outbound, Westwood & Exchange to Penn & SW 44<sup>th</sup>

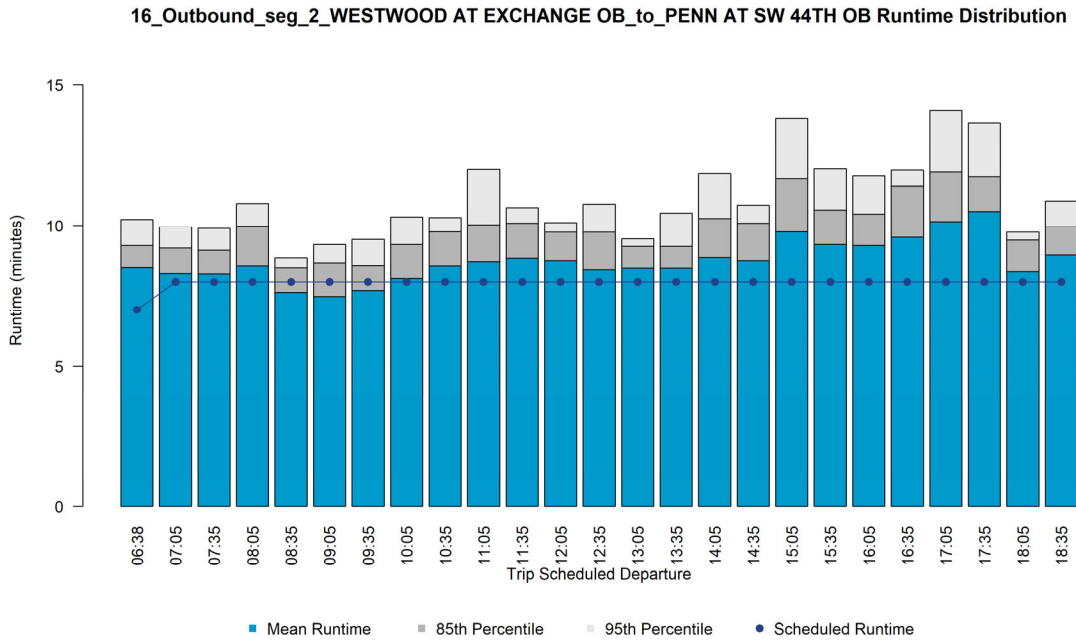


Figure 109 Runtime Chart – Route 016 Outbound, Penn & SW 44<sup>th</sup> to Penn & SW 74<sup>th</sup>

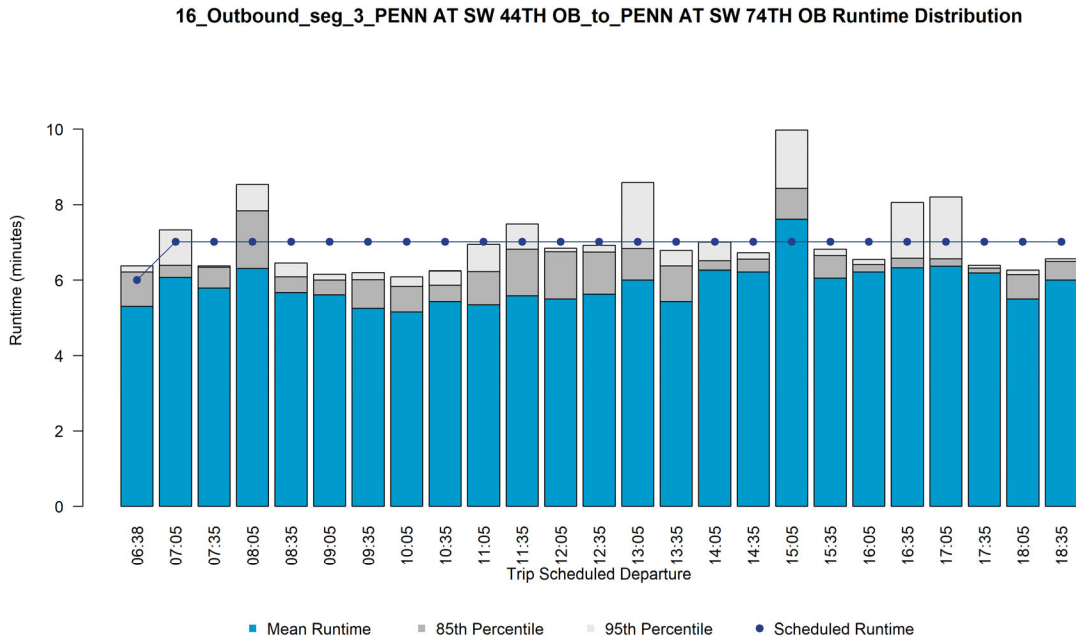
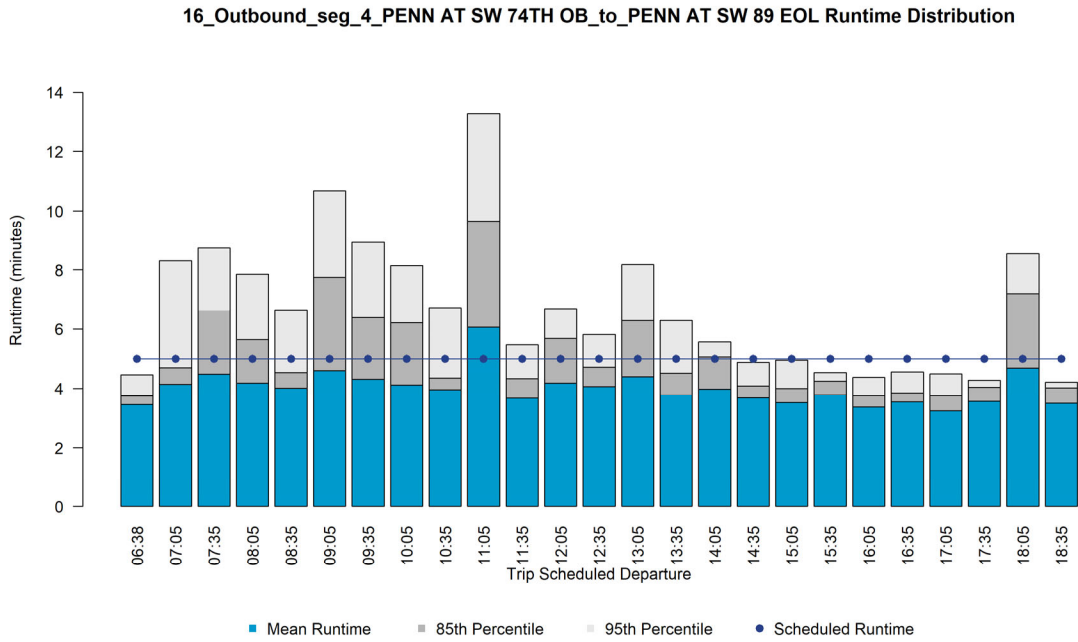




Figure 110 Runtime Chart – Route 016 Outbound, Penn & SW 74<sup>th</sup> to Penn & SW 89<sup>th</sup>



## Route 018

### Inbound

Figure 111 Runtime Chart – Route 018 Inbound, Broadway & Britton to NE 63<sup>rd</sup> & Broadway

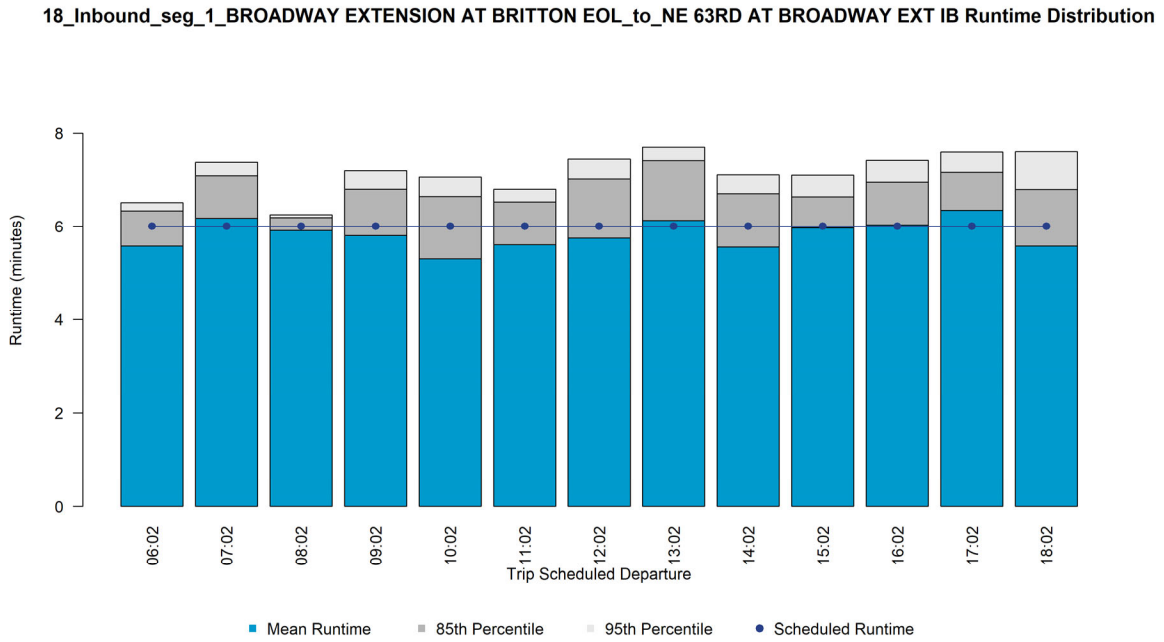


Figure 112 Runtime Chart – Route 018 Inbound, NE 63<sup>rd</sup> & Broadway to Lincoln & NE 50<sup>th</sup>

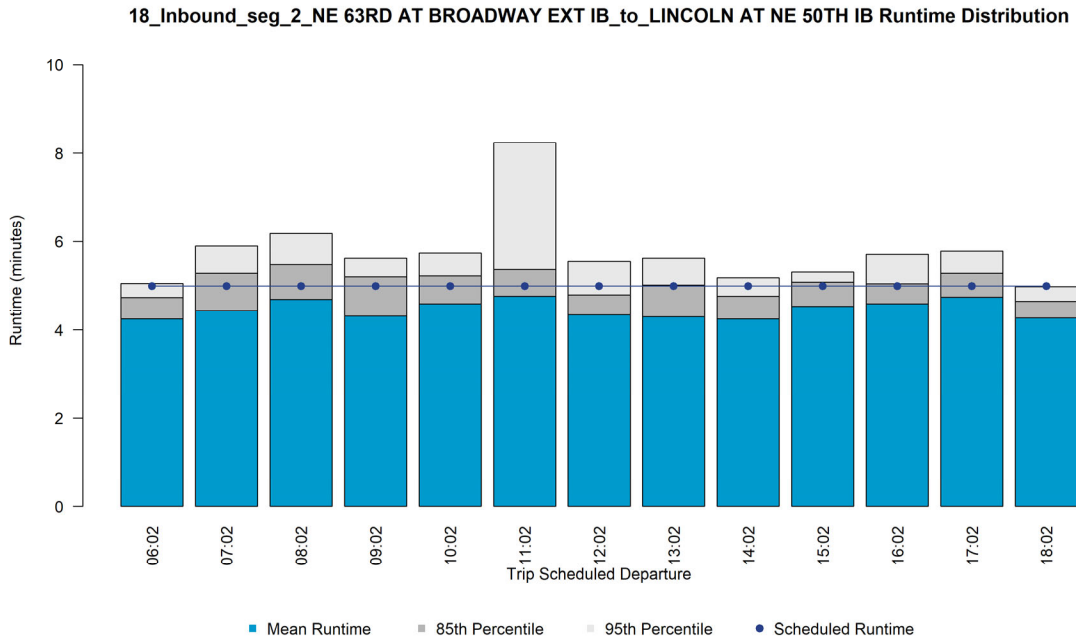


Figure 113 Runtime Chart – Route 018 Inbound, Lincoln & NE 50<sup>th</sup> to State Capitol

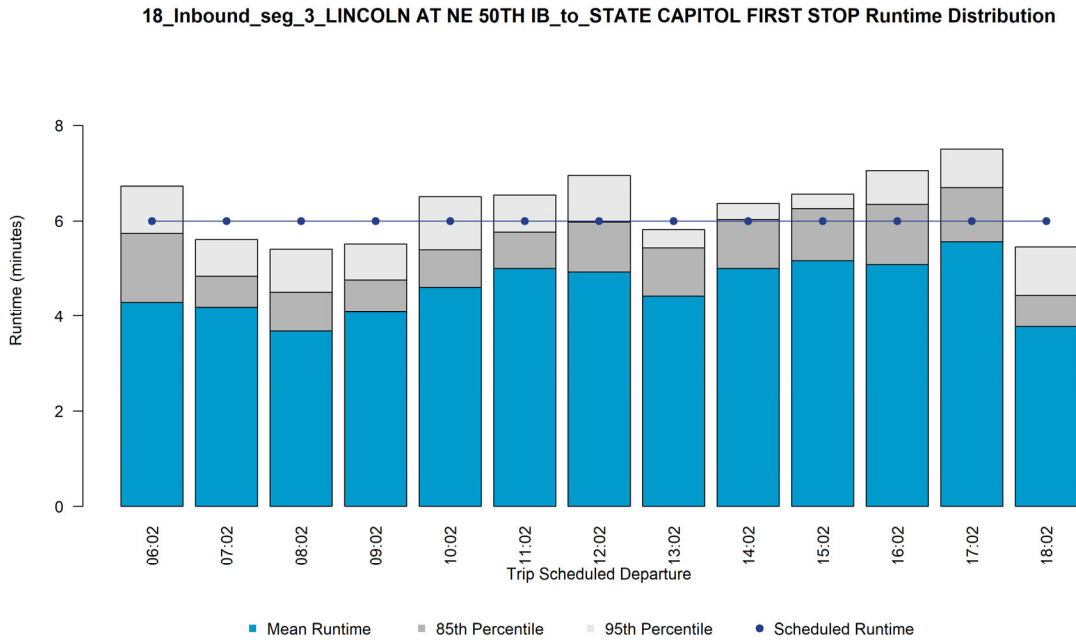


Figure 114 Runtime Chart – Route 018 Inbound, State Capitol to Lincoln & NE 13<sup>th</sup>

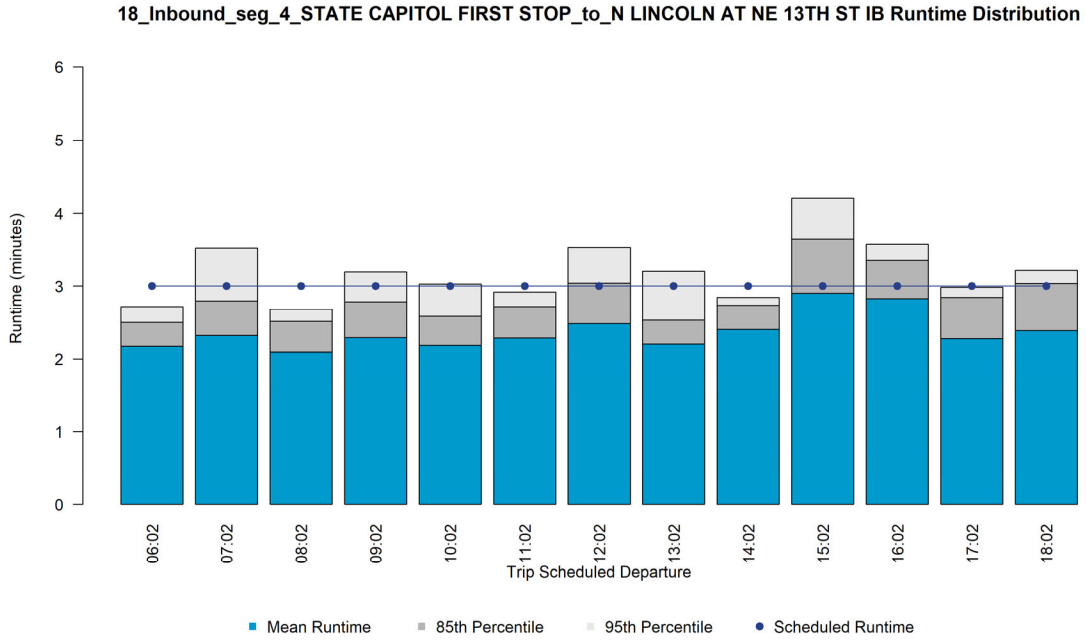
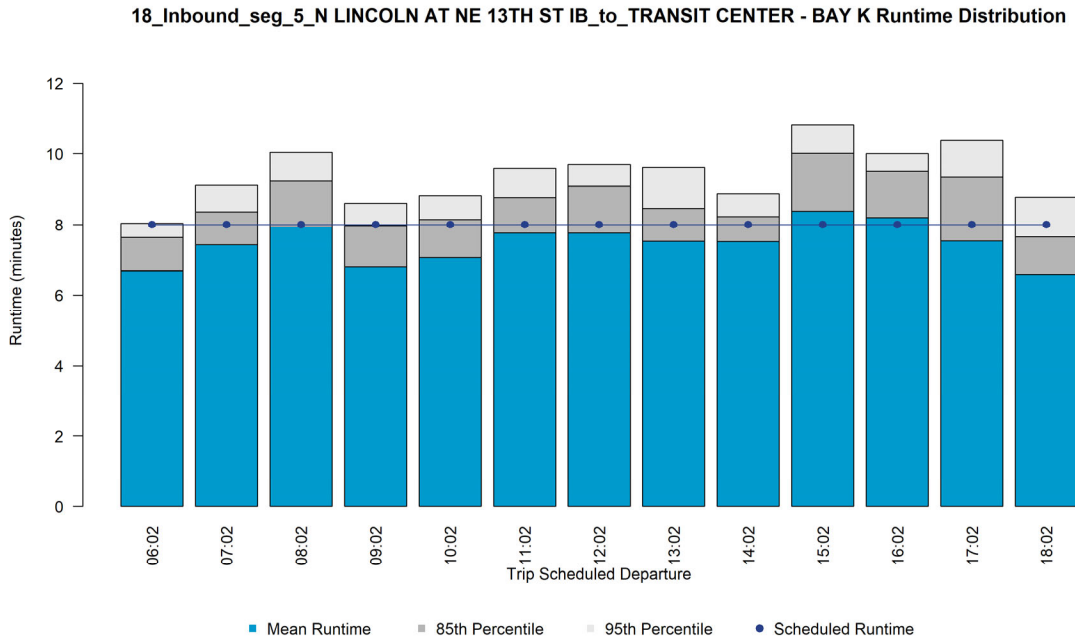


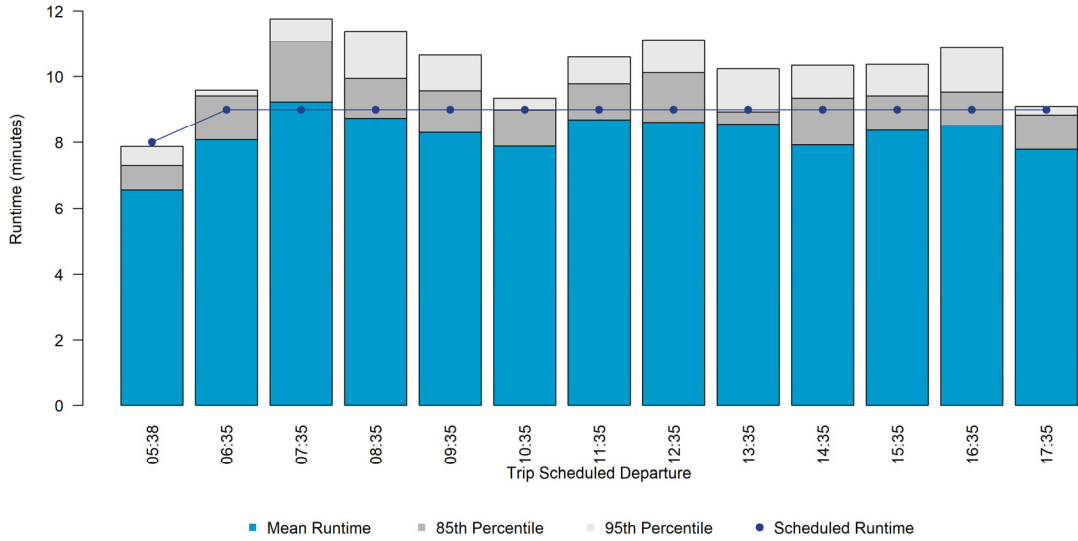
Figure 115 Runtime Chart – Route 018 Inbound, Lincoln & NE 13<sup>th</sup> to Downtown Transit Center



**Outbound**

**Figure 116 Runtime Chart – Route 018 Outbound, Downtown Transit Center to Lincoln & NE 13<sup>th</sup>**

18\_Outbound\_seg\_1\_TRANSIT CENTER - BAY K\_to\_N LINCOLN BLVD AT NE 13TH ST OB Runtime Distribution



**Figure 117 Runtime Chart – Route 018 Outbound, Lincoln & NE 13<sup>th</sup> St to State Capitol**

18\_Outbound\_seg\_2\_N LINCOLN BLVD AT NE 13TH ST OB\_to\_STATE CAPITOL FIRST STOP Runtime Distribution

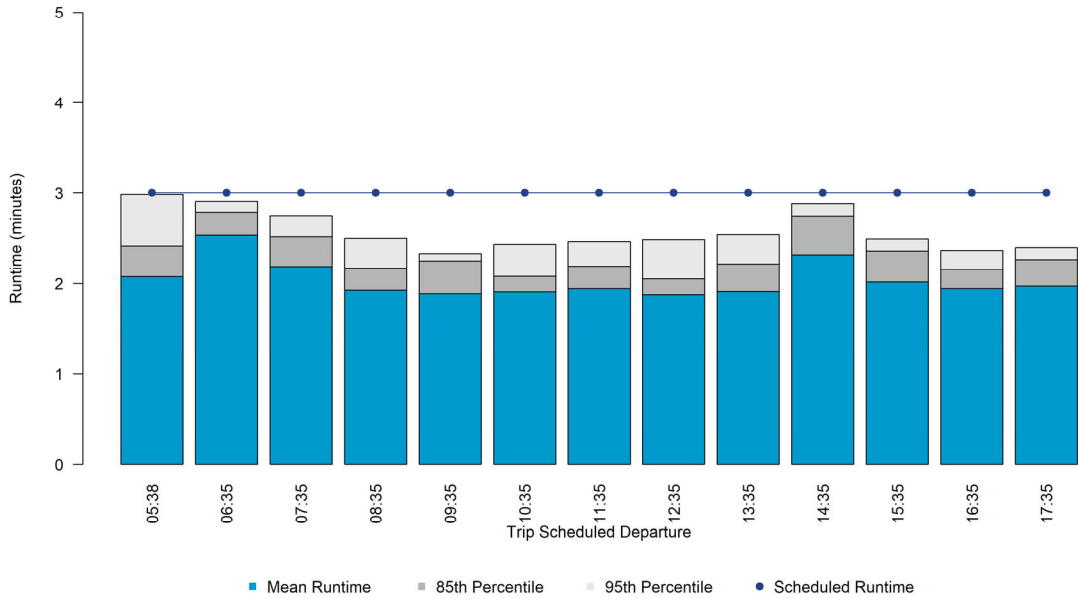


Figure 118 Runtime Chart – Route 018 Outbound, State Capitol to Lincoln & NE 50<sup>th</sup>

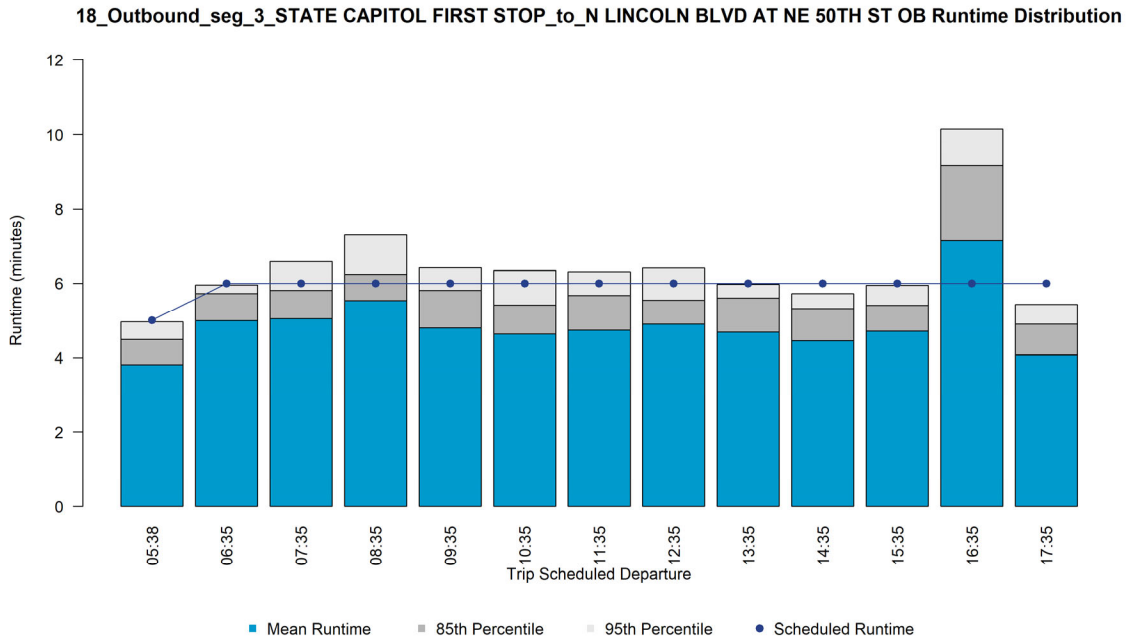
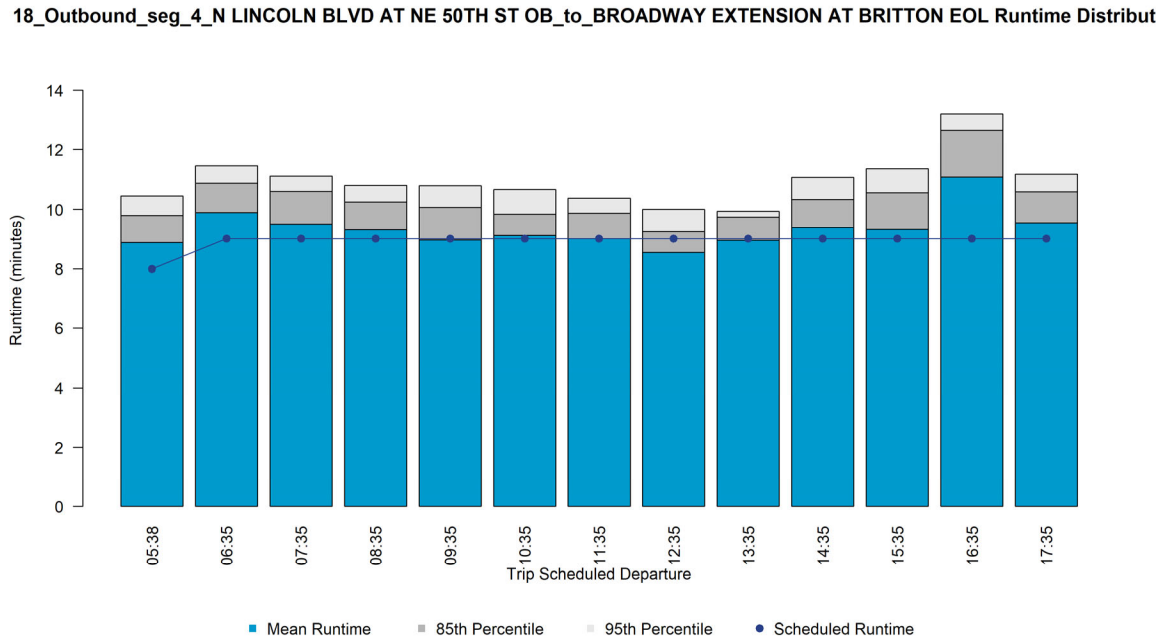


Figure 119 Runtime Chart – Route 018 Outbound, Lincoln & NE 50<sup>th</sup> St to Broadway & Britton



## Route 019

### Eastbound

Figure 120 Runtime Chart – Route 019 Eastbound, Coltrane & NE 20<sup>th</sup> to NE 23<sup>rd</sup> & County Social Services

\_Eastbound\_seg\_1\_COLTRANE AT NE 20TH EOL\_to\_NE 23RD AT OKLAHOMA COUNTY SOCIAL SERVICES OB Runtime Distri

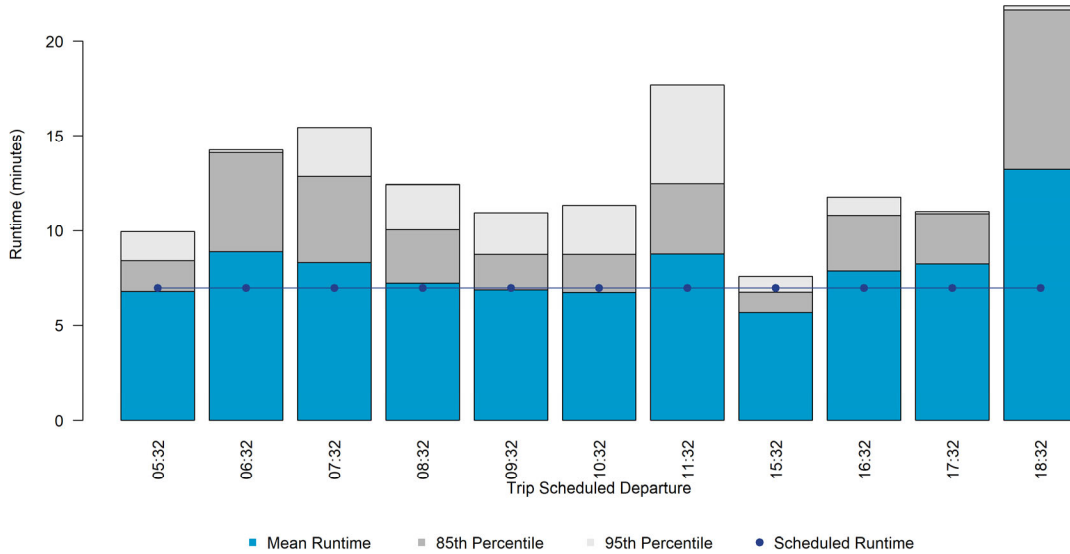


Figure 121 Runtime Chart – Route 019 Eastbound, NE 23<sup>rd</sup> & County Social Services to NE 10<sup>th</sup> & Douglas

\_Eastbound\_seg\_2\_NE 23RD AT OKLAHOMA COUNTY SOCIAL SERVICES OB\_to\_NE 10TH AT DOUGLAS MWC Runtime Distri

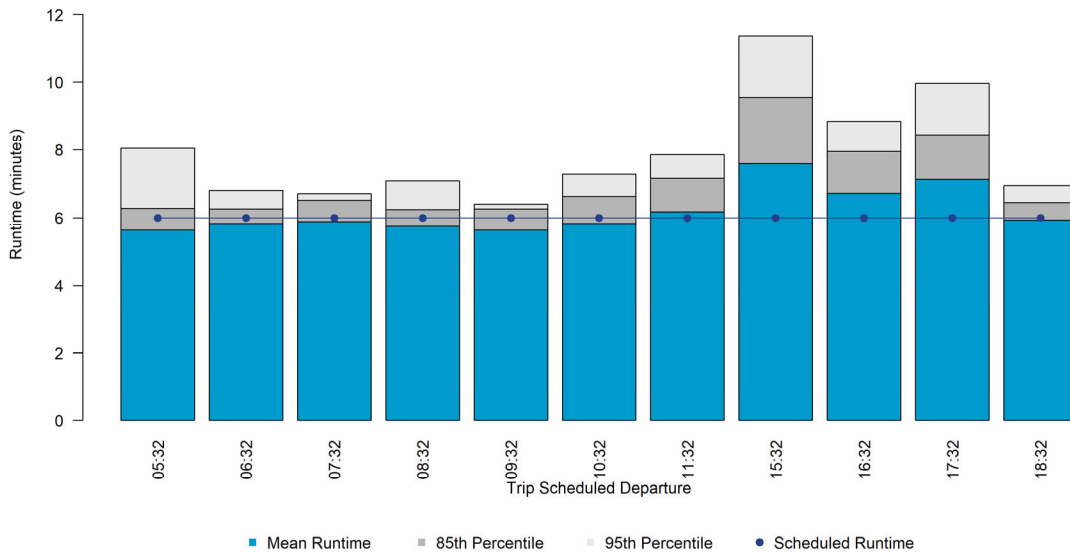


Figure 122 Runtime Chart – Route 019 Eastbound, NE 10<sup>th</sup> & Douglas to Mary Mahoney

19\_Eastbound\_seg\_3\_NE 10TH AT DOUGLAS MWC\_to\_MARY MAHONEY OB Runtime Distribution

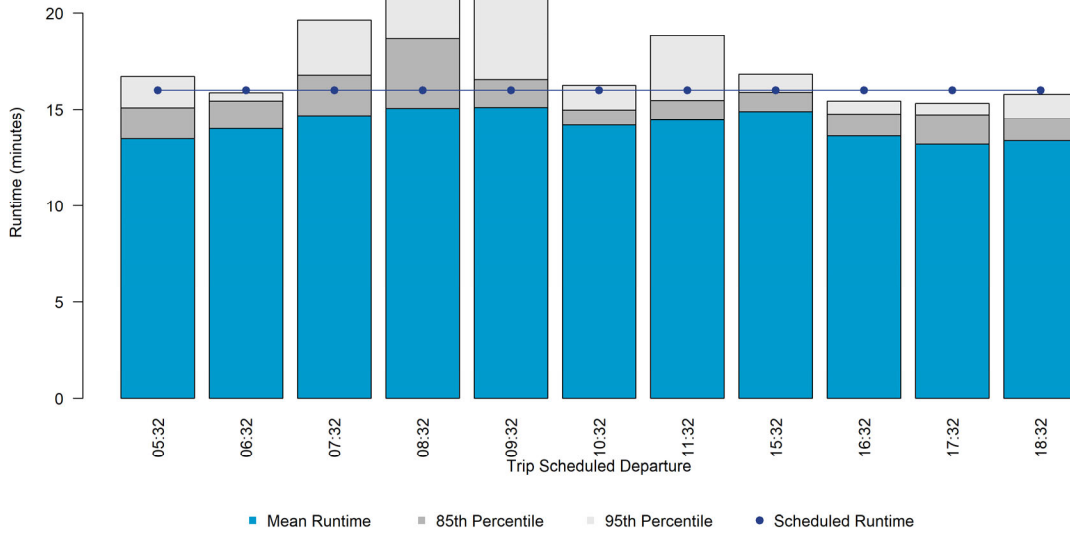
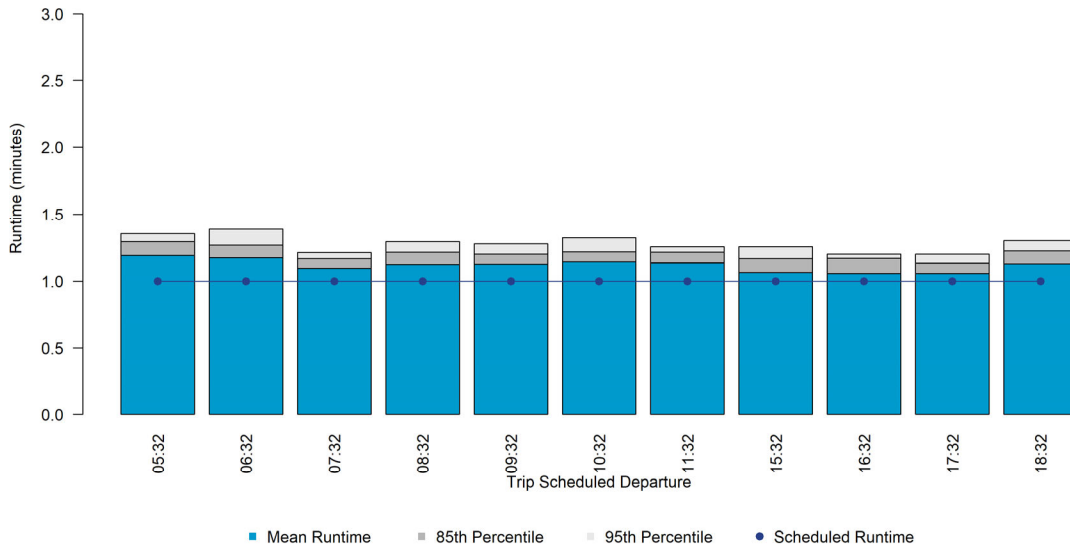


Figure 123 Runtime Chart – Route 019 Eastbound, Mary Mahoney to NE 39<sup>th</sup> & Hiwasee

19\_Eastbound\_seg\_4\_MARY MAHONEY OB\_to\_NE 39TH AT HIWASEE RD EOL Runtime Distribution



Westbound

Figure 124 Runtime Chart – Route 019 Westbound, NE 39<sup>th</sup> & Hiwasee to NE 36<sup>th</sup> & Adair

19\_Westbound\_seg\_1\_NE 39TH AT HIWASEE RD EOL\_to\_NE 36TH AT ADAIR IB Runtime Distribution

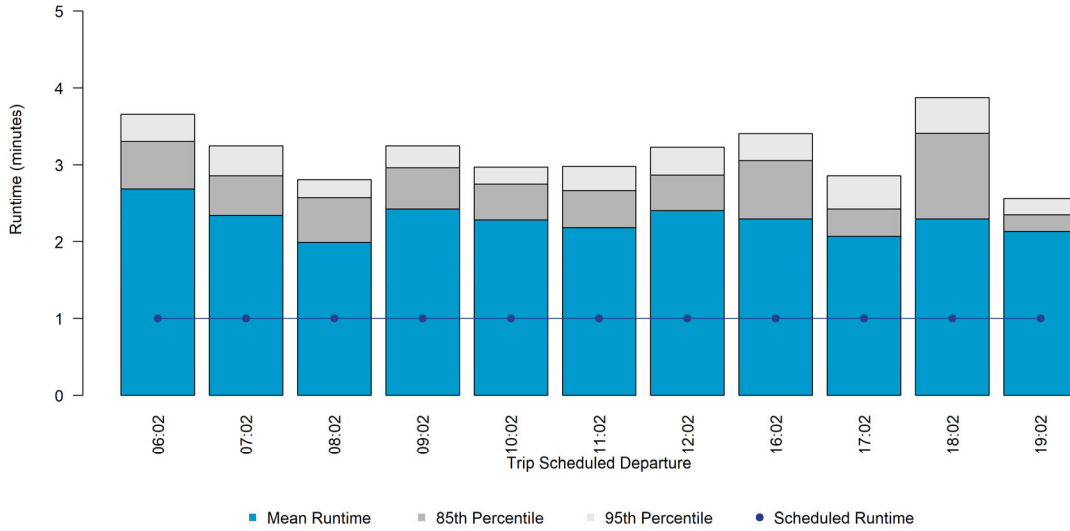


Figure 125 Runtime Chart – Route 019 Westbound, NE 36<sup>th</sup> & Adair to NE 10<sup>th</sup> & Douglas

19\_Westbound\_seg\_2\_NE 36TH AT ADAIR IB\_to\_NE 10TH AT DOUGLAS MWC Runtime Distribution

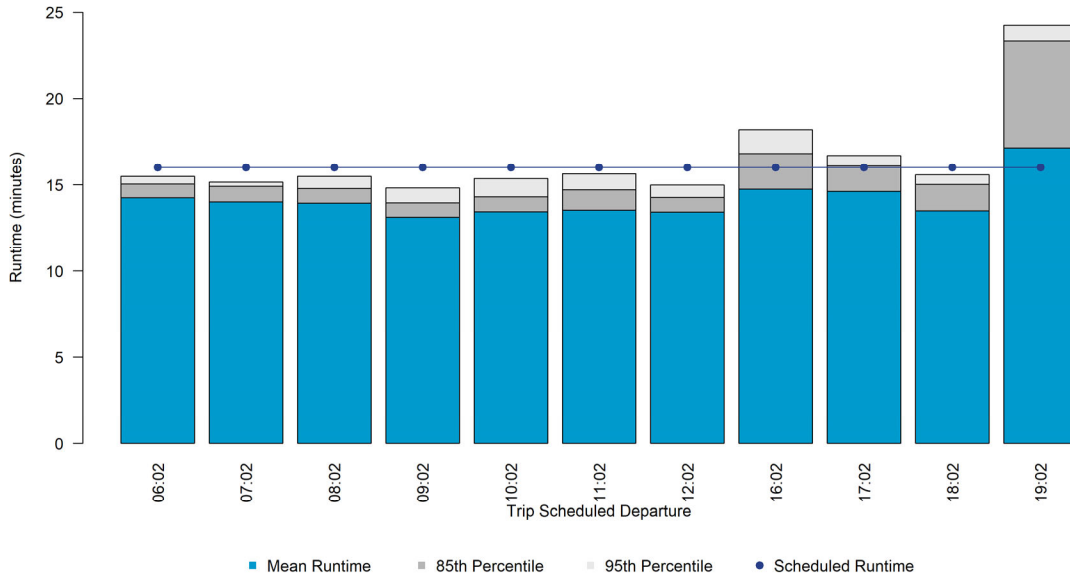




Figure 126 Runtime Chart – Route 019 Westbound, NE 10<sup>th</sup> & Douglas to NE 23<sup>rd</sup> & County Social Services

\_Westbound\_seg\_3\_NE 10TH AT DOUGLAS MWC\_to\_NE 23RD AT OKLAHOMA COUNTY SOCIAL SERVICES OB Runtime Distr

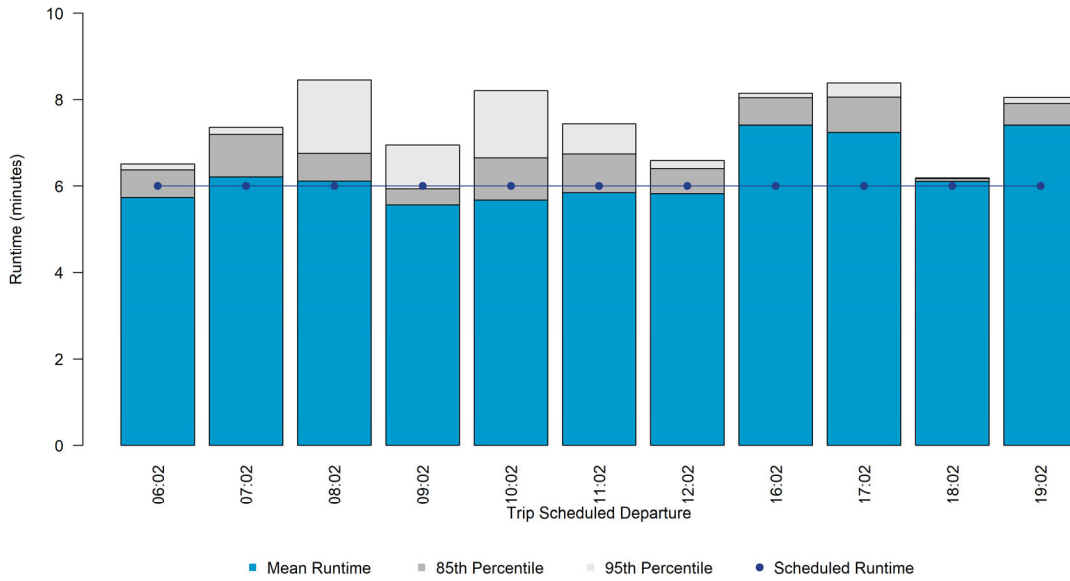
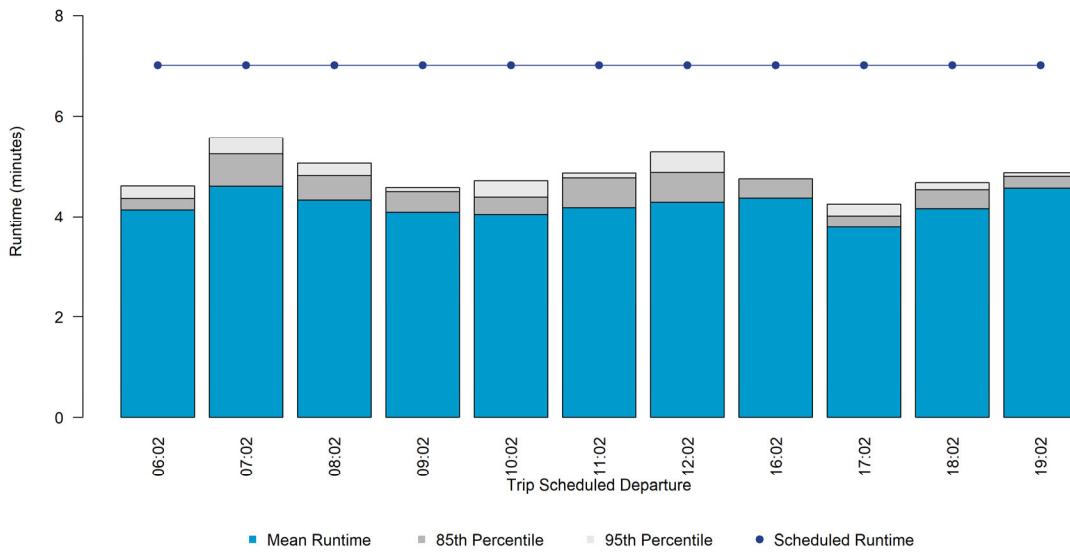


Figure 127 Runtime Chart – Route 019 Westbound, NE 23<sup>rd</sup> & County Social Services to Coltrane & NE 20<sup>th</sup>

\_Westbound\_seg\_4\_NE 23RD AT OKLAHOMA COUNTY SOCIAL SERVICES OB\_to\_COLTRANE AT NE 20TH EOL Runtime Distr



## Route 022

### Inbound

Figure 128 Runtime Chart – Route 022 Inbound, County Health to MLK & NE 50<sup>th</sup>

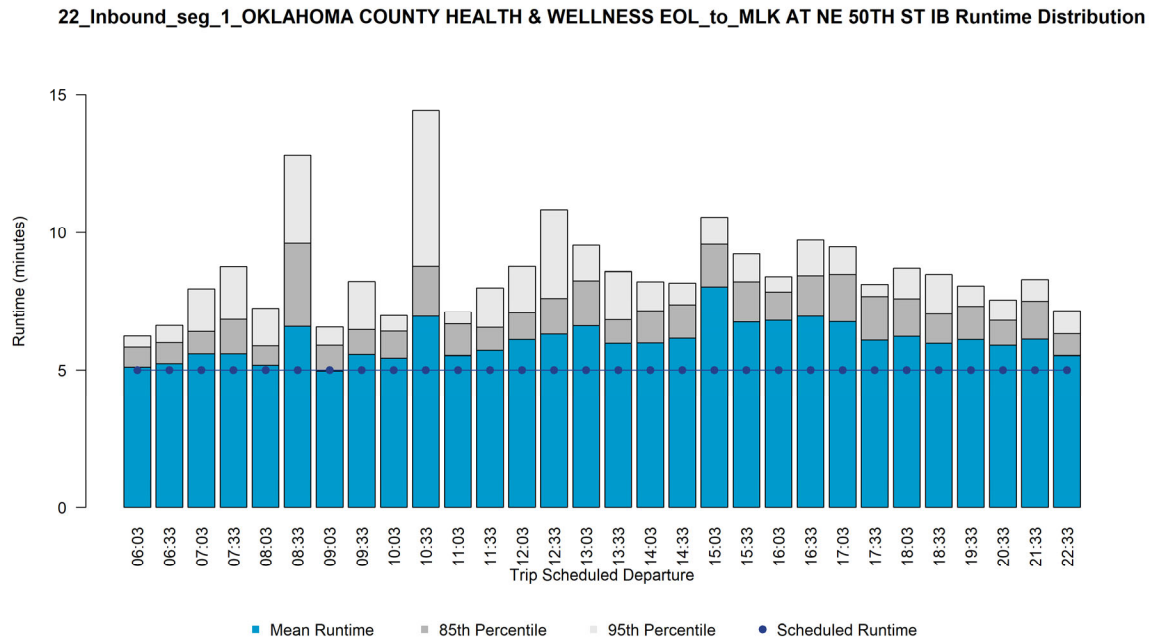


Figure 129 Runtime Chart – Route 022 Inbound, MLK & NE 50<sup>th</sup> to MLK & NE 23<sup>rd</sup>

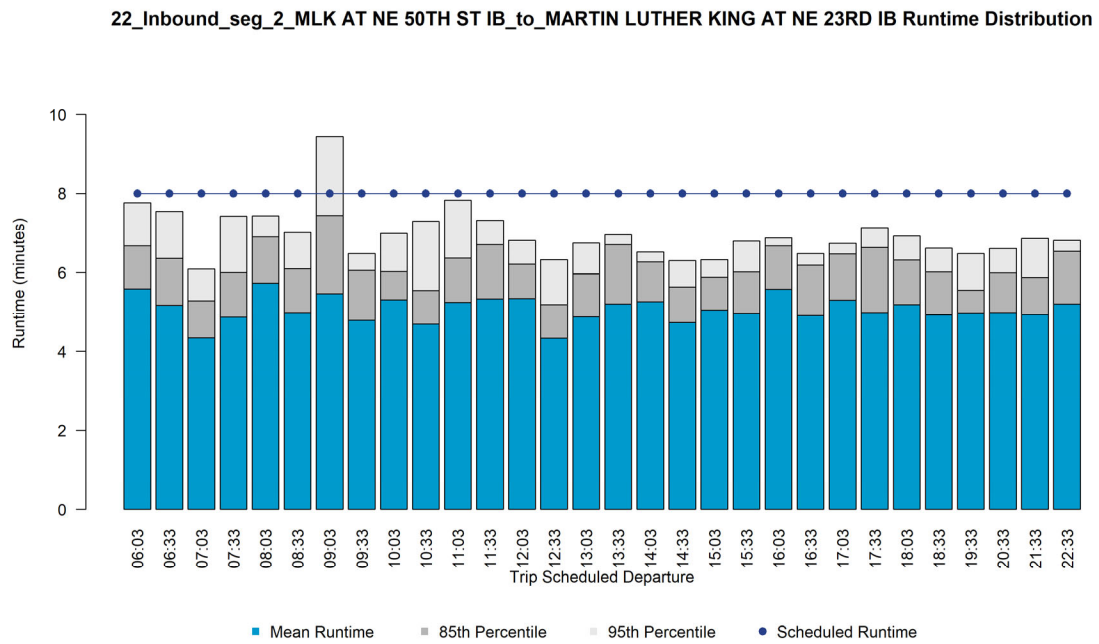


Figure 130 Runtime Chart – Route 022 Inbound, MLK & NE 23<sup>rd</sup> to MLK & NE 8<sup>th</sup>

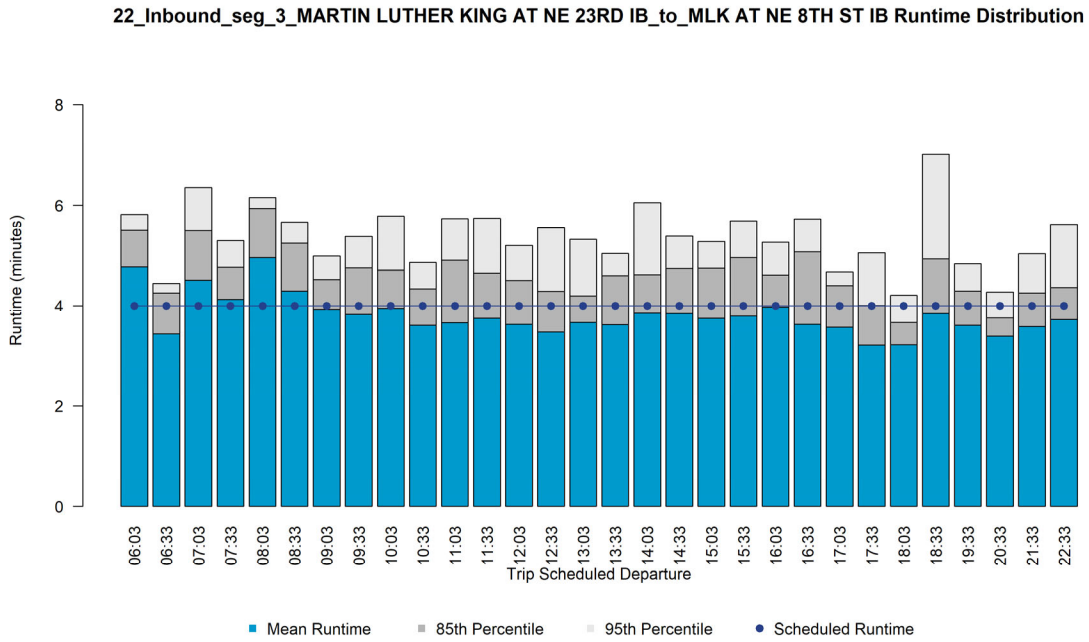
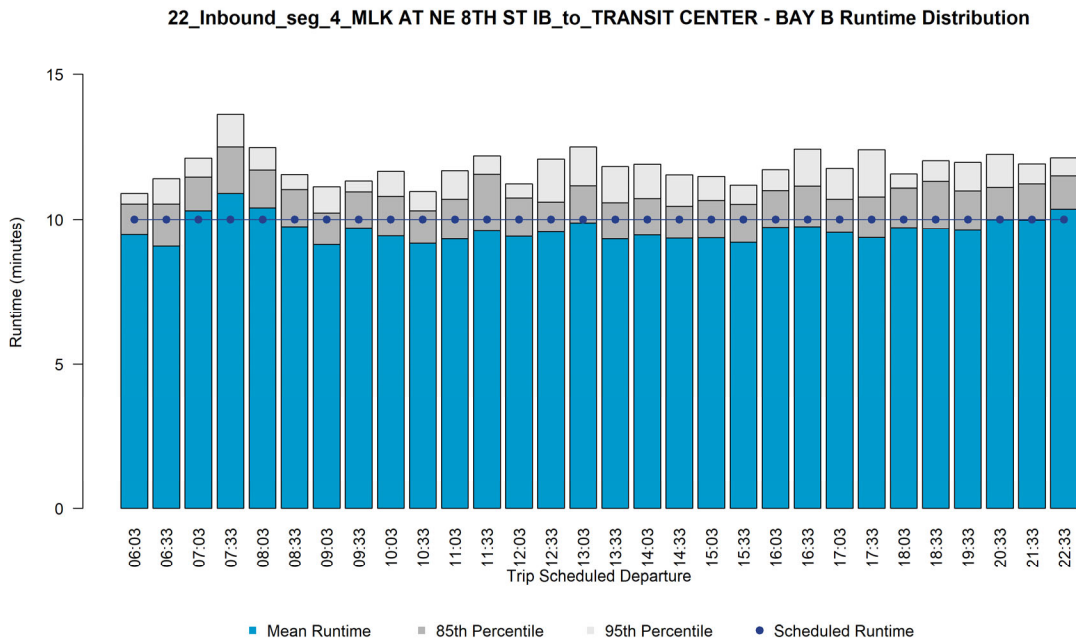
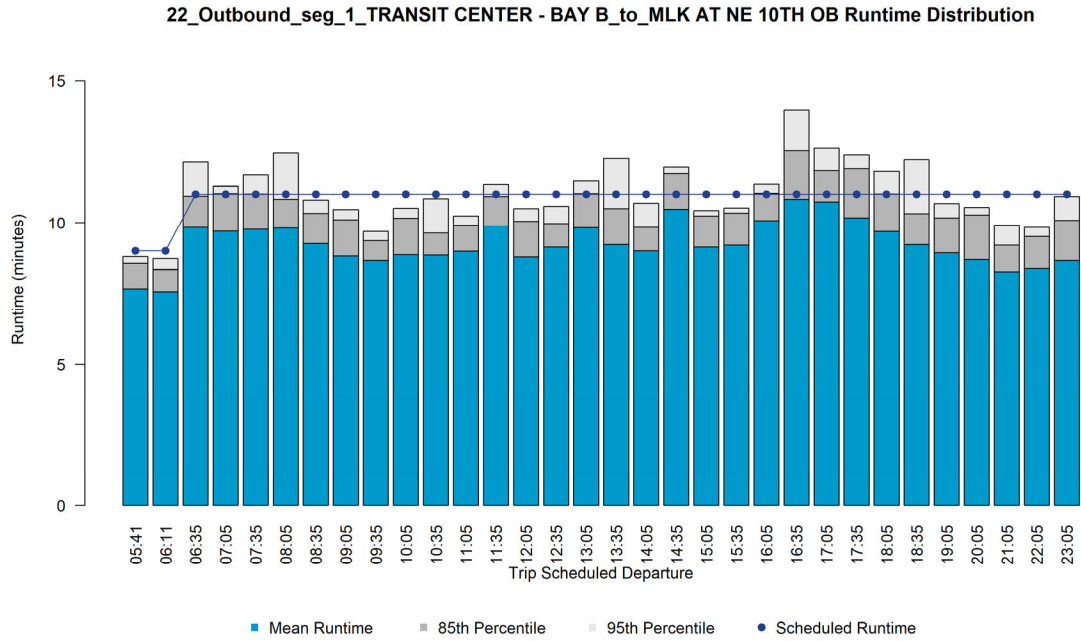


Figure 131 Runtime Chart – Route 022 Inbound, MLK & NE 8<sup>th</sup> to Downtown Transit Center



**Outbound**

**Figure 132 Runtime Chart – Route 022 Outbound, Downtown Transit Center to MLK & NE 10<sup>th</sup>**



**Figure 133 Runtime Chart – Route 022 Outbound, MLK & NE 10<sup>th</sup> to MLK & NE 23<sup>rd</sup>**

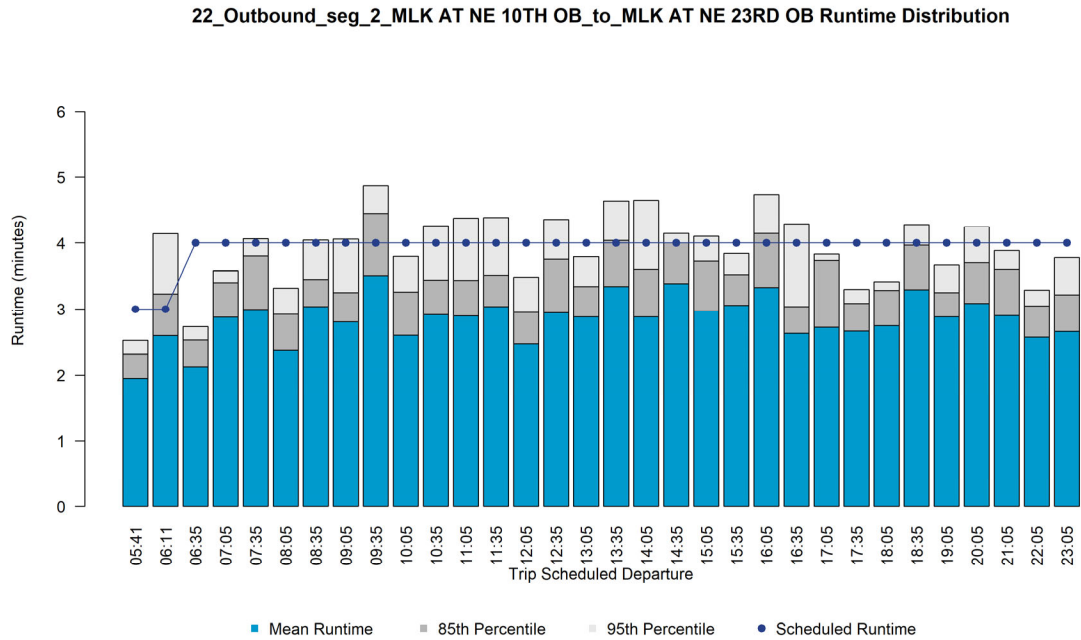


Figure 134 Runtime Chart – Route 022 Outbound, MLK & NE 23<sup>rd</sup> to MLK & NE 50<sup>th</sup>

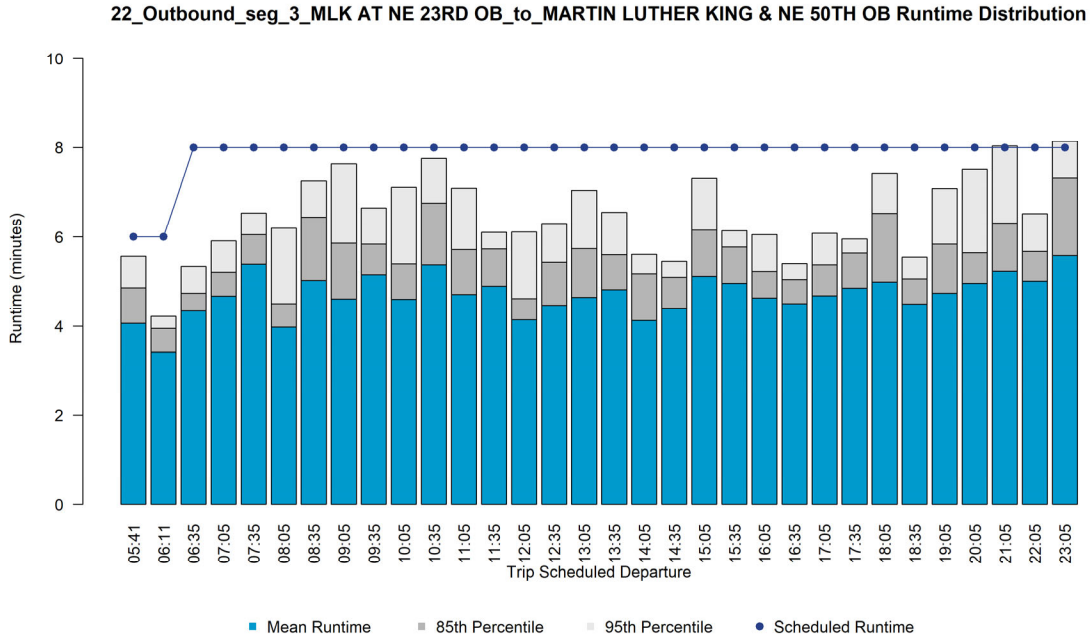
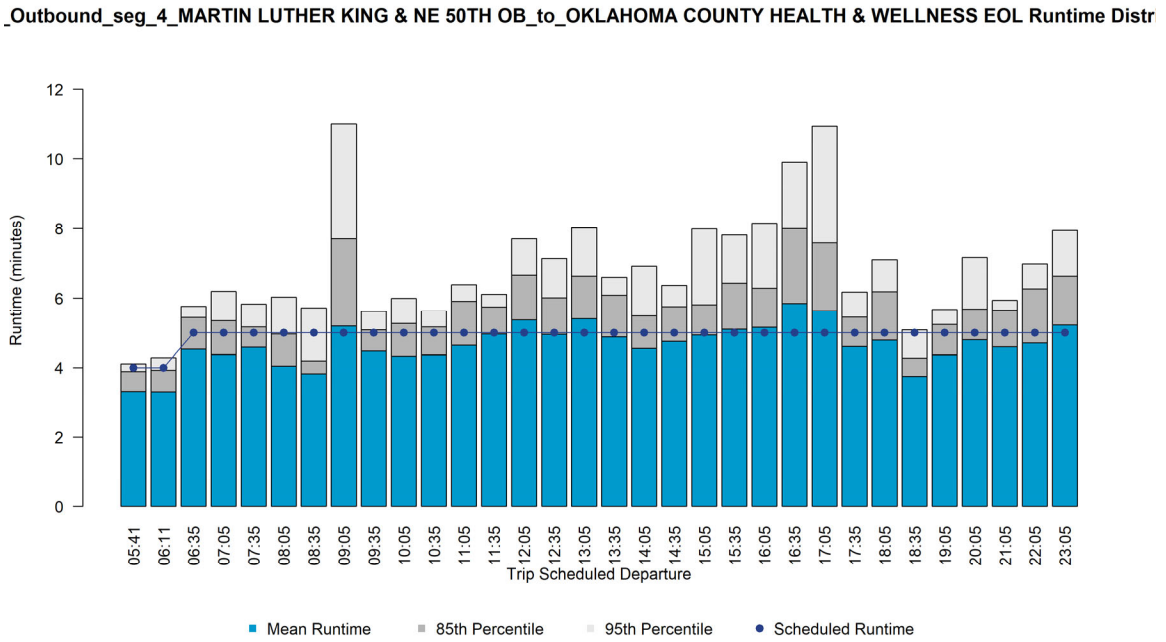


Figure 135 Runtime Chart – Route 022 Outbound, MLK & NE 50<sup>th</sup> to County Health



## Route 023

### Eastbound

Figure 136 Runtime Chart – Route 023 Eastbound, Reno Mini Hub to NW 10<sup>th</sup> & Rockwell

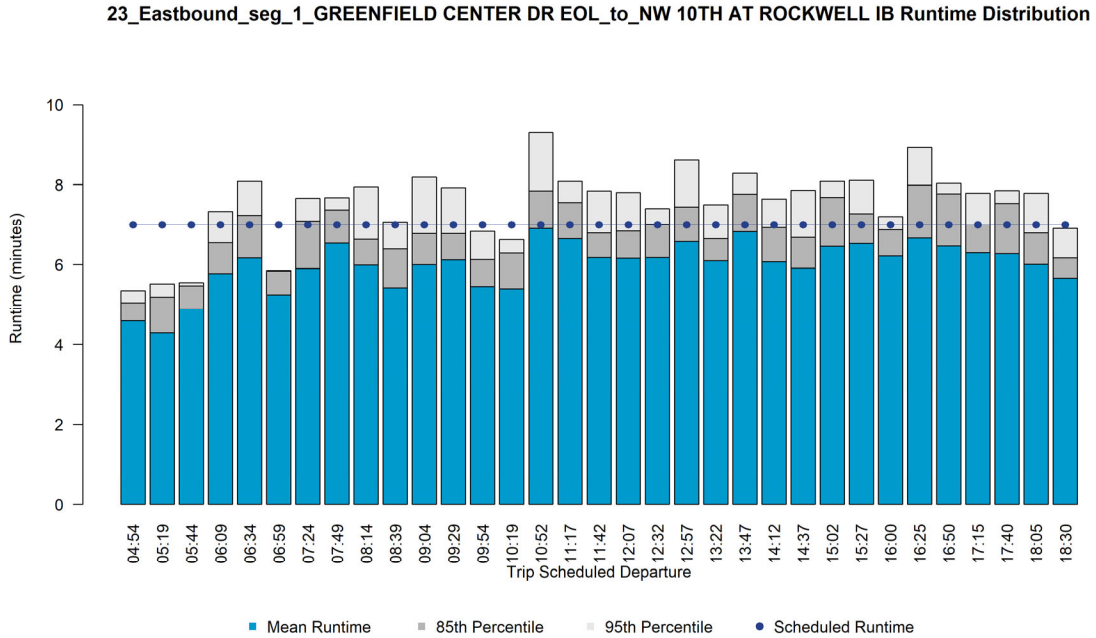


Figure 137 Runtime Chart – Route 023 Eastbound, NW 10<sup>th</sup> & Rockwell to NW 23<sup>rd</sup> & MacArthur

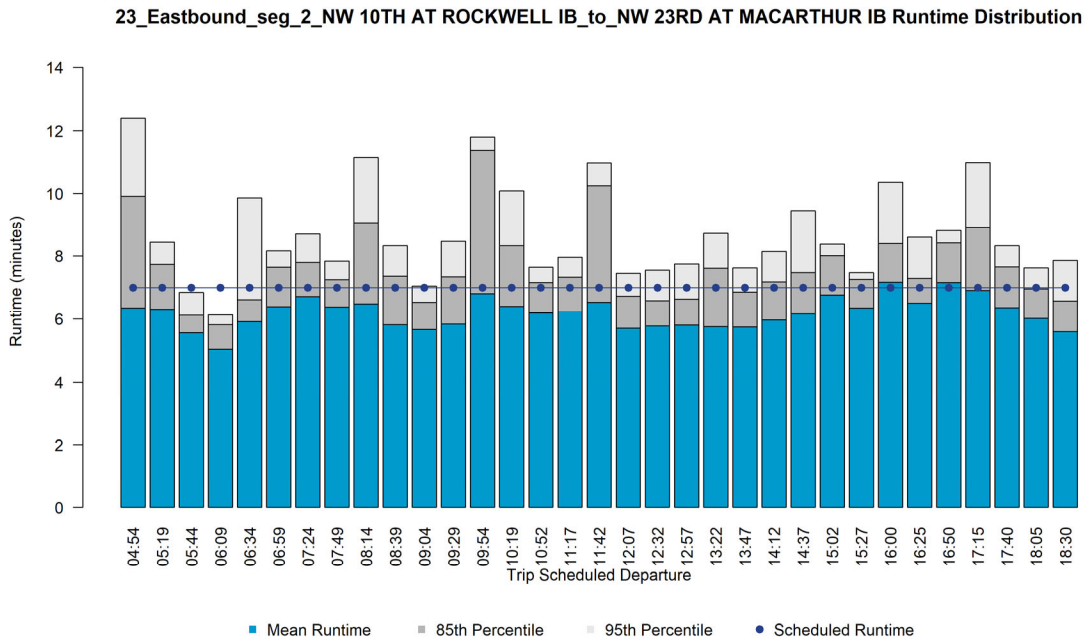


Figure 138 Runtime Chart – Route 023 Eastbound, NW 23<sup>rd</sup> & MacArthur to NW 23<sup>rd</sup> & Portland

23\_Eastbound\_seg\_3\_NW 23RD AT MACARTHUR IB\_to\_NW 23RD AT PORTLAND IB Runtime Distribution

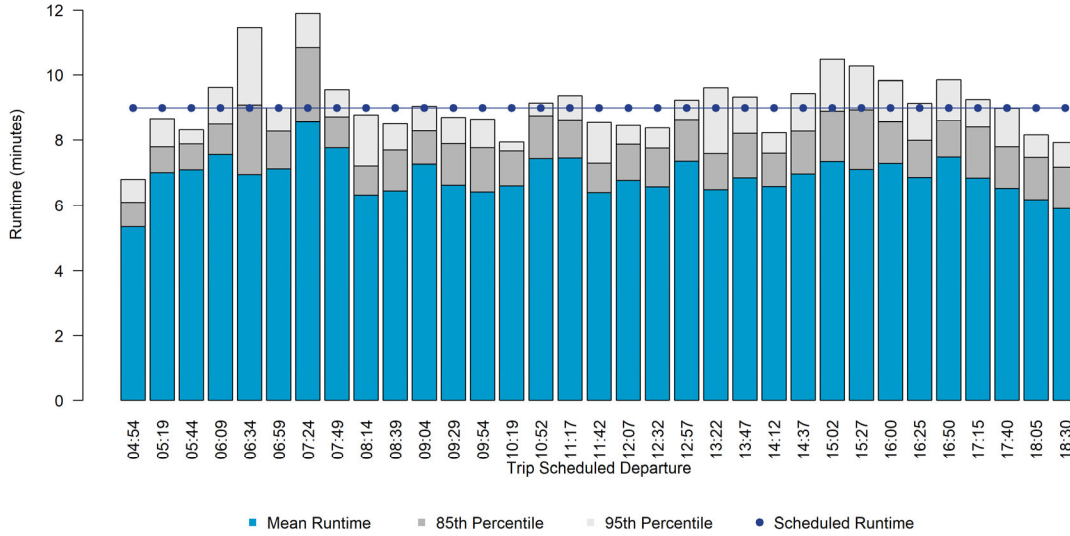


Figure 139 Runtime Chart – Route 023 Eastbound, NW 23<sup>rd</sup> & Portland to NW 23<sup>rd</sup> & Penn

23\_Eastbound\_seg\_4\_NW 23RD AT PORTLAND IB\_to\_NW 23RD AT PENNSYLVANIA IB Runtime Distribution

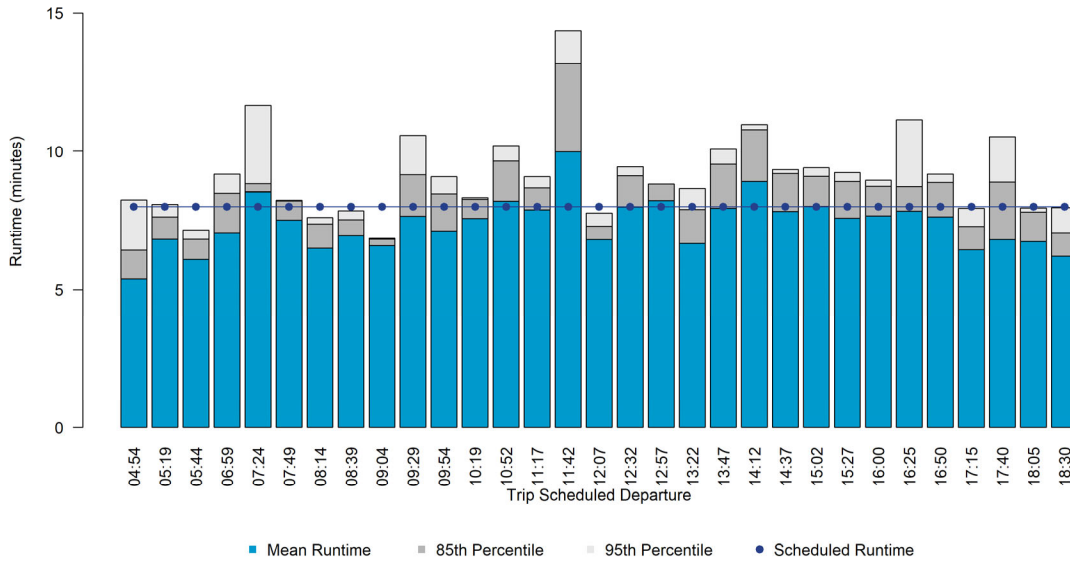


Figure 140 Runtime Chart – Route 023 Eastbound, NW 23<sup>rd</sup> & Penn to NW 23<sup>rd</sup> & Western

23\_Eastbound\_seg\_5\_NW 23RD AT PENNSYLVANIA IB\_to\_NW 23RD AT WESTERN IB Runtime Distribution

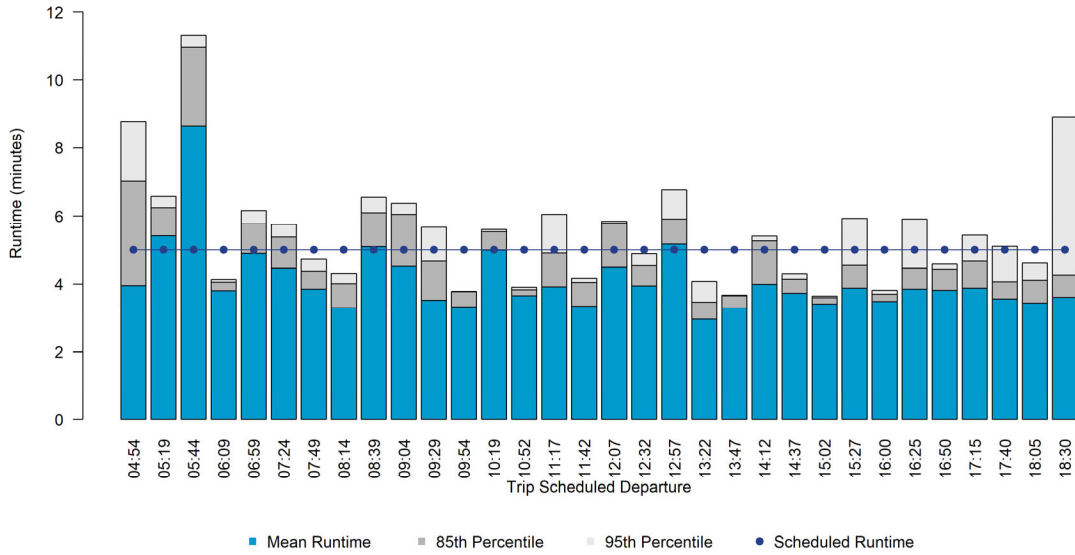


Figure 141 Runtime Chart – Route 023 Eastbound, NW 23<sup>rd</sup> & Western to State Capitol

23\_Eastbound\_seg\_6\_NW 23RD AT WESTERN IB\_to\_STATE CAPITOL FIRST STOP Runtime Distribution

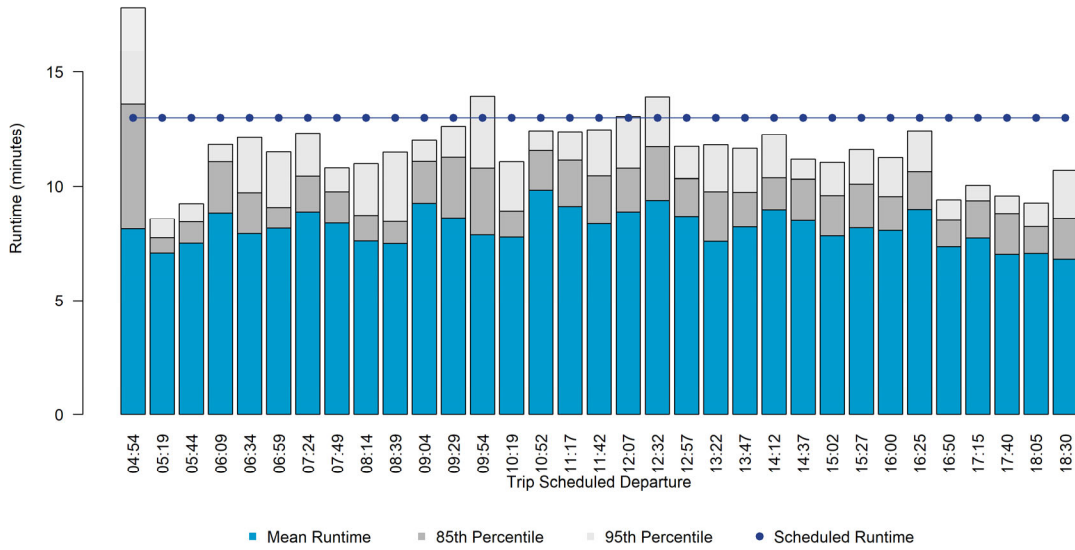
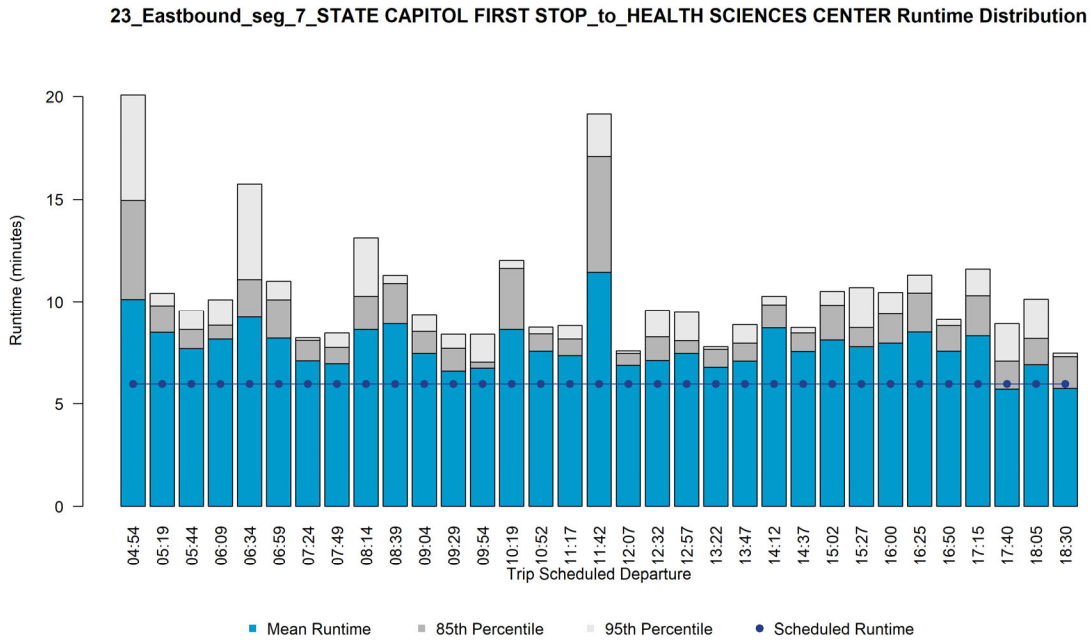




Figure 142 Runtime Chart – Route 023 Eastbound, State Capitol to Health Sciences Center



Westbound

Figure 143 Runtime Chart – Route 023 Westbound, Health Sciences Center to NW 23<sup>rd</sup> & Classen

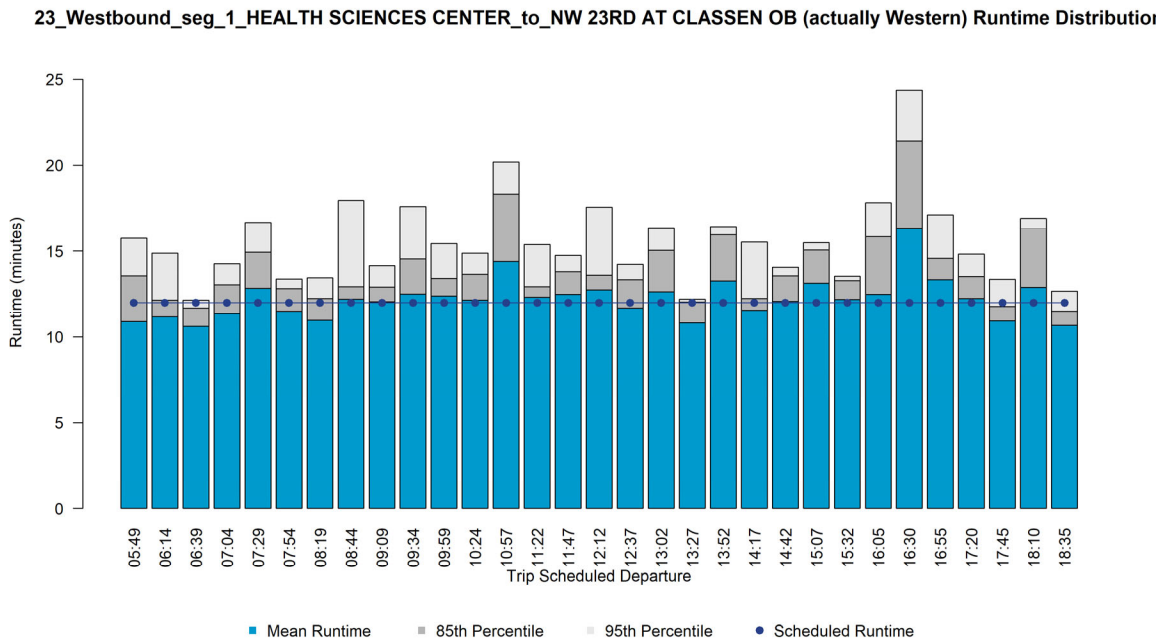


Figure 144 Runtime Chart – Route 023 Westbound, NW 23rd & Classen to Shepherd Mall & Flynn

23\_Westbound\_seg\_2\_NW 23RD AT CLASSEN OB (actually Western)\_to\_SHEPHERD MALL AT FLYNN OB Runtime Distributi

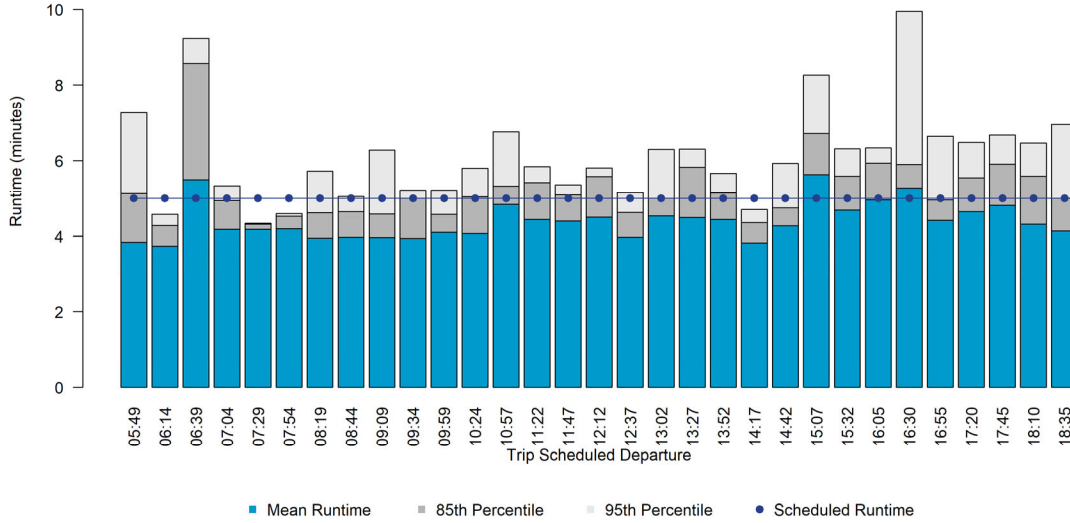


Figure 145 Runtime Chart – Route 023 Westbound, Shepherd Mall & Flynn to NW 23rd & Portland

23\_Westbound\_seg\_3\_SHEPHERD MALL AT FLYNN OB\_to\_NW 23RD AT PORTLAND AVE OB Runtime Distribution

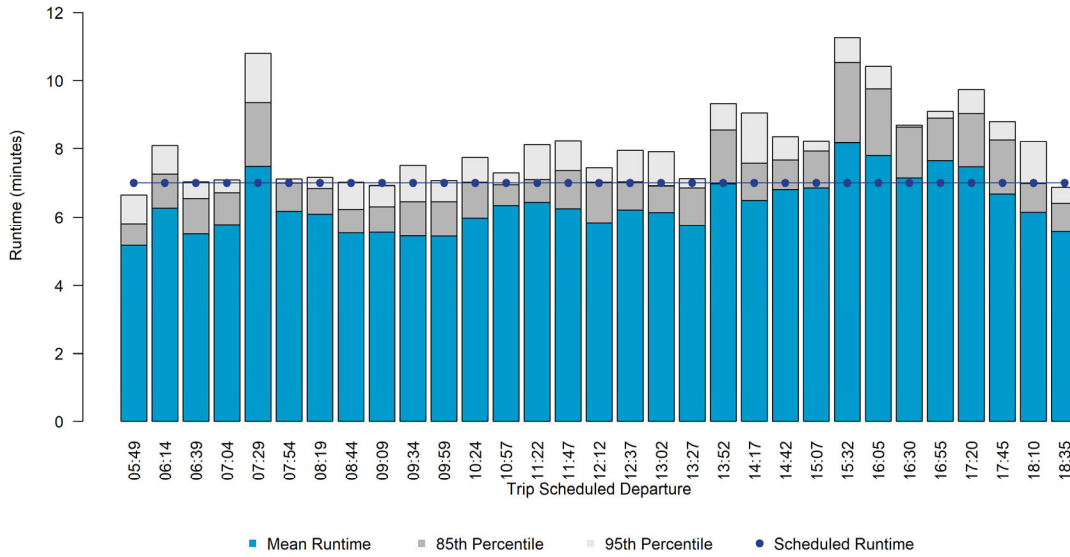


Figure 146 Runtime Chart – Route 023 Westbound, NW 23<sup>rd</sup> & Portland to MacArthur & NW 16<sup>th</sup>

23\_Westbound\_seg\_4\_NW 23RD AT PORTLAND AVE OB\_to\_MACARTHUR AT NW 16TH OB Runtime Distribution

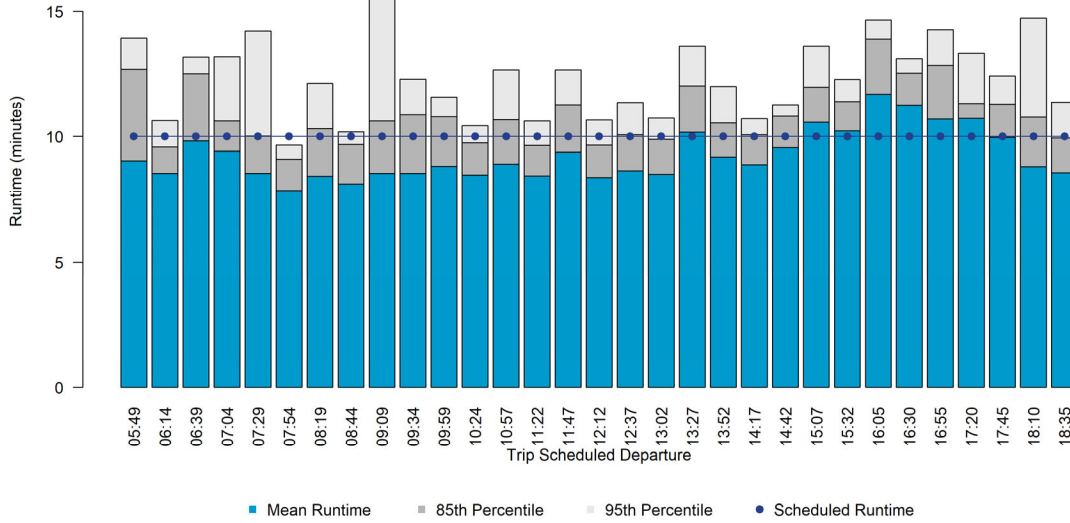
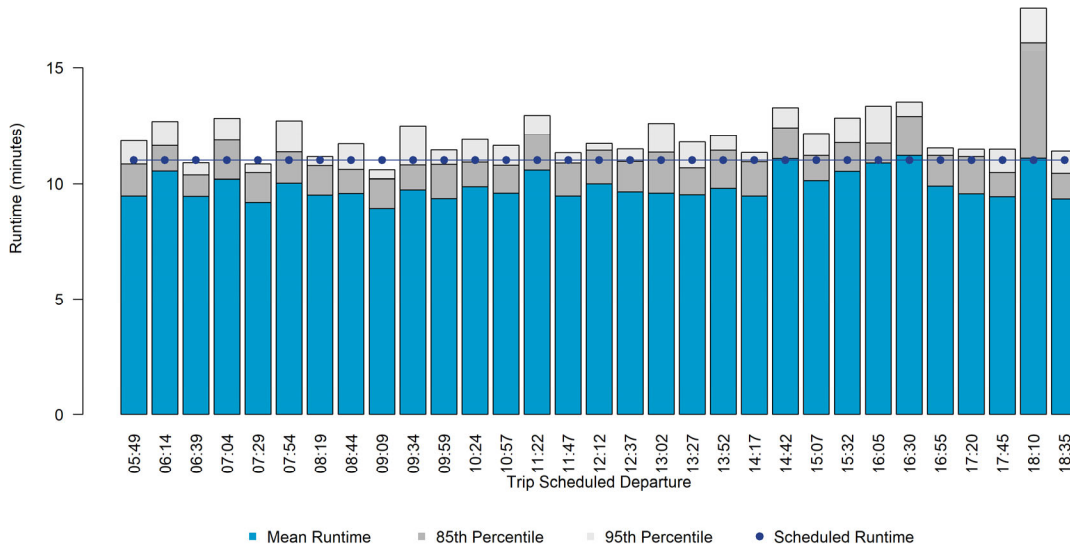


Figure 147 Runtime Chart – Route 023 Westbound, MacArthur & NW 16<sup>th</sup> to Reno Mini Hub

23\_Westbound\_seg\_5\_MACARTHUR AT NW 16TH OB\_to\_GREENFIELD CENTER DR EOL Runtime Distribution



## Route 024

### Southbound

Figure 148 Runtime Chart – Route 024 Southbound, Downtown Transit Center to Homeland Park-and-Ride

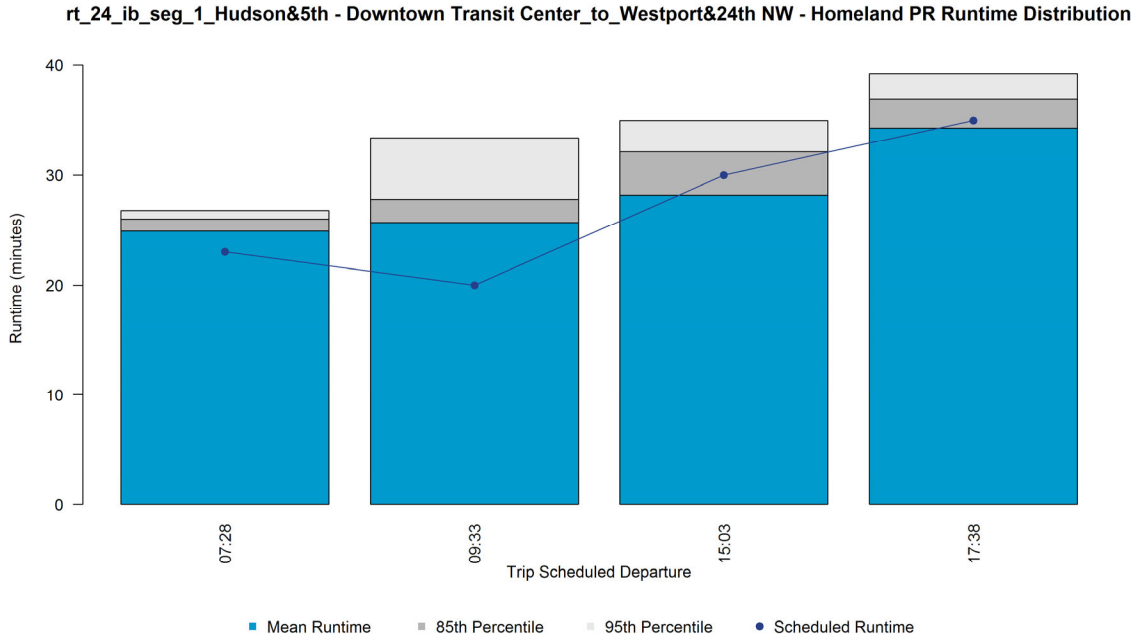
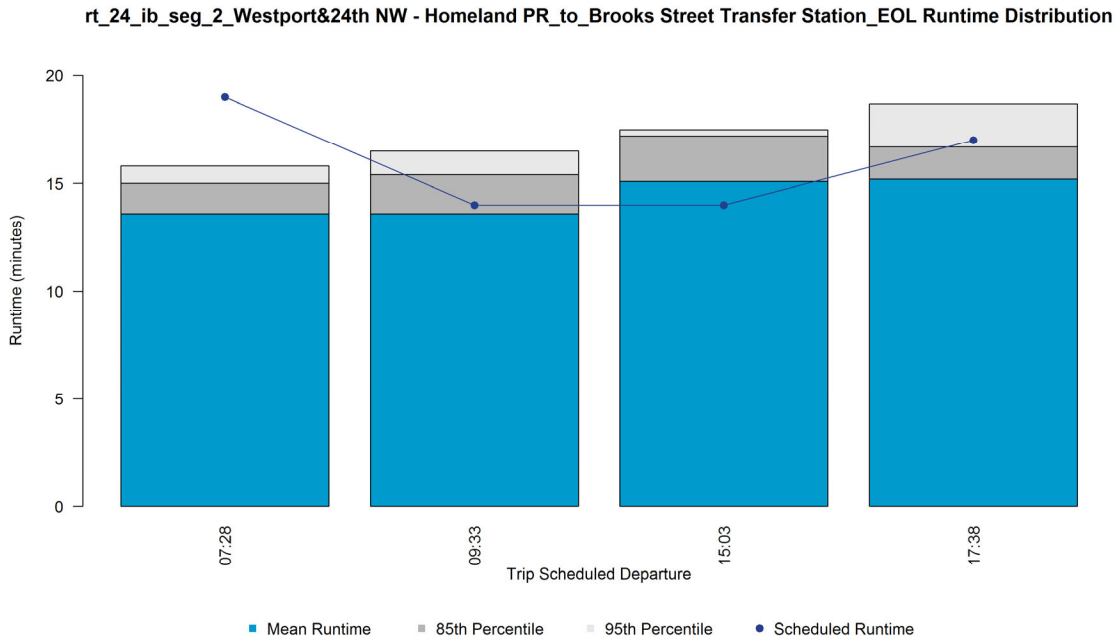
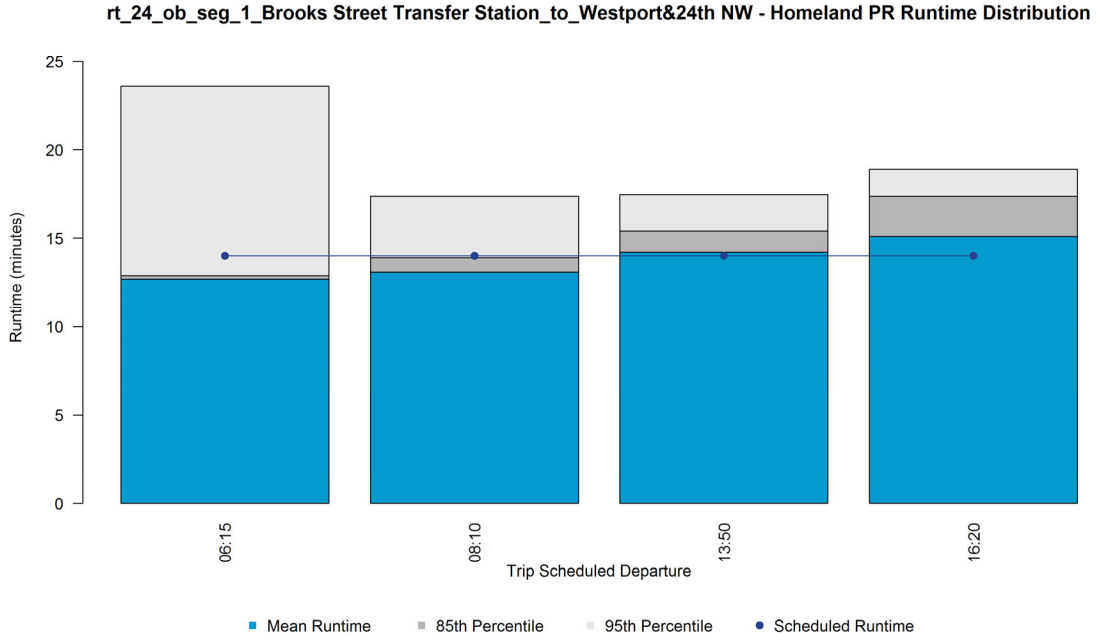


Figure 149 Runtime Chart – Route 024 Southbound, Homeland Park-and-Ride to Brooks Street Transfer Station



**Northbound**

**Figure 150 Runtime Chart – Route 024 Northbound, Brooks Street Transfer Station to Homeland Park-and-Ride**



**Figure 151 Runtime Chart – Route 024 Northbound, Homeland Park-and-Ride to Robinson & Main**

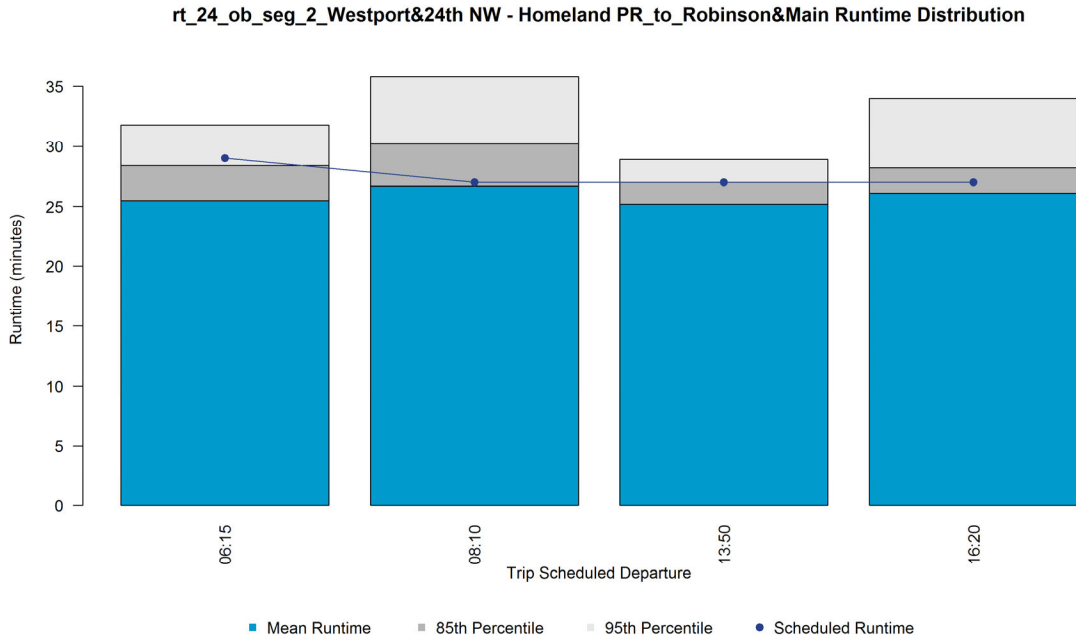


Figure 152 Runtime Chart – Route 024 Northbound, Robinson & Main to NE 13<sup>th</sup> & Lincoln

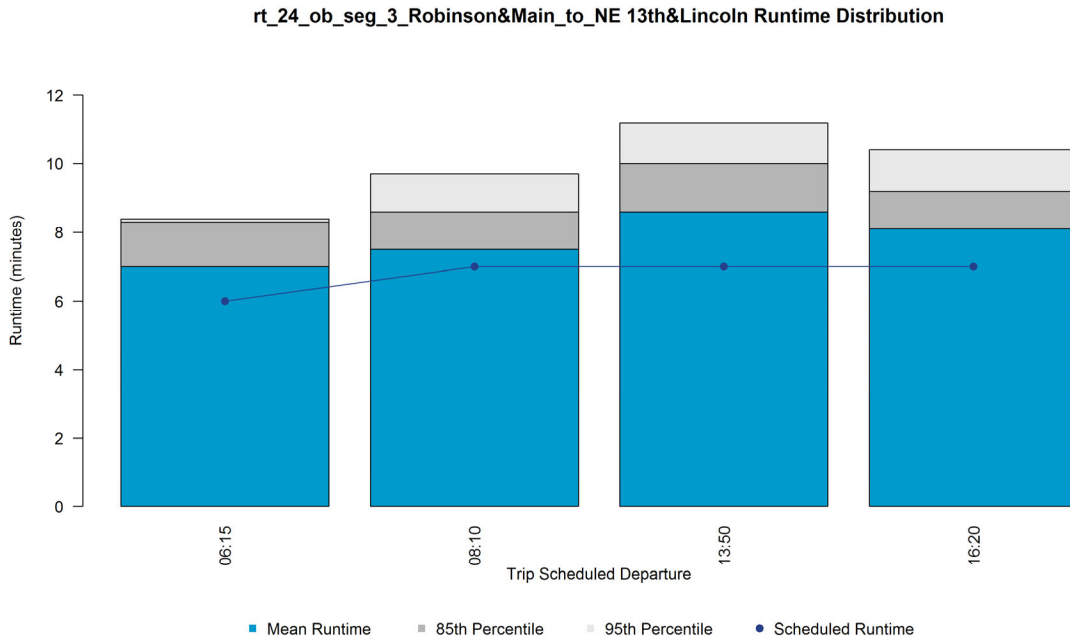
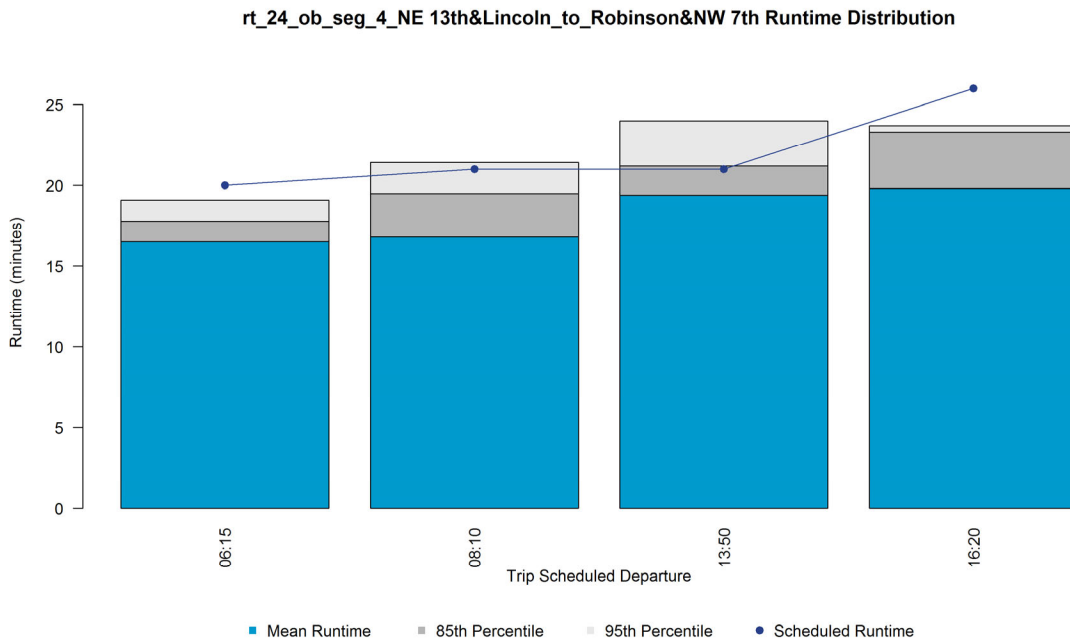


Figure 153 Runtime Chart – Route 024 Northbound, NE 13<sup>th</sup> & Lincoln to Robinson & NW 7<sup>th</sup>



## Route 038

### Inbound

Figure 154 Runtime Chart – Route 038 Inbound, Reno Mini Hub to NW 10<sup>th</sup> & Council

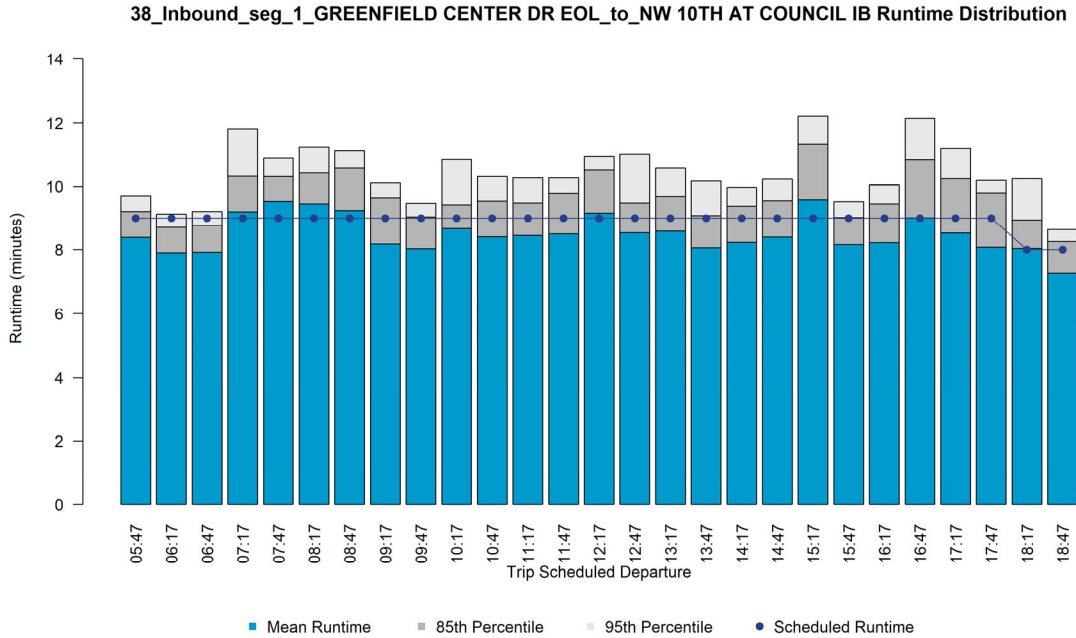


Figure 155 Runtime Chart – Route 038 Inbound, NW 10<sup>th</sup> & Council to NW 10<sup>th</sup> & MacArthur

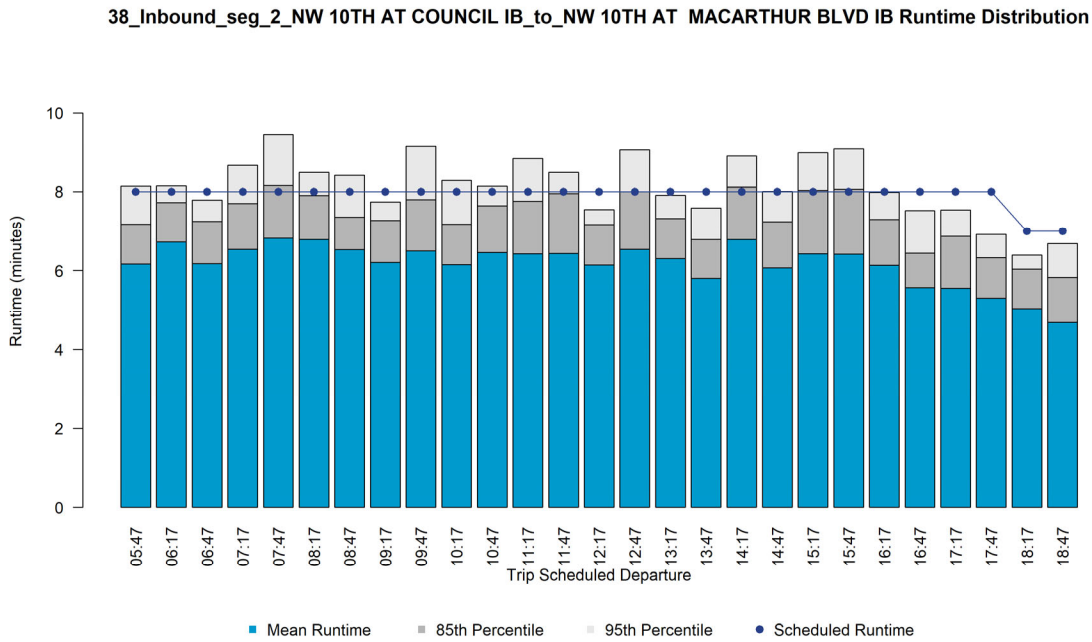


Figure 156 Runtime Chart – Route 038 Inbound, NW 10<sup>th</sup> & MacArthur to NW 10<sup>th</sup> & Portland

38\_Inbound\_seg\_3\_NW 10TH AT MACARTHUR BLVD IB\_to\_NW 10TH AT PORTLAND IB Runtime Distribution

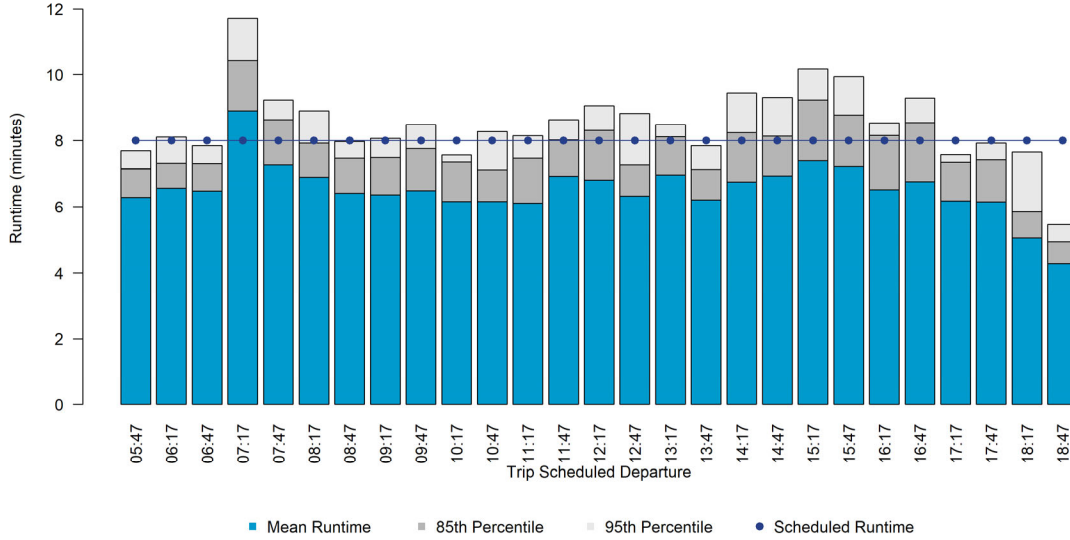


Figure 157 Runtime Chart – Route 038 Inbound, NW 10<sup>th</sup> & Portland to NW 10<sup>th</sup> & Virginia

38\_Inbound\_seg\_4\_NW 10TH AT PORTLAND IB\_to\_NW 10TH AT VIRGINIA IB Runtime Distribution

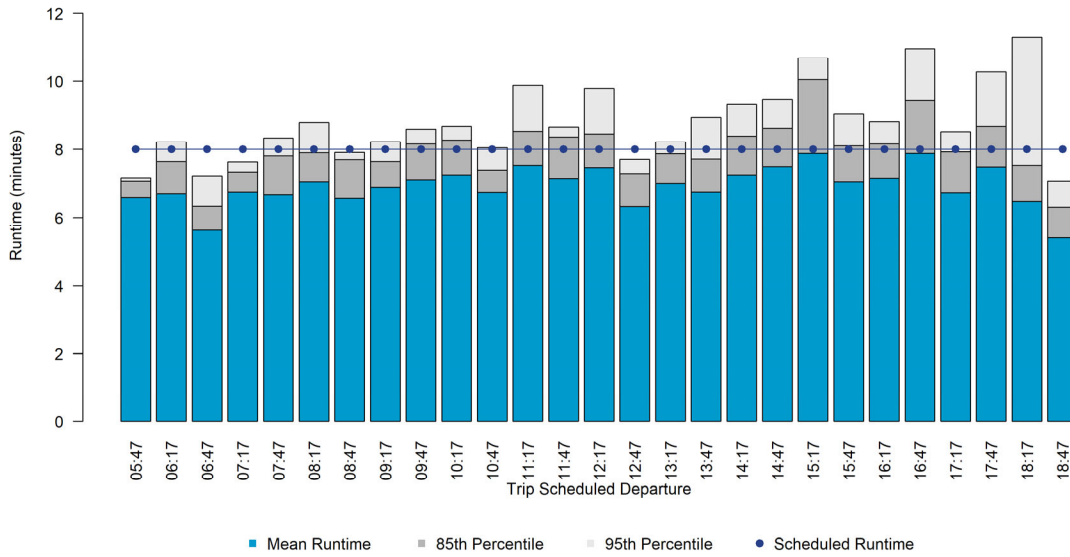
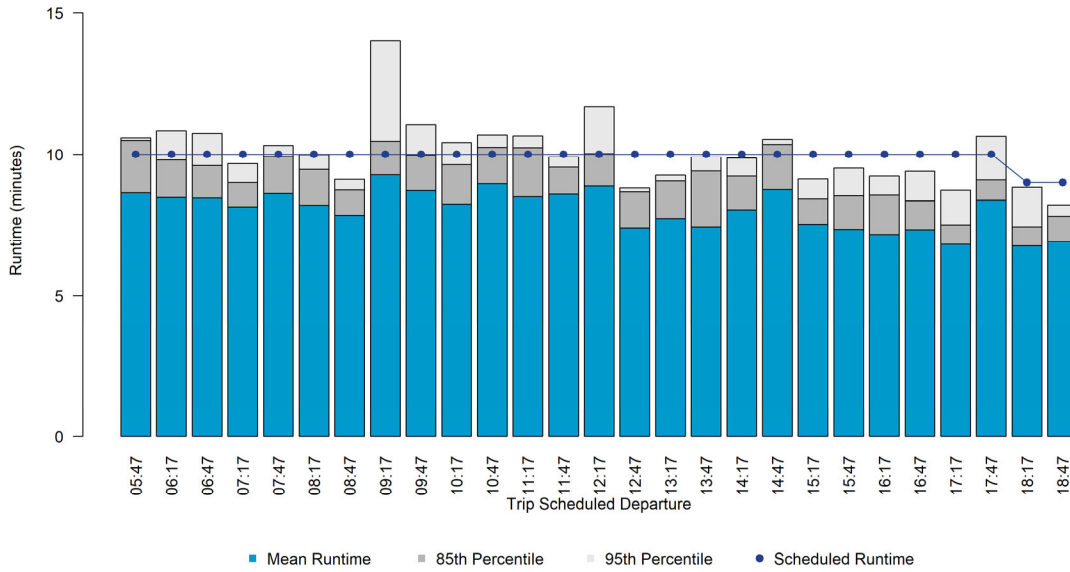




Figure 158 Runtime Chart – Route 038 Inbound, NW 10<sup>th</sup> & Virginia to Downtown Transit Center

38\_Inbound\_seg\_5\_NW 10TH AT VIRGINIA IB\_to\_TRANSIT CENTER - BAY M Runtime Distribution



**Outbound**

Figure 159 Runtime Chart – Route 038 Outbound, Downtown Transit Center to NW 10<sup>th</sup> & Penn

38\_Outbound\_seg\_1\_TRANSIT CENTER - BAY M\_to\_NW 10TH AT PENN OB Runtime Distribution

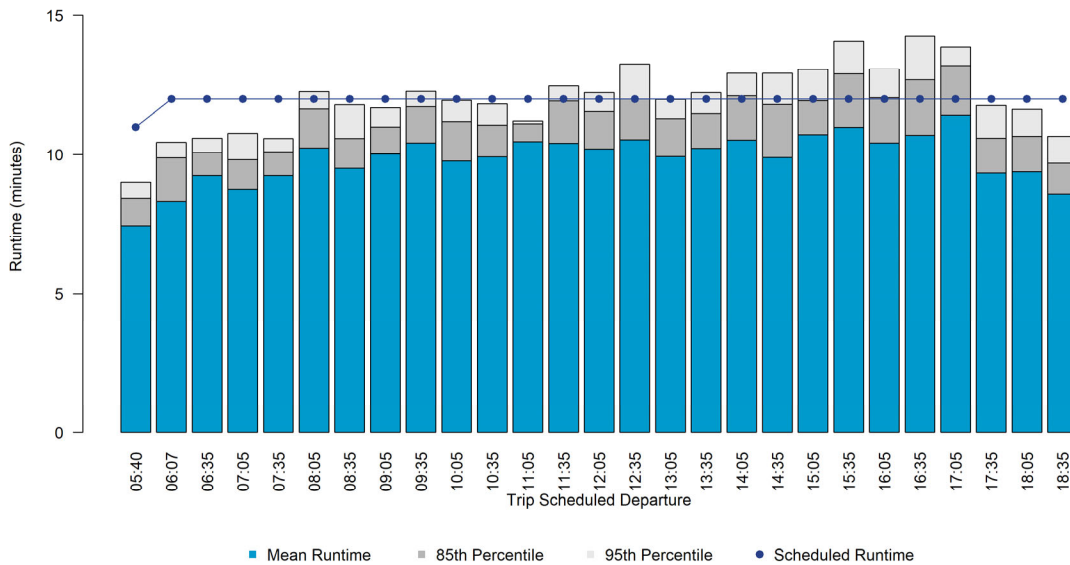


Figure 160 Runtime Chart – Route 038 Outbound, NW 10<sup>th</sup> & Penn to NW 10<sup>th</sup> & Portland

38\_Outbound\_seg\_2\_NW 10TH AT PENN OB\_to\_NW 10TH AT PORTLAND OB Runtime Distribution

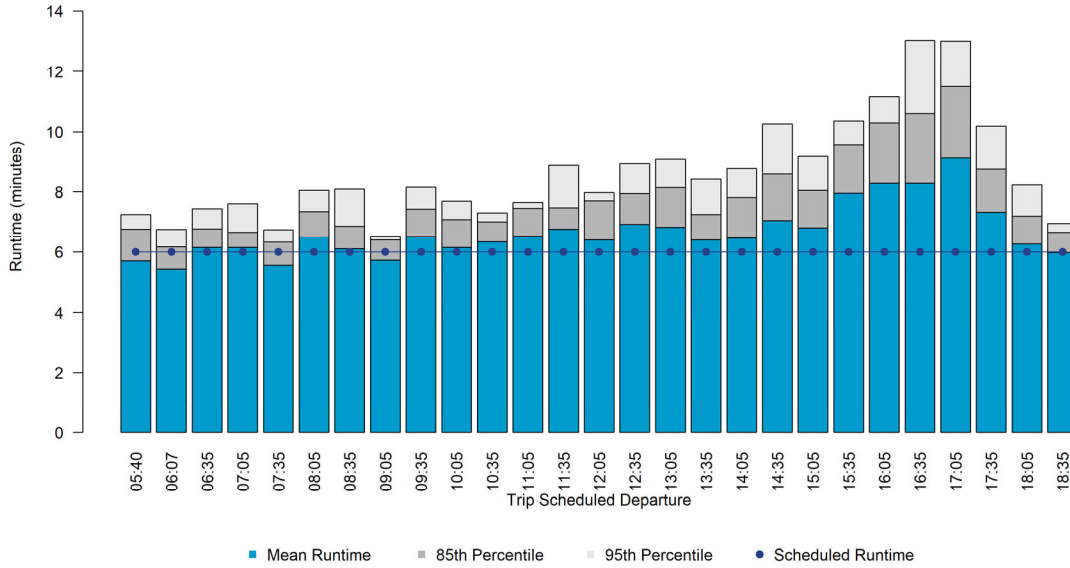


Figure 161 Runtime Chart – Route 038 Outbound, NW 10<sup>th</sup> & Portland to NW 10<sup>th</sup> & MacArthur

38\_Outbound\_seg\_3\_NW 10TH AT PORTLAND OB\_to\_NW 10TH AT MACARTHUR BLVD OB Runtime Distribution

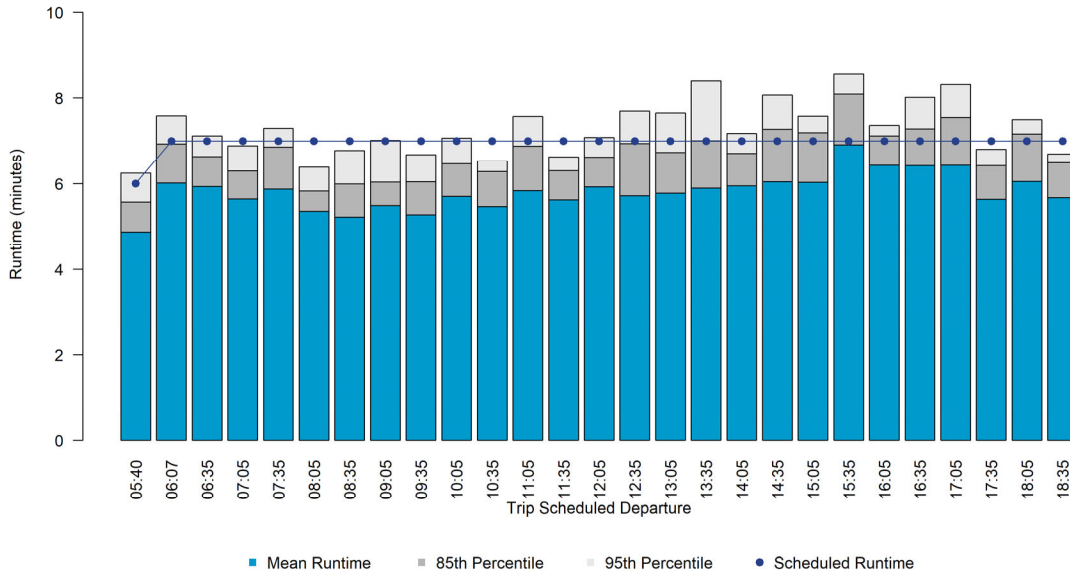


Figure 162 Runtime Chart – Route 038 Outbound, NW 10<sup>th</sup> & MacArthur to Council & NW 10<sup>th</sup>

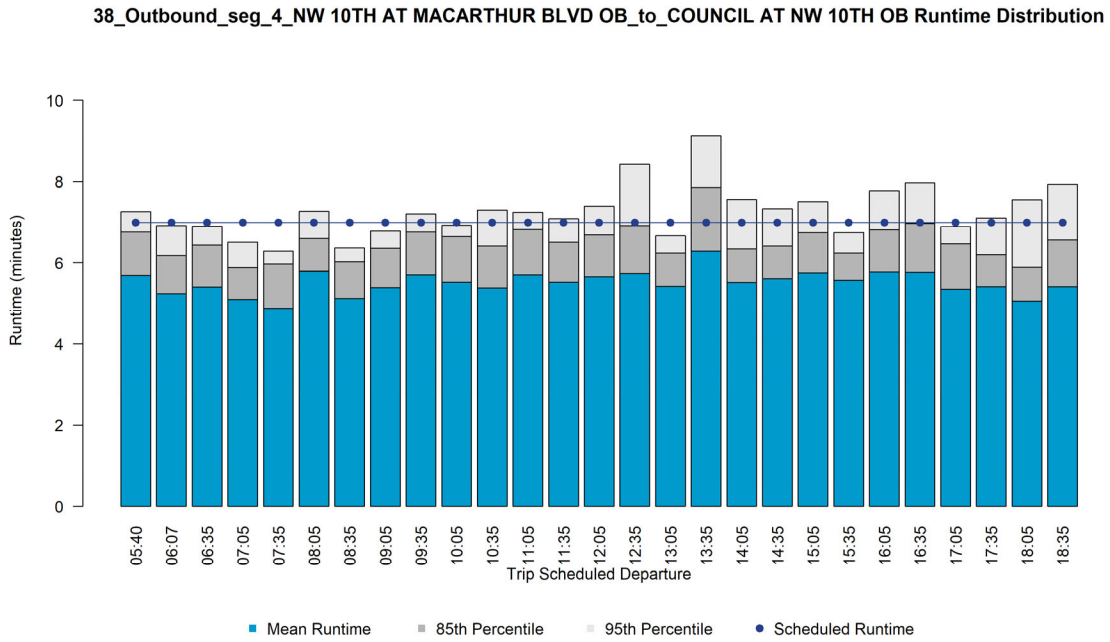
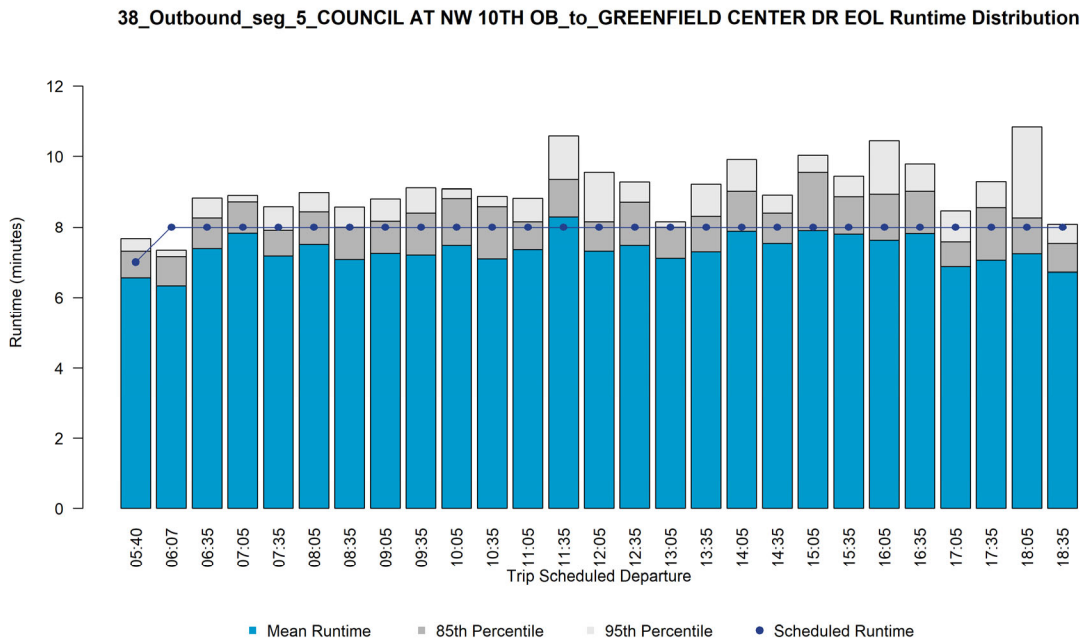


Figure 163 Runtime Chart – Route 038 Outbound, Council & NW 10<sup>th</sup> to Reno Mini Hub



## Route 040

### Inbound

Figure 164 Runtime Chart – Route 040 Inbound, Santa Fe & SW 104<sup>th</sup> to Santa Fe & SW 89<sup>th</sup>

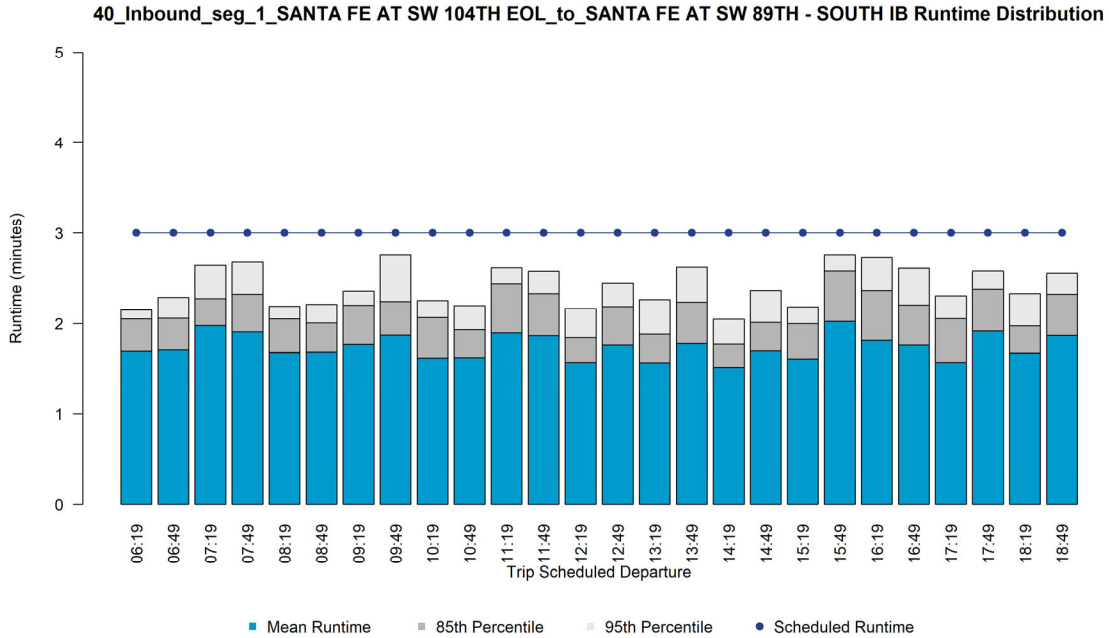


Figure 165 Runtime Chart – Route 040 Inbound, Santa Fe & SW 89<sup>th</sup> to Walker & SW 44<sup>th</sup>

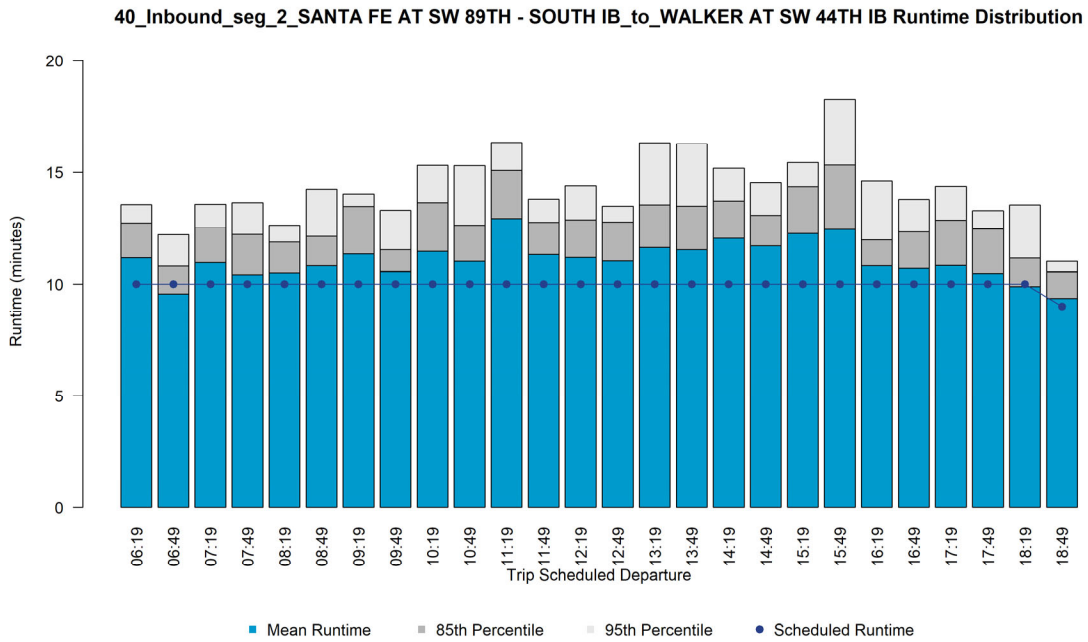


Figure 166 Runtime Chart – Route 040 Inbound, Walker & SW 44<sup>th</sup> to Walker & SW 25<sup>th</sup>

40\_Inbound\_seg\_3\_WALKER AT SW 44TH IB\_to\_WALKER AT SW 25TH ST IB Runtime Distribution

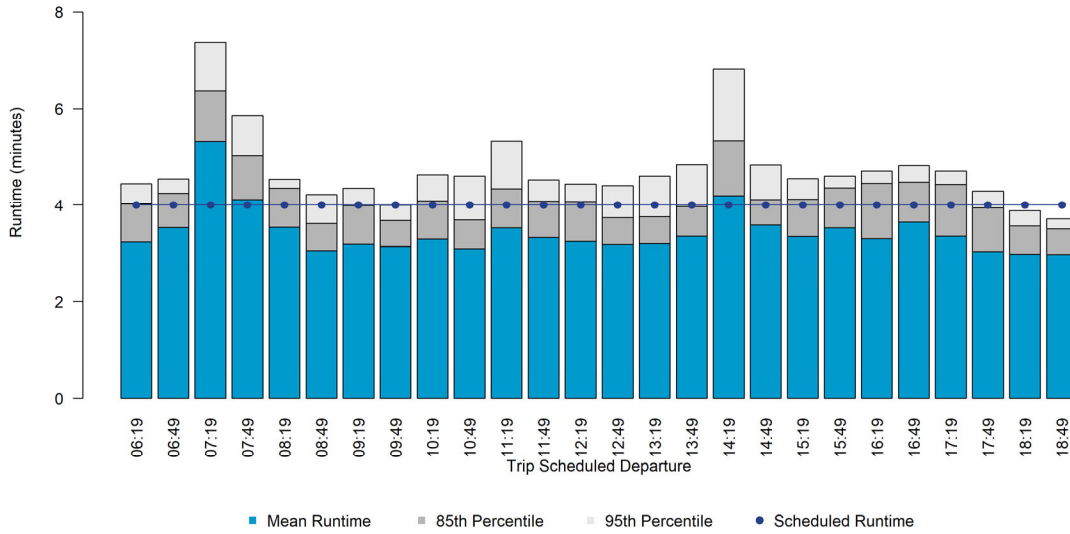
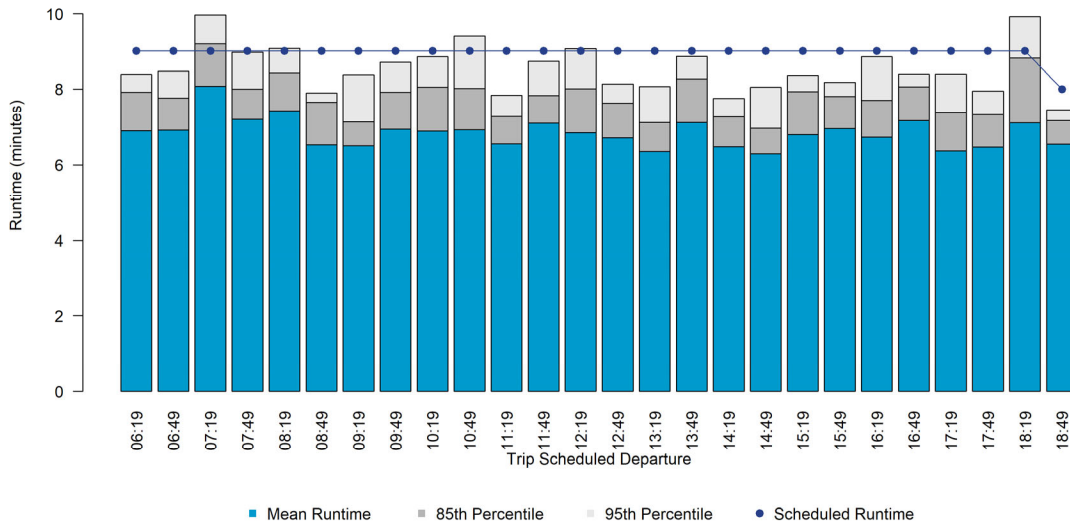


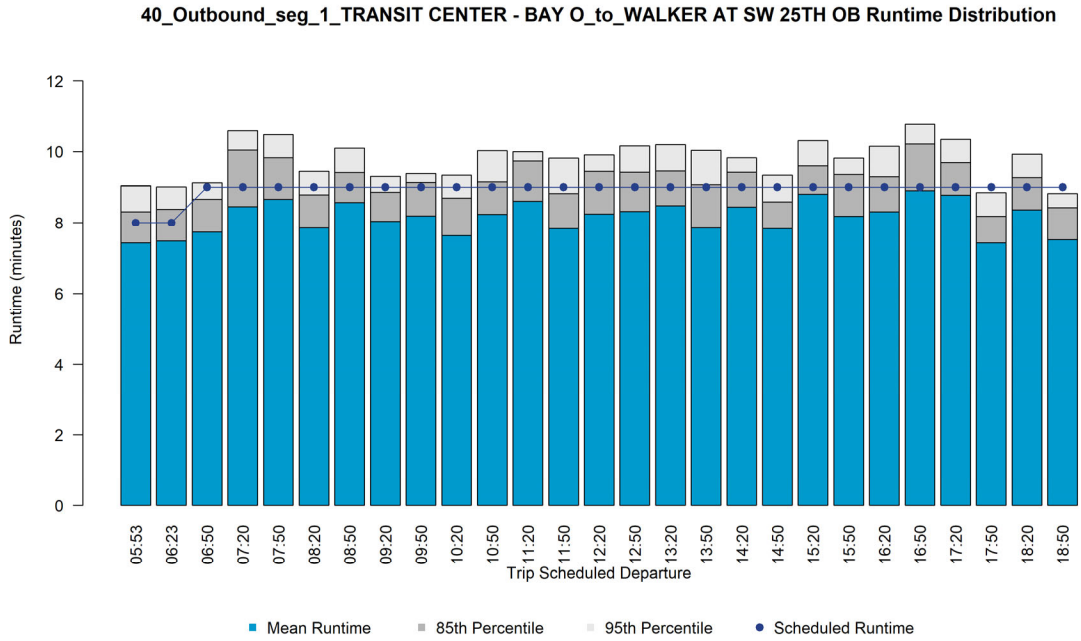
Figure 167 Runtime Chart – Route 040 Inbound, Walker & SW 25<sup>th</sup> to Downtown Transit Center

40\_Inbound\_seg\_4\_WALKER AT SW 25TH ST IB\_to\_TRANSIT CENTER - BAY O Runtime Distribution



**Outbound**

**Figure 168 Runtime Chart – Route 040 Outbound, Downtown Transit Center to Walker & SW 25<sup>th</sup>**



**Figure 169 Runtime Chart – Route 040 Outbound, Walker & SW 25<sup>th</sup> to Walker & SW 44<sup>th</sup>**

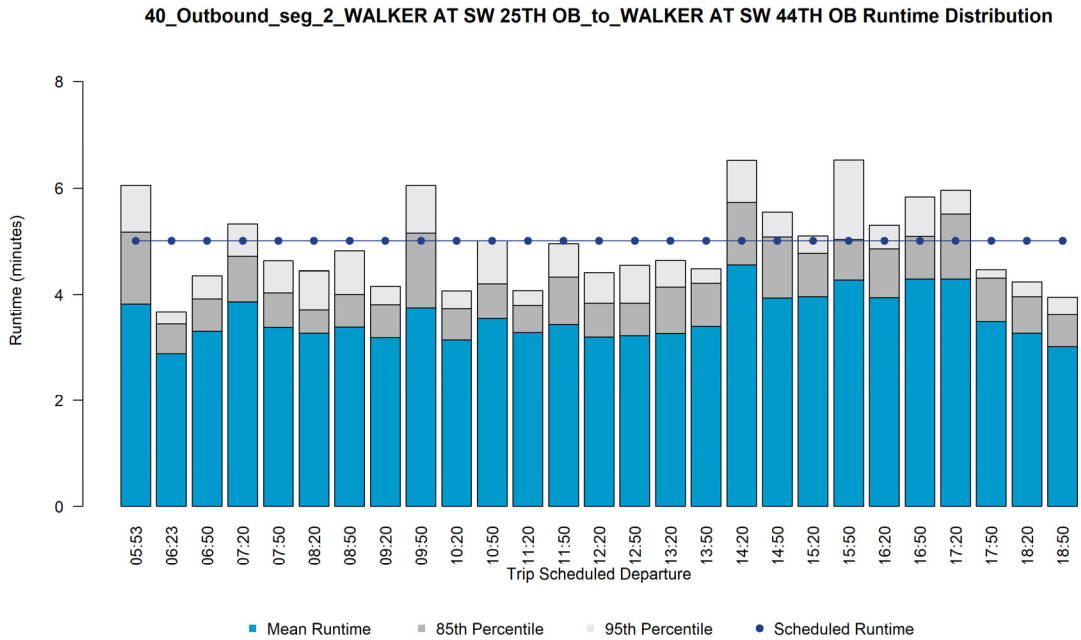


Figure 170 Runtime Chart – Route 040 Outbound, Walker & SW 44<sup>th</sup> to SW 89<sup>th</sup> & Walker

40\_Outbound\_seg\_3\_WALKER AT SW 44TH OB\_to\_SW 89TH AT WALKER OB Runtime Distribution

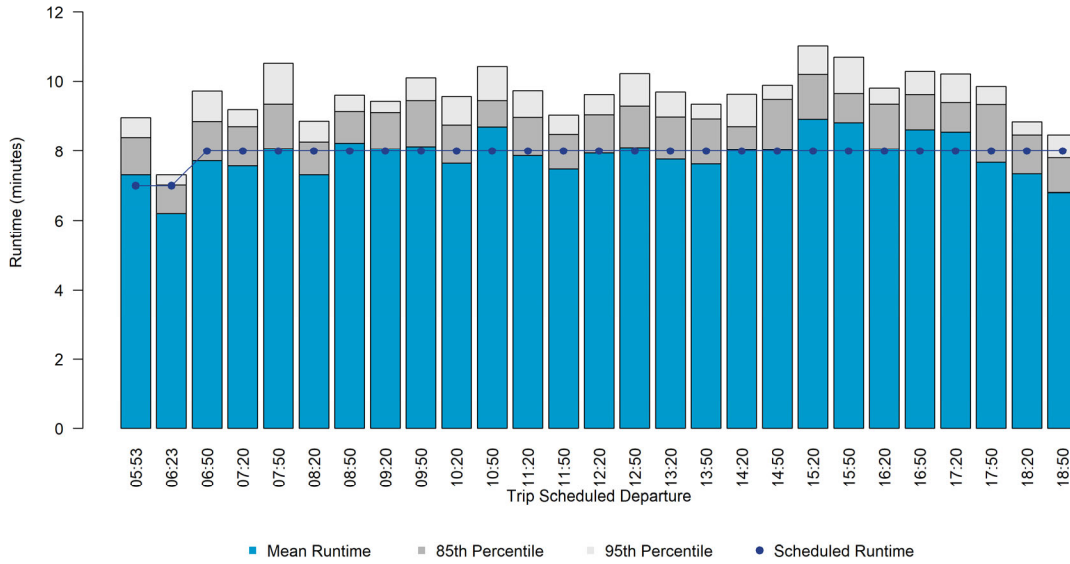
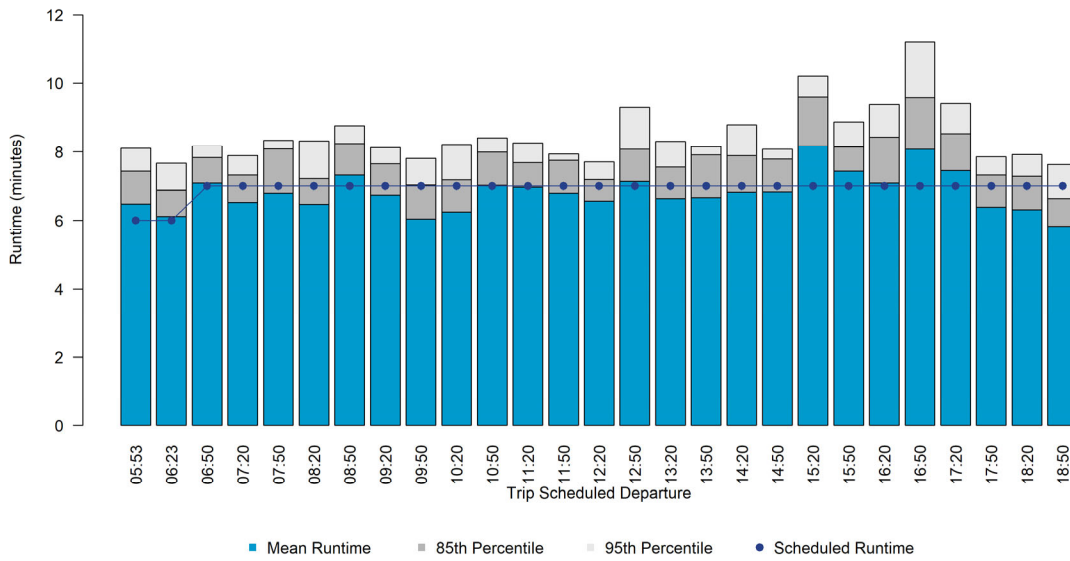


Figure 171 Runtime Chart – Route 040 Outbound, SW 89<sup>th</sup> & Walker to Santa Fe & 104<sup>th</sup>

40\_Outbound\_seg\_4\_SW 89TH AT WALKER OB\_to\_SANTA FE AT SW 104TH EOL Runtime Distribution



**APPENDIX D      PREFERRED  
ALTERNATIVE ROUTE  
MAPS**



# SHORT-TERM RECOMMENDATIONS

Figure 1 Route 003 Short-Term Recommendations Route Map

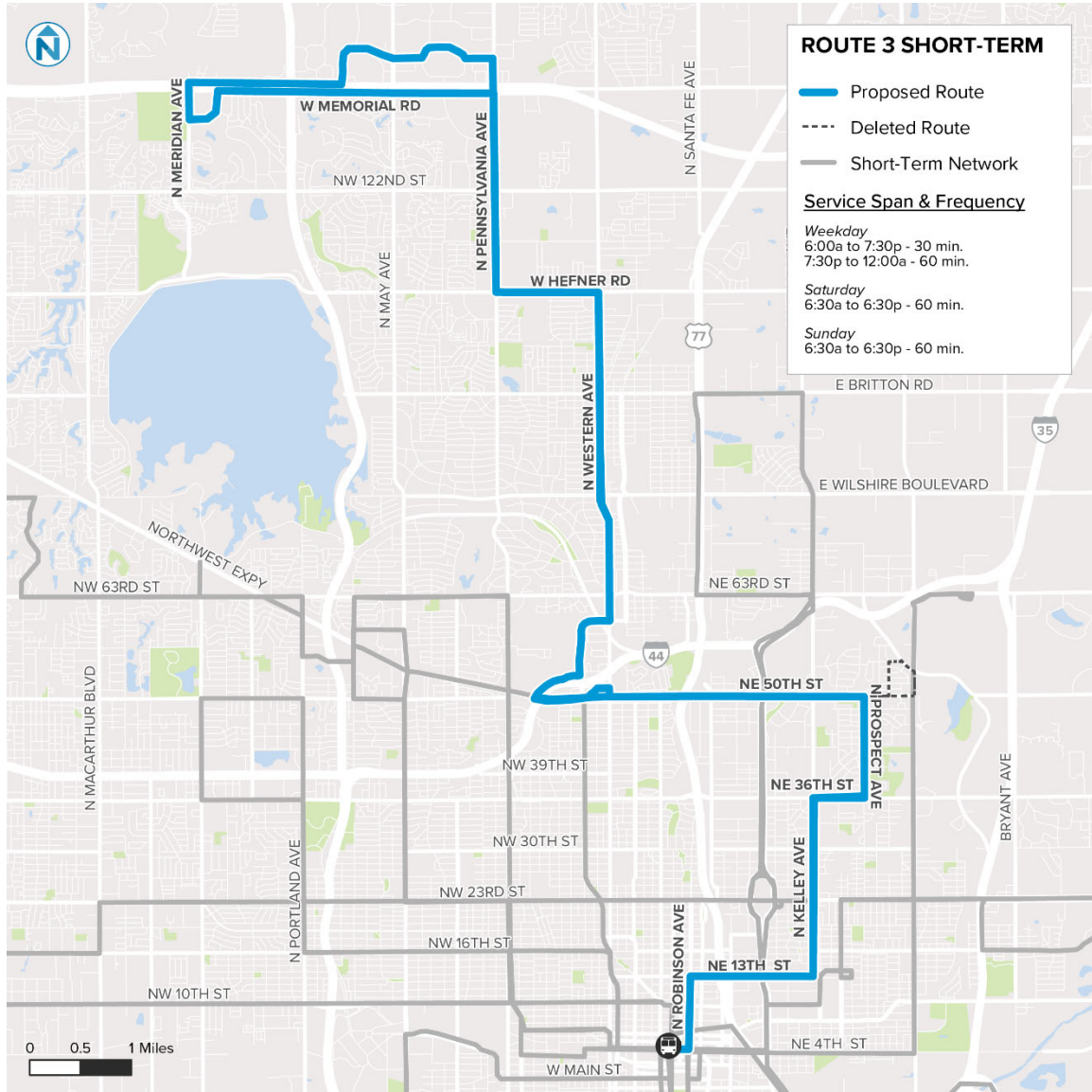


Figure 2 Route 005 Short-Term Recommendations Route Map

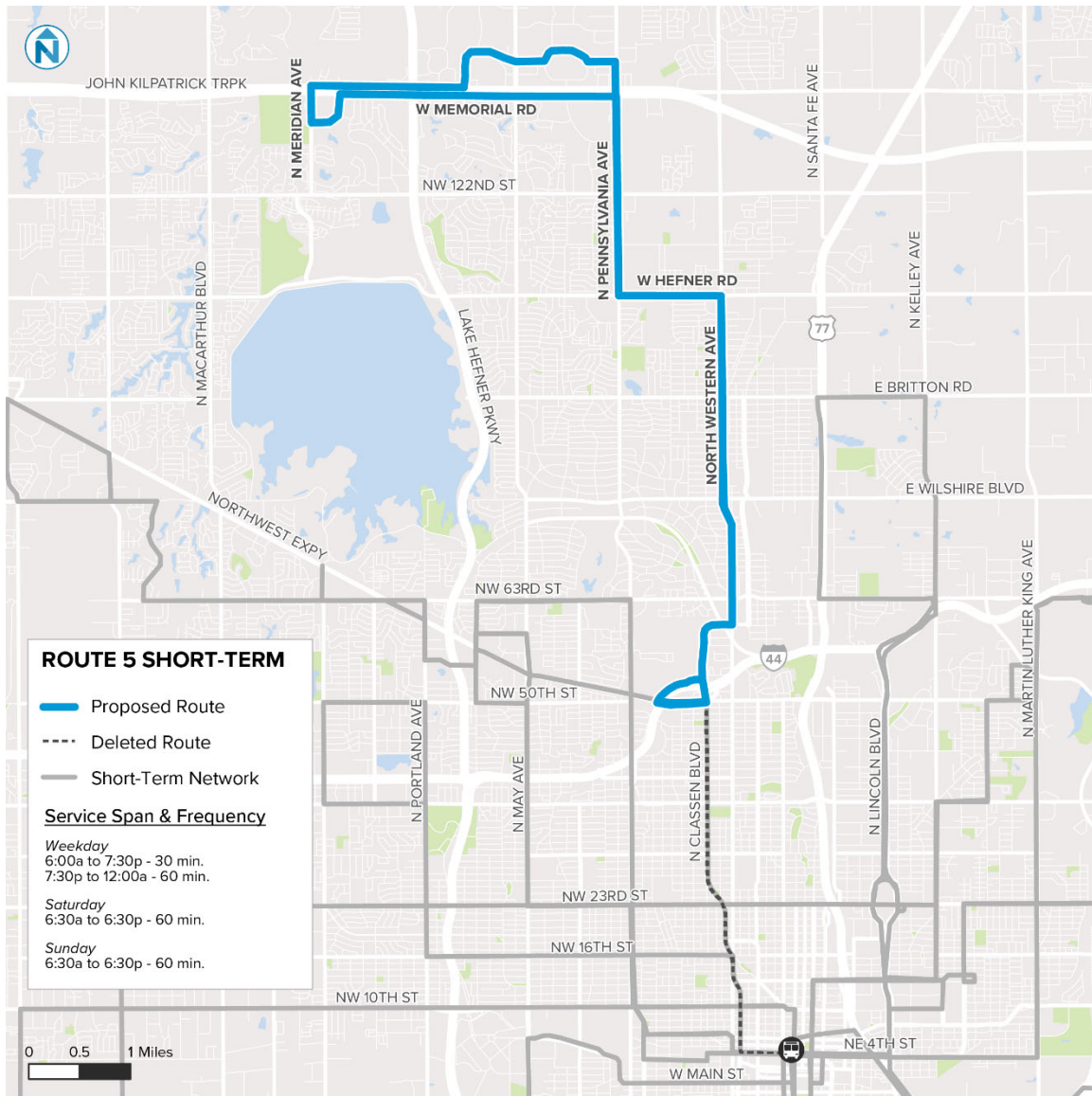


Figure 3 Route 008 Short-Term Recommendations Route Map

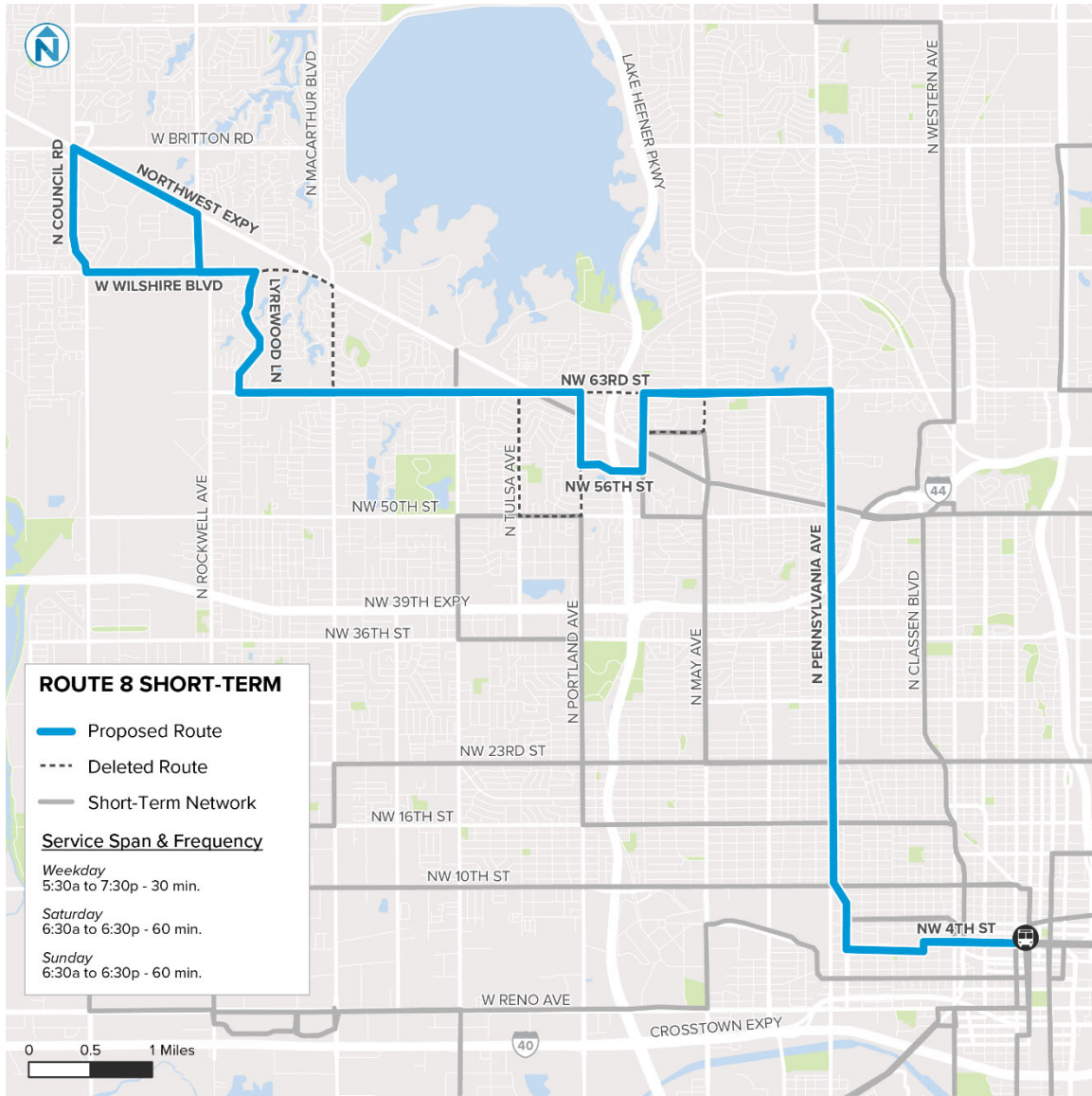


Figure 4 Route 012 Short-Term Recommendations Route Map

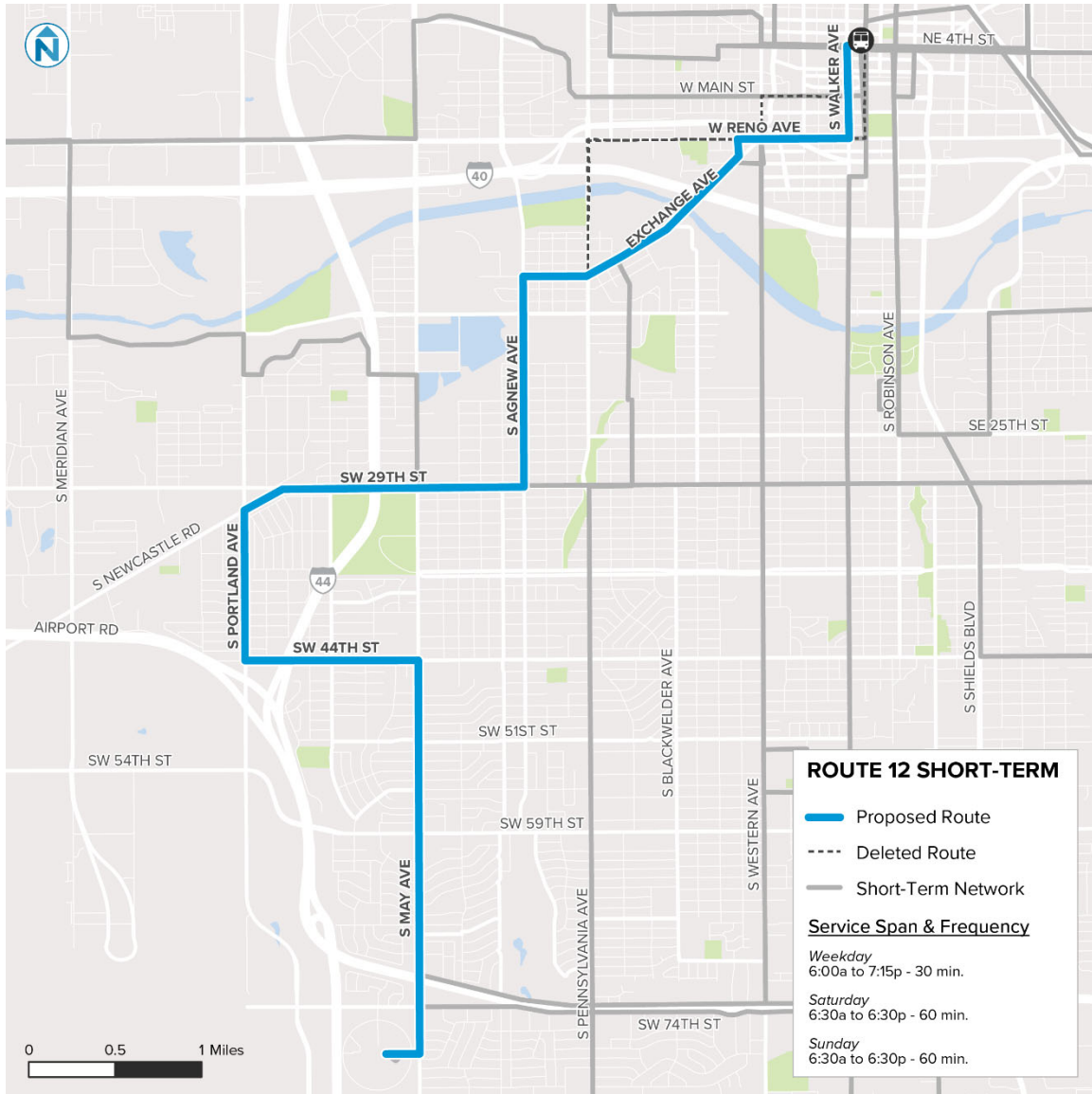


Figure 5 Route 013 Short-Term Recommendations Route Map

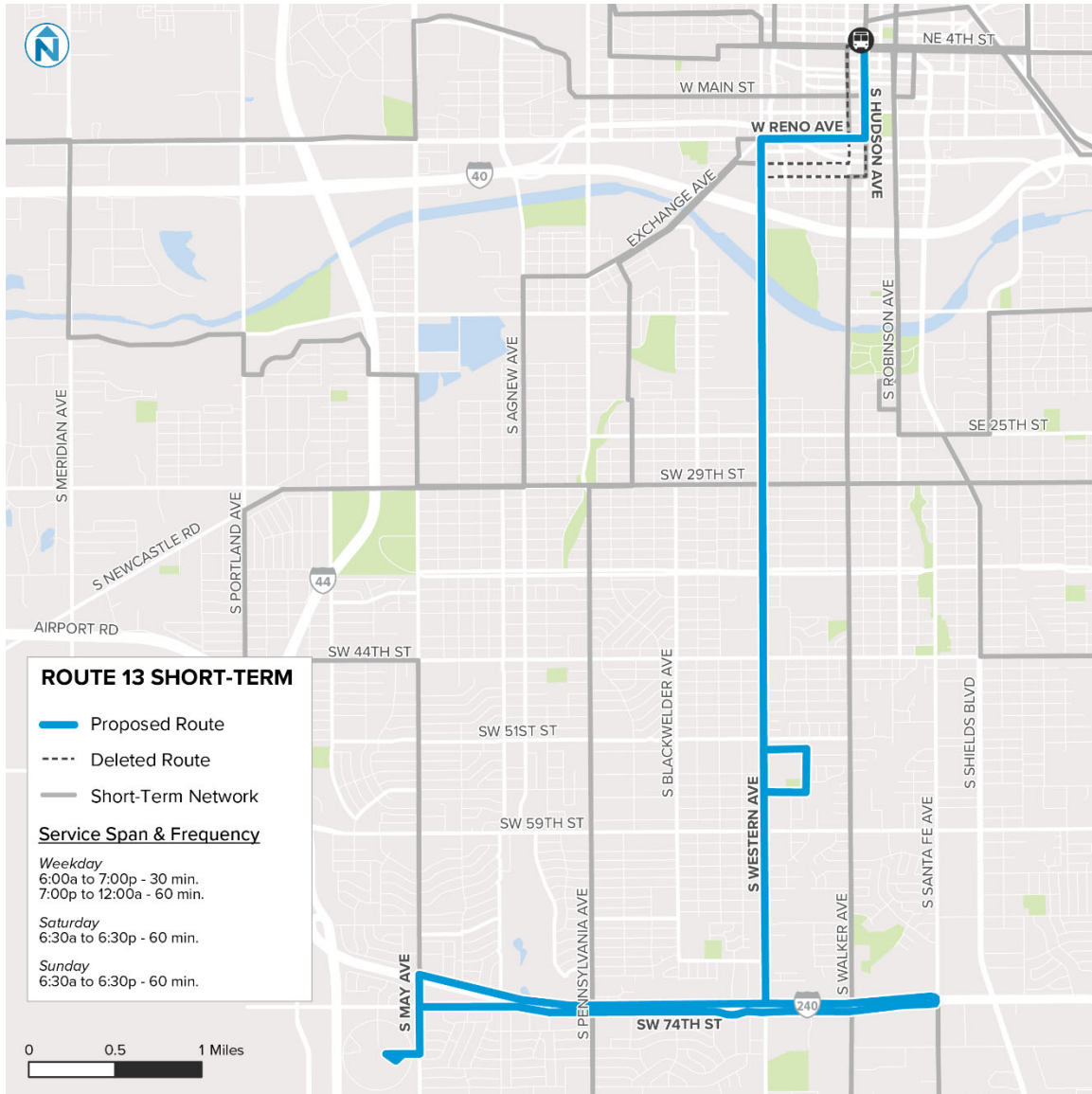


Figure 6 Route 014 Short-Term Recommendations Route Map

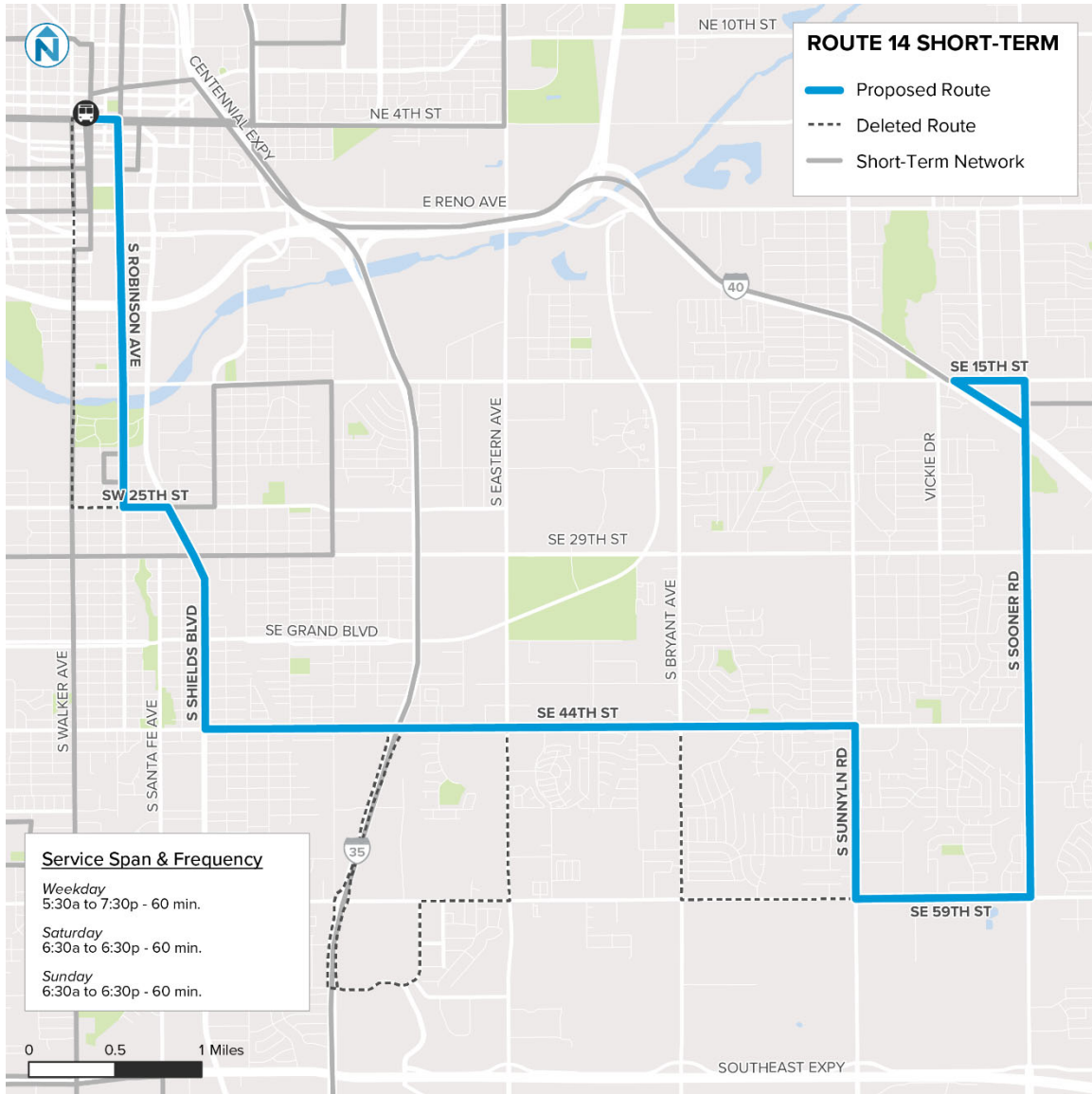


Figure 7 Route 015/019 Short-Term Recommendations Route Map

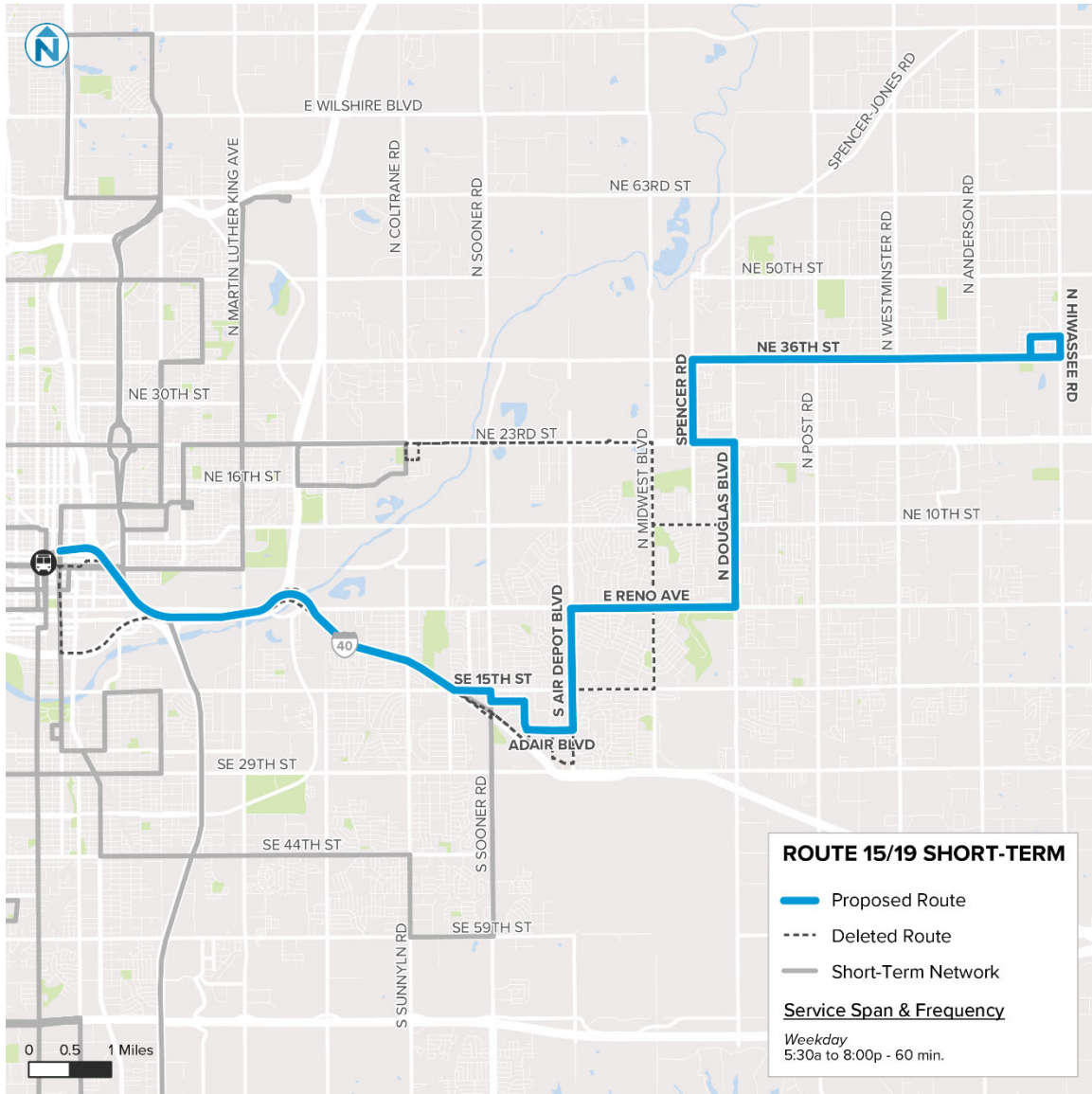


Figure 8 Route 016 Short-Term Recommendations Route Map

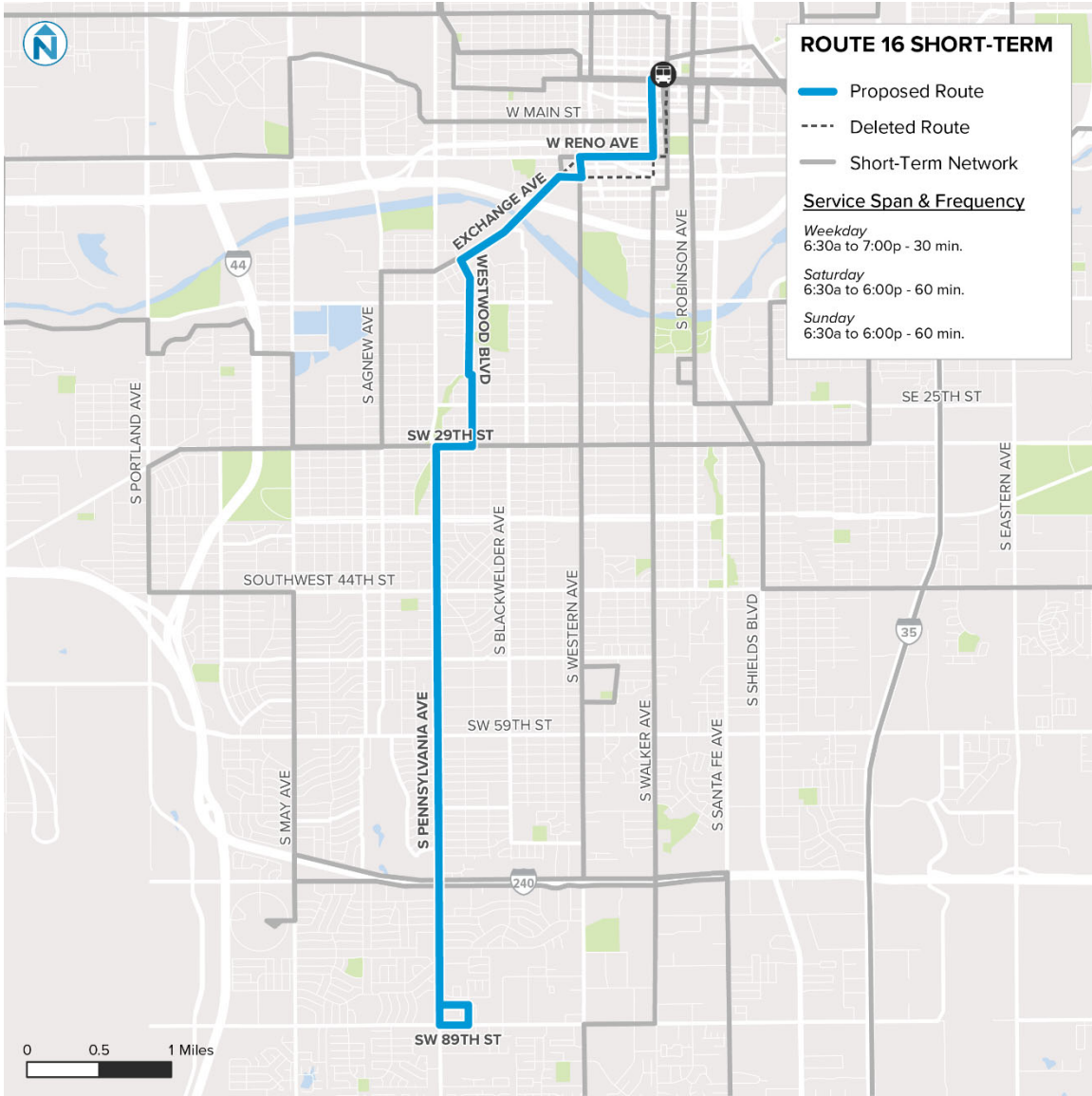




Figure 9 Route 023 Short-Term Recommendations Route Map

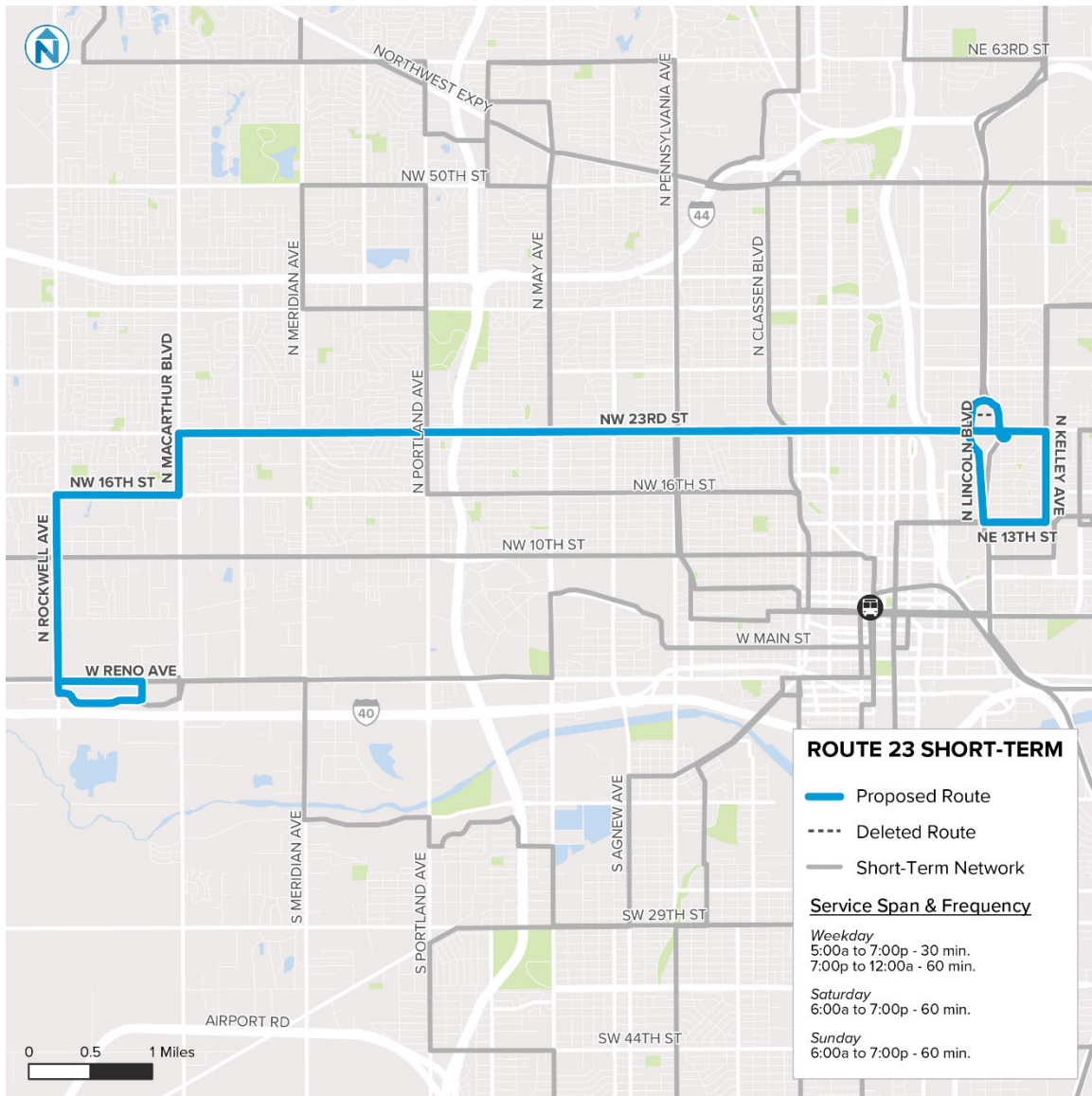
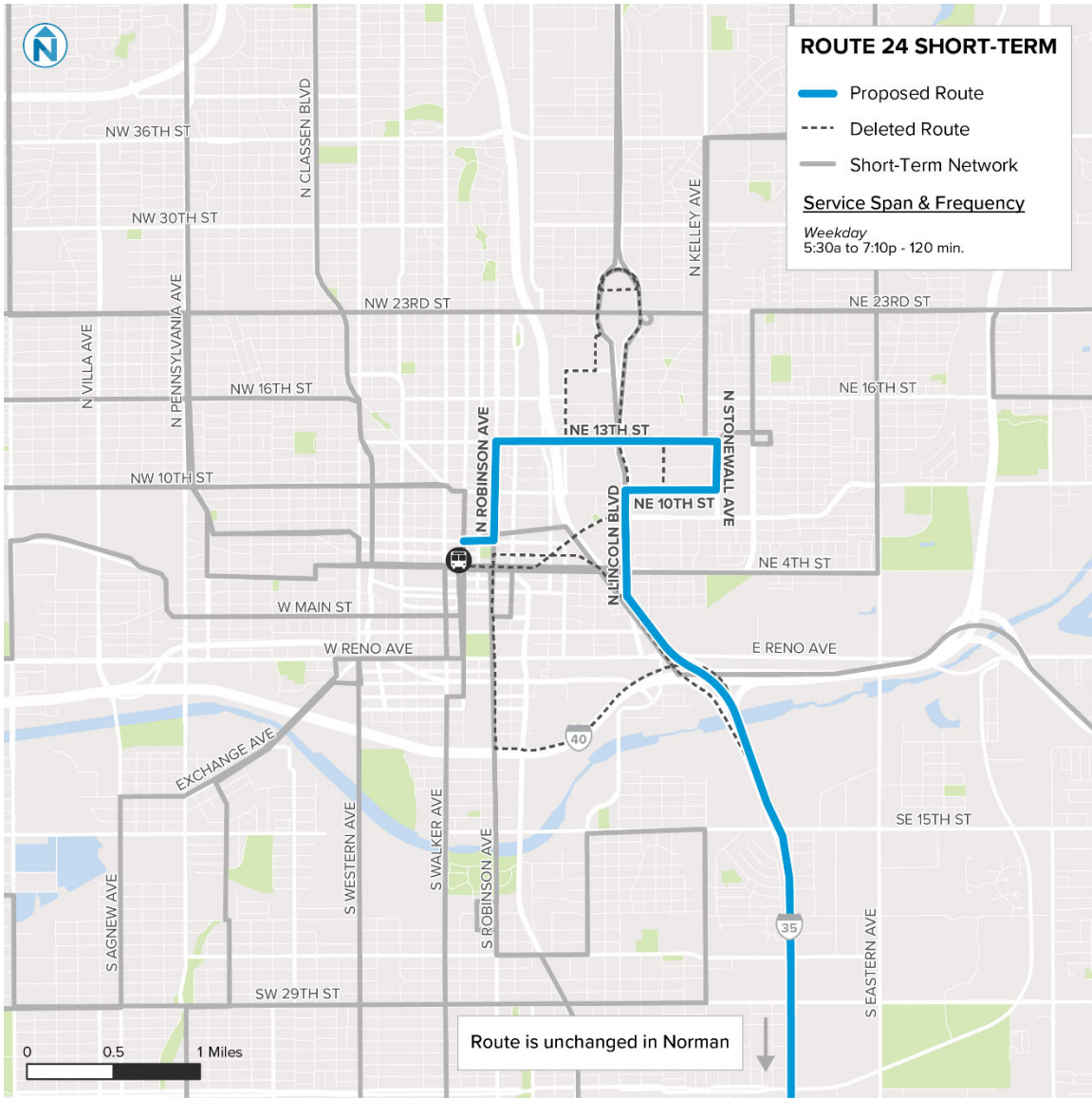


Figure 10 Route 024 Short-Term Recommendations Route Map



## LONG-TERM RECOMMENDATIONS

Figure 11 Route 002 Long-Term Recommendations Route Map

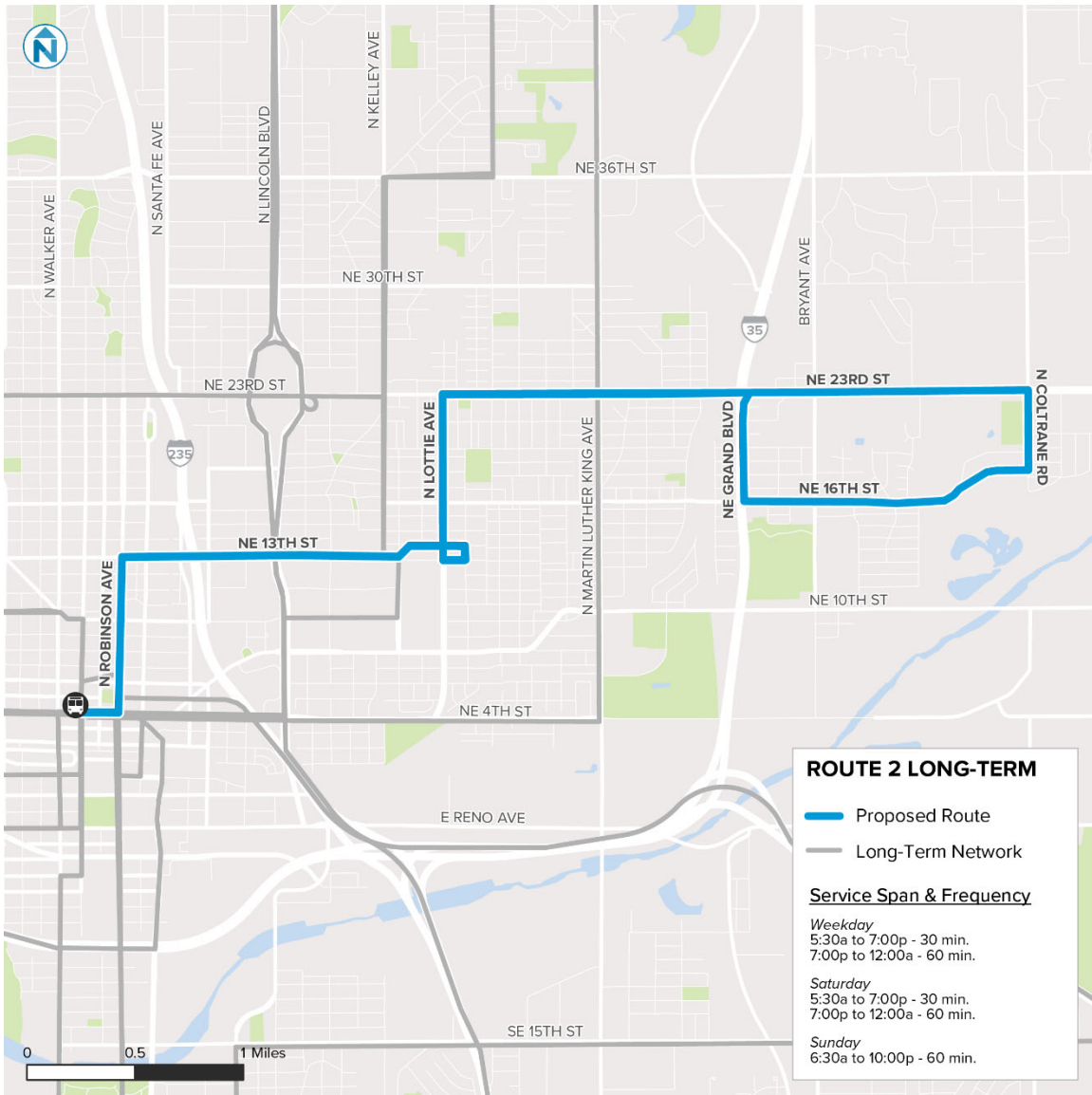


Figure 12 Route 003 Long-Term Recommendations Route Map

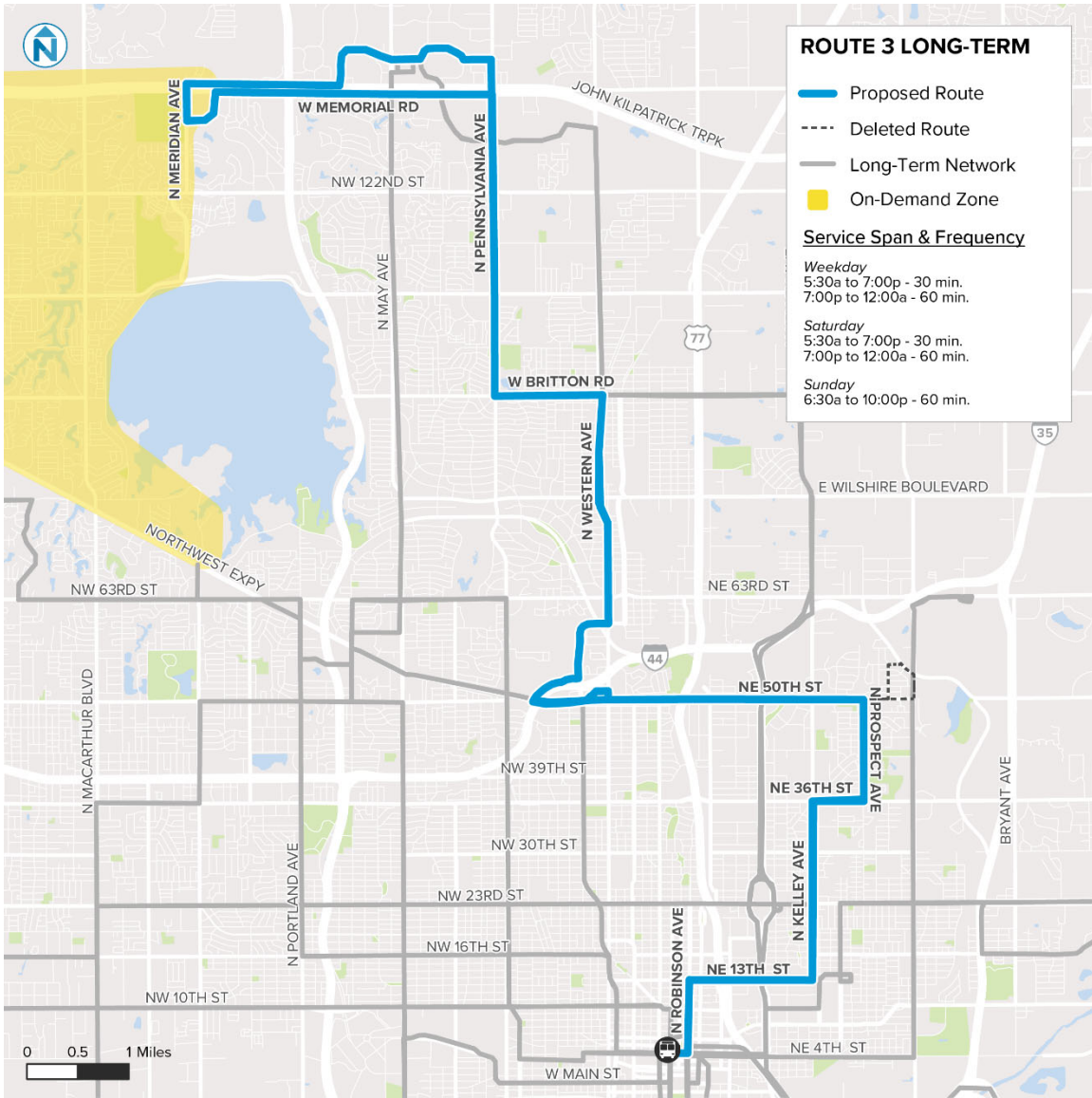


Figure 13 Route 007 Long-Term Recommendations Route Map

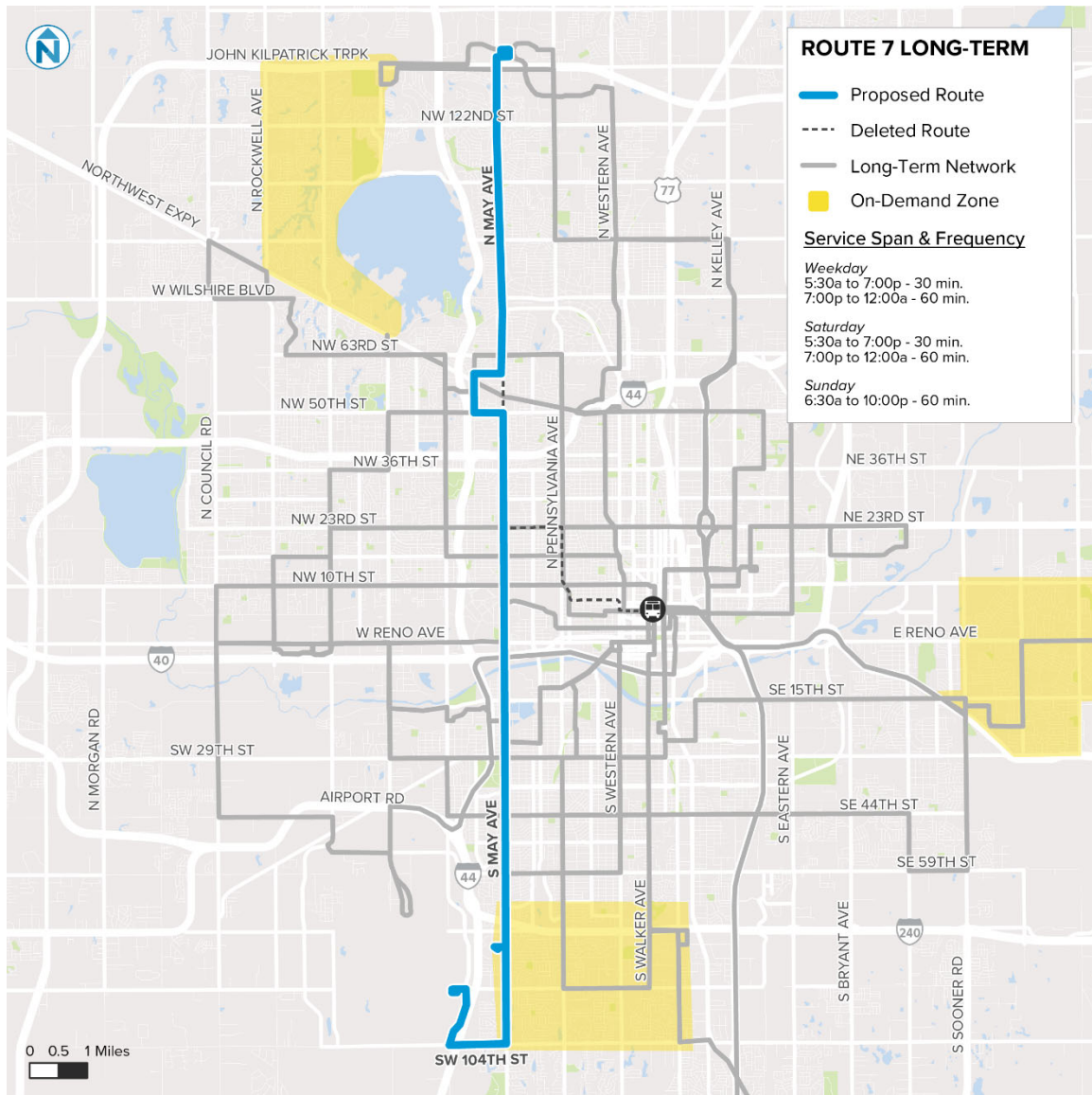




Figure 15 Route 009 Long-Term Recommendations Route Map

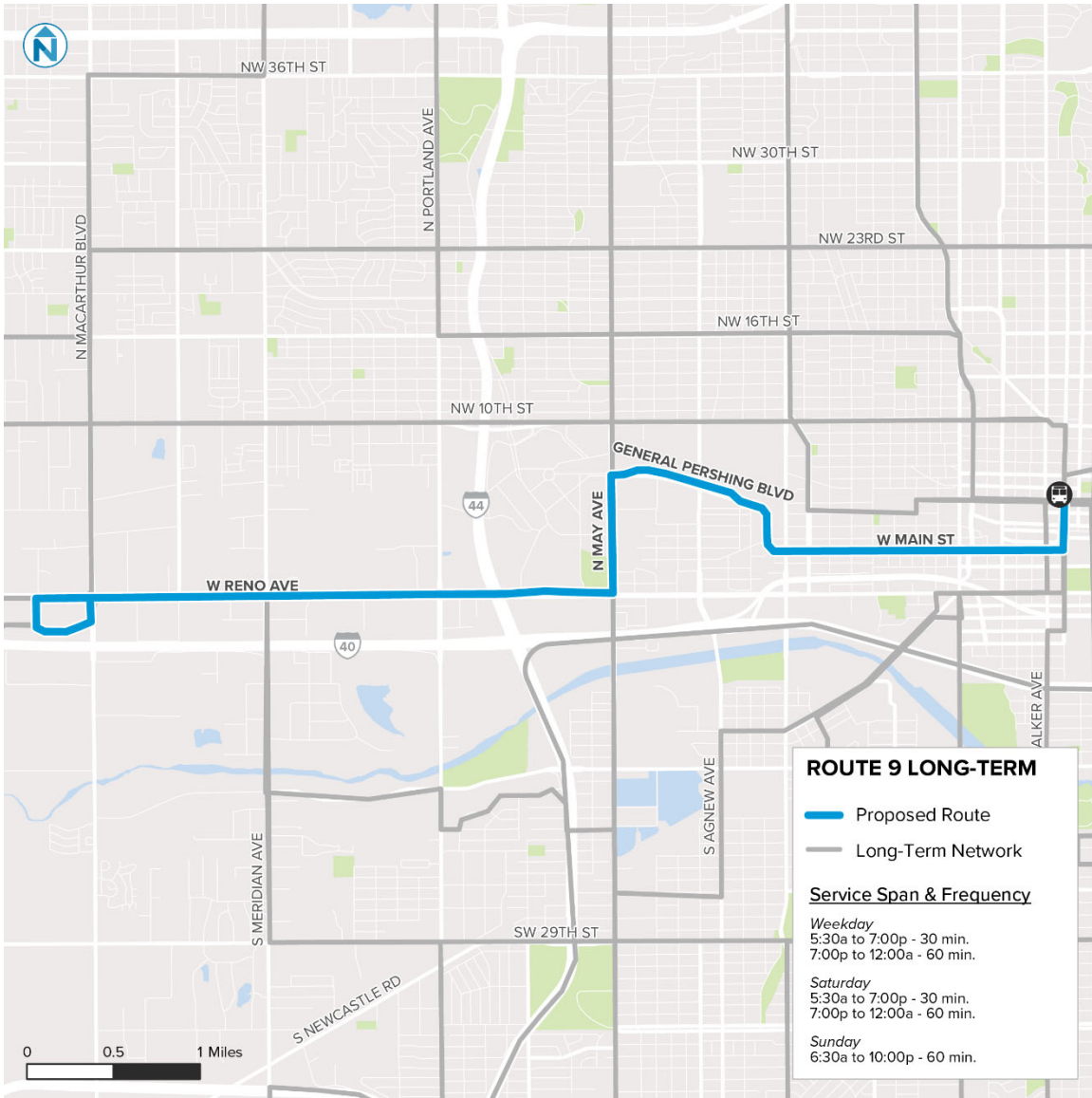


Figure 16 Route 010 Long-Term Recommendations Route Map

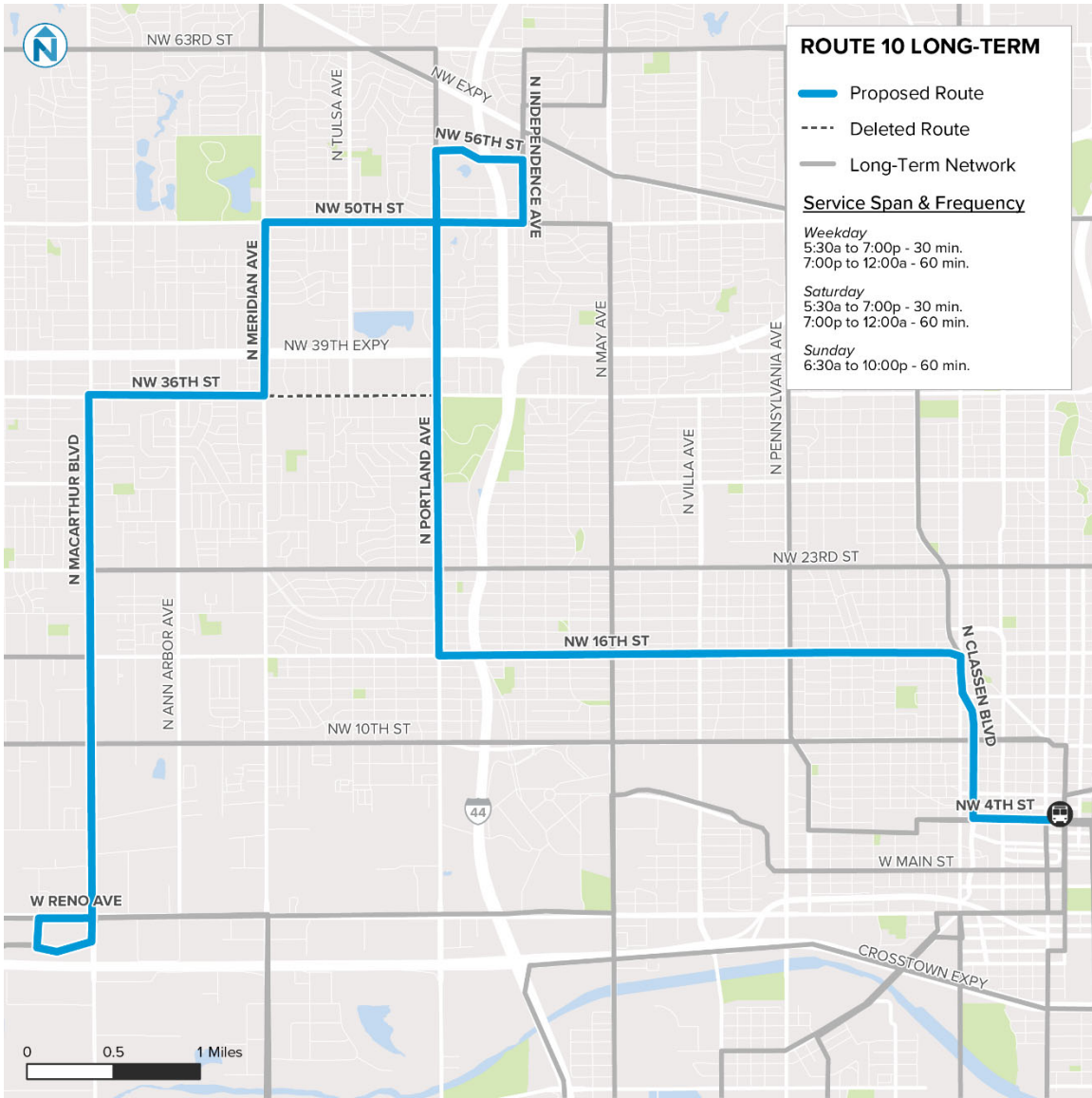




Figure 17 Route 011 Long-Term Recommendations Route Map

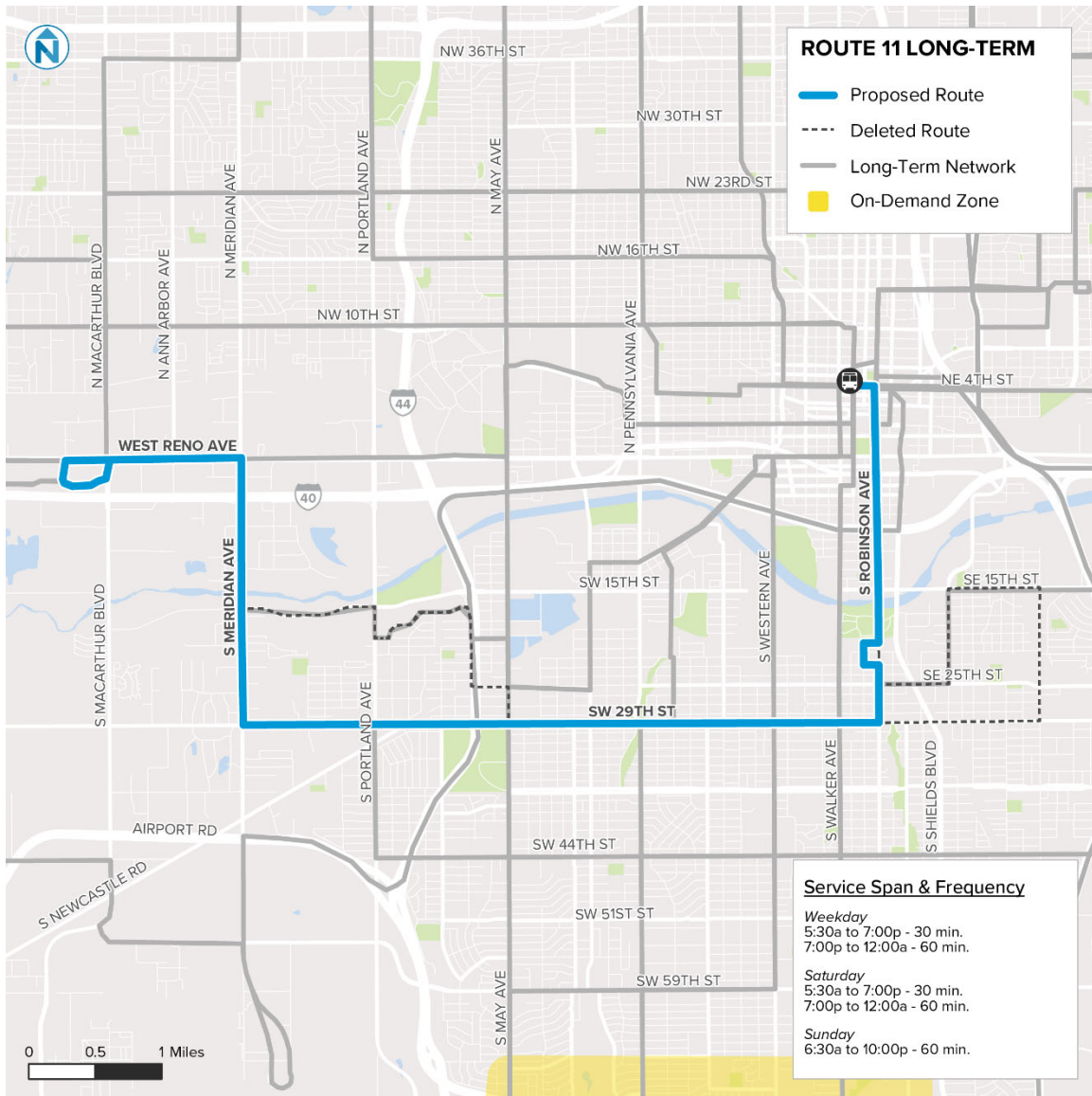


Figure 18 Route 012 Long-Term Recommendations Route Map

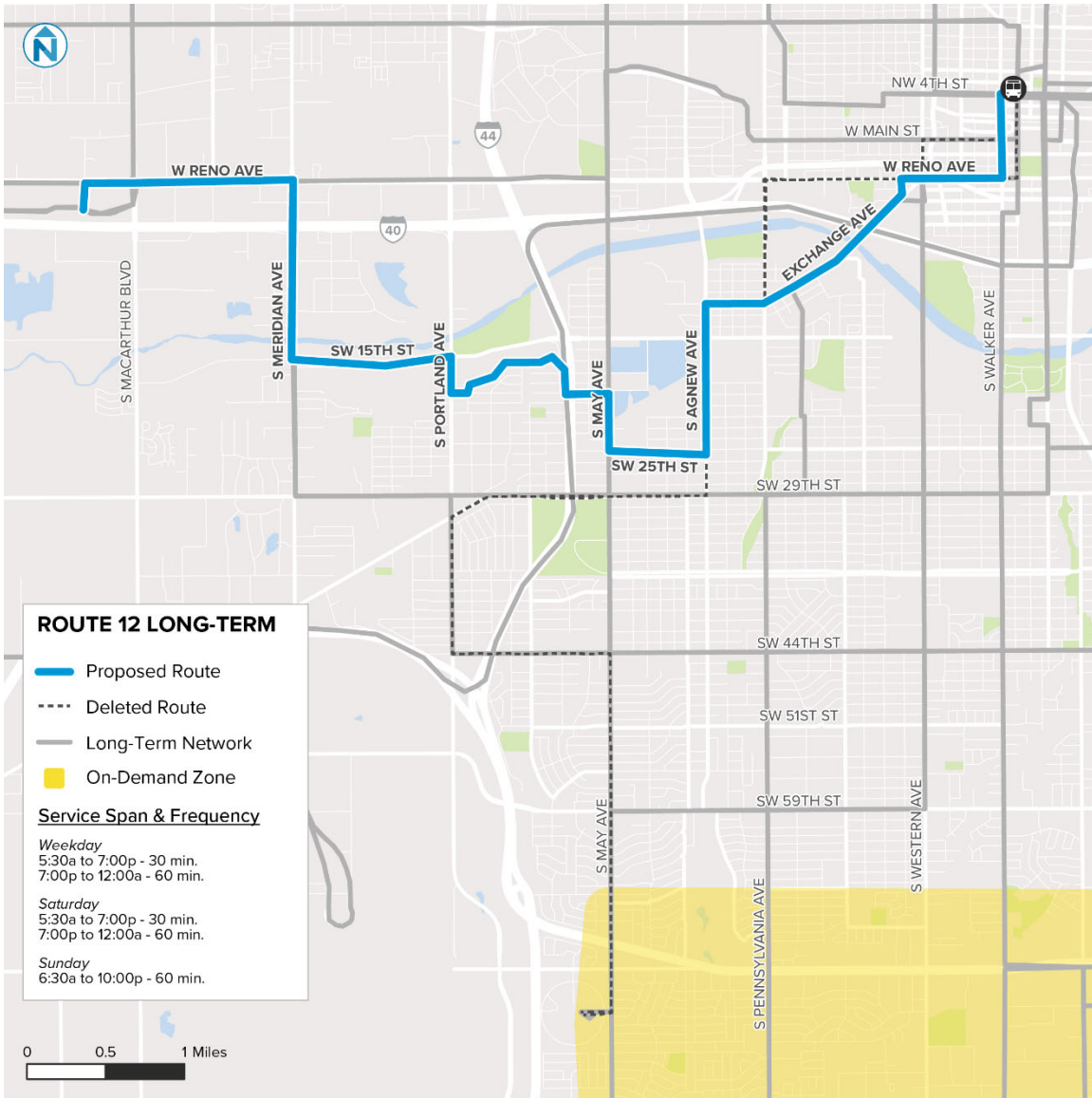


Figure 19 Route 013 Long-Term Recommendations Route Map

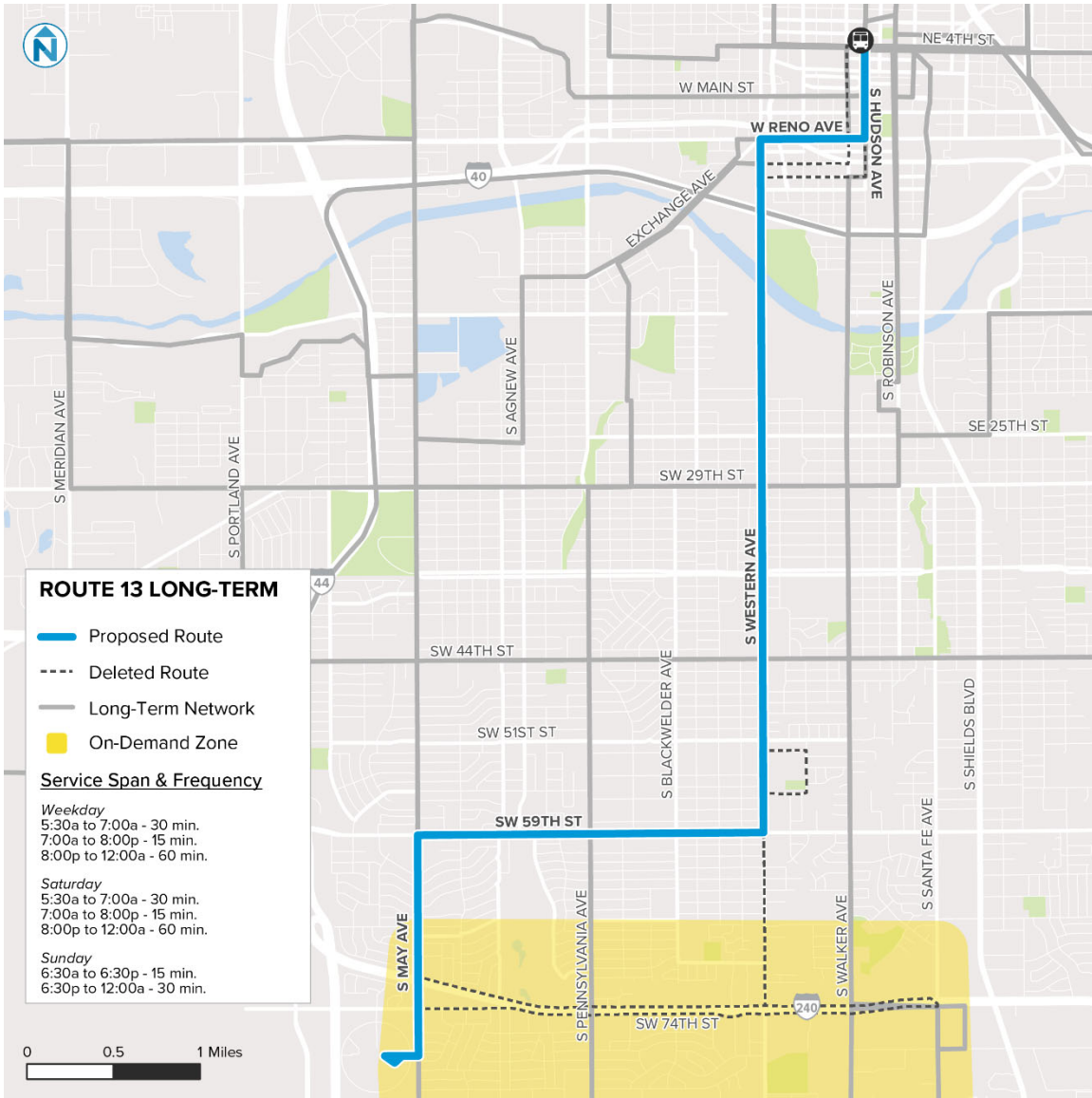


Figure 20 Route 014 – Route 044 Long-Term Recommendations Route Map

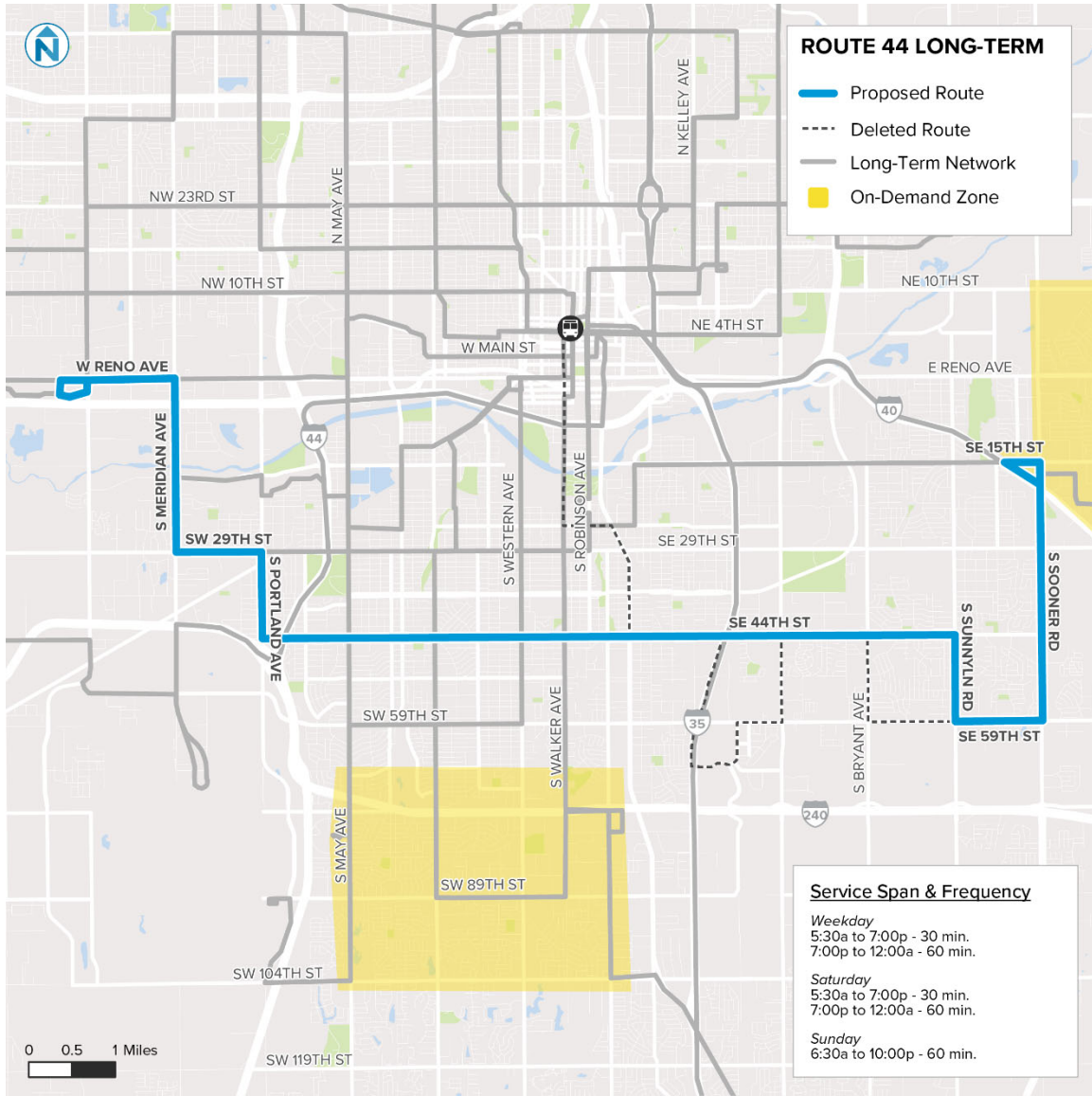


Figure 21 Route 015/019 Long-Term Recommendations Route Map

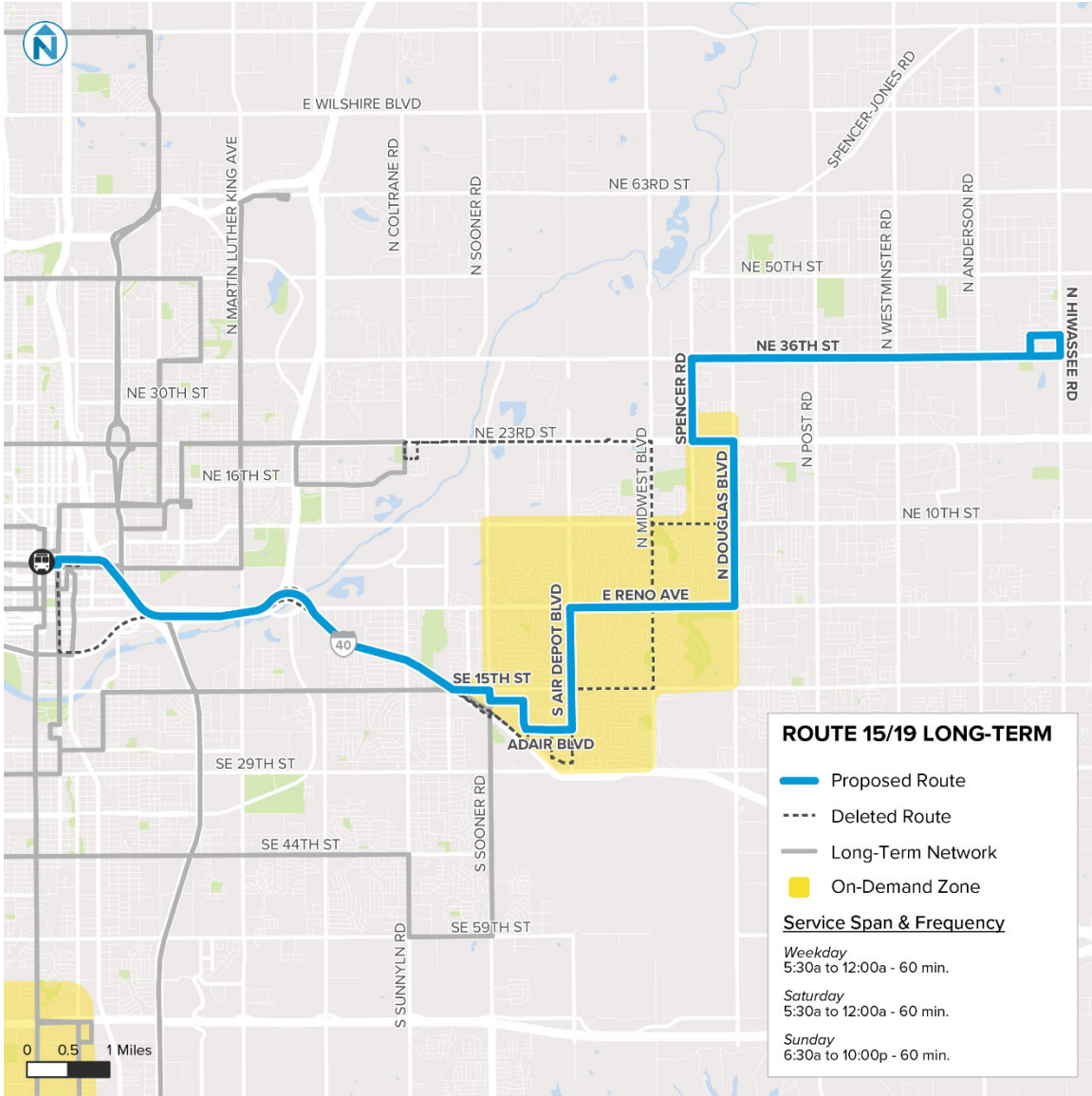


Figure 22 Route 016 Long-Term Recommendations Route Map

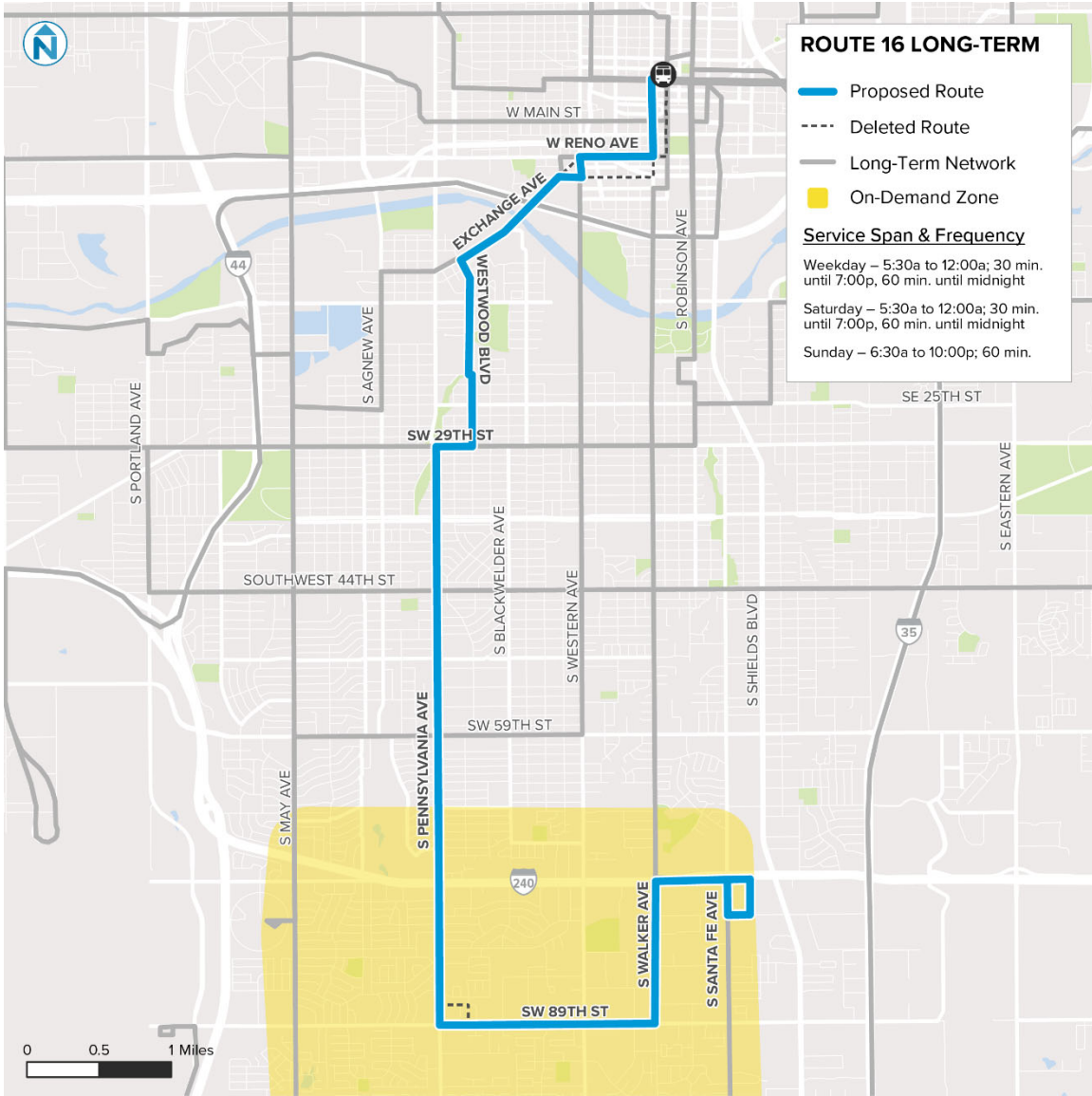


Figure 23 Route 018 Long-Term Recommendations Route Map

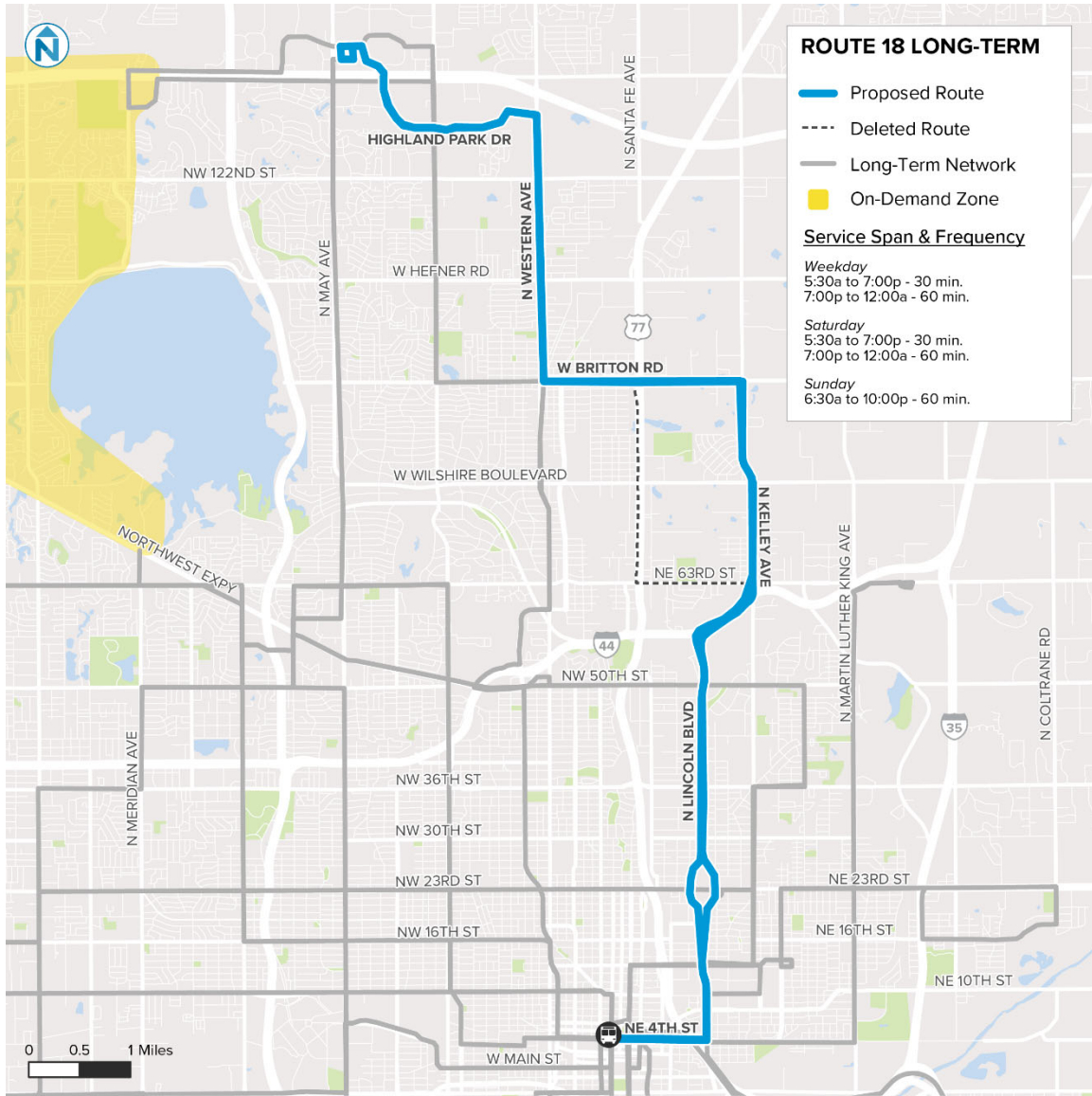


Figure 24 Route 022 Long-Term Recommendations Route Map

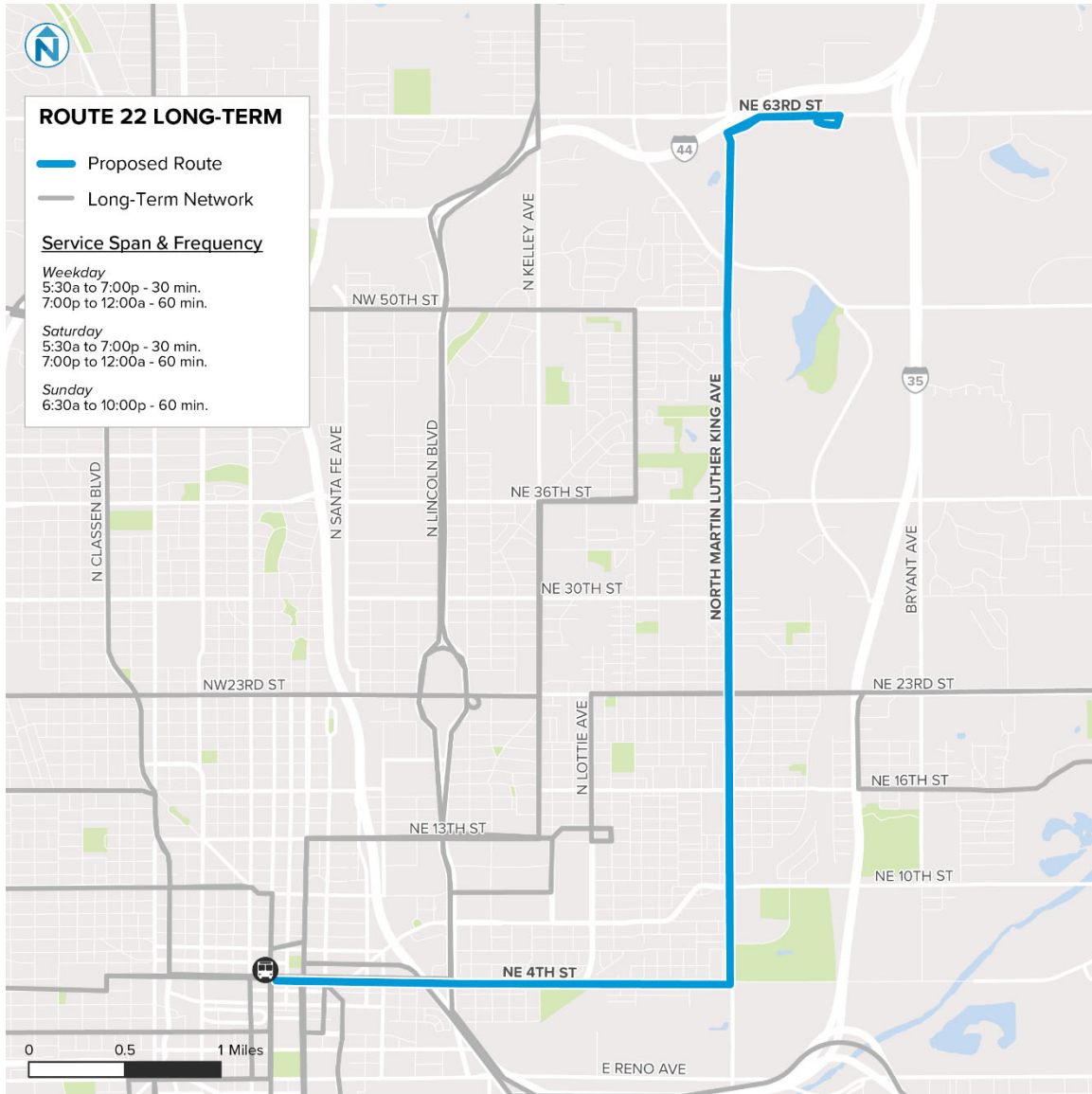




Figure 25 Route 023 Long-Term Recommendations Route Map

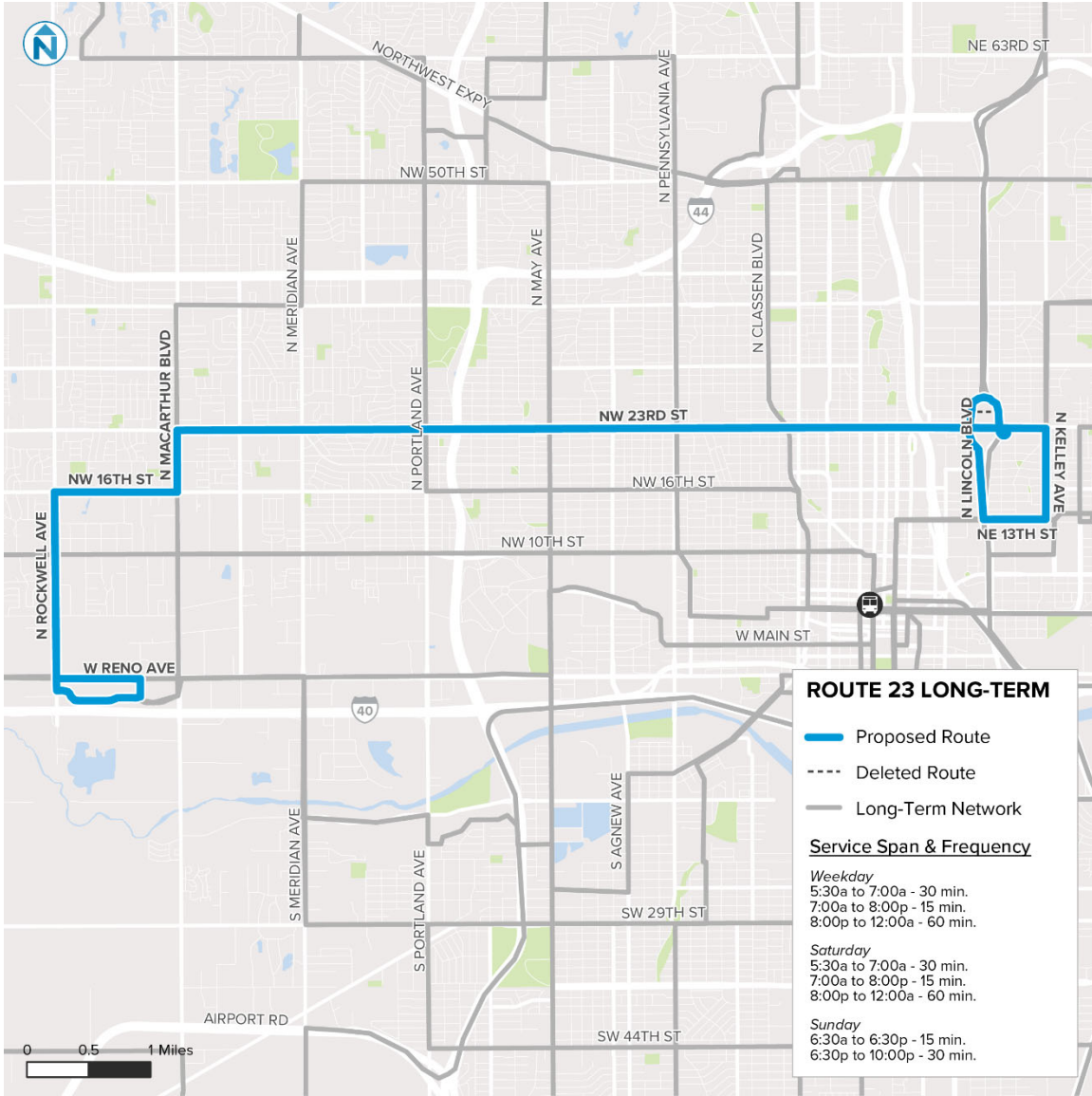


Figure 26 Route 024 Long-Term Recommendations Route Map

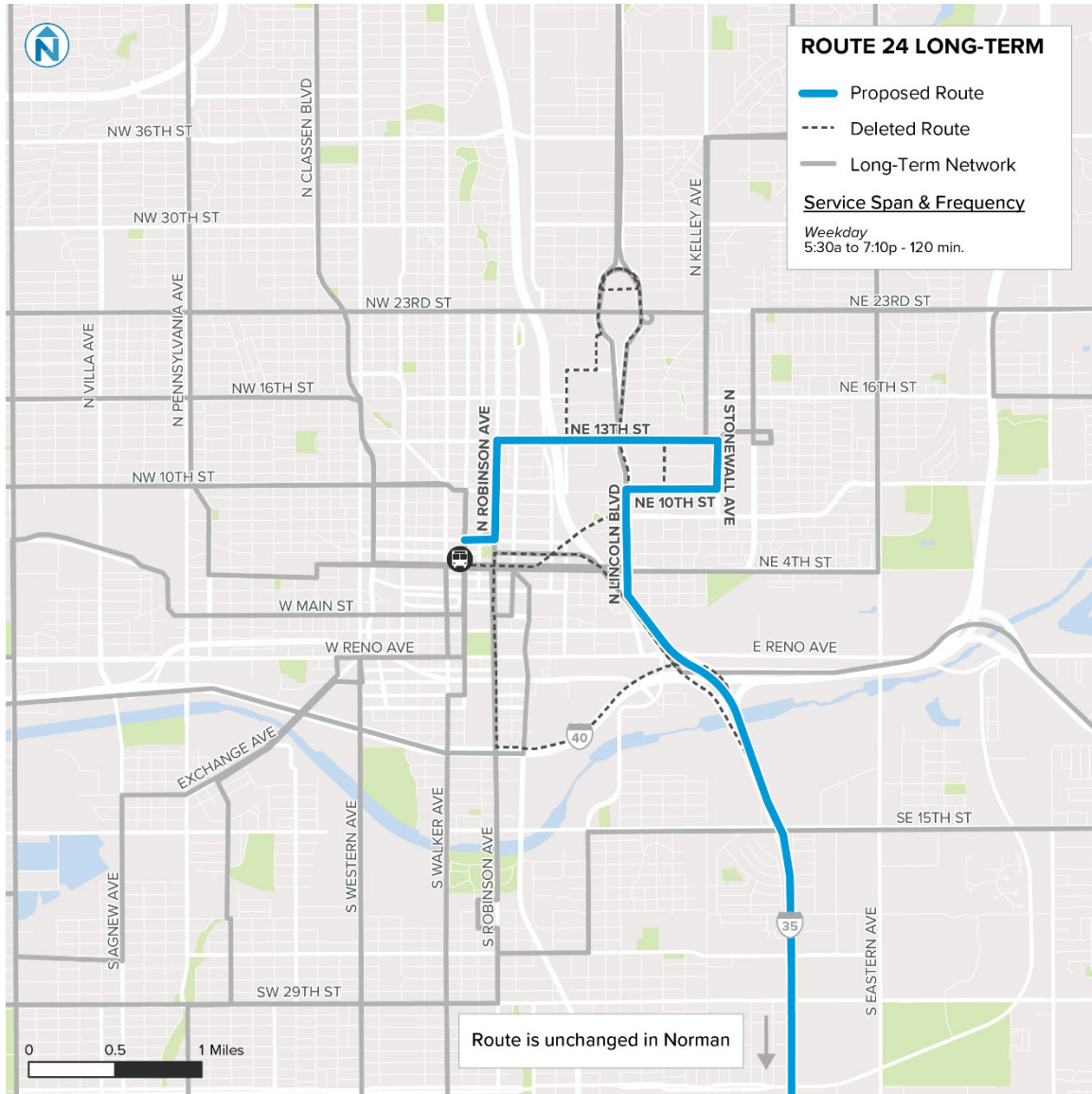




Figure 28 Route 038 Long-Term Recommendations Route Map

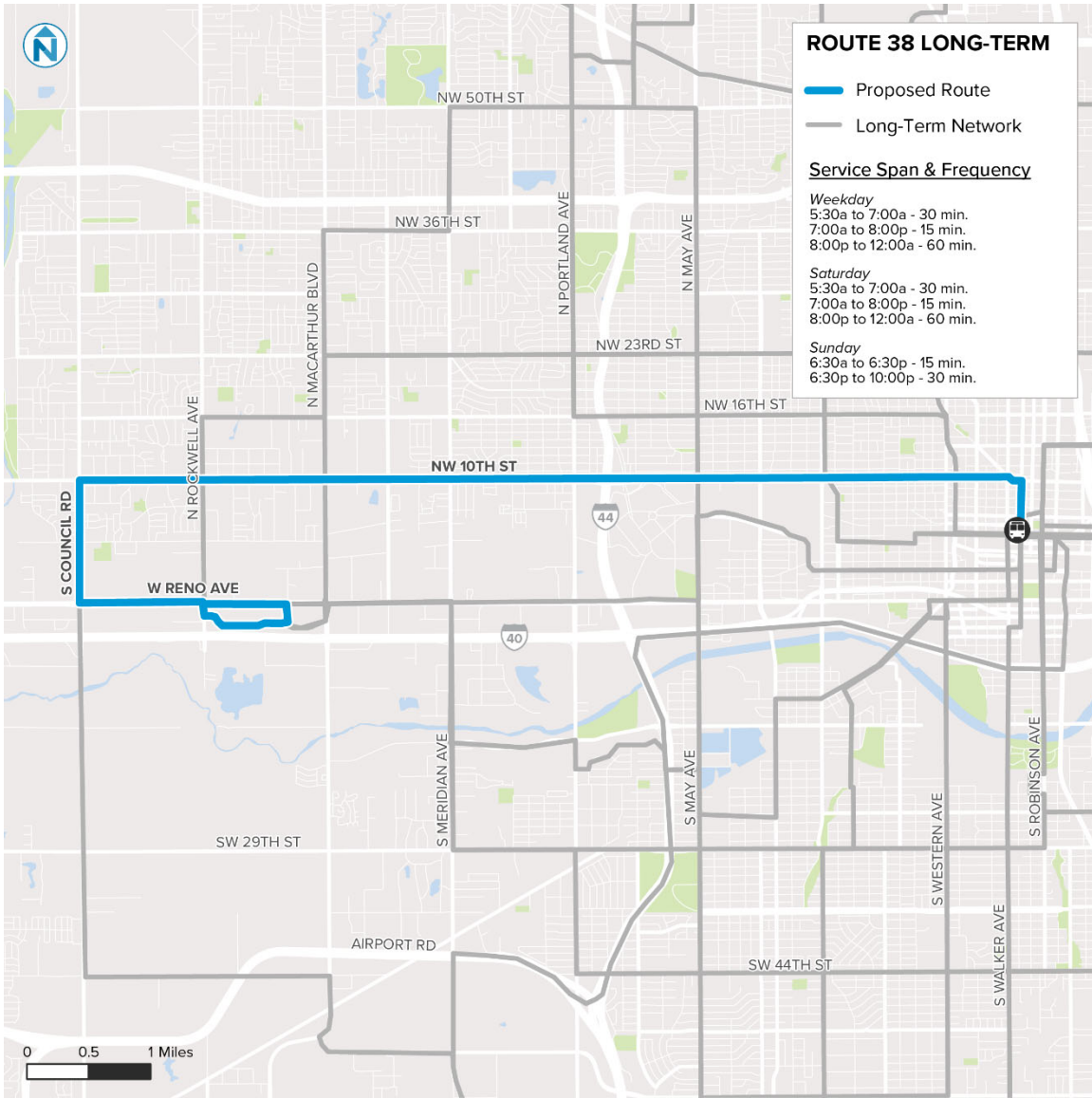


Figure 29 Route 040 Long-Term Recommendations Route Map

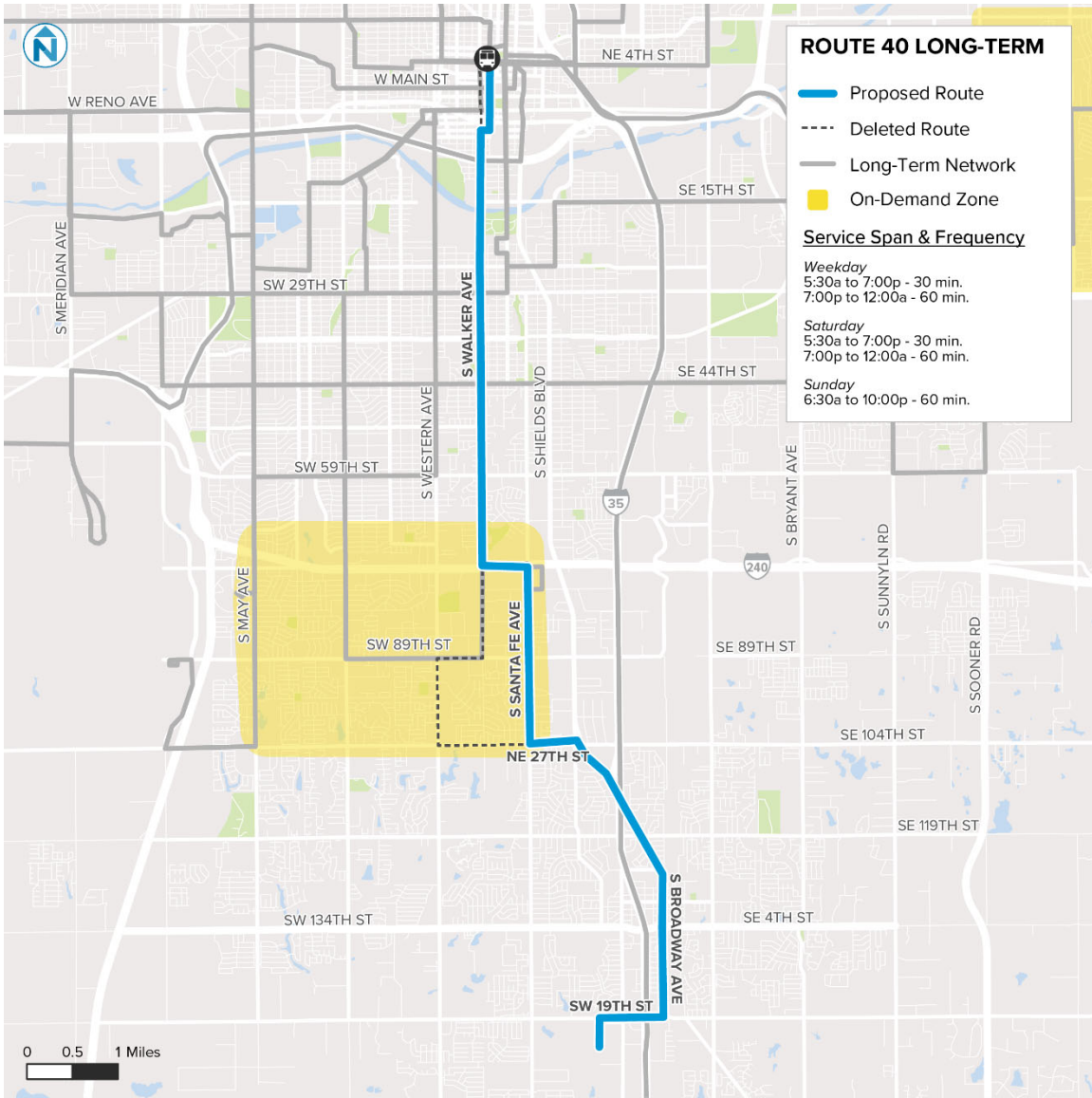
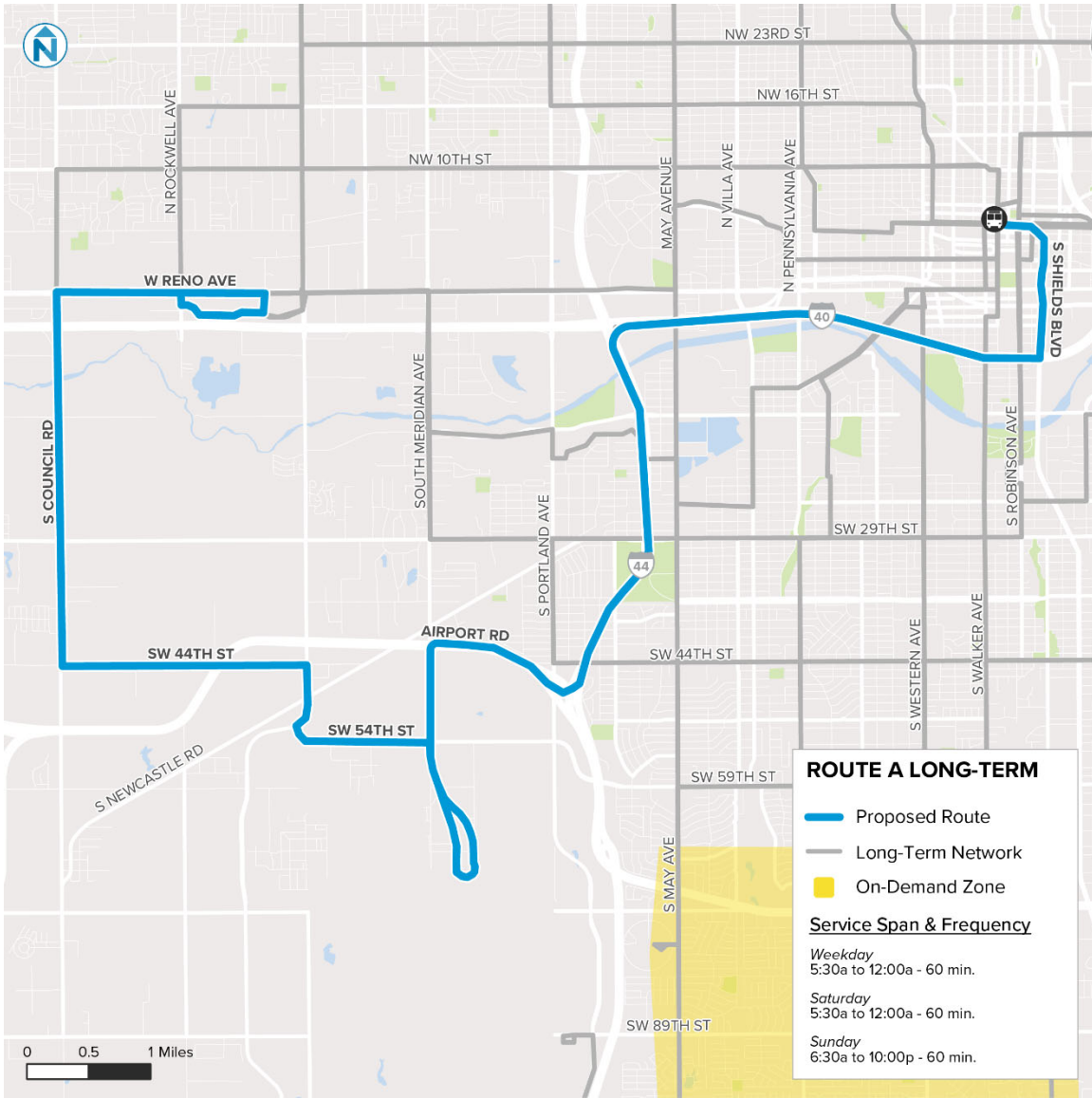


Figure 30 Route A Long-Term Recommendations Route Map



# **APPENDIX E SERVICE GUIDELINES AND STANDARDS**



# Service Guidelines and Standards

OKC Moves Bus Study  
EMBARK

**FINAL**

April 2022





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# 1 INTRODUCTION

## Purpose

EMBARK's mission is to be a self-sustaining transportation network that removes barriers of location and socioeconomic status, while elevating the status and use of public transportation, so all of central Oklahoma can safely and quickly reach their destination. EMBARK also strives to make efficient and equitable use of its limited resources. This document details the service guidelines, performance measures and service change process that will direct EMBARK in accomplishing its mission and goals in a rational and transparent manner.

## Overview

This document is divided into three sections:

- **Service guidelines** serve as a framework for the provision, design and allocation of routes, schedules and stops. Guidelines are intended to be used with some flexibility.
- **Performance measures** describe the process by which existing services are evaluated in terms of ridership productivity, on-time performance and passenger safety.
- **Service changes** are implemented twice a year, primarily in response to performance evaluations, new development, and rider feedback.

This document is primarily focused on fixed-route bus services, including local, express, and planned BRT service. Other services like streetcar, ferries, EMBARK Plus paratransit, and other mobility management programs are not discussed in this document.

## Route Classification

Four route types are identified in this document, each with distinctive service guidelines and performance measures, including frequent, local, coverage, and express services. EMBARK currently classifies routes as local and express only. However, with the planned implementation of future BRT corridors and higher frequency service in Oklahoma City, there is an opportunity to further classify routes in the system with more specific service standards and design guidelines.

Lower performing routes currently classified as local, may be reclassified as coverage routes, while there may also be potential for local routes with higher ridership and transit supportive development patterns to be reclassified as frequent routes. The recommended service types are shown in Figure 1-1 and the existing and recommended route classifications are shown in Figure 1-2.

**Figure 1-1 | EMBARK Transit Services Types**

Service Type	Characteristics
<b>Frequent Route</b>	Frequent routes are high productivity local services that operate along densely developed primary arterials and offer a high level of frequency. Routes should be simple and direct.
<b>Local Routes</b>	Local routes also operate along primary arterials, but in areas of less dense development patterns. These routes offer relatively frequent, simple, and direct service.
<b>Coverage Routes</b>	Coverage routes serve low-density areas and typically focus on extending service coverage. Productivity is usually low.
<b>Express Routes</b>	Express or commuter routes operate over long distances with limited stops and typically operate during peak travel periods or infrequently throughout the day. Guidelines for these routes are typically relaxed due to their unique rider markets.

**Figure 1-2 | EMBARK Route Classifications**

Route	Existing	Recommended
002 – Coltrane	Local	Local
003 – N Kelley	Local	Local
005 – Memorial Rd	Local	Local
007 – N May	Local	Local
008 – N Penn/NW 63 <sup>rd</sup>	Local	Local
009 – W Reno Crosstown	Local	Local
010 – N Portland	Local	Local
011 – 29 <sup>th</sup> St Crosstown	Local	Local
012 – S May	Local	Local
013 – S Western/I-240 Crosstown	Local	Local

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<b>Route</b>	<b>Existing</b>	<b>Recommended</b>
014 – SE Bryant or Sunnyslane	Local	Local
015 – Midwest City	Local	Coverage
016 – S Penn	Local	Local
018 – Lincoln	Local	Local
019 – Spencer	Local	Coverage
022 – Martin Luther King	Local	Local
023 – 23 <sup>rd</sup> St Crosstown	Local	Frequent
024 – Norman	Express	Express
038 – 10 <sup>th</sup> St Crosstown	Local	Local
040 – S Walker	Local	Local
13N – S Western Night	Local	Coverage
23N – 23 <sup>rd</sup> St Crosstown Night	Local	Coverage

## 2 SERVICE GUIDELINES

Service guidelines are often used as a framework for the design and allocation of bus service and bus stops. Service guidelines are typically divided into five categories:

1. **Service coverage** guides the development of new services.
2. **Route design** focuses on the simple and efficient alignment and structure of service.
3. **Service span** guidelines sets route start and end times.
4. **Service frequencies** guide how often transit service is operated.
5. **Bus stop** guidelines cover stop spacing, stop placement and passenger amenities.

### Service Coverage

Coverage and frequency are competing service characteristics that strongly influence the convenience and efficiency of a transit system. As Oklahoma City expands outside of the urban core, it is important to increase service coverage in a responsive yet responsible manner. This involves ensuring that sufficient demand exists for new routes and/or route extensions so that transit services are cost-effective.

The combination of population and employment density are the strongest indicators of potential transit demand. Recent transit analyses in cities similar to Oklahoma City reveal that densities of less than four persons per acre or two jobs per acre cannot successfully support basic fixed-route transit. Once densities exceed 16 persons per acre or 10 jobs per acre, frequent bus service may be viable. These guidelines for service based on population and employment densities are shown in Figure 2-1 The relative demand for transit based on these densities in the Oklahoma City area is depicted in Figure 2-2.

Recognizing that it may not be possible or practical to serve all areas that meet these density criteria, particularly as new developments emerge further from the urbanized core, transit systems should strive to serve 85% of these high-density areas.

While population density is a good method to evaluate the service demand, there are other factors to consider, such as vehicle ownership, household income, low-income employment, and low supply and/or high cost of parking. In areas where one or more of these conditions exist, transit service may be effective even if population densities are low. These population densities are shown in the transit propensity index in Figure 2-3.

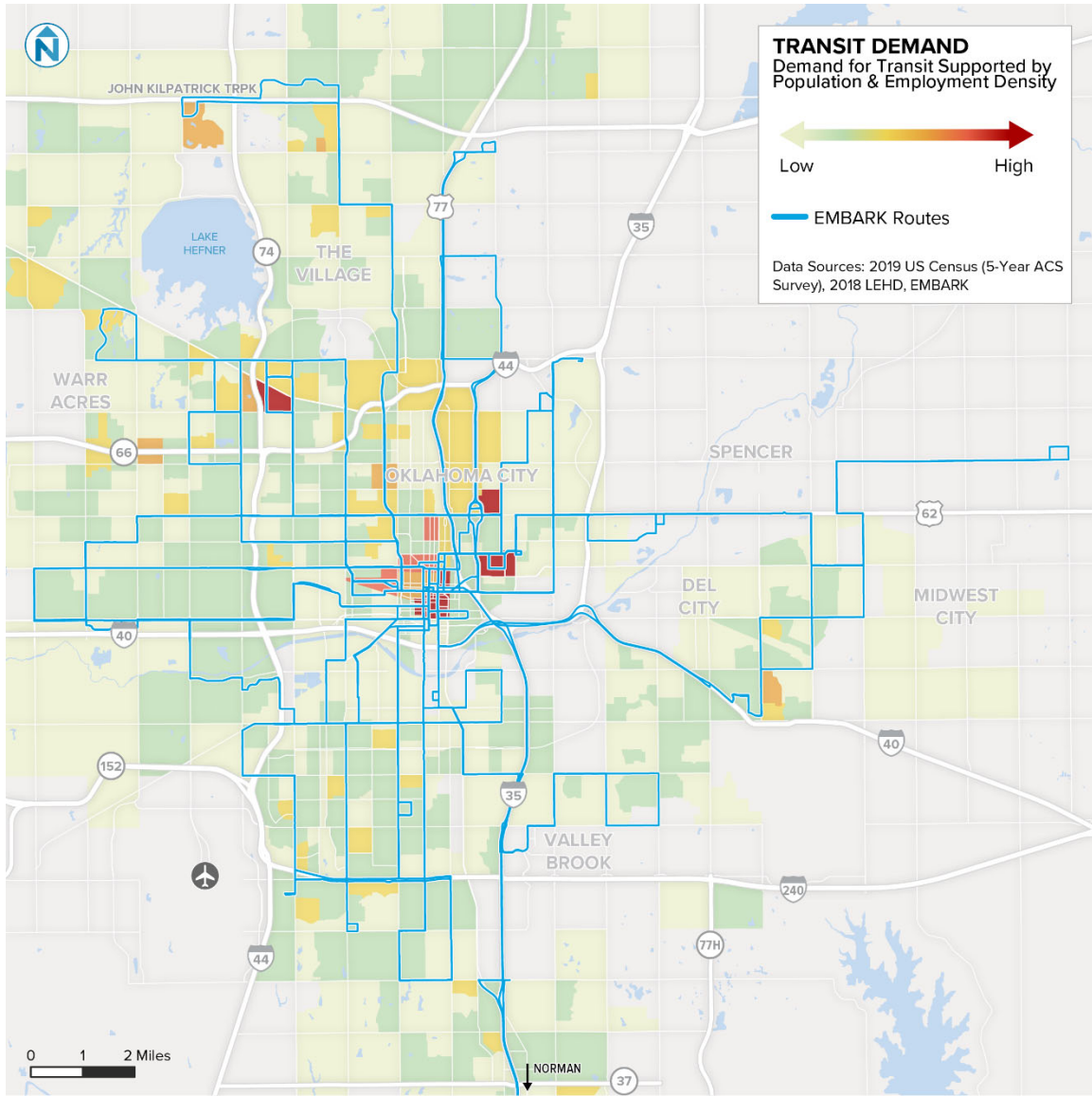
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Figure 2-1 | Density Based Guidelines for Service



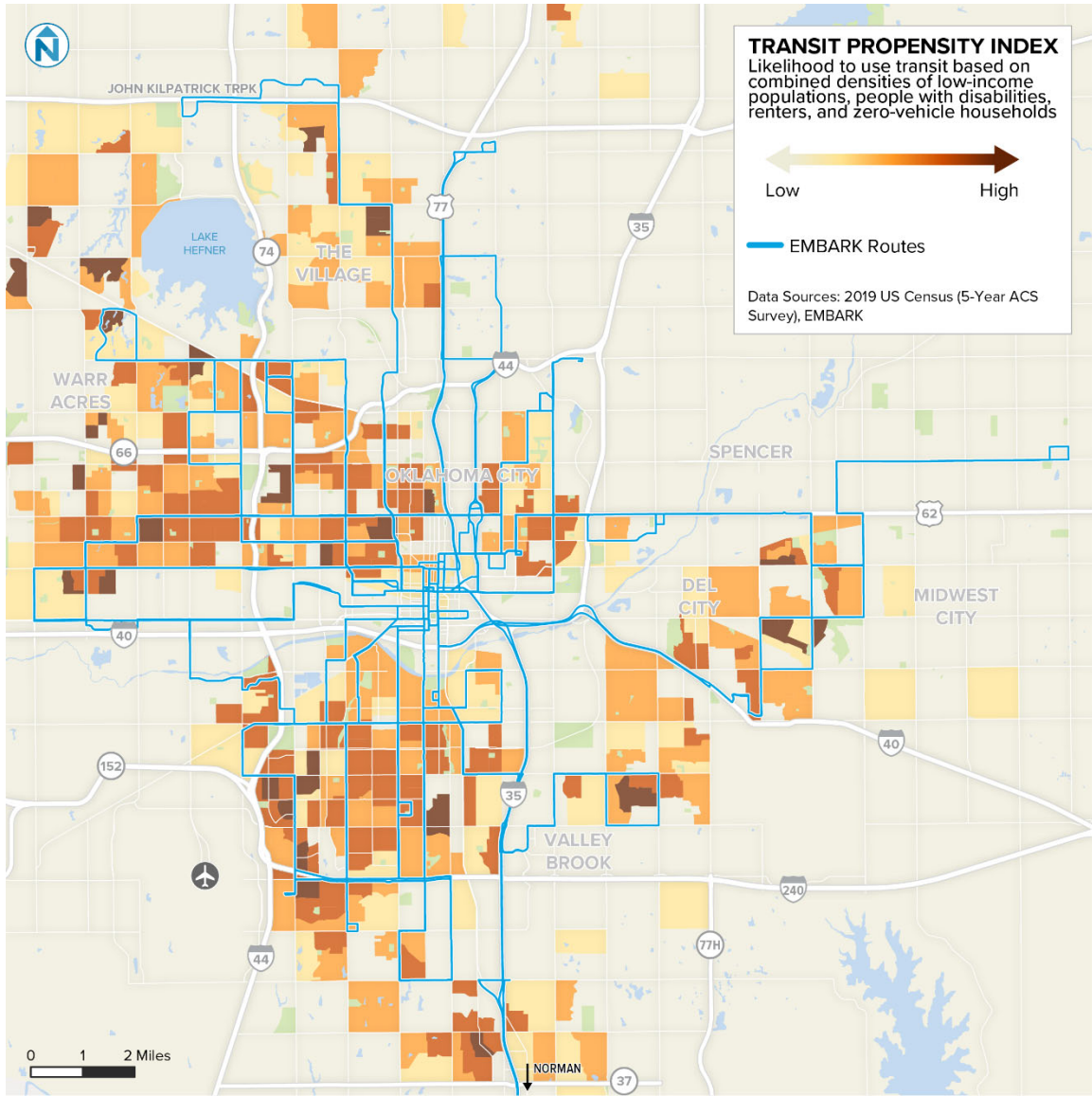
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Figure 2-2 | Transit Supportive Population and Employment Densities



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Figure 2-3 | Transit Propensity Index





## Route Design

### Simple

The way transit service is designed influences how easy it is for people to understand available transportation options. Most of the guidelines in this section aim to make service intuitive, logical, and easy to understand. Common characteristics of simple route design include bi-directional service, rather than large one-way loops, and consistent service throughout the day, rather than operating short turns or peak only services. Short turns may be appropriate in areas where demand for service decreases sharply after a certain location.

Route branching should be minimized where possible to ensure simplicity but may be necessary to provide service along corridors with high demand. Vehicles should alternate branches on every other trip to ensure consistency throughout the day.

### Direct

Riders prefer faster, more direct transit services. In order to remain competitive with personal vehicles, special attention should be placed on designing routes to operate as directly as possible. Direct routes maximize average speed for the bus and minimize travel time for passengers. Route deviations should be limited to major destinations such as shopping centers, employment sites, medical centers, schools, etc. In these cases, the benefits of deviating service from the main route must be weighed against the inconvenience caused to passengers already on board. Route deviations may also be considered when pedestrian access to a large trip generator is unsafe due to a lack of infrastructure.

In most cases, where route deviations are provided, they should operate for the entire service period. Exceptions are during times when the sites that the route deviations serve have no activity—for example, route deviations to high schools do not need to be in place on weekends. Deviations should be limited to no more than five minutes or 10% of the existing one-way travel time for the route and should result in an overall increase in ridership.

### Efficient

The distance and travel time of a route determine how efficiently a bus can operate. Service should be designed to maximize the time a vehicle is in service and minimize the amount of time it is out-of-service. Routes should be designed to operate at clockface cycles of 30, 60, 90 or 120 minutes with less than 10-15% layover time. Strategies for addressing routes with excess layover may include extending service to pick up a few more passengers or interlining with other routes to arrive at a combined clockface headway (e.g.  $45' + 45' = 90'$ ). Route lengths may also be extended or shortened to increase or reduce layover time.

Route efficiency may be improved by serving high ridership “anchor” destinations at both termini of the route. This approach maximizes ridership activity in both directions of the route. Additionally, parallel routes operating in close proximity have the potential to split service demand and reduce route efficiency. Appropriate spacing requires a tradeoff between walking distances and service frequency with potential customers being more

likely to walk further for more frequent service. Route spacing in the urbanized area of Oklahoma City should be approximately every ½ mile and every ¼ mile within the downtown area.

## Service Span

Span of service refers to the time a route begins and the time it ends. Service span guidelines define the minimum period that different route types should operate. Service can start earlier and/or end later if demand warrants and the route meets minimum productivity expectations described in the following chapter. Because service span is a major factor in determining how much a route will cost to operate, it may not be financially feasible to operate extended service spans on all routes.

EMBARK currently provides consistent weekday service span on all local routes beginning between 5:00 a.m. and 6:30 a.m. and ending between 6:30 p.m. and 7:30 p.m. with late night service on select routes extending until midnight. Saturday and Sunday service span is also consistent on all local routes that begins between 6:00 a.m. and 6:30 a.m. and ends between 6:00 p.m. and 6:30 p.m.

Figure 2-4 details the recommended minimum service spans for each route type by day. Current EMBARK service spans are depicted in Figure 2-5, Figure 2-6, and Figure 2-7.

**Figure 2-4 | Minimum Service Span**

	Frequent Routes	Local Routes	Coverage Routes	Express Routes
<b>Weekdays</b>				
Begin	5:30 a.m.	5:30 a.m.	6:00 a.m.	No minimum
End	12:00 a.m.	12:00 a.m.	10:00 p.m.	No minimum
<b>Saturdays</b>				
Begin	6:00 a.m.	6:00 a.m.	6:00 a.m.	No minimum
End	12:00 a.m.	10:00 p.m.	8:00 p.m.	No minimum
<b>Sundays</b>				
Begin	6:00 a.m.	6:00 a.m.	6:00 a.m.	No minimum
End	12:00 a.m.	10:00 p.m.	8:00 p.m.	No minimum

Notes: The beginning span refers to the departure of the first trip, and the ending span refers to the departure time of the last trip.

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**Figure 2-5 | Current EMBARK Weekday Service Spans**

Route	Early				Morning				Early PM				Late PM				Night			
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
002 - Coltrane																				
003 - N Kelley																				
005 - Memorial Rd																				
007 - N May																				
008 - N Penn/NW 63rd																				
009 - W Reno Crosstown																				
010 - N Portland																				
011 - 29th St Crosstown																				
012 - S May																				
013 - S Western/I-240 Crosstown																				
13N - S Western																				
014 - SE Bryant or Sunnyslane																				
015 - Midwest City																				
016 - S Penn																				
018 - Lincoln																				
019 - Spencer																				
022 - Martin Luther King																				
023 - 23rd St Crosstown																				
23N - 23rd St Crosstown Night																				
024 - Norman																				
038 - 10th St Crosstown																				
040 - S Walker																				

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**Figure 2-6 | Current EMBARK Saturday Service Spans**

Route	Early				Morning				Early PM			Late PM				Night				
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
002 - Coltrane																				
003 - N Kelley																				
005 - Memorial Rd																				
007 - N May																				
008 - N Penn/NW 63rd																				
009 - W Reno Crosstown																				
010 - N Portland																				
011 - 29th St Crosstown																				
012 - S May																				
013 - S Western/I-240 Crosstown																				
13N - S Western																				
014 - SE Bryant or Sunnyslane																				
015 - Midwest City																				
016 - S Penn																				
018 - Lincoln																				
019 - Spencer																				
022 - Martin Luther King																				
023 - 23rd St Crosstown																				
23N - 23rd St Crosstown Night																				
024 - Norman																				
038 - 10th St Crosstown																				
040 - S Walker																				

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**Figure 2-7 | Current EMBARK Sunday Service Spans**

Route	Early				Morning				Early PM			Late PM				Night				
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11
002 - Coltrane				█	█	█	█	█	█	█	█	█	█	█						
003 - N Kelley				█	█	█	█	█	█	█	█	█	█	█						
005 - Memorial Rd			█	█	█	█	█	█	█	█	█	█	█	█	█					
007 - N May				█	█	█	█	█	█	█	█	█	█	█						
008 - N Penn/NW 63rd				█	█	█	█	█	█	█	█	█	█	█						
009 - W Reno Crosstown			█	█	█	█	█	█	█	█	█	█	█	█						
010 - N Portland				█	█	█	█	█	█	█	█	█	█	█						
011 - 29th St Crosstown				█	█	█	█	█	█	█	█	█	█	█	█					
012 - S May				█	█	█	█	█	█	█	█	█	█	█						
013 - S Western/I-240 Crosstown				█	█	█	█	█	█	█	█	█	█	█						
13N - S Western																				
014 - SE Bryant or Sunnyslane				█	█	█	█	█	█	█	█	█	█	█						
015 - Midwest City																				
016 - S Penn				█	█	█	█	█	█	█	█	█	█	█						
018 - Lincoln																				
019 - Spencer																				
022 - Martin Luther King				█	█	█	█	█	█	█	█	█	█	█						
023 - 23rd St Crosstown			█	█	█	█	█	█	█	█	█	█	█	█						
23N - 23rd St Crosstown Night																				
024 - Norman																				
038 - 10th St Crosstown				█	█	█	█	█	█	█	█	█	█	█						
040 - S Walker				█	█	█	█	█	█	█	█	█	█	█						

## Service Frequencies

Service frequency is critical to establish transit service as an attractive and viable travel mode, and significantly influences transit ridership. Alternatively, frequency has a significant impact on operating costs. Improving a route from a 60-minute frequency to a 30 minute-frequency doubles the route’s operating costs. Because operating high-frequency service is so expensive, transit service frequency can vary throughout the day (i.e. peak and off-peak periods) to reflect existing or potential demand. Service frequencies are also set to ensure there are enough vehicles on the route to accommodate passenger volumes while not exceeding recommended loading standards.

Note that when a corridor is served by multiple or branched routes, the overall service frequency along the trunk segment the corridor is effectively more frequent than the branch segments. Service frequencies are listed in terms of “clock face intervals” (e.g. every 15, 30, or 60 minutes) as these intervals are easier for passengers to remember and can help facilitate better transfer connections between routes. Whenever possible, frequencies should be set at regular clock-face intervals. However, there are two key exceptions:

- Where individual trips must be adjusted away from clock face intervals to meet shift times, transfer connections, or other special circumstances;
- Where the desired frequency of service causes round trip recovery time to exceed 20% of the total round trip vehicle time. In such cases, the inefficiency of the schedule outweighs the benefit of a clock face schedule, except when trying to meet a timed transfer at a location like the downtown transit center.

Maximum service frequency guidelines are presented in Figure 2-8 and existing frequencies are shown in Figure 2-9. As with service spans, recommended service frequencies should be used as a guideline.

Figure 2-8 | Maximum Service Frequency (minutes)

	Frequent Routes	Local Routes	Coverage Routes	Express Routes
<b>Weekdays</b>				
Peak	15	30	60	No maximum
Base	15	30	60	No maximum
Night	30	60	60	No maximum
<b>Saturdays</b>				
Base	30	30	60	No maximum
Night	30	60	60	No maximum
<b>Sundays</b>				
Base	30	60	60	No maximum
Night	30	60	60	No maximum

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**Figure 2-9 | Current EMBARK Service Frequencies (minutes)**

Route	Weekday Base	Weekday Night	Saturday	Sunday
002 – Coltrane	30	--	60	60
003 – N Kelley	30	--	60	60
005 – Memorial Rd	30	60	60	60
007 – N May	30	--	60	60
008 – N Penn/NW 63 <sup>rd</sup>	30	--	60	60
009 – W Reno Crosstown	30	--	60	60
010 – N Portland	30	--	60	60
011 – 29 <sup>th</sup> St Crosstown	30	60	60	60
012 – S May	30	--	45	45
013 – S Western/I-240 Crosstown	30	--	45	45
13N – S Western Night	--	60	--	--
014 – SE Bryant or Sunnyslane	45	--	45	45
015 – Midwest City	70	--	--	--
016 – S Penn	30	--	60	60
018 – Lincoln	60	--	--	--
019 – Spencer	60	--	--	--
022 – Martin Luther King	30	60	60	60
023 – 23 <sup>rd</sup> St Crosstown	30	--	60	60
23N – 23 <sup>rd</sup> St Crosstown Night	--	60	--	--
024 – Norman	60-120	--	--	--
038 – 10 <sup>th</sup> St Crosstown	30	--	60	60
040 – S Walker	30	--	60	60

## Bus Stops

### Bus Stop Spacing

Bus stop spacing guidelines are intended to guide the placement of future stops, while balancing customer convenience with operating efficiency. Customer convenience involves a tradeoff between distance to stops and travel speeds. Closely spaced stops reduce the distance to/from customer origins and destination. However, closely spaced stops also result in slower bus speeds as each additional stop requires the bus operator to decelerate, come to a complete stop, allow time for customers to alight and/or board, accelerate, and merge back into traffic. Since most riders want service that balances convenience and speed, the number and location of stops is a key component of determining that balance.

In general, areas with high population and employment density should have shorter stop spacing than areas with moderate or low densities. Additionally, higher frequency service should also have longer bus stop spacing to support faster travel times. Figure 2-10 provides stop spacing guidelines based on population and employment density characteristics. Recognizing that the development characteristics will vary along a route's alignment, some areas of a route may be better suited for shorter stop spacing while other areas are better suited for longer stop spacing. In Oklahoma City, stops should be spaced at least 1,300 to 1,000 feet apart in the moderate to high density areas of the city. In lower density areas, stops should be at least 1,300 feet apart. Actual stop spacing will vary based on built environment characteristics.

Figure 2-10 | Guidelines for Bus Stop Spacing Minimums

	Frequent Routes	Local Routes	Coverage Routes	Express Routes
<b>Minimum Stop Spacing in Feet</b>				
Moderate to High Density Areas	1,300	1,000	1,000	No Guideline
Low Density Areas	1,300	1,300	1,300	No Guideline
<b>Maximum Number of Stops Per Mile</b>				
Moderate to High Density Areas	4	5	5	No Guideline
Low Density Areas	4	5	5	No Guideline

### Bus Stop Placement

Bus stop placement necessarily requires a tradeoff between safety, accessibility, and efficiency. Pedestrian safety and accessibility are highest when bus stops are placed at existing intersections. However, certain circumstances like right of way availability, installation costs, or other regulations may make these placement locations impractical for bus stop siting.

Far-side stop placement, in which the bus stop is served after the vehicle crosses the intersection, are generally preferred over near-side and mid-block stop placements. Far-side stops are more effective for reducing conflicts with general traffic vehicles,



encouraging passengers to cross behind the bus, and maintain close access to crosswalks present at the intersection. Far-side stop placement may be impractical if there are existing obstructions or limited infrastructure that would make an alternative placement safer or more efficient.

Near-side stops, in which the bus stop is served before the vehicle crosses the intersection, and mid-block stops, which are located between two intersections, are less preferred but viable options for stop siting if far-side placement is impractical. These placement approaches may also be preferred if there are major trip generators present in the mid-block or near-side areas.

### **Bus Stop Amenities**

In addition to stop spacing and placement, stops should include amenities that are appropriate for the level of passenger activity occurring at each stop. This guideline serves several purposes: it ensures amenities are distributed with equity and ensures that transit providers are efficiently investing capital resources in locations where it is most appropriate. Since passenger amenities enhance multiple routes, these standards are not specific to the type of service, only the total number of boardings, as described.

Where practicable, all new or improved bus stops and passenger waiting areas must conform to the ADA requirements as laid out in the Department of Transportation ADA standards for Transportation Facilities (2006). These standards specify a variety of requirements for platform surface, widths, and connectivity to surrounding sidewalk infrastructure and shelter facilities. As funds are available, existing bus stops and passenger waiting areas should be updated to meet ADA requirements.

Additionally, all stops should include clear signage. Additional amenities such as benches should be provided, as appropriate, depending on the level of passenger activity. Figure 2-11 provides a description of recommended bus stop amenities based on average daily passenger boardings.

Special services like Bus Rapid Transit (BRT) or streetcar service require different branding and bus stop amenities that are not covered in this document. In some instances, where routes operate on shared alignments or to better facilitate transfers, fixed-route services may also use these bus stops designed for BRT or streetcar. However, some aspects of BRT and streetcar stops, like platform height for example, may result in operational issues for standard fixed-route vehicles. Bus stops may be shared between these service types where it is practical from a design, construction, or operational perspective but is not necessary at all locations.

Figure 2-11 | Bus Stop and Transit Station Types

### BASIC BUS STOP

**ELEMENTS:**

- Bus stop sign
- Paved boarding area
- Sidewalk connection
- Street lighting

**APPROXIMATE COST:**

\$5,000 - \$10,000

**TYPICAL RIDERSHIP:**

Fewer than 10 daily passenger boardings



### BUS STOP + BENCH

**ELEMENTS:**

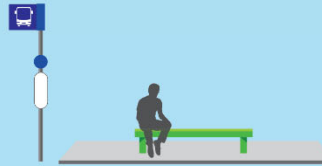
- Bus stop sign
- Paved boarding area
- Seating
- Sidewalk connection
- Street lighting
- Pavement markings

**APPROXIMATE COST:**

\$5,000 - \$10,000

**TYPICAL RIDERSHIP:**

10-15 daily passenger boardings



### BUS STOP + SHELTER

**ELEMENTS:**

- Bus stop sign
- Paved boarding area
- Shelter/seating
- Sidewalk connection
- Street lighting
- Pavement markings

**APPROXIMATE COST:**

\$15,000 - \$30,000

**TYPICAL RIDERSHIP:**

15-75 daily passenger boardings



### HIGH VOLUME BUS STOP

**ADDITIONAL ELEMENTS:**

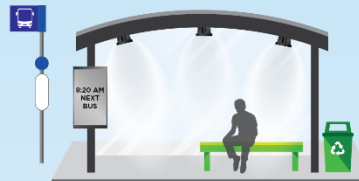
- Real-time display
- Bus pad on roadway
- Lighting
- Bicycle racks

**APPROXIMATE COST:**

\$30,000 - \$45,000

**TYPICAL RIDERSHIP:**

75+ daily passenger boardings



## 3 PERFORMANCE MEASURES

Performance measures describe the methodology by which services are evaluated. Routes should be evaluated monthly to identify trends and inform the service change proposal development. The following three performance measures are recommended for EMBARK:

- On-Time Performance
- Route Productivity and Cost Effectiveness
- Passenger Loads

These performance measures will identify high- and low-performing routes and trips, thereby assisting EMBARK in determining when it is appropriate to adjust investments associated with specific route schedules. Accordingly, performance measures are defined for route type, recognizing that expectations for productivity and efficiency will be shaped by the underlying market and operating characteristics. Performance measures should be evaluated on a monthly basis with service changes occurring every six months.

### **On-Time Performance**

On-time performance measures how closely a transit service adheres to the published schedule. It is an important measure for transit users because it directly impacts service reliability. It is also crucial for timed-transfer systems as buses arriving more than five minutes late throughout the system, especially at the Downtown Transit Center, will likely result in missed connections. On-time performance is measured by comparing scheduled and actual bus departure and arrival times at fixed time points (bus stops identified in published schedules).

To precisely measure on-time performance, a definition of on-time must be established. The most widely accepted fixed route measure of on-time is up to one minute earlier and no more than five minutes later (-1 minute to +5 minutes) than the scheduled arrival time at all time points. The only exception to this measure would include early arrivals on commuter routes to their final destinations. Minimum on-time performance percentages are defined in Figure 3-1.

**Figure 3-1 | Minimum On-Time Performance**

	Frequent Routes	Local Routes	Coverage Routes	Express Routes
Weekday	85%	85%	85%	85%
Saturday	85%	85%	85%	85%
Sunday	85%	85%	85%	85%

## Route Productivity and Cost Effectiveness

The number of passenger boardings per revenue hour (or revenue trip on commuter routes) measures how well the service is being used. For frequent, local and coverage routes, productivity should be measured by dividing the number of passenger boardings by the number of vehicle revenue hours for each route. For express routes, productivity should be measured as passenger boardings per trip.

An ideal productivity range for each route type and day of the week is provided in Figure 3-2. Routes performing below the ideal range may require corrective action, such as schedule adjustments or route revisions. At the opposite end of the scale, routes performing above the ideal range may indicate the demand for additional service (i.e. headway or span improvement) or capacity (i.e. higher-capacity vehicle).

**Figure 3-2 | Target Route Productivity Range**

	Boardings per Revenue Hour			Boardings per Revenue Trip
	Frequent Routes	Local Routes	Coverage Routes	Express Routes
Weekdays	20-40	15-30	10-25	10-25
Saturdays	10-25	10-20	-	-
Sundays	10-25	10-20	-	-

Cost effectiveness is a measure of the operating cost per passenger for each route in the EMBARK system. Operating cost per passenger and passenger subsidy (the operating cost per passenger that is not directly paid for by passenger fares) should be calculated and assessed monthly for each route in the system. There is no recommended service standard for operating cost per passenger or passenger subsidy. However, ongoing monitoring of these performance metrics provides useful insight for potential updates to fare structure and fare policies.

## Passenger Loads

Passenger loads refers to the ratio of riders on the bus relative to the number of available seats. Passenger loads vary by route type, time of day and for some routes, direction of travel. High passenger loads impact rider comfort and safety. During peak periods, some riders on high-ridership routes may be expected to stand for a portion of the trip. Overcrowding on buses often indicates the need for improved frequency or increased capacity.

During off-peak periods, most services should be designed to try to provide a seat to all customers. Commuter service should always be designed to provide a seat to all customers due to high travel speeds. Appropriate vehicle assignments are critical in managing passenger loads. Recommended maximum vehicle loads by service type and time of day are detailed in Figure 3-3.

Figure 3-3 | Maximum Vehicle Loads

	Frequent Routes	Local Routes	Coverage Routes	Express Routes
<b>Weekdays</b>				
Peak	133%	133%	100%	100%
Base	133%	100%	100%	100%
Night	133%	100%	100%	100%
<b>Saturdays</b>				
Base	100%	100%	100%	100%
Night	100%	100%	100%	100%
<b>Sundays</b>				
Base	100%	100%	100%	100%
Night	100%	100%	100%	100%

## 4 SERVICE CHANGES

EMBARK typically conducts two service changes each year to modify routes and adjust schedules based on performance evaluation findings, rider feedback, operator feedback and land use changes. These service changes are generally implemented in August/September and January/February. Each service change process also allows EMBARK to implement new services and if necessary, discontinue consistently unproductive route segments or scheduled trips. Route realignment or consolidation should always be explored prior to considering the elimination of an entire route.

Each service change includes multiple opportunities for public comment, staff revision and board review. Each service change process spans approximately six months from the start of proposal development to the implementation date.

EMBARK’s adopted service change policy currently applies to all fare changes and major service changes (changes that impact 25% or more of the systems revenue hours or revenue miles). However, there is no existing policy to evaluate service changes that do not meet the major service change threshold. Several additional types of service change are recommended for inclusion in EMBARK’s service change policy.

Each recommended service change type has unique minimum impacts, public engagement requirements, and necessary approvals, as detailed in Figure 4-1.

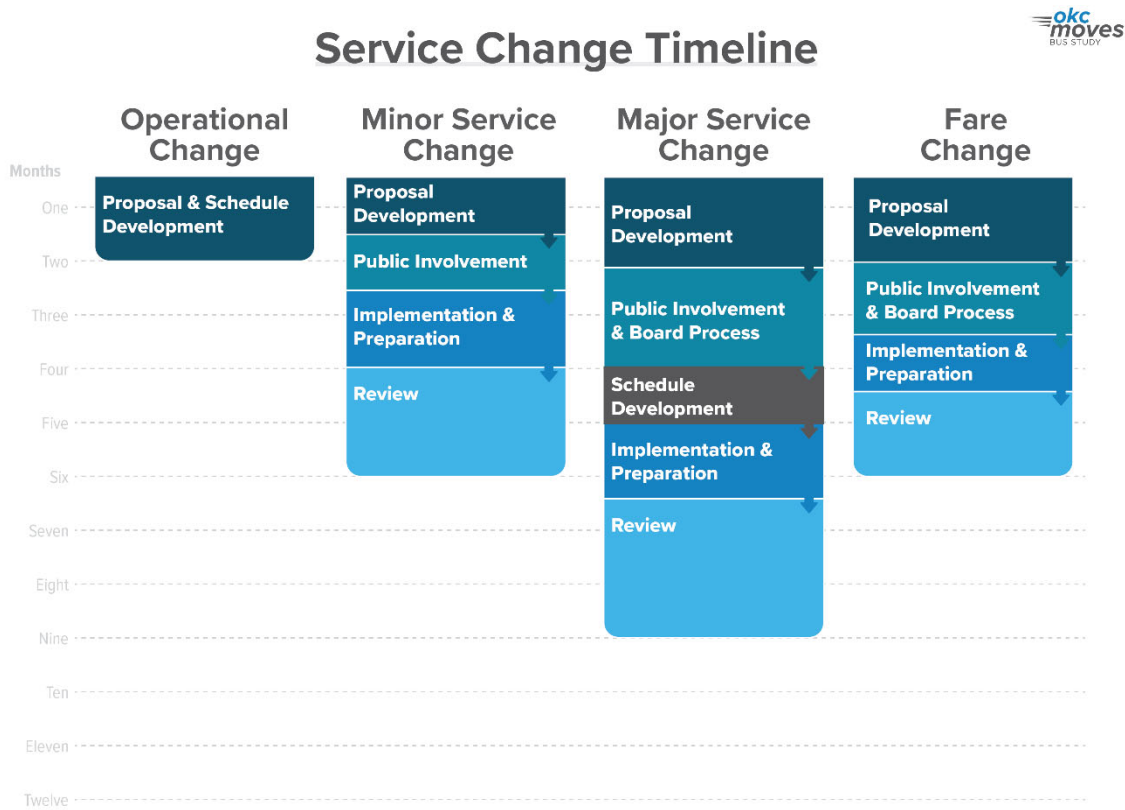
Figure 4-1 | Recommended Service Change Classifications

Service Change Type	Rider Impact	Requirements	Approval
<b>Operational change</b> <ul style="list-style-type: none"> <li>▪ Detours</li> <li>▪ Stop change or closure</li> </ul>	<ul style="list-style-type: none"> <li>▪ &lt; ¼ mile of existing route</li> <li>▪ &lt; ¼ mile bus stop impact</li> </ul>	<ul style="list-style-type: none"> <li>▪ None</li> </ul>	EMBARK Staff
<b>Minor service change</b> <ul style="list-style-type: none"> <li>▪ Route</li> <li>▪ Schedule adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▪ &lt; 25% of a route’s boardings</li> <li>▪ &lt; 25% of a route’s miles or</li> <li>▪ &lt; 25% of a route’s revenue hours</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public comment encouraged</li> </ul>	EMBARK Staff
<b>Major service change</b> <ul style="list-style-type: none"> <li>▪ Route</li> <li>▪ Schedule adjustment</li> </ul>	<ul style="list-style-type: none"> <li>▪ &gt; 25% of a route’s boardings</li> <li>▪ &gt; 25% of a route’s miles or</li> <li>▪ &gt; 25% of a route’s revenue hours</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public hearing</li> <li>▪ Title VI analysis</li> </ul>	EMBARK Board
<b>Fare change</b>	<ul style="list-style-type: none"> <li>▪ Any rider impact</li> </ul>	<ul style="list-style-type: none"> <li>▪ Public hearing</li> <li>▪ Title VI analysis</li> </ul>	EMBARK Board

The service change process varies for each type of service change, with operational changes spanning one to two months, minor service changes spanning approximately four to six months, major service changes spanning approximately six to nine months, and fare changes requiring approximately six months. All of these service changes

would be subject to an additional review period to monitor the effectiveness and impacts of changes over time. The approximate service change timelines are shown below in Figure 4-2.

Figure 4-2 | Approximate Service Change Timelines



The service change process typically includes the following elements:

- **Proposal development**
  - Service analysis
  - Initial concepts
  - Review of customer and operator input
  - Concept refinement and cost estimates
  - Title VI and ADA review (if required)
  - Initial proposals
  - Community outreach (if required)
  - Proposal revisions
- **Board process**
  - Board committee review
  - Public hearing
  - Final recommendations

- Board decision
- **Implementation and preparation**
  - Schedule development
  - Operator work assignments
  - Marketing and communication materials
  - Capital upgrades
  - Information technology updates
- **Review**
  - Evaluate route performance
  - Update recommendations



## 5 TITLE VI ANALYSIS

The Federal Transit Administration (FTA) has established requirements and guidelines that transit systems must use when implementing a “major service change and/or fare change”. According to these guidelines, EMBARK must conduct an analysis to determine whether the proposed changes would create a disparate impact on minority populations or a disproportionate burden on low-income populations.

The most current Census decennial data or Census American Community Survey (ACS) demographic data should be used for this analysis. For reference, the FTA defines the following populations as minorities: American Indian, Asian, African American, Hispanic, and Native Hawaiian. The FTA defines low-income persons as a person whose median household income is at or below the U.S. Department of Health and Human Services (HHS) Poverty Guidelines. FTA Title VI requirements and guidelines were updated on October 1, 2012 and can be reviewed in their entirety in FTA Circular 4702.1B.

Certain service standards and policies identified in this document are related to Title VI requirements.

### **Vehicle Assignment**

EMBARK operates a mixed fleet including 30 ft, 35 ft, and 40 ft vehicles. To ensure compliance with Title VI requirements, vehicles should be assigned to routes based upon service readiness, mechanical availability, and the operational needs of each routes to ensure that service capacity is aligned with demand. Newer vehicles and older vehicles should be assigned routes where they can perform the same or equivalent level of service based upon its availability, dependability, passenger amenities, and seating capacity. Rotating vehicles between routes may prevent a newer vehicle from premature wear and lengthen the useful life of older vehicles.

Bus assignments should be based upon an assessment of vehicle dependability and the classification of route on which it is operating.

### **Disparate Impacts and Disproportionate Burdens**

EMBARK’s existing policies for disparate impacts and disproportionate burdens establish a threshold for determining when adverse effects of a major service change or fare change are borne disproportionately by minority or low-income populations, respectively. EMBARK’s threshold for statistically significant disparities are when minority or low-income populations or riders will experience a 20% or greater adverse effect than that borne by the non-minority or non-low-income population or riders.

The service coverage, service frequency, and service span guidelines established in this document are all related to this disparate impact and disproportionate burden policy. When designing routes, EMBARK should continuously monitor changes and potential

adverse effects to these minority and low-income populations related to changes in route alignments, service frequencies, and service spans that may have disproportionate impacts on these populations.

# **APPENDIX F – EMBARK OPERATIONS ANALYSIS**

# 1 NW BRT STAFFING & OPERATIONS

## INTRODUCTION

NW BRT is a new type of service for EMBARK that will be implemented in 2023. The purpose of this memorandum is to identify some of the changes the Operations Department will have to make in preparation for the BRT service. The NW BRT operating plan that includes 12-minute weekday service frequency and an extended service span. Seven buses will be added to the weekday operation; a total of nine buses will be added to the fleet. The additional service equates to a 16 percent increase in EMBARK's fixed route service hours.

## NORTHWEST BRT STAFFING

In addition to the added service, BRT will also have 30 stations that will require additional maintenance and cleaning. Electronic messaging signs and other electronics at stations will require maintenance. BRT can be expected to require the addition of staff in several functional areas:

- **Bus operators.** It is estimated that 21 full time operators will be required to cover the BRT operating plan. This includes additional extraboard operators for fill in.
- **Operations supervisors.** One additional supervisor is required to provide additional coverage.
- **Vehicle maintenance staff.** EMBARK operates with a ratio of one mechanic for every three buses. Applying this ratio, an additional three mechanics will be needed. It is assumed that the small increase in fleet will not require additional service workers.
- **Electronics technician.** BRT stations will have a technology package which will require servicing and maintenance. It is estimated that one additional electronic technician will be needed.
- **Station maintenance.** NW BRT will have 30 stations which will require frequent cleaning and maintenance. Assuming the stations will be cleaned every other day three additional utility maintenance workers will be required.

The estimated increase in staffing is summarized in Figure 1.

Figure 1 Estimated Staffing Increase

Staff Type	Staff Increase
Bus operators	21
Operations supervisors	1
Vehicle maintenance staff	3
Electronic technician	1
Station maintenance staff	3
<b>Total staff increase</b>	<b>29</b>

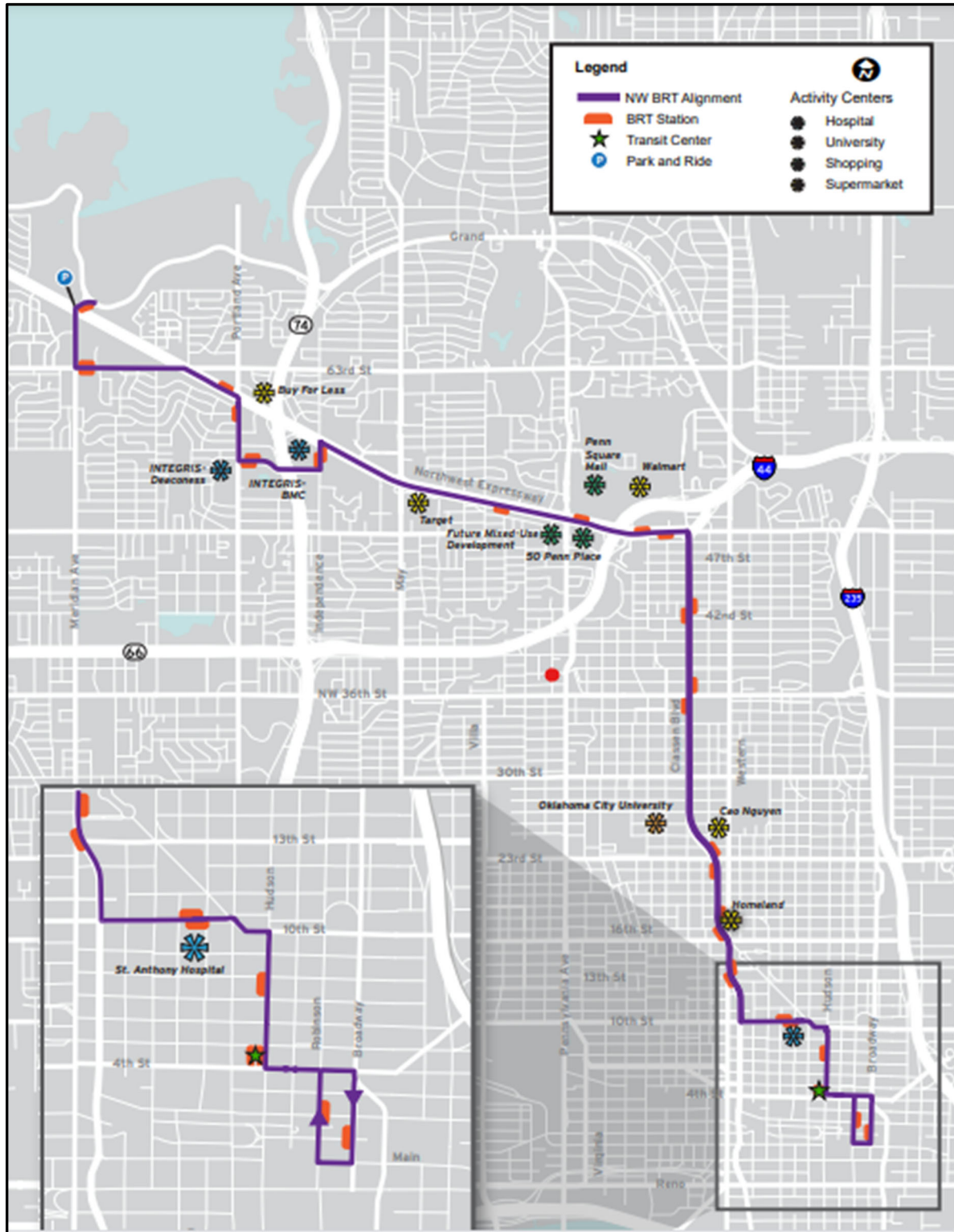
## BRT OPERATIONS

BRT operations are essentially not very different to the fixed route bus service EMBRAK operates. The differences are:

- Weekday daytime headways will be 12 minutes which is more frequent than any route currently operated.
- Fares will not be collected onboard to speed up the boarding process.
- Boarding and alighting can be through both doors to speed up the boarding process.
- Stations are more widely spaced to speed up running times.
- Transit signal priority will be installed at most signalized intersections to give BRT buses priority over other traffic to improve reliability.
- Special signals giving priority allowing buses to merge into traffic and the left lane for left turns at 1) 42<sup>nd</sup> and Classen northbound and 2) NW Expressway and Portland westbound.
- With these measures operators will be expected to operate the bus as rapidly along the route as possible within posted speed limits, with priority given to safety, in accordance with the operating schedule.
- Passenger stops will be made at BRT stations which will have raised boarding platforms.
- The stations will have electronic signs that show bus arrival times making adherence to schedule even more important.
- BRT buses will have special branding features to distinguish them from other EMBARK buses. The buses will operate the same as other EMBARK buses.

BRT runs will be posted and bid along with all other runs. Open BRT assignments will be covered by the extraboard. For these reasons all bus operators need to be trained on the BRT route and operations, including proper docking at the raised platforms. The BRT route is shown in Figure 2.

Figure 2 Northwest BRT Route and Stations



## BRT SERVICE MONITORING

BRT is a premium transit service that requires a substantial investment in capital and operating funds. The BRT service is marketed as a premium service to new discretionary passengers to the EMBARK system. As such, the BRT service must be operated in a manner that meets the public's expectations in terms of reliability and on-time performance. SOPs should be adopted to ensure BRT is operated as a high-quality transit service. All EMBARK transit services are expected to be high-quality; these procedures would apply specifically to BRT service. The following is an example of a SOP for supervisors and dispatchers to oversee BRT on-time performance.

The goal for BRT on-time performance is ninety-(90) percent of trips operated within zero (0) to five (5) minutes late compared to schedule time. With fifteen (12)-minute weekday headways, a trip more than five (5) minutes late opens up a space of nearly twenty (20) minutes in the schedule. This is unacceptable. Moreover, bus arrival times are electronically posted at all BRT stations thus deviations from schedule will be readily apparent to the public.

Operations Department supervisors will monitor pull out times and departures from the end of the line and from the downtown transit center to ensure operators are adhering to proper procedure.

Supervisors will monitor BRT buses using the AVL/CAD system to detect late trips before they become a problem.

- If a trip is three (3) to four (4) minutes late the Operations Supervisor will determine whether the time can be made up, or whether corrective action should be taken. This requires knowledge of the route and schedule, and the Operator's ability. If necessary, the Supervisor can contact the Operator via the MDT or radio to assist in the determination.
- Operations Supervisors will contact the operators of buses running late to leave the end of the line or the transit center on time regardless of their arrival time at that point.

During period of twelve (12)-minute headways, BRT buses will not wait more than three (3) minutes for a connecting bus unless the connection is necessary in the judgement of the Operations Supervisor and the time can be made up.

If an Operator is consistently late and unable to maintain proper schedule, the Transportation Supervisor will file a report. The Operator may be required to have remedial training. At the discretion of the Operations Manager, the remedial training may include a Supervisor or instructor to ride along with the Operator for remedial training.

## 2 ON-TIME PERFORMANCE

### INTRODUCTION

EMBARK currently is not meeting goals and targets for on-time performance (OTP). On-time performance is defined as trips arriving at a time point between one minute early and no more than five minutes late. EMBARK has established a goal of 85 percent on time. 2021 performance was reported at 71 percent compared to the 2021 target of 75 percent. There are many reasons for substandard OTP, ranging from unrealistic schedules and running times to ineffective supervision and operator performance. The list includes:

- Unrealistic scheduled running times
- Cascading late operation carried over from previous trip due to inadequate layover
- Unexpected traffic congestion, detours, etc.
- Maintenance problems resulting in road calls
- Maintenance problems resulting in change outs
- Operator performance
- Culture

A thorough service reliability analysis was conducted in 2021 as part of the COA. This analysis addressed running time and layovers. As the recommendations are implemented it is expected the OTP will improve significantly. The purpose of this memorandum is to address the problem through operating measures. EMBARK should have standard operating procedures (SOPs) for use by dispatchers and supervisors to address service disruptions.

### MONITORING SCHEDULE ADHERENCE

The computer-aided dispatch/automatic vehicle locator (CAD/AVL) is the heart of the schedule monitoring system. The operations supervisor on duty will monitor on-time performance using a screen that shows the location and schedule adherence of all buses in operation. The point is to identify buses not within the window of acceptable schedule adherence and to take appropriate corrective action as necessary. All cases of early or late operation will be included in the daily report of schedule adherence.



## RESPONSE TO SERVICE DISRUPTIONS

Regardless of how realistic the schedules are, there will be occasions due to mechanical failure, unexpected traffic congestion, or other interruptions that result in delays. The key is how supervision respond to the disruption to restore service.

Operations should work with the maintenance department to ensure spare buses are available if needed. To the extent possible, dispatch should retain a report operator for spaces or pulls. In the past, EMBARK had a practice of staging a spot bus at the downtown transit center for spaces and pulls if required. This practice should be reviewed to determine whether it should be reinstated. It does not appear that vehicle maintenance problems are significant so staging a spot bus may not be necessary. However, the spot bus could be used for maintaining schedule adherence.

An important point is that dispatchers and supervisors must be aware that they are expected to respond to all service disruptions. The AVL/CAD dispatcher is the point person on response to service disruptions because they are likely to be the first supervisor to be aware of the problem and have the capability to direct resources.

This section includes two examples of service restoration techniques that can be incorporated into EMBARK Operations Department SOPs:

- Sample Service Restoration Techniques
- Sample Dispatch Control Function Guidelines

### Sample Service Restoration Techniques

The following are actions that may be taken by supervisors to restore service that is operating significantly behind schedule. In all cases, the supervisor should assess the situation to determine the most effective action to correct the late operation. In some cases, no action by the supervisor is warranted because the situation will correct itself without supervisor intervention. For example, if an outbound trip has a layover sufficient to correct the lateness the supervisor need only direct the operator to leave the layover on time, then monitor through AVL/CAD (preferred) or follow up directly with the operator to ensure the operator complied. In other cases, a report operator and spare bus may be required to restore on-time service, however if one or both is not available, a supervisor's possible actions are limited. However, in this situation it is expected that the supervisor will assess the situation and contact the operator to determine the reason for the problem and to direct them to leave the terminal points on time.

The supervisor should have a report operator available at all times and should work with the Maintenance Department on the availability and location of spare buses.

Several situations are detailed below.

1. If a trip is running more than five (5) minutes late on a trip that is to be relieved (and the time cannot be made up), the supervisor will send the relief driver to the relief point with a bus with instructions to leave the relief point on time. The first operator should be instructed to complete the trip to the next terminus, or when all passengers are discharged, then return to the garage. This requires a spare bus and the first operator will be paid overtime (if applicable).

2. If a trip is running more than ten (10) minutes late on an outbound trip and the supervisor has determined that the time cannot be made up, the supervisor is expected to take action. A report operator should be directed to take a spare bus to the terminus and begin the trip on time. The operators should be directed to meet along the line and trade buses. The report operator will bring the bus to the garage, or other location designated by the supervisor, and wait for further instructions. The first operator will continue the trip with the spare bus. This requires a spare bus and the first operator will be paid overtime (if applicable).
3. If a trip is running more than ten (10) minutes late on an inbound trip to the downtown transit center or a secondary hub and the supervisor has determined that the time cannot be made up, the supervisor should take action. A report operator should be directed to take a spare bus to the transit center or the secondary hub and begin the outbound trip on time. The operators should be directed to meet along the line and trade buses. The report operator will bring the bus to the garage, or other location designated by the supervisor, and wait for further instructions. The first operator will continue the trip with the spare bus. This requires a spare bus and the first operator will be paid overtime (if applicable).
4. If a bus is late to the extent that it is within five (5) minutes of its follower (two (2) minutes for BRT) the supervisor should assess the situation and take action. In this case there are options for addressing the situation:
  - a. Contact the operator and verify that the time can be made up.
  - b. Have the following bus pass the first bus to take passengers from the late bus which will allow it to pick up time. Care must be taken to avoid early operation.
  - c. Have the first operator wait at a convenient safe location to transfer passengers to the following bus. The first operator would then be instructed to deadhead to a specified location to catch time. The second operator will then complete the trip on time. Before this action is taken the disruptive effects on passengers should be considered. Also, this is more likely to be the proper resolution for 30-minute headway routes rather than 15-minute services.
  - d. Another option is to institute a headway-based schedule where the supervisor instructs operators to adhere to service frequencies rather than the scheduled timepoints.

## Sample Dispatch Control Function Guidelines

The following is a guide intended to help guide supervisor decision making in the event of service disruptions. In all cases the supervisor should assess the situation and prioritize the service disruption and the solution.

The supervisor should be aware of resources available to restore service such as report operators, spare buses and spot buses (ready spare buses deployed in the service area).

Amount Late	Supervisor Action
<b>Missed Trip</b>	Fill space immediately. Regardless of the reason, a disabled bus that may result in a missed trip has the highest priority for service restoration.
<b>3 – 4 minutes Late</b>	<ol style="list-style-type: none"> <li>1. Assess situation and determine whether time can be made up</li> <li>2. Contact operator and:                Confirm schedule adherence                Determine reason for lateness                Verify that time can be made up</li> <li>3. If the time can be made up put the block on watch list</li> <li>4. If action is warranted prioritize against other trips</li> <li>5. Apply appropriate Service Restoration Technique</li> </ol>
<b>5 – 10 minutes Late</b>	Assess situation and determine whether time can be made up Contact operator and: Confirm schedule adherence Determine reason for lateness Verify that time can be made up If the time can be made up put the block on watch list If action is warranted prioritize against other trips Apply appropriate Service Restoration Technique File a report for the daily log
<b>More than 10 minutes late</b>	Assess situation; proactive action must be taken Contact operator and: Confirm schedule adherence Determine reason for lateness Advise action will be taken Trips more than 10 minutes late have priority over all disruptions except missed trips Apply appropriate Service Restoration Technique File a report for the daily log

## OPERATOR PERFORMANCE

Procedures should be established for operators who cannot or will not maintain proper schedule adherence. The AVL/CAD can be used to summarize an operator's schedule adherence performance.

Early operation is never acceptable; operators who are found to be habitually early should be subjected to progressive discipline. EMBARK should reconsider the policy of allowing operation one minute ahead of the scheduled time.

Operators who are frequently behind schedule should be evaluated and coached on operating techniques to maintain schedule. If the problem persists the operator should be required to have refresher training specifically focused on schedule adherence.

## CULTURE

At times, culture allows substandard schedule adherence to be a norm. This culture or attitude is created inadvertently by messages management and supervision send to operators. There was inadequate time during the project to ascertain whether such a condition exists at EMBARK. Operations Department management should evaluate their "culture" as it relates to service reliability and on-time performance.

These inadvertent messages are sent by:

- Management's failure to respond to schedules that are clearly unrealistic and result in continued late operation.
- Management's failure to provide adequate recovery time in schedules.
- Management's failure to correct early operation.
- Management's failure to take corrective action on mechanical problems that result in service disruptions.
- Supervisors who fail to respond to service interruptions properly.
- Inconsistent supervisor response to late operation.
- Offhand statements by supervisors, instructors and managers that can be misinterpreted by operators – "being on time isn't important."
- An absence of reinforcement of the importance of reliability in daily conversations.

EMBARK can address this issue by stressing the importance of reliability and on-time performance.

- Upper management must set the tone by emphasizing goals and targets for reliability.
- Department managers and supervisors must follow up with actions to address reliability problems. They should examine policies, practices, and training materials to make sure there are no contradictory messages.
- Schedules and running times should be constantly monitored; problems should be addressed expediently. Implementation of the first phase of running time recommendations from the COA must be a priority.

- Establishment of the AVL/CAD dispatcher position should be a priority. Regular and systematic schedule adherence monitoring and corrective action this position contributes will send a strong message about the importance of reliability.
- Management should establish SOPs that include addressing reliability performance issues.
- Management can promote reliability and on-time performance as a priority through communications with operators. For example, OTP progress can be posted on bulletin boards in the operators' room along with supporting statements.

## 3 SUPERVISORY SCHEDULING & DEPLOYMENT

### CURRENT OPERATIONS MANAGEMENT

EMBARK has 11 transportation supervisors (dispatchers and street supervisors), an Operations Specialist (mid-manager) and a Director. Generally, the supervisory personnel are deployed in accordance with the following principles. It is recommended that EMBARK adopt these principles to guide supervisor deployment currently and in the future as service expands.

#### Dispatcher

- A dispatcher will be on duty during all hours of operation.
- Responsible for ensuring runs are filled in accordance with the CBA and department practices.
- Responsible for accurate timekeeping and other aspects of workforce management.
- Responsible for addressing calls from operators regarding assignments and other matters.
- Responsible for responding to radio calls from operators and supervisors.
- Responsible for coordination with the maintenance department as necessary.
- The Night Dispatcher prepares the extraboard.

#### Transit Center Supervisor

- To the extent possible a supervisor will be at the TC on weekdays from 5 am to 7 pm.
- AM supervisor opens the transit center.
- Oversees operation at the TC; supervises line ups.
- Communicates with operators regarding various matters such as detours, etc.
- Available to respond to incidents in the field as necessary.

#### Street Supervisor

- To the extent possible three supervisors will be deployed in a vehicle during the primary service period on weekdays 4:30 am to 7:00 pm and weekends 5:00 am to 7:00 pm one supervisor.

- AM supervisor available to assist with pull out.
- Observes operation for timeliness and proper operation.
- Responds to incidents in the field.

Figure 4 shows how dispatchers and supervisors are deployed on weekdays and weekends. EMBARK service levels are the same on Saturdays and Sundays and supervisory levels are also the same.

The current dispatcher/supervisor plan requires 11.6 full-time equivalents (FTEs). With 11 supervisors available some shifts are left open on a regular basis. All supervisory personnel are cross trained. The Operations Specialists prepare weekly supervisor schedules. Absences due to vacation, illness, etc. result in further open shifts.

## CONCLUSIONS SHORT TERM

The following were developed through observations and interviews with management and supervisory staff.

5. Current staffing is adequate to fill with a few exceptions. There are 58 weekly shifts which require 11 FTEs. EMBARK has 50 buses in operation during the daytime service period on weekdays, but only nine buses operating after 7:30 pm. 25 buses are in operation during the daytime service period on weekends; no buses are operated after 7:30 pm.
  - a. A dispatcher must be on duty when services are operated to ensure runs are filled and to address any issues that may occur with the operation. One dispatcher is on duty during all service periods; one dispatcher is adequate.
  - b. It is EMBARK's practice to deploy three street supervisors during the daytime service period on weekdays, in addition to a supervisor based at the downtown transit center. With only nine buses in operation after 7:30 pm, a street supervisor is not deployed. The dispatcher can respond to incidents in the field.
  - c. There are no set industry standards for the number of street supervisors. The level of field supervision is more a function of the size of the service area than the level of service. The current level of field supervision is more than adequate when all shifts are filled; as noted previously, absences in the group result in open supervisory shifts.
  - d. The weekend dispatch/supervisor coverage appears adequate.
  - e. Absences pose a staffing problem; openings are filled through overtime or by moving a supervisor from the assigned shift to the open shift.
6. Supervisory personnel appear to function adequately.
  - a. The dispatchers appear to function well despite the issues with timekeeping.
  - b. The transit center supervisor is an important part of operations control given how the service is configured.
  - c. The street supervisors were not observed directly. This position is a traditional part of operations control.

- d. The AVL/CAD system appears to be underutilized as a tool for operations control.
  - e. The lack of standard operating procedures (SOPs) poses potential problems with consistent oversight and control of the operation.
7. Operator timekeeping is currently an issue that requires an inordinate amount of time to review and manually adjust pay time. This responsibility falls to the Operations Specialist and even the Director, a poor use of management time for what is essentially a clerical activity.

## RECOMMENDATIONS SHORT TERM

These recommendations should be considered for implementation as soon as arrangements can be made. Service levels are not expected to change materially between now and 2023 when BRT opens.

1. Create SOPs for all supervisory positions to include routine duties and responsibilities. SOPs should also include responses to accidents, incidents, service restoration and other situations the supervisor is likely to encounter. EMBARK is in the process of creating SOPs. The completion of this documentation should be a priority. In addition to supervisory SOPs an operator rulebook should be created to codify aspects of the operator position. This document would set basic expectations and could be the basis for discipline.
2. Add a supervisor/dispatch position dedicated to AVL/CAD monitoring and use. An AVL/CAD system can be the most effective tool in controlling the operation and can be particularly effective in addressing on-time performance (OTP) problems.
  - a. Responsibilities include:
    - i. Receiving and responding to radio calls and text messages from operators.
    - ii. Using the AVL/CAD to proactively monitor operator performance.
    - iii. Restoring service in the event of service disruptions.
    - iv. Directing the activities of street supervisors and the transit center supervisor.
    - v. Back up the dispatcher as necessary.
    - vi. Respond to incidents in the field as necessary.
  - b. The AVL/CAD dispatcher shift can be achieved by either adding supervisors (two weekday shifts) or converting one of the street supervisor positions to AVL/CAD dispatcher. The AVL/CAD dispatcher significantly extends the supervisor's ability to monitor operator performance and bus trips and is a more effective means of controlling the operation. This position can reduce the need for street supervisors and make other supervisors more effective. EMBARK should continue to develop the AVL/CAD shift when staffing permits. The Operations Department will then add two supervisors to staff this position on a permanent basis. Figure 5 shows this recommendation.



- c. With the addition of the AVL/CAD dispatcher during weekdays there is an opportunity to focus attention on the operations control function by having one dispatcher responsible for manpower management and one responsible for the operations control function.
3. With the creation of the AVL/CAD dispatcher position, the number of street supervisors can be reduced compared to current levels.
  - a. There are multiple ways to deploy the street supervisors. The level of street supervision varies widely across the industry. Two street supervisors during most of the weekday service period should provide adequate coverage. The AVL/CAD dispatcher and TC supervisor are also primarily responsible for monitoring and controlling operations.
  - b. Consideration should be given to configuring the shift of one street supervisor to 10:30 or 11:00 pm to cover night operation. EMBARK should consider creating an operating procedure that requires supervisory coverage throughout the service day, including nights.
4. Consideration should be given to adding a relief supervisor to cover absences. With 11 supervisory positions this relief supervisor will likely be used the majority of the time to fill absences. When not used for filling absences the relief supervisor can be used for other duties such as augmenting supervision, observing operators while on duty through ride-alongs, etc.

Another way to fill open supervisory shifts is to create a team of temporary supervisors from the operator ranks. This team would be trained in the basic functions, but not discipline. It does not appear that the CBA precludes this approach.
5. Adding a clerk position should be considered to relieve management of some of the tasks related to operator timekeeping. This position can also be assigned to cover other clerical and administrative activities that otherwise fall to the dispatcher. This will allow the dispatchers to focus on supervisory functions.
6. The recommended changes shown in Figure 6 would require 1.6 FTEs plus the relief supervisor for a total requirement of 13.6 FTEs. This is an increase of two positions compared to the current supervisory plan.

## 2023 OPERATIONS WITH BRT

The addition of NW BRT in 2023 will necessitate changes in EMBARK's transportation supervision.

- BRT will operate with an extended service span. Friday and Saturday service will be extended to 2:00 am the following morning, and service will be extended to 8:30 pm on Sunday.
- BRT will result in a service increase by adding seven buses during weekday peak periods and three to four buses during other periods.
- BRT will be operated as a premium service which will require new supervisory procedures.

## Conclusions 2023 Operations with BRT

- Three dispatchers (one dispatcher per shift) are adequate; the presence of the AVL/CAD dispatcher will provide back up as needed.
- Weekday supervision should be increased to cover the additional service span, particularly BRT. The extension of BRT service to 2:00 am on Friday and Saturday nights requires an additional street supervisor.

## Recommendations 2023 with BRT

- The third shift dispatcher should be extended to cover the period from 8:00 pm to 4:00 am. This late coverage is required two days per week with the extended BRT service span. Responsibilities can be shifted to provide maximum benefit. For example, the All-Night Dispatcher can be responsible for marking up the yard, taking calls from operators regarding assignments, filling late notice absences, etc. Because of this shift other administrative-type duties can be addressed, such as preparing reports, filing, etc.
- An additional street supervisor should be added on Friday and Saturday nights to provide coverage for the extension of BRT to 2:00 am.
- These recommendations require 13.4 FTEs plus the relief supervisor for a total of 14.4 FTEs. This is an increase of 2.8 FTEs compared to the current plan.
- Figure 6 shows how the supervisor shifts can be configured.

## 2023 OPERATIONS WITH BRT

It is assumed that EMBARK service will double by 2031. For planning purposes:

- Weekday service will increase to 100 operating buses.
- Night service will increase to 24 operating buses.
- Weekend service will increase to 50 operating buses.
- The service span and route coverage will be similar to the current system.

## Conclusions for 2031

- Three dispatchers (one dispatcher per shift) are adequate; the presence of the AVL/CAD dispatcher will provide back up as needed. This assumes technology and systems are in place for timekeeping, reporting, etc.
- Two AVL/CAD dispatchers are adequate on weekdays.
- The increase in service requires additional street supervision on weekdays.
- The increase in service requires additional street supervision on weekends.
- Two TC supervisors should be added on weekends.

## Recommendations for 2031

- Two TC supervisors should be added on weekends.
- Two additional street supervisors should be added on weekends.

- These recommendations require 17.0 FTEs plus the relief supervisor for a total of 18.0 FTEs. This is an increase of 6.4 FTEs compared to the current plan.
- Figure 7 shows how the supervisor shifts can be configured.

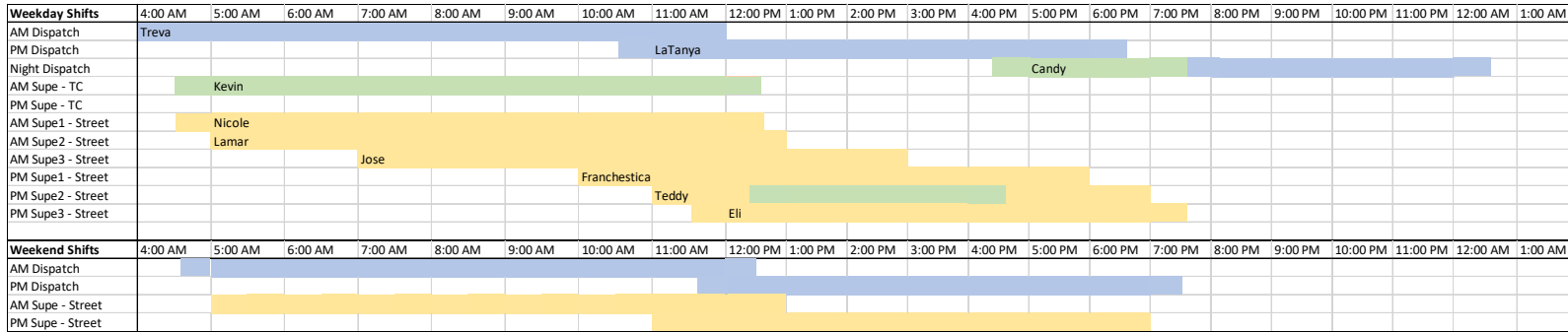
The recommendations are offered as a guide for planning purposes. The supervisor shifts, starting and ending times and other details can be adjusted based on the judgement of the Director and Operations Specialist. Figure 3 summarizes the recommended supervisor levels.

**Figure 3 Summary of Supervisory Levels**

Position	Current	Short Term	2023 with BRT	2031
Dispatcher	3	3	4	4
AVL/CAD Dispatcher	0	2	2	2
Supervisor	9	7.6	7.4	11
Relief Supervisor	0	1	1	1
<b>Total</b>	<b>12</b>	<b>13.6</b>	<b>14.4</b>	<b>18</b>

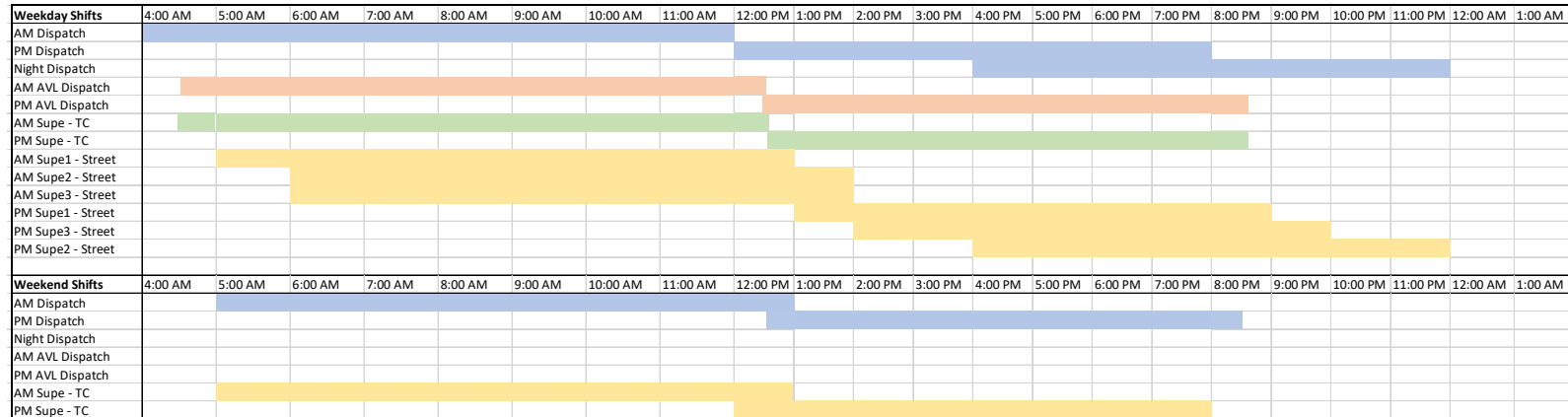
**Final Report | OKC Moves**  
EMBARK

**Figure 4 Current Supervisory Deployment**



Required FTEs: 11.6

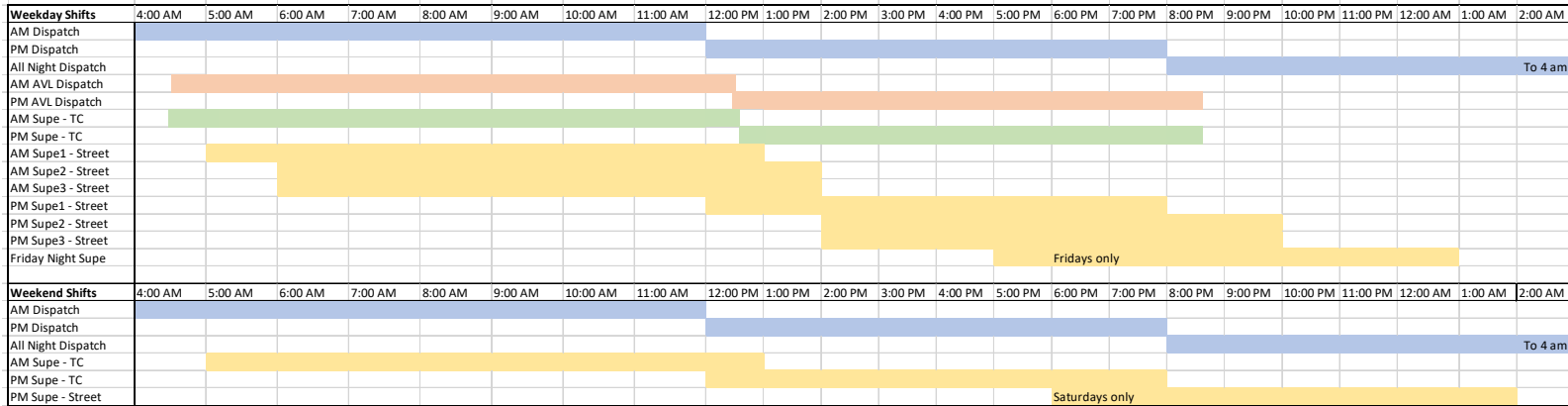
**Figure 5 Proposed Short Term Supervisor Deployment**



Required FTEs: 12.6 plus 1 relief supervisor

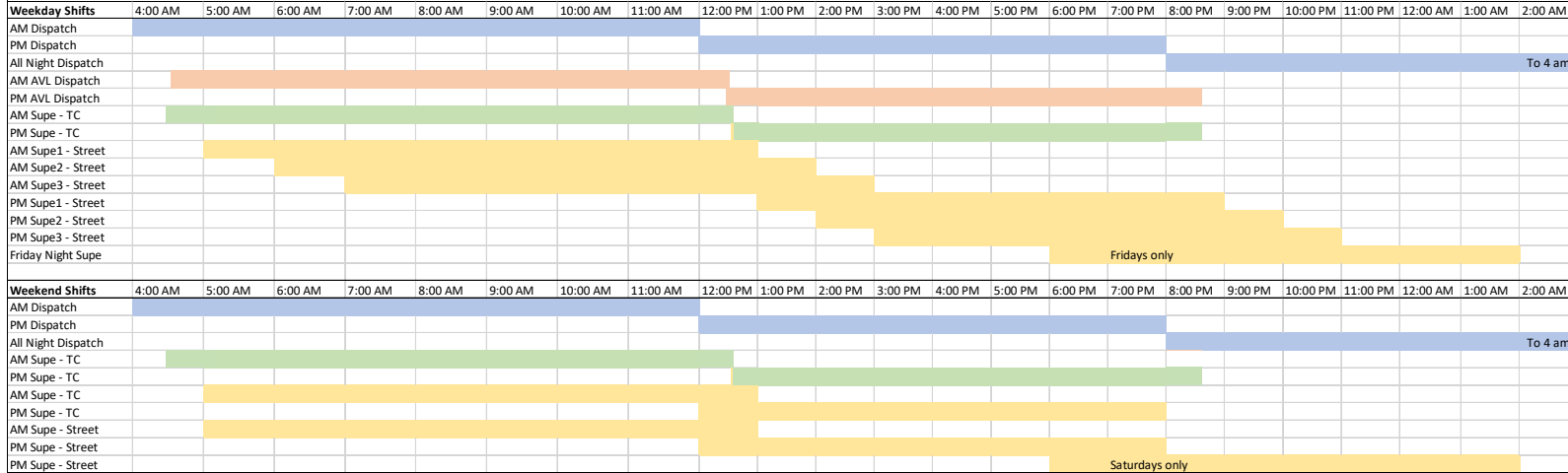
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**Figure 6 Proposed 2023 with BRT Supervisor Deployment**



FTEs: 13.4 plus 1 relief supervisor

**Figure 7 Proposed 2031 Supervisor Deployment**



FTEs: 17.0 plus 1 relief supervisor

## 4 SCHEDULING & RUNCUTTING

### CURRENT SCHEDULING OPERATION

EMBARK currently uses Trapeze FX software (Version 13) for scheduling and runcutting, however they have not procured the Blockbuster module, which results in some parts of the scheduling and runcutting being performed manually. During the kickoff meeting in May 2021, a number of questions were asked regarding the scheduling function. A follow-up meeting in November 2021 that included Nelson Nygaard's scheduling team yielded additional thoughts for consideration.

8. EMBARK is seeking advice on upgrading their scheduling function and their Trapeze software and use of it. EMBARK will implement significant service changes which will require substantial rescheduling, including NW BRT in 2023 and recommendations from the COA.
9. EMBARK would like to reconfigure runs to reduce the number of split runs and reduce overtime to make the bus operator position more attractive to help with retaining and recruiting operators.
10. EMBARK would like to reconfigure runs to create scheduled meal breaks to make the bus operator position more attractive to help with retaining and recruiting operators.
11. EMBARK would like to increase face-to-face interaction between bus operators and supervision by adding a pre-shift briefing prior to the start of each operator's run.
12. EMBARK faces operator recruiting and retention challenges and would like to identify strategies that makes bus operations more attractive to new hires and reducing attrition of the existing workforce while also ensuring reliable service pull-out each day.
13. EMBARK recognizes the need to increase their capacity to complete day-to-day as well as detailed scenario-based scheduling activities.

## CONCLUSIONS & RECOMMENDATIONS

1. EMBARK should pursue the Trapeze upgrade that they are planning to include Blockbuster. Alternatively, EMBARK may explore other scheduling systems through an RFP process. EMBARK is planning to secure scheduling assistance through an on-call planning contract. The provider of scheduling assistance will be able to provide detailed recommendations on upgrading the scheduling system and its use. In addition, EMBARK's Trapeze representative can provide information on options to upgrade if the decision is made to retain Trapeze.
2. EMBARK should pursue on-call scheduling assistance to provide much-needed capacity and relief to the Manager of Short Range Planning and Scheduling. This is especially critical as implementation of the COA recommendations and NW BRT approaches.
3. EMBARK staff responsible for scheduling should arrange to have formal training on the use of Trapeze, either through Trapeze and/or the scheduling consultant. Multiple staff persons should receive this training to ensure this expertise is not limited to one individual.
4. EMBARK should conduct an analysis of scheduling strategies that assess the feasibility of meal breaks, pre-shift briefings, limits on swing and spread, minimum recovery requirements and any other tactics that may reduce operator attrition and/or increase operating efficiency.

- a. Reducing split shifts will likely result in a significant increase in operator costs. The percentage of allowable split runs is set in the CBA which places requirements on the number of straight runs (30 percent of total runs). A different approach may be to set internal limits on swing (time between run pieces) and/or spread (time between start of first piece and end of last piece of work). It is not recommended to formalize these limits in the CBA as they may be used as a bargaining tool to further constrain management.

Reducing overtime will lead to higher operator costs to the extent current runs are optimized. Additional drivers would need to be hired to assume the hours no longer operated through overtime. These constraints may also increase the number of split shifts. The precise cost and staffing impacts cannot be determined without a detailed analysis including a hypothetical runcut(s).

EMBARC does not currently have the capability to quickly do scenario analyses to test these changes in practice. It is recommended EMBARK contract with the scheduling consultant to conduct these scenario analyses while training EMBARK staff, if this matter is to be pursued.

The configuration of runs is somewhat governed by the CBA. EMBARK could use the addition of meal breaks as a bargaining tool to secure other provisions that benefit management. Likewise, EMBARK may want to reserve formally adding meal breaks into the contract so that the provision could be easily rescinded if the intended results are not achieved.

- b. Meal breaks can take several different forms, for example:
  - i. Minimum layover requirements. This could be expressed as a percentage of layover time during a workday, or at least one

layover of x minutes. It is assumed the operator has a sufficient break for meals during the layover. Depending on the length of break, this approach may have impacts to headway consistency and systemwide connectivity as the meal breaks are built into each route's blocking.

- ii. Stipulated meal breaks. Meal breaks come in many forms with varying requirements. The breaks may be paid or unpaid, taken at specified locations (e.g., the dispatch area), may have minimum/maximum lengths (above the maximum length the run would become a split), and may be required to be spaced at certain times during the workday. With so many options, further discussion and analysis is recommended to better understand EMBARK's constraints.

There are several ways to create operator breaks. Some transit systems simply increase layover time to provide a break for operators. Other systems schedule meal break runs, sometimes called swing runs, to operate a roundtrip for the initial operator to have a break. Another approach is to use a drop back, where an operator is relieved for a break and resumes the work on the next scheduled trip, thereby relieving the operator on the following trip.

Establishing scheduled breaks in straight runs will likely increase operator costs significantly, assuming the break is paid time. For example, an operator holding a meal relief run may be able to make ten reliefs in an eight-hour shift. Assuming there are 50 weekday straight runs, approximately five meal relief operators would be required for weekdays alone.

Determining the preferred approach to creating meal breaks is a matter of policy, management preference, possibly labor negotiations and runcut analysis. It is recommended that EMBARK contract with the scheduling consultant to conduct scenario analyses of possible meal breaks, if this matter is to be pursued.



## 5 TECHNOLOGY

### INTRODUCTION

The purpose of this technical memorandum is to evaluate the current technology used by the Operations Department and their use of the technology.

### CURRENT TECHNOLOGY AND SYSTEMS

The Operations Department has limited technology and makes limited use of the technology that is available. The technology available includes:

- An open channel radio system for communications between dispatch and operators and supervisors
- A TripSpark AVL/CAD system, approximately eight years old
- Trapeze Ops, an old version
- Kronos timekeeping system

### TIMEKEEPING – KRONOS TRAPEZE INTERFACE

The Kronos system was installed to make the Operations Department's timekeeping practices consistent with the practices in place for other city employees. The original intent was that Kronos and Trapeze Ops would be integrated to expedite timekeeping for bus operators. Bus operators would "clock in" and out using kiosks in the operators' room. Kronos would access assignment information in Trapeze and the pay information would be sent to payroll.

The Kronos/Trapeze interface has not been achieved and the two systems are functionally independent. As a result, the dispatcher manually enters sign on information into Trapeze. Another result is that timekeeping and payroll frequently has errors that need to be corrected manually. The Operations Specialist reports spending 10 to 15 hours per week on payroll issues. The Operations Manager also spends time on payroll.

This is regarded by Operations Department management to be a significant problem.

### OTHER OPERATIONS TECHNOLOGY

The AVL/CAD system is not used effectively due to supervisory scheduling issues and staffing limitations. The system is regarded as accurate for the most part and provides useful reports.

The radio system is adequate.

Much of the tasks performed by dispatchers and the Operations Specialist is supported by manual processes. That is, records are kept by hand, pencil, and paper forms.

## CONCLUSIONS AND RECOMMENDATIONS

### Timekeeping and Other Departmental Recordkeeping

For several reasons the Kronos/Trapeze interface was not achieved, and the Operations Department is left with an untenable situation. Timekeeping and payroll are critical functions and are not being supported.

Trapeze Ops is deployed in hundreds of transit agencies worldwide and is interfaced with various payroll systems. The interface is often difficult for a number of reasons, including the complexity of bus operator pay rules.

The manual processing of timekeeping information and other departmental records should be a priority for attention.

The following outlines an approach to address the situation.

- The timekeeping interface should be an organizational priority to resolve. EMBARK has limited IT staff and likely doesn't have the capacity to address the issue. One approach is to use contract IT personnel to augment EMBARK and city staff. Contractors are likely familiar with Kronos systems. Trapeze needs to be compelled to address the situation from their side of the interface. The objective should be to at least reduce the manual transfer of data and reduce errors that need to be corrected manually.
- It may be that the old version of Trapeze Ops is part of the problem. The module should either be upgraded or replaced. This decision can be informed by the work of the team assigned to the project. Replacing the module with a new system may take two years or more (if a new system is acquired). This is an extended time to endure the current situation and it should be addressed as soon as possible.
- Some of the manual recordkeeping in the department can be computerized through spreadsheet or database applications, at least in the near term. IT staff, either in house or contract, should be assigned to work with Operations Department to improve these processes.
- While short term improvements are being made, a technology plan for the Operations Department should be developed to guide future decisions.
  - Operations management (like Trapeze Ops) are available as optional modules to many AVL/CAD systems and most automated scheduling systems. A decision needs to be made regarding which direction is best for EMBARK.
  - The "Kronos concept" should be reevaluated. While the idea of having bus operators clock in and clock out may be appealing in some respects, one result is that an operator has even less contact with supervision. Fitness duty should be assessed by the dispatcher when the operator reports to work; this opportunity is lost if operators sign in remotely.

- A new system implemented with a clear directive regarding interfaces can be expected to solve the problem. A new system will require one or two years for implementation.

## **AVL/CAD System**

EMBARK has released an RFP to acquire a new AVL/CAD system. This is a positive development, but operations with a new system could be two years away.

In the interim, the Operations Department should continue steps to enhance the use of AVL/CAD.

- Create a position of AVL/CAD dispatcher as described in the Operations Assessment Technical Memorandum.
- Develop standard operating procedures (SOPs) for AVL/CAD use.

## 6 CONCLUSIONS AND RECOMMENDATIONS

### INTRODUCTION

As part of the comprehensive operations analysis (COA), an assessment of EMBARK's operations was performed. The purpose of the operations assessment was to provide EMBARK managers responsible for service delivery with recommendations that can be implemented as EMBARK grows and provides new services such as BRT.

The operations assessment included a review of the existing organizational structure, procedures within the Operations Department, performance monitoring, key performance indicators (KPIs), and scheduling/runcutting. The evaluation was based in part on an on-site review of department operations and practices, as well as phone and in-person interviews with Operations staff to discuss responsibilities, structure, and procedures.

Overall, the Operations Department functions well and does an acceptable job of providing transit service. Managers and supervisors are knowledgeable about transit operations and appear diligent in the execution of their duties. The main areas of concern are on-time performance, use of technology, and a lack of standard operating procedures.

The purpose of this memorandum is to summarize and document conclusions and recommendations.

### ORGANIZATIONAL STRUCTURE

The Operations Department is well placed in the EMBARK organization. There are clear lines of responsibility; the Operations Manager reports directly to the Assistant Director of Operations, who also has responsibility for other operating functions, including vehicle and facility maintenance, and safety and training.

The Operations Department's support functions of safety and training are organized into a separate department within the Operations Division. This structure is common and can work well as long as there is effective coordination between safety and training and the Operations Department. This appears to work well for EMBARK currently.

The planning/scheduling function, another function critical to the Operations Department, is organized in the Administration Division. This is not uncommon, but effective coordination between planning/scheduling and Operations is required. This appears to work well for

EMBARC currently. Formalizing this relationship by creating a standing interdepartmental service planning committee should be considered.

EMBARC's ADA paratransit operation was organized into the Operations Department but was recently reorganized into the Mobility Management Department. ADA paratransit service delivery is fundamentally different than fixed route transit. Separation of these functions is common in the transit industry. As EMBARK grows, this separation should continue to allow the Operations Department to focus on fixed route service delivery. For example, the existing extraboard combines fixed route and paratransit operators; the CBA allows for a separate paratransit extraboard. This arrangement should be evaluated in the future to ascertain the feasibility of separation.

EMBARC has plans to provide microtransit service in the future. Microtransit is a general public on-call service that relies on technology for trip scheduling and dispatching. Like ADA paratransit service, microtransit should be the responsibility of the Mobility Management Department rather than Operations.

## **Standard Operating Procedures (SOPs)**

The Operations Department functions without the benefit of standard operating procedures (SOPs). Management recognizes this deficiency and is in the process of developing SOPs. SOPs should cover all positions in the department and to the extent possible should address all situations that are likely to be encountered by supervisory personnel. The development of SOPs has been in process for an extended period of time. The reason for the delay is unknown but is not uncommon in transit operations where the focus is on the immediate task of service delivery. Creating and documenting SOPs may not be in the department's skill set. Finalizing SOPs needs to be a priority. An example of SOPs for dispatchers developed for another transit agency was provided as a guide for EMBARK Operations. Upper management can assist by providing resources. For example, a planner can be assigned to assist with SOP development. Transit planners have at least some familiarity with transit operations and may be more proficient in writing techniques. The Safety and Training Department is currently providing some assistance; this should be prioritized (SOPs are critical inputs of both safety and training). Other administrative and documentation assistance can be provided from other parts of the organization. It is suggested that upper management designate specific responsibilities and set a schedule for completion of Operations Department SOPs. SOPs and their use are discussed further in other Operations Assessment technical memoranda.

## **Bus Operator Manual**

A bus operator manual can serve as SOPs for bus operators. As with supervisory SOPs, a bus operator manual has been under development by the EMBARK Operations Department. The completion of this manual should be a priority to set expectations for bus operators, provide a basis for discipline and define the bus operator position.

## **Key Performance Indicators (KPIs)**

One technique to ensure an organization is constantly improving is to track key performance indicators or KPIs. KPIs are a set of (mostly) quantifiable measures used to gauge performance

and determine if operational goals are being met. EMBARK has established KPIs as part of the city's performance management program. Goals from the performance management program in the realm of the Operations Department are:

- Revenue service hours lost will be at or below 1%. This is a goal shared with the vehicle maintenance department. (Note: performance not provided in the 2021 Year End Performance Report)
- 8% or less employee vacancy rate. This metric reflects EMBARK's overall vacancy rate and is not specific to the Operations Department. 2021 performance is reported at 7% compared to a target of 8%.
- At least 80% of customers will be satisfied with EMBARK services (as measured by an annual survey of customers). This is a goal shared with the vehicle maintenance department and other departments. 2021 performance is reported at 72% satisfactory compared to a target of 78%.
- On-time performance will be 85% of bus trips will be on time. 2021 performance reported as 71% on time compared to a target of 75%.
- Preventable vehicle accidents will be at or below 2.97 per 100,000 miles. This is a goal shared with the safety and training department. 2021 performance was reported at 1.6 accidents per 100,000 miles compared to a target of 1.58.
- Preventable On-the-Job Injury Incident Rate will be 10% below the industry standard. This is a goal shared with other departments. 2021 performance was reported at 89% of employees without an OJI compared to a target of 90%.

KPIs that would be helpful to the Operations Department are categorized as follows.

### **Service Delivery Reliability**

- On-time performance
- Missed trips measured as trips not made in total or in part

### **Operator Workforce Management**

- Bus operator headcount versus authorized level
- Absenteeism measured by absent operators as a ratio to assigned operators
- OJIs

### **Safety**

- Total vehicular accidents
- Preventable vehicular accidents
- Total passenger accidents
- Preventable passenger accidents

### **Operator Performance**

- Customer complaints
- Uniform compliance and neatness

These KPIs should be incorporated into the department's management and supervisory practices to improve the department's service delivery. Targets should be set by upper management in conjunction with Operations Department management. Targets or goals can be set based on a combination of current agency performance, professional judgment, and agency goals. Performance that does not meet targets can be identified for further corrective action. These operations KPIs and reports would be primarily used internally by the Operations Department; some, such as OTP and safety are input to EMBARK's goals and performance reports for the city's performance management program.

## BUS OPERATOR MORALE – RETENTION AND RECRUITMENT

EMBARC, like other transit agencies, is challenged maintaining the required level of bus operator staffing. Compensation is one factor in employee job satisfaction but was not addressed in the Operations Assessment. Other factors that contribute to job satisfaction are being addressed. These other factors include:

- **Assignments and Shifts.** Transit is somewhat unique in that the nature of transit service requires work assignments that are unattractive to some employees.
- **Job Stress.** The position can be stressful due to factors such as traffic that makes maintaining schedule difficult, constantly dealing with the public and sometimes difficult customers, isolation stemming from performing the job outside a traditional workplace.
- **Ineffective Supervisory Practices.** Bus operators are more likely to have negative contact with supervisors than positive contact. Poor performing operators, and those that encounter discipline, receive attention from management and supervisors. Operators who perform well infrequently receive attention or positive reinforcement.

EMBARC is exploring the feasibility of assignment (runs) revisions such as reducing split shifts and creating breaks within scheduled assignments. Revisions in scheduled running times to make schedules more realistic will help reduce stress. Breaks from driving, even adequate layovers, will also reduce stress. These are positive initiatives and should be pursued as priorities.

Some transit agencies have had success with training for handling stress. The training teaches techniques such as stress reduction, conflict resolution, dealing with difficult customers, etc. This type of training has improved operator performance as well as contributing to increased job satisfaction. This training can be incorporated into new operator training as well as refresher training for veteran operators.

Supervisor refresher training can be directed to instruct supervisors on techniques to deal with employee encounters in a positive manner, and initiate contact with operators.

Recognition and incentive programs can be used to provide positive reinforcement to the majority of operators who perform well. These programs do not have to be costly; there are successful programs that EMBARK can emulate. <https://ridekc.org/news/ridekc-honors-76-bus-operators-for-distinguished-service> The success of recognition and incentive programs has been documented. The Collective Bargaining Agreement (CBA) in Section 31 has provisions for incentive pay if EMBARK meets certain performance goals and for individual employees who meet performance levels for attendance and preventable accidents. A recognition program for

high performing operators can be created based on these provisions. Figure 8 shows an outline of steps that can be used to develop a recognition program.

EMBARK should consider initiating these types of programs. Incentive programs are candidates for labor/management committees to consider, which can result in the added benefit of improved labor/management relations.

EMBARK should also institute a process for annual operator performance reviews. The annual review does not have to be elaborate. Rather the review should summarize the operator's performance during the prior year, attendance, accidents, incidents, violations, customer complaints – information that should be readily available. The review should be conducted by department managers, or senior supervisors to provide an opportunity for a positive interaction between bus operators and departmental management.

**Figure 8 Transit Operator Incentive Program Steps**

5. **Program Objective:** Highlight operator performance areas and use objective performance measures in an incentive program to affect operator performance and behavior.
6. **Performance Areas**
  - a. Safety (avoidable collisions)
  - b. Customer service (chargeable complaints)
  - c. Operations (avoidance of citations for on time performance, etc.)
  - d. Attendance (unplanned absences, misses, etc.)
  - e. Other
7. **How do they work?**
  - a. They are proven to affect performance. A positive approach is used rather than the typical discipline-based approach. A bus operator's job is more different than most: the job is away from the supervisor, all operators have the same classification, wage, etc., it's a solitary job.
    - i. Pride of accomplishment (recognition ceremonies, publications, uniform insignia)
    - ii. Peer pressure
    - iii. Attainment of awards of value (gift certificates, paid days off, other perks)
    - iv. Management recognition of good work
    - v. Do not affect all employees
  - b. Use information that is readily available and/or used for other purposes (e.g., absenteeism).
8. **How do you start?**
  - a. Establish project objectives – What do you want to accomplish?
  - b. Involve labor in the design of the program.



- c. Performance areas have to be generally accepted as “important” and the measures need to be regarded as fair. This is not always easy.
- d. Buy in from front line supervisors.

## CURRENT EXTRABOARD PRACTICES

EMBARK’s extraboard practices are included in the Collective Bargaining Agreement (CBA). The rules are typical in that the board rotates daily based on the prior day’s assignments given to extraboard operators. Seniority is the basis for the assignments. These rules are intended to ensure the most senior operators, and operators with rotational priority receive the most attractive assignments. The rules also ensure that open work is distributed evenly among extraboard operators, and objectively in accordance with negotiated rules.

## CONCLUSIONS & RECOMMENDATIONS

There are several issues with the current extraboard practices according to Operations Department managers.

- The practice of having one extraboard for the entire day results in excessive time differences in individual assignments from day to day. An operator working a night run one day may be assigned a day run the next day.
- The current rules were negotiated years ago when EMBARK operated less service and did not operate seven days per week.
- The rules for assigning runs and extras are overly complicated resulting in confusion and disagreement in assignments.

Operations Department managers are beginning negotiations on extraboard rules with union representatives. This is a necessary process, and the results will undoubtedly be a compromise. The following are suggestions for revisions to the extraboard rules.

- Understand that the concepts of seniority, rotation and objectivity are nonnegotiable; solutions need to incorporate these concepts.
- Identify rules that most operators find objectionable and include resolution for these issues in the proposals.
- Complicated rules are unfortunately part of extraboard assignment processes. Execution of the rules becomes more complicated as open work increases. Reducing open work may result in simplification of the process without changing rules.
  - A practice of limiting or even eliminating trippers is an example. Working trippers into regular biddable runs, even inefficient runs, may be less expensive than having the work assigned daily on the extraboard.
  - Use of part time operators to regularly work trippers can reduce open work.
  - Removing predictable open work from the extraboard can simplify the process. For example, some transit agencies have a separate vacation board to cover work open due to annual leave.

- Identify rules that are unclear or confusing and negotiate revisions to clarify or simplify. Some rules, for example Rule #13, may be clarified by rewriting the rule.
- The application of the rules becomes more complicated when the board is short of operators. Maintaining a sufficient headcount by itself simplifies the process.
- Establish a Complementary Day Board and a Night Board. EMBARK has added night service that is not accounted for properly in the extraboard rules. Establishing a night board will address several current problems.
  - Day runs and reports for day work would be marked up to the day board. Night runs and reports for night work would be marked up to the night board.
    - Night runs would be defined as any run that works beyond 7:30 or 8:00 pm. In defining night work take care to ensure that only runs that work late, at least 10 pm, are included in the definition.
    - Night board reports would be scheduled midafternoon, around 3:00 pm.
    - The two boards still have to work together, at least when the open work exceeds the capacity of either board.
      - New rules would be developed to govern how the overlap works.
- Establish a Vacation Board. Vacations are for the most part predictable and are known well in advance. Operators are required to take a portion of their annual leave in one-week increments. Creating a vacation board can simplify the extraboard by taking open work off the board.
  - A vacation board can either be established as a separate board or as part of the extraboard.
    - In the case of a separate board, the number of spots would be determined based on vacation selections. Vacation board would be selected as an assignment at the sign-up. A vacation board sign-up would be conducted periodically, e.g., every two weeks. If there are insufficient vacation assignments, the least seniority vacation operator would move to the extra board.
    - If the vacation board was operated as part of the extra board vacation selections could be selected similar to current provisions for temporary runs.
- Weekend Work. Rule #16 should be revised to account for the establishment of weekend service.

## OTHER OPERATIONS ASSESSMENT AREAS

In addition to the summaries included in this technical memorandum, the Operations Assessment addressed several other areas of concern to EMBARK managers. Separate tech memos have been prepared and delivered to EMBARK to provide more in-depth discussion and recommendations for these areas. These technical reports are listed below with a brief description:

- **On-Time Performance.** Addresses actions the Operations Department can take to positively affect reliability and on-time performance.

- **Supervisory Scheduling and Deployment.** Evaluates the Operations Department supervisory practices, particularly supervisor deployment. Recommendations are made for changes in supervisory levels for the future as EMBARK service grows.
- **BRT Operations.** Provides information on Northwest BRT scheduled to begin service in 2023. Recommendations to assist in preparations include staffing levels and operating procedures.
- **Technology and Timekeeping.** Assesses the Operations Department's use of technology and issues with timekeeping.
- **Scheduling and Runcutting.** Provides an assessment of EMBARK scheduling and recommendations to upgrade the function and address other Operations Department objectives.