State of the System Report

Comprehensive Operational Analysis

The Rapid

FINAL

November 2019

NELSON
NYGAARD

Table of Contents

Table of Figures

1 INTRODUCTION

This State of the System report is the first element of the Comprehensive Operational Analysis (COA) effort for The Rapid. The purpose of this report is to summarize the background conditions in which The Rapid operates and provide a comprehensive evaluation of existing service characteristics and system performance. This report is intended to serve as the foundation for the development of recommendations during the Comprehensive Operational Analysis for The Rapid.

PROJECT GOALS

The overall focus of this study is to provide practical and sustainable recommendations to improve the productivity and reliability of The Rapid system, as well as to further enhance the agency's image throughout the Grand Rapids metropolitan area. Specific goals and objectives established at the outset of the Comprehensive Operational Analysis are summarized as follows:

- **Emphasize convenience and system accessibility.** Create a system that's easier to use, less confusing, and a low barrier to entry for existing customers and the broader community. The Rapid should be a system that works for everyone.
- **Create a reliable system that meets the expectations of customers.** Grand Rapids is experiencing unprecedented population growth, and with that growth comes more vehicles, higher vehicle miles traveled (VMT), and congestion. This evaluation should consider on-time performance and develop recommendations to improve the overall reliability of the system.
- **Evaluate the effectiveness of the current route structure and increase ridership.** Given the region's population growth, there is an opportunity to attract new riders to the system. Travel time competitiveness will be a critical component to consider. The COA should evaluate the existing radial pulse system, which was designed 15 years ago.
- **Develop priorities related to coverage, cost effectiveness, and equity.** The region is growing faster than funding to support transit, and employment clusters continue to expand geographically. At the same time, housing affordability is a concern, and many people with high transit need are being pushed further from the urban core. The COA process should help develop a path forward for determining the right balance of service to meet the region's needs.
- **Evaluate opportunities for innovative service and vehicles.** Transportation throughout the region should be seamless, and there is opportunity for The Rapid to function as a true coordinator for mobility options. In addition to innovative service and new vehicle types, this study should also consider the role of technology in improving mobility.

- **Maximizing existing resources and leverage others.** Consider opportunities to better connect riders throughout the broader West Michigan region, as well as potential connections to Lansing.

REPORT ORGANIZATION

This report assesses operating context in the six cities service area of Grand Rapids, East Grand Rapids, Kentwood, Wyoming, Grandville, and Walker, and the connecting communities in Kent County and Ottawa County. This State of the System report assesses the demographic and socioeconomic characteristics of the service area, and transit system characteristics and performance. This document consists of four chapters in addition to this Introduction as well as three appendices, which are summarized below:

- **Chapter 2** considers a variety of local planning efforts for The Rapid's service area.
- **Chapter 3** evaluates socioeconomic and demographic conditions within The Rapid service area to better understand transit demand and service gaps.
- **Chapter 4** provides an overview of trends in The Rapid fixed-route service, including recent operational and performance data.
- **Chapter 5** provide detailed information for existing The Rapid routes.
- **Appendix A** provides route maps for every route in the system which show the alignment, bus stop locations, and the average daily weekday boardings and alightings in the inbound and outbound direction.
- **Appendix B** provides route summary tables and charts that give insight into passenger loads, boardings, and alightings.
- **Appendix C** provides charts that show the riders per trip for every route in the system on Saturdays and Sundays in both the inbound and outbound direction.

2 DOCUMENT REVIEW

Current transit planning efforts in the Grand Rapids area exist within a broader planning context that has evolved over time. This chapter reviews that planning context, beginning with the Grand Valley Metropolitan Council (GVMC) 2040 Transportation Plan, The Rapid's short- and long-range transit plans, recent transit improvement plans, and feasibility studies for new services including Grand Rapids Streetcar and the Laker Line Bus Rapid Transit (BRT) project.

The seven primary documents reviewed in this chapter include:

- The Rapid Transit Master Plan (2010)
- Grand Rapids Streetcar Route Refinement Study (2014)
- GVMC 2040 Metropolitan Transportation Plan (2015)
- Laker Line Study Locally Preferred Alternative Report (2015)
- The Rapid Short-Range Plan (2016)
- City of Walker: Latent Transit Demand Analysis (2017) Align: The Rapid's Transit Improvement Plan (2018)
- GR Forward Downtown & River Action Plan (2015)

Findings from this chapter contextualize future transit planning work in Grand Rapids by enumerating the region's planning goals, highlighting consistent visions, and identifying unfulfilled objectives of the planning process.

KEY FINDINGS

The following are key findings from the document review:

- **The Rapid is committed to providing new types of transit service.** Following the implementation of the Silver Line BRT in 2014, The Rapid is currently planning to implement the Laker Line BRT in 2020 and is in the process of developing a funding plan to implement the Grand Rapids Streetcar project.
- **The City of Walker may be underserved.** Both The Rapid's Transit Master Plan and the city of Walker's Latent Transit Demand Analysis identified a growing need for crosstown and local transit service in the 3 Mile and 4 Mile Road corridor in the City of Walker.
- **The highest priorities for passengers are extending service hours in the evenings and weekends, as well as improving service frequency.**
- **Expanding service to key corridors outside of the six-cities area is a priority for the region.** Byron Township, Gaines Township, Ada Township, and Alpine Township are all identified in the Transit Master Plan as potential areas for expansion of fixed-route services.

- **Construction of the Laker Line BRT began in April 2019, and the new service is expected to be operational by August 2020.**

PLAN REVIEW

The Rapid Transit Master Plan (2010)

The Transit Master Plan (TMP) was envisioned as a tool that would provide strategic direction for The Rapid over the next 20 years by identifying current and future transit needs, examining alternative courses of action, and targeting transit improvements to accommodate regional growth. The TMP also includes an update of the 2005 Comprehensive Operational Analysis (COA), a review of the GO!Bus paratransit service, and prescribes transit-supportive land use policies for corridors identified for possible BRT or streetcar service.

Based on comments received during community workshops, online surveys, and visioning sessions, five transit priorities were identified:

- Expand span of service, particularly on routes that end in the early evening or do not have weekend service
- Improve service frequency
- Provide customers with new types of transit service, such as BRT and streetcar
- Extend service beyond the current service area on major corridors, such as Alpine Avenue, Plainfield Avenue, and 28th Street
- Improve service for currently underserved areas within The Rapid service area, such as northern Walker and southwest Wyoming

Preferred Scenario

The TMP project team developed three scenarios of service enhancements for public review before developing a single preferred scenario. The preferred scenario incorporated span of service improvements, frequency improvements, BRT on The Rapid's two most highly-used corridors, and a streetcar network that would connect the West Side, downtown Grand Rapids, and Medical Mile. The preferred scenario also includes extending GO!Bus paratransit service to new areas and calls for the development of an Accessibility Improvement Plan. The improvements contained in the preferred scenario call for the millage rate to be increased from 1.12 mills to 2.00 mills. Specific recommendations contained in the TMP preferred scenario are shown in Figure 2-1.

Figure 2-1 Improvements Recommended in the Transit Master Plan Preferred Scenario

Improvement Category	Recommendations
Expanded Span of Service (Systemwide)	▪ Weekdays: 5:00 am to 12:00 am ▪ Saturdays: 6:00 am to 12:00 am ▪ Sundays: 7:00 am to 9:00 pm
Improved Service Frequencies	▪ 15-minute service on Eastern, Kalamazoo, Eastown, Alpine, and Plainfield ▪ 30-minute service nights and weekends on most routes
Other Fixed-Route Improvements	▪ Extend routes outside of The Rapid service area along major corridors ▪ Extend routes outside of The Rapid service area into Byron and Gaines townships
GO!Bus Improvements	▪ Expand GO!Bus for new local bus corridors ▪ Develop Accessibility Improvement Plan ▪ Implement Same Day Booking
New Services	Bus Rapid Transit ▪ Silver Line (Division Ave) ▪ Laker Line (Lake Michigan Dr) Express Bus ▪ Downtown to Gerald R. Ford International Airport ▪ Cedar Springs/Rockford (US 131 North) ▪ Walker (I-96 West) ▪ Georgetown Township/Hudsonville (I-196 West/Chicago Dr) ▪ Byron/Gaines Townships (US 131 South) ▪ Cascade/Caledonia Townships (I-96 East) ▪ Ada Township (East Fulton St) Modern Streetcar ▪ North/South (Rapid Central Station to North Monroe) ▪ East/West (West Side to Medical Mile via downtown Grand Rapids)
New Routes	Crosstown Service ▪ Leonard Ave ▪ 3 Mile Rd Local Service ▪ Georgetown Township/Hudsonville ▪ Walker Ave/3 Mile Rd ▪ Rockford/Knapp St ▪ Comstock Park/Belmont (W River Dr/Jupiter Ave)

Comprehensive Operational Analysis Update

The COA update component of the TMP concentrates on identifying additional service improvements that could be implemented over the next five years. Findings from this review include:

- Since the 2005 COA, the following routes experienced significant performance improvements. The success of these routes indicates that they may be good candidates for additional service enhancements:
  - Route 2 – Kalamazoo
  - Route 4 – Eastern
  - Route 8 – Grandville / Rivertown Crossings
  - Route 9 – Alpine
  - Route 11 – Plainfield
- The lack of evening and weekend service is most notable in the areas north and northwest of downtown Grand Rapids; additionally, there is no evening or weekend crosstown service available in the southern portion of the service area.

Transit-Supportive Land Use Policy Recommendations

The TMP project team analyzed the Grand Rapids region's master plans to identify the current policies and plans that may impact transit-oriented development (TOD).

- **City of Grand Rapids** – land use recommendations focus on increasing housing density, mixed-use centers, and major job centers near transit routes. The plan also supports assessing the feasibility of fixed-guideway transit routes and supporting transit related enhancements.
- **City of Wyoming** – focus on transit and TOD along major commercial corridors, including Division Avenue, M-6 interchange areas, and employment clusters.
- **City of Kentwood** – recommends targeted redevelopment of high-density residential properties that are supported by adjacent transit routes.
- **City of Walker** –includes several subarea plans accommodating high-density residential in the Standale Subarea, the Alpine Avenue Subarea, and the area surrounding the I-96 corridor.
- **City of East Grand Rapids** – the Gaslight Village subarea plan calls for high-density, mixed-use development, including commercial, mixed-density residential, and business/office.
- **City of Grandville** – downtown Grandville is planning for mixed-use redevelopment as is the area surrounding the intersection of Ivanrest Avenue and 44th Street.

Grand Rapids Streetcar Route Refinement Study (2014)

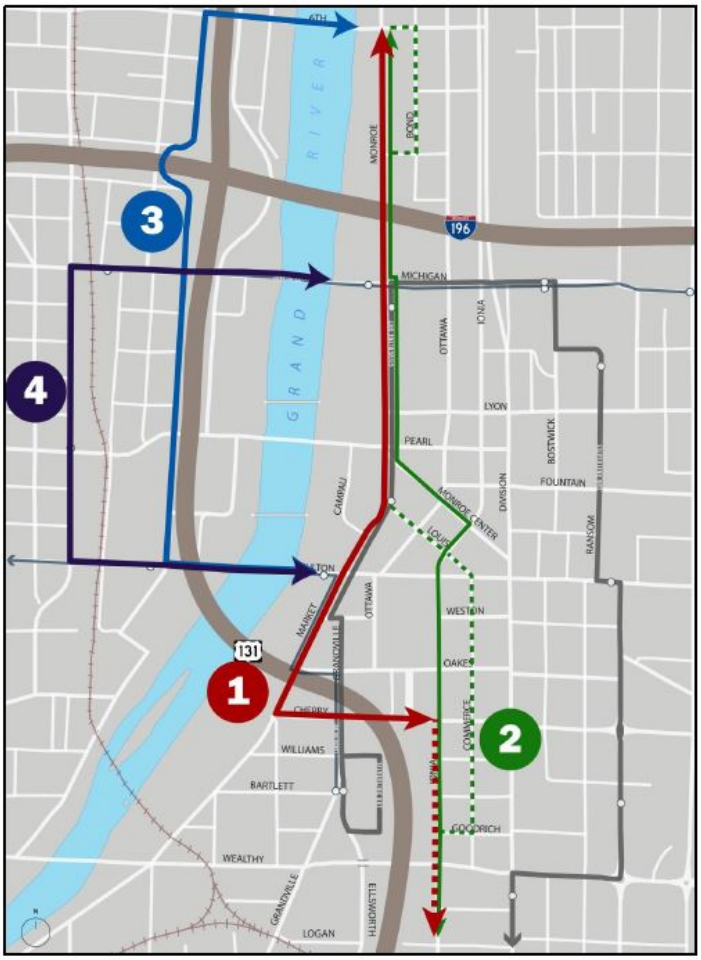
In January 2008, The Rapid initiated a Modern Streetcar study. Through its Public Transportation Tomorrow Taskforce and evaluation of several route options, a specific streetcar alignment was proposed. The 2008 study recommended further review and development of the proposed route, which is the primary focus of the Route Refinement study. The study was conducted by the Streetcar Advisory Committee (SAC), which included representatives of the city of Grand Rapids, downtown businesses, institutions, civic organizations and developers. The SAC provided the following support:

- Technical-level input into the various work items throughout the study.
- Unique perspectives combining detailed knowledge of the project with respective partner agencies, residents, businesses, and organizations within the study area.
- Identified key implementation challenges such as the development of a feasible financial plan.

Additionally, the SAC adopted a streetcar Mission Statement to help guide development and evaluation of alternatives, and selection of a preferred route. The Mission Statement is as follows:

"*The Grand Rapids Streetcar will advance the City's image as a progressive and robust community by adding a unique alternative transportation mode which expands the boundaries of downtown, enriches the community's sense of place, stimulates private investment, expands walkability options, and strengthens a vibrant and dense urban environment where more people can live, work, visit and enjoy the community.*"

Figure 2-2 Initial Streetcar Alternatives



Alignment

As seen in Figure 2-2, a broad range of potential streetcar routes were considered by the SAC; however, Alternatives 1 and 2 were the only ones carried forward for additional analysis. While Alternative 2 provided better service to existing retail development along Monroe Center, the committee ultimately selected Alternative 1 due to its superior development opportunities. Alternative 1 runs along the edge of a retail and entertainment district and provides a balance between existing and future streetcar

markets. The recommended route is approximately 1.8 miles in length, totaling 3.88 miles of track. Service would operate at 10 to 15-minute headways depending on the time of day and day of the week.

Funding Options

All streetcar projects in the U.S. have had a unique mix of funding sources. A number of projects have used federal funding, decreasing the amount of necessary local funding. However, using federal funds generally increases implementation time, which in turn tends to increase overall costs. State governments have supported streetcar implementation in other cities. The State of Michigan does have some state funding, which may be available to offset capital and operating costs. Local funding options range from donations to assessment districts. A specific funding option has yet to be identified for the streetcar project; however, there is an interest in advancing the project quickly to avoid cost impacts associated with federal funding.

Governance

The organizational structure to build, operate, and maintain the streetcar is identified by role below:

- **Owner:** Responsible for all capital, operating, and maintenance needs being met – *City of Grand Rapids.*
- **Sponsor:** Responsible for securing funding and satisfying federal funding requirements if federal funding is pursued (NEPA, Grants Management, oversight) – *The Rapid or Non-Profit Organization.*
- **Implementer:** Responsible for design, right of way, permitting, construction, procurement – *Partnership between City of Grand Rapids and The Rapid.*
- **Operator:** Responsible for day to day management of operations, maintenance, fare collection, training, marketing – *The Rapid.*

GVMC 2040 Metropolitan Transportation Plan (2015)

GVMC is the Metropolitan Planning Organization (MPO) for Kent County and eastern Ottawa County. The purpose of the Metropolitan Transportation Plan (MTP) is to establish a sustainable multimodal transportation system for the mobility and accessibility of people, goods, and services within the region. The MTP is a fiscally constrained, project-specific plan, without which federal transportation funding could not be allocated in the region.

Early in the planning process, GVMC conducted a survey to determine public priorities for transportation system improvements by asking respondents to select their three highest priority transportation enhancements from a list of nine options. The top priorities identified were:

- Improve the road condition (83%)
- Widen busy roads and intersections (36%)
- Use technology to reduce congestion (34%)
- Enhance transit service (30%)

Based on public feedback, GVMC determined that the primary transportation investment needs for the region include congestion mitigation, non-motorized transportation, pavement condition improvements, safety improvements, and transit service improvements. Regionally, the MTP

identified a $2.47 billion need for these investments and $1.50 billion in dedicated funding, leaving an unmet need of $970 million over the 15-year planning horizon.

The MTP includes a financially-constrained prioritized project list to address identified deficiencies in the transportation system within the $1.50 billion in dedicated funding for the region. Major projects included in the project list for The Rapid include vehicle replacement and preventative maintenance, park-and-ride lot development, BRT implementation, bus shelters and bus stop signage, and facility rehabilitation and maintenance.

Laker Line Study Locally Preferred Alternative Report (2015)

The Laker Line Study represents a crucial step towards developing a higher quality transit service along one of the most important corridors in The Rapid's service area. The Locally Preferred Alternative (LPA) is a combination mixed traffic and dedicated lane BRT, which will connect the Grand Valley State University (GVSU) Allendale campus to the GVSU Center for Health Sciences (CHS) campus.

The new route will operate more frequently, more days per week, and for more months per year than the existing services (Route 50 and Route 51). As demand continues to increase among GVSU students, the LPA will better serve these riders and may encourage local residents to consider taking transit instead of driving. The LPA is reflective of technical analyses, outcomes, and community input. Additionally, the LPA is responsive to the five-corridor transportation needs as defined in the project Purpose and Need Statement:

- Provide additional corridor capacity to reduce overcrowding.
- Create high-capacity service with room to accommodate additional transit trip-making in the future.
- Support economic revitalization at corridor station locations.
- Increase multimodal access to key regional destinations, including downtown and the Medical Mile.
- Connect with Silver Line service, providing access to high-capacity transit serving Central Station and Division Street Corridor.

Key Findings

Key findings from the Laker Line study related to operational improvements and future planning efforts include:

- **Use higher-capacity buses.** Using larger buses while maintaining six-minute peak headways will provide additional capacity to meet current demand while accommodating increased ridership along the corridor.
- **Optimize station locations.** By reducing the number of stations, removing route deviations from the main corridor, and the integration of dedicated lanes and transit signal priority, the LPA will offer measurable time savings for transit trips along the corridor.
- **Target use of dedicated lanes.** Along certain segments of the corridor, dedicated lanes were not found to be cost effective (not a significant ridership gain for significantly higher capital costs) or were found to result in significant negative traffic or parking impacts. Mixed-traffic operations in these segments will generate ridership and economic benefits while minimizing or avoiding negative impacts.

- **Operate on Monroe Street through Downtown.** The LPA will operate along Monroe Street through downtown Grand Rapids rather than along a north-south route on the western side of the Grand River. Service on Monroe Street will generate higher levels of ridership, will provide connectivity to the recently opened Silver Line BRT service, and will offer the opportunity to co-locate with some of the Silver Line stations and dedicated lane operations.
- **Consider future extensions.** The LPA will operate from the Kirkhof Center on GVSU's Allendale Campus to the GVSU CHS Campus on the northeast side of downtown Grand Rapids. Future Laker Line extensions westward to downtown Allendale and eastward to Plymouth Avenue may be considered as a second phase or extension of the Laker Line.

The Rapid Short-Range Plan (2016)

The Rapid Short-Range Plan serves as the agency's guiding document for services and capital projects through the 2016-2020 planning horizon. The Short-Range Plan includes forecasts for revenue and ridership, prioritized service improvements, and a five-year capital plan.

Ridership and Revenue Forecast

- The operating budget for The Rapid is forecast to increase by 18.3% over this planning horizon, increasing from $42.5 million in 2016 to $48.6 million in 2020.
- Ridership on The Rapid has been declining since it reached a peak of 12.5 million in 2014; however, the agency forecasts ridership to rebound and increase through 2020 due to planned service increases and implementation of the Laker Line.

Service Improvements

The Short-Range Transit Plan prioritizes service improvements that were previously identified in the TMP but have not yet been implemented. The plan also bases service improvements on identified public priorities and data analysis. These service priorities include:

- Expand service hours
- Increase frequency of service
- Additional modes (BRT & Streetcar)
- Extend service outside the six-city area
- Improve access to and service in under-served areas

Five-Year Capital Plan

The five-year capital plan outlines the agency's capital priorities, generally including fleet replacement, facility needs, technology needs, and capital projects to reduce operating expenses. Key capital expenditure priorities include:

- Replace existing diesel fueled fixed-route vehicles with CNG fueled vehicles
- Renovate Wealthy Operations Center for CNG compatibility
- Construct a new CNG fueling station
- Replace the existing magnetic paper ticket fare system with an electronic smart card
- Complete Laker Line BRT

City of Walker: Latent Transit Demand Analysis (2017)

The Rapid is the primary transit agency serving Kent County and the six cities area surrounding Grand Rapids, including the city of Walker. Walker, which has a population of roughly 25,000 people, is growing along with the rest of the region. As the city continues to grow, the city's board members requested The Rapid explore the possibility of expanding services based on latent demand within the city.

Currently, The Rapid routes 7, 9, 12, and 50 provide service in the city of Walker; however, no transit service is available in the 3 Mile and 4 Mile Road corridor. This corridor contains several key employment centers and trip generators, including light industrial facilities, the Meijer Corporation Headquarters, and Kenowa Hills High School. The aim of this study was to determine transit demand within the City of Walker and develop recommendations for transit service around the 3 Mile and 4 Mile Road area. Eleven public transit providers were analyzed along with two supplemental transportation providers (ride hailing & taxis).

Transportation Provider Analysis

Not all transportation providers would be able to provide service along the 3 Mile and 4 Mile Road corridor. Service in this area would primarily serve those traveling to and from work in the study area. Employers along this corridor are growing and are interested in expanding affordable and reliable transportation options for their employees. The study found that many employees are already creating their own internally-organized rideshare programs.

Specialized transportation providers such as GO!Bus, RideLink, Hope Network Transportation, and Health Care Associates have operating programs that are required to ensure mobility options for seniors and people with disabilities. These providers do not have the capacity to provide additional services in the study area. According to the study, carpool and vanpool services would not be ideal service providers in this area because these services are tailored to longer commutes, are less cost efficient, and would not function well picking up and dropping of large number of people. Identified services that could properly serve this corridor include fixed-route service, a more localized demand response service in the specific study area, or a hybrid version of the two services.

Further analysis needs to be conducted to determine the need for and type of additional services along the corridor. Commuting patterns, employment concentrations, transit propensity, employer surveys, public outreach data, and overall service needs must be analyzed to determine the type of service, number of vehicles, operating times, and route options that may be needed to properly serve this corridor.

Align: The Rapid's Transit Improvement Plan (2018)

The Align transit improvement plan was a year-long planning initiative that identified, analyzed, and prioritized a set of transit improvements for The Rapid system. The project goal was to improve the overall transit experience for those living in Grand Rapids and the surrounding communities. The study took place from June 2017 to June 2018 and built upon previous BRT studies to explore potential BRT improvements and expansions within the Grand Rapids area. This study explored infrastructure enhancements to improve speed and reliability, as well as amenity enhancements to improve the rider experience while increasing the visibility of public transit in the community.

The Rapid currently provides service in the six incorporated cities of Grand Rapids, Walker, East Grand Rapids, Kentwood, Wyoming, and Grandville. The Align study focused on these six cities while pursuing a regional transit investment approach that considers service throughout the entire Grand Rapids Urbanized Area (UZA) boundary.

Throughout the last decade, The Rapid significantly increased the amount of transit service operating within the UZA. As transit service has increased, growth in ridership has followed, by nearly 4 million passengers between 2008 and 2018. While The Rapid has seen an overall increase in ridership, there has been a slight decrease since 2014, consistent with other transit agencies throughout the country. This decrease in ridership can be attributed to low gas prices, improved economic conditions, and the rise of other transportation modes. Two recent successes seen by The Rapid include the implementation of the Silver Line BRT service and the Laker Line, which is set to open in 2020.

Implementation Phasing

The Align plan includes elements that should be immediate priorities, as well as others that may take years of planning or new funding resources.

Now (2018-2020): Make the best use of the current system

- Conduct a COA to explore service enhancements within the current system budget: extended peak period service levels, expanded weekend service, and additional cross-town routes.
- Continue to encourage use of new Wave Fare Card to speed up passenger boarding.
- Leverage recent and upcoming investments in BRT through corridor land-use planning.
- Implement Transit Signal Prioritization (TSP) in key corridors including Eastern Avenue, Alpine Avenue, 28th Street, Fulton Street, and Grandville/Clyde Park Avenue.
- Enhance dedicated-lane markings and visibility in downtown corridors (Monroe, Ransom, Fulton).
- Prioritize amenity enhancements in high-need equity neighborhoods with transit-supportive land use and accessibility improvements.
- Partner with municipalities and road agencies on priority pedestrian accessibility improvements along high-ridership service corridors.
- Pilot mobility on-demand service for employment growth zones within Walker and Kentwood.

Next (2021-2023): Carefully consider service expansion priorities

- Extend Laker Line BRT service east to Plymouth to serve growing Michigan Street corridor and commuter trips to hospitals.
- Implement service changes and restructuring based on results of COA.
- Strengthen amenities, operations, and ridership in high-frequency, high-ridership corridors.
- Create mobility hubs and super stop amenities to boost profile and connectivity of transit at key regional destinations.
- Establish commuter and park-and-ride bus services.

Future (2024+): Continue expanding BRT network

Based on evolution of service and ridership, identify next opportunities for BRT network expansion, commuter lines, or mobility on demand services.

Performance Metrics

In the coming years, the success of the Align study will be dependent upon how well the agency meets the following core goals. Figure 2-3 includes metrics that the agency will use to track and measure impacts of the enhancement strategy.

Figure 2-3 Align Goals and Performance Metrics

Goal	Performance Metric
Provide enhanced transit service options to grow ridership and improve reliability	▪ Total Ridership ▪ Ridership per service hour and mile ▪ Ridership on high frequency corridors ▪ Average transit travel speeds ▪ On-time performance
Improve equitable access to transit services	▪ System accessibility to high-need populations ▪ High frequency service accessibility to high-need populations ▪ Amenities and investment in high-need areas
Prioritize future transit enhancement projects that maximize positive regional impact	▪ Regional and community mode shift ▪ Employment accessibility by transit system ▪ Employment accessibility by high-frequency transit
Foster transit supportive land use policies and encourage economic development	▪ Amount of new development within the station areas ▪ Percent of regional development near station areas
Develop and select implementable investments that have community support	▪ Customer satisfaction surveys ▪ Community and stakeholder satisfaction surveys

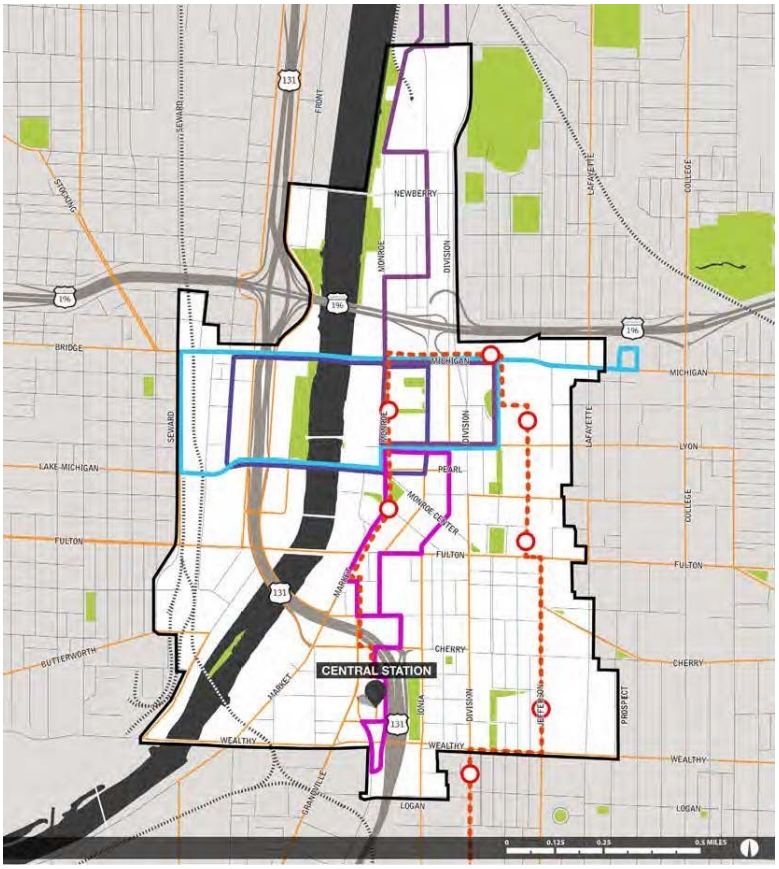
Grand Rapids Forward: Downtown & River Action Plan (2015)

Grand Rapids Forward (GR Forward) is a roadmap that envisions the future of Downtown Grand Rapids and the Grand River, two of the greatest assets of the city and region. The plan was facilitated by Downtown Grand Rapids Inc., the City of Grand Rapids, and Grand Rapids Public Schools. The project was launched in April 2014 with the intention of creating a community-driven plan by gathering public input through surveys, focus groups, neighborhood meetings, public forums, and an active online presence. Through public input and collaboration among facilitators of the plan, the following six goals were established:

- Goal 1: Restore the river as the draw and create a connected and equitable river corridor
- Goal 2: Create a true downtown neighborhood that is home to a diverse population
- Goal 3: Implement a 21st century mobility strategy
- Goal 4: Expand job opportunities and ensure continued vitality of the local economy
- Goal 5: Reinvest in public space, culture, and inclusive programming
- Goal 6: Retain and attract families, talent, and job providers with high quality public schools

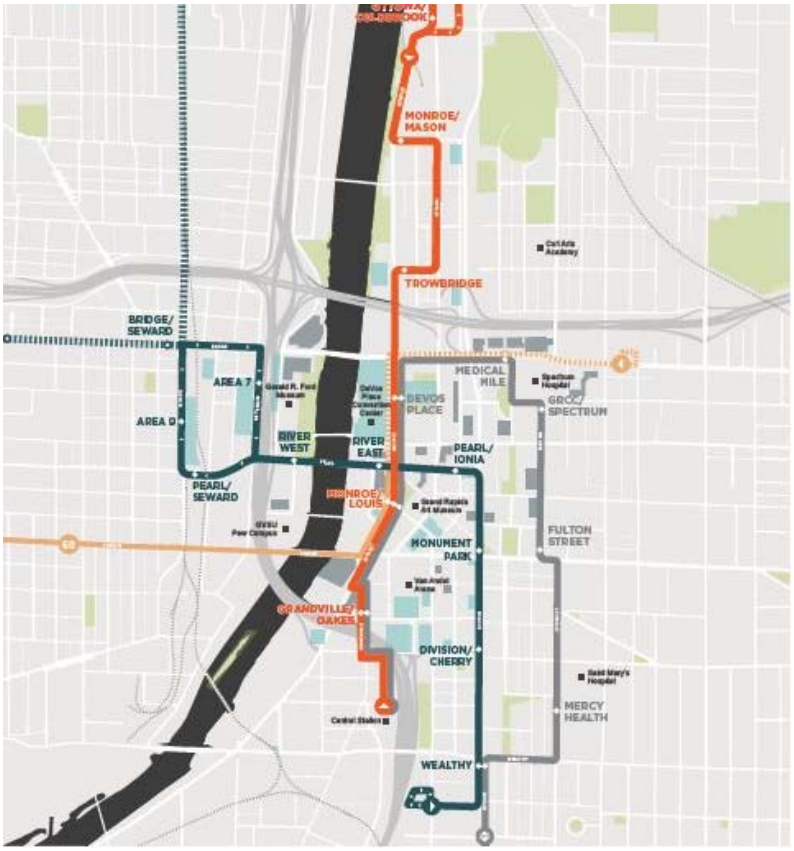
Transportation improvements were primarily focused within Goal 3. Due to the geography and size of Downtown Grand Rapids, a primary connectivity issue is a lack of simple and reliable transit service that links all downtown destinations. To better compliment the city's existing BRT investments, a DASH service revision was recommended to ensure the service functions as a circulator to complete a high-frequency Downtown Grand Rapids transit network. Existing DASH service operated as four separate routes including Dash North, Dash West, Dash Hill, and Dash South as seen in Figure 2-4.

Figure 2-4 Existing DASH Service



The improved service would consist of two simple routes connecting parking facilities to downtown destinations operating on all weekdays except holidays. The East-West Line would connect destinations west of the Grand River, including the GVSU Pew Campus. The North-South Line would connect areas to the north of downtown Grand Rapids with DeVos Place, the Convention Center, and Central Station, as seen in Figure 2-5.

Figure 2-5 Proposed DASH Service



Another improvement identified in Goal 3 was to incentivize transit use through the provision of free or reduced transit fares among Downtown employees. Additionally, it was recommended that existing paratransit service be reviewed to identify opportunities of improved service for users. Technological improvements such as monitors, screens, and real-time bus arrivals in the downtown area were also included because the uncertainty of bus arrivals was noted as one of the main reasons for not using public transportation in Downtown.

Implementation Approach

Implementation of the improvements laid out within Goal 3 will help transform Downtown Grand Rapids into a place that provides a more balanced set of transportation options. Transformations such as these will encounter growing pains therefore projects must be extremely well-implemented and continually monitored and internal and external communication must be kept clear and concise.

3 MARKET ANALYSIS

This market analysis presents demographic characteristics associated with the market for transit ridership in the Grand Rapids 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 nine 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	2010 Census	Block Group	TDI
Employment	Work	Jobs per Acre	2015 LEHD[1]	Block Group	TDI
Low-Wage Employment	Work	Jobs paying $1,250/ month or less per square mile	2015 LEHD	Block Group	--
Low-Income	Residence	People earning less than 100% of the federal poverty level per square mile	2013-2017 ACS[2]	Block Group	TPI
People with Disabilities	Residence	People with disabilities per square mile	2009-2013 ACS	Block Group	TPI
Young Adults	Residence	Population age 18-24 per square mile	2010 Census	Block Group	--
Seniors	Residence	Population age 65 and over per square mile	2010 Census	Block Group	TPI
Rental Units	Residence	Rental units per square mile	2013-2017 ACS	Block Group	TPI
Zero-Vehicle Households	Residence	Households without access to a vehicle per square mile	2013-2017 ACS	Block Group	TPI

[1] Job data was taken from the US Census Bureau's Longitudinal Employer-Household Dynamics database.

[2] American Community Survey, five-year estimates

KEY FINDINGS

This market analysis assesses nine demographic characteristics that are commonly associated with demand for transit. The analysis shows where people who are likely to use transit live and work. Key findings from this analysis include:

- **Downtown Grand Rapids and inner neighborhoods are a major existing market for transit.** High and moderate density residential, employment hubs, and industrial and manufacturing areas located in or adjacent to downtown Grand Rapids make up the core of transit demand in The Rapid's network.
- **The Rapid does a good job serving areas with high transit demand.** In addition to the downtown core, there are also high transit demand areas on the periphery of the service area, most notably around the southern area of the city of Grand Rapids, continuing into the cities of Kentwood and Wyoming. The Rapid's network currently provides connections to nearly all of these high transit demand areas and provides a robust service network within the downtown core.
- **There may be opportunities to expand service to additional areas in Ottawa County.** Located to the west of the existing service area, there appears to be moderately high transit demand in the unincorporated community of Jenison and Georgetown Township in Ottawa County. There may be an opportunity to expand service across county lines to reach the population and employment concentrated in this area.
- **Low-wage employment is concentrated along the 28th Street SE and 44th Street SW corridors.** Downtown Grand Rapids is the primary employment hub for the region; however, low-wage employment is concentrated around the 28th Street SE corridor in Grand Rapids and Kentwood and the 44th Street SW corridor in Grandville. Employees working in these low-wage employment hubs are more likely to rely on transit to reach their jobs than other, higher-wage employees.
- **Transit propensity is concentrated in downtown Grand Rapids and relatively dense inner neighborhoods.** There is both high transit demand and propensity throughout the downtown core of the city of Grand Rapids and the moderate-density inner neighborhoods adjacent to the south, as well as the Swan, West Grand, and Belknap Lookout neighborhoods to the west, northwest, and north of downtown. Additional areas with high demand for transit include the Clyde Park Avenue SW Corridor, Calvin University, the city of Kentwood, south Grand Rapids, and the Alpine Center and Alpine Township area.

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 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.[3] Many of these driving trips are replaced with transit trips. In the Grand Rapids area, the highest population densities, 16 or more people per acre, exist in several inner neighborhoods surrounding downtown Grand Rapids, most notably the Swan and West Grand neighborhoods to the northwest of downtown.

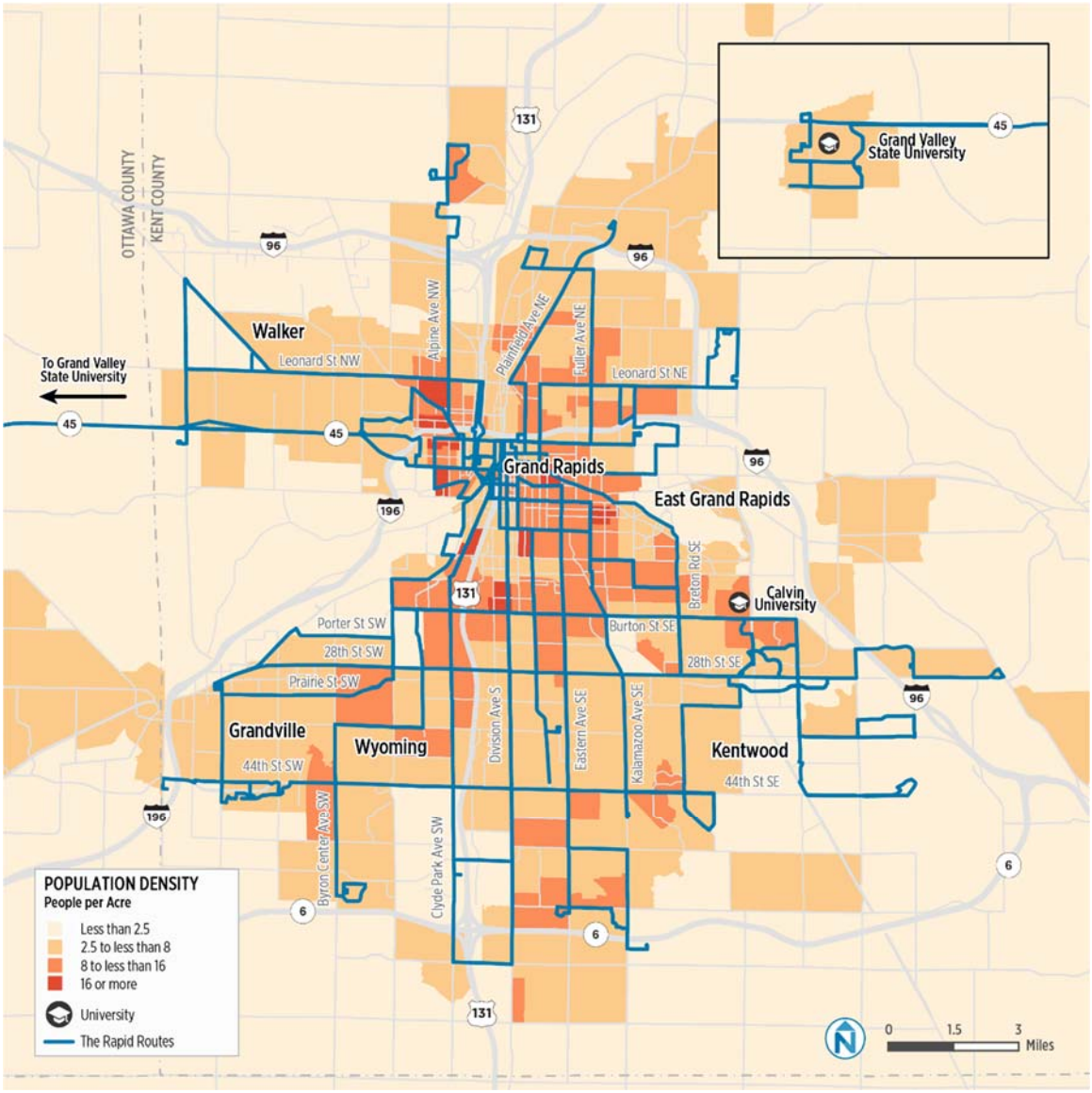
Additionally, the following areas have moderately high population density:

- The Midtown and East Hills neighborhoods immediately to the east and south of downtown Grand Rapids.
- The apartment complexes located in the northeast area of the city of Walker and Alpine Township north of I-96 and west of US 131.
- The Roosevelt Park neighborhood located south of downtown Grand Rapids, east of the Grand River, and west of US 131, near the border of the city of Grand Rapids and the city of Wyoming.
- The Calvin University campus area and surrounding neighborhoods located west of I-96 and north of 28th Street SE.
- The Clyde Park corridor in the city of Wyoming, located west of US 131, south of Burton Street SW, and north of 44th Street SW.
- The neighborhoods along Burton Street SE in the of the city of Grand Rapids and the northern portion of the city of Wyoming.

Figure 3-2 presents population density for block groups in the Grand Rapids metropolitan area.

[3] *Patterns of Automobile Dependence in Cities*. Newman and Kenworthy, 1989

Figure 3-2 Population Density



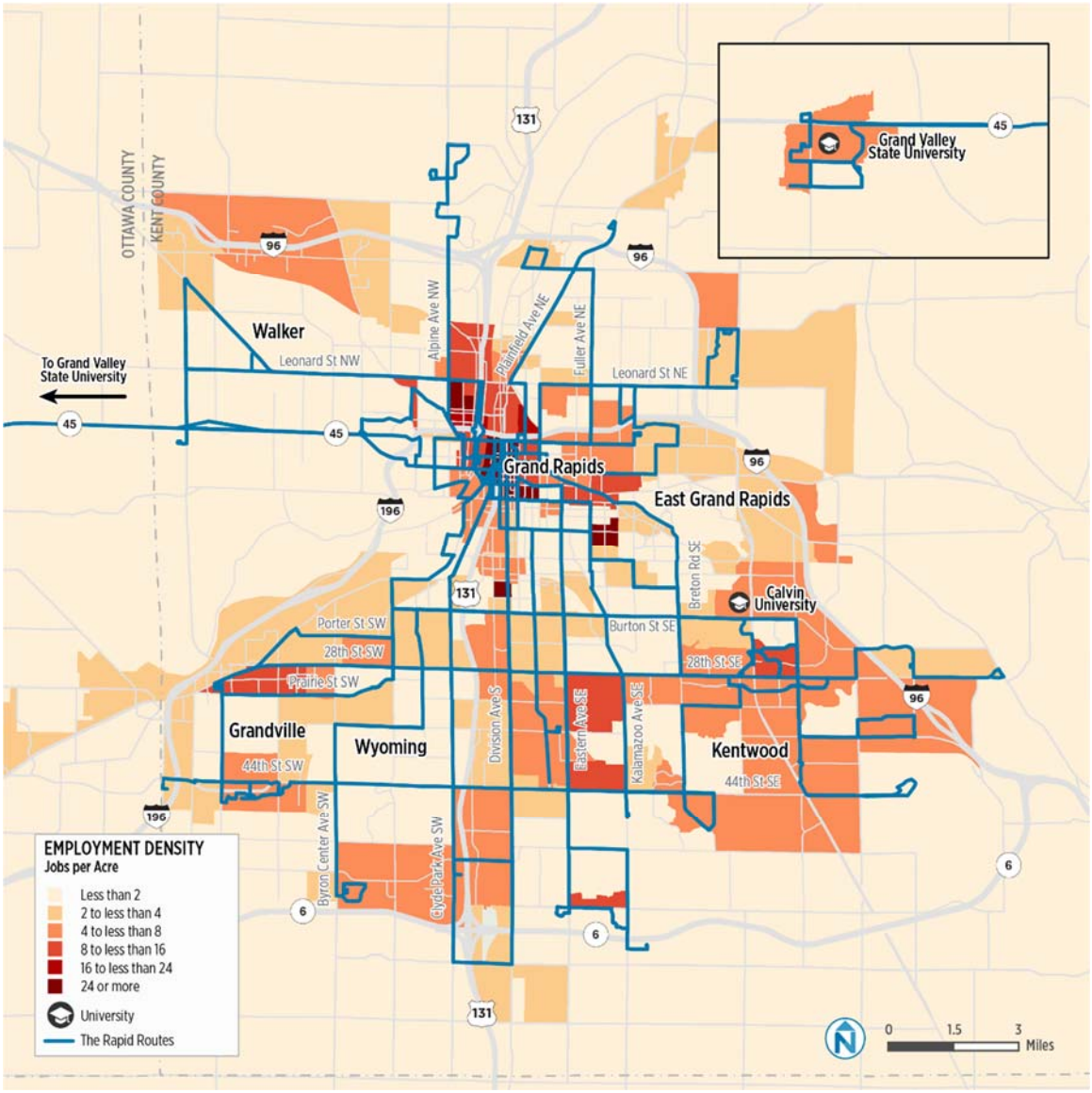
EMPLOYMENT

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 Grand Rapids and the Medical Mile, extending north of downtown along the eastern bank of the Grand River until Leonard Street NE.

There are also a few disparate employment hubs to the south and east of downtown. There are additional areas with moderately high employment density in the following locations:

- North of downtown Grand Rapids in the industrial areas surrounding the Grand River.
- Along the 28th Street SE corridor between Breton Road SE and Patterson Avenue SE, including the Woodland Mall in the northern portion of the city of Kentwood and in the southeastern portion of the city of Grand Rapids.
- Along Kalamazoo Avenue SE and Eastern Avenue SE between 28th Street SE and 44th Street SE in the southern portion of the city of Grand Rapids.
- The commercial and administrative complexes in the city of Grandville located south of 28th Street SW and north of Prairie Street SW.

Figure 3-3 Employment Density



TRANSIT DEMAND INDEX

The single most important factor influencing demand for transit service is the combined metric of population and employment density. Each metric, population density and employment density, has been shown to be capable of supporting a certain level of transit service, shown in Figure 3-4.

Figure 3-4 Level of Transit Service Supported by Population and Employment Density

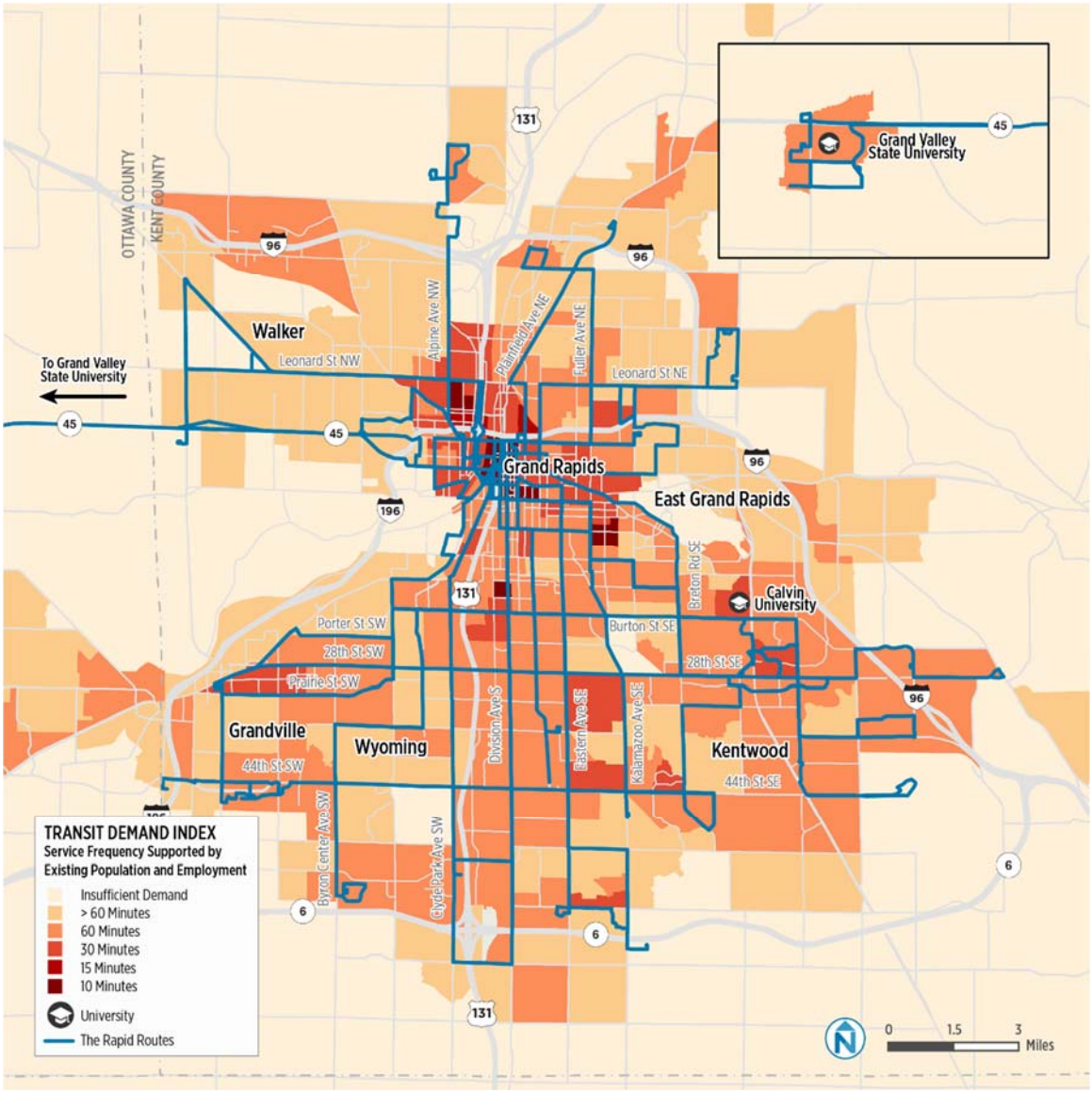
Frequency	Population per Acre	Employment per Acre	Buses per Hour
Very low demand	Less than 2.5	Less than 2	0
Less than 60 minutes	2.5 – 8	2 – 4	0.5
60 minutes	8 – 16	4 – 8	1
30 minutes	16 – 31	8 – 16	2
15 minutes	31 – 47	16 – 24	4
10 minutes	47 – 92	24 – 48	6
5 minutes	92 or more	48 or more	12

Combining the transit service supported by both of these factors into a single Transit Demand Index indicates what levels of service may be supported throughout the Grand Rapids area, shown in Figure 3-5.

In general, the central core of downtown shows the highest demand for transit service. Areas adjacent to downtown Grand Rapids, including the Swan, West Grand, Belknap Outlook, and Eastown neighborhoods, also show moderate demand for transit service.

Transit service is supported throughout several corridors. East-west corridors include Burton Street, 3 Mile Road NW, 28th Street, and 44th Street. North-south corridors include Clyde Park Avenue, Byron Center Avenue, Division Avenue, Eastern Avenue, and M-44.

Figure 3-5 Transit Demand Index

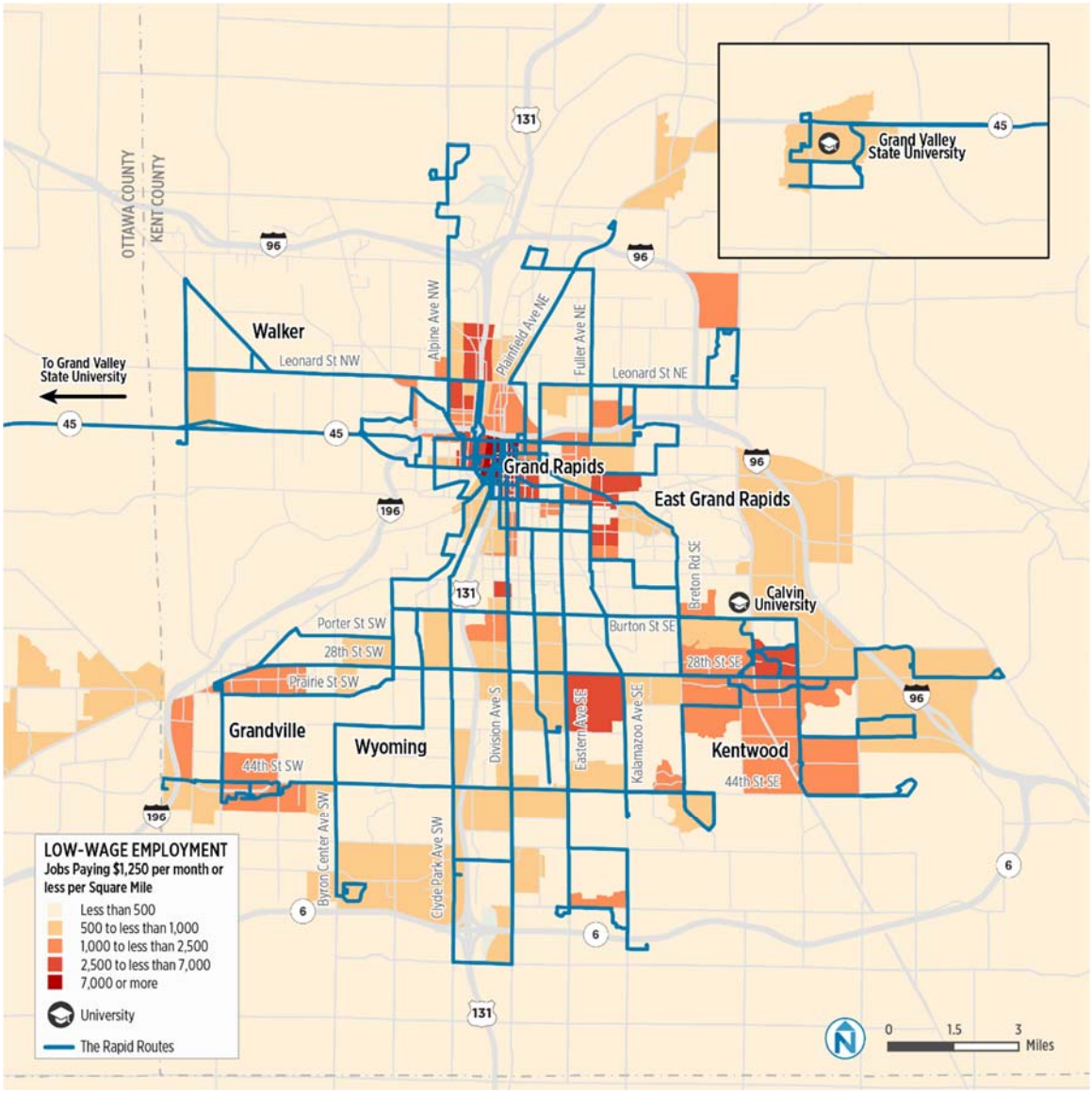


LOW-WAGE EMPLOYMENT

Low-wage employment, shown in Figure 3-6, follows a similar pattern as total employment, with the bulk of low-wage jobs located in downtown Grand Rapids and north along the Grand River. However, there are several areas in which low-wage employment is more pronounced than total employment:

- The concentration of low-wage employment along the 28th Street SE corridor, particularly the area surrounding the intersection of Kalamazoo Ave SE and 28th Street SE, is more pronounced than for total employment, making this a key area for low-wage employment accessibility.
- The shopping centers along 44th Street SW in the southern portion of the city of Grandville, including Bucktown Shopping Center, Wilson Town Center, RiverTown Crossings, and Grandville Marketplace, also represent a key cluster of low-wage jobs.

Figure 3-6 Low-Wage Employment Density



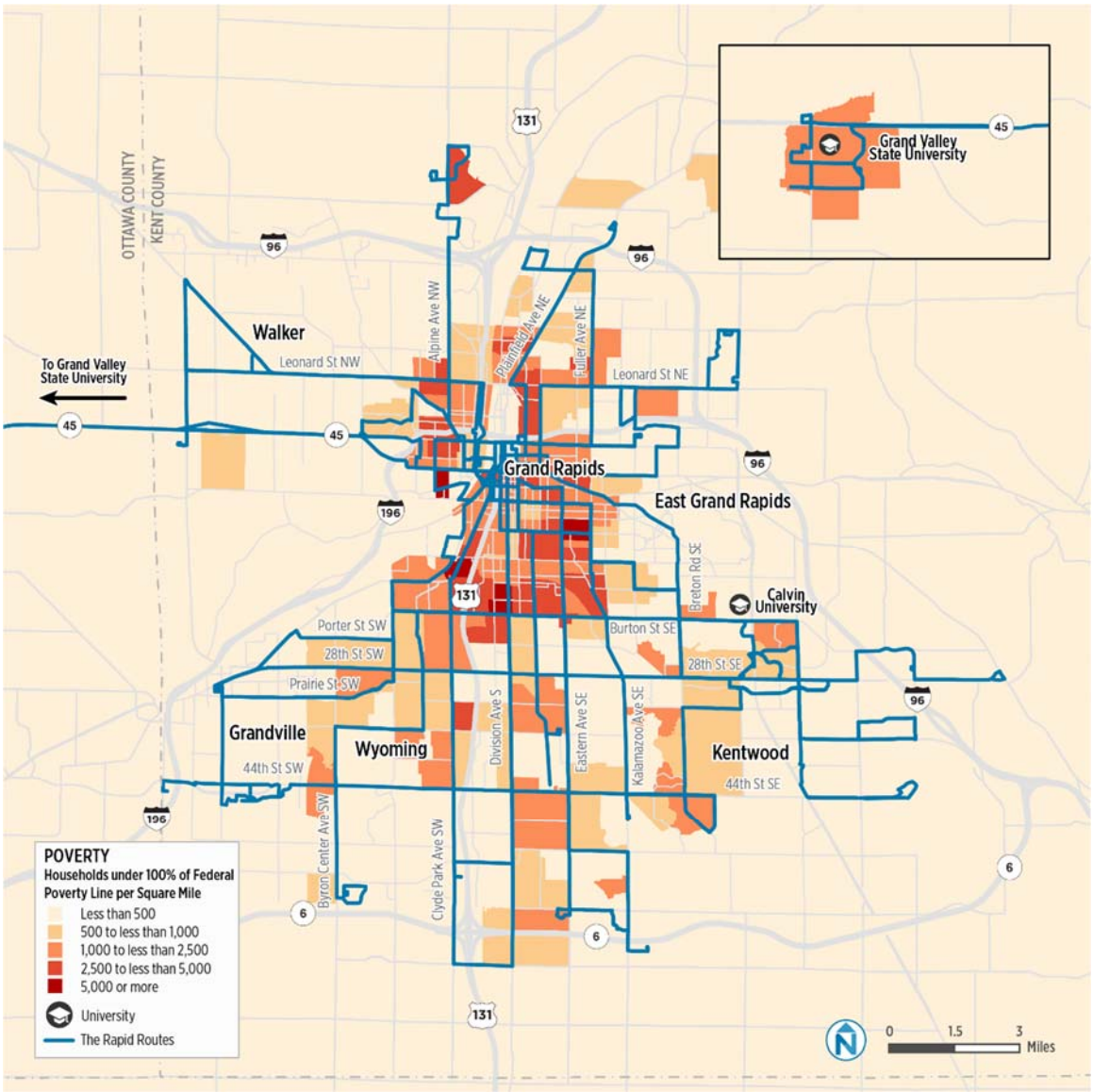
LOW-INCOME POPULATIONS

Low-income populations, shown in Figure 3-7, are generally clustered in neighborhoods just outside of downtown Grand Rapids, including:

- Belknap Lookout, located north of I-196 and east of the Grand River.
- The Burton Heights and Roosevelt Park neighborhoods located adjacent to US 131 between Hall Street SE and Burton Street SE.
- The neighborhood surrounding the intersection of Fuller Avenue SE and Franklin Street SE in the eastern portion of the city of Grand Rapids.

Additionally, there are clusters of moderately low-income populations located in Alpine Township and the Grand Valley State University campus area.

Figure 3-7 Low-Income Population Density

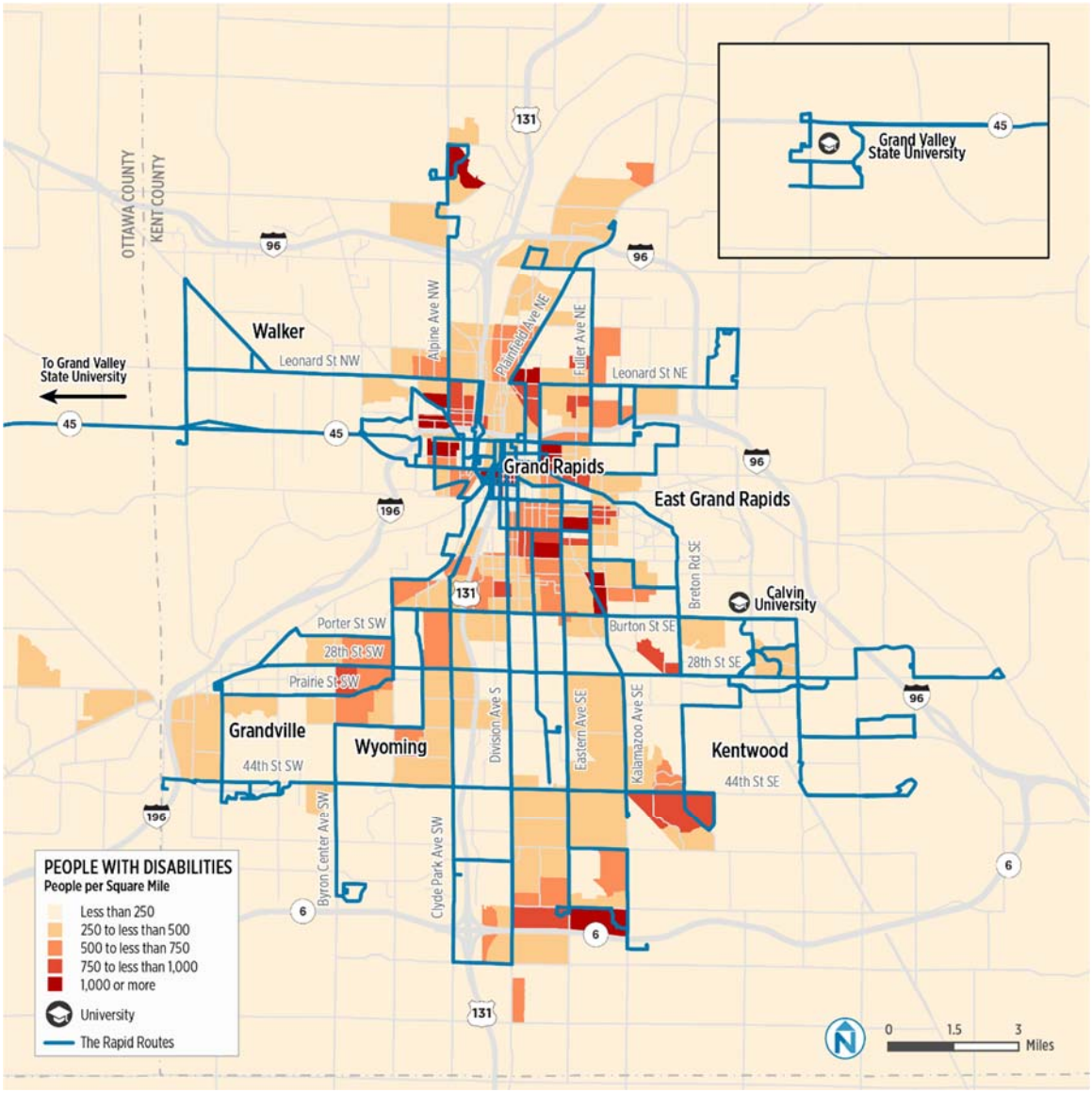


PEOPLE WITH DISABILITIES

People with disabilities, shown in Figure 3-8, are generally clustered in a few neighborhoods on the periphery of downtown Grand Rapids and in several communities toward the edge of the service area. These neighborhoods and communities include:

- The neighborhoods located generally between Eastern Avenue SE, Plymouth Avenue SE, Franklin Street SE, and Hall Street SE.
- The Swan and West Grand neighborhoods located east of US 131 and adjacent to both the north and south of I-196, generally northeast of downtown Grand Rapids.
- The apartment complexes located in the northeast area of the city of Walker and Alpine Township, north of I-96 and west of US 131.
- The apartment and townhome communities located in the city of Kentwood around the interchange of M-6 and Kalamazoo Avenue SE.

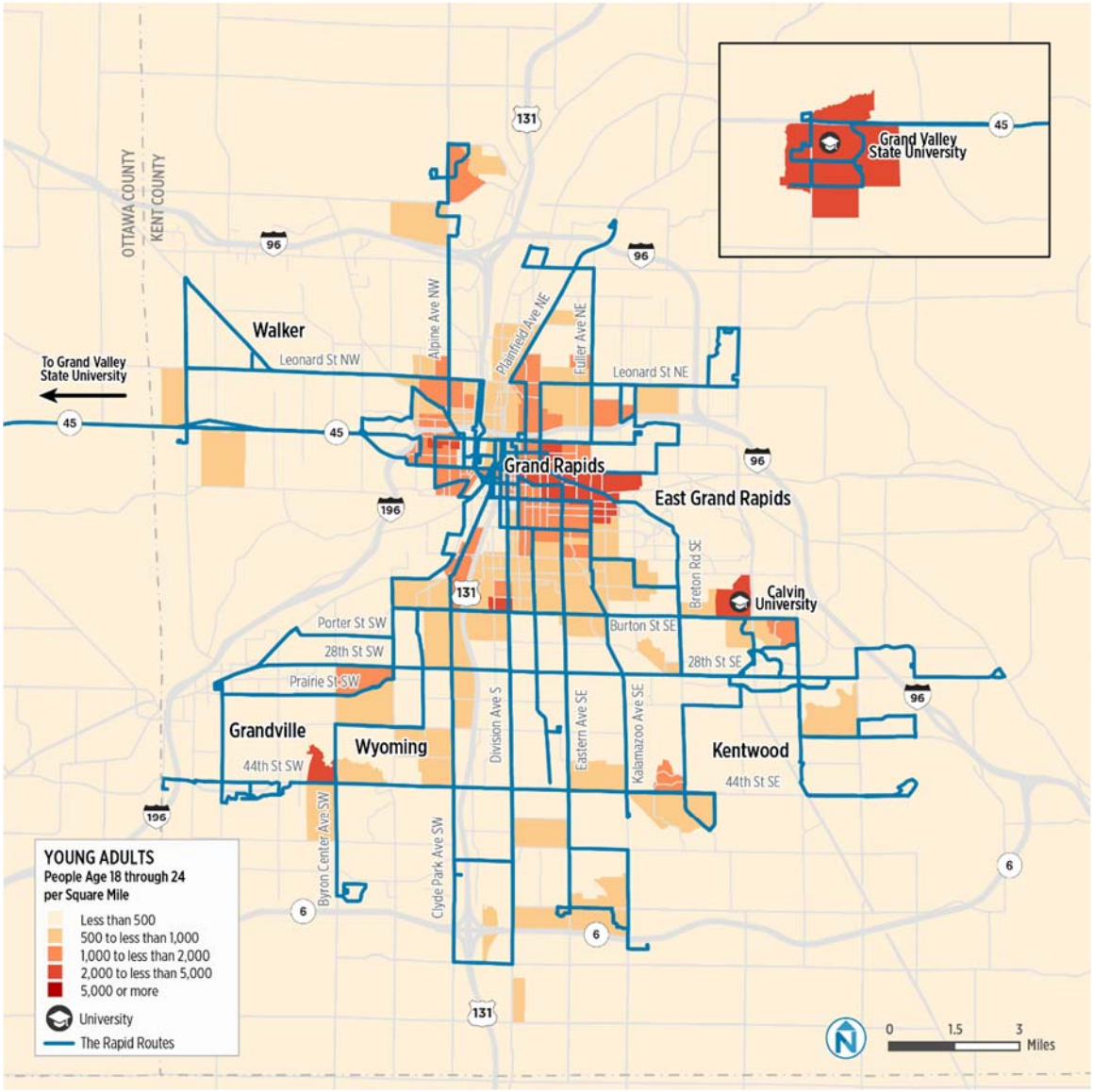
Figure 3-8 Density of People with Disabilities



YOUNG ADULTS

Adults between the ages of 18 and 24 are more likely to take transit than adults over the age of 24. Young adults, shown in Figure 3-9, are concentrated around the Grand Valley State University campus area; in the eastern neighborhoods within the city of Grand Rapids, generally between Fulton Street SE, Plymouth Avenue SE, Franklin Street SE, and Madison Avenue SE; and the Calvin University campus area located just south of the city of East Grand Rapids.

Figure 3-9 Density of Adults Age 18 to 24



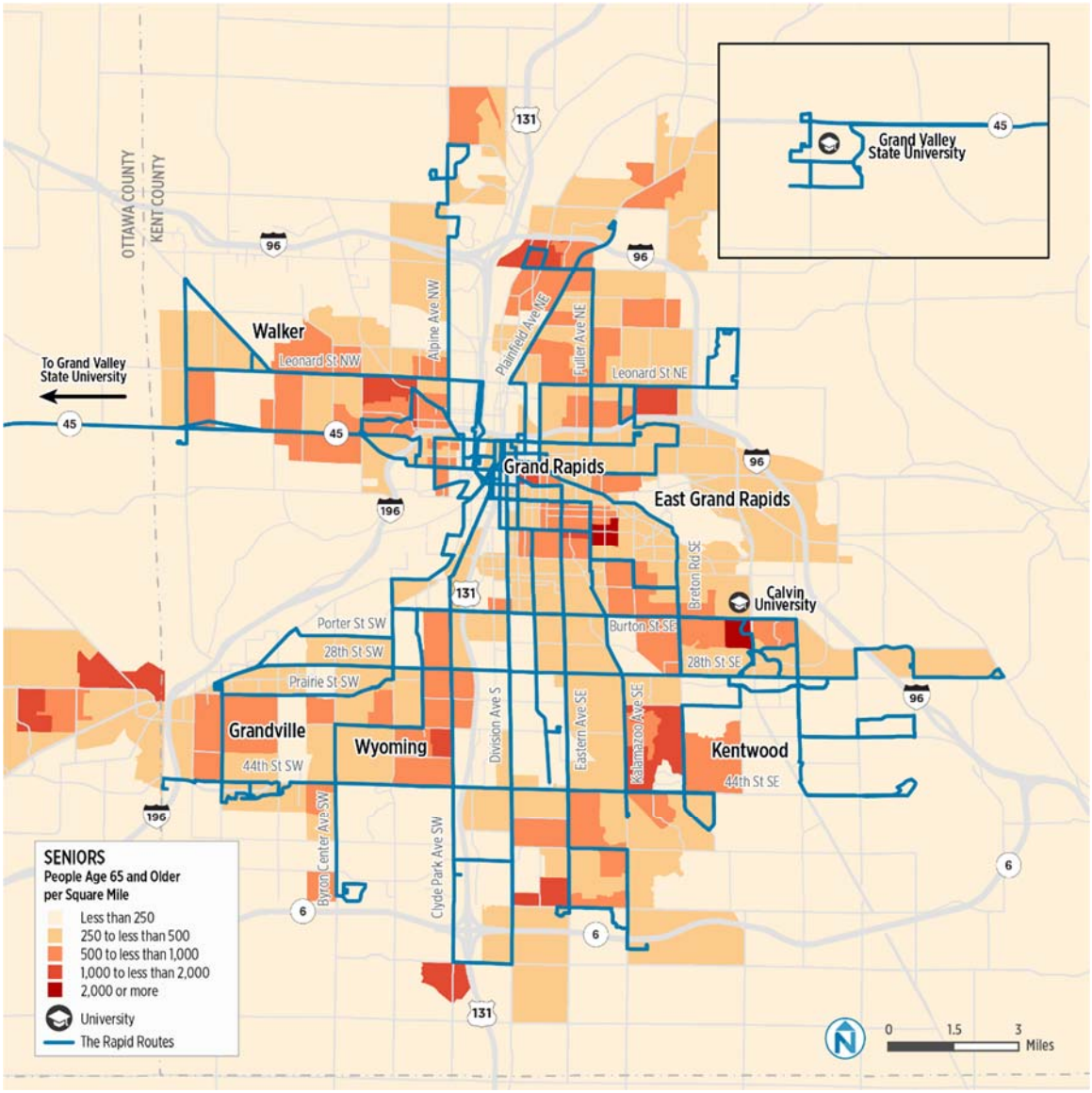
SENIORS

Similar to young adults, people ages 65 and older are more likely to take transit than those age 64 and younger. The highest concentrations of senior populations in the service area, shown in Figure 3-10, are located in:

- The neighborhood to the southwest of the intersection of Burton Street SE and M-44.
- The Ottawa Hills neighborhood near the intersection of Franklin Street SE and Plymouth Avenue SE, around the border between the city of Grand Rapids and the city of East Grand Rapids.
- The neighborhood near the intersection of 3 Mile Road NE and Coit Avenue NE in the northern portion of the City of Grand Rapids.
- The neighborhood located to the northeast of the intersection of 44th Street SE and Breton Road SE in the city of Kentwood.

There are additional concentrated populations of seniors in Jenison and Georgetown Township located to the west of the existing service area in Ottawa County.

Figure 3-10 Density of Adults Age 65 and Older

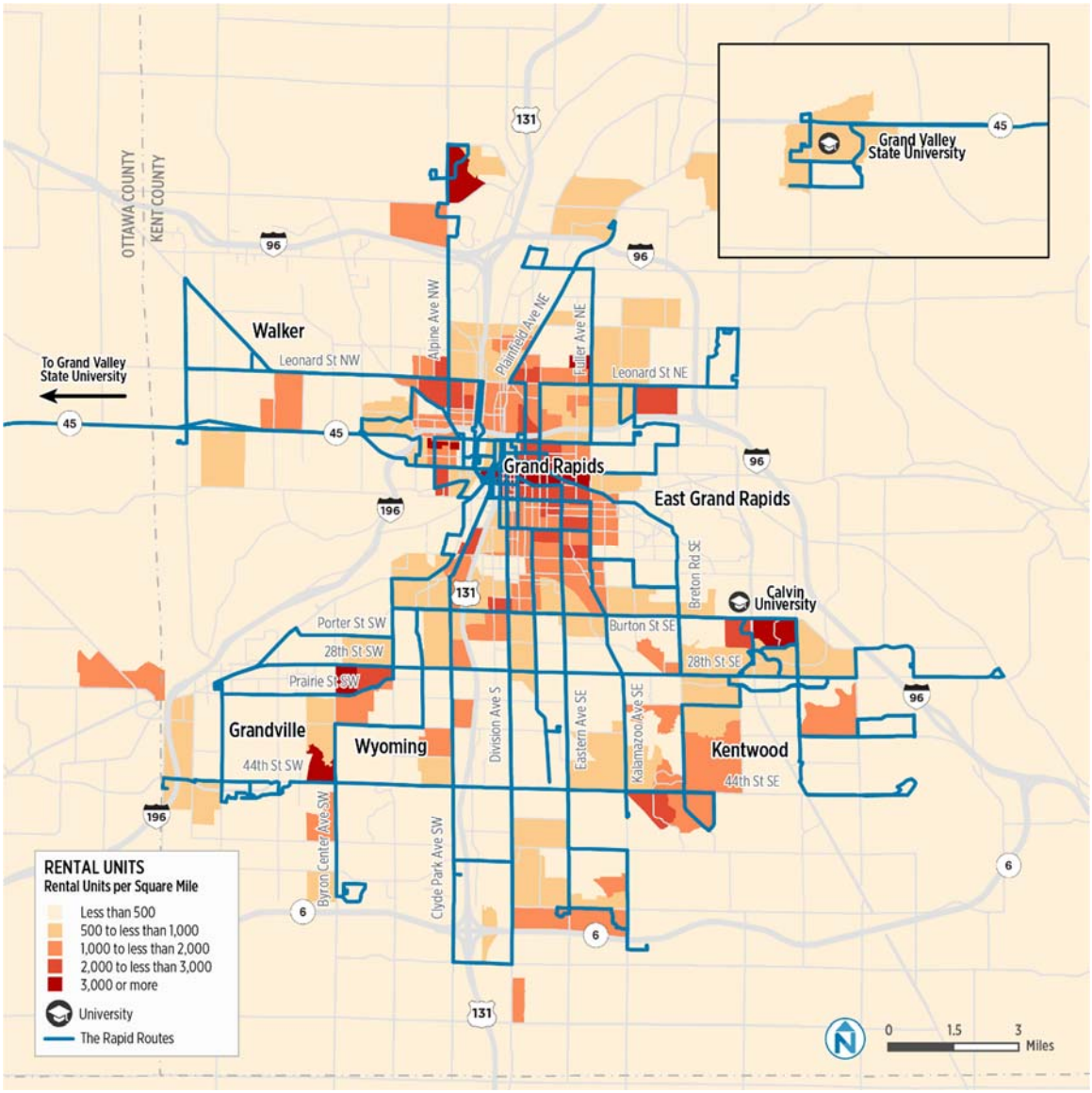


RENTAL UNITS

There is also a relationship between rental units and transit ridership, with higher concentrations of rental units correlating with higher transit ridership. The highest concentrations of rental units are generally located in the downtown Grand Rapids area and in large apartment complexes toward the periphery of the service area, including:

- The apartment complexes located in the northeast area of the city of Walker and Alpine Township, north of I-96 and west of US 131.
- The apartment complexes located south of Burton Street SE and east of M-44 in the eastern portion of the city of Grand Rapids.
- The apartment complexes located along Byron Center Avenue SW near 44th Street SE and near Prairie Street SW in the city of Wyoming.

Figure 3-11 Density of Rental Units

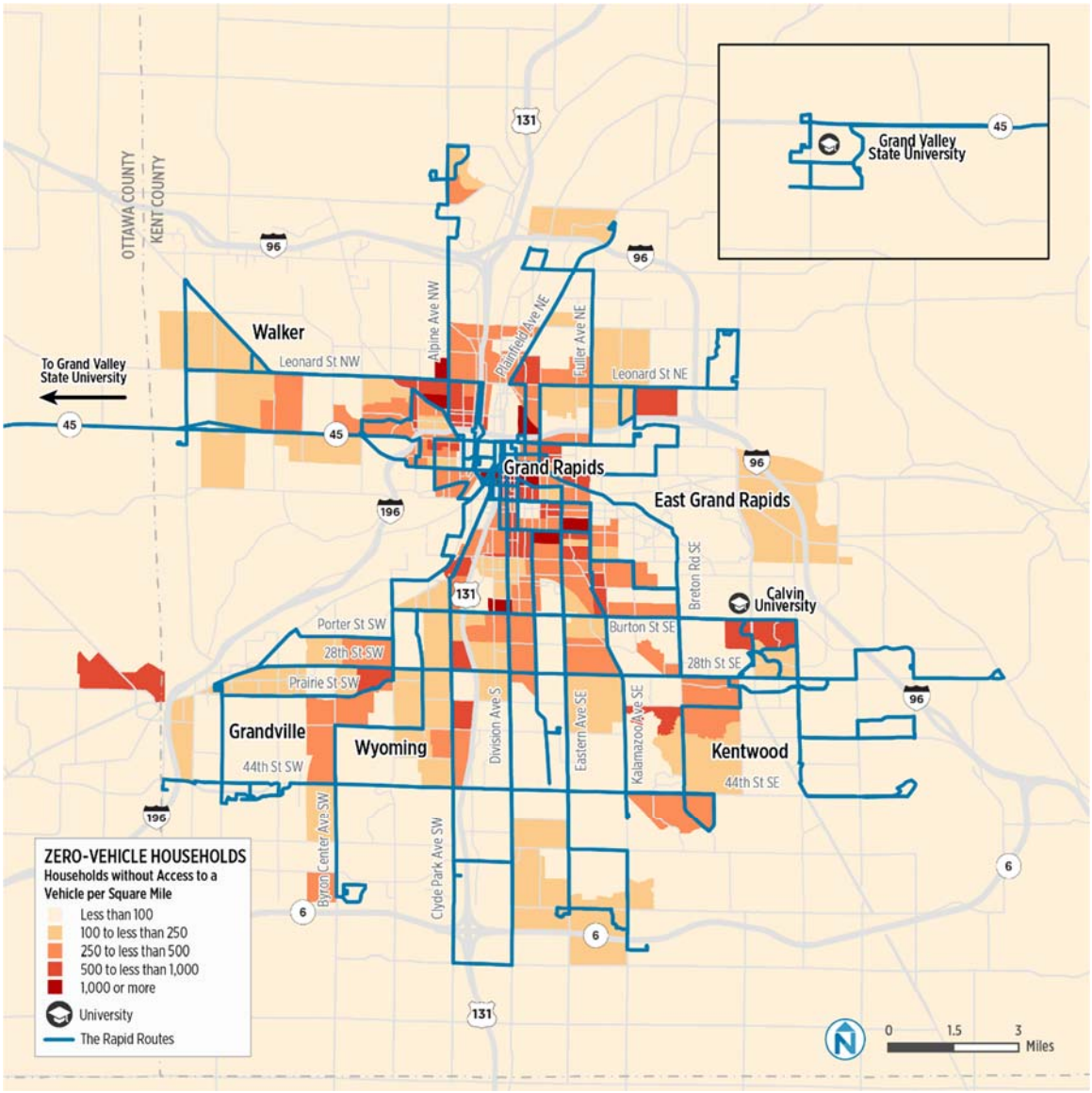


ZERO-VEHICLE HOUSEHOLDS

Many households in the service area have access to a motor vehicle. However, some areas, particularly in the neighborhoods surrounding downtown Grand Rapids, have more than 1,000 households per square mile without access to a motor vehicle, shown in Figure 3-12. The areas with the highest density of zero-vehicle households include:

- The apartment complexes located south of Burton Street SE and east of M-44 in the eastern portion of the city of Grand Rapids
- The West Grand neighborhood to the northwest of downtown Grand Rapids
- Along the Hall Street SE corridor between Madison Avenue SE and Plymouth Avenue SE

Figure 3-12 Density of Households without Access to a Motor Vehicle



TRANSIT PROPENSITY INDEX

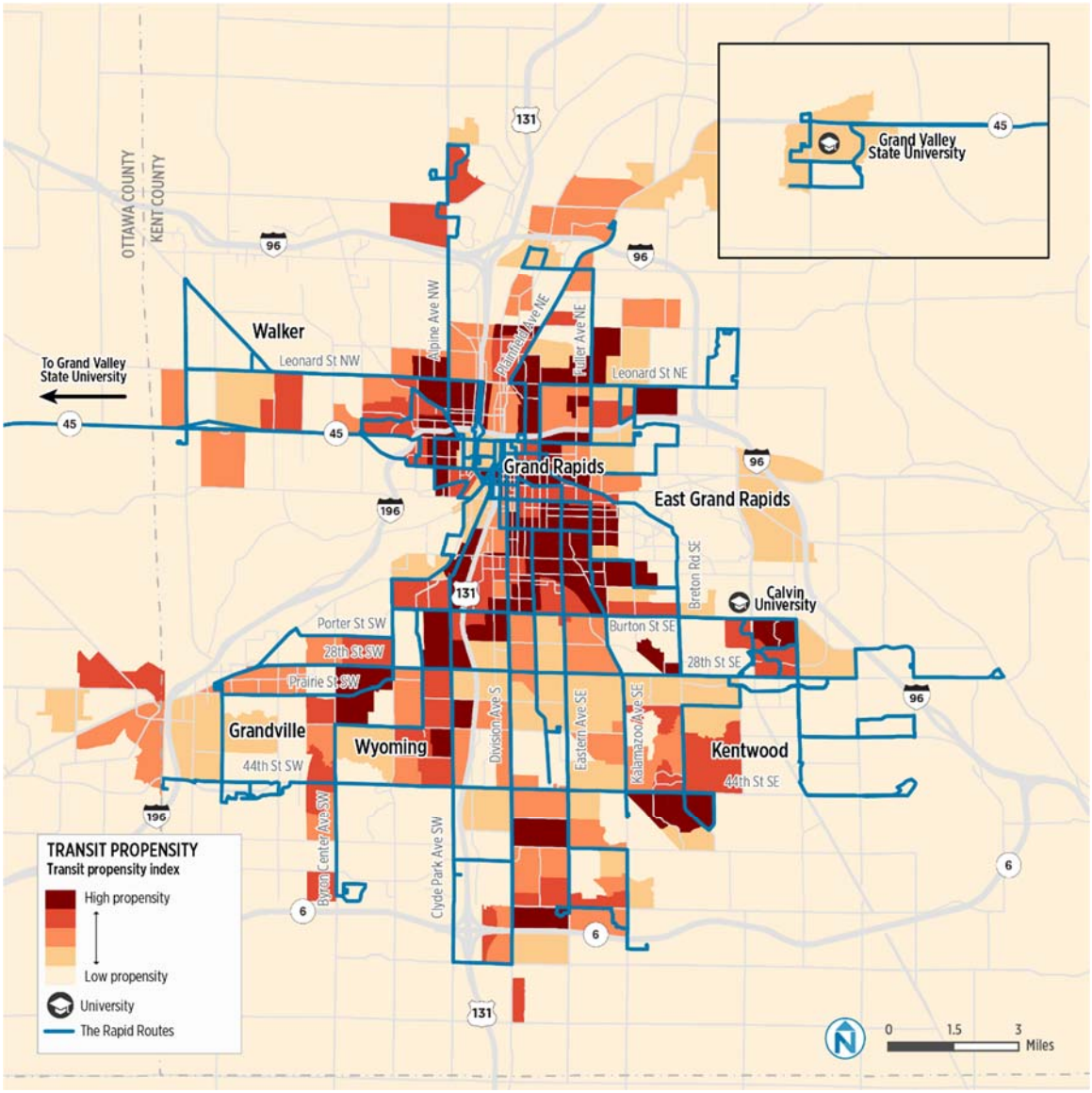
For the purposes of this analysis, propensity to take transit is based on the density of five combined indicators: seniors (age 65 and up), people with low-incomes (under 100% of the federal poverty level), people with disabilities, rental units, and zero-vehicle households.

Based on this index, the largest demand for transit is clustered into eight general areas:

- **Downtown Grand Rapids.** There is high transit demand throughout the downtown core of the city of Grand Rapids and the moderate-density inner neighborhoods adjacent to the south. This area, which is generally bound by Division Avenue S, I-196, Plymouth Avenue S, and Burton Street SE, ranks highly for almost every transit propensity indicator. While it is not included as a factor in the Transit Propensity Index, downtown Grand Rapids also ranks among the highest in terms of employment density and low-wage employment density.
- **Belknap Lookout.** This high transit propensity neighborhood is located north of downtown Grand Rapids, generally bound by I-196, Monroe Avenue NW, Knapp Street NE, and College Avenue NE. It is a moderately dense neighborhood located adjacent to industrial and manufacturing land uses on the eastern bank of the Grand River.
- **West Grand Rapids**. Similar to Belknap Lookout, the Swan and West Grand neighborhoods, generally bound by US 131, Richmond Street NW, Covell Avenue NW, and Butterworth Street SW, are also relatively dense residential neighborhoods with adjacent industrial land uses on the western bank of the Grand River.
- **Alpine Township.** Located around the intersection of 4 Mile Road NW and M-37 in the northern portion of the service area, this neighborhood is characterized by high density apartment complexes and several big box retailers, including Walmart and Meijer. This area ranks highly for population density, low-income populations, people with disabilities, and rental units.
- **The Clyde Park Avenue SW Corridor.** This corridor runs north-south through the city of Grand Rapids and the city of Wyoming and is located adjacent to the west of US 131. The corridor includes moderate density residential development throughout the corridor, industrial and manufacturing at the northern end, and big box retail to the south. This corridor ranks highly in terms of population density and low-income populations and ranks moderately high for rental units.
- **South Grand Rapids.** Located north of M-6 and east of US 131, this area is both within the city of Grand Rapids and the city of Kentwood. This neighborhood is characterized by large apartment complexes and several big box retailers including Walmart and Home Depot.
- **Kentwood.** The central area of the city of Kentwood, generally around the intersection of Breton Road SE and 44th Street SE, contains high density apartment complexes and a retail corridor.
- **North Kentwood and Calvin University.** The area surrounding this intersection includes numerous high-density apartment complexes, Calvin University, Woodland Mall, and the Shops at CenterPoint. It also ranks highly in zero-vehicle households, seniors, population density, and rental units.

Figure 3-13 shows the TPI for block groups in the Grand Rapids area.

Figure 3-13 Transit Propensity Index



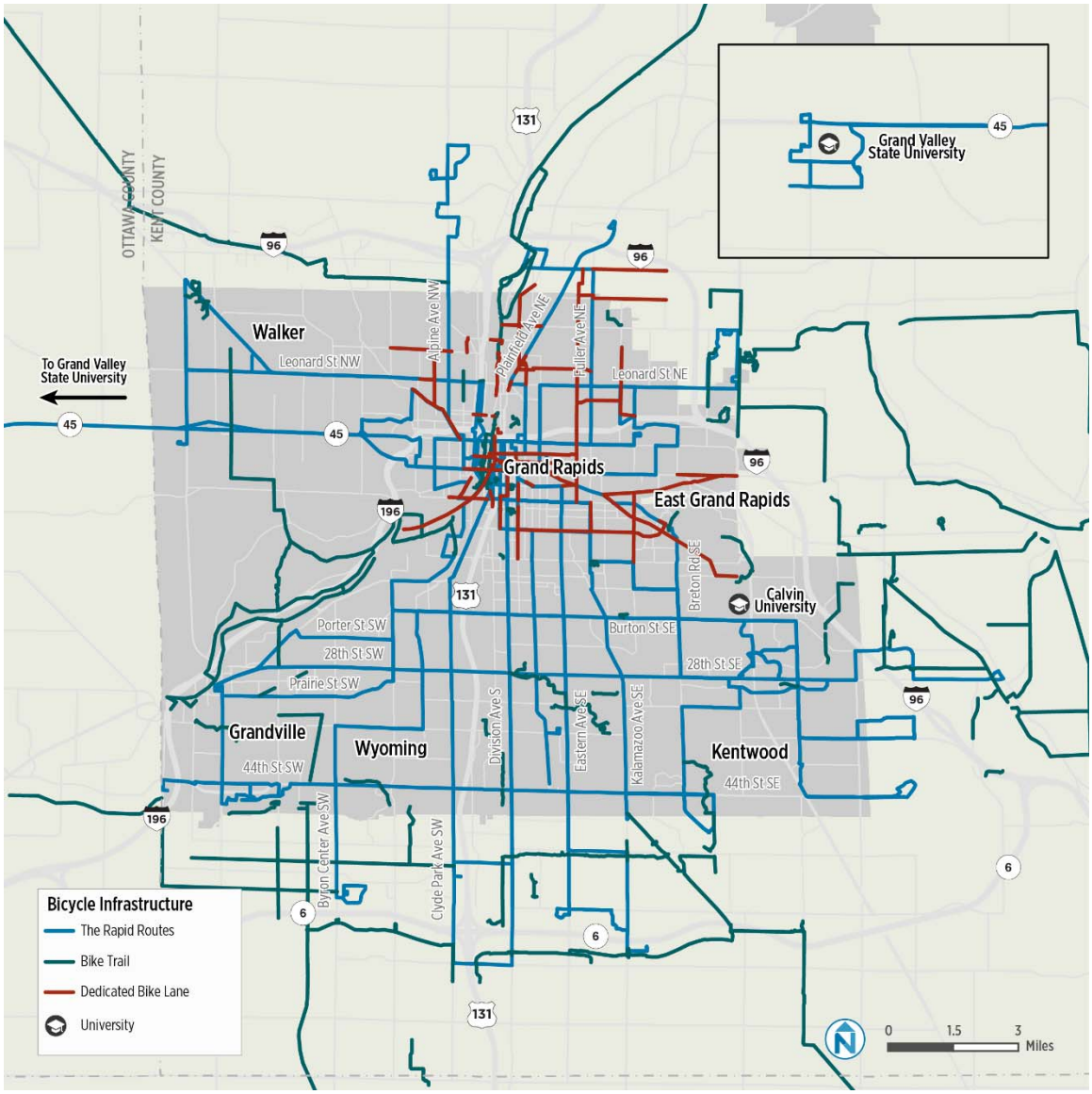
BICYCLE INFRASTRUCTURE

Another potential indicator for transit performance is the presence of bicycle infrastructure. Safe, comfortable bicycling and pedestrian networks provide the first- and last-mile connections needed for people to access the transit network. Areas of The Rapid service area with a higher concentration of quality bicycle infrastructure, including separated bike trails and dedicated bike lanes, are shown in Figure 3-14.

Dedicated bike lanes are concentrated in the downtown core and inner neighborhoods of Grand Rapids and East Grand Rapids. Key bike corridors include Diamond Avenue, Ball Avenue, Jefferson Avenue, Franklin Street, Robinson Road, Lake Drive, Plymouth Avenue, Fulton Street, and Market Avenue. Most routes in The Rapid network intersect at least one dedicated bike lane in the downtown core; however, Routes 2, 5, 6, 11, 13, 41, and 18 operate near or adjacent to dedicated bike lanes for a significant portion of their alignment.

Bike trails tend to be located on the periphery of the service area. However, multiple east-west bike trails in the southern portion of the service area provide connections to the Silver Line and Routes 1, 4, 10, and 16. Additional routes with connections to bike trails include Routes 7, 9, 12, 13, 15, 24, and 28.

Figure 3-14 Bicycle Infrastructure and Transit Network Overlay



4 TREND ANALYSIS

This trend analysis compares The Rapid's current performance with past performance. The trends in this section paint a data-driven picture of performance relative to previous years, which in turn helps to shape recommendations for future service improvements.

This section assesses 10 fixed-route performance indicators for the 10-year period from FY 2008 through FY 2017. The ten indicators are:

- Annual passenger trips
- Annual revenue hours
- Passengers per revenue hour
- Annual revenue miles
- Passengers per revenue mile
- Total annual operating expenses
- Operating expense per passenger
- Operating expense per revenue hour
- Annual farebox revenue
- Farebox recovery ratio

Figure 4-1 through Figure 4-10 present these performance indicators for the years specified.

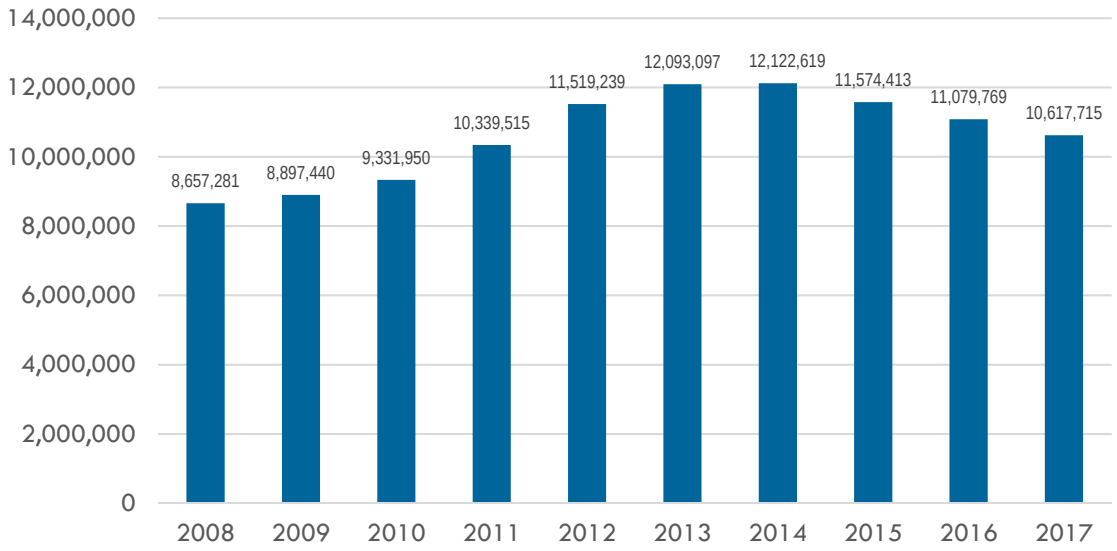
KEY FINDINGS

- The Rapid underwent a period of significant expansion between 2011 and 2014. During this time, the agency increased annual revenue hours by 19%, annual revenue miles by 24%, annual operating expenses by 24%, and annual passenger trips by 17%.
- Since 2014, The Rapid has generally continued increasing service levels in terms of annual revenue hours and annual revenue miles; however, annual passenger trips have been decreasing over this time period. Despite providing more service, The Rapid has been unsuccessful in generating new ridership. This suggests that service investments may not have been made in areas of highest transit demand or that external factors such as low gasoline prices, increased use of Transportation Network Company (TNC) services, or larger economic trends may be contributing to declining ridership.
- Total annual operating expense per revenue hour has been steadily decreasing since 2014, while annual revenue hours have increased. This suggests that while the agency has not been successful in generating new ridership, it has been able to provide service more efficiently.

RIDERSHIP

Ridership on The Rapid, measured in annual passenger trips, increased steadily between 2008 and 2014, accounting for a 40% increase in ridership over the seven-year period. A ridership decline began in 2015 following a $0.25 base fare increase, and annual passenger trips have continued to decrease through 2017. Overall ridership has decreased by 12% since reaching a peak of 12.1 million annual passenger trips in 2014. This decrease in ridership occurred despite increasing annual revenue hours and the implementation of the Silver Line BRT. Figure 4-1 shows the annual passenger trips between 2008 and 2017.

Figure 4-1 Annual Passenger Trips



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

REVENUE HOURS

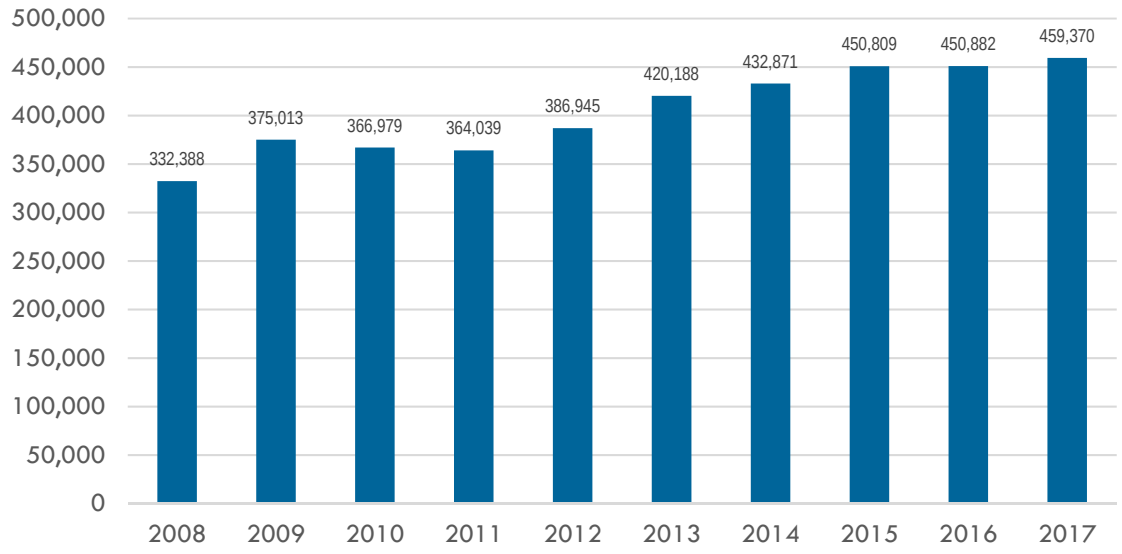
Revenue hours have been generally increasing since 2008, aside from slight decreases in 2010 and 2011. Over the past 10 years, revenue hours have increased by 38% to approximately 459,000 annual revenue hours in 2017.

Passenger trips per revenue hour decreased slightly from 2008 to 2009, before increasing to a peak of 29.77 trips per revenue hour in 2012. Since 2012, passenger trips per revenue hour have continued to decrease, reaching a low of 23.11 trips per revenue hour in 2017. This represents a 22% decrease over the six-year period and also corresponds with steadily declining annual passenger trips since 2014.

The data suggests that ridership generally increased while transit service was expanding until around 2013 or 2014, at which point service continued to expand and ridership began to decrease.

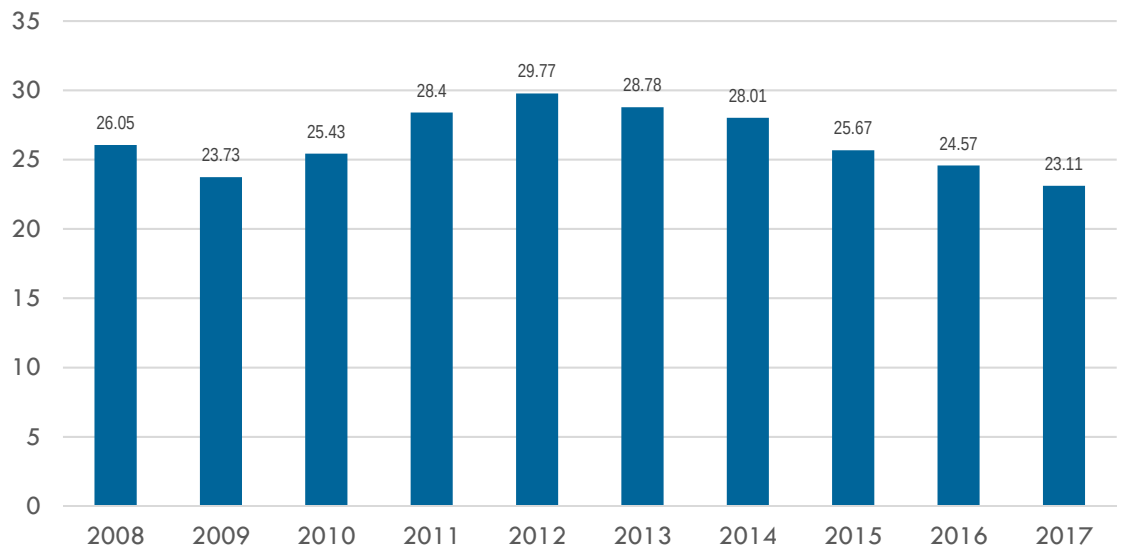
Figure 4-2 shows annual revenue hours and Figure 4-3 shows passenger trips per revenue hour between 2008 and 2017.

Figure 4-2 Annual Revenue Hours



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

Figure 4-3 Annual Passenger Trips per Revenue Hour

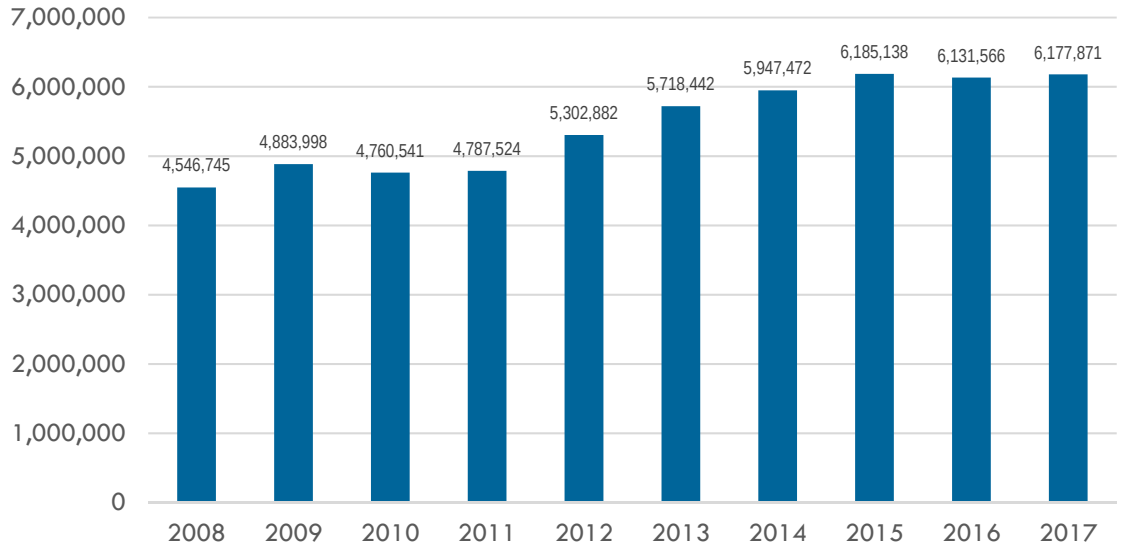


Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

REVENUE MILES

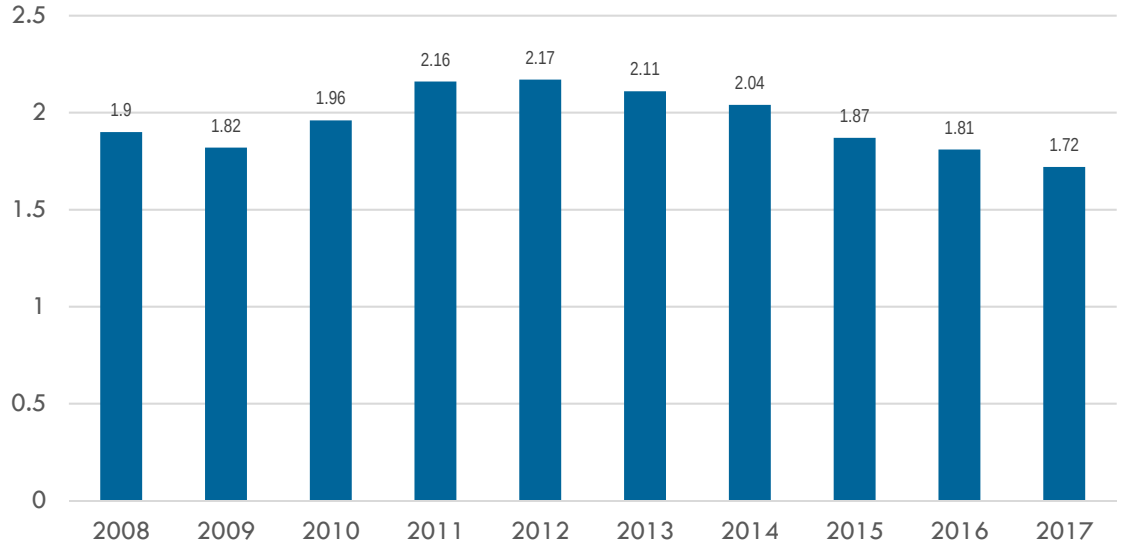
Annual revenue miles, shown in Figure 4-4, were relatively stable between 2008 and 2011, before steadily increasing between 2011 and 2015. Over this five-year period, annual revenue miles increased from 4.8 million to 6.1 million, a 29% increase. Since 2015, annual revenue miles have generally flattened. Annual passenger trips per revenue mile, shown in Figure 4-5, reached a peak of 2.17 trips per revenue mile in 2012 before steadily decreasing to a 10-year low of 1.72 trips per revenue mile in 2017. This represents a 21% decrease over the six-year period.

Figure 4-4 Annual Revenue Miles



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

Figure 4-5 Annual Passenger Trips per Revenue Mile



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

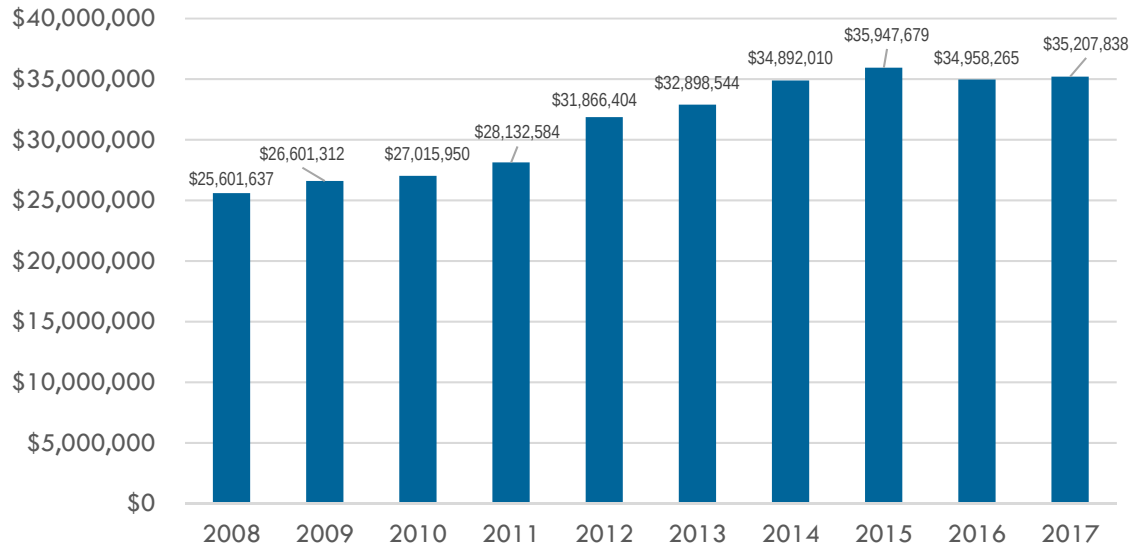
OPERATING EXPENSES

Annual operating expenses, shown in Figure 4-6, follow the same general trend as annual revenue hours and annual revenue miles—steadily increasing from 2008 until 2015 before stabilizing. Annual operating costs have increased by approximately 38% during the ten-year period between 2008 and 2017 to approximately $35 million annually.

As operating costs increased and stabilized, ridership began decreasing. This trend has resulted in an increasing operating expense per passenger since 2013, as shown in Figure 4-7. Operating expense per passenger has increased by 22% over this five-year period. Operating expense per revenue hour, shown in Figure 4-8, fluctuated significantly from year to year between 2008 and 2013. From 2014 through 2017, operating expense per revenue hour decreased steadily.

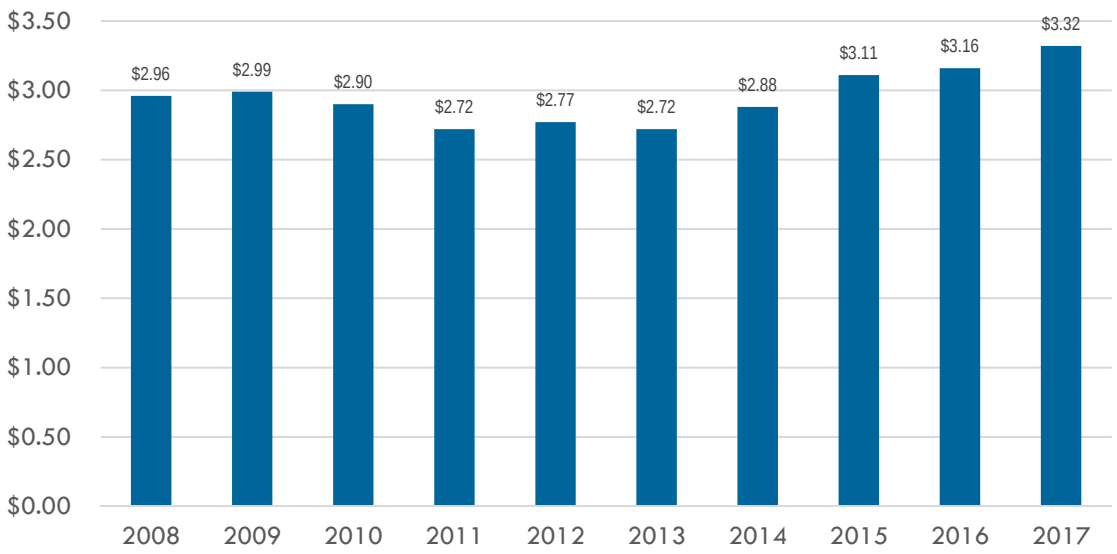
This data suggests that over the past four years, The Rapid has been able to provide more revenue hours at a lower cost per revenue hour. At the same time, declining ridership has led to increasing operating costs per passenger over time.

Figure 4-6 Total Annual Operating Expenses



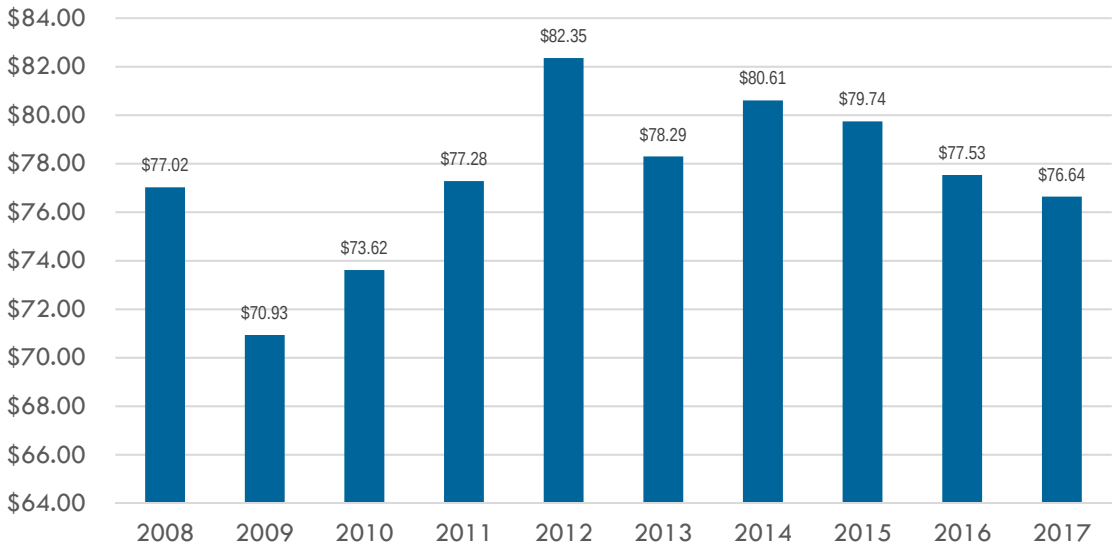
Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

Figure 4-7 Operating Expense per Passenger



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

Figure 4-8 Operating Expense per Revenue Hour



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

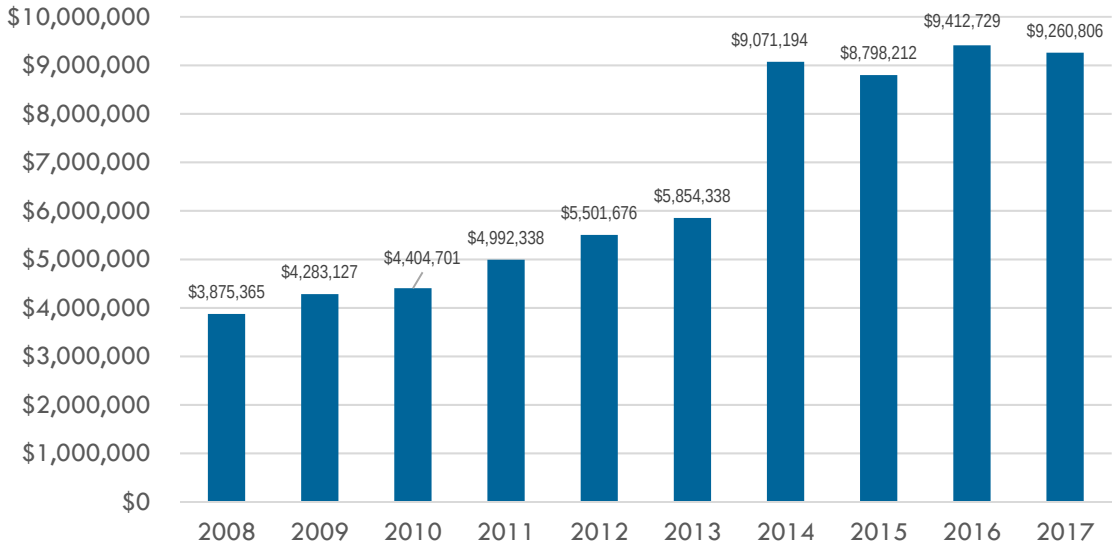
FAREBOX REVENUE

Annual farebox revenue, the revenue collected by the agency as fares paid by passengers, and the farebox recovery ratio, the ratio of operating expenses met by farebox revenue, both generally increased from 2008 through 2013. In 2014, both the annual farebox revenue and the farebox recovery ratio increased dramatically—by 55% and 45%, respectively. This increase is due to a change in reporting by The Rapid to include service contract revenue from partners like Grand Valley State University as farebox revenue.

Since this reporting change, farebox revenue and farebox recovery have been relatively stable. Farebox recovery ratio has been between 25.1% and 27.4%, and farebox revenue has been between $8.8 million and $9.4 million.

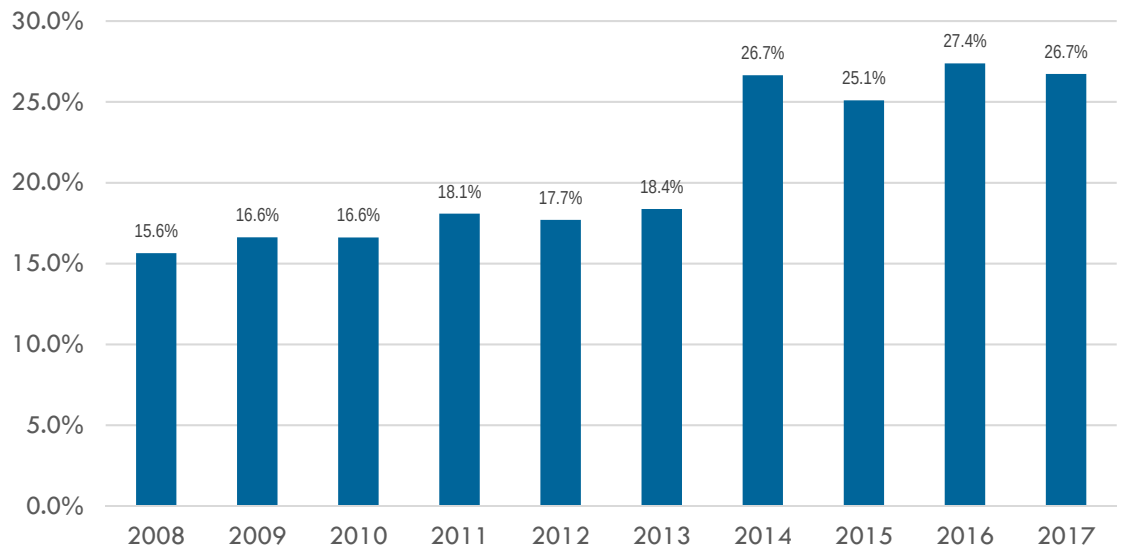
Figure 4-9 shows annual farebox revenue and Figure 4-10 shows farebox recovery ratio for The Rapid between 2008 and 2017.

Figure 4-9 Annual Farebox Revenue



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

Figure 4-10 Farebox Recovery Ratio



Source: iNTD Interurban Transit Partnership, FY2008 – FY2017

5 ROUTE PROFILES

This chapter describes The Rapid's fixed routes, including alignment characteristics, service span, headway, destinations served, ridership, and schedule adherence.

Figure 5-1 shows the existing system map for The Rapid, Figure 5-2 presents average daily weekday ridership for each route, Figure 5-3 shows boardings per revenue hour for each route. Figure 5-4 and Figure 5-5 present the average daily ridership for each route on Saturdays and Sundays, respectively. Figure 5-6 shows a system map of boardings by stop.

Ridership maps accompany each route profile and can be found in Appendix A. These maps depict boardings and alightings at each stop for each direction based on Automatic Passenger Count (APC) data provided by The Rapid for the time period between June 4, 2019 and July 14, 2019.

Appendix B provides more detailed information associated with each route, including the following charts and tables for reference:

- Weekday load by stop
- Weekday boarding/alighting profile
- Weekday ridership and maximum load by trip
- Tables summarizing boardings, alightings, and maximum load by direction, segment, and time of day

Appendix C provides ridership charts for each route providing Saturday and Sunday service, including the average number of riders per trip in both the inbound and outbound directions.

Figure 5-1 The Rapid System Map

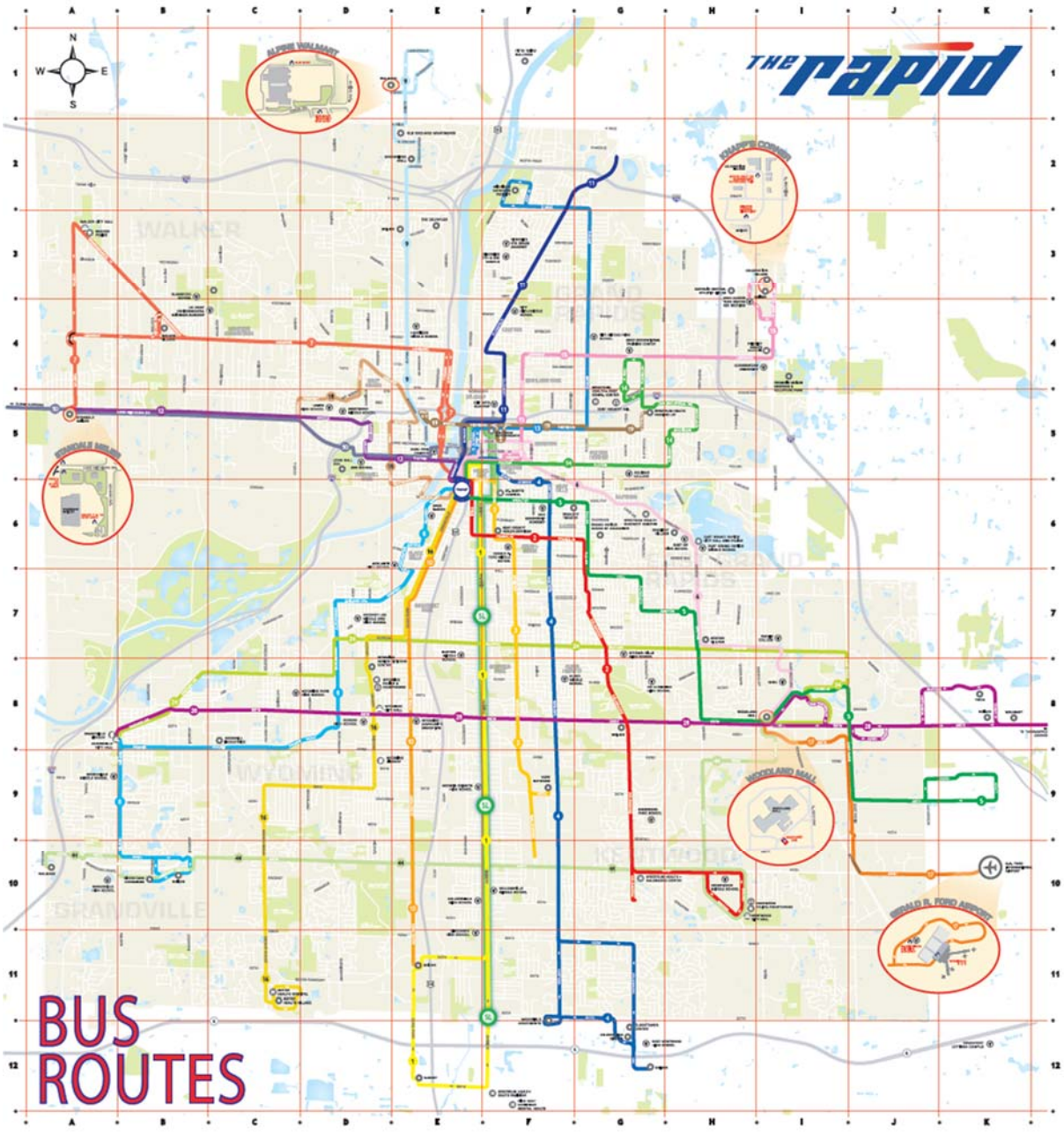
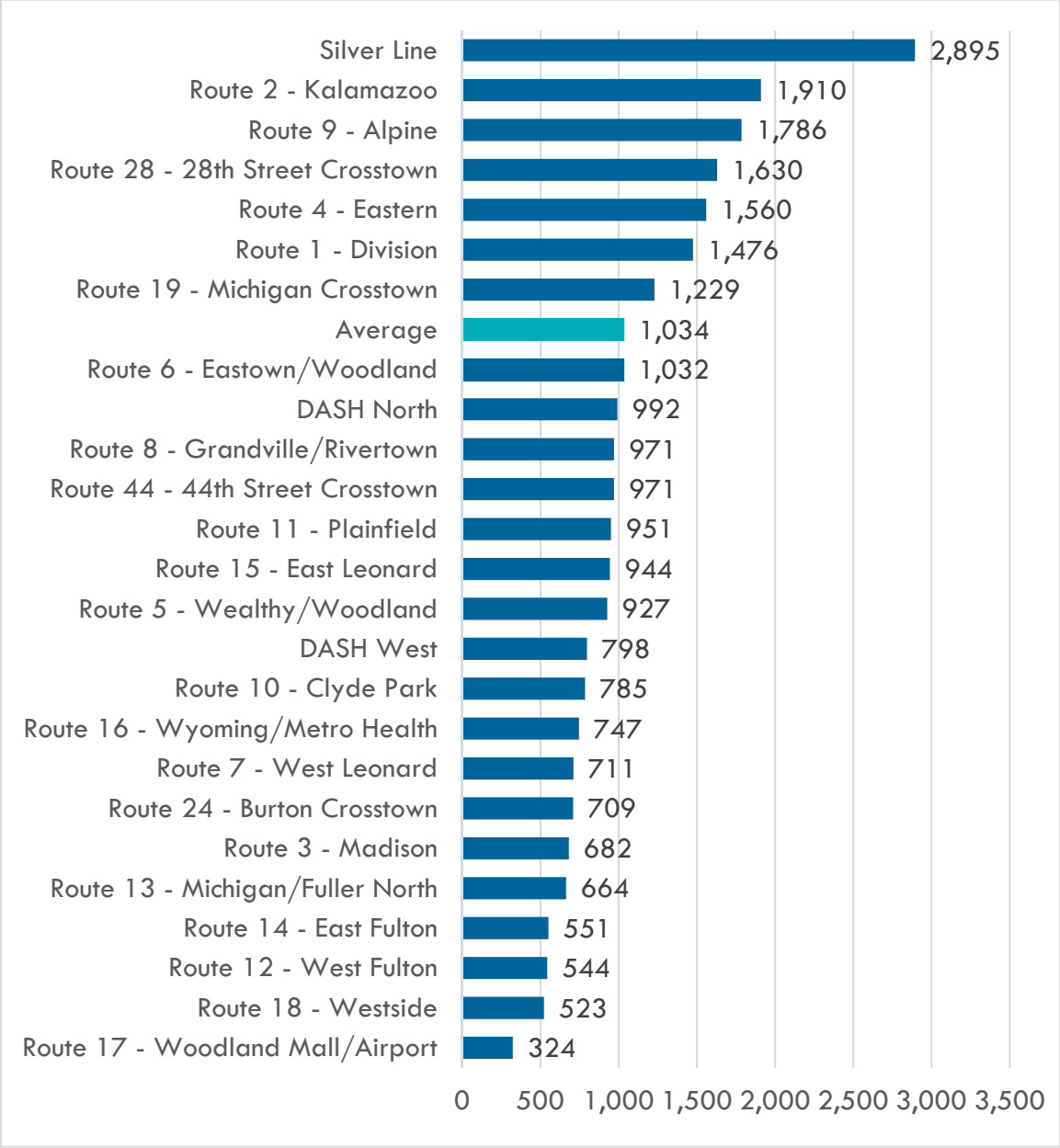
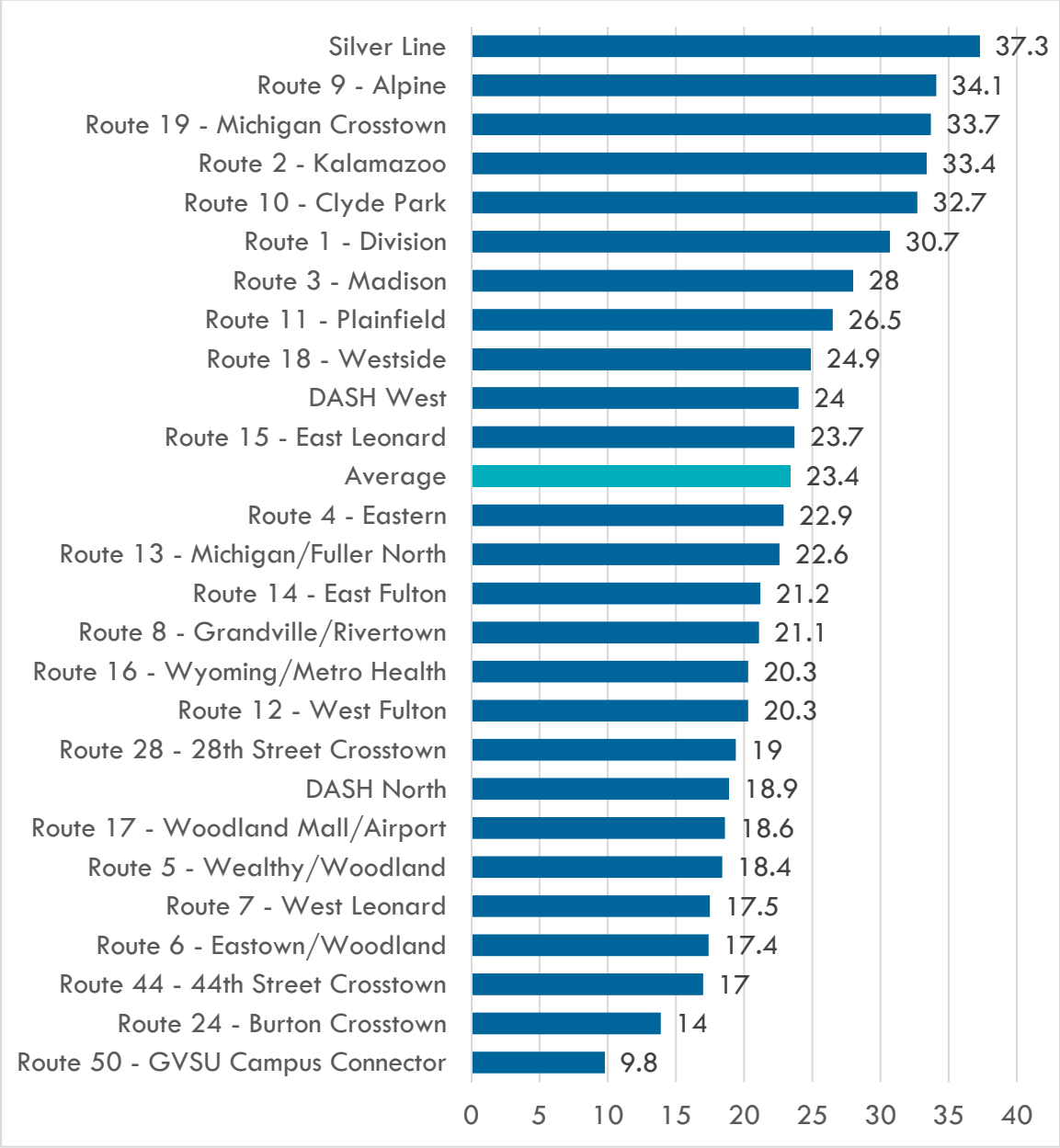


Figure 5-2 Weekday Riders by Route



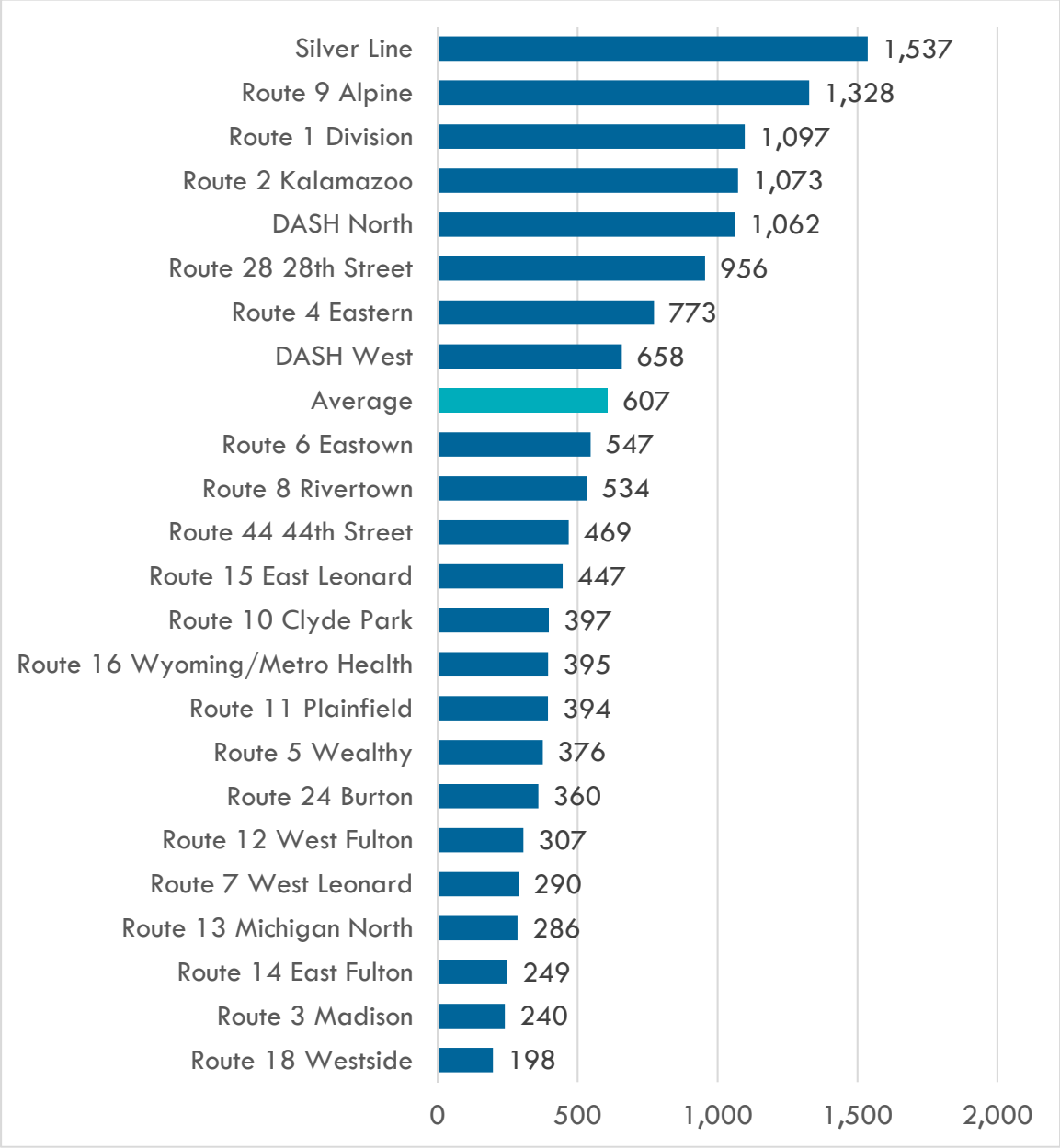
Source: The Rapid System Overview, APC data analysis, October-May 2019

Figure 5-3 Weekday Boardings per Revenue Hour



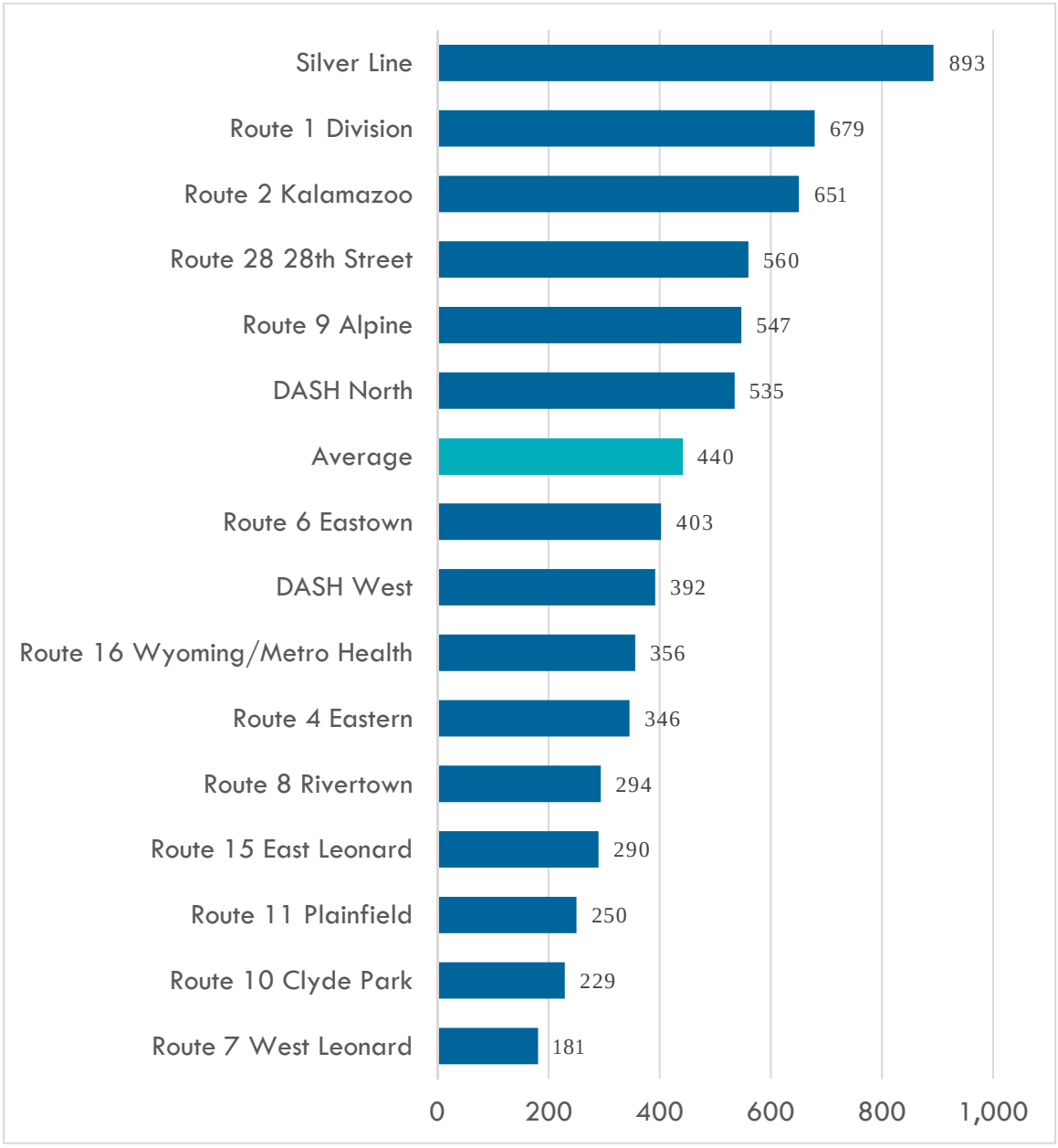
Source: The Rapid System Overview, APC data analysis, October-May 2019

Figure 5-4 Saturday Riders by Route



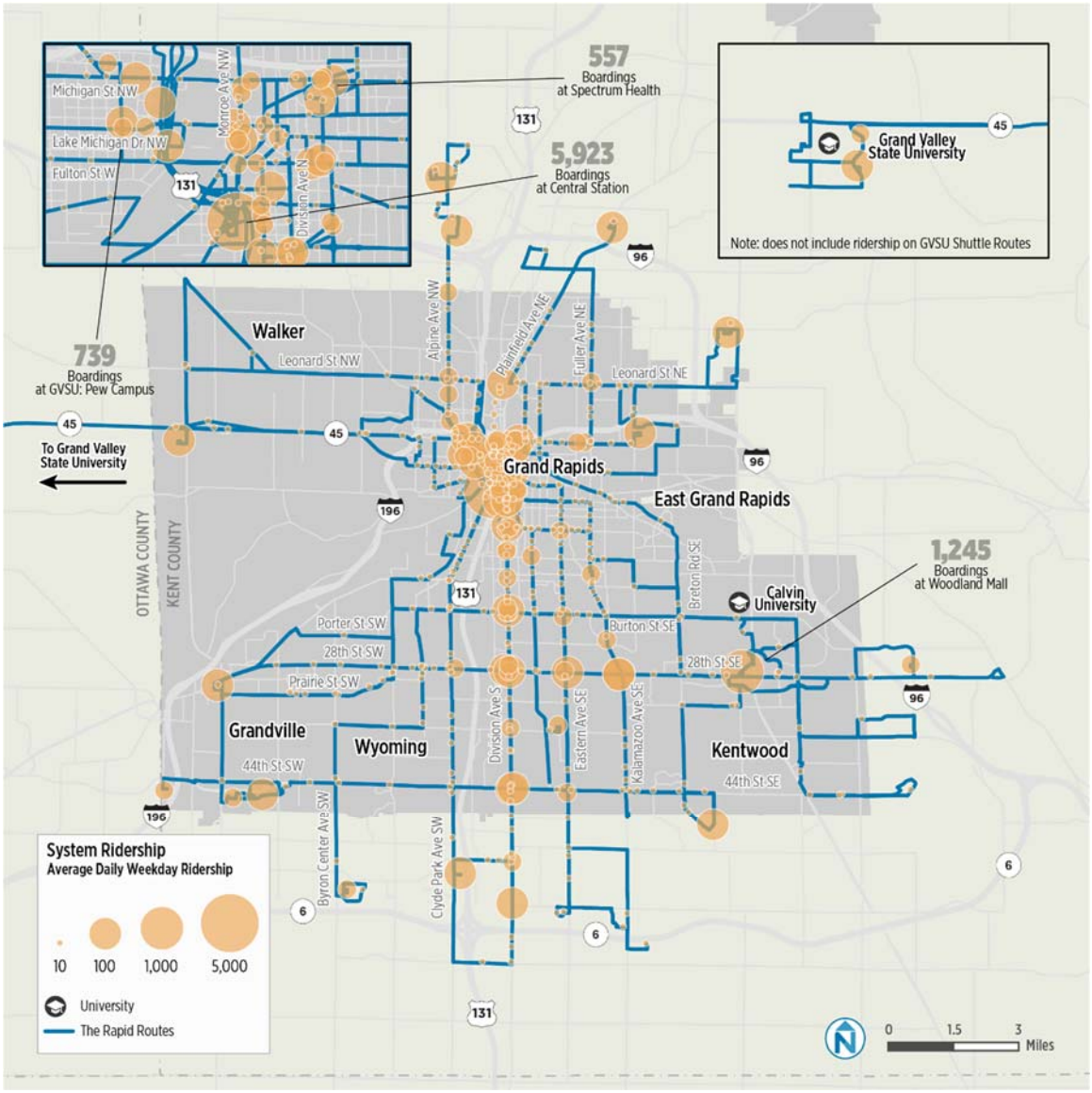
Source: The Rapid System Overview, APC data analysis, October-May 2019

Figure 5-5 Sunday Riders by Route



Source: The Rapid System Overview, APC data analysis, October-May 2019

Figure 5-6 The Rapid System Ridership, Average Weekday Boardings by Stop



WEEKEND SERVICE

The Rapid system provides different levels of service on weekdays, Saturdays, and Sundays. The Saturday service map, shown in Figure 5-7, covers much of the same area as weekday service. Only Routes 17 and 19 do not provide Saturday service. While coverage remains relatively consistent, service frequency and span are reduced. Saturday service frequency, shown in Figure 5-8, drops to 30-minute frequency on core routes and 60-minute frequency on coverage routes. Additionally, all service ends before 10:30 pm on Saturdays.

Sunday service coverage and frequency, shown in Figure 5-9 and Figure 5-10, respectively, are further reduced from Saturday levels. Less than 60% of routes in The Rapid system provide Sunday service, and only the Silver Line, Route 1, Route 2, and the combined alignment of Route 10 and Route 16 north of Burton Street operate with 30-minute frequencies. The remainder of the Sunday network operates hourly. Additionally, all Sunday service ends before 7:30 pm. This reduction in late night service on both Saturdays and Sundays makes it difficult for some workers to rely on transit for their commute needs.

Figure 5-7 Saturday Service Map

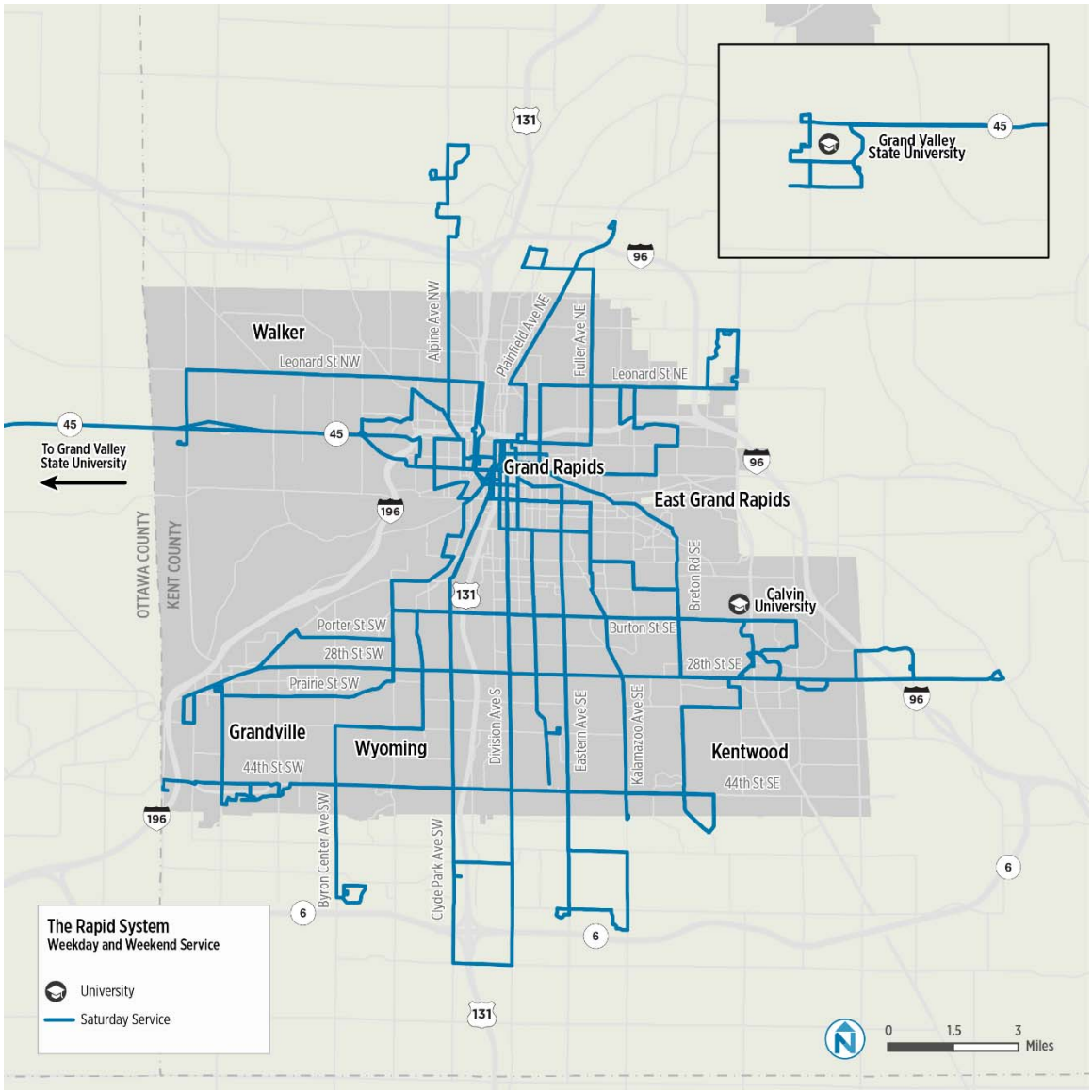


Figure 5-8 Saturday Service Frequency

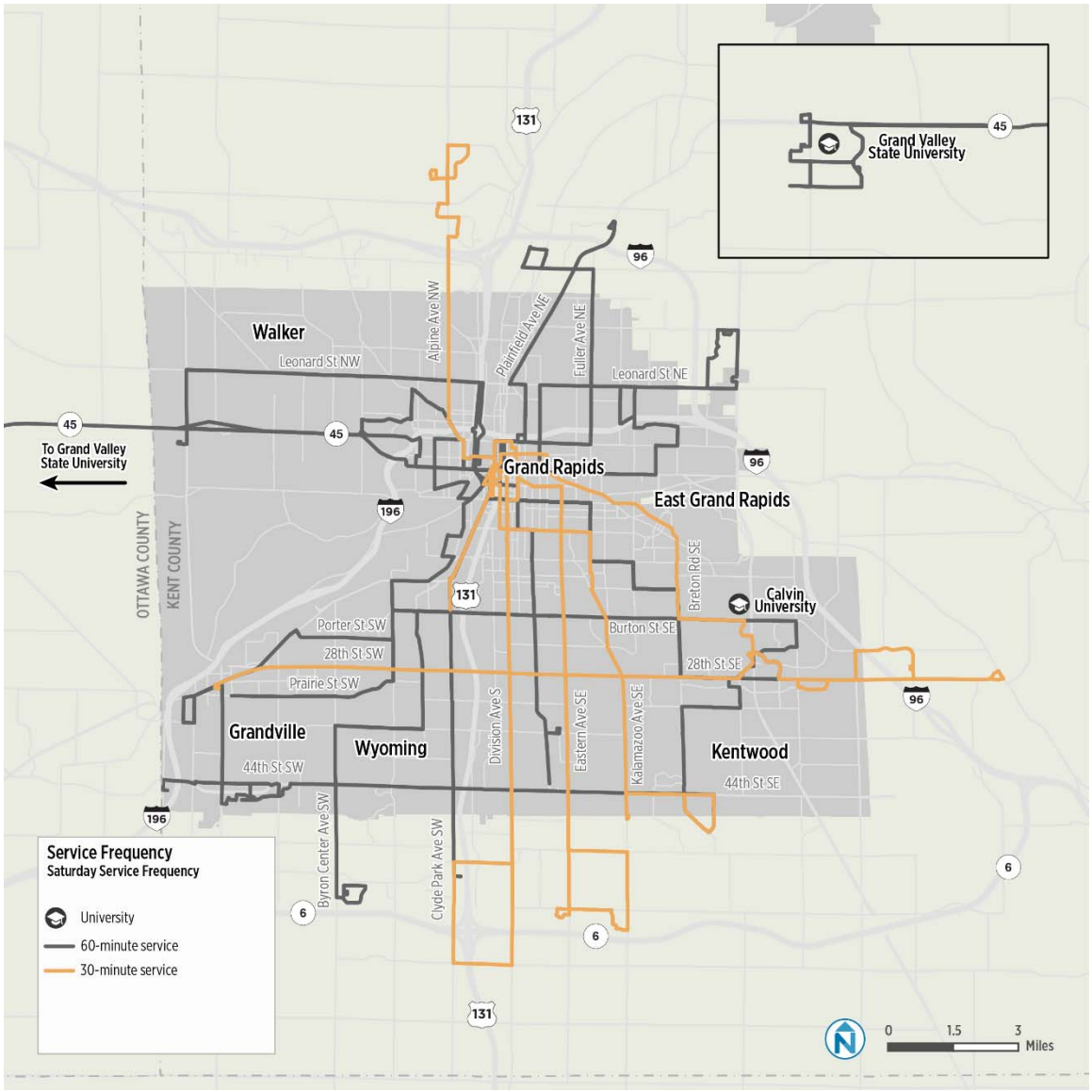


Figure 5-9 Sunday Service Map

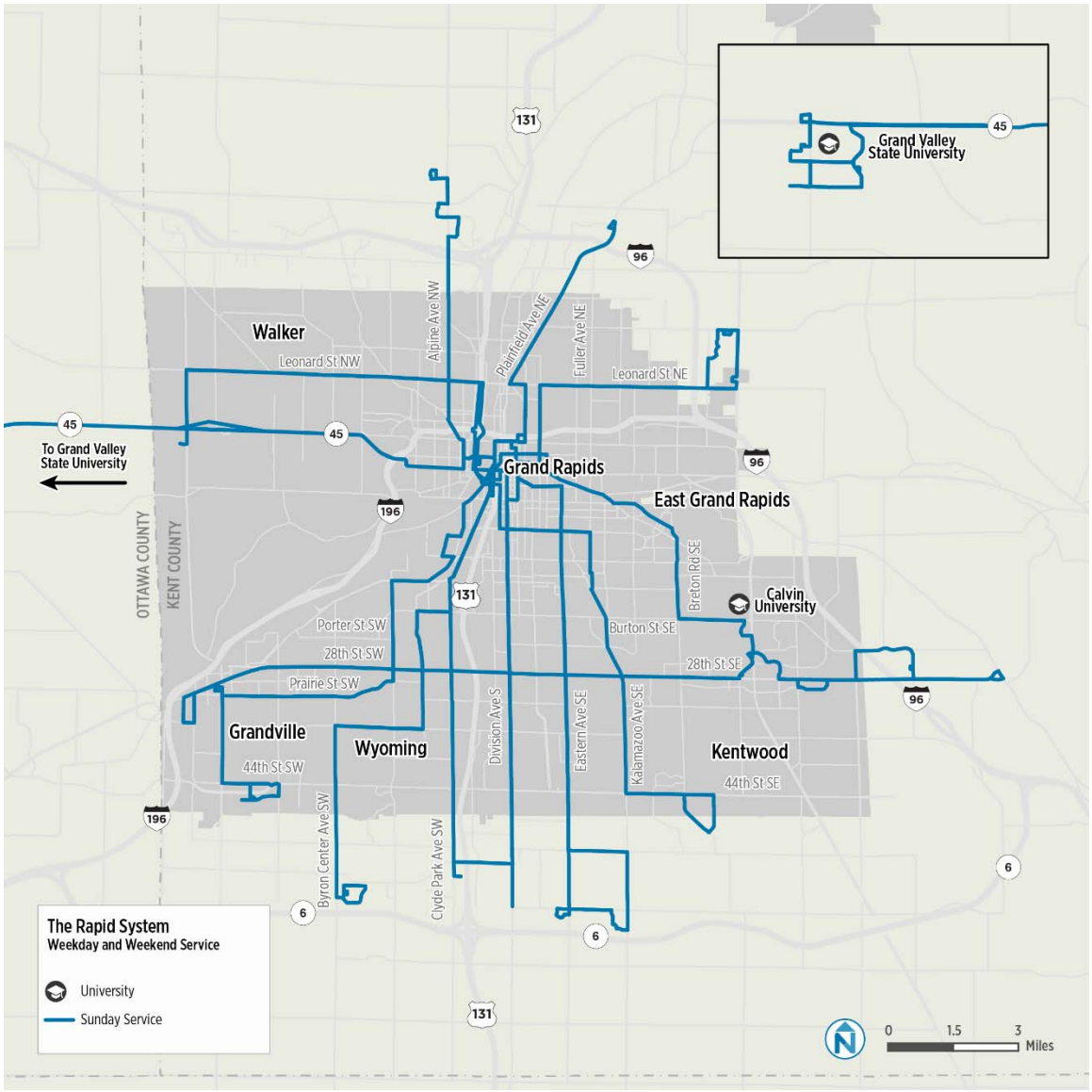
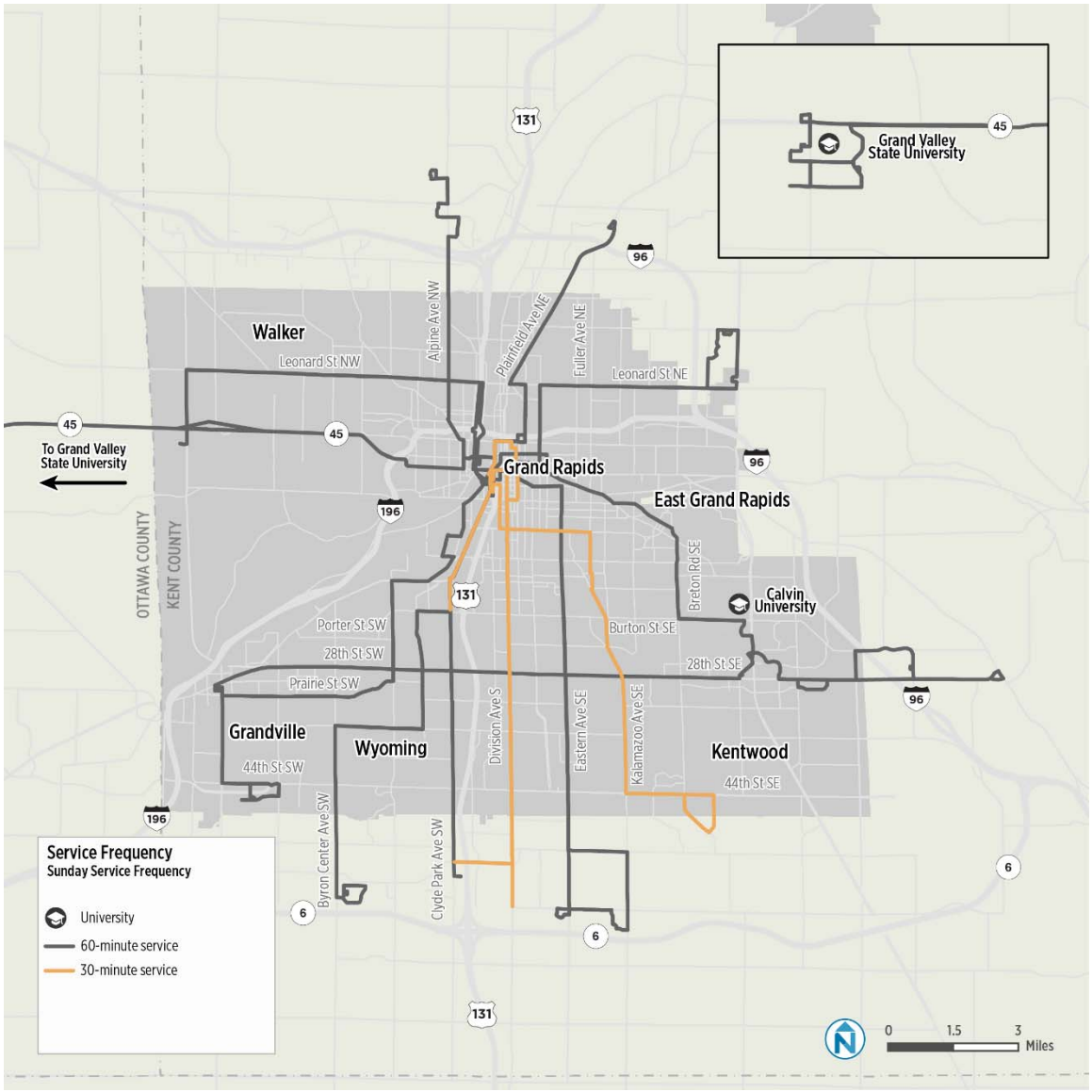


Figure 5-10 Sunday Service Frequency



SILVER LINE

The Silver Line is the only Bus Rapid Transit (BRT) route in the system. The route alignment, shown in Figure 5-11, travels between Central Station in downtown Grand Rapids and the 60th Street Park-and-Ride lot on Division Avenue & 60th Street. The route alignment includes an out-of-direction loop through downtown Grand Rapids, designed to directly serve major employers in downtown rather than facilitating transfers at Central Station with a faster, more direct trip. The Silver Line also operates in a fare free zone within downtown Grand Rapids, shown as the inset map in Figure 5-11.

The Silver Line operates on the same alignment as Route 1 outside of downtown, along Division Avenue south of Wealthy Street and north of 60th Street. Despite running along the same alignments, the Silver Line and Route 1 do not share stops, making it difficult for discretionary

riders to choose between the two services. Stops served by the Silver Line are spaced approximately every half mile to mile, while stops served by Route 1 are spaced approximately every 500 to 1,000 feet. The relatively far stop spacing for the Silver Line compared to Route 1 generally results in faster travel times on the Silver Line but makes Route 1 more accessible to a larger number of passengers.

The Silver Line provides connections to Grand Rapids Community College, DeVos Place, Medical Mile and Spectrum Health-Butterworth, and Mercy Health. In addition to the routes serving Central Station, the Silver Line also enables transfers with Routes 3, 4, 5, 11, 14, 15, 19, 24, 28, 44 and 50.

Major Destinations

- Central Station
- Van Andel Arena
- DeVos Place
- Medical Mile
- Grand Rapids Community College
- Mercy Health
- 60th Street Park-and-Ride

Ridership

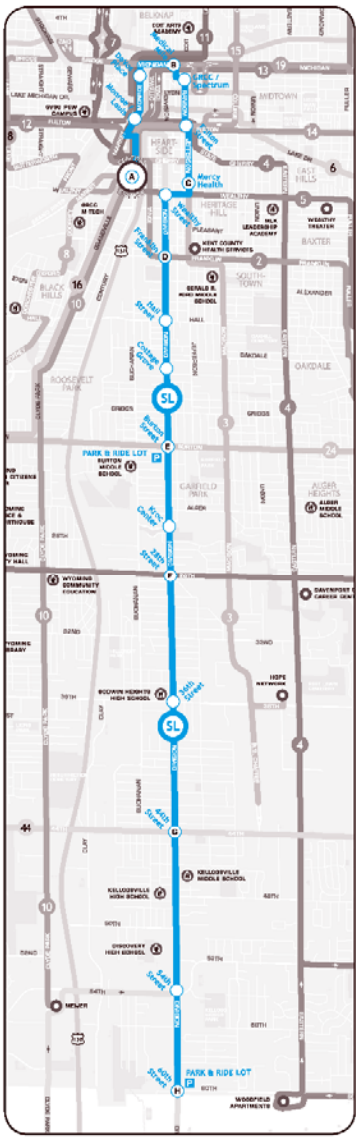
The Silver Line averages approximately 2,895 riders per weekday, making it the highest ridership route in the system. Route 1 operates along the same alignment as the Silver Line south of Wealthy Street and is the 6th highest ridership route in the system, averaging 1,476 riders per weekday. The combined ridership on the shared alignment outside of the downtown area averages approximately 2,683 riders per weekday. Peak headways are every 10 minutes, 20 minutes during the midday period, and 30 minutes during the evening. The first outbound trip in the morning has higher ridership than the next several trips, indicating that there may be demand for earlier service. This pattern also exists for Route 1, indicating demand for earlier service along the Division corridor.

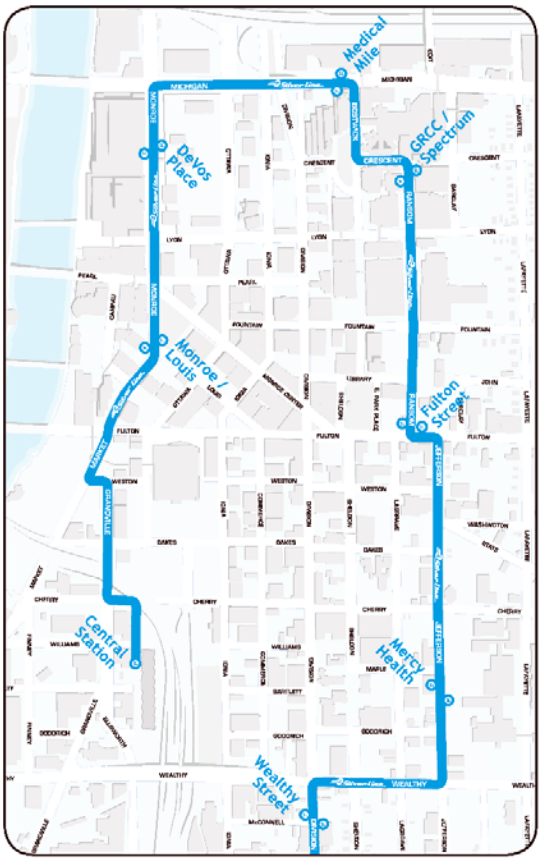
The Silver Line averages 37.3 boardings per revenue hour, making it the most productive route in the system. Productivity between Franklin Street Station and Mercy Health Station (69.2 boardings per revenue hour) is nearly double the route's average productivity. Productivity is below average at the southern end of the route between 60th Street Station and 44th Street Station (28.1 boardings per revenue hour) and between 44th Street Station and 28th Street Station (17.9 boardings per revenue hour).

Ridership and productivity on the Silver Line are highest during the midday period when the service frequency is reduced from every 10 minutes to every 20 minutes. This indicates that there may be sufficient demand for the Silver Line to operate more frequently during the midday period. Additionally, the 20-minute headways during the midday period make transfer timing at Central Station more difficult since all other routes are operating at 30- or 60-minute frequency.

The Silver Line is also the highest ridership route in terms of weekend service, averaging approximately 1,537 Saturday riders and 893 Sunday riders. This represents a 47% and 69% decrease from weekday ridership, respectively.

Figure 5-11 Route Map, Silver Line





Schedule Adherence

The Silver Line's on-time performance (OTP) varies significantly by the time of day. Between June of 2018 and June of 2019, the route arrived on-time 96.2% of the time during the early morning, 90.0% of the time during the morning peak, 77.9% of the time during the midday period, 45.1% of the time during the afternoon peak, and 80.0% of the time during the evening period. On average, the OTP for the Silver Line is 77.8%, the 2nd lowest average OTP in the system.

During the afternoon peak, the inbound Silver Line is over five minutes late entering the Monroe & Louis stop, on average. This indicates that the inbound Silver Line is not able to meet its scheduled time points in the downtown area may result in passengers missing their transfers at Central Station. During the afternoon peak, the outbound Silver Line is over five minutes late on average to the transfer points at Division & Burton, Division & 28th, and Division & 44th. This indicates that the outbound Silver Lane is not able to meet its scheduled timepoints and may result in passengers missing their transfers with Routes 24, 28, and 44.

Silver Line Characteristics		
Weekday		
Start Time		5:07 AM
End Time		12:33 AM
Average Daily Boardings		2,895[1]
Peak Headway (mins)[2]		10
Off-Peak Headway (mins)		20
Evening Headway (mins)		30
Schedule Adherence	On Time	77.8%[3]
Saturday		
Start Time		5:37 AM
End Time		10:03 PM
Headway (mins)		30
Sunday		
Start Time		6:07 AM
End Time		7:03 PM
Headway (mins)		30

Scheduled travel times for the Silver Line are consistent across different times of day. Thus, it is likely that as traffic congestion ebbs and flows throughout the day, OTP similarly improves and worsens since the schedule does not allow for additional travel time during heavily congested time periods. This is particularly evident during afternoon peaks, when downtown Grand Rapids traffic slows down the Silver Line.

Summary

The Silver Line is among the highest ridership and productivity routes in The Rapid system, despite running duplicative service with Route 1 along Division Avenue. The high frequency service and relatively large spaces between stops allow the Silver Line BRT route to operate like an express route, while Route 1 provides more local service along the highest ridership corridor in the service area. However, because the two routes do not share any stops, passengers are likely to use whichever service is closest to their origin or destination, rather than walking out of their way to choose the fastest or most direct service. The Silver Line and Route 1 both represent two of the top six highest ridership routes in the system, but allowing shared stops between the two services would provide passengers with more choices and improve accessibility to the transit network. The

[1] Average daily boardings is drawn from The Rapid APC data between June 2019 and July 2019 and represents 'Weekday Riders'.

[2] Peak hours defined as 6:00AM-10:00AM and 3:00PM-7:00PM.

[3] On-time performance (OTP) is drawn from The Rapid provided weekly on-time performance data collected between June 2018 and June 2019.

Silver Line also has the second lowest average OTP in the system, especially low in the afternoon peak period. Operating earlier morning service, tailoring running times to specific times of day, and improving OTP and service reliability on The Rapid's only BRT route may make the service more attractive to discretionary riders and increase ridership on the system.

ROUTE 1 – DIVISION

Route 1 travels between Central Station in downtown Grand Rapids and the Meijer located in the City of Wyoming via Division Avenue. The route alignment, shown in Figure 5-12, includes an out-of-direction loop through downtown Grand Rapids along Division Avenue, Fulton Street, Ottawa Avenue, Oakes Street, and Grandville Avenue. This loop operates on a different alignment than the Silver Line downtown loop. Unlike the Silver Line, the route alignment also makes a loop between Division Avenue, 68th Street, Clyde Park Avenue, and 54th Street. This loop allows Route 1 to provide service to several shopping centers in addition to the Meijer located at the intersection of Clyde Park Avenue and 54th Street.

Route 1 operates on the same alignment as the Silver Line outside of downtown along Division Avenue, south of Wealthy Street and north of 60th Street. Despite running along the same alignments, the Silver Line and Route 1 do not share stops, making it difficult for discretionary riders to choose between the two services. Stops served by the Silver Line are spaced approximately every half mile to mile, while stops served by Route 1 are spaced approximately every 500 to 1,000 feet. The relatively far stop spacing for the Silver Line compared to Route 1 generally results in faster travel times on the Silver Line but makes Route 1 more accessible to a larger number of passengers.

Route 1 provides connections to Grand Rapids Community College, Van Andel Arena, 60th Street Park-and-Ride, Meijer and, in addition to the routes serving Central Station, enables transfers with Routes 3, 4, 5, 11, 14, 15, 19, 24, 28, 44, and 50.

Major Destinations

- Central Station
- Van Andel Arena
- Grand Rapids Community College
- 60th Street Park-and-Ride
- Meijer

Ridership

Route 1 averages approximately 1,476 riders per weekday, making it the 6th highest ridership route in the system, despite sharing the majority if its alignment with the Silver Line. Service on Route 1 operates with 30-minute headways all day, including peak, off-peak, and evening time periods. The first inbound trip in the morning has higher ridership than the next three trips, indicating that there may be sufficient demand for earlier morning service.

Route 1 averages 30.7 boardings per revenue hour, making it the sixth most productive route in the system. Productivity is highest on the segments between Division & Fulton and Central Station (69.1 boardings per revenue hour) and between Division & Burton and Division & Franklin (41.8 boardings per revenue hour). The southernmost segment, Meijer to Division & 54th, has the 3rd highest productivity of any segment on the route (29.3 boardings per revenue hour).

Ridership and productivity on Route 1 are highest during the midday period, the afternoon peakafternoon peak, and the morning peak. The Silver Line also has high ridership and productivity during the midday period, which indicates that there may be demand for more

frequent midday service for both routes operating on the Division Avenue corridor. While the Silver Line's frequency is reduced from 15 minutes to 20 minutes during the midday period, Route 1's frequency remains consistent at 30 minutes. This indicates that there may be demand for more frequent service on Route 1 during the midday period and during the afternoon peak period.

Route 1 is the third highest ridership route on Saturdays and the second highest ridership route on Sundays, averaging approximately 1,097 Saturday riders and 679 Sunday riders. This represents a 26% and 54% decrease from weekday ridership, respectively.

Figure 5-12 Route Map, Route 1 – Division

Route 1 Characteristics		
Weekday		
Start Time		4:48 AM
End Time		12:49 AM
Average Daily Boardings		1,476
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	77.5%
Saturday		
Start Time		5:23 AM
End Time		10:28 PM
Headway (mins)		30
Sunday		
Start Time		6:32 AM
End Time		7:19 PM
Headway (mins)		30

Schedule Adherence

Route 1's OTP varies significantly by time of day, similar to the Silver Line. Between June of 2018 and June of 2019, the route arrived on-time 96.5% of the time during the early morning, 85.6% of the time during the morning peak, 72.8% of the time during the midday period, 42.6% of the time during the afternoon peak, and 90.1% of the time during the evening period. On average, the OTP for the Route 1 is 77.5%, the lowest average OTP in the system.

Much like the Silver Line, Route 1's schedule does not vary throughout the day, but traffic levels and the associated delays do impact the route, particularly in downtown Grand Rapids during the afternoon peak. On average during the afternoon peak, inbound trips arrive over five minutes late to all timepoints except the starting point of the route, the 54th Street Meijer. The average trip arrives over eight minutes late to the downtown stops located at Division & Burton, Division & Fulton, and Central Station. The average outbound trip during the afternoon peak arrives over five minutes late to all timepoints, including the starting point at Central Station. The afternoon peak delays on Route 1 are so severe that the average passenger is likely to miss their transfer opportunities along the entire alignment of the route.

Summary

Route 1 is the sixth highest ridership and sixth most productive route in the system, despite running somewhat duplicative service with the Silver Line on Division Avenue. While the Silver Line operates with higher frequency, the relatively dense stop spacing on Route 1 makes it a slower but more accessible service. Dense stop spacing, every 500 to 1,000 feet, allows more people to live or work within walking distance of the service than the wider stop spacing, every half mile to a mile, on the Silver Line. Because the two routes do not share any stops, passengers are likely to use whichever service is closest to their origin or destination, rather than walking out of their way to choose the fastest or most direct service. This makes the Silver Line and Route 1 complementary services, rather than supplemental. Route 1 and the Silver Line both represent two of the top six highest ridership and productivity routes in the system, but allowing shared stops between the two services would provide passengers with more choices and improve accessibility to the transit network. The low on-time performance for Route 1 during the afternoon peak make it a highly unreliable service, particularly for passengers who rely on transfers at Central Station.

ROUTE 2 – KALAMAZOO

Route 2 travels between Central Station in downtown Grand Rapids and Kentwood City Hall via Iona Avenue, Franklin Street, Fuller Avenue, Kalamazoo Avenue, and 44th Street, as shown in Figure 5-13. Route 2 operates a loop through 44th Street, Walma Avenue, and Breton Road to provide service to several apartment complexes and the municipal building campus for the City of Kentwood. Route 2 also operates a deviation on Kalamazoo Avenue south of 44th Street to provide service to the Kent County Health Department's Kentwood office in the outbound direction only. Route 2 operates a short turn service between Central Station and the Meijer located at Kalamazoo & 28th every 30 minutes, operating in tandem with the full route between Central Station and Kentwood City Hall. This enables the route to provide 15-minute peak service between Central Station and Kalamazoo & 28th and 30-minute all day service on the full route alignment.

In addition to providing connections to the City of Kentwood City Hall and other municipal buildings, Route 2 provides service to Meijer and the State of Michigan Department of Human Services. Route 2 also enables transfer opportunities with all the routes serving Central Station, as well as with the Silver Line and Routes 1, 3, 4, 5, 24, 28, and 44.

Route 2 Characteristics		
Weekday		
Start Time		4:48 AM
End Time		12:50 AM
Average Daily Boardings		1,910
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	85.3%
Saturday		
Start Time		5:20 AM
End Time		9:50 PM
Headway (mins)		15-60
Sunday		
Start Time		6:27 AM
End Time		7:20 PM
Headway (mins)		30

Major Destinations

- Central Station
- State of Michigan Department of Human Services
- Grand Rapids Housing Commission
- Kentwood City Hall and Municipal Buildings
- Kent County Health Department
- Spectrum Health-Kalamazoo Center
- Meijer

Ridership

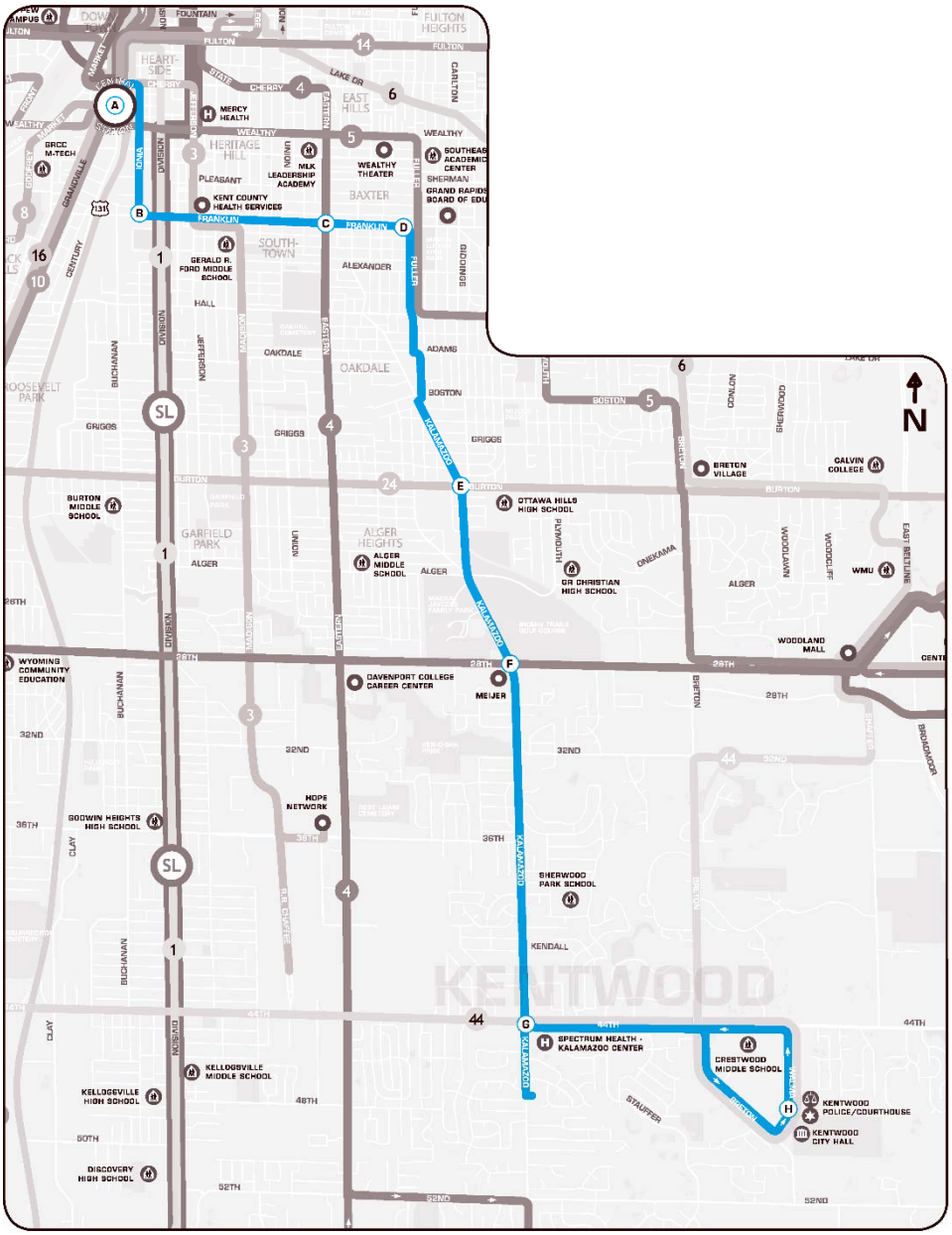
Route 2 averages approximately 1,910 riders per weekday, making it the second highest ridership route in the system. Peak headways are every 15 minutes, while off-peak and evening headways are every 30 minutes.

Route 2 averages 33.4 boardings per revenue hour, making it the fourth most productive route in the system. Productivity between Franklin & Division and Central Station is significantly higher than any other segment in the route (84.5 boardings per revenue hour). Productivity between Meijer and Kalamazoo & Burton (36.7 boardings per revenue hour) and on Franklin between Eastern and Division (37.5 boardings per revenue hour) were also above the average productivity for the route. Aside from ridership at the Meijer near Kalamazoo & 28th, productivity is generally lower for the southern portion of the route and higher for the northern portion.

Ridership and productivity on Route 2 are highest during the midday period when the route's headways are reduced from 15 minutes to 3o minutes. This indicates that there may be sufficient midday demand for Route 2 to operate more frequently during the midday period.

Route 2 is the fourth highest ridership route on Saturdays and the third highest ridership route on Sundays, averaging approximately 1,073 Saturday riders and 651 Sunday riders. This represents a 44% and 66% decrease from weekday ridership, respectively.

Figure 5-13 Route Map, Route 2 – Kalamazoo



Schedule Adherence

Route 2's OTP varies somewhat by time of day. Between June of 2018 and June of 2019, the route arrived on-time 95.5% of the time during the early morning, 88.7% of the time during the morning peak, 77.1% of the time during the midday period, 72.1% of the time during the afternoon peak, and 93.2% of the time during the evening period. On average, the OTP for Route 2 is 85.3%, slightly below average for the system.

On-time performance appears relatively consistent throughout the corridor, however, the average outbound trip arrives at Kent City Hall over five minutes late during the midday period and over seven minutes late during the afternoon peak period. This trend is not observed in other segments of the route or in the inbound direction. These delays may be a result of traffic congestion in the vicinity of the Kent County South Clinic stop, which is only served in the outbound direction.

Summary

Route 2 provides a north-south connection between downtown Grand Rapids and the City of Kentwood along Kalamazoo Avenue and has the second highest ridership and productivity in The Rapid system. Route 2 is one of the core north-south services in The Rapid system, along with the Silver Line, Route 1, and Route 4. The route operates with 15-minute headways from 28th Street to Downtown Grand Rapids during peak periods and 30-minute headways during off-peak periods. The midday productivity strongly suggests that there may be sufficient demand during the midday period to increase frequency. During peak hours, the Route 2 short-turns (the trips that only go between 28th and Downtown Grand Rapids) are not as productive as the trips that go the full length of Route 2. Less than 10 riders a day use the Kent County South Clinic stop on Kalamazoo south of 44th which is served by the Route 2 deviation and may result in the most significant on-time performance issues for the route.

ROUTE 3 – MADISON

Route 3 provides a north-south connection between Central Station in downtown Grand Rapids and Mercy Health, Hope Network, and the industrial and manufacturing area along R.B. Chafee Boulevard located south of 32nd Street. The route alignment, shown in Figure 5-14, operates on Cherry Street, Jefferson Avenue, Franklin Street, Madison Avenue, and R.B. Chaffee Boulevard. Route 3 also operates an extension on 36th Street to provide direct service to the West Michigan Hope Network, a job training and support services center.

Route 3 provides north-south service on Madison Avenue, operating parallel with The Silver Line and Route 1 on Division Avenue and Route 4 on Eastern Avenue. The route provides connections to Mercy Health, Kent County Health Services, and West Michigan Hope Network. In addition to the routes serving Central Station, Route 3 also enables transfers to the Silver Line and Routes 2, 4, 5, 24, 28.

Route 3 Characteristics		
Weekday		
Start Time		5:45 AM
End Time		12:05 AM
Average Daily Boardings		682
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	89.2%
Saturday		
Start Time		5:45 AM
End Time		10:05 PM
Headway (mins)		60

Major Destinations

- Central Station
- Mercy Health
- Kent County Health Services
- West Michigan Hope Network

Ridership

Route 3 averages approximately 682 riders per weekday, making it the sixth lowest ridership route in the system. Peak and off-peak headways on Route 3 are every 30 minutes, and evening headways are reduced to every 60 minutes.

Route 3 averages 28.0 boardings per revenue hour, the seventh highest productivity in the system. Both ridership and productivity are highest toward the northern end of the route, with the highest productivity occurring on Madison between Hall and Franklin (46.7 boardings per revenue hour) and between Madison & Franklin and Central Station (42.9 boardings per revenue hour). Only 10 percent of total route boardings happen south of 28th Street. Route 3 carries less than 10 passengers per hour south of 28th Street, with the majority of those riders having a destination at Hope Network.

Productivity is highest during the midday period (33.7 boardings per revenue hour) but is relatively consistent with productivity during the morning and afternoon peak periods (29.5 boardings per revenue hour and 30.1 boardings per revenue hour, respectively). This suggests that demand for service on Route 3 is consistent throughout the day.

Route 3 has the second lowest Saturday ridership of any route and does not provide Sunday service. The route averages approximately 240 Saturday riders, representing a 65% decrease from weekday ridership.

Schedule Adherence

The OTP for Route 3 varies slightly by time of day. Between June of 2018 and June of 2019, the route arrived on-time 92.5% of the time during the early morning, 85.9% of the time during the morning peak, 90.7% of the time during the midday period, 81.2% of the time during the afternoon peak, and 95.7% of the time during the evening period. On average, the OTP for Route 3 is 89.2%, slightly above average for the system.

Summary

Route 3 is among the lower ridership routes in The Rapid system but has above average productivity. The alignment for Route 3 is located approximately half a mile to the east of Division Avenue, served by Route 1 and the Silver Line, and half a mile west of Eastern Avenue, served by Route 4. Both the Division Avenue and Eastern Avenue corridors operate service with higher peak frequencies than Route 3 along Madison Avenue.

However, north of 28th Street, Route 3 serves one of the lowest income areas in Grand Rapids and productivity is high. Productivity is very low south of 28th Street.

Figure 5-14 Route Map, Route 3 – Madison

ROUTE 4 – EASTERN

Route 4 provides a north-south connection between Central Station in downtown Grand Rapids and the City of Kentwood along Eastern Avenue. The route operates a loop through the City of Kentwood along 52nd Street, Kalamazoo Avenue, 60th Street, and Eastern Avenue, with two deviations to provide service to the Gaines Marketplace Meijer and the Woodfield apartment complex, as shown in Figure 5-15.

Route 4 operates a short turn between Central Station and 28th Street which allows the route to operate with 15-minute headways between Central Station and 28th Street during the peak period and 30-minute headways during all day for the full route alignment. Route 4 provides connections to the Davenport College Career Center, West Michigan Hope Network, the Woodfield apartment complex, and several shopping centers, including Gaines Marketplace, Meijer, and Clock Tower Center. In addition to the routes serving Central Station, Route 4 also enables transfers to Routes 2, 5, 24, 28, and 44.

Route 4 Characteristics		
Weekday		
Start Time		4:35 AM
End Time		1:00 AM
Average Daily Boardings		1,560
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	84.0%
Saturday		
Start Time		5:20 AM
End Time		10:00 PM
Headway (mins)		30-60
Sunday		
Start Time		6:54 AM
End Time		7:00 PM
Headway (mins)		60

Major Destinations

- Central Station
- Davenport College Career Center
- West Michigan Hope Network
- Woodfield Apartments
- The Crossings Apartments
- Clock Tower Center
- Gaines Marketplace
- Meijer

Ridership

Route 4 averages approximately 1,560 boardings per weekday, making it the fifth highest ridership route in the system. However, Route 4 also averages approximately 22.9 boardings per weekday, making it an average route in terms of productivity.

Ridership is consistently lower south of 44th Street, where all segments average less than 19 passengers per hour. The short-turn trips that only operate between 28th Street and Central Station typically carry less than 7 passengers per trip and are much less utilized than the trips going further south.

Productivity is highest during the midday and afternoon peak periods (29.3 boardings per revenue hour and 28.5 boardings per revenue hour, respectively). The higher productivity during the midday period indicates that there may be sufficient demand for Route 4 to operate with higher frequencies during the midday period. Ridership on the first inbound trip has higher ridership than the second inbound trip, indicating potential demand for earlier service.

Route 4 is an above average ridership route on Saturdays and below average on Sundays, averaging approximately 773 Saturday riders and 346 Sunday riders. This represents a 50% and 78% decrease from weekday ridership, respectively.

Schedule Adherence

Route 4's OTP varies significantly by time of day. Between June of 2018 and June of 2019, the route arrived on-time 92.6% of the time during the early morning, 87.9% of the time during the morning peak, 83.5% of the time during the midday period, 64.3% of the time during the afternoon peak, and 91.6% of the time during the evening period. On average, the OTP for Route 4 is 84.0%, the fifth lowest in the system.

Delays in the afternoon peak are concentrated in the second half of the route alignment in both directions. Inbound trips begin experiencing significant delays of approximately five minutes at Eastern & Franklin and get progressively worse through downtown Grand Rapids with the average trip arriving at Central Station over seven minutes late. Outbound trips generally arrive on time through downtown Grand Rapids but start experiencing significant delays around Kalamazoo & 52nd, arriving over four minutes late. Outbound trips, on average, arrive at the Woodfield Place Apartments over eleven minutes late, indicating that there may be significant delays associated with the route turning around at Meijer and traveling through Clock Tower Center.

Figure 5-15 Route Map, Route 4 – Eastern

Summary

Route 4 is among the highest ridership routes in the system but is only average in terms of productivity. Route 4 is one of the core north-south services in The Rapid system, along with the Silver Line, Route 1, and Route 2. The highest productivity segment of Route 4 is located in downtown Grand Rapids near Central Station. Aside from this high productivity segment, the next highest productivity segments are those that enable transfers with east-west crosstown Routes 24 and 28. The remaining segments all have below average productivity, indicating that demand for Route 4 may be concentrated around transfer opportunities and access to downtown Grand Rapids. In the outbound direction, Route 4 travels out of direction to provide service to the Gaines Meijer before backtracking north on Kalamazoo Avenue to serve Clock Tower Center, The Crossings Apartments, and the Woodfield Place Apartments. This segment is associated with significant delays during the afternoon peak, arriving at the Woodfield Place Apartments eleven minutes late on average.

ROUTE 5 – WEALTHY/WOODLAND

Route 5 provides service between Central Station in downtown Grand Rapids, the City of East Grand Rapids, Woodland Mall, and the industrial employment center located near 36th Street & Patterson Avenue. The alignment of Route 5 (shown in Figure 5-16) stairsteps through southeast Grand Rapids and East Grand Rapids to Woodland Mall. Route 5 operates with peak headways of 15 minutes between Central Station and Burton Street & Breton Road, off-peak headways of 30 minutes, and evening headways of 60 minutes. Seventeen trips, all peak hour, extend from Woodland Mall to 36th Street and Patterson Avenue.

The route provides service to Mercy Health, the Grand Rapids Board of Education, Breton Village, Woodland Mall, Eastbrook Apartments, Camelot Woods Apartments, Kentwood Towne Center, and Woodbridge Apartments before operating a loop between 36th Street, Kraft Avenue, 33rd Street, and Patterson Avenue. Route 5 operates an underutilized peak period short turn service between Central Station and Burton & Breton, averaging fewer than 10 boardings per revenue hour. The trips serving the extension between Woodland Mall and 33rd & Patterson are also less productive than the trips ending at Woodland Mall. In addition to all routes serving Central Station, Route 5 also enables transfers with Routes 2, 4, 6, 17, 24, 28, and 44.

Major Destinations

- Central Station
- Mercy Health
- Grand Rapids Board of Education
- Breton Village
- Woodland Mall
- Eastbrook Apartments
- Camelot Woods Apartments
- Kentwood Towne Center
- Woodbridge Apartments

Route 5 Characteristics		
Weekday		
Start Time		4:31 AM
End Time		12:06 AM
Average Daily Boardings		927
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	93%
Saturday		
Start Time		6:34 AM
End Time		10:15 PM
Headway (mins)		60

Ridership

Route 5 averages approximately 927 riders per weekday, making it a generally average ridership route. However, Route 5 averages 18.4 boardings per revenue hour, making it the fifth least productive route in the system. Productivity is significantly higher during the midday period (26.3 boardings per revenue hour) than all other time periods.

The segments ending at Central Station and Woodland Mall have significantly higher productivity than any other segments of the route (57.3 boardings per revenue hour and 45.1 boardings per revenue hour, respectively). This indicates that these two stops are key destinations for the route. Additionally, the loop near Patterson Avenue has very low productivity with fewer than 10 boardings per revenue hour. There are approximately 29 passengers served by the seventeen trips that loop on 33rd and 36th Streets.

Between Central Station and Burton Street & Breton Road in the peak periods, there is a bus trip every 15 minutes. The five morning and three afternoon round trips that travel only to Burton Street & Bretton Road are not well utilized and average less than four passengers per trip.

Route 5 is a below average route in terms of Saturday ridership and does not provide Sunday service. The route averages approximately 376 Saturday riders, representing a 59% decrease from weekday ridership.

Schedule Adherence

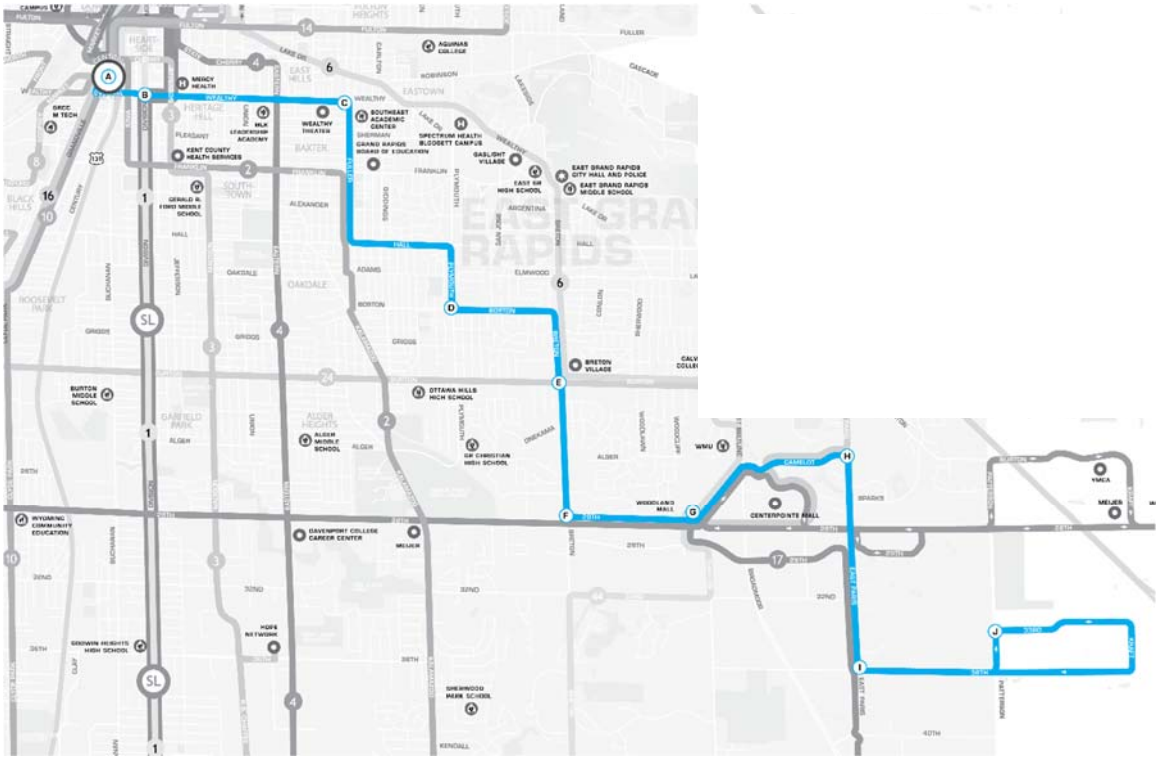
Route 5's OTP is among the highest in the system and varies slightly by time of day. Between June of 2018 and June of 2019, the route arrived on-time 97.0% of the time during the early morning, 93.9% of the time during the morning peak, 93.2% of the time during the midday period, 83.5% of the time during the afternoon peak, and 97.5% of the time during the evening period. On average, the OTP for Route 5 is 93.0%, the fifth highest OTP of any route in the system.

On-time performance is relatively stable in both directions throughout the day. The average inbound trip in the afternoon peak arrives at Central Station three minutes late and the average outbound trip arrives at Woodland Mall about three minutes late and at 33rd & Patterson about three minutes late.

Summary

Route 5 is an average route in terms of ridership and below average in terms of productivity. While the route serves some high ridership areas, it also travels through parts of the service area that are not generating much demand. Ridership on Route 5 is primarily driven by boardings at Central Station and Woodland Mall. Route 6 also provides a connection between these two major destinations. The peak 15-minute service is not warranted based on ridership levels. The extension past Woodland Mall and the short turn at Burton & Breton are both unproductive, with few riders being carried.

Figure 5-16 Route Map, Route 5 – Wealthy

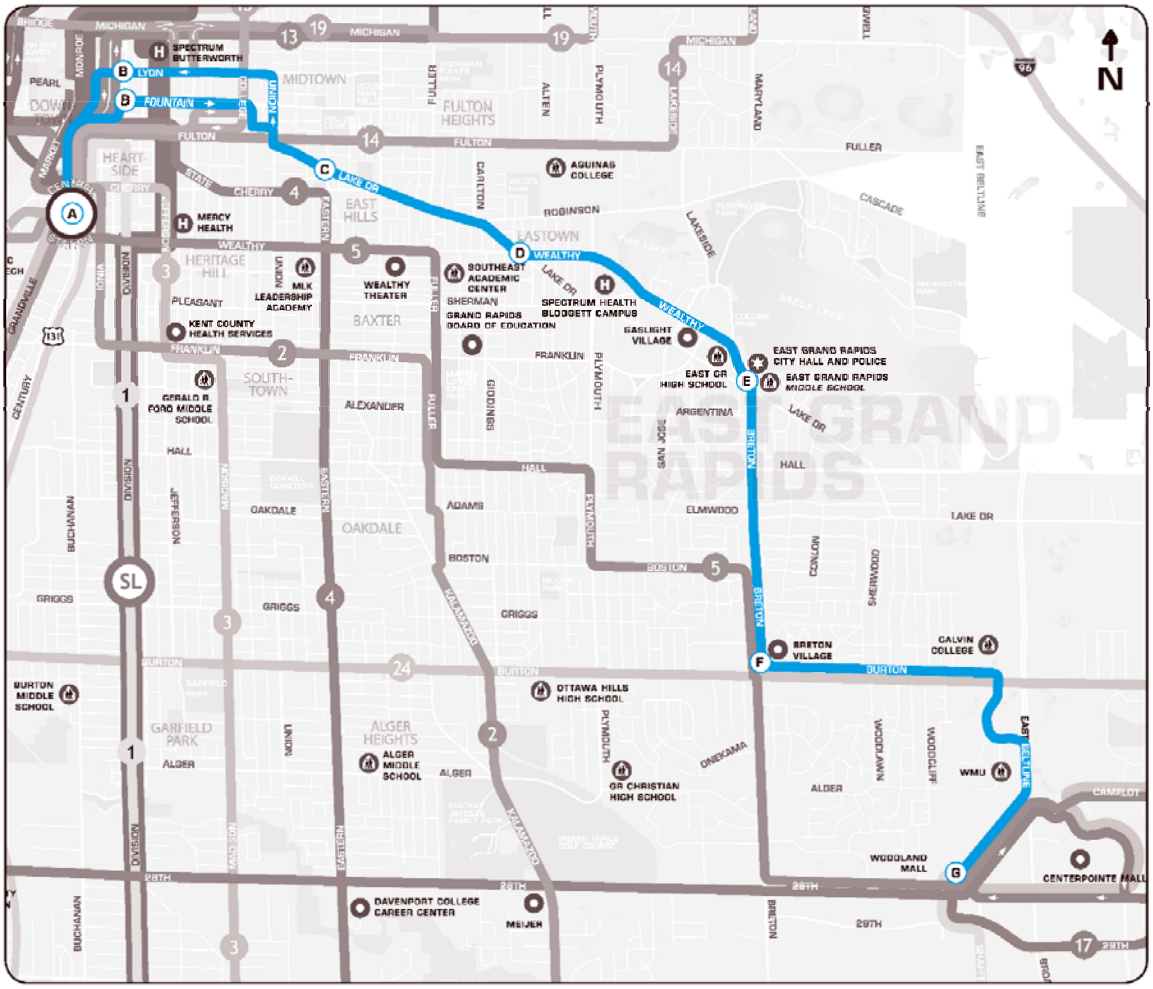


ROUTE 6 – EASTOWN/WOODLAND

Route 6 provides a connection between Central Station in downtown Grand Rapids and Woodland Mall. Route 6 operates north of Central Station and along a one-way couplet traveling eastbound on Fountain Street and westbound on Lyon Street between Ottawa Avenue and Union Avenue. Route 6 also operates along Lake Drive, Wealthy Street, Breton Road, Burton Street, and Beltline Avenue, as shown in Figure 5-17.

Route 6 provides connections to Van Andel Arena, Grand Rapids Community College, Spectrum Health-Butterworth, Spectrum Health-Blodgett, Gaslight Village, East Grand Rapids City Hall, East Grand Rapids High School, Breton Village, Calvin University, and Woodland Mall. In addition to the routes serving Central Station, Route 6 also enables transfers with Routes 4, 5, 14, 15, 17, 24, 28, and 44.

Figure 5-17 Route Map, Route 6 – Eastown



Major Destinations

- Central Station
- Grand Rapids Community College
- Van Andel Arena
- Spectrum Health-Butterworth
- Spectrum Health-Blodgett
- Gaslight Village
- East Grand Rapids City Hall
- East Grand Rapids High School
- Breton Village
- Calvin University
- Woodland Mall

Ridership

Route 6 averages approximately 1,032 riders per weekday, making it the eighth highest ridership route but slightly below average for the system. Peak headways are every 15 minutes, and both off-peak and evening headways are every 30 minutes. Route 6 averages 17.4 boardings per service hour, making it the third least productive route in the system. Productivity on Route 6 is significantly higher at the route's termini, averaging 29.1 boardings per revenue hour on the segment from Lyon & Bostwick to Central Station and 20.7 boardings per revenue hour on the segment from Woodland Mall to Burton & Breton. Productivity for the remaining segments on the route are below average, ranging from 7.0 boardings per revenue hour to 16.3 boardings per revenue hour.

Route 6 Characteristics		
Weekday		
Start Time		4:31 AM
End Time		12:49 AM
Average Daily Boardings		1,032
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	87.2%
Saturday		
Start Time		5:30 AM
End Time		10:19 PM
Headway (mins)		30
Sunday		
Start Time		6:30 AM
End Time		6:49 PM
Headway (mins)		60

Route 6 deviates from Burton Street and Beltline Avenue to directly serve Claystone Street and Raybrook Avenue. Approximately 20 boardings happen along this deviation, most of which is within a ¼ mile walk of Burton Street.

Productivity is highest during the afternoon peak period (20.9 boardings per revenue hour) and the midday period (20.6 boardings per revenue hour). The relatively consistent ridership and productivity between midday service and afternoon peak service indicate that the headways are adequately meeting demand for service.

Route 6 is a slightly below average ridership route on both Saturdays and Sundays, averaging approximately 574 Saturday riders and 403 Sunday riders. This represents a 44% and 61% decrease from weekday ridership, respectively.

Schedule Adherence

Route 6's OTP varies somewhat by the time of day. Between June of 2018 and June of 2019, the route arrived on-time 95.4% of the time during the early morning, 87.8% of the time during the morning peak, 88.9% of the time during the midday period, 71.1% of the time during the afternoon peak, and 92.9% of the time during the evening period. On average, the OTP for Route 6 is 87.2%, an average route for the system.

Summary

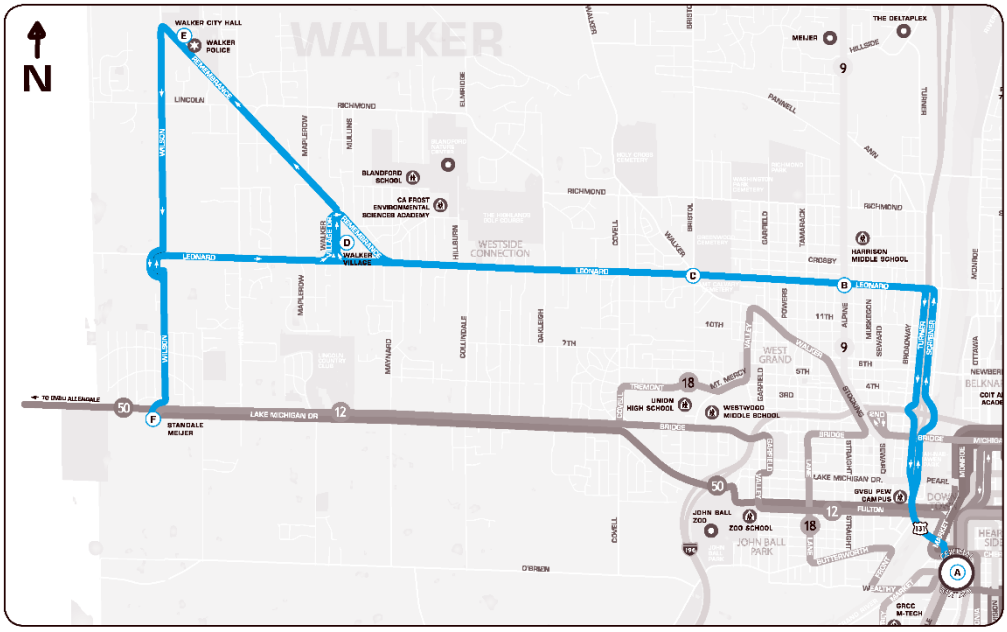
Route 6 is an average ridership route with low productivity. The 15-minute peak period service is not warranted given the average ridership and low productivity of the route, particularly outside of downtown Grand Rapids and the East Hills neighborhood. Route 6 primarily serves riders traveling between Central Station in downtown Grand Rapids and Woodland Mall in southeast Grand Rapids. Similar to Route 5, Route 6 provides local circulator service between two high ridership anchor destinations. While local service through East Grand Rapids may provide benefits to the community, the high ridership at Central Station and Woodland Mall may be sufficient to warrant additional service between these two anchor destinations.

ROUTE 7 – WEST LEONARD

Route 7 provides service between Central Station in downtown Grand Rapids, the City of Walker, and Meijer via Leonard Street. The route alignment, shown in Figure 5-18, operates on a one-way loop, traveling on Remembrance Road and Wilson Avenue north of Leonard Street in the westbound direction and traveling on Leonard Street in the eastbound direction. The route also operates on a couplet between Central Station and Leonard Street, traveling north on Schriber Avenue and south on Tumer Avenue.

The route operates with 15-minute peak headways, 30-minute off-peak headways, and 60-minute evening headways. Route 7 provides connections to Central Station, Grand Valley State University (GVSU) Pew Campus, Walker City Hall and municipal campus, Walker Meadow Retirement Community, and Meijer. In addition to the routes serving Central Station, Route 7 also enables transfers with Routes 9, 12, 19, and 50.

Figure 5-18 Route Map, Route 7 – West Leonard



Major Destinations

- Central Station
- GVSU Pew Campus
- Walker City Hall
- Walker Meadow Retirement Community
- Meijer

Ridership

Route 7 averages approximately 711 riders per weekday, making it the eighth lowest ridership route in the system. Route 7 is also the fourth least productive route in the system, with an average boardings per revenue hour of 17.5. Productivity on Route 7 is highest during the midday period (23.1 boardings per revenue hour) and is lowest during the morning peak (14.3 boardings per revenue hour) and afternoon peak (15.1 boardings per revenue hour). Given the relatively low productivity for the route, this indicates that peak period service frequencies may be higher than demand for the service.

Route 7 Characteristics		
Weekday		
Start Time		4:49 AM
End Time		11:14 PM
Average Daily Boardings		711
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	82.5%
Saturday		
Start Time		5:28 AM
End Time		10:08 PM
Headway (mins)		60
Sunday		
Start Time		7:43 AM
End Time		7:08 PM
Headway (mins)		60

Productivity on Route 7 is also highest on segments closer to downtown Grand Rapids and the West Grand neighborhood. The highest productivity occurs on the segment from Leonard & Alpine to Central Station (29.3 boardings per revenue hour) and on Leonard between Walker and Alpine (17.4 boardings per revenue hour). Productivity west of Leonard Street & Walker Avenue is poor, at 8.7 passengers per hour. Without the 60 boardings at the Meijer stop, this figure would be much lower.

Route 7 is the fifth lowest ridership route on Saturdays and the lowest ridership route on Sundays, averaging approximately 290 Saturday riders and 181 Sunday riders. This represents a 59% and 75% decrease from weekday ridership, respectively.

Schedule Adherence

Route 7's OTP varies significantly by time of day. Between June of 2018 and June of 2019, the route arrived on-time 88.2% of the time during the early morning, 89.5% of the time during the morning peak, 79.4% of the time during the midday period, 68.0% of the time during the afternoon peak, and 87.7% of the time during the evening period. On average, the OTP for Route 7 is 82.5%, the 4th lowest average OTP in the system.

On-time performance is worse in the outbound direction than in the inbound direction. In the afternoon peak, the average outbound trip is over four minutes late arriving at all timepoints beyond Central Station, including nearly six minutes late at the Meijer. The average outbound tip in the midday time period arrives approximately four minutes late to the Meijer. These delays appear to be related to traffic congestion on the Leonard Street corridor.

Summary

Route 7 is a relatively low ridership, low productivity route that provides service between downtown Grand Rapids and the City of Walker. Productivity on the route is particularly low outside of downtown Grand Rapids and the West Grand neighborhood. Peak period service on Route 7 operates with high frequencies, every 15 minutes, and has relatively low productivity. This indicates that the 15-minute peak period service frequency is too high for the level of ridership demand along the route, particularly west of Walker Avenue NW. The existing service design with one-way service to Walker City Hall and also on Leonard Street between Walker Village Drive and Wilson Avenue provides prospective riders with poor choices, as it guarantees any rider will need to spend more than 20 minutes travelling out of direction.

ROUTE 8 – GRANDVILLE/RIVERTOWN

Route 8 provides service between Central Station in downtown Grand Rapids, the City of Wyoming, and the City of Grandville. The route alignment, shown in Figure 5-19, deviates to provide service to the Black Hills neighborhood, Adelante High School, and Oxford Food Center. Route 8 makes an additional deviation to provide service to Grandville City Hall (and connections to Route 24 and 28) before continuing south, connecting to Meijer and RiverTown Crossings Mall. Route 8 operates with 15-minute peak headways between Prairie Street & Ivanrest Avenue and Central Station, 30-minute off-peak headways, and 60-minute evening headways. Route 8 operates ten round trip short turn routes between Prairie Street & Ivanrest Avenue and Central Station, allowing the route to provide peak period 15-minute service for this portion of the route and 30-minute off peak service for the full alignment. Productivity on the short turn trips are slightly lower than the full route, about four fewer passengers per hour than the route average.

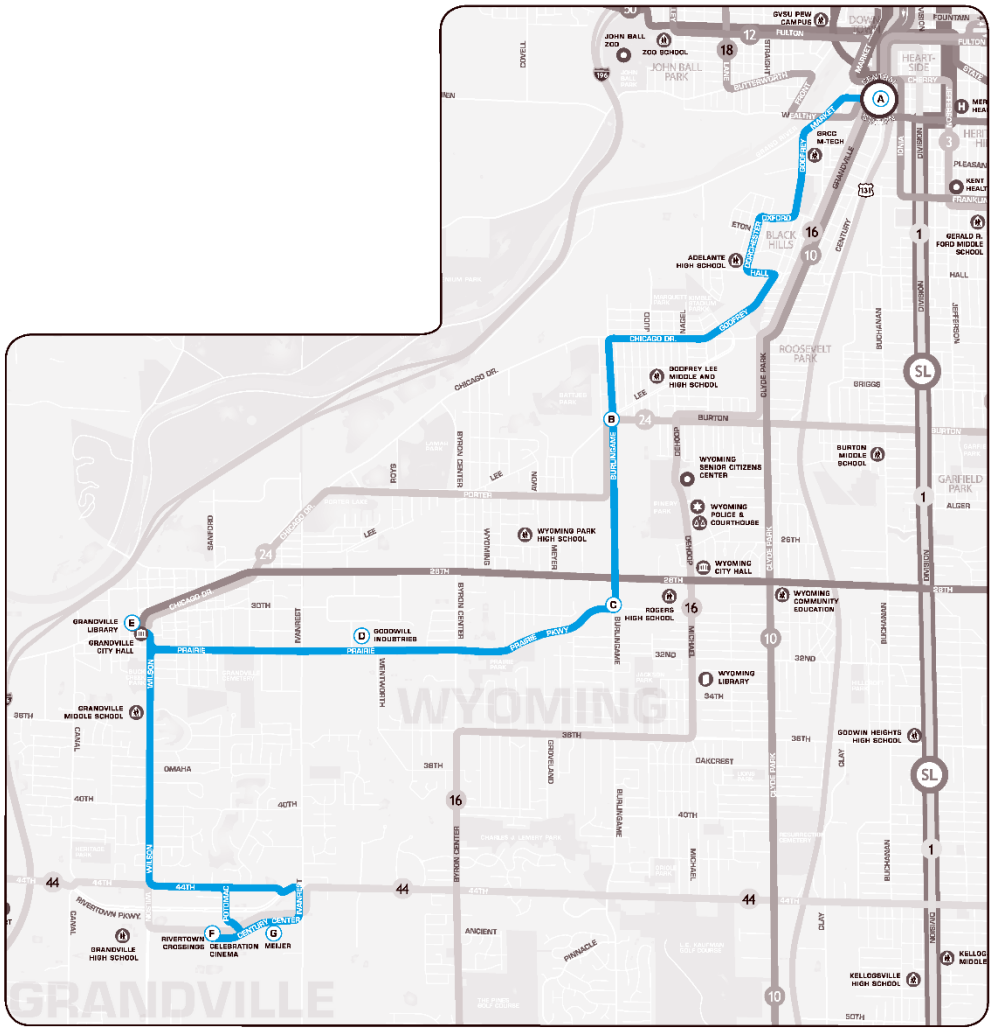
Route 8 provides service to Central Station, Grand Rapids Community College M-TEC building, Goodwill Industries, Grandville City Hall, Meijer, and RiverTown Crossings Mall. In addition to the routes serving Central Station, Route 8 also enables transfers with Routes 24, 28, and 44.

Major Destinations

- Central Station
- GRCC M-TEC Building
- Goodwill Industries
- Grandville City Hall
- Meijer
- RiverTown Crossings Mall

Route 8 Characteristics		
Weekday		
Start Time		5:00 AM
End Time		11:52 PM
Average Daily Boardings		971
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	88.7%
Saturday		
Start Time		6:00 AM
End Time		9:52 PM
Headway (mins)		60
Sunday		
Start Time		7:00 AM
End Time		6:52 PM
Headway (mins)		60

Figure 5-19 Route Map, Route 8 – Rivertown



Note: Route 8 trips to/from Rivertown Mall WILL NOT go into the Goodwill parking lot.

N

Ridership

Route 8 averages approximately 971 riders per weekday, making it an average ridership route. The highest ridership stops on the route are the two termini, Central Station and Meijer. Route 8 also averages 21.1 boardings per revenue hour, making it a slightly below average route in terms of productivity.

Productivity is relatively consistent throughout the day on Route 8, ranging from 20.0 boardings per revenue hour in the morning peak period to 24.4 boardings per hour in the midday period. The morning and afternoon peak hour trips that only connect Central Station and the Goodwill underperform. Most of these trips carry less than 5 passengers.

Several route segments have very little ridership. Prairie Street between Ivanrest Avenue and Wilson Avenue as well as Wilson Avenue between Prairie Street and Rivertown Parkway have almost no riders.

By segment, productivity is highest on the segments between Meijer and the Grandville Library (21.8 boardings per revenue hour) and between the Grandville Library and Prairie & Ivanrest (22.3 boardings per revenue hour). High ridership stops on these segments include the Grandville Library and the Oldebrook Apartment complex at Prairie Parkway & Byron Center Avenue.

Route 8 is a below average ridership route on both Saturdays and Sundays, averaging approximately 534 Saturday riders and 294 Sunday riders. This represents a 45% and 70% decrease from weekday ridership, respectively.

Schedule Adherence

Route 8's OTP is relatively consistent throughout the day. Between June of 2018 and June of 2019, the route arrived on-time 92.2% of the time during the early morning, 90.8% of the time during the morning peak, 87.8% of the time during the midday period, 82.2% of the time during the afternoon peak, and 90.6% of the time during the evening period. On average, the OTP for Route 8 is 88.7%—an average route for the system.

Inbound on-time performance is generally consistent with trips arriving to most timepoints with less than a two-minute delay. However, the average inbound trip arrives at Central Station nearly five minutes late during the morning peak and nearly six minutes late during the afternoon peak. This level of delay reduces the reliability of the service and makes it difficult for passengers to make transfers during the peak periods.

On-time performance in the outbound direction is generally worst during the afternoon peak and evening periods. During the afternoon peak, outbound trips arrive over five minutes late to the Rivertown Mall and Meijer stops, on average.

Summary

Route 8 is below average in terms of ridership and average in terms of productivity. The route provides relatively indirect, circuitous service between downtown Grand Rapids, Wyoming, and Grandville. Route 8 provides direct service to the Black Hills neighborhood, which is isolated due to former rail lines. In Black Hills, Route 8 uses Dorchester Avenue, which is unsuited for full size buses. The indirect routing increases travel times and makes the service less attractive to potential riders. Ridership on the route is highest at Central Station, Meijer, and the RiverTown Crossings Mall. Given the ridership, the peak-hour 15-minute service may not be warranted.

ROUTE 9 – ALPINE

Route 9 provides service between Central Station in downtown Grand Rapids and the Walmart in Alpine Township, north of Grand Rapids. The route also provides connections to the Swan and West Grand neighborhoods before traveling north on Alpine Avenue. The route alignment, shown in Figure 5-20, takes a relatively direct route north from downtown until it crosses I-96. North of I-96, Route 9 makes two out of direction deviations to provide direct service to Green Ridge Square, The Orchards at Four Mile, and Highpoint Center. Route 9 also makes an out of direction loop to serve the York Creek Apartments, Alpine Slope Apartments, Daily Deals Food Outlet, and ALDI before serving Walmart. Other key destinations served by Route 9 include the Alpine Center Meijer and Spectrum Health Urgent Care, both located on Alpine Avenue south of I-96.

Route 9 operates short turns between Central Station and Greenridge Mall to provide 15-minute service during the peak period and 30-minute service all day for the full route alignment. The short turns cover most of the full route alignment, but do not provide service to Walmart or the apartment complexes located north of 4 Mile Road.

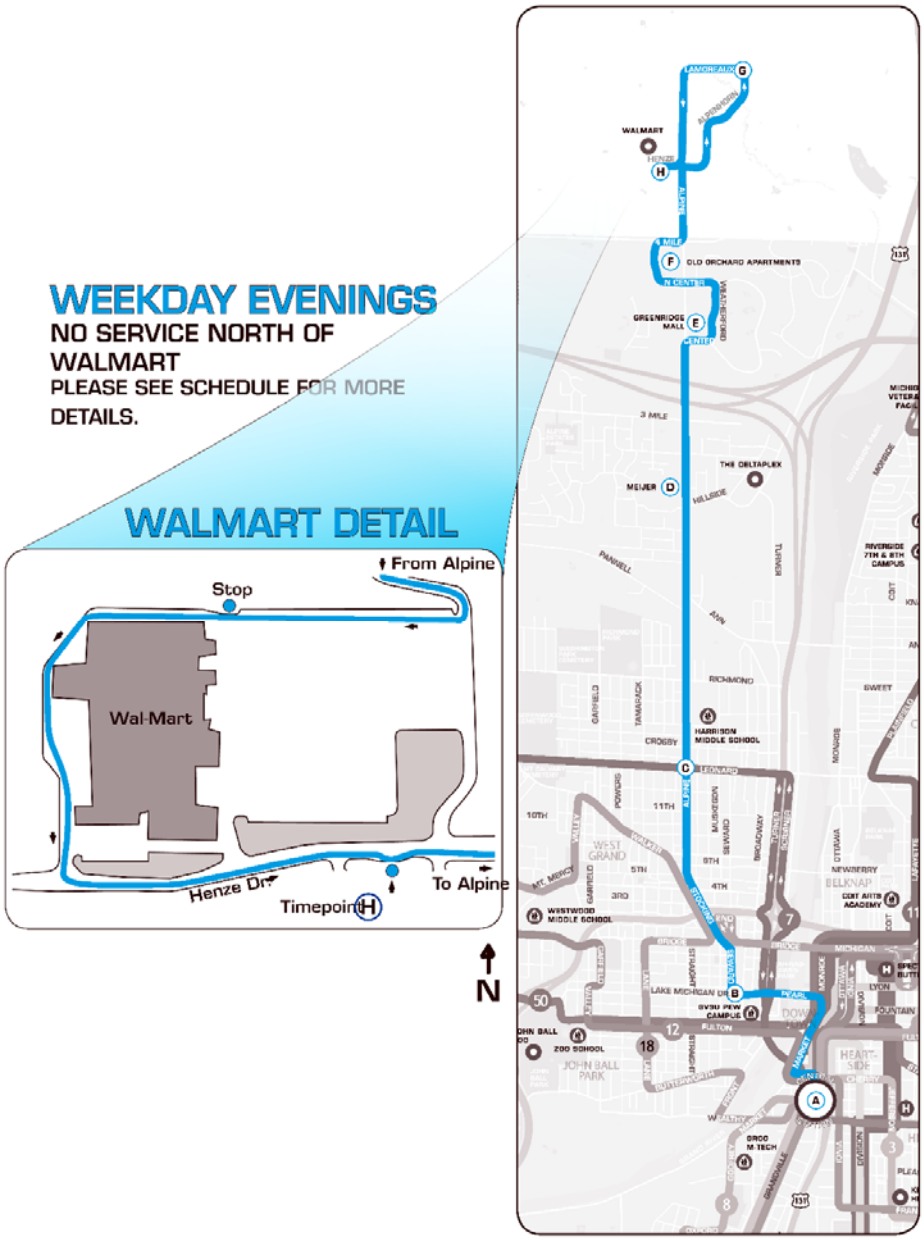
The route operates with 15-minute peak headways between Central Station and Greenridge Mall and 30-minute headways in the off-peak and evening periods. In addition to the routes serving Central Station, Route 9 also enables transfers with Routes 7, 18, 19, and 50.

Major Destinations

- Central Station
- Van Andel Arena
- GVSU Pew Campus
- Alpine Center Meijer
- Spectrum Health Urgent Care
- Green Ridge Square Shopping Center
- Green Ridge Apartments
- The Orchards at Four Mile
- Highpoint Center
- York Creek Apartments
- Alpine Slopes Apartments
- Comstock Park Walmart

Route 9 Characteristics		
Weekday		
Start Time		4:37 AM
End Time		12:46 AM
Average Daily Boardings		1,786
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	85.1%
Saturday		
Start Time		5:06 AM
End Time		10:23 PM
Headway (mins)		30-60
Sunday		
Start Time		6:36 AM
End Time		7:14 PM
Headway (mins)		60

Figure 5-20 Route Map, Route 9 – Alpine



Ridership

Route 9 averages approximately 1,786 riders per weekday, making it the second highest ridership route in the system. Route 9 also averages 34.1 boardings per revenue hour, making it the third highest productivity route in the system. Ridership and productivity on Route 9 are highest during the midday and afternoon peak periods (46.1 boardings per revenue hour and 40.3 boardings per revenue hour, respectively). The relatively high midday ridership and productivity indicate that there may be sufficient demand to increase service frequency during this time period. Increasing midday frequency would spread the existing passengers across more trips and make the route more attractive to passengers.

During the morning and afternoon peaks, ridership on the trips ending at Greenridge Mall have significantly lower ridership than the trips extending further north, approximately 12 fewer passengers per revenue hour. The existing ridership pattern north of the Greenridge Mall, along with destinations such as Walmart and the large number of apartments, suggest that extending 15-minute peak service further north may be warranted.

Productivity by segment is highest from Seward & Lake Michigan to Central Station (64.0 boardings per revenue hour), from Meijer to Alpine & Leonard (32.5 boardings per revenue hour), and from Walmart to the Old Orchard Apartments (29.3 boardings per revenue hour). The highest ridership stops along Route 9 include Central Station, Walmart, Weatherford at Greenridge Mall, Meijer, and Alpine & Leonard (a transfer point with Route 7).

Route 9 is the second highest ridership route on Saturdays and an above average route on Sundays, averaging approximately 1,328 Saturday riders and 547 Sunday riders. This represents a 26% and 69% decrease from weekday ridership, respectively.

Schedule Adherence

Route 9's OTP varies somewhat throughout the day, particularly during the midday and afternoon peak period. Between June of 2018 and June of 2019, the route arrived on-time 92.7% of the time during the early morning, 94.0% of the time during the morning peak, 81.5% of the time during the midday period, 64.9% of the time during the afternoon peak, and 92.4% of the time during the evening period. On average, the OTP for Route 9 is 85.1%, slightly below average for the system.

In the outbound direction, on-time performance is worst during the midday and evening periods. During these periods, two to three-minute delays generally begin at Seward & Lake Michigan and continue until Alpenhorn & Lamoreaux and Walmart, where delays worsen. On average, midday trips arrive at Walmart about four minutes late, afternoon peak trips arrive about five minutes late, and evening trips arrive about six minutes late.

Inbound trips typically have better on-time performance than outbound trips throughout the route alignment. The exception is the segment between Seward & Lake Michigan and Central Station in the afternoon peak. On average, afternoon peak trips arrive at Seward & Lake Michigan less than three minutes late but arrive at Central Station over seven minutes late. This trend suggests that congestion along the Alpine corridor is relatively low until the route enters downtown, at which point on-time performance declines significantly.

Summary

Route 9 is among the highest ridership and productivity routes in The Rapid system, providing the only service option through north Grand Rapids into Alpine Township and the nearby shopping centers and apartment complexes. Route 9 provides relatively direct service between downtown Grand Rapids and the shopping centers and apartment complexes located in Alpine Center, Comstock Park, and Alpine Township, near Alpine Avenue and I-96. The high ridership and productivity during the midday period indicate that there may be sufficient midday demand for Route 9 to operate more frequently during the midday period. Peak period 15-minute service that ends at the Greenridge Mall does not operate as effectively as trips that extend the full route length.

ROUTE 10 – CLYDE PARK

Route 10 provides direct service between Central Station in downtown Grand Rapids and the Meijer located at the intersection of Clyde Park Avenue and 54th Street. Route 10 operates on Grandville Avenue and Clyde Park Avenue without any notable deviations, as shown in Figure 5-21. The route provides access to the Roosevelt Park neighborhood, Rogers Plaza Town Center, ALDI, the Wyoming Community Education Center, and the Clyde Park Avenue Meijer. Route 10 operates along the same alignment as Route 16 north of Burton Street and terminates at the same Meijer location as Route 1.

The route operates with 30-minute headways during peak and off-peak periods and with 60-minute headways during the evening period. Route 16 operates with the same headways as Route 10, offset by 15-minute intervals. This allows the two routes to operate at 30-minute headways but provide consistent 15-minute service along the shared corridor, north of Burton Street. In addition to the routes serving Central Station, Route 10 also enables transfers with Routes 1, 16, 24, 28, and 44.

Major Destinations

- Central Station
- Rogers Plaza Town Center
- ALDI
- Wyoming Community Education Center
- Meijer

Route 10 Characteristics		
Weekday		
Start Time		5:11 AM
End Time		11:36 PM
Average Daily Boardings		785
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	89.3%
Saturday		
Start Time		5:27 AM
End Time		10:05 PM
Headway (mins)		60
Sunday		
Start Time		7:41 AM
End Time		7:05 PM
Headway (mins)		60

Ridership

Route 10 averages approximately 785 riders per weekday, making it a below average route in terms of ridership. Despite being below average in ridership, Route 10 has the 5th highest productivity of any route in the system, averaging 32.7 boardings per revenue hour. Productivity on Route 10 is relatively high throughout all times of day but is highest during the afternoon peak period (39.0 boardings per revenue hour) and the midday period (36.0 boardings per revenue hour).

More than half of the boardings on Route 10 occur on its highest productivity segment, located between Clyde Park & Crofton and Central Station (53.1 boardings per revenue hour), which shares its alignment with Route 16. This suggests the 15-minute all-day service is warranted along the Grandville Avenue corridor south of downtown Grand Rapids. Ridership is also high at both Clyde Park Avenue & 36th and Clyde Park Avenue & 28th Street, a transfer point with Route 28.

Route 10 is a below average ridership route on Saturdays and the second lowest ridership route on Sundays, averaging approximately 397 Saturday riders and 229 Sunday riders. This represents a 49% and 71% decrease from weekday ridership, respectively.

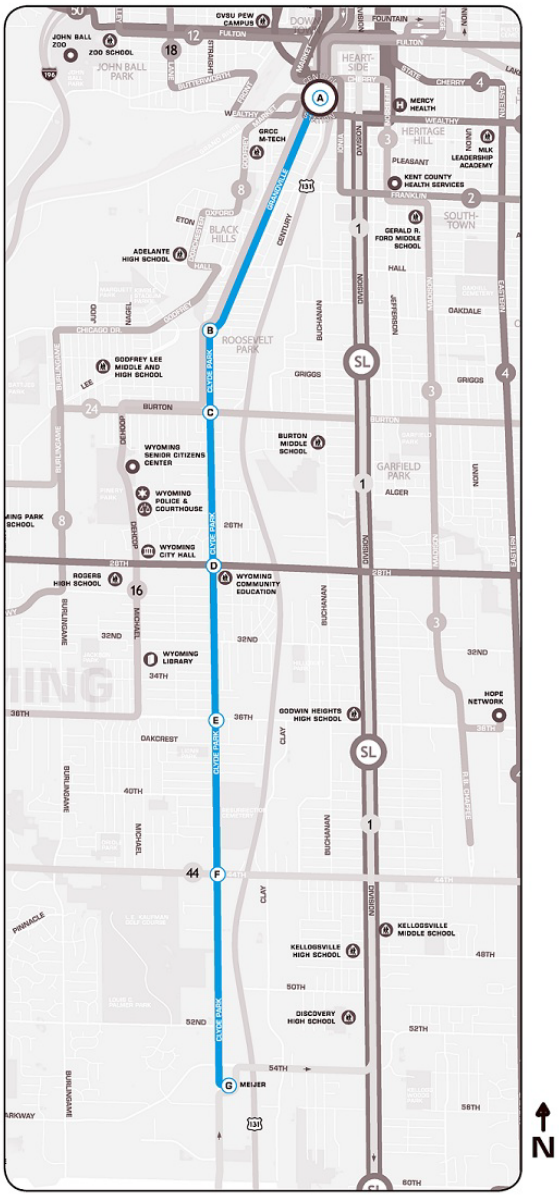
Schedule Adherence

The OTP for Route 10 is generally consistent, except during the afternoon peak period. Between June of 2018 and June of 2019, the route arrived on-time 99.1% of the time during the early morning, 93.7% of the time during the morning peak, 92.8% of the time during the midday period, 67.5% of the time during the afternoon peak, and 93.2% of the time during the evening period. On average, the OTP for Route 10 is 89.3%, above average for the system.

On-time performance is relatively consistent throughout the route alignment however, delays are most common at the termini of the route, Central Station for inbound trips and Meijer for outbound trips. Arrival times at these termini are most delayed during the morning peak, arriving five minutes late on average for inbound trips and over six minutes late for outbound trips.

During all time periods, outbound trips arrive at Meijer more than three minutes late on average, regardless of how much delay is observed at the previous timepoint. This indicates that the schedule may not be allowing sufficient travel times to reach the route terminus.

Figure 5-21 Route Map, Route 10 – Clyde Park



Summary

Route 10 is a high productivity, below average ridership route that provides a direct north-south connection between downtown Grand Rapids and the Clyde Park Avenue Meijer in the southern portion of Grand Rapids.

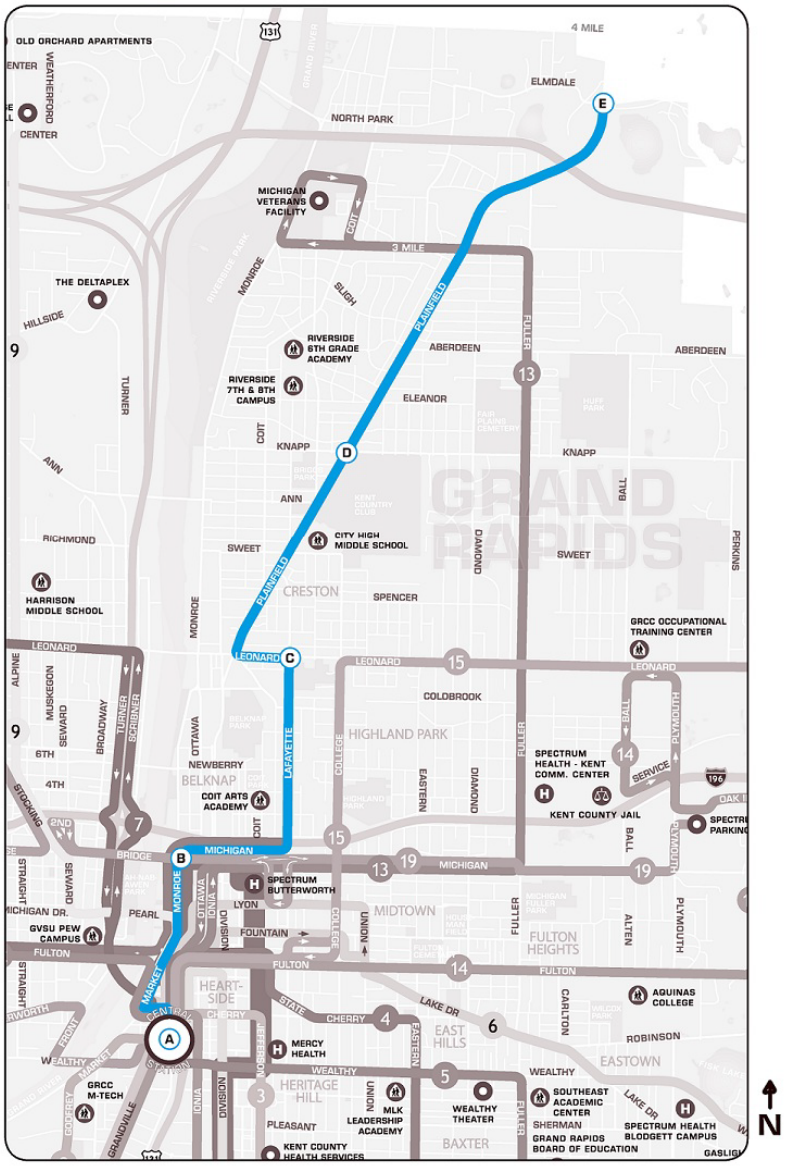
Route 10 shares an alignment with Route 16 on Grandville Avenue and Clyde Park Avenue north of Burton Street. The two routes operate with alternating 30-minute headways during the peak and off-peak time periods, which effectively functions as all day 15-minute service frequency on the corridor north of Burton Street. The portion of Route 10 that shares an alignment with Route 16 is also the most productive segment of the route. The 15-minute service frequency is warranted by the high ridership on this segment which operates through a high transit demand neighborhood. The route consistently arrives at Meier over three minutes late on average, regardless of how much delay was observed at previous timepoints. Indicating that the schedule may not allow sufficient travel time to complete the route.

ROUTE 11 – PLAINFIELD

Route 11 provides service between Central Station in downtown Grand Rapids and the Michigan Unemployment Insurance Agency and nearby shopping center located at Plainfield Avenue & 4 Mile Road on the northeast side of Grand Rapids. Route 11 travels out of direction to provide service to Medical Mile and Spectrum Health-Butterworth on Michigan Street, and provide service along Lafayette Avenue through the Belknap Lookout neighborhood.

Route 11 operates with 15-minute headways during the peak period and 30-minute headways during the off-peak and evening periods. In addition to the routes serving Central Station, Route 11 also enables transfers with Routes 13, 19, and 50.

Figure 5-22 Route Map, Route 11 – Plainfield



Major Destinations

- Central Station
- Medical Mile
- Spectrum Health-Butterworth
- Creston Plaza Apartments
- Michigan Unemployment Insurance Agency
- Home Instead Senior Care
- Northtown Shopping Center

Route 11 Characteristics		
Weekday		
Start Time		5:13 AM
End Time		12:37 AM
Average Daily Boardings		951
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	84.9%
Saturday		
Start Time		5:27 AM
End Time		10:05 PM
Headway (mins)		60
Sunday		
Start Time		6:43 AM
End Time		7:05 PM
Headway (mins)		60

Ridership

Route 11 averages approximately 951 riders per weekday and 26.5 boardings per revenue hour, making it an average ridership route and the eighth most productive route in the system. The first three inbound trips of the day, departing at 5:13 am, 5:43 am, and 6:13 am, have higher average ridership than any other trips in that direction. This indicates that there may be demand for additional inbound trips earlier in the morning.

The highest ridership and productivity for Route 11 occurs during the midday period (36.0 boardings per revenue hour), followed by the early morning period (29.5 boardings per revenue hour). This indicates that there may be sufficient demand to consider increased service frequency during the midday period.

Route 11 is a below average ridership route on Saturdays and the third lowest ridership route on Sundays, averaging approximately 394 Saturday riders and 250 Sunday riders. This represents a 59% and 74% decrease from weekday ridership, respectively.

Schedule Adherence

Route 11's OTP varies significantly by time of day, particularly in the afternoon peak period. Between June of 2018 and June of 2019, the route arrived on-time 95.8% of the time during the early morning, 88.0% of the time during the morning peak, 88.0% of the time during the midday period, 60.5% of the time during the afternoon peak, and 92.3% of the time during the evening period. On average, the OTP for Route 11 is 84.9%, the 6th lowest in the system.

On-time performance appears to worsen significantly on Michigan Street. Outbound and inbound trips average about one to two minutes of delay after operating on Michigan Street. Delays are also worst in the afternoon peak, with inbound trips arriving at Central Station over six minutes late. This reduces the reliability of the route and makes transfers more difficult during the afternoon peak period.

Summary

Route 11 is a relatively high productivity, average ridership route providing service between downtown Grand Rapids, Belknap Lookout, Creston, and northeast Grand Rapids via Plainfield Avenue. Ridership is high and steady until Knapp Street and there is little activity from there until north of I-96. Ridership is high at the end of the line and anecdotal evidence suggests that many passengers are walking to the Meijer which is located just over a half mile away. There appears to be demand for additional inbound trips during the early morning period, likely due to the commute patterns of the residents in these neighborhoods. Afternoon traffic on Michigan Street appears to be severely affecting Route 11's ability to stay on time.

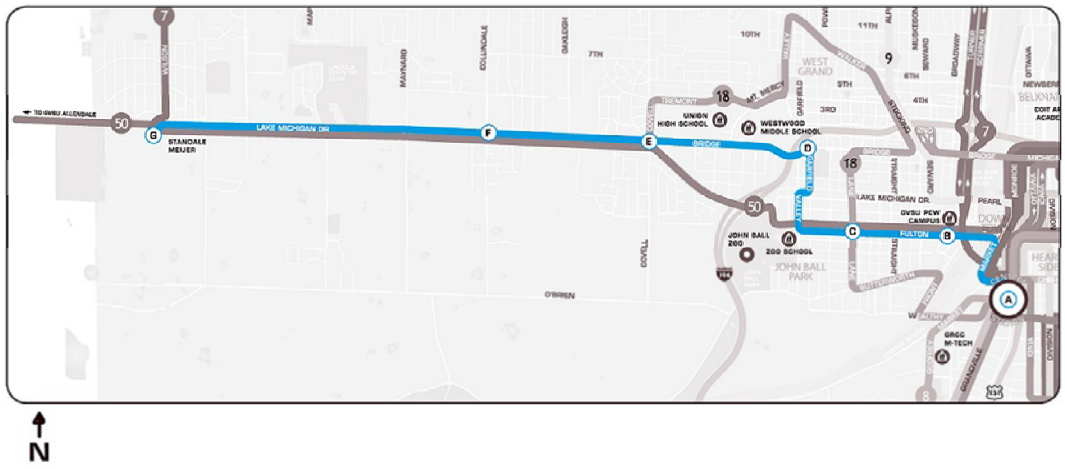
ROUTE 12 – WEST FULTON

Route 12 provides east-west service between Central Station in downtown Grand Rapids and the Wilson Avenue Meijer via Fulton Street, Bridge Street, and Lake Michigan Drive. The route alignment, shown in Figure 5-23, makes a slight deviation onto Valley Avenue, instead of the more direct alignment on Garfield Avenue, to provide service to John Ball Park and the John Ball Zoo. Route 12 operates with 30-minute headways during the peak and off-peak time periods and 60-minute headways during the evening time period.

Route 12 operates along the same alignment as Route 50 on Fulton Street between Seward Avenue and Valley Avenue and on Lake Michigan Drive between Covell Avenue and Wilson Avenue. Route 50 is an express connector route providing service between GVSU's main campus in Allendale Township and the Pew Campus in downtown Grand Rapids. Route 12 provides local service with stops located approximately every ¼ mile compared to the express connector service offered by Route 50 with stops located approximately every ½ mile to mile. Route 50 will be replaced by the upcoming Laker Line BRT and underlying local service on Lake Michigan Drive west of Covell Avenue may become unnecessary.

Route 12 provides connections to John Ball Park and Zoo and Lincoln Park in the Swan neighborhood, the Marsh Ridge Senior Community, the Lincoln Square Retirement Community, Apple Ridge Apartments, and the Wilson Avenue Meijer. In addition to the routes serving Central Station, Route 12 also enables transfers with Routes 7, 12, 18, and 50.

Figure 5-23 Route Map, Route 12 – West Fulton



Major Destinations

- Central Station
- John Ball Park and Zoo
- Lincoln Park
- Marsh Ridge Senior Community
- Lincoln Square Retirement Community
- Apple Ridge Apartments
- Grandview Apartments
- Meijer

Ridership

Route 12 averages approximately 544 riders per weekday, making it the third lowest ridership route in the system. Route 12 averages approximately 20.3 boardings per revenue hour, making it a below average productivity route. Ridership and productivity on Route 12 are highest during the midday period (23.4 boardings per revenue hour) and the afternoon peak period (22.2 boardings per hour). Higher productivity during the midday period, despite consistent service frequencies during the peak period, indicates that Route 12 is likely used to access services throughout the day rather than as a commuter route to access employment centers during the peak periods.

Route 12 Characteristics		
Weekday		
Start Time		5:06 AM
End Time		11:39 PM
Average Daily Boardings		544
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	95.0%
Saturday		
Start Time		5:43 AM
End Time		10:08 PM
Headway (mins)		60

Productivity is above average on the two segments closest to downtown Grand Rapids, Fulton & Lane to Fulton & Mt. Vernon (24.4 boardings per revenue hour) and Fulton & Vernon to Central Station (38.3 boardings per revenue hour). Route 12 operates along the same alignment as Route 50 between Lake Michigan Drive & Covell Avenue and Meijer and share a combined six stops on Lake Michigan Drive. At these shared stops, Route 12 averages a combined 22.5 boardings and 32.5 alightings per weekday, while Route 50 averages a combined 23.1 boardings and 21.7 alightings per weekday. Boardings and alightings between the two routes is relatively similar, with slightly more alightings on Route 12. This indicates that passengers are utilizing both Route 12 and Route 50 at about the same level.

Route 12 is a below average ridership route on Saturdays and does not provide service on Sundays. The route averages approximately 307 Saturday riders, representing a 44% decrease from weekday ridership.

Schedule Adherence

Route 12's OTP is relatively consistent throughout the day. Between June 2018 and June 2019, the route arrived on-time 96.2% of the time during the early morning, 96.8% of the time during

the morning peak, 97.1% of the time during the midday period, 88.0% of the time during the afternoon peak, and 96.9% of the time during the evening period. On average, the OTP for Route 12 is 95.0%, the second best OTP in the system.

On-time performance is generally consistent and high across the route alignment in the inbound direction. The only exception is through downtown Grand Rapids in the afternoon peak period, when the average trip arrives four minutes late to Central Station. In the outbound direction, on-time performance is also relatively high and consistent except during the afternoon peak period. The average outbound trip arrives between two and four minutes late to all time points during the afternoon peak with delays getting progressively worse throughout the corridor.

Summary

Route 12 is a relatively low ridership and low productivity route providing east-west service between downtown Grand Rapids and the Meijer located on Wilson Avenue. Route 12 operates along a similar alignment as Route 50 through the Swan neighborhood and along Lake Michigan Drive between Wilson Avenue and Covell Avenue. Route 50 has limited stops. On Lake Michigan Drive, 136 riders on Route 12 are not served by Route 50 or the upcoming Laker Line. Likewise, on Fulton Street, 162 riders on Route 12 are not served by Route 50 or the upcoming Laker Line. Many Route 12 riders may be within a short walk of a proposed Lake Line stop.

ROUTE 13 – MICHIGAN/FULLER NORTH

Route 13 provides service between Central Station in downtown Grand Rapids and the Michigan Veterans Facility in north Grand Rapids via Ottawa Avenue, Michigan Street, Fuller Avenue, and 3 Mile Road, as shown in Figure 5-24.

Route 13 Characteristics		
Weekday		
Start Time		5:22 AM
End Time		11:42 PM
Average Daily Boardings		664
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	87.7%
Saturday		
Start Time		5:42 AM
End Time		10:08 PM
Headway (mins)		60

The route operates along the same alignment as Route 19 on Michigan Street between Ottawa Avenue and Fuller Avenue. Route 13 operates with 30-minute headways during the peak and off-peak periods and 60-minute headways during the evening period. However, Route 19 operates with 15-minute headways during the peak, off-peak, and evening periods. These services are scheduled to facilitate transfers between the two routes along Michigan Street.

Route 13 provides connections to Grand Rapids Community College, Medical Mile and Spectrum Health-Butterworth, Kent County Veteran Services, Kent County Health Department, Kent County Sheriff's Office, Spectrum Health Rehabilitation and Nursing Center, Orchard Place Apartments, QCI Healthcare, and the Michigan Veterans Facility. In addition to the routes serving Central Station, Route 13 also enables transfers with Routes 11, 15, 19, and 50.

Major Destinations

- Central Station
- Van Andel Arena
- Grand Rapids Community College
- Spectrum Health-Butterworth
- Kent County Veteran Services
- Kent County Health Department
- Kent County Sherriff and Jail
- Spectrum Health Rehabilitation and Nursing Center
- QCI Healthcare
- Michigan Veterans Facility

Ridership

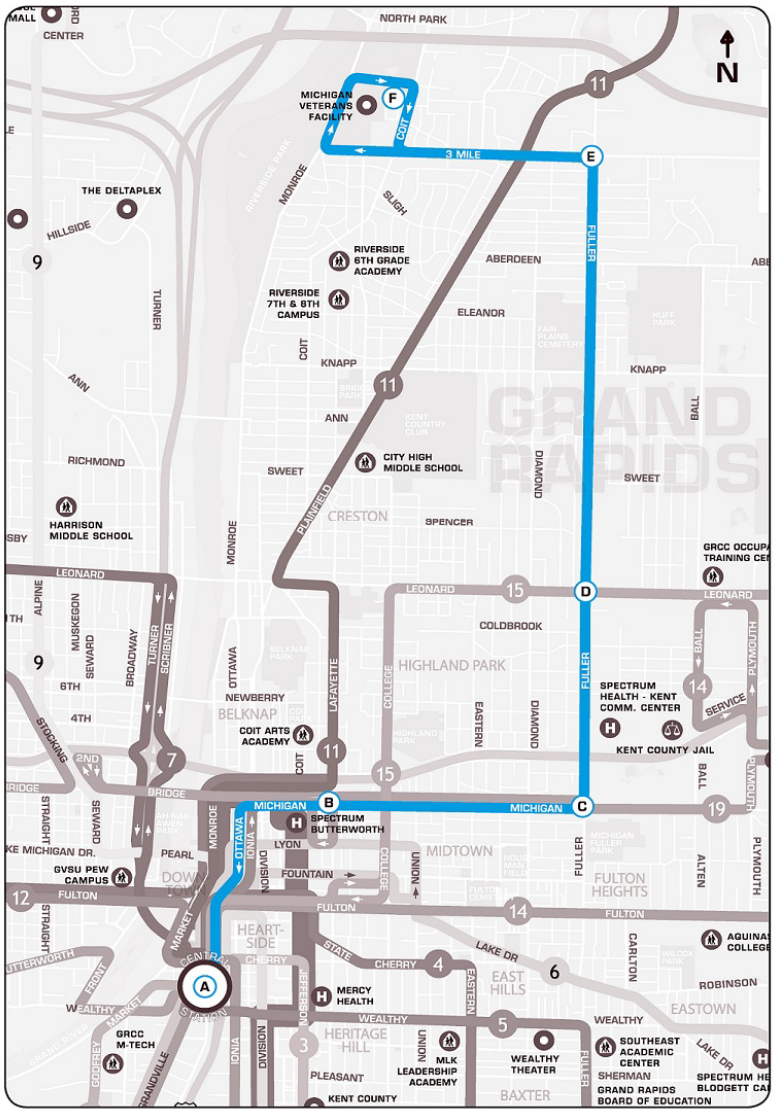
Route 13 averages approximately 664 riders per weekday, making it the fifth lowest ridership route in the system. Route 13 also averages approximately 22.6 boardings per revenue hour, making it a slightly below average productivity route. Productivity on Route 13 is relatively consistent during the peak and midday periods, averaging 24.3 boardings per revenue hour in the morning peak, 25.6 boardings per revenue hour in the midday period, and 24.5 boardings per revenue hour in the afternoon peak.

Productivity by segment is much less consistent than by time of day. Over half of the boardings on the route occur in the segment between Central Station and Michigan & Lafeyette. The productivity on this segment (42.1 boardings per revenue hour) is also nearly double the average productivity for the route. Ridership is much weaker north of Leonard Street, with just 121 boardings, 30 of which are at the Michigan Veterans Facility. Productivity north of Leonard Street is just over 10 passengers per hour.

High ridership stops on Route 13 include Central Station, Spectrum Health-Butterworth, Michigan & Fuller, Fuller & Leonard (a transfer point with Route 15), Orchard Place, and the Michigan Veterans Facility.

Route 13 is the fourth lowest ridership route on Saturdays and does not provide service on Sundays. The route averages approximately 286 Saturday riders, representing a 57% decrease from weekday ridership.

Figure 5-24 Route Map, Route 13 – Michigan North



Schedule Adherence

The OTP for Route 13 varies somewhat by time of day. Between June 2018 and June 2019, the route arrived on-time 97.6% of the time during the early morning, 90.4% of the time during the morning peak, 88.0% of the time during the midday period, 69.1% of the time during the afternoon peak, and 93.4% of the time during the evening period. On average, the OTP for Route 13 is 87.7%, average for the system.

Michigan Street congestion levels are likely responsible for the poor afternoon peak on-time performance, particularly for outbound trips during the afternoon peak period. Outbound trips arrive at Michigan & Lafayette nearly eight minutes late during the afternoon peak and continue to be delayed throughout the remainder of the corridor, arriving at every timepoint more than six minutes late.

Summary

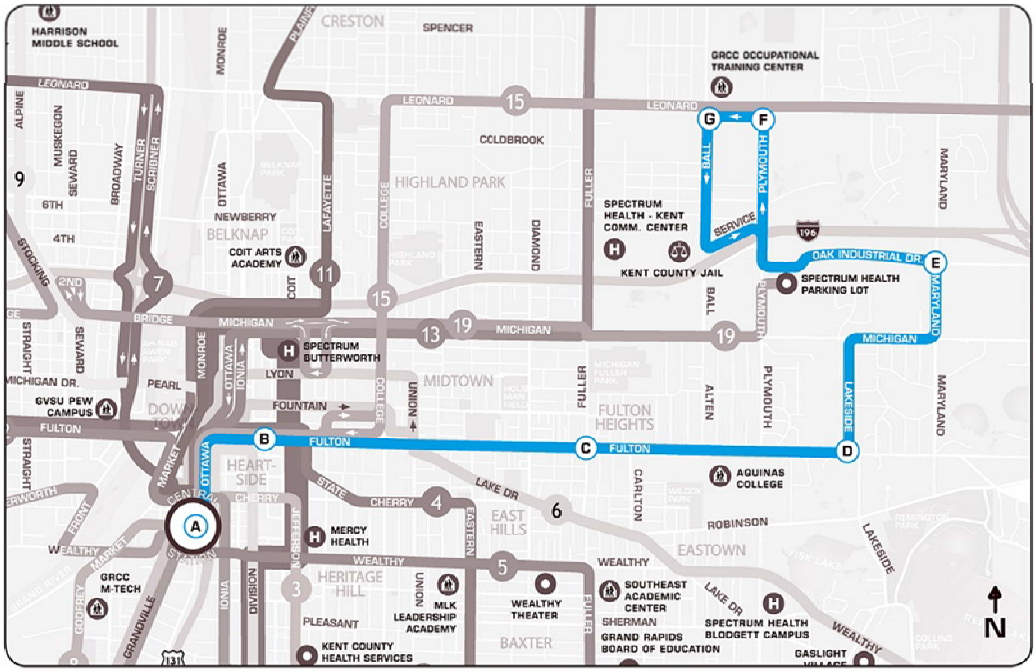
Route 13 is a generally low ridership, below average productivity route. On weekdays, Route 13 duplicates Route 19 service along Michigan Street, and Route 19 is more frequent and free. Most of the ridership and productivity on Route 13 is driven by the service between Central Station and Spectrum Health-Butterworth in downtown Grand Rapids. North of Leonard Street, Route 13 is underperforming, carrying very few passengers. On-time performance on Route 13 is significantly reduced while operating on Michigan Street in the afternoon peak.

ROUTE 14 – EAST FULTON

Route 14 provides service between Central Station in downtown Grand Rapids to the Grand Rapids Community College Occupational Training Center located at Ball Avenue & Leonard Street. The route alignment, shown in Figure 5-25, operates on Ottawa Avenue and Fulton Street through downtown Grand Rapids and makes an out-of-direction deviation onto Lakeside Avenue, Michigan Street, Maryland Avenue, and Oak Industrial Drive to provide service to the Marywood Health Center, the Maryland Park Apartments, the Bel Air Condominiums, and the industrial employment hub along Oak Industrial Drive. This route alignment results in longer travel times but increases coverage in the service area. Route 14 also operates a loop on Plymouth Avenue, Leonard Street, and Ball Avenue.

Route 14 operates with 30-minute headways during the peak and off-peak periods and 60-minute headways during the evening period. In addition to the routes serving Central Station, Route 14 also enables transfers with the Silver Line and Routes 4, 6, and 15.

Figure 5-25 Route Map, Route 14 – East Fulton



Major Destinations

- Central Station
- Van Andel Arena
- Marywood Health Center
- Aquinas College
- GRCC Occupational Training Center
- Kent County Jail

Ridership

Route 14 averages approximately 551 riders per weekday, making it the fourth lowest ridership route in the system. Route 14 also averages 21.2 boardings per revenue hour, making it a slightly below average productivity route. Productivity on Route 14 is highest during the morning peak (26.1 boardings per revenue hour) and the afternoon peak (23.6 boardings per revenue hour) periods. Productivity during the midday period (21.2 boardings per revenue hour) is not significantly lower than the peak period productivity, indicating that riders commonly use the route to access health and social services.

Route 14 Characteristics		
Weekday		
Start Time		5:12 AM
End Time		11:39 PM
Average Daily Boardings		551
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	91.1%
Saturday		
Start Time		5:42 AM
End Time		10:06 PM
Headway (mins)		60

Productivity by segment is highest at the ends of the route. The segment on Leonard between Plymouth and Ball averages 77.0 boardings per revenue hour. Additionally, the segment between Central Station and Fulton & Sheldon averages 37.5 boardings per revenue hour. Productivity on these segments is driven by boardings at the GRCC Occupational Training Center, Central Station, and Fulton & Sheldon in downtown Grand Rapids, with relatively low ridership in between.

Route 14 is the third lowest ridership route on Saturdays and does not provide service on Sundays. The route averages approximately 249 Saturday riders, representing a 55% decrease from weekday ridership.

Schedule Adherence

Route 14's OTP is somewhat consistent throughout the day, with reliability dropping during the afternoon peak time. Between June of 2018 and June of 2019, the route arrived on-time 99.1% of the time during the early morning, 93.6% of the time during the morning peak, 94.6% of the time during the midday period, 73.4% of the time during the afternoon peak, and 94.9% of the time during the evening period. On average, the OTP for Route 14 is 91.1%, the 8th highest in the system.

On-time performance is worst at the end point of the route for both directions in the morning peak period. Outbound trips arrive at Ball & Leonard over five minutes late on average and inbound trips arrive at Central Station over five minutes late on average. This makes transfer timing more difficult for passengers during this peak period and reduces the reliability of the service.

Summary

Route 14 is a low ridership, below average productivity route providing service east of downtown Grand Rapids through the Midtown and Fulton Heights neighborhood. The route's alignment makes an out of direction deviation to provide additional coverage service to several large apartment complexes, a medical facility, and an industrial employment hub. More than half of

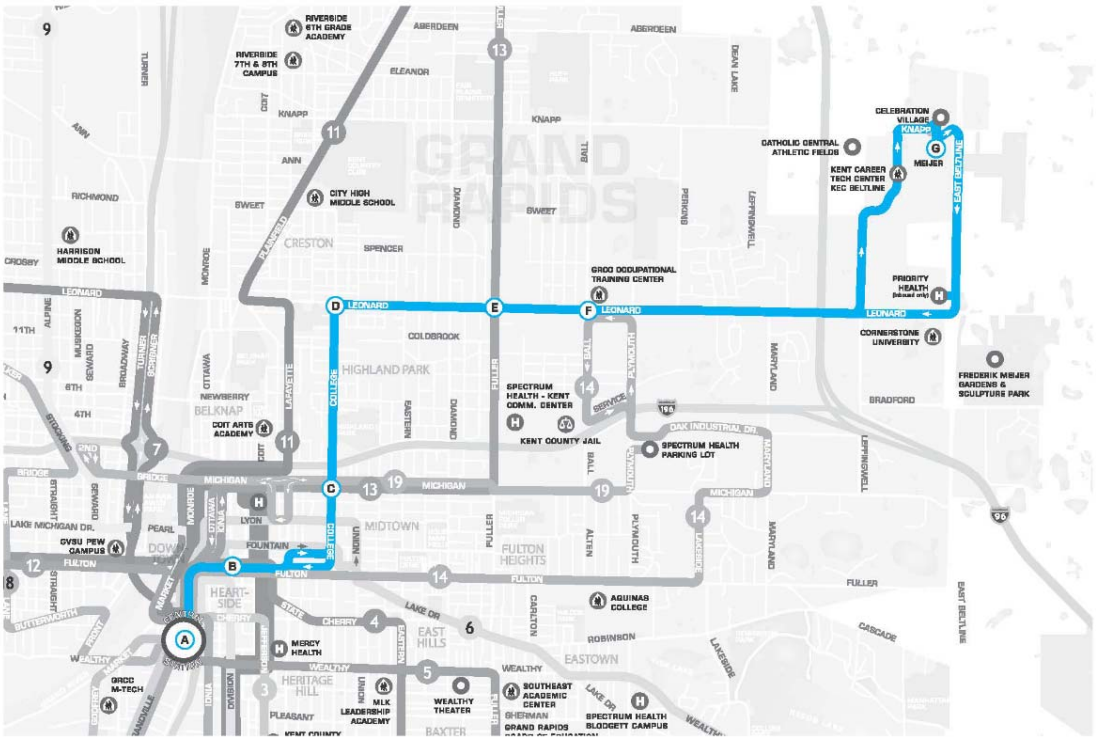
Route 14's alignment is within walking distance of other routes; Route 14 does not have a large unique ridership market.

ROUTE 15 – EAST LEONARD

Route 15 provides service between Central Station in downtown Grand Rapids and the Meijer located on Knapp Street in northeast Grand Rapids. The route alignment, shown in Figure 5-26, operates along Fulton Street, College Avenue, and Leonard Street. Route 15 also operates a couplet around the GRCC DeVos Campus with eastbound service operating on Fountain Street and westbound service operating on Fulton Street between Lafayette Avenue and College Avenue. The route also operates a loop between Leonard Street, Beltline Avenue, Knapp Street, and Leffingwell Avenue, making additional deviations within this loop to provide direct service to Priority Health, Meijer, ALDI, the Social Security Administration, and the Kent Career Technical Center.

Route 15 operates with 15-minute peak headways, 30-minute off-peak headways, and 60-minute evening headways. In addition to the routes serving Central Station, Route 15 also enables transfers with the Silver Line and Routes 4, 6, 13, 14, 15, and 19.

Figure 5-26 Route Map, Route 15 – East Leonard



Major Destinations

- Central Station
- GRCC DeVos Campus
- Priority Health
- Mercy Health Urgent Care – East Beltline

- Meijer
- Kent Career Technical Center

Route 15 Characteristics		
Weekday		
Start Time		4:52 AM
End Time		11:43 PM
Average Daily Boardings		944
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	87.4%
Saturday		
Start Time		6:07 AM
End Time		10:18 PM
Headway (mins)		60
Sunday		
Start Time		6:37 AM
End Time		7:13 PM
Headway (mins)		60

Ridership

Route 15 averages approximately 944 riders per weekday, making it a slightly below average ridership route. Route 15 also averages 23.7 boardings per revenue hour, making it average in terms of productivity. Productivity on Route 15 is highest during the midday period (31.9 boardings per revenue hour), although productivity remains relatively high during the afternoon peak (23.6 boardings per revenue hour) and the evening period (24.4 boardings per revenue hour). The high productivity during the midday and evening periods, when service frequency is reduced to 30 and 60 minutes, respectively, indicates that there may be demand for higher frequency service during the off-peak and evening time periods, particularly in the inbound direction. Productivity in the morning is only 16 boardings per revenue hour, and there are multiple trips carrying 5 or less passengers. Despite this low productivity, the first inbound trip in the morning has higher ridership than the next trips, indicating potential demand for earlier morning service.

Productivity is highest at the termini of the route, averaging 81.6 boardings per revenue hour between the Knapp Corner Meijer and the Kent Career Technical Center and averaging 45.0 boardings between Central Station and Fulton & Sheldon. There is also relatively high productivity on the segments operating on Leonard between Ball and Fuller (33.8 boardings per revenue hour) and between Fuller and College (22.6 boardings per revenue hour). Ridership on the route is primarily driven by Central Station, Meijer, and Fulton & Sheldon in downtown Grand Rapids.

Route 15 is a below average ridership route on Saturdays and the fourth lowest ridership route on Sundays, averaging approximately 447 Saturday riders and 290 Sunday riders. This represents a 53% and 69% decrease from weekday ridership, respectively.

Schedule Adherence

Route 15's OTP is somewhat consistent throughout the day, but gets worse during the afternoon peaks time. Between June of 2018 and June of 2019, the route arrived on-time 97.3% of the time during the early morning, 88.3% of the time during the morning peak, 84.6% of the time during the midday period, 74.2% of the time during the afternoon peak, and 92.8% of the time during the evening period. On average, the OTP for Route 15 is 87.4%, average for the system.

On-time performance is relatively consistent and high for outbound trips. Inbound trips are also relatively consistent and high except in downtown Grand Rapids during the afternoon peak

period. The average inbound trip during the afternoon peak arrives at Fulton & Sheldon nearly five minutes late and arrives at Central Station over seven minutes late. This level of delay may result in passengers missing their transfers and reduces the reliability of the service.

Summary

Route 15 is slightly below average route in terms of ridership and average in terms of productivity. The deviation to Priority Health (Waters Circle) serves 6 boardings while adding travel time to the route. Likewise, ridership at Kent Career Technical Center is low, with only 10 daily passengers. The peak nature of this route may be different than others due to the heavy retail nature of the Knapps Corner area. The morning service is underperforming, whereas the remainder of the day has good productivity.

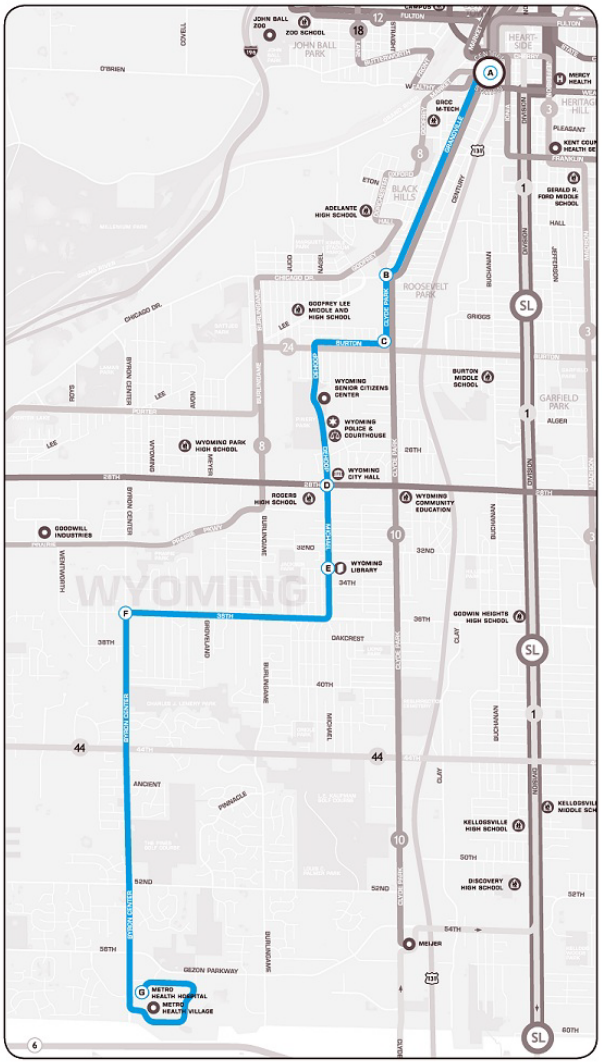
ROUTE 16 – WYOMING/METRO HEALTH

Route 16 provides service between Central Station in downtown Grand Rapids and Metro Health Village in Wyoming. The route alignment, shown in Figure 5-27, operates along Grandville Avenue, Clyde Parke Avenue, Burton Street, De Hoop Avenue, Michael Avenue, 36th Street, and Byron Center Avenue. The route makes a deviation to fully enter the Metro Healthy Village and Hospital facility and to provide direct service to the Kent District Library – Wyoming Branch on Michael Avenue.

Route 16 operates along the same alignment as Route 10 between Central Station and Burton Street, through the Black Hills and Roosevelt Park neighborhoods. Route 16 operates with the same 30-minute headways in the peak and off-peak periods as Route 10, offset by 15-minute intervals. This allows the two routes to operate at 30-minute headways and provide consistent 15-minute service along the shared corridor, north of Burton Street. Route 16 also shares an alignment with Route 24 on Burton Street between Clyde Park Avenue and Cleveland Avenue.

In addition to the routes serving Central Station, Route 16 also enables transfers with Routes 10, 16, 24, 28, and 44.

Figure 5-27 Route Map, Route 16 – Wyoming/Metro Health



Major Destinations

- Central Station
- Wyoming Senior Citizens Center
- Wyoming Policy and Courthouse
- Wyoming City Hall
- Kent District Library – Wyoming Branch
- Metro Health Village and Hospital

Ridership

Route 16 averages 747 riders per weekday and 20.6 boardings per revenue hour, making it a below average route in terms of both ridership and productivity. Productivity on Route 16 is highest during the midday period (24.4 boardings per revenue hour) and the afternoon peak period (23.7 boardings per revenue hour). The segments with the highest productivity are between Clyde Park & Crofton and Central Station (42.6 boardings per revenue hour) and between the Wyoming Library and De Hoop & 28th (29.1 boardings per revenue hour).

Route 16 Characteristics		
Weekday		
Start Time		5:16 AM
End Time		11:21 PM
Average Daily Boardings		747
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	91.9%
Saturday		
Start Time		5:31 AM
End Time		10:21 PM
Headway (mins)		60
Sunday		
Start Time		7:31 AM
End Time		7:05 PM
Headway (mins)		60

Ridership on the route is driven by Metro Health Hospital, Central Station, and De Hoop & 28th (a transfer point with Route 28). Ridership on Byron Center Avenue is low, except at the end of line and areas where transfers can take place.

Route 16 is a below average ridership route on both Saturdays and Sundays, averaging approximately 395 Saturday riders and 356 Sunday riders. This represents a 47% and 52% decrease from weekday ridership, respectively.

Schedule Adherence

Route 16's OTP is relatively consistent throughout the day. Between June of 2018 and June of 2019, the route arrived on-time 98.0% of the time during the early morning, 95.0% of the time during the morning peak, 93.0% of the time during the midday period, 78.9% of the time during the afternoon peak, and 94.8% of the time during the evening period. On average, the OTP for Route 16 is 91.9%, the 6th highest in the system.

On-time performance is relatively consistent throughout the route alignment and across different time periods, except outbound trips during the afternoon peak. Outbound trips appear to experience significant delays in downtown Grand Rapids, arriving at Grandville & Clyde Park nearly five minutes late on average. Delays continue throughout the corridor, with the average trip arriving between two and five minutes late at the remaining timepoints.

Summary

Route 16 is a below average ridership and productivity route. Metro Health Village is a high ridership stop at the end of the line, but there are long stretches of low-density residential areas that have limited ridership potential on the route. The ridership along the shared segment with Route 10 north of Burton Street seems to support the effective all-day 15-minute service.

ROUTE 17 – WOODLAND MALL/AIRPORT

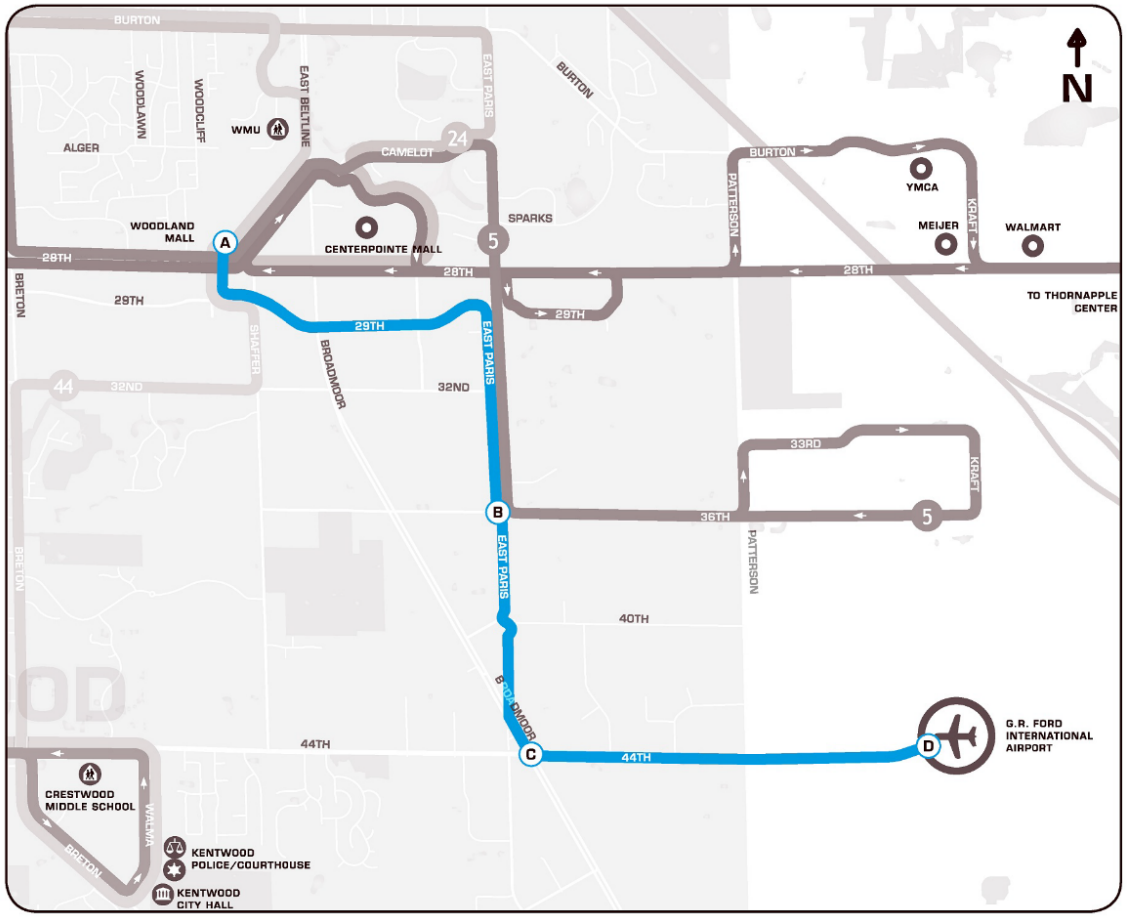
Route 17 provides service between Woodland Mall and Gerald R. Ford International Airport via 29th Street, Paris Avenue, Broadmoor Avenue, and 44th Street, shown in Figure 5-28. The route also provides service to multiple large apartment complexes located on Paris Avenue between 29th Street and 36th Street. Route 17 operates with 30-minute headways in the peak and off-peak periods and 60-minute headways in the evening period.

Route 17 is one of only five routes that do not provide service to Central Station in downtown Grand Rapids. The route enables transfers with Routes 5, 6, 24, 28, and 44 and is the only route providing service the airport.

Major Destinations

- Woodland Mall
- Gerald R. Ford International Airport

Figure 5-28 Route Map, Route 17 – Woodland/Airport



Ridership

Route 17 averages approximately 324 riders per weekday, making it the lowest ridership route in the system. Route 17 also averages 18.6 boardings per revenue hour, making it the 6th least productive route in the system.

The morning peak period has the highest productivity of the route (22.5 boardings per revenue hour). Additionally, the first outbound trip in the morning has significantly higher ridership than any other trip in that direction, which suggests service to a particular shift change. This first trip in the morning also has high alightings at the Aerotech Industrial Park.

Ridership on Route 17 does not appear to be driven by trips to the airport. There are only 18 daily boardings at the Airport. Instead, destinations along the industrial 44th Street corridor appear to be the biggest ridership generator. More than one quarter of trips carry less than 5 passengers.

Route 17 Characteristics		
Weekday		
Start Time		6:23 AM
End Time		11:40 PM
Average Daily Boardings		324
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	95.1%

Route 17 does not provide Saturday or Sunday service.

Schedule Adherence

Route 17's OTP is generally consistent throughout the day. Between June of 2018 and June of 2019, the route arrived on-time 98.3% of the time during the early morning, 94.5% of the time during the morning peak, 95.2% of the time during the midday period, 89.9% of the time during the afternoon peak, and 97.8% of the time during the evening period. On average, the OTP for Route 17 is 95.1%, the highest average OTP in the system.

On-time performance is consistently high in the outbound direction. Delays are most significant in the inbound direction during the afternoon peak period when the average trip arrives at Woodland Mall five minutes late. This level of delay may result in passengers missing transfer opportunities, making the service less reliable for passengers.

Summary

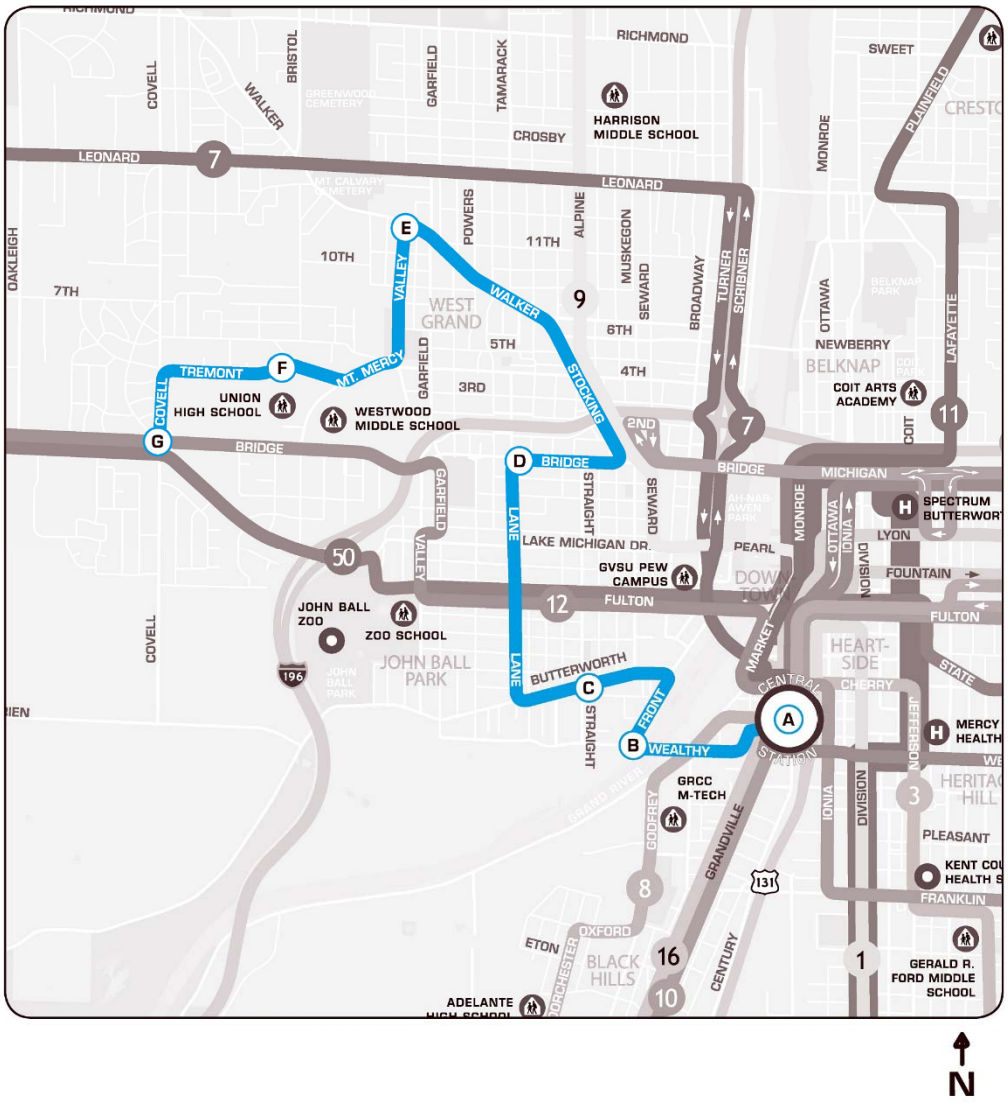
Route 17 connects the Woodland Mall Transit Center with the Gerald R. Ford International Airport. Virtually everyone using Route 17 is transferring to or from another route at the Woodland Mall. Route 17 operates primarily in a low-density industrial area. Its outbound alignment has two Michigan left turns that cause long travel times for a route this length. Route 17 is the lowest ridership route in the system and ranks relatively low in terms of productivity. Few passengers are actually going to the airport; most passengers have destinations in the industrial parks. Requiring a transfer to travel between downtown Grand Rapids and the airport may make this service less attractive to potential riders.

ROUTE 18 – WESTSIDE

Route 18 operates on a circuitous alignment, shown in Figure 5-29, providing local coverage service between Central Station in downtown Grand Rapids and the Swan and West Grand neighborhoods. Route 18 was designed to fill in the gaps between Route 12 and 9 service in West Grand Rapids, which leads to an indirect alignment.

Route 18 operates with 30-minute headways during the peak and off-peak periods and 60-minute headways during the evening period. In addition to the routes serving Central Station, Route 18 also enables transfers with Routes 8, 9, 12, 19, and 50.

Figure 5-29 Route Map, Route 18 – Westside



Major Destinations

- Central Station
- Vention Medical
- Grand Rapids Public Library – West Side Branch
- Hope Network
- Union High School
- Edison Plaza Shopping Center

Route 18 Characteristics		
Weekday		
Start Time		5:11 AM
End Time		11:37 PM
Average Daily Boardings		523
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	93.5%
Saturday		
Start Time		5:41 AM
End Time		10:05 PM
Headway (mins)		60

Ridership

Route 18 averages approximately 523 riders per weekday, making it the 2nd lowest ridership route in the system. Despite the low ridership, Route 18 averages approximately 24.9 boardings per revenue hour, making it a slightly above average route in terms of productivity. Route 18 operates over a relatively small area and provides service to the high transit propensity neighborhoods on the west side of Grand Rapids connecting to Central Station in downtown Grand Rapids.

The ridership patterns for the route indicate that most passengers are using Route 18 to reach downtown Grand Rapids or to access other connecting routes at Central Station. In the inbound direction, boardings are relatively consistent and evenly distributed throughout the route, while nearly all alightings occur at Central Station. In the outbound direction, nearly all of the boardings occur at Central Station and the alightings are relatively consistent and evenly distributed throughout the route. However, the APC data used for this analysis was collected during the summer months, when high schools were out of session. A supplemental review of ridership data from October 2019 indicated that there is relatively high ridership at Union High School.[4]

Productivity is highest during the midday and pm peak periods (23.7 boardings per revenue hour and 23.0 boardings per revenue hour, respectively). By segment, productivity is highest from Central Station to Market & Wealthy (51.7 boardings per revenue hour) and from Market & Wealthy to Butterworth & Straight (22.7 boardings per revenue hour). Ridership west of Walker & Van Buren is low, with only 45 daily riders, most of which board within walking distance of Route 12.

Route 18 is the lowest ridership route on Saturdays and does not provide service on Sundays. The route averages approximately 198 Saturday riders, representing a 62% decrease from weekday ridership.

[4] Route profile data analyzed in Appendix B does not include the supplemental ridership data collected in October 2019. The Ridership data shown in Appendix A was collected during the time period between October 11 and October 17 2019.

Schedule Adherence

Route 18's OTP is relatively consistent throughout the day. Between June of 2018 and June of 2019, the route arrived on-time 98.6% of the time during the early morning, 93.0% of the time during the morning peak, 93.6% of the time during the midday period, 87.1% of the time during the afternoon peak, and 95.3% of the time during the evening period. On average, the OTP for Route 18 is 93.5%, the 3rd highest in the system.

In the inbound direction, delays appear to be concentrated at Market & Wealthy. During all time periods, average delays across the route alignment are under two minutes except at the Market & Wealthy timepoint, where delays are between two and three minutes during the early morning, morning peak, midday, and afternoon peak periods. The average trip is able to make up time following these delays and generally arrive at Central Station on time.

Outbound trips experience the most delay during the afternoon peak, arriving at Walker & Valley nearly four minutes late and arriving at Tremont & Union three minutes late on average. Despite these delays, the average outbound trip in the afternoon peak period reaches the route terminus at Lake Michigan & Covell one minute late.

Summary

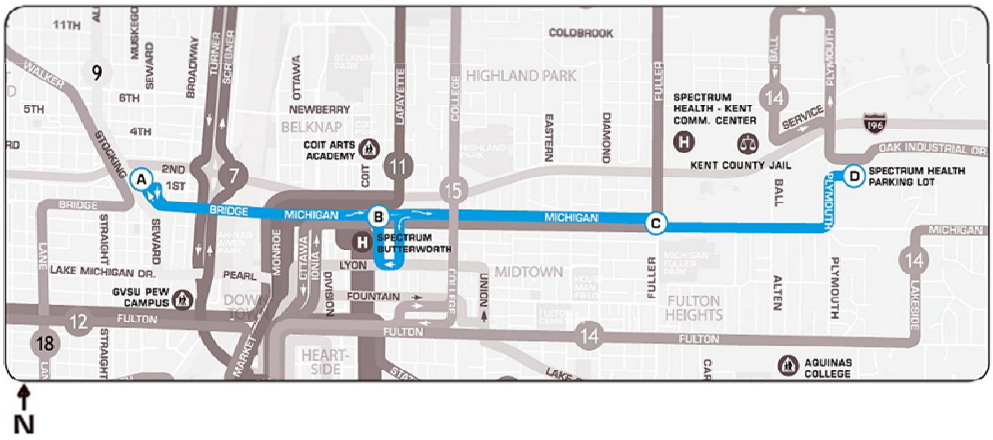
Route 18 is a coverage route that provides service throughout the Swan and West Grand neighborhoods and connects to Central Station in downtown Grand Rapids. Ridership on the route is highly concentrated at the Central Station terminus and relatively dispersed throughout the rest of the route alignment, suggesting there are few major destinations on the route other than Central Station. Rather than connecting directly to major destinations, this route provides a connection to Central Station, where passengers may transfer to other routes serving major destinations. Route 18 is a low ridership route but has slightly above average productivity due to its relatively short alignment and the high transit propensity area that it serves. Ridership is much lower in the less dense areas west of Walker.

ROUTE 19 – MICHIGAN CROSSTOWN

Route 19 is a high frequency, fare free, crosstown connector route that operates along Michigan Street through downtown Grand Rapids and the Swan, Midtown, and Fulton Heights neighborhoods. Route 19 operates a deviation onto Lafayette Avenue, Lyon Street, and Barclay Avenue, shown in Figure 5-30. Outbound service makes the deviation for every trip until the early afternoon, and some outbound trips make the deviation in the afternoon peak. The route provides connections to the West Michigan Center for Arts and Technology, Bridgewater Place, the Gerald R. Ford Federal Building, Medical Mile, Spectrum Health – Butterworth, and the Spectrum Health Park-and-Ride Lot on Plymouth Avenue. Route 19 only operates on weekdays.

Route 19 operates with 15-minute headways all day. During the morning peak, Spectrum Health supplements Route 19 service with shuttle vehicles, so that the effective morning frequency is 7.5 minutes. Route 19 is one of only five routes that do not provide service to Central Station in downtown Grand Rapids. The route enables transfers with the Silver Line and Routes 7, 9, 11, 13, 15, and 50.

Figure 5-30 Route Map, Route 19 – Michigan Crosstown



Major Destinations

- West Michigan Center for Arts and Technology
- Bridgewater Place
- The Gerald R. Ford Federal Building
- Medical Mile
- Spectrum Health – Butterworth
- Spectrum Health Park-and-Ride

Route 19 Characteristics		
Weekday		
Start Time		5:47 AM
End Time		10:22 PM
Average Daily Boardings		1,229
Peak Headway (mins)		15
Off-Peak Headway (mins)		15
Evening Headway (mins)		15
Schedule Adherence	On Time	89.6%

Ridership

Route 19 averages approximately 1,229 riders per weekday, making it the seventh highest ridership route in the system. The route also averages approximately 33.7 boardings per revenue hour, making it the third highest productivity

route in the system. Route 19 has the highest productivity during the morning and afternoon peak periods (42.8 boardings per revenue hour and 64.0 boardings per revenue hour, respectively). In the outbound direction, most riders board at Michigan & Barclay, outside of Spectrum Health – Butterworth, and alight at the Plymouth Avenue Spectrum Health park-and-ride lot. The opposite is true for the inbound direction, most riders board at the Spectrum Health park-and-ride lot and alight at the Spectrum Health – Butterworth Hospital, ridership west of the Butterworth Hospital is much lower. Route 19 appears to have one of the only traditionally peak-oriented ridership patterns in the system, likely due to the commute patterns of Spectrum Health employees using the service.

In the outbound direction, ridership is highest during early afternoon between approximately 2:00 pm and 4:00 pm and in the evening between approximately 7:00 pm and 8:00 pm. Conversely, inbound ridership is highest during the morning from approximately 6:30 am to 8:00 am. This ridership trend suggests that Route 19 is primarily used as a shuttle service connecting employees from the Spectrum Health – Butterworth Hospital and Medical Mile to and from the Spectrum Health park-and-ride lot. There also appears to be potential demand for earlier morning service due to higher ridership on the first inbound trip than the next few trips.

Route 19 does not provide Saturday or Sunday service.

Schedule Adherence

Route 19's OTP is somewhat consistent throughout the day with the biggest decrease occurring in the afternoon peak period. Between June of 2018 and June of 2019, the route arrived on-time 98.0% of the time during the early morning, 93.1% of the time during the morning peak, 95.5% of the time during the midday period, 77.4% of the time during the afternoon peak, and 93.2% of the time during the evening period. On average, the OTP for Route 19 is 89.6%, above average for the system. Traffic congestion on Michigan Avenue may be a major contributor to the reduced afternoon on-time performance.

Summary

Route 19 ranks among the highest ridership routes in the system. Route 19 is an attractive route for many riders because it is fare free, high frequency, and operates through the relatively dense areas of downtown Grand Rapids and the inner neighborhoods of Swan, Midtown and Fulton Heights. The route also provides fast, direct service between the Spectrum Health park-and-ride lot and the Spectrum Health – Butterworth Hospital, making it a very attractive service for Spectrum Health employees. Demand for service on Route 19 is highly directional. Demand is much higher for outbound service in the afternoon and evening and demand for inbound service is much higher in the morning.

ROUTE 24 – BURTON CROSSTOWN

Route 24 provides east-west crosstown service between Woodland Mall and the Visser Family YMCA in Grandville. The alignment for Route 24, shown in Figure 5-31Figure 5-30, operates along Burton Street, Burlingame Avenue, Porter Street, and Chicago Drive. Much of the route travels through mostly residential areas. The route travels out of direction to provide direct service to the Shops at Centerpoint as well as the numerous apartment complexes located north of Woodland Mall, including Springbrook Flats, Camelot Woods Apartments, Addington Place at East Paris, The Fountains Apartments, and Ridgewood Apartments.

Route 24 operates with 30-minute headways during the peak and off-peak periods and with 60-minute headways during the evening period. Route 24 is one of only five routes that do not provide service to Central Station in downtown Grand Rapids. The route enables transfers with the Silver Line and Routes 1, 2, 3, 4, 5, 6, 8, 10, 16, 17, 28, and 44.

Figure 5-31 Route Map, Route 24 – Burton Crosstown

Major Destinations

- Woodland Mall
- The Shops at Centerpoint
- Calvin University
- Breton Village Shopping Center
- Kent District Library – Grandville Branch
- Visser Family YMCA

Route 24 Characteristics		
Weekday		
Start Time		5:30 AM
End Time		11:50 PM
Average Daily Boardings		709
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	93.1%
Saturday		
Start Time		6:00 AM
End Time		10:50 PM
Headway (mins)		60

Ridership

Route 24 averages approximately 709 riders per weekday, making it a below average ridership route. Additionally, the route averages 13.9 boardings per revenue hour, making it the least productive route in the system. Route 24 has high morning and night ridership with morning passengers arriving at Woodland Mall and night passengers leaving Woodland Mall. This indicates that the high ridership during these time periods are likely employees commuting to and from work at the mall.

Route 24 has the highest productivity during the early morning period (21.7 boardings per revenue hour) however, the service only operates for 0.8 revenue hours during that time period, skewing the average productivity. The highest productivity segments on the route are all east of Clyde Park. These higher productivity segments all contain key transfer opportunities with the Silver Line and Routes 1, 2, 3, 4, and 10. West of Clyde Park, the route averages less than 10 boardings per revenue hour, which is low.

Route 24 is a below average ridership route on Saturdays and does not provide service on Sundays. The route averages approximately 360 Saturday riders, representing a 49% decrease from weekday ridership.

Schedule Adherence

Route 24's OTP is relatively consistent throughout the day. Between June of 2018 and June of 2019, the route arrived on-time 96.5% of the time during the early morning, 93.1% of the time during the morning peak, 94.7% of the time during the midday period, 83.8% of the time during the afternoon peak, and 97.6% of the time during the evening period. On average, the OTP for Route 24 is 93.1%, the 4th highest in the system.

During the afternoon peak period, inbound delays of about three minutes begin at Burton & Clyde Park and continue through the remainder of the route alignment, resulting in the average trip arriving at Woodland Mall four minutes late. In the outbound direction, trips have relatively little delay until Burton & Clyde Park, where the average trip arrives nearly four minutes late. The average outbound trip during the afternoon peak arrives at the Grandville Library nearly three minutes late.

Summary

Route 24 is a crosstown coverage route that operates about one mile north of 28th Street. It has much fewer retail destinations than 28th Street and is the worst performing route of the three crosstown services. Correspondingly, ridership is low. Ridership between Clyde Park and Grandville is low. Of the existing 150 boardings in this segment, approximately 35 are not directly served or within walking distance of Routes 8, 16, or 28. The Grandville Library does not appear to be a strong anchor for Route 24, with only 50 boardings all day, which is much lower than the 150 boardings at Kentwood Station.

ROUTE 28 – 28TH STREET CROSSTOWN

Route 28 operates an east-west crosstown service between the Grandville Branch of the Kent District Library, located near Chicago Drive & Wilson Avenue, to the shopping center located near 28th Street & Cascade Road. The route makes two out of direction loop, shown in Figure 5-32, in the inbound direction. The first loop is to provide direct service to the Kraft Avenue Meijer, Mary Free Bed YMCA, and Patterson Ice Center. The second loop deviates onto 29th Street east of East Paris Avenue, operating behind the Kentwood Towne Center and providing service to the Poplar Creek Condominiums, the adjacent residential neighborhood, and Meijer. Route 19 also operates on Lake Eastbrook Boulevard to provide direct service to the Shops at Centerpoint and Woodland Mall. Route 28 operates peak period short turns between the Grandville Library and 28th & Acquest which allow the route to provide 15-minute service in the peak period for this segment and 30-minute all day service between the Grandville Library and the Cascade Retail Center.

Route 28 operates with 15-minute headways during the peak period and 30 minute-headways during the off-peak and evening periods. The peak 15-minute frequency extends as far east as Paris Avenue. Route 28 is one of only five routes that do not provide service to Central Station in downtown Grand Rapids. The route enables transfers with the Silver Line and Routes 1, 2, 3, 4, 5, 6, 8, 10, 16, 17, 24, and 44.

Figure 5-32 Route Map, Route 28 – 28th Street Crosstown

Major Destinations

- Kent District Library – Grandville Branch
- Rogers Plaza Town Center
- ALDI
- Meijer – Kalamazoo Avenue
- Woodland Mall
- The Shops at Centerpoint
- Kentwood Towne Center
- Meijer – Kraft Avenue
- Costco
- Walmart
- Mary Free Bed YMCA
- Patterson Ice Center
- Kent District Library – Cascade Township Branch

Ridership

Route 28 averages approximately 1,630 riders per weekday, making it the fourth highest ridership route in the system, the highest ridership of the three crosstown routes. Despite this high ridership, Route 28 averages 19.0 boardings per revenue hour, making it a below average productivity route.

Productivity is highest during the midday period (26.4 boardings per revenue hour) when the headways are reduced from 15-minutes to 30-minutes. During the periods when the route is operating every 15-minutes, many trips carry less than 5 passengers.

Productivity by segment is highly concentrated on four segments in the middle of the route, from 28th & Burlingame to 28th & Clyde Park (26.6 boardings per revenue hour), from 28th & Clyde Park to 28th & Division (38.4 boardings per revenue hour), from 28th & Division to 28th & Eastern (43.6 boardings per revenue hour), and from 28th & Eastern to 28th & Kalamazoo (22.9 boardings per revenue hour). These higher productivity segments all contain key transfer opportunities with the Silver Line and Routes 1, 2, 3, 4, and 10.

Route 28 is the fifth highest ridership route on Saturdays and the fourth highest ridership route on Sundays, averaging approximately 956 Saturday riders and 560 Sunday riders. This represents a 41% and 66% decrease from weekday ridership, respectively.

Route 28 Characteristics		
Weekday		
Start Time		5:32 AM
End Time		12:28 AM
Average Daily Boardings		1,630
Peak Headway (mins)		15
Off-Peak Headway (mins)		30
Evening Headway (mins)		30
Schedule Adherence	On Time	78.6%
Saturday		
Start Time		6:47 AM
End Time		10:28 PM
Headway (mins)		30-60
Sunday		
Start Time		6:52 AM
End Time		6:58 PM
Headway (mins)		60

Schedule Adherence

Route 28's OTP varies significantly by time of the day, with the midday period and afternoon peak period experiencing the most delays. Between June of 2018 and June of 2019, the route arrived on-time 97.9% of the time during the early morning, 91.5% of the time during the morning peak, 65.3% of the time during the midday period, 49.1% of the time during the afternoon peak, and 89.2% of the time during the evening period. On average, the OTP for Route 28 is 78.6%, the 3rd lowest in the system. Traffic congestion increases throughout the afternoon and into the afternoon peak, which may contribute to the poor on-time performance. Route 28 experiences significantly delays across the entire route alignment for inbound trips during the midday and afternoon peak. After departing Grandville Library, the average trip is over three minutes late to every time point. These delays worsen further at 28th & Acquest, Meijer, and 28th & Cascade. During the afternoon peak, the average trip arrives at 28th & Acquest nine minutes late, Meijer nine minutes late, and 28th & Cascade seventeen minutes late. These delays are less severe during the midday period, but the average trip still arrives between six and eight minutes late.

Outbound trips during the afternoon peak arrive to all timepoints over three minutes late on average, including over eight minutes late to 28th & Cascade and Meijer and over seven minutes

late to 28th & Clyde Park and the Grandville Library. This level of delay makes the route highly unreliable for passengers, particularly at transfer points at Clyde Park, Division, Eastern, and Kalamazoo.

Summary

Route 28 is a crosstown route that has high ridership. Much of the ridership on Route 28 appears to be related to transfers with other north-south operating routes, Woodland Mall, Meijer, and Walmart. The outbound deviation into Meijer at Kalamazoo Avenue adds approximately 4 minutes of travel time to Route 28, while the inbound deviation adds at least 2 minutes of travel time. On 28th Street, inbound Route 28 passes within 20 feet of the existing bus stop in the Meijer parking lot. Route 28's morning peak does not appear to be strong enough to support 15-minute service. Before 9 a.m., much of the retail that is spread along the entire corridor is not open, which reduces some of the demand for service. On-time performance issues on the corridor are significant during the midday and afternoon peak periods and are likely to result in passengers missing transfers to other routes.

ROUTE 44 – 44TH STREET CROSSTOWN

Route 44 provides an east-west running crosstown service operating between Woodland Mall, Kentwood City Hall, and the Grandville Walmart. Route 44 operates several out of direction loops and deviations, shown in Figure 5-33, to provide service to additional destinations including the Wingate Apartments on 32nd Street, the Kentwood City Hall and municipal campus between Breton Road, Walma Avenue, and 44th Street, the RiverTown Crossings Shopping Center, and Grandville Marketplace. The eastern end of Route 44 runs adjacent to the western end of Route 17. There is potential to combine these services into a more direct east-west crosstown route, however, Woodland Mall serves as a major destination and is a strong route terminus for both Route 44 and Route 17.

Route 44 operates with 30-minute headways during the peak and off-peak periods and 60-minute headways during the evening period. Route 44 is one of only five routes that do not provide service to Central Station in downtown Grand Rapids. The route enables transfers with Routes 1, 2, 5, 6, 8, 10, 16, 17, 24, and 28.

Figure 5-33 Route Map, Route 44 – 44th Street Crosstown

Major Destinations

- Woodland Mall
- The Shops at Centerpoint
- Wingate Apartments
- Kentwood City Hall and Police Department
- Kent District Library – Kentwood Branch
- Meijer
- RiverTown Crossings Shopping Center
- Grandville Marketplace

- Grandville High School
- Walmart

Ridership

Route 44 averages approximately 971 riders per weekday, making it a slightly below average ridership route. Additionally, Route 44 averages 17.0 boardings per revenue hour, making it the 2nd least productive route in the system.

Route 44 Characteristics		
Weekday		
Start Time		5:22 AM
End Time		12:21 AM
Average Daily Boardings		971
Peak Headway (mins)		30
Off-Peak Headway (mins)		30
Evening Headway (mins)		60
Schedule Adherence	On Time	91.6%
Saturday		
Start Time		5:22 AM
End Time		10:13 PM
Headway (mins)		60

Productivity on Route 44 is highest during the early morning period (24.4 boardings per revenue hour), however, this time period only operates for 0.9 revenue hours, skewing the productivity. Outside of the early morning period, productivity is relatively consistent throughout the day, ranging between 17.0 boardings per revenue hour in the morning peak period and 19.5 boardings per revenue hour in the afternoon peak period. After 9:30 pm, every Route 44 trip carries less than 10 passengers.

The highest productivity segments on the route include those that connect with Woodland Mall and enable transfers with other north-south operating routes. These high productivity segments include from 32nd & Breton to Woodland Mall (27.3 boardings per revenue hour), from 44th & Eastern to 44th & Division (34.0 boardings per revenue hour), and from 44th & Division to 44th & Clyde Park (21.8 boardings per revenue hour).

The highest ridership stops on the route include Woodland Mall, Walmart, Meijer, 44th & Division, and 44th & Eastern.

Route 44 is a below average ridership route on Saturdays and does not provide service on Sundays. The route averages approximately 469 Saturday riders, representing a 52% decrease from weekday ridership.

Schedule Adherence

Route 44's OTP is relatively consistent throughout the day. Between June of 2018 and June of 2019, the route arrived on-time 96.3% of the time during the early morning, 91.5% of the time during the morning peak, 91.8% of the time during the midday period, 81.7% of the time during the afternoon peak, and 96.6% of the time during the evening period. On average, the OTP for Route 44 is 91.6%, above average for the system.

On-time performance for Route 44 is worst during the afternoon peak in the outbound direction. Intersections with delays of over four minutes include 32nd & Breton, 44th & Byron Center, and the Rivertown Meijer. These delays make the route less reliable for passengers, particularly at transfer points at Clyde Park, Division, Eastern, and Kalamazoo.

Summary

Route 44 is a low-productivity crosstown service that is the southern-most east-west route operated by The Rapid. It is primarily a coverage route and its ridership pattern is focused on either transfer locations to other routes, such as Division, or at retail establishments such as Walmart or Meijer. The deviation to Kentwood City Hall is low ridership and duplicates service with Route 2, which has significantly higher ridership to those stops.

CAMPUS CONNECTOR – ROUTE 50

Route 50 is a campus connector service providing connections between GVSU's main campus in Allendale Township, the GVSU's Pew Campus in downtown Grand Rapids, and the Medical Mile and Spectrum Health-Butterworth Hospital.

Route 50 operates along the same alignment as Route 12 on Fulton Street between Seward Avenue and Valley Avenue and on Lake Michigan Drive between Covell Avenue and Wilson Avenue. Route 50 is a express route connecting GVSU's main campus in Allendale Township with the Pew Campus in downtown Grand Rapids, while Route 12 provides more local service with stops located approximately every ¼ mile compared to the express service offered by Route 50 with stops located approximately every ½ mile or mile.

Route 50 provides a high frequency service, operating with 6 to 12-minute headways in the peak period, 6 to 30-minute headways in the off-peak period, and 12 to 30-minute headways in the evening period. Route 50 enables transfers with the Silver Line and Routes 7, 9, 11, 12, 13, 19 and the Route 37, 48, and 85 campus circulator services.

The APC data used to assess the ridership and productivity of the routes in The Rapid's system were collected during the summer, when Route 50 was operating at a reduced service level and when fewer students were commuting to campus. There was insufficient data to conduct an in-depth analysis on the performance of these routes, however, historical ridership data for October 2019-May 2019 yielded an average of 5,471 riders per weekday.

Figure 5-34 Route Map, Route 50 – GVSU Campus Connector

GRAND VALLEY STATE UNIVERSITY CAMPUS ROUTES

The Rapid operates several circulator and connector routes within the GVSU Main Campus and connecting to the GVSU Pew Campus in downtown Grand Rapids. These campus routes include:

- Route 37 – North Campus
- Route 48 – South Campus
- Route 85 – Combined 37/48

Campus Circulators – Routes 37, 48, and 85

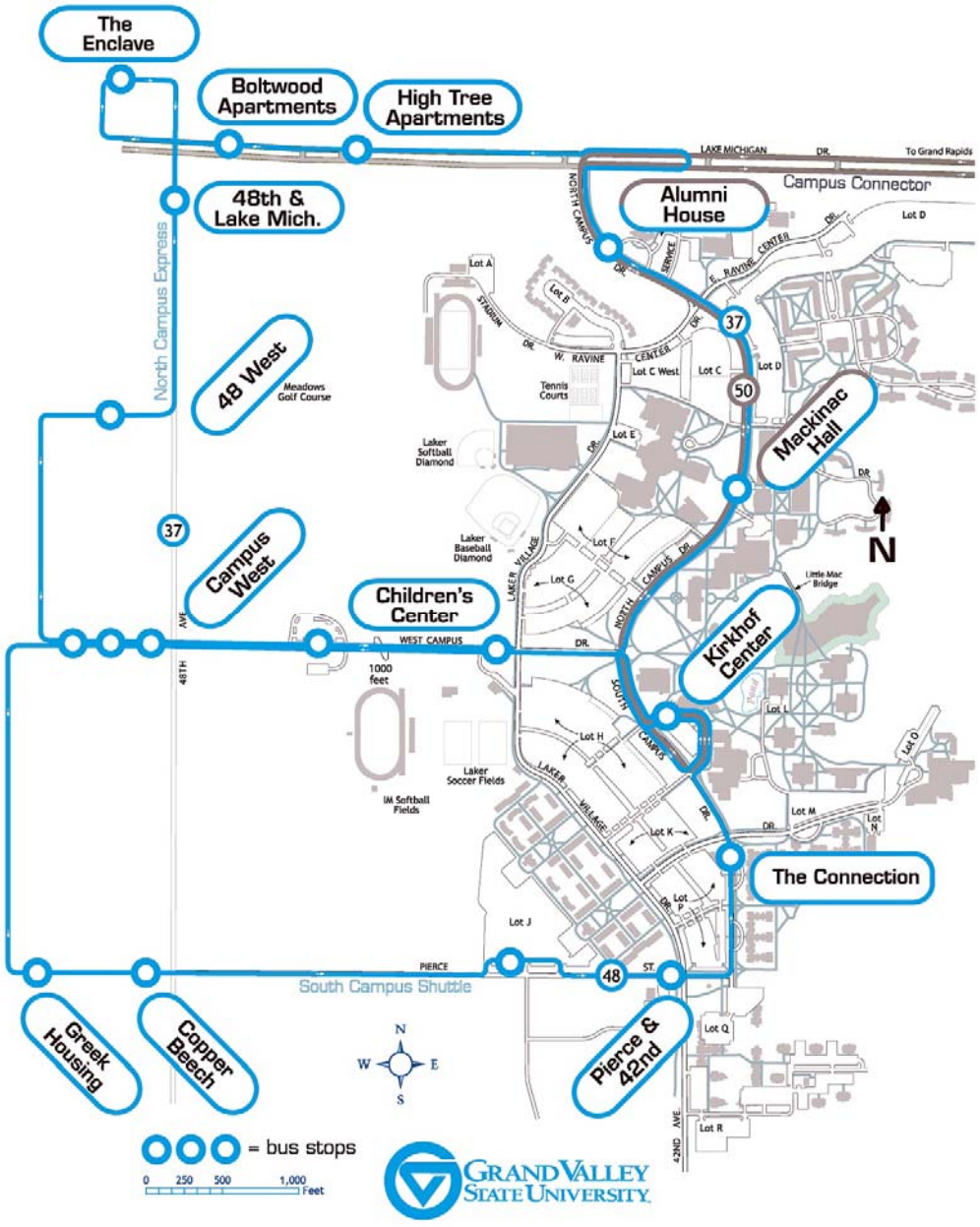
Routes 37, 48, and 85 provide circulator service throughout the GVSU Main Campus in Allendale Township, shown in Figure 5-35, and are open to the general public. Route 37 operates through the northern portion of the campus in a loop between Lake Michigan Drive, North Campus Drive, West Campus Drive, and 48th Avenue. Route 37 provides service to the Campus West Apartments, 48 West, The Enclave, Boltwood Apartments, High Tree Apartments, Alumni House, Mackinac Hall, Kirkhof Center, and Children's Center. Route 37 operates every 6-10 minutes all day.

Route 48 operates similarly to Route 37 but provides service to the southern portion of the campus in a loop between West Campus Drive, South Campus Drive, Pierce Street, and Lodge Drive. Route 48 provides service to The Lodge at Allendale, Campus West Apartments, Children's Center, Kirkhof Center, The Connection Dining, TRIO Townhomes and Apartments, and Evolve Student Living. Route 48 operates every 4-10 minutes all day.

Route 85 is a combined hybrid service of Routes 37 and 48 that operates as a loop around campus on Lake Michigan Drive, North Campus Drive, South Campus Drive, Pierce Street, and 48th Avenue. Route 85 only operates three trips on weekday mornings at 5:45 am, 6:10 am, and 6:35 am, but operates every 12 to 25 minutes between 6:00 pm and 3:00 am on Fridays. Route 85 operates when Routes 37 and 48 are out of service, on weekday mornings, Friday nights, and weekends.

The APC data used to assess the ridership and productivity of the routes in The Rapid's system were collected during the summer, when campus circulator routes were not operating. There was insufficient data to conduct an in-depth analysis on the performance of these routes, however, historical ridership data for October 2019-May 2019 yielded an average of 2,366 weekday riders on Route 48 and an average of 3,143 weekday riders on route 37.

Figure 5-35 Route Map, Routes 37 and 48 – Campus Circulator Service



DASH ROUTES

The Rapid also operates two Downtown Area Shuttles (DASH), known as DASH West and DASH North. DASH routes operate fare free, similar to Route 19 and the Silver Line through downtown Grand Rapids. DASH routes are planned and funded by the City of Grand Rapids and are operated by The Rapid. The alignments for the two DASH routes are shown in Figure 5-36. Both DASH North and DASH West operate as high frequency routes with 8-minute headways all day. DASH service operates from 6:30 AM-10:30 PM Monday-Wednesday, 6:30 AM-1:00 AM Thursday-Friday, 10:00 AM – 1:00 AM Saturday, and 10:00 AM – 8:00 PM Sunday. Major destinations served by the DASH routes include City Hall, DeVos Place, Grand Rapids Community College, GVSU Pew Campus, and Van Andel Arena.

DASH North

DASH North provides north-south service along Monroe Avenue, Market Avenue, Cherry Street, and Ionia Avenue. DASH North operates on two loops at either end of the route, between Monroe Avenue, Leonard Street, Iona Avenue, and Coldbrook Street to the north, and between Ionia Avenue, McConnel Street, Division Avenue, and Logan Street to the South.

Ridership on DASH North is highest at Downtown Market, Ionia & Leonard, Monroe & Pearl, and Monroe & Louis. DASH North averages approximately 992 riders per weekday and 18.9 boardings per revenue hour, making it a below average route in terms of ridership and productivity. The route is most productive during the midday and afternoon peak period, averaging 21.5 and 27.0 boardings per revenue hour, respectively.

DASH West

DASH West operates as two loops connected by Pearl Street. The eastern loop operates between Pearl Street, Division Avenue, Ottawa Avenue, Fulton Street, and Iona Avenue. The western loop operates between Lake Michigan Street, Seward Avenue, Bridge Street, and Turner Avenue.

Ridership on DASH West is highest at Lake Michigan & Seward, driven by the multiple park-and-ride lots located adjacent to the GVSU Pew Campus. Additional high ridership stops include the Area 7 parking lot and Oaks & Commerce. DASH West averages approximately 798 riders per weekday and 24 boardings per revenue hour, making it a below average ridership route and an average productivity route. Productivity is highest during the morning and afternoon peak periods, averaging approximately 34.9 and 25.0 boardings per revenue hour, respectively.

Figure 5-36 Route Map, DASH Routes