TARTA Comprehensive Operational Analysis and Alternatives Analysis

State of the System

DRAFT - January 2022

TARTA Next
It's Go Time.

Table of Contents

Table of Contents (continued)

Introduction

Overview

TARTA Next
It's Go Time.

In 2020, TARTA embarked on a transformational journey to develop a new strategic plan that will serve as a roadmap for the agency over the coming years. The focus of the strategic plan is to improve the customer and employee experience, as well as the agency's long-term financial stability. The goal of this new vision is to modernize and energize TARTA to ensure that public transit services in the Toledo area make a positive impact on residents and visitors alike.

A critical piece of TARTA's transformation also involves restructuring transit service. The Comprehensive Operations Analysis (COA) and Alternatives Analysis (AA) – branded collectively as **TARTA Next** – will help TARTA meet this goal. The COA includes a redesign of existing bus services to better match service with current travel patterns and create transit service that is faster, more direct, simpler and easier to understand. High-level goals for the study are as follows:

- Secure long-term, sustainable funding
- Improve customer experience
- Identify operational efficiencies
- Invest in technologies
- Prove value to the community

STATE OF THE SYSTEM

The **State of the System** report provides a detailed evaluation of existing services and an understanding of transit markets, demand, and service needs in the Toledo area. To understand the strengths and opportunities associated with the existing system, this document provides an overview of:

- Existing services, route network, and operating characteristics
- Existing ridership trends and performance
- Transit markets defined according to population, employment, and socioeconomic characteristics as well as activity centers and commute patterns
- How well existing services are matched with demand and community needs

The report concludes with a description of system considerations for transit improvements for residents and people who travel in the Toledo area for school, work, and as visitors.

Why is Transit, and TARTA, Important?

Cities and regions support public transportation services for a variety of reasons, including that transit provides travel choices beyond the private automobile, creating a diversified, accessible, and equitable transportation network. A successful transit system creates opportunities to support a variety of community interests:

ECONOMIC DEVELOPMENT

Transit has a demonstrated ability to attract economic investment along corridors as well as in specific commercial areas. Transit is also critical for low-income households by providing access to jobs and economic opportunity.

AFFORDABILITY

Well-functioning transit services can reduce household expenses for individuals and families. On average, Toledo residents spend about 47% of their incomes on transportation costs (H+T Index). Just the average transportation costs of owning and operating a car, including gas, insurance, and maintenance, are estimated at $11,480 a year. While TARTA is currently fare-free, a year of monthly bus passes would cost a fraction of this: $720.

ACCESS, PARTICIPATION AND INDEPENDENCE

TARTA's service is especially important for households that do not have access to a vehicle and individuals who have limited abilities. TARTA's service provides community members the ability to participate in daily activities and to travel throughout Lucas County and Rossford with access to places of work, recreation, education, and health care.

SAFETY AND ENVIRONMENT

Transit service is among the safest ways to travel. Bus riders help reduce the number of vehicles on the road and reduce air pollution and greenhouse gas emissions.

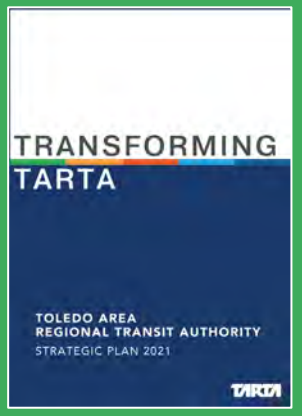
BUILDING SUPPORT FOR ENHANCED TRANSIT

2020 REPORT TO THE COMMUNITY

This plan focused on four themes that will move TARTA forward through past funding and investment challenges: Transform, Change, Pivot and Reimagine. This Comprehensive Operations Analysis is a critical element of the vision to reimagine and redesign the next generation of transit service in the Toledo region.

TARTA STRATEGIC PLAN (2021)

The Strategic Plan outlines the highest priority projects for TARTA over the next five years. The primary values driving the plan are a focus on high-quality customer service and providing value to taxpayers. A series of strategic priorities are defined for the agency, along with metrics that are aligned with each strategic priority.



2021 TAX LEVY

In November 2021, voters approved Issue 12 that repealed a long-standing property tax and replaced it with a 0.5% sales tax for 10 years. The vote also added Lucas County to TARTA. The vote required a simple majority and passed 55% to 45%.

Key Findings: Existing Transit Services

FIXED ROUTE KEY FINDINGS

Based on the evaluation of TARTA's existing fixed route services, key issues and findings to be explored in the next phase of the study include:

- **The highest ridership routes offer the most frequency**. Not surprisingly, routes that serve the most developed corridors and offer 30-minute frequencies (on weekdays), also have the highest ridership (Routes 2, 5, 19 and 31). Ridership is much stronger on the more urban portions of these routes. Three of these routes (2, 5 and 31) operate with an alternating pattern with a longer and shorter version of route. TARTA uses the alternating patterns to operate more frequent service in the urbanized part of the route.
- **Routes 14 and 12 in East Toledo are TARTA's most productive** routes in terms of passengers per revenue hour. Both routes operate hourly on weekdays and Saturday. It should be noted that Route 14 is also TARTA's fifth highest ridership route.
- **Saturday ridership is about half of weekday ridership.** Service operates less frequently and for less time on Saturday and as such, ridership is about 45% compared to weekday. On the other hand, productivity (passenger per hour) is higher on Saturday than on weekdays.
- **Ridership is not peak oriented.** Most routes have consistent ridership during the midday period with the peak travel period from 1:00 – 3:00 PM.
- **On-time performance is not a significant issue.** While several routes have some modest issues with running late, most routes are either on-time or even running early. It should be noted that routes that are consistently running early may need to have time removed from their schedule.

TARPS/CALL-A-RIDE KEY FINDINGS

The analysis of TARPS and Call-A-Ride is based on monthly data in 2019, 2020 and 2021. Based on this information, some trends and key findings from this analysis are as follows:

- **Ridership on TARPS has largely recovered** from the pandemic. While ridership dropped in 2020, as was common on nearly all transit services in the country, ridership on TARPS is at or near 2019 levels. It is important to note that this is from a single month rather than an annual figure, so annual figures for 2021 are still likely lower than 2019. It is also important to note that TARPS is currently fare-free, which could result in additional trips that customers may not take if a fare was being collected. Because this is ADA service, all reasonable requests for service must be accommodated.
- **Call-A-Ride service is not well utilized** and has yet to recover to 2019 levels. Ridership on Call-A-Ride is relatively low and averages just 4 rides per hour (down from an average of 5.25 per hour in 2019). The Sylvania-Sylvania Township-Ottawa Hills Call-A-Ride is the most popular Call-A-Ride service, followed by Maumee and Rossford (that has very few daily riders). The low ridership on Call-A-Ride could be related to possible duplication with fixed route services (that are also fare-free), the need to book trips in advance, or the lack of an app-based trip booking platform.
- **Ridership on TARPS peaks in the morning and again in the afternoon**, which is typical of paratransit services. The peak demand period on TARPS is 2:00 PM. **Call-A-Ride ridership peaks in the morning** and slowly decreases throughout the day. These trends are like previous years but 2021 volumes are lower than 2019.

Key Findings: Market Analysis

AREAS WITH STRONG LOCAL TRANSIT DEMAND

The analysis of underlying local transit demand based on current and future population density, socioeconomic characteristics, and employment density shows transit demand to be the strongest in the following areas:

- **Downtown Toledo**, while not as prominent as it once was, remains an important destination and has relatively high transit demand both in 2020 and 2035. The concentration of office, civic and entertainment activities downtown are all important transit drivers. Trips within the downtown area are also expected to increase by 2035, even as some connections to and from downtown Toledo are not as strong as in 2020.
- **The Monroe Street corridor** from downtown Toledo to Sylvania is a critical connection in the region, especially from the ProMedica Toledo Hospital to Flower Hospital in Sylvania. This corridor is expected to remain important well into the future.
- **Many central Toledo neighborhoods** show strong transit demand, largely due to neighborhoods that are lower income and households without access to a vehicle. This includes East Toledo, West Toledo, the La Grange, Warren Sherman and Old Town neighborhoods, as well as the Southside neighborhood.
- **The Franklin Park Mall and Westgate areas** are major draws in the region for shopping and services and is where many people in the older residential neighborhoods travel for jobs and essential services. These areas are expected to maintain their importance in the future.
- **The University of Toledo and UT Health Sciences Campuses** are both strong generators of transit demand. The main UT campus tends to have more localized and internal demand, whereas the Health Sciences campus generates more regional demand.
- **The northern part of Maumee and southwest Toledo** also has strong current and future transit demand, largely due to a mix of commercial uses, medical facilities and jobs. This area includes the Amazon fulfillment center in Southwyck.

AREAS WITH WEAKER LOCAL TRANSIT DEMAND

Most of the rural parts of Lucas and Wood Counties are not strong markets for traditional fixed-route transit services, largely due to lower population and employment density, but also based on propensity for populations to use transit. This is especially true for areas in Lucas County west of I-475 (except for pockets of demand in Holland and Sylvania), most of Wood County (outside of Rossford and Perrysburg closer to the Maumee River), and the eastern part of Lucas County (most of eastern Oregon and points further east). Other types of transportation services could be successful here but would not be expected to generate significant ridership.

There are also several locations throughout the region that are large regional trip generators but are either difficult to reach with transit service or are located further away from population centers. Some of these facilities also operate in shifts that generates demand at some times, but far less demand at other times. These areas include:

- **Fiat Chrysler Automobile Plant**
- **GM Powertrain Plant**
- **Owens Community College in Perrysburg**
- **Amazon Distribution Center in Rossford**

Key Findings: Market Analysis

OTHER FACTORS AFFECTING TRANSIT DEMAND

In addition to population and employment density, factors that affect transit demand include the pedestrian environment and activity centers, as well as the analysis of travel flows between, within, and outside of zones in Lucas and Wood Counties. Key findings from this analysis shows that:

- **The pedestrian network** in Lucas and northern Wood Counties varies widely depending on the location. While the more urbanized neighborhoods have sidewalks, there are many disconnected pedestrian segments, especially at major highway interchanges or in neighborhoods developed in the middle and late 20th century.
- **Travel flows** between 2020 and 2035 are expected to decline slightly – which correlates to declining population. The strongest travel flows, both in 2020 as well as in 2035, are estimated to be north-south between the Maumee area zone and Franklin Park zone, generally east of I-475, as well as between downtown Toledo and south Toledo and Maumee.
- **Major destinations and activity centers** are well-distributed throughout the region. However, many of the shopping centers and grocery stores in the region are located outside of the more urban neighborhoods located in central Toledo. This is important as it relates to transit needs since those who are unable to drive, or cannot afford a vehicle, must travel well beyond their neighborhoods for basic services. There are multiple "food deserts" in the Toledo area, largely in the older neighborhoods in central Toledo, but also in more isolated housing developments that are less walkable and accessible to transit, low-income, and where transit dependency is high.

Figure 1: Sidewalk Density

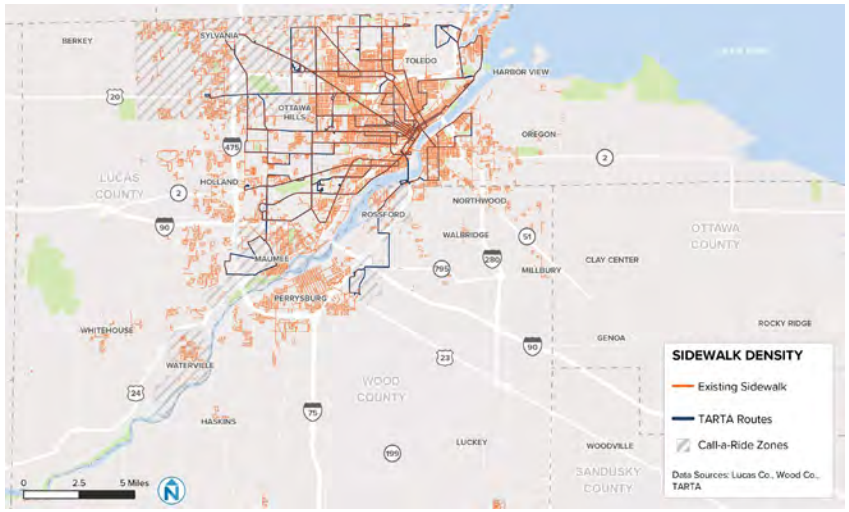
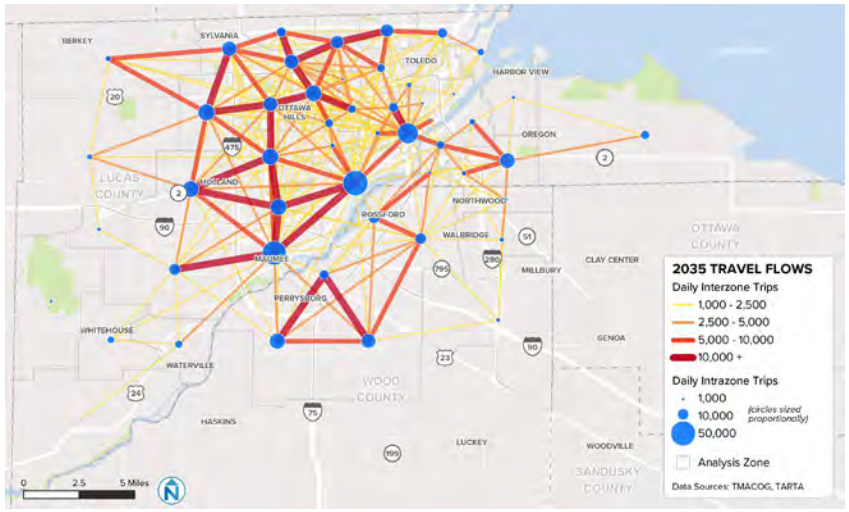


Figure 2: Future (2035) Travel Flows



TARTA Today

Transit Service Overview

TARTA's transit network is largely focused on the City of Toledo as the major city in Northwest Ohio but also serves the neighboring communities of Maumee, Sylvania, Ottawa Hills and Sylvania Township in Lucas County and Rossford in Wood County. The network operates largely as a "hub-and-spoke" model with most bus routes beginning or ending in downtown Toledo. The existing network is supported by a handful of routes that provide "crosstown" service and that connect to other transit centers outside of downtown Toledo (such as the Franklin Park Mall and the University of Toledo).

TARTA's fixed route and Call-A-Ride services are summarized in the table to the right and includes the following services:

- **Twenty weekday and nineteen Saturday fixed routes**
- **One University of Toledo campus route** that operates only when the university is in session.
- **Three Call-A-Ride zones** that offer general public demand response service throughout the area and to transfer locations with the fixed route network.

TOLEDO AREA REGIONAL PARATRANSIT SERVICE (TARPS)

In addition to the fixed route services, TARPS provides the ADA complementary paratransit service in the Toledo area serving the same communities as the fixed route services. More information about TARPS is provided later in this report.

Figure 3: Existing TARTA Fixed Route and Call-A-Ride Routes

Route	Serving	Service Type	Major Transfer Locations
1	Ottawa Hills/Sylvania/Sylvania Twp.	Call-A-Ride	Franklin Park Mall
2	Flower Hospital via Monroe	FR	HUB, Flower Hosp.
3	Franklin Park Mall/VA Clinic Crosstown	FR	FPM, UTMC, UT
5	Dorr via UT	FR	HUB, UT, FPM
8	Maumee/Waterville	Call-A-Ride	
10	Rossford	Call-A-Ride	
10L	Rossford Meijer/Amazon	FR	HUB
12	Birmingham via Main/Starr/Front	FR	HUB
14	Hollywood Casino via East Broadway	FR	HUB, HC
15	Meijer Alexis Rd	FR	
16	Meijer Alexis Rd via Manhattan	FR	
17	Miracle Mile via Lagrange	FR	HUB, MM
19	Franklin Park Mall via Cherry/Sylvania	FR	HUB, FPM
20	Franklin Park Mall via Franklin/Central/Collingwood	FR	HUB, FPM
22	Franklin Park Mall via UT / Bancroft	FR	HUB, UT
26	Miracle Mile via Douglas/Lewis	FR	HUB, MM
27	Walmart/South & Reynolds	FR	HUB
28	UT via Indiana/Oakwood	FR	HUB, UT
31	Maumee via Southwyck	FR	HUB, UTMC
32	Home Depot/Southwyck via Airport	FR	HUB, UTMC
34	UT Med Center	FR	HUB, UTMC
51	Talmadge/Secor Loop	FR	FPM
52	Tremainsville Loop	FR	FPM
UT	Blue Loop	FR	UT

Legend: FR=Fixed Route, FPM=Franklin Park Mall, UTMC=UT Medical Center, UT= Univ. of Toledo Transit Center, HC=Hollywood Casino, MM=Miracle Mile

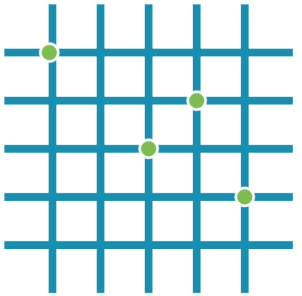
Transit Service Overview

NETWORK DESIGN

TARTA's current fixed route network is largely "radial" where all but three routes connect in downtown Toledo and where routes then "radiate" to other areas in the region. Because the system is designed this way, it largely relies on connections to other routes at a single location downtown in order to reach destinations throughout the network. This contrasts with a "grid" network where transit services are not designed around a single location (such as a downtown) but rather operate on major corridors and connections can be made at many locations throughout the network. To minimize the penalty associated with connections between routes, the radial network works best when routes can be timed to connect, whereas the grid network works best when routes are frequent and timed connections are not as necessary. The graphic to the right illustrates these two types of network designs.

TARTA's existing fixed route network also consists of many routes that branch – either in the middle of the route or on the outer ends. When a route branches, the frequency is half of the frequency of the shared segment, as shown in the illustration to the right. While this feature provides geographic coverage and shorter walk distances to the route, it also results in less frequent service, longer waits, and service that is more difficult to understand.

RADIAL NETWORK



GRID NETWORK

BRANCHING ROUTE

RECENT SERVICE HISTORY

It is worth noting that TARTA is currently operating in a "reduced" service mode due to the Covid-19 pandemic and other changes that have occurred in the past several years. Prior to the pandemic, all TARTA routes operated on 30-minute headways during the weekday and every 90 minutes in the evening and on Saturday. TARTA also provided a handful of express routes. And as recent as 2019, service was offered on Sunday and holidays. TARTA also operated an extensive school route service through early 2021 through a contract with the Toledo Public Schools.

While TARTA has increased service levels on some routes (such as the 30-minute "core" Routes 2, 5, 19 and 31), the services profiled in this report reflect an overall reduction of service and the resulting decline in ridership.

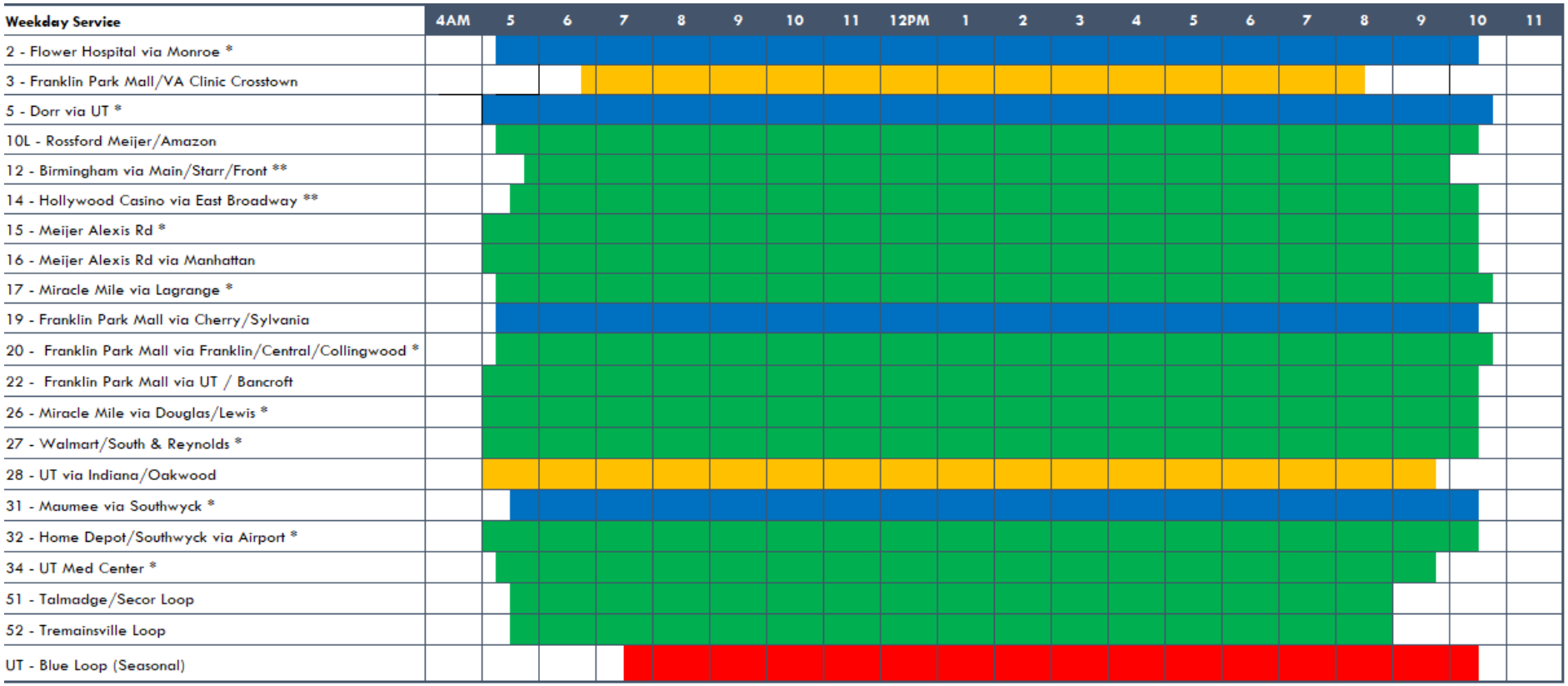
Fixed Route Overview

FIXED ROUTE WEEKDAY SERVICE CHARACTERISTICS

On weekdays, TARTA's routes operate for roughly 17 hours a day, starting around 5:00 AM and ending at 11:00 PM. In terms of frequency, most TARTA routes operate with a 60-minute frequency during all periods. A handful of routes operate with 30-minute service all day (see Figure 4). Two routes, Route 3 and Route 28, operate service that is great than 60 minutes or irregular service.

Frequency
15 min
30 min
60 min
> 60 min / Irregular

Figure 4: Weekday Service Span and Frequency by Route



* This route has route variations, so frequencies show are for the common segments only. Frequencies on branches or split segments of this route are half the common segments.

** Schedules on these routes are offset to provide 30 minute service between downtown Toledo and Starr Avenue in East Toledo.

Fixed Route Overview

FIXED ROUTE SATURDAY SERVICE CHARACTERISTICS

On Saturday, TARTA's routes operate for roughly 13 hours a day, starting around 8:00 AM and ending at 10:00 PM. In terms of frequency, most TARTA routes operate with a 60-minute frequency during all periods. A handful of routes operate with 90- or 120-minute service all day (see Figure 5). Currently, TARTA operates weekday and Saturday service and has plans to add Sunday service and earlier morning service on Saturday starting in 2022.

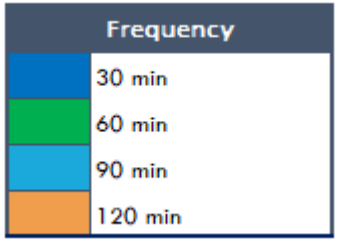


Figure 5: Saturday Service Span and Frequency by Route

Saturday Service	4AM	5	6	7	8	9	10	11	12PM	1	2	3	4	5	6	7	8	9	10	11
2 - Flower Hospital via Monroe*																				
3 - Franklin Park Mall/VA Clinic Crosstown																				
5 - Dorr via UT*																				
10L - Rossford Meijer/Amazon																				
12 - Birmingham via Main/Starr/Front																				
14 - Hollywood Casino via East Broadway																				
15 - Meijer Alexis Rd *																				
16 - Meijer Alexis Rd via Manhattan																				
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34 - UT Med Center *																				
51 - Talmadge/Secor Loop																				
52 - Tremainsville Loop																				

* This route has route variations, so frequencies show are for the common segments only. Frequencies on branches or split segments of this route are half the common segments.

Figure 6: Existing TARTA Fixed Route and Call-A-Ride Zones

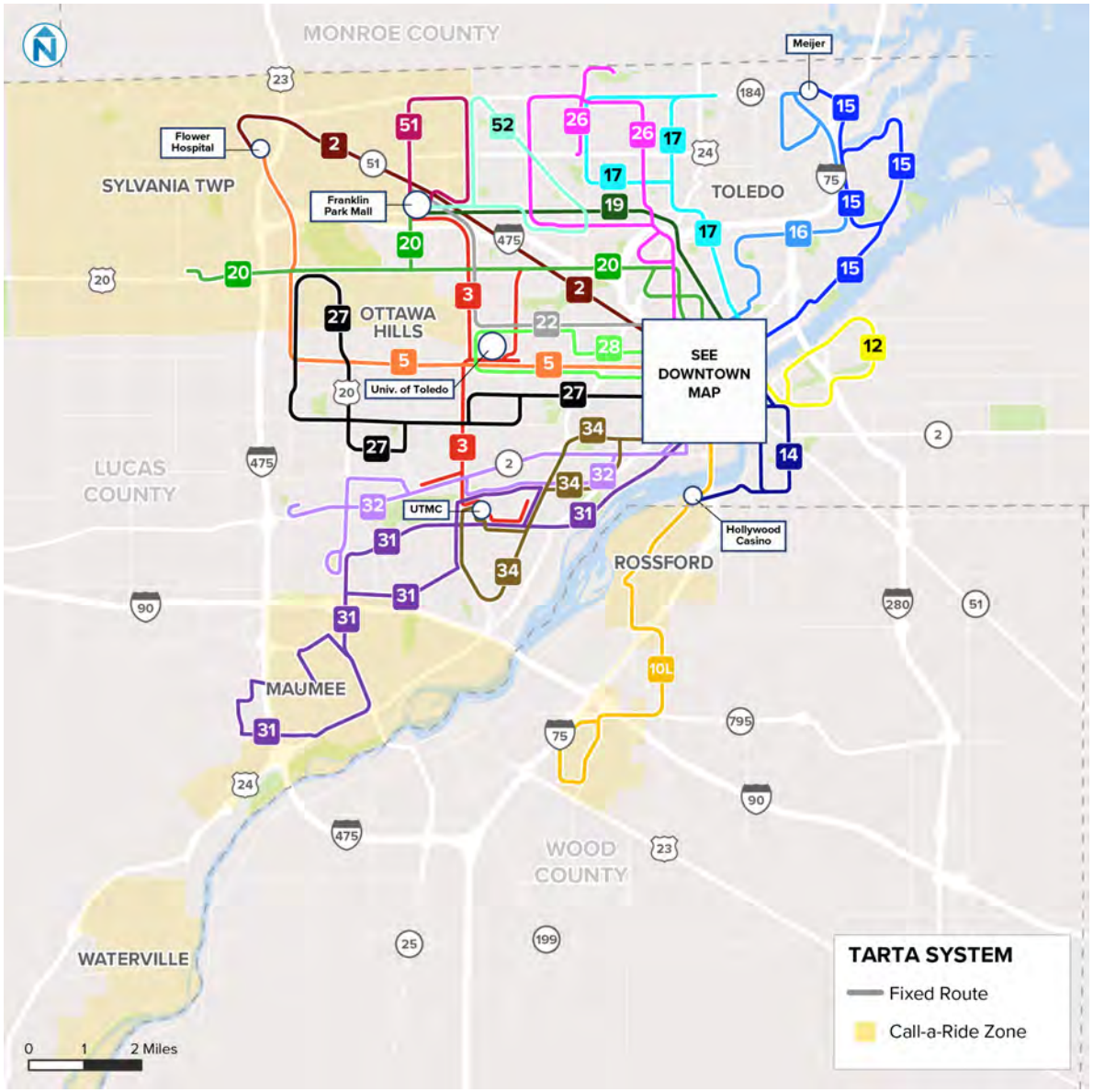
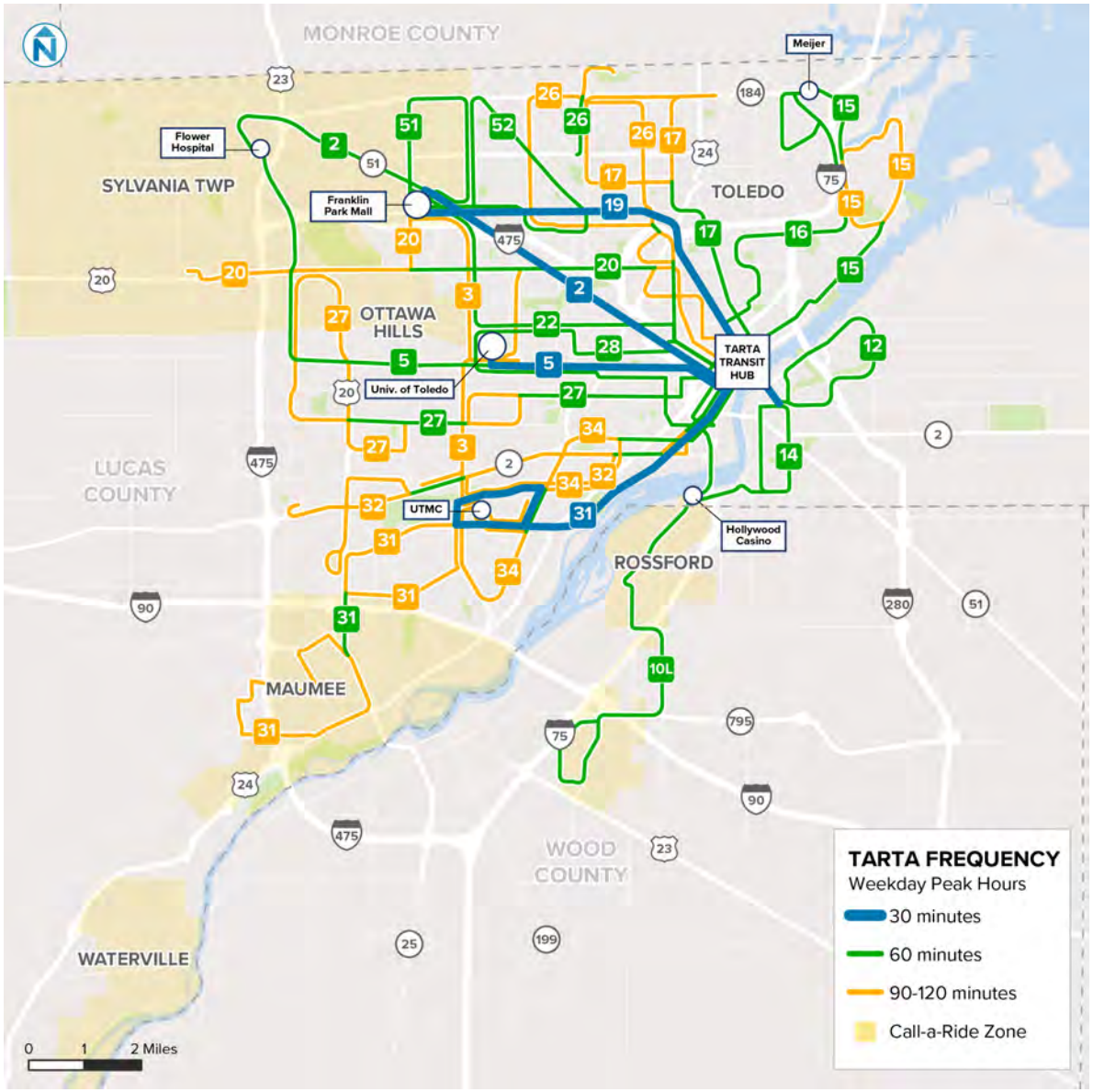


Figure 7: Downtown Toledo TARTA Routing

Figure 8: Existing TARTA Fixed Route and Call-A-Ride Zones (Weekday Frequency)



TARTA WEEKDAY SERVICE FREQUENCY

As shown in Figure 8, weekday service frequency varies throughout the system. Five corridors have service every 30 minutes on weekdays:

- **The Monroe corridor** (Route 2/2C) from downtown Toledo to Franklin Park Mall
- **The Lagrange/Sylvania** corridor (Route 19) from downtown Toledo to Franklin Park Mall
- **The Dorr Avenue corridor** (Route 5/5C) from downtown Toledo to the University of Toledo Transit Center
- **The Broadway corridor** (Route 31C) from downtown Toledo to the UT Medical Center via Glendale Avenue and Detroit Avenue.
- **The Main Street corridor** (Routes 12 and 14) from downtown Toledo to Starr Avenue in East Toledo.

The remainder of TARTA's routes generally operate hourly on weekdays. It should be noted that many of the routes have variations where frequencies are hourly on the common segment but are half as frequent on the variant where the route splits. For example, Route 15 splits at Summit and Manhattan Boulevard (15A and 15E) and rejoins at Suder Avenue and Ottawa River Rd before terminating at the Meijer on Alexis Road. Service on the common segment is every hour, but every two hours on the split segment.

Fixed Route Ridership

WEEKDAY RIDERSHIP

On Weekdays, TARTA's highest ridership weekday routes are Route 31 and Route 5, followed by Route 2 and Route 19. TARTA's lowest ridership routes on weekdays are Route 51 and Route 52.

SATURDAY RIDERSHIP

On Saturdays, TARTA's highest ridership routes are Routes 31 and 5, followed by Routes 2 and 19. TARTA's lowest ridership routes on Saturday are Route 52 and Route 28. It should be noted that Route 3 does not operate on Saturday.

Figure 9: Average Daily Ridership (Weekday and Saturday)

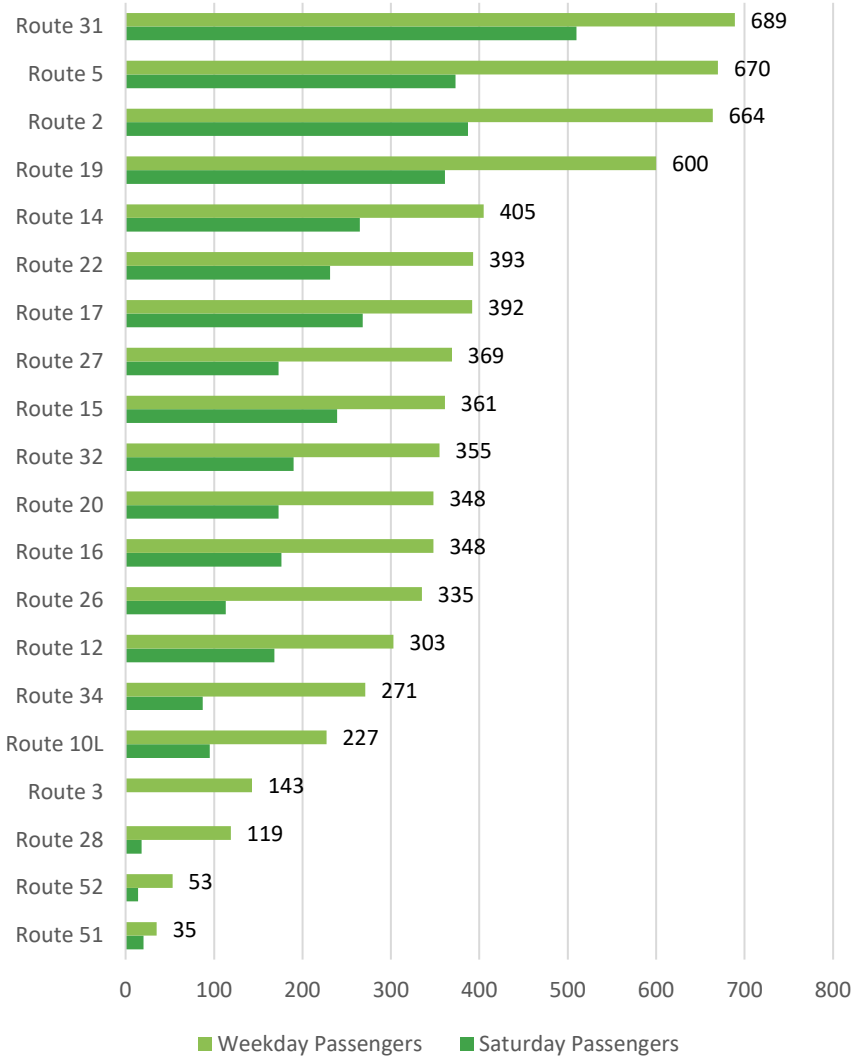
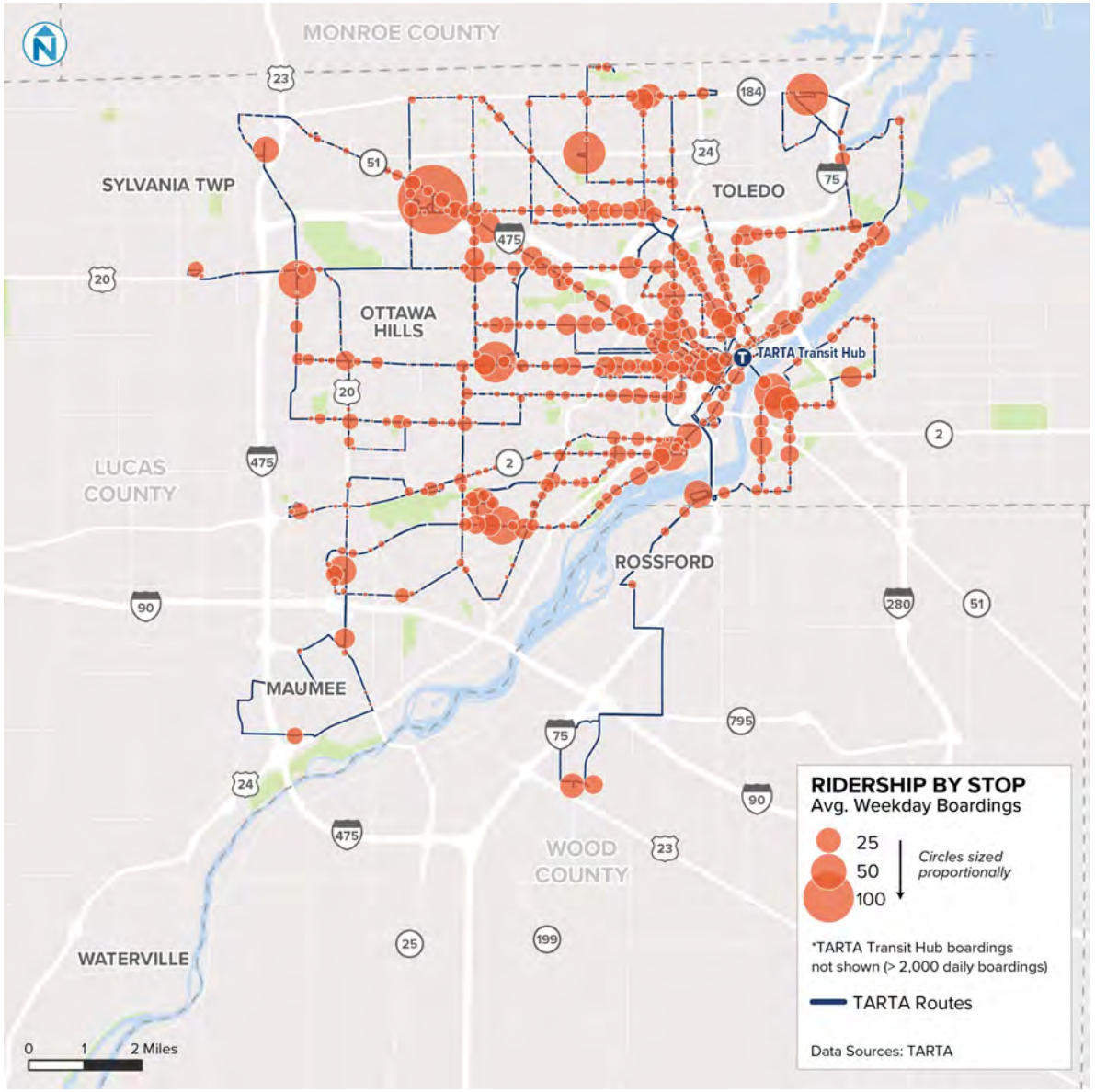


Figure 10: Weekday Systemwide Ridership by Stop



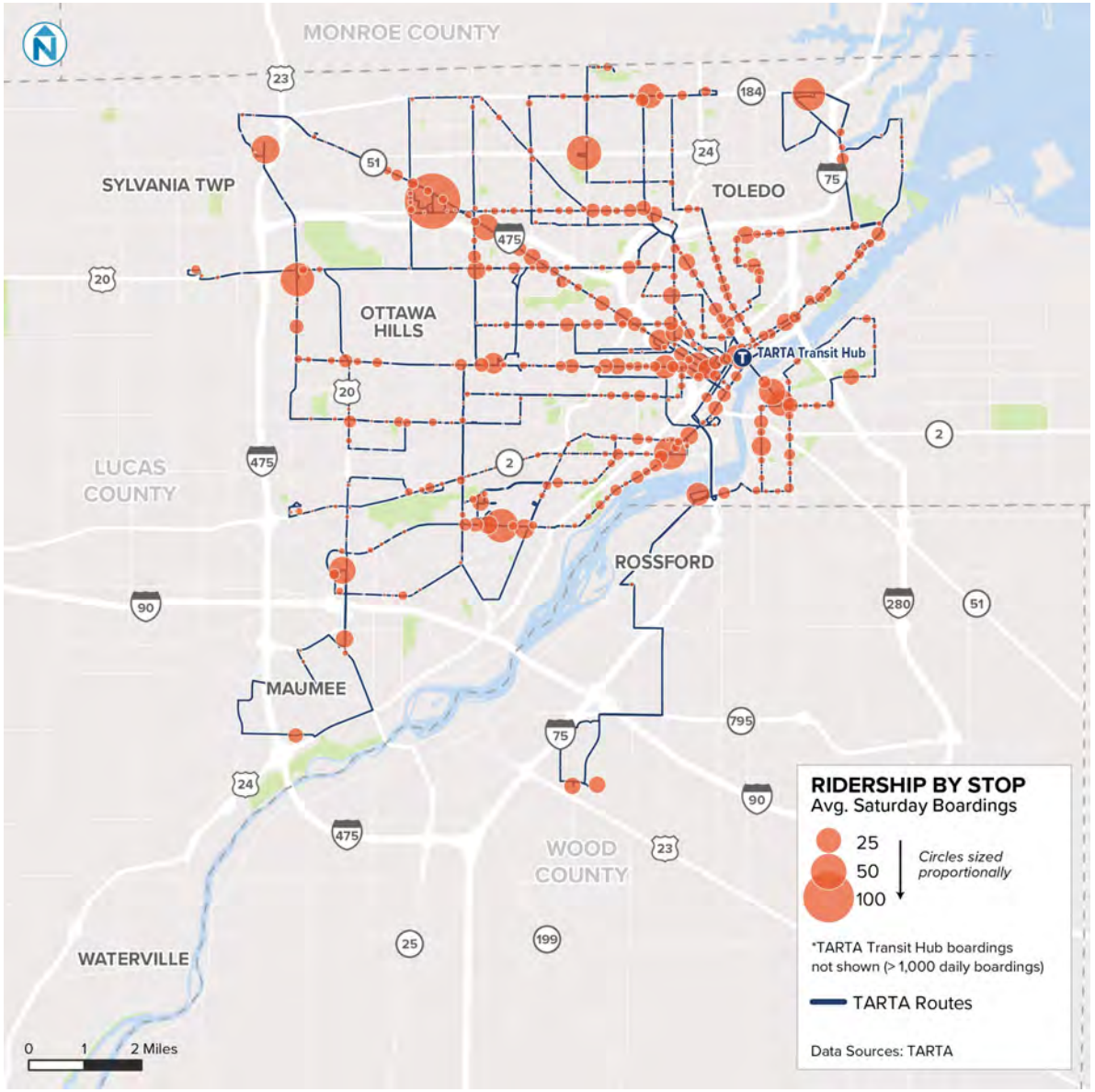
WEEKDAY SYSTEMWIDE RIDERSHIP

As shown in Figure 10, the highest weekday ridership stop (outside of the Hub, which is not shown for clarity) is Franklin Park Mall. Other major stops include the University of Toledo Transit Center, Miracle Mile, the Meijer on Alexis Road, Walmart on Central/Holland-Sylvania Road, Walmart on Glendale Avenue, and several stops on Main Street in East Toledo.

In addition to nearly all corridors leading into and out of downtown Toledo, the following corridors stand out with relatively strong and consistent ridership activity:

- Monroe Avenue (between downtown Toledo and Franklin Park Mall)
- Dorr Avenue (between downtown Toledo and the University of Toledo Transit Center)
- Nearly all of Cherry Avenue and Sylvania Avenue (Route 19)
- Summit Street and Broadway Street (from downtown Toledo and South Street)
- Lagrange Street (from downtown Toledo to Manhattan Boulevard)
- North Huron/North Erie/Summit Street (from downtown Toledo to Suder Avenue)
- Bancroft Street (between Collingwood Boulevard and Secor Road)
- Nebraska Avenue (east of Detroit Avenue)

Figure 11: Saturday Systemwide Ridership by Stop



SATURDAY SYSTEMWIDE RIDERSHIP

Total ridership activity on Saturday is about 45% of weekday ridership activity, as shown in Figure 11. This level of ridership activity on Saturday compared to weekdays is typical for systems of many transit systems.

As noted earlier, service frequency on Saturday is also less than weekdays. In some cases, frequencies are three hours on some route segments. While this reduction in service is appropriate given lower weekend demand, this may also work to suppress demand as customers find other options.

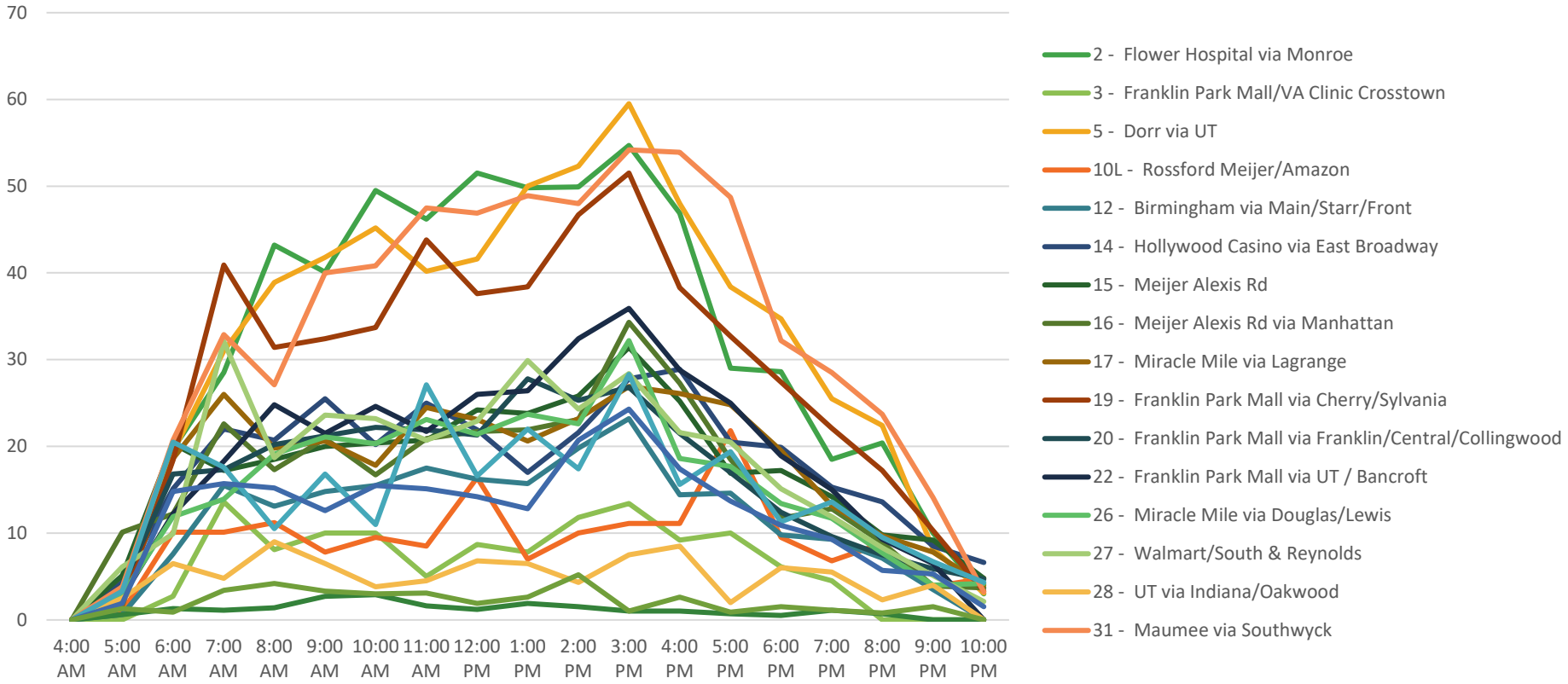
Fixed Route Ridership

TIME OF DAY RIDERSHIP

TARTA's ridership varies by time of day, which reflects both a combination of service frequency and the times when people are most likely to travel. On Weekdays, most TARTA routes exhibit small peaks during the AM Peak (7AM – 8AM) and PM Peak (2PM – 6PM), such as Routes 19, 14, and 27.

As shown in the chart below, much of TARTA's ridership is not oriented around morning and afternoon peaks. These trends may reflect high numbers of students and workers who do not commute to school or work causing swells throughout the day, rather than during traditional peak periods. In addition, even among routes that do have peaks, there is consistent ridership during the midday period. TARTA's route headways even throughout most of the day which is reflected within TARTA's ridership trends.

Figure 12: Weekday Ridership by Time of Day



Fixed Route Productivity

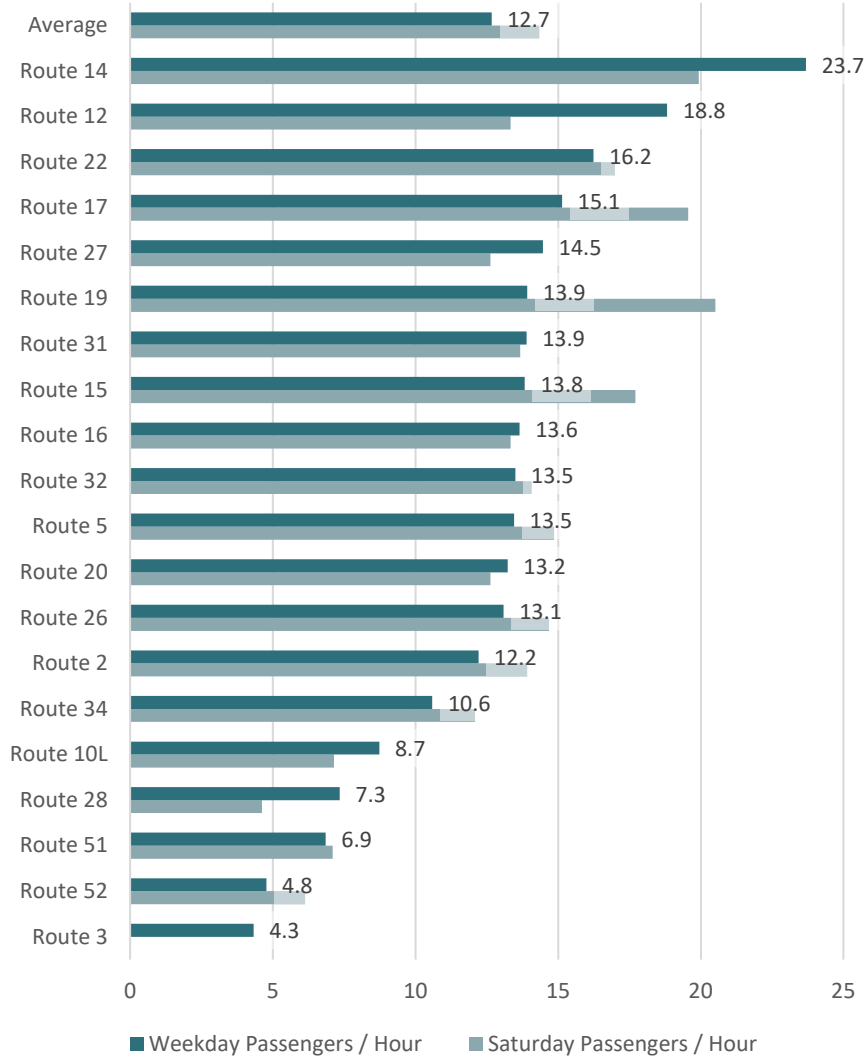
WEEKDAY PRODUCTIVITY

On Weekdays, TARTA carries an average of 12.7 passengers per vehicle revenue hour (productivity) across all routes. Despite hourly headways, Route 14 and Route 12 has the greatest average productivity, followed by Route 22 and Route 17. Routes 52 and 3 have the lowest average weekday productivity.

SATURDAY PRODUCTIVITY

On Saturdays, TARTA carries more passengers per vehicle revenue hour than on weekdays (14.4 passengers per hour). Route 17 and Route 19 have the greatest productivity, with an average between 13 to 14 passengers per hour. Route 28 and Route 52 have the lowest productivity, with an average of three to five passengers per hour. It should be noted that Route 3 does not operate on Saturday.

Figure 13: Average Passengers per Vehicle Revenue Hour (Weekday and Saturday)



Fixed Route Reliability

ON-TIME PERFORMANCE

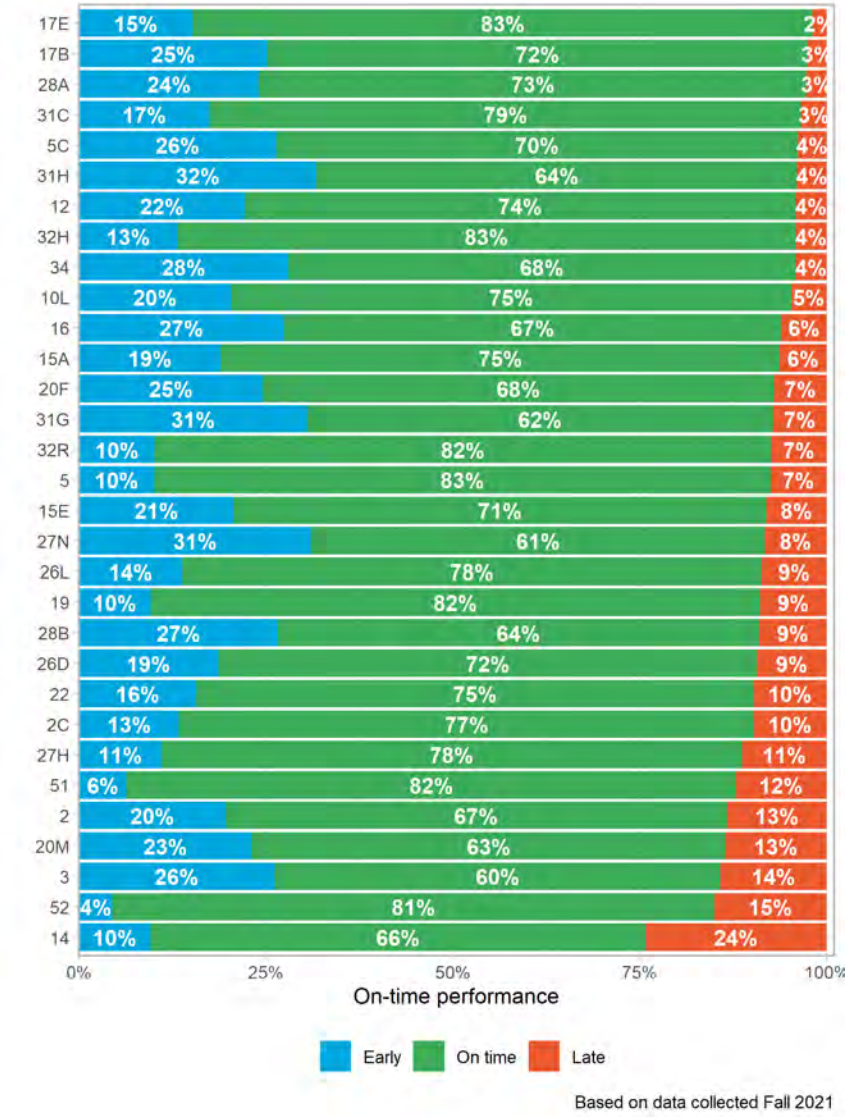
Figure 14 shows TARTA's on-time performance by route and route variation (e.g., 17E, 17B, 31H, etc.). These figures are based on multiple observations of trips in September and October 2021. On-time performance is a measure of the percentage of trips that operate early, late, and on-time. In this analysis, these thresholds are defined as:

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

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

Routes with a high percentage of late arrivals may need additional time added to the schedule, while routes with a high percentage of early departures may need to have time removed from the schedule.

Figure 14: Route-Level On-Time Performance



Fixed Route Transfers

TARTA HUB

The primary transfer location on TARTA is the "Hub" located at Cherry Street and Huron Street in downtown Toledo. As shown in Figure 15, the Hub includes curbside transit-only lanes on both sides of Huron Street between Cherry Street and Orange Street, as well as a curbside transit-only lane on Cherry Street between Huron Street and Superior Street. The Hub also has a remodeled climate-controlled passenger waiting facility with bathrooms and a staffed customer information booth. While transit is the dominant use on this section of Huron Street, there are no restrictions on general purpose travel, which can create conflicts with transferring passengers.

All routes except three (Routes 3, 51 and 52) serve the Hub, and most routes lineup on either side of Huron Street except four routes (Routes 2, 5, 10L and 19) that lineup on Cherry Street. Not all routes that serve the Hub are timed to connect to each other with a relatively short wait, as show in Figure 16. Ten of the routes have timed connections ever 30 minutes. Routes 2C, 5C and 19 have connections to all other routes every 30 minutes. Connections between some routes could require a 30- to 45-minute wait.

FRANKLIN PARK MALL

Seven routes (2, 3, 20, 22, 19, 51 and 52) connect at the Franklin Park Mall stop on Royer Road between Sylvania Avenue and Monroe Avenue. The stop consists of three shelters and a curbside transit-only lane that can accommodate as many as 10-12 vehicles. Several routes are interlined at Franklin Park Mall and timed transfers are available between routes in some directions.

UT TRANSIT CENTER

The UT Transit Center is located about ¼ mile north of Dorr Avenue on Towerview Boulevard on the University of Toledo campus. Three regular routes connect here (Route 3, 5 and 28) as well as the Blue Loop route that serves the UT campus. There are four shelters and curbside stops that can accommodate 3-5 vehicles.

OTHER TRANSFER LOCATIONS

Less formal but off-street transfers between routes are also available at the University of Toledo Medical Center (Routes 3, 31, 32 and 34), Flower Hospital (Routes 2 and 5), Hollywood Casino (Routes 10L and 14), Miracle Mile (Routes 26 and 17) and Southwyck/Amazon (Routes 31 and 32). Outside of TARTA's major transfer locations (previously mentioned) perpendicular on-street transfers between routes are limited due to the system's current structure, the nature of the route network, and the hostile pedestrian environment throughout TARTA's service area.

Figure 15: Hub Transit Center

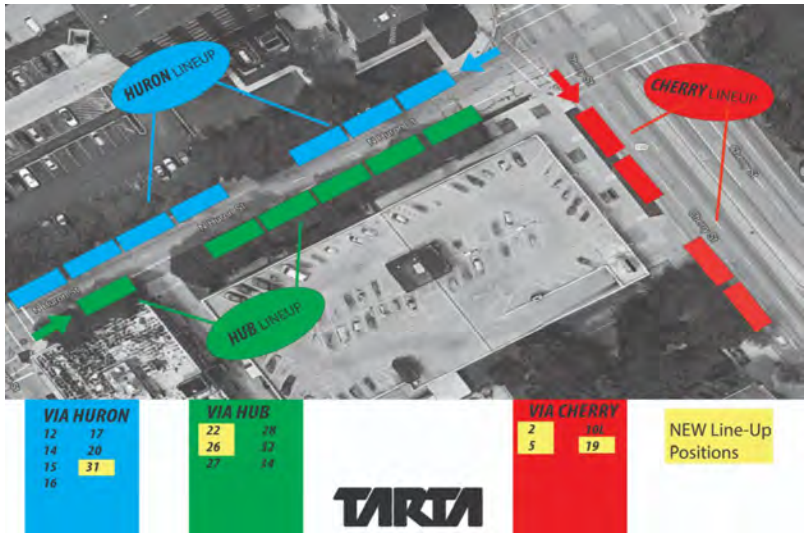


Figure 16: Timed Transfers at the Hub

0:05	0:10	0:15	0:20	0:25	0:30	0:35	0:40	0:45	0:50	0:55	0:00
		2	-	-	2					19	2C
				19	19			2C	-	-	19
		5C	-	-	5C			5	-	-	5
			10L	-	20			20	-	-	10L
		12	-	-	31			14	-	-	31
				31	12					31	14
		22	-	-	15			15	-	-	22
		16	-	-	32			32	-	-	16
			27	-	17			17	-	-	27
		26	-	-	34			34	-	-	26
		28 *	-	-	28 *			28 **	-	-	28 **

* Every 3 hours starting at 7:15 am

** Every 3 hours starting at 5:45 am

XX Arrival at the Hub

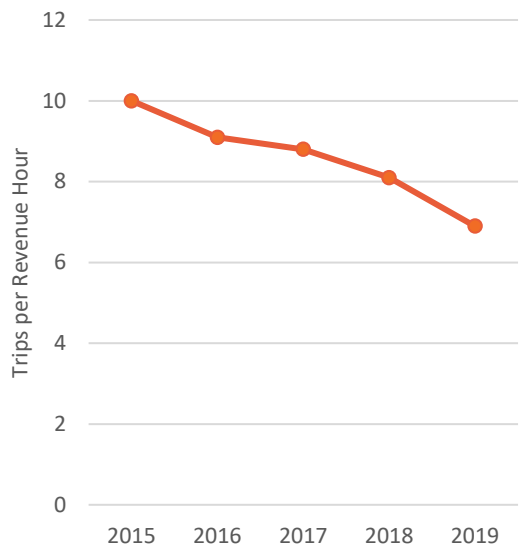
XX Departure from the Hub

Fixed Route Performance

TRANSIT PERFORMANCE METRICS

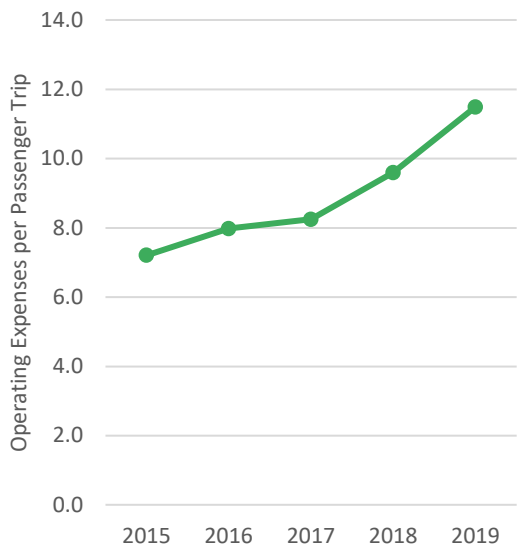
Passenger trips per revenue hour is used to measure service effectiveness, or how much the capacity of the service is being used. Between 2015 and 2019, TARTA's riders per revenue hour has declined from about 10 passengers per hour to less than 7.

Passenger Trips per Revenue Hour



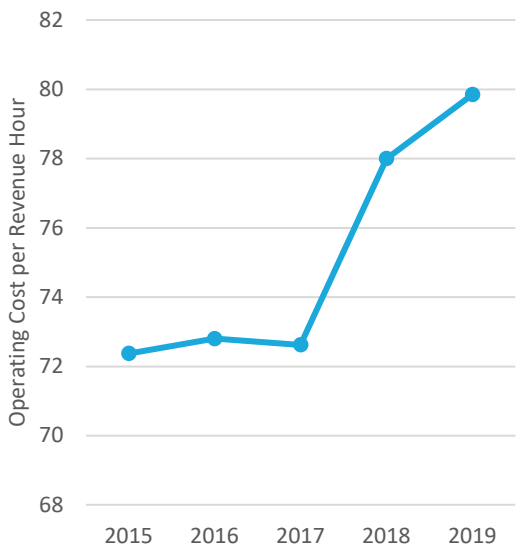
Operating cost per passenger trip is used to measure service effectiveness, or how well the service is being used by riders. Between 2015 and 2019, TARTA's cost per passenger trip increased by 59% or about 13% per year on average.

Operating Cost per Passenger Trip



Operating cost per revenue hour is used to measure cost efficiency, or how well resources are allocated within TARTA. Between 2015 and 2019, cost per revenue increased by 10%, or about 3% per year.

Operating Cost per Revenue Hour



Call-A-Ride Overview

SERVICE OVERVIEW

Call-A-Ride is a general public, demand response service that operates in three specific zones in TARTA's service area:

- Ottawa Hills, Sylvania, and Sylvania Township
- Maumee and Waterville
- Rossford

Call-A-Ride provides curb-to-curb service to any location within these zones and provides connections to TARTA's fixed route service for longer-distance trips.

Call-A-Ride operates six days a week with no Sunday or holiday service; Monday-Friday 6:30 AM to 8:30 PM and Saturday 9:30 AM to 3:30 PM. Call-A-Ride trips must be scheduled a day in advance by calling the reservation line. Currently no fares are being collected as part of TARTA's COVID-19 and rider safety guidelines.

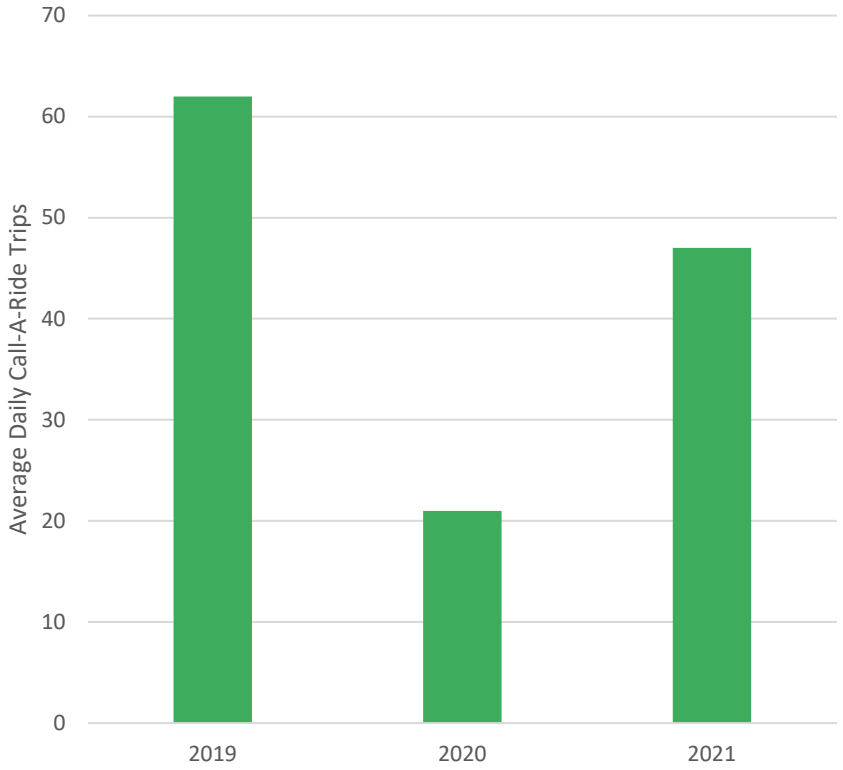
PERFORMANCE

Call-A-Ride averages just under 50 trips per day in 2021 (for all three zones). Between 2019 and 2021, Call-A-Ride experienced a similar ridership trend as TARTA fixed route with a dip in ridership in 2020. Ridership on Call-A-Ride recovered somewhat in 2021 but has not reached pre-pandemic levels.

MAJOR DESTINATIONS

Key Call-A-Ride destinations include Regency Hospital, the Franklin Park Mall area, Timberstone Commons, Flower Hospital, and University of Toledo Medical Center (see Figure 19 and Figure 20).

Figure 17: Average Daily Call-A-Ride Trips



Call-A-Ride Overview

CALL-A-RIDE TRIPS BY TIME OF DAY

Figure 18 shows the average weekday ridership by time of day on Call-A-Ride. During the day, ridership drastically increasing during the AM peak period. The peak demand hours on Call-A-Ride are between 9-11 AM.

Figure 18: Average Weekday Call-A-Ride Trips by Time of Day

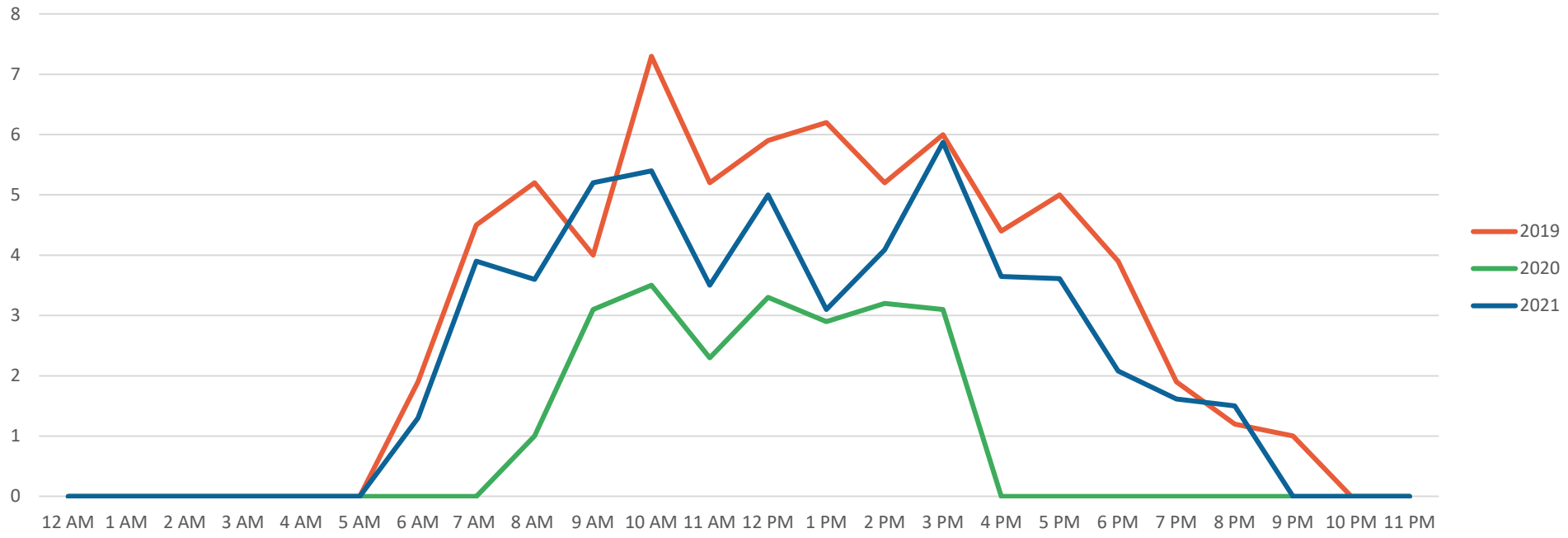
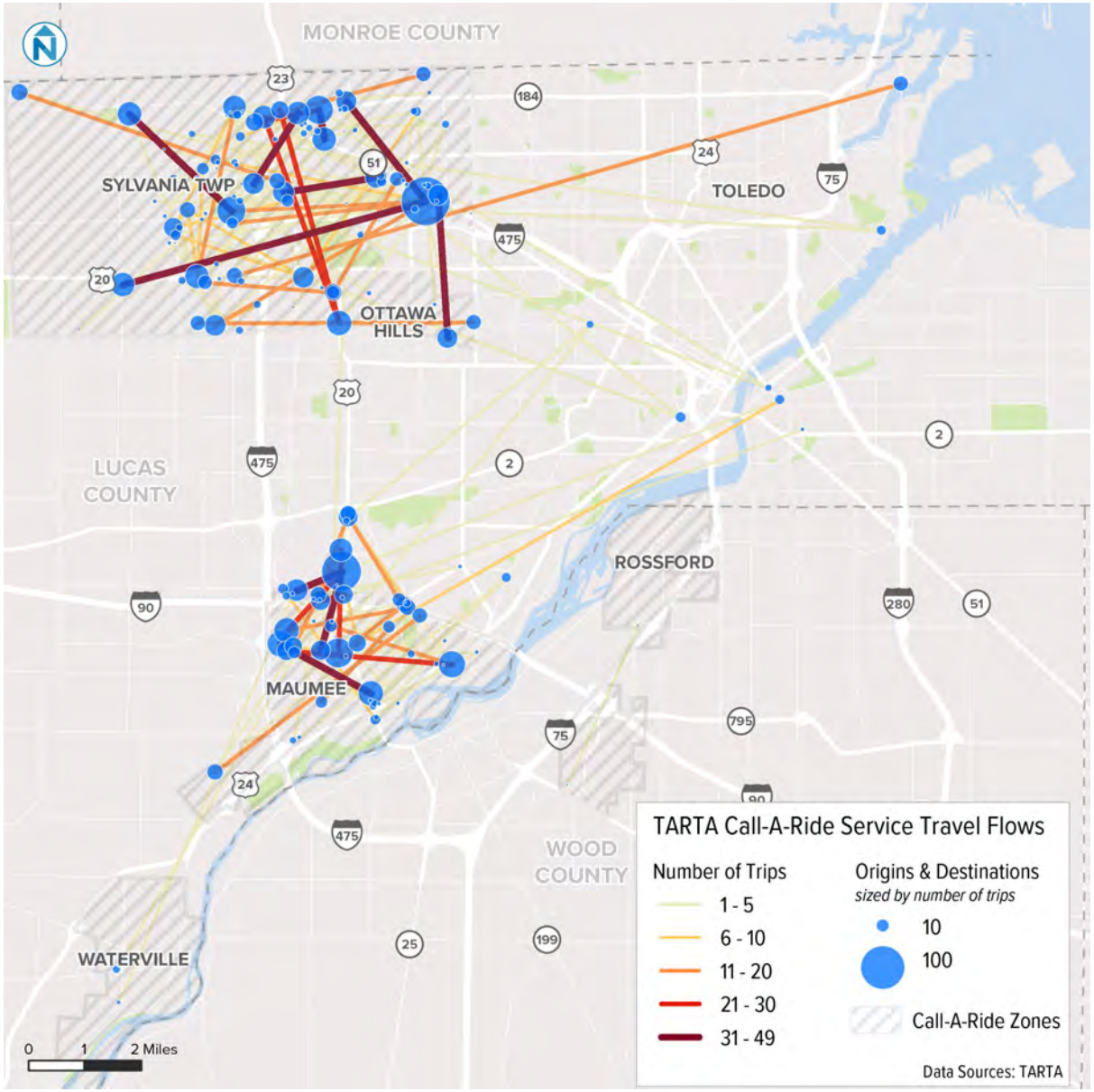


Figure 19: Call-A-Ride Service Travel Flows (October 2021)



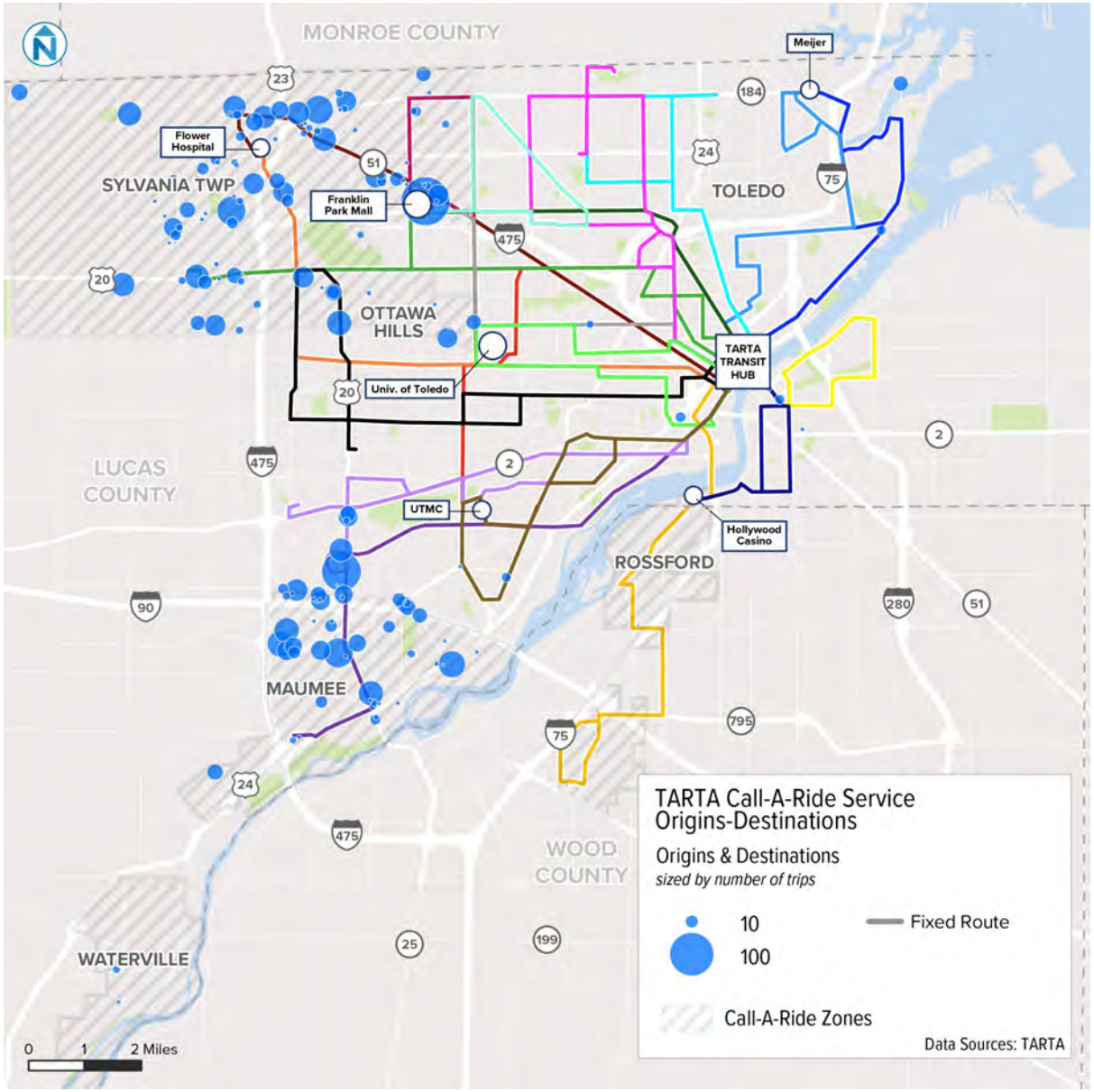
CALL-A-RIDE TRAVEL FLOWS

Because Call-A-Ride trips are intended to be contained within the designated zone, travel flows largely correspond to the three zones with a few trips that extend beyond the zone (Figure 19).

The top travel pairs on the Call-A-Ride are as follows:

- North Maumee to South Maumee
- Glendale Marketplace Shopping Center (Southwyck) to Arrowhead Shops
- Silica to Franklin Park Mall
- Regency Hospital to Franklin Park Mall
- Timberstone Commons to Mayberry Square
- Monroe Street Plaza to Renaissance Place
- Franklin Park Mall to Sylvania Country Squire Shopping Center

Figure 20: Call-A-Ride Service Travel Origins and Destinations (October 2021)



CALL-A-RIDE ORIGINS AND DESTINATIONS

Figure 20 shows the top origins and destinations on Call-A-Ride compared to TARTA's fixed route network. The top 10 origins and destinations on Call-A-Ride are shown below:

TOP 10 ORIGINS

- Franklin Park Mall
- Glendale Marketplace Shopping Center (Southwyck)
- Sylvania Country Squire Shopping Center
- Flower Hospital
- Meijer (Maumee)
- Bowles Court Apartments (Maumee)
- McDonald's (Maumee)
- Hondros College of Nursing
- Jazz Commons Apartments
- McDonald's (Sylvania)

TOP 10 DESTINATIONS

- Franklin Park Mall
- Glendale Marketplace Shopping Center (Southwyck)
- Timberstone Commons
- Meijer (Maumee)
- Sylvania Country Squire Shopping Center
- East Maumee (Corey Street)
- Dollar Tree (Sylvania)
- North Maumee (Gibbs Street)
- McDonald's (Maumee)
- Reynolds Corner

TARPS Overview

SERVICE OVERVIEW

TARPS is TARTA's ADA complementary paratransit service for persons with disabilities. TARPS operates seven days a week including holidays; Monday-Friday 4:55 AM to 10:23 PM, weekends 7:51 AM to 9:23 PM, and holidays 6:30 AM to 2:30 PM. It should be noted that providing service on Sundays and holidays goes well beyond what is required by the ADA, which only requires paratransit service when fixed route service is operating.

All TARPS riders must be eligible based on ADA guidance. TARPS trips can be reserved up to seven days in advanced and can be scheduled by calling the TARPS reservation line. Currently no fares are being collected as part of TARTA's COVID-19 and rider safety guidelines.

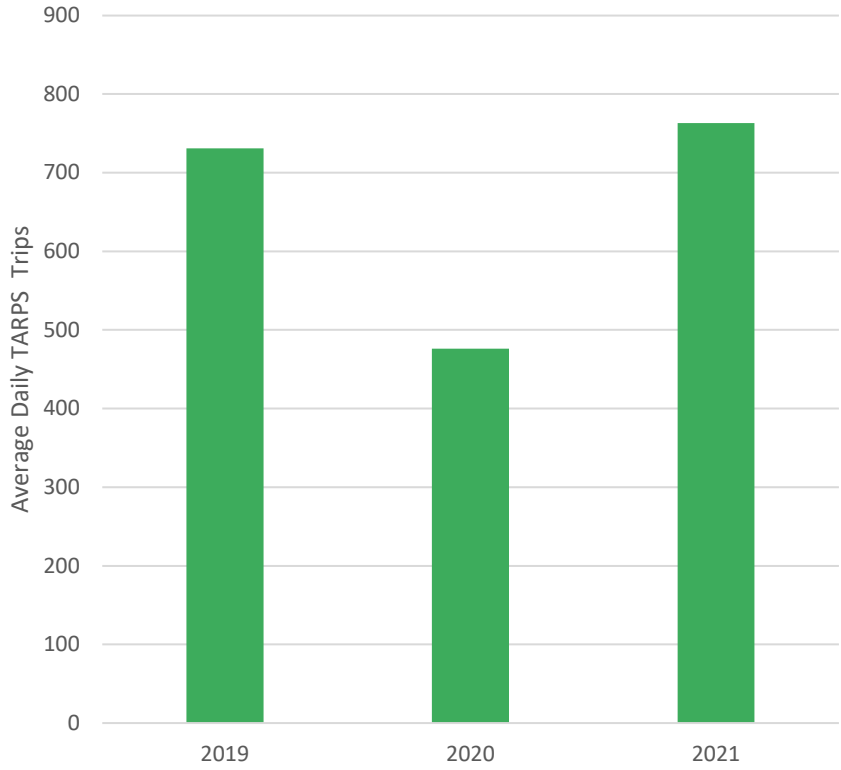
PERFORMANCE

Between 2019 and 2021, TARTA's TARPS average daily trips decreased from approximately 750 trips during 2019 to approximately 500 trips during 2020. Between 2020 and 2021 the average number of trips increased from about 500 trips to about 750 trips during 2021, slightly above 2019 (pre-COVID) figures. It should be noted that these trends are based data from October 2019, 2020 and 2020 and do not reflect fluctuations in ridership that occurs throughout the year.

MAJOR DESTINATIONS

In addition to grocery stores and other retail locations, key destinations on TARPS include Lott Industries, several nursing and rehabilitation centers, and medical facilities (see Figure 23 and Figure 24).

Figure 21: Average Daily TARPS Trips



TARPS Overview

TARPS TRIPS BY TIME OF DAY

Figure 22 shows the average weekday ridership by time of day on TARPS from 2019 to 2021. Ridership swells during the AM Peak period and the peak demand hours on TARPS are between 1-3 PM.

Figure 22: Average Weekday TARPS Trips by Time of Day

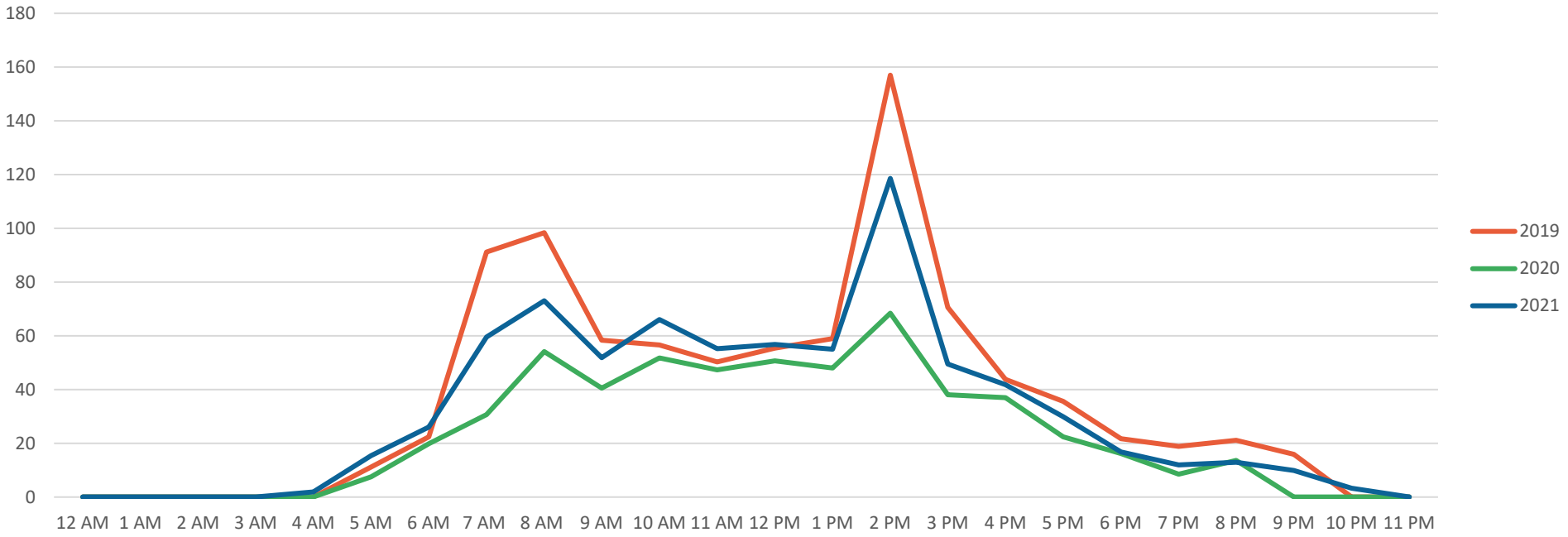
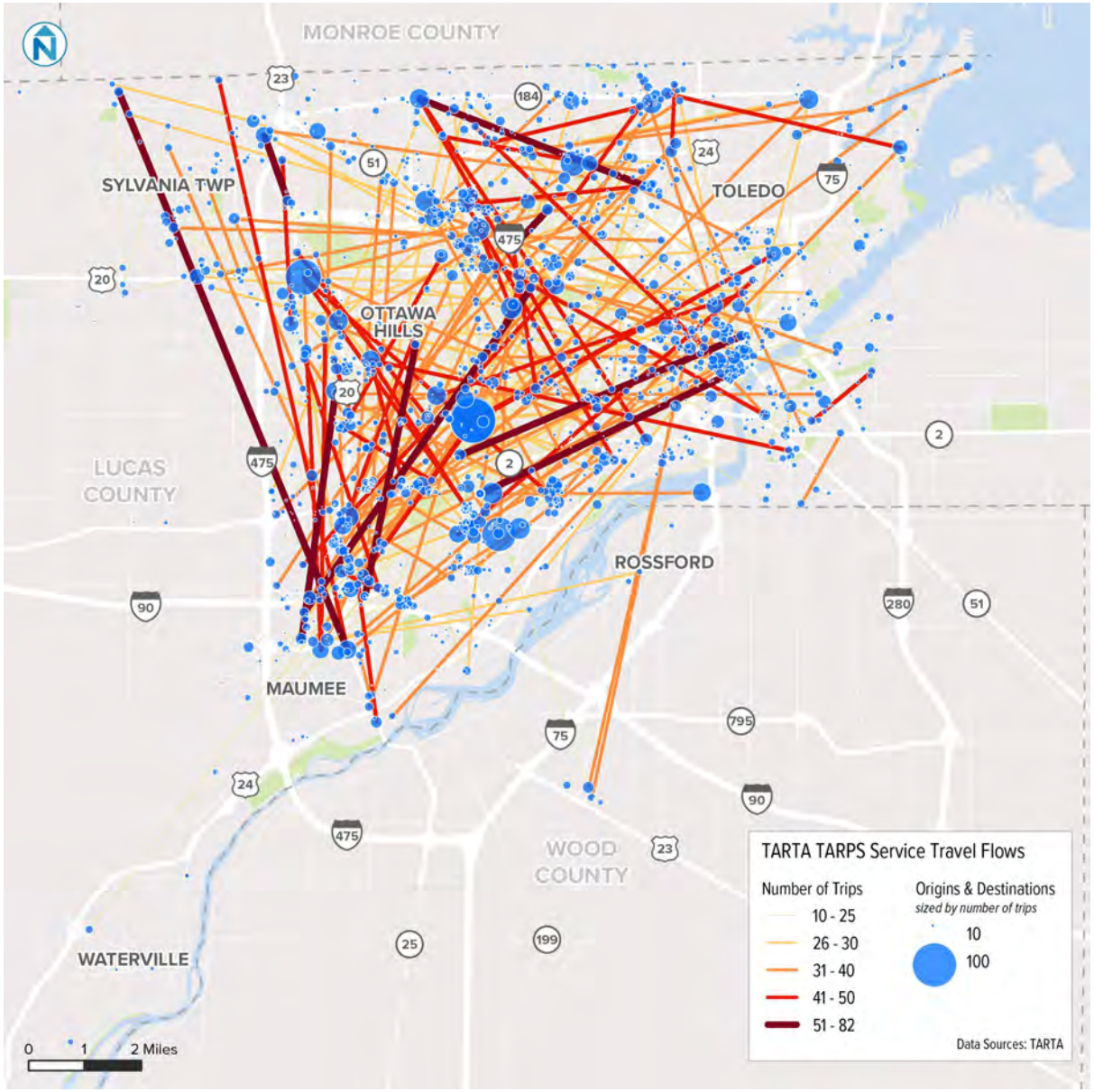


Figure 23: TARPS Service Travel Flows (October 2021)



TARPS TRAVEL FLOWS

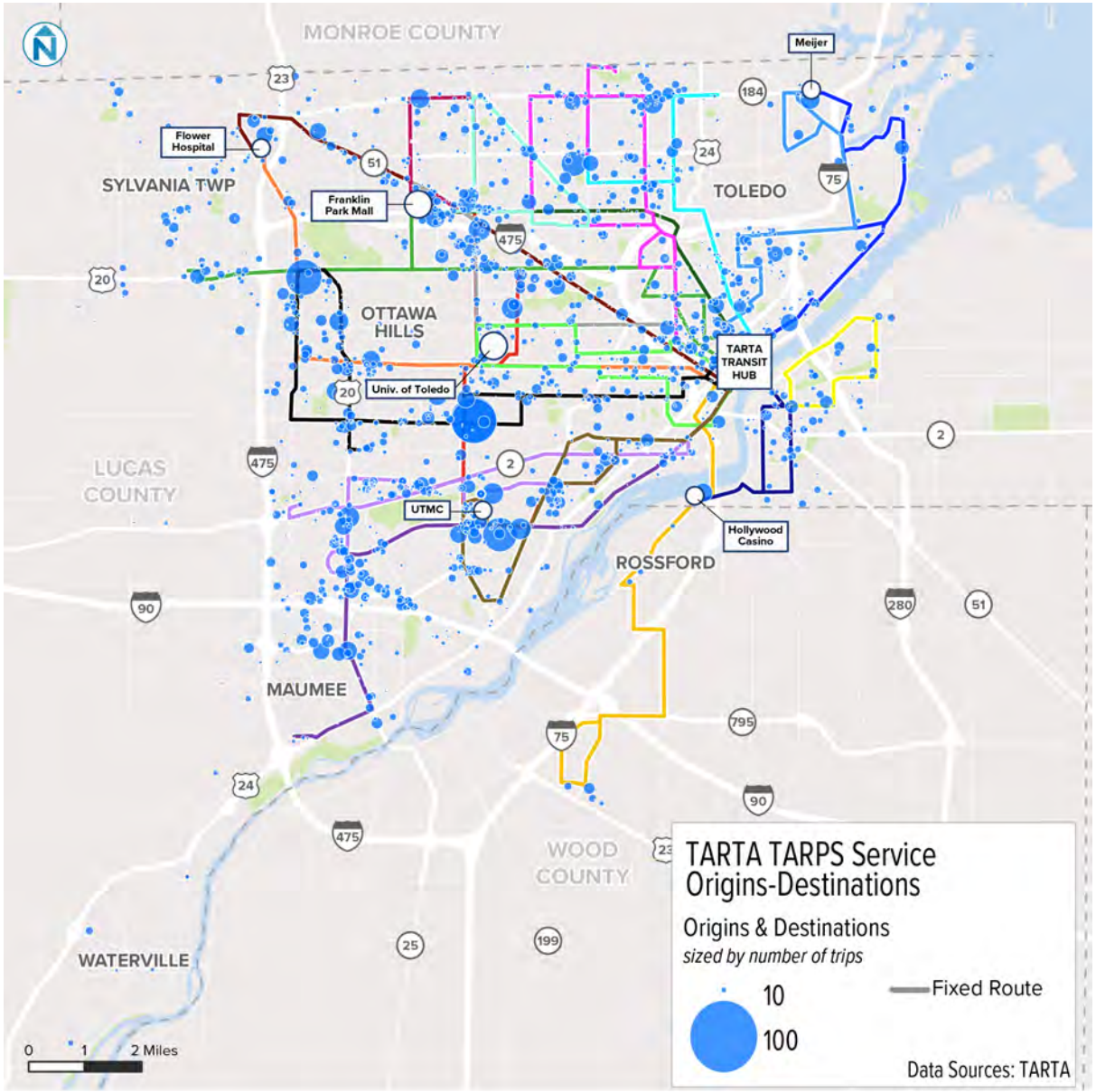
As shown in Figure 23, travel flows for the month of October 2021 on TARPS are well distributed throughout the Toledo area. Trip lengths range from relatively short (1-2 miles) to 10 miles or more.

Notably, travel flows are also heavily concentrated between southwest Toledo/North Maumee and downtown Toledo, the Monroe Avenue corridor, and destinations east of the I-475 corridor.

The top 10 origin-destination travel pairs on TARPS are show below:

- Reynolds Corner to Conant Street Crossings
- Eastgate Plaza to Waterford Apartments
- Oakleaf Village to Flower Hospital
- Reynolds Plaza Shopping Center to ProMedica Medical Facilities
- The Ohio Building (DT) to University of Toledo Medical Center
- Rosary Cathedral Parish (West Toledo) to Scott Park
- West Toledo to Rainbow Homes Inc (Northwest Toledo)
- North Towne to Creative Living Services (Point Place)

Figure 24: TARPS Service Travel Origins and Destinations (October 2021)



TARPS ORIGINS AND DESTINATIONS

Figure 24 shows the top origins and destinations on TARPS and how those compare to TARTA's fixed route network. Except for a few areas (such as in Sylvania Township and in north Maumee), most trips are located relatively close to a fixed route. The top 10 origins and destinations on TARPS are shown below:

TOP 10 ORIGINS

- Lott Industries Inc.
- Walmart Supercenter (Sylvania)
- Toledo Commons
- Kroger (near Bowman Park)
- Kroger (Westgate)
- University of Toledo Medical Center
- NorthStar Plaza Shopping Center
- Kroger (Glendale- Heatherdowns)
- Park Terrace Nursing and Rehabilitation center
- U.S. Renal Care (Ottawa Hills)

TOP 10 DESTINATIONS

- Lott Industries Inc.
- Walmart (Sylvania)
- Walmart (Toledo Commons)
- Kroger (Near Bowman Park)
- Kroger (Westgate)
- Pelham Manor
- University of Toledo Medical Center
- Kroger (Glendale- Heatherdowns)
- Genoa Healthcare
- University of Toledo

TARTA Facilities and Fleet

TARTA OPERATIONS AND MAINTENANCE FACILITY

TARTA's operations and maintenance (O&M) facility is located at 1127 Central Avenue in Toledo. This facility is largely used to store and maintain TARTA's fixed route fleet but also includes office space for most of TARTA's administrative staff as well as supervisors and customer service support staff.

TARPS FACILITY

The TARPS facility is located at 130 Knapp Street in Toledo. This facility is largely used for TARPS and Call-A-Ride fleet storage, maintenance, and dispatch, and administration. The TARTA Board of Trustees also meets at this facility.

FLEET

TARTA's fixed route fleet consists of 78 vehicles (Figure 25) and includes 40', 35' and 29' buses. The majority of TARTA's fixed-route vehicles are second-hand . The average age of the fixed route fleet is between 11 and 12 years, which is close to the useful life for this class of vehicles. According to industry standards, the average vehicle age is 7-12 years old. TARTA's fixed-route vehicles are much older than the industry standard.

The fleet for TARPS and Call-A-Ride consists of ADA lift-equipped cutaway vehicles and non-ADA cutaway vehicles. A total of 62 vehicles are available for both services. The average age of the TARPS and Call-A-Ride fleet is less than fixed route, but these vehicles have a shorter useful life.

As shown in Figure 26, about 90% of TARTA's vehicles are scheduled for replacement in the next three years.

Figure 25: TARTA Fleet Summary

Vehicle Type	Service	Number Active in Fleet	Average Age	Average Mileage
40' Bus	Fixed Route	53	11.1	346,644
35' Bus	Fixed Route	13	10.9	388,022
29' Bus	Fixed Route	12	12.9	343,647
ADA Cutaway	TARPS Paratransit	46	8.9	273,725
Cutaway	TARPS / Call-A-Ride	16	9.8	301,989
Service Vehicle	TARTA	16	9.7	47,445
TOTAL	-	**156**	**10.6**	**283,579**

Figure 26: TARTA Fleet Replacement Summary

Replacement Schedule	Number of Units per Year
2022	59
2023	33
2024	45
2025	0
2026	0
2027	0
2028	0
2029	0
2030	11
2031	10

Summary of Community Engagement

Community Engagement

MULTI-FACETED APPROACH

Engagement associated with TARTA Next included a multi-faceted effort that included:

Developing project branding, collateral, and outreach infrastructure including launching a project website, project fact sheets and other "infrastructure" to encourage awareness and share information. More information is available at www.tartanext.com

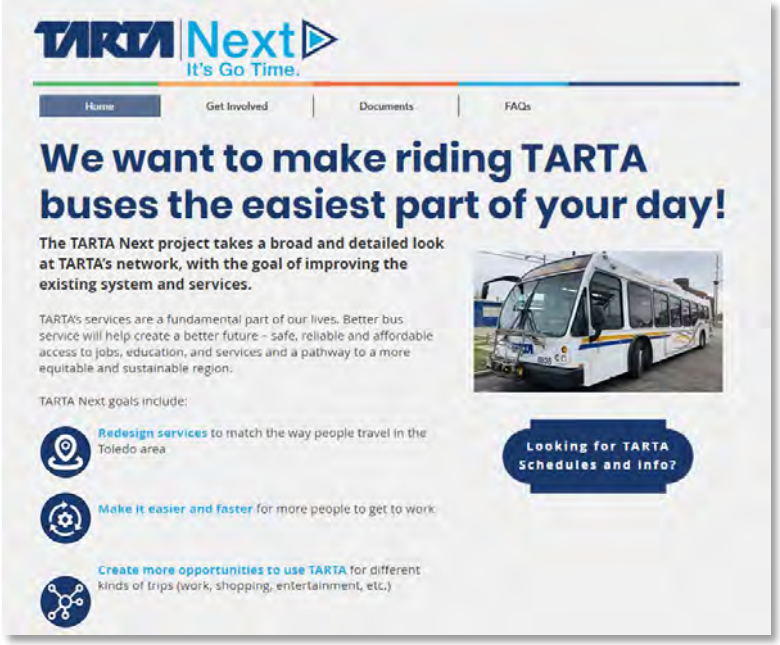
Establishing a **TARTA Next Advisory Committee (TNAC)** to bring together community stakeholders to guide and provide feedback on the project findings and help promote the project regionally.

Conducting "in reach" with TARTA Board members and staff, including transit operators.

Holding **two community meetings** and **multiple "pop-up" events** to collect feedback on TARTA services and discuss transit service design options.

Administering **surveys with community members and transit customers**. While both surveys were designed to collect similar information as the community meetings, the transit customer survey also asked additional questions about travel patterns.

Convening a **stakeholder "transit planning workshop"** for participants to consider their priorities and values for transit service improvements.



Community Engagement

SUMMARY OF ENGAGEMENT FINDINGS

Monroe Avenue is Toledo's most important corridor for transit service. It travels through the heart of the urbanized areas with potential for connections/routes to other important parts of the community.

While East Toledo has some transit service, both stakeholders and transit customers suggested strengthening the service with faster, more direct connections into Toledo, but also connections to closer shopping and employment on the east side of the Maumee River.

Sunday service is one of the most widely voiced themes and desires expressed at nearly every venue.

Cross-town services are desired by transit customers so they can avoid traveling into downtown Toledo to transfer between routes. An example of a cross town route is the existing Route 3 that connects the Franklin Park Mall area to the UTMC/VA Clinic area.

Transit customers asked for **more and better equipped bus stops**, including more information at the bus stops. People said that there aren't enough enclosed shelters or dry waiting areas for passengers. They also acknowledged the need for improved access to information portals and hotlines.

In terms of specific service improvements, transit customers suggested that TARTA:

- Add more service to the Rossford area (past the casino)
- Provide service to Fallen Timbers Mall
- Provide earlier trips to downtown on Route 5 west of the University of Toledo
- Provide service via Douglas to the Miracle Mile
- Strengthen and improve service in East Toledo

Market Analysis

Underlying Local Transit Demand in 2020

Underlying Local Transit Demand

REASSESSING THE TRANSIT MARKET

To supplement the evaluation of existing TARTA services, the project team analyzed the need for transit services in Lucas and northern Wood Counties by looking at the underlying market and potential demand for service. This section uses the most current Census data available (from 2019 in most cases) and forecasted data to 2035 from the Toledo Metropolitan Area Council of Governments (TMACOG). Our approach involves assessing the current demand as well as expected future needs. Findings will be summarized in the final section of this report where opportunities for transit improvements have been identified.

FACTORS RELATED TO TRANSIT DEMAND

Transit demand is strongly related to six factors that are the focus of the market analysis:

1. **Population and population density** – Transit relies on people in proximity, so higher population density makes it more feasible to provide higher levels of service.
2. **Socioeconomic Characteristics** – Different people are more likely to use transit than others, so our analysis looks for people that share characteristics with transit riders, like lower-income and zero vehicle households.
3. **Employment and Employment Density** – Travelling to and from work are the most frequent and predictable trips for most people. Our analysis looks for places with a high density of jobs. Trips to schools, especially to colleges and universities are also major employers, and important markets for transit.
4. **Development Patterns** – There is a strong correlation between development patterns and transit ridership. Transit is easier to use and more convenient in areas with denser development and a good pedestrian environment.
5. **Major Activity Centers** – Larger employers, colleges, tourism destinations, and town centers can attract large volumes of people and generate many transit trips.
6. **Travel Flows** – Travel flows provide information on where people originate and end their trips, which shows which locations and corridors have the highest travel demand. Inter-county travel flows are also important to assess regional transit priorities.

Analyzing How the Toledo Region Travels

APPROACH

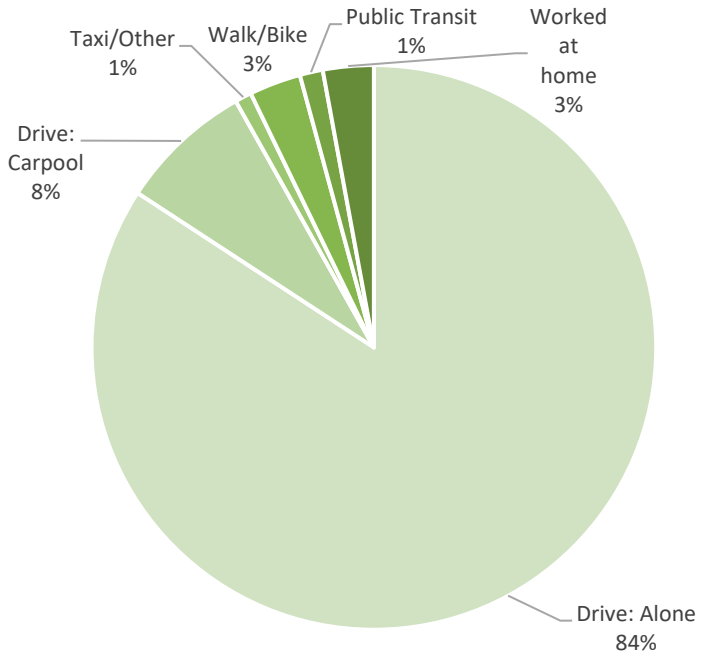
In order to understand the demand and need for public transportation services in the Toledo region, the project team analyzed the following factors over the listed years:

- Population density in 2020 and 2035
- Population density adjusted by socioeconomic characteristics in 2020 and 2035
- Employment density in 2020 and 2035
- Composite density (combined population and employment) for 2020 and 2035
- Major activity centers and education facilities
- Local travel patterns in 2020 and 2035
- Existing TARTA services profile

COMMUTE TO WORK MODESHARE

As shown to the right, the majority of workers in Lucas and Wood County drive alone to work (about 84%). The transit modeshare to work for both counties is about 1%, though it should be noted that far more people in Lucas County use public transit compared to Wood County (1.7% and 0.2%, respectively). Other significant modes of transportation to work include carpooling (8%) and walking and biking (3%).

Figure 27: Lucas and Wood Counties Means of Transportation to Work



Source: ACS 2019 5-Year Estimates

KEY DATA SOURCES

- Demographic data from the US Census – American Community Survey 2019 5-year estimates
- Population, employment and travel flow data by Travel Analysis Zone (TAZ) in 2020 and 2035 from the Toledo Metropolitan Area Council of Governments (TMACOG)

Transit Demand

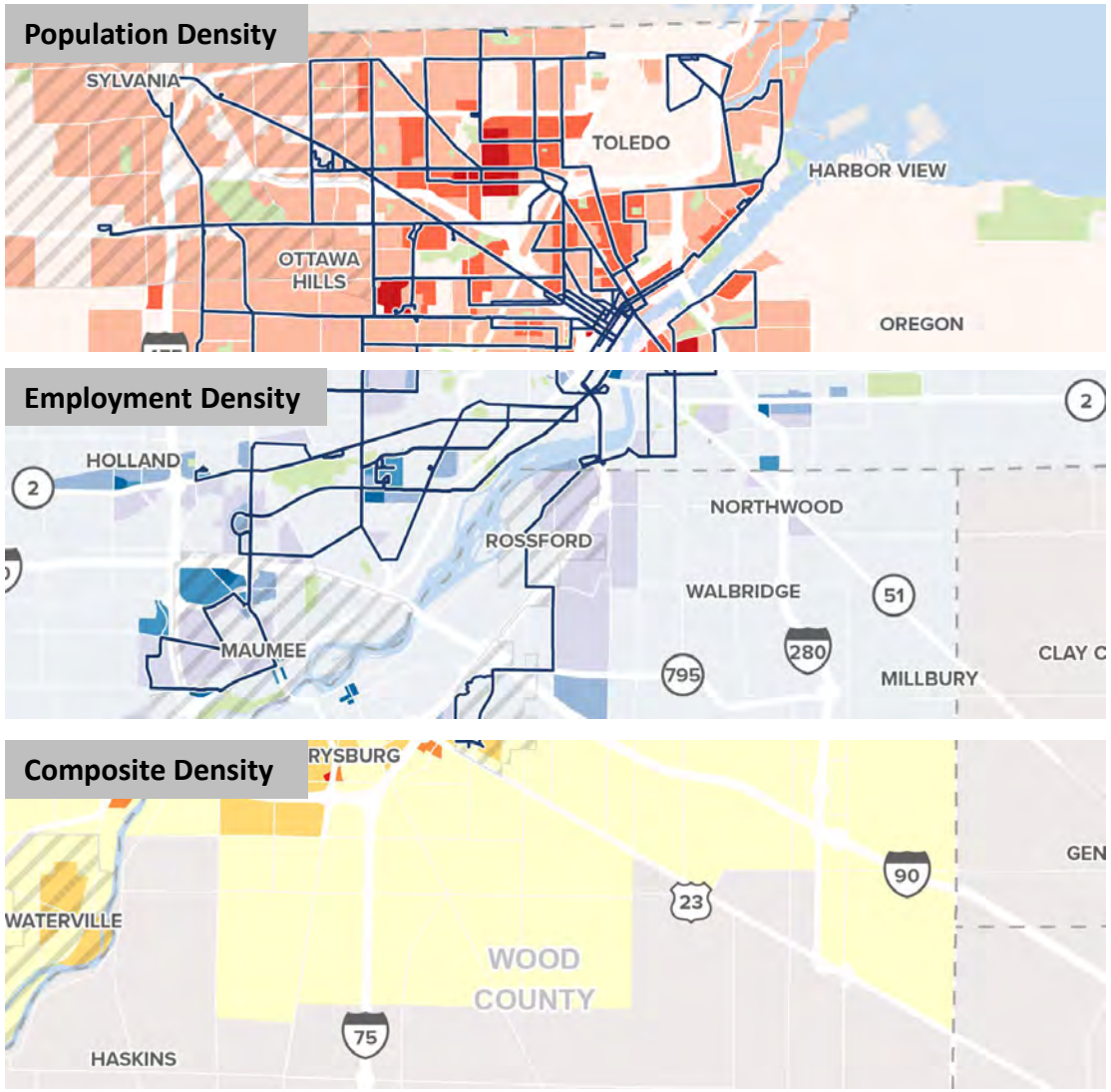
Population and employment density are the most important factors that determine the underlying demand for transit, due to the following reasons:

1. Transit is generally accessible to those who live and/or work within one-quarter mile of a bus stop or one-half mile of a bus rapid transit or rail stop. Transit routes that run along high-density corridors can serve more people.
2. Transit service levels must be matched with demand. Higher frequency service can be productive in areas with more people.
3. To attract travelers who often drive, transit must be able to connect people and destinations in a cost and time competitive manner.

The street environment also affects transit ridership. Transit services are most effective when paired with sufficient and well-lit sidewalks and crosswalks that allow people to safely reach bus stops. Even in the places with the highest density, people may not use transit services if stops are not accessible.

Lastly, it is important to recognize that areas without some level of population and employment density may not provide an environment where fixed-route transit can generate enough ridership to succeed. In these instances, TARTA and its partners can explore alternative types of transportation services, such as shared mobility solutions.

Figure 28: Sample Density Maps



Transit-Supportive Land Use and Density

Different levels of residential and employment density are supportive of different levels of transit, as shown in the graphic to the right. Most of the land area of the Toledo region is in the mixed neighborhoods and low density categories, with pockets of higher density throughout the region. Areas with the highest land use density include:

- Downtown Toledo
- Franklin Park Mall area
- East Toledo
- The University of Toledo main campus
- The University of Toledo Health Sciences campus

It is important to note that the table to the right is indicative of appropriate types of transit service based on land use densities and is not intended to be prescriptive. Also, the categories of residents and jobs per acre are used for all demographic maps presented in this report.

Figure 29: Transit-Supportive Transit and Land Use Densities

LAND USE			TRANSIT	
Land Use Type	Residents per Acre	Jobs per Acre	Appropriate Types of Transit	Frequency of Service
Downtowns & High Density Corridors	>45	>25	Light Rail, BRT, Rapid Bus, Local Bus	10 mins or better
Urban Mixed-Use	30-45	15-25	BRT, Rapid Bus, Local Bus	10-15 minutes
Neighborhood & Surburban Mixed-Use	15-30	10-15	Local Bus	15-30 minutes
Mixed Neighborhoods	10-15	5-10	Local Bus, Micro-transit	30-60 minutes
Low Density	2-10	2-5	Micro-transit, Rideshare, Volunteer Driver Pgm	60 mins or less or On Demand
Rural	<2	<2	Rideshare, Volunteer Driver Pgm	On Demand

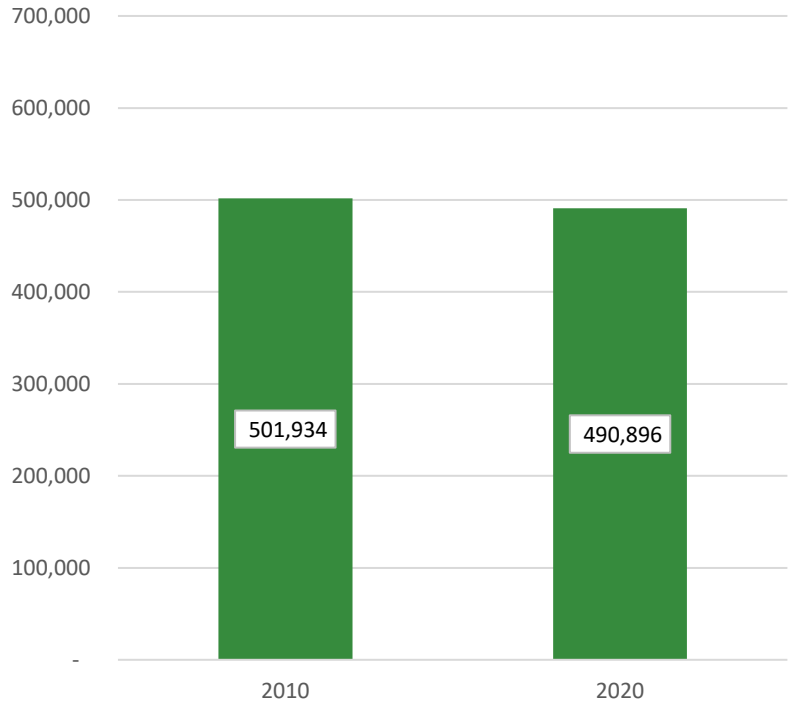
Source: Thresholds based on research by Nelson\Nygaard.

Population Density

As mentioned, population density is an important indicator for transit demand, since effective transit systems require people living and working within walking distance to stops and stations. Additionally, denser areas tend to be more walkable and less automobile-oriented, with limited access to parking and less reason to own a private automobile.

The following map shows the population density for Lucas County and the northern part of Wood County in 2020. The highest population density areas in the region include central and west Toledo, the Southside in Toledo, the University of Toledo main campus, and East Toledo. Outside of these areas, the region has relatively low population density except for large apartment complexes, many of which are outside of the urban core.

Figure 30: Lucas and Northern Wood County Population in 2010 and 2020



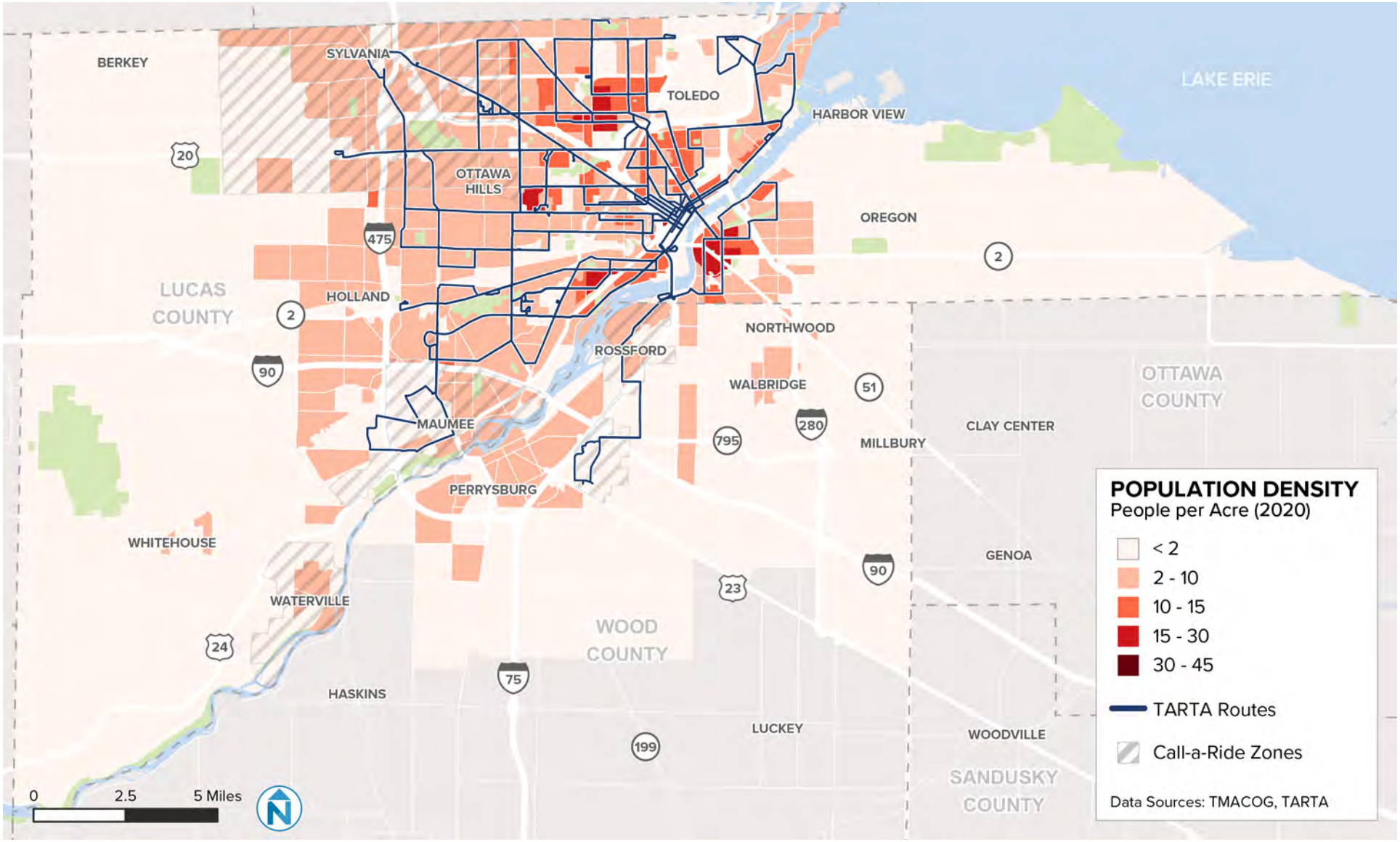
Source: Decennial Census (2010) and TMACOG (2020)

MAPPING POPULATION DENSITY

The following population density map uses the following symbology:

High to Very High Density	More than 30 people per acre
Medium Density	15 to 30 people per acre
Low Density	10 to 15 people per acre
Very Low Density	2 to 10 people per acre
Not Transit Supportive	Less than 2 people per acre

Figure 31: Population Density (2020)



Demographics-Based Transit Propensity

In addition to population density, socioeconomic characteristics influence people's propensities toward using transit. Many population groups often have a higher propensity for transit than the overall population, generally groups that are more disadvantaged in society.

RACE AND ETHNICITY

Race and ethnicity are often indicators of transit propensity. Within TARTA's current service area, Black residents are 2.9 times more likely to use transit to get to work than the average resident. This is likely due to concentrations of Black residents in the central part of Toledo as well as lower household income in these areas, which translates to limited resources for other transportation options. Hispanic or Latino and Asian residents are only slightly more likely to use transit, whereas White Non-Hispanic residents are about 2.4 times less likely to use transit than the average resident.

FOREIGN-BORN

Residents born outside of the United States are about 1.4 times more likely to use transit than average residents.

Figure 32: Race and Ethnicity by Commuter Type (2019)

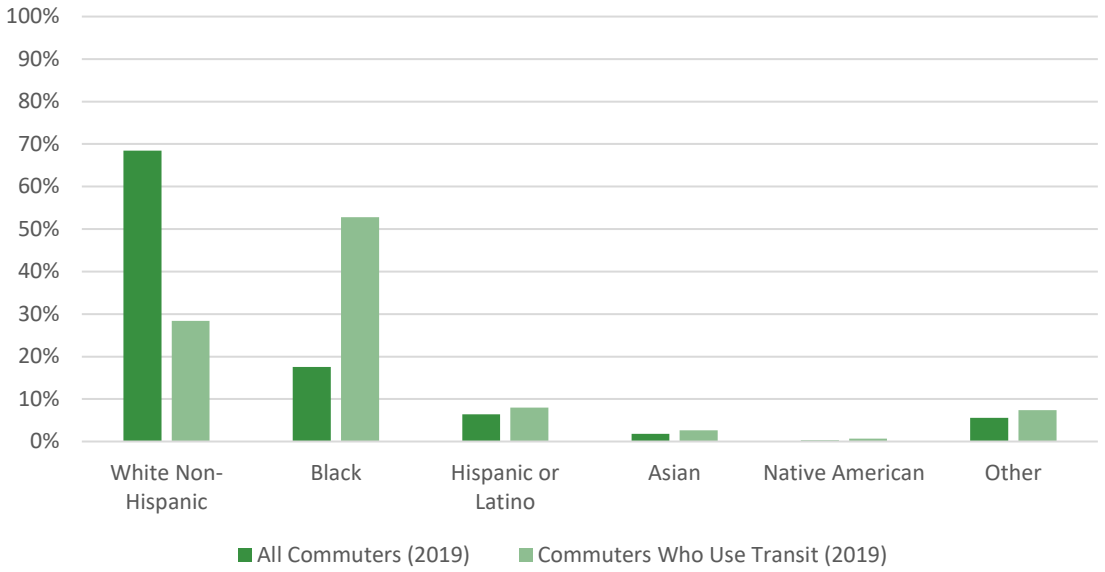
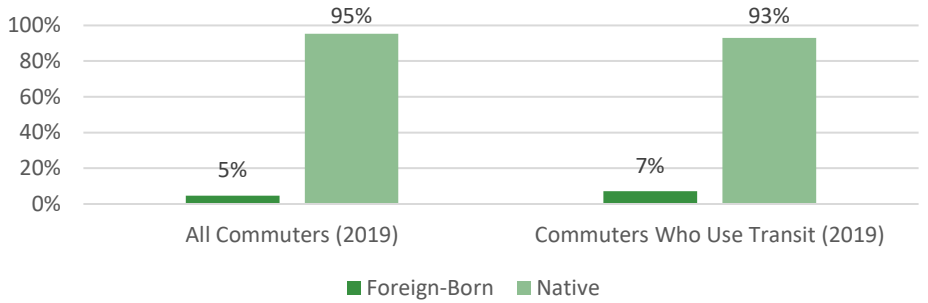


Figure 33: Foreign- and Native-Born by Commuter Type (2019)



Source: ACS 5-Year Estimates

Demographics-Based Transit Propensity

INCOME LEVEL

Household income is a strong indicator of transit propensity. Households who live below the federal poverty level are much more likely to have difficulty paying for basic needs – especially transportation costs – and are thus much more likely to use transit.

*Federal poverty levels scale to the number of people in a family. In 2017, the poverty level was $16,250 for a family of two and $24,600 for a family of four.

Figure 34: Income Levels All Commuters (2019)

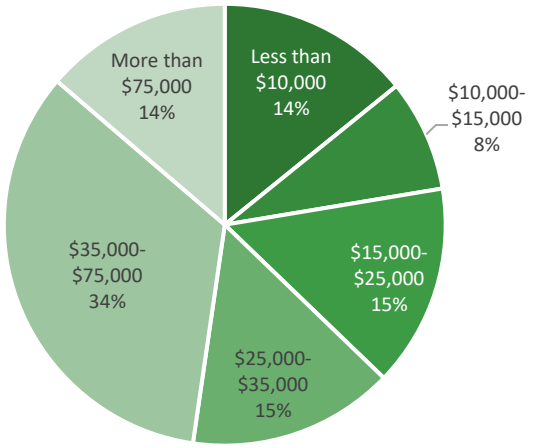
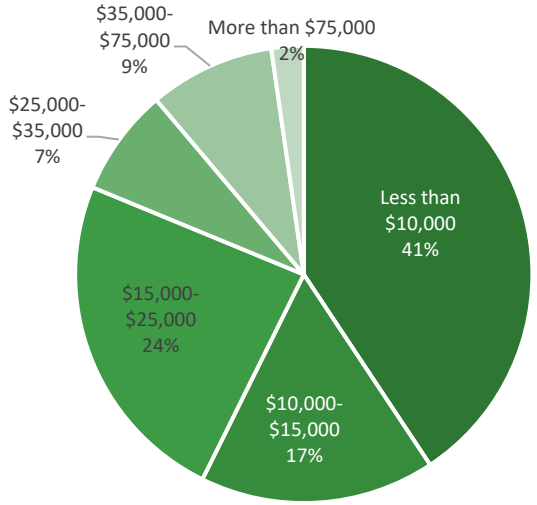


Figure 36: Income Levels Transit Commuters (2019)



CAR AVAILABILITY

Similar to household income, households without a vehicle available are far likelier to use transit than households that have at least one vehicle available. Over half of households in the Toledo area who commute via transit have no vehicle available to them and only a quarter of these households have access to 2 or more vehicles.

Figure 35: Car Availability All Commuters (2019)

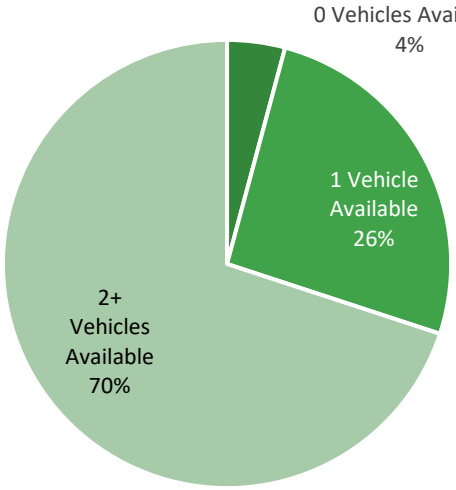
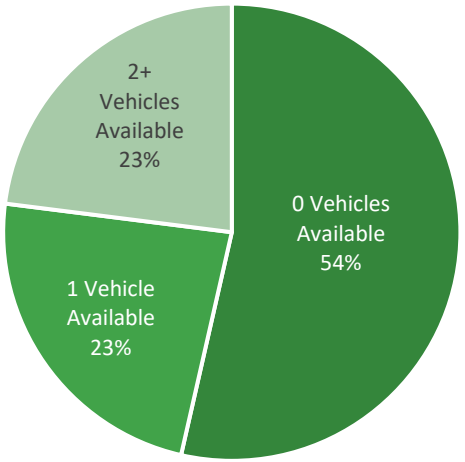


Figure 37: Car Availability Transit Commuters (2019)



Source: ACS 5-Year Estimates

Transit Propensity Adjustment Factor

When a significant number of people from the demographic groups described earlier live in clustered areas, the underlying demand for transit in these areas may be higher than is captured by just looking at population density. Conversely, in areas where transit-supportive groups have lower representation, the transit demand may be lower than what is captured purely by population density.

Taking these factors into account, the project team calculated a measure called the **Transit Propensity Adjustment Factor**, which measures the relative demand for transit in different areas of the Toledo region based on demographic characteristics*. The table to the right shows the relative transit propensity among different groups. A factor greater than 1 means that the group is *x* times more likely to use transit than the average population, with *x* signifying the value of the factor.

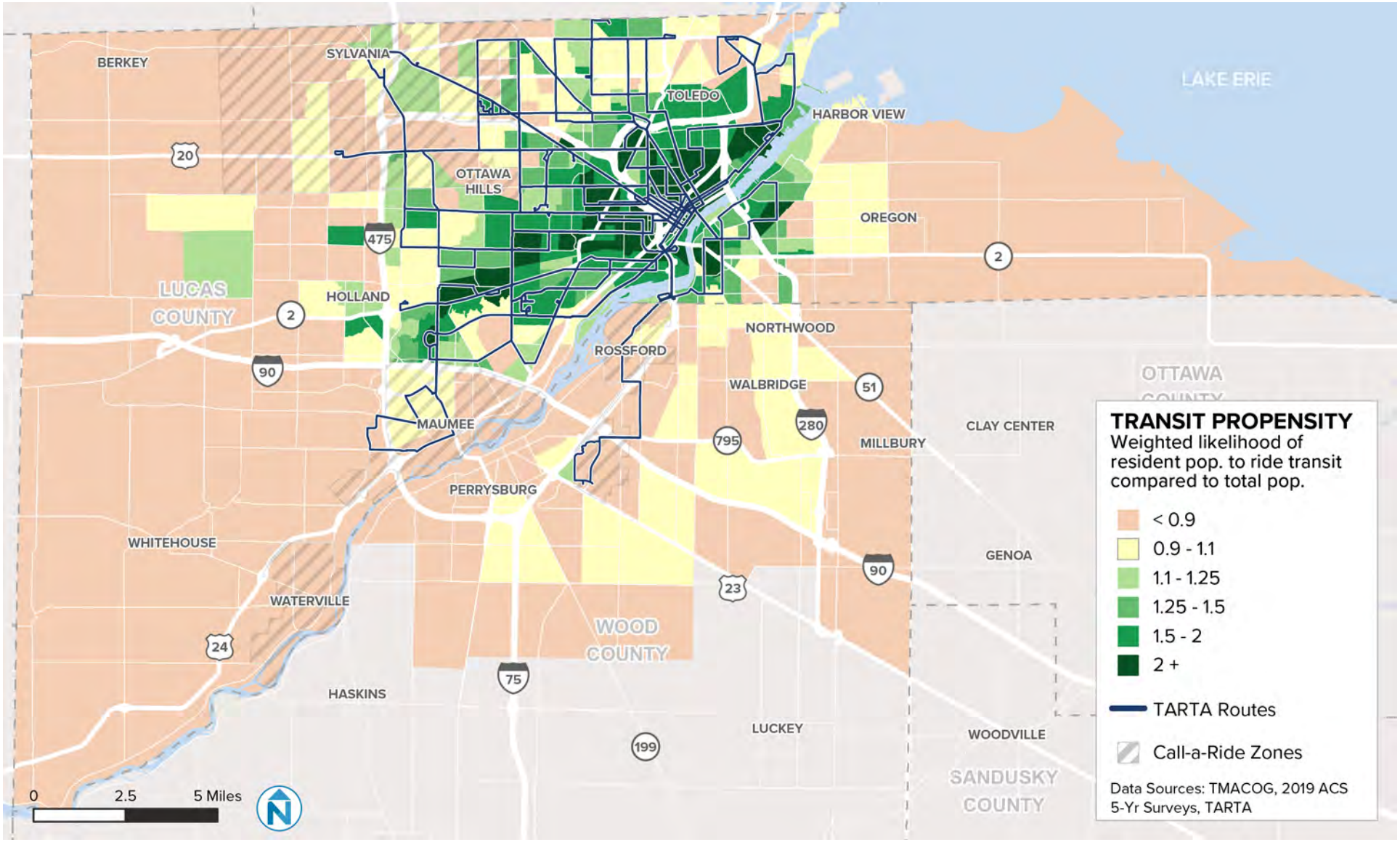
The following map shows the effect the transit propensity adjustment factor has on the population density map for Lucas County and the northern portion of Wood County. This map shows that the older neighborhoods in central Toledo, as well as many neighborhoods along the Highway 2/Airport Highway corridor, are significantly more likely to use transit than many other areas of the study area, and more than just population density would suggest. Conversely, many parts of Lucas and Wood Counties that are low density to begin with are even less likely to use transit.

*The Transit Propensity Adjustment Factor is calculated by finding the ratio between the transit modeshare of the demographic group and the transit modeshare of the general population. For example, the Transit Propensity Adjustment Factor for foreign-born residents is found by dividing the % of foreign-born residents who commute to work via transit by the % of all residents who commute to work via transit.

Figure 38: Transit Propensity Adjustment Factors

Demographic Group	Transit Propensity
Race/Ethnicity	
White, non-Hispanic	0.42
Hispanic or Latino	1.28
Black	3.08
Native American	2.76
Asian	1.48
Other	2.17
Native/Foreign Born	
Native -Born	0.97
Foreign-Born	1.53
Income Level (annually)	
Less than $10,000	2.87
$10,000-$15,000	2.03
$15,000-$25,000	1.61
$25,000-$35,000	0.50
$35,000-$75,000	0.26
More than $75,000	0.17
Vehicle Availability	
No Vehicles	12.46
1 Vehicle	0.88
2 or More Vehicles	0.32

Figure 39: Transit Propensity (2020)



Adjusted Population Density

Using the transit propensity adjustment factors discussed earlier, the following map shows the population density in 2020 adjusted by socioeconomic characteristics. Adjusting the population density towards groups that generally use and need to use transit often intensifies transit demand in urban areas and diminishes demand in rural areas.

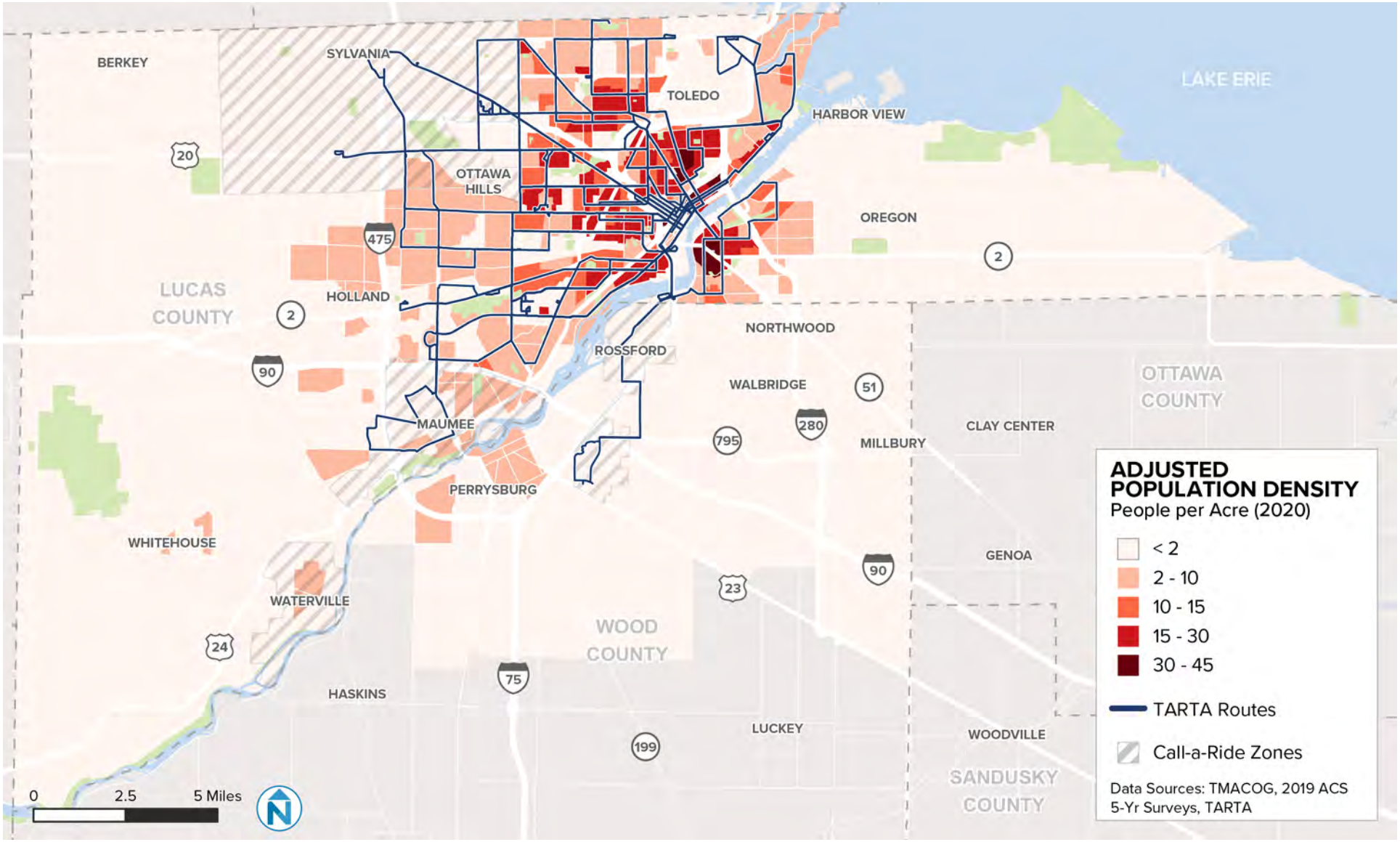
The adjusted population density is clearly the greatest in central Toledo, especially in the La Grange, Old Towne and Scott Park neighborhoods. There are also pockets of low to medium adjusted population density adjacent to the downtown in the West Toledo, Southside, Roosevelt and Onyx neighborhoods.

The aerial photos to the right provide examples of different levels of density throughout the region.

Figure 40: Visualizing Population Density

Source: Google Maps Satellite View

Figure 41: Adjusted Population Density (2020)



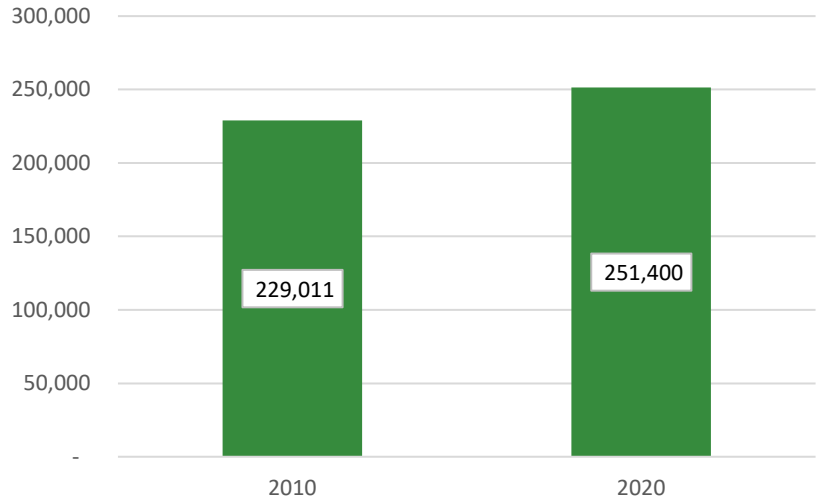
Employment Density

Employment density provides a strong indication of transit demand derived from people travelling to and from jobs, as well as to the services that these jobs provide. For example, restaurant and hospital employees may take transit to and from work, and customers and patients may also use the same transit. In the Toledo region, there are also large plants related to the auto and glass industries as well as distribution sites for online/retail companies that employ large numbers of people in single locations. Some of these locations are centrally located and accessible via transit, while others may be difficult to serve effectively with transit.

Figure 42: Sample Large Employers in the Toledo Area

Source: TMACOG and Google Maps

Figure 43: Lucas and Northern Wood County Employment in 2010 and 2020



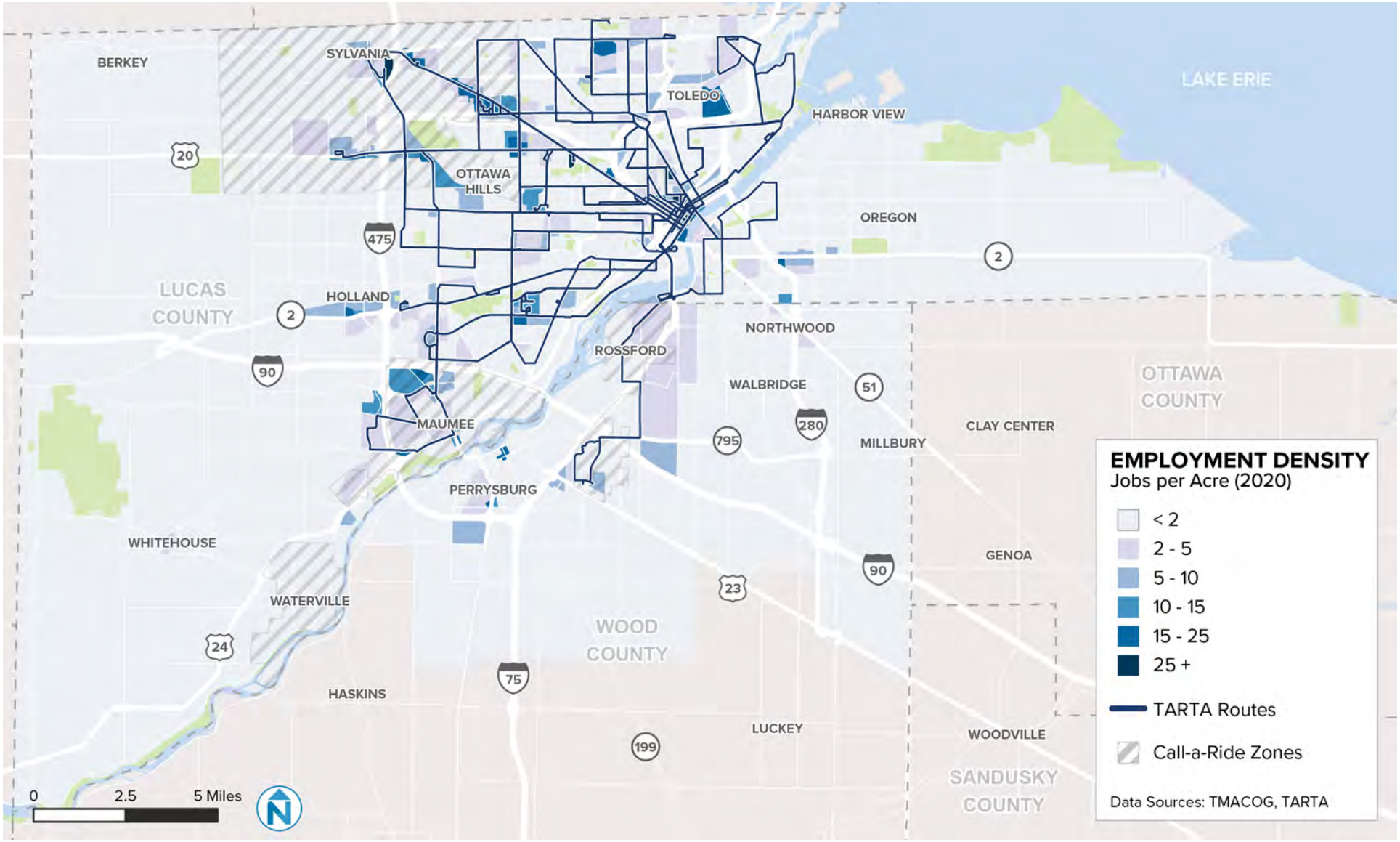
Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (2010) and TMACOG (2020)

MAPPING EMPLOYMENT DENSITY

The following map show employment density in 2020 based on the following symbology:

Very High Density	More than 25 jobs per acre
High Density	15 to 25 jobs per acre
Medium Density	10 to 15 jobs per acre
Low Density	5 to 10 jobs per acre
Very Low Density	2 to 5 jobs per acre
Not Transit Supportive	Less than 2 jobs per acre

Figure 44: Employment Density (2020)



Composite Density

Population density, socioeconomic characteristics, and employment density all play a role in the demand for public transit. The following maps combine these factors into a **Composite Density**, which shows the total transit demand in an area based on where people live and work. The composite density is equal to the adjusted population density plus twice the employment density, which takes into account both the workers themselves and customers who visit the job sites.

The 2020 composite density map shows pockets of density throughout Lucas and Wood Counties, though most density is concentrated in downtown Toledo, East Toledo, the Franklin Park/Westgate area, the Monroe Street corridor, the University of Toledo main campus and UT Health Sciences campus, portions of north Maumee, Sylvania around Flower Hospital and the major employers in the region (GM Powertrain, Fiat-Chrysler assembly plant, major hospitals, Amazon, etc.).

Based solely on the adjusted population density, about 75% of the land area in Lucas County and 90% of the land area in the northern part of Wood County does not have a high enough density to be transit supportive (less than 2 people per acre). The remaining areas range from “Very Low” to “Medium” levels of population density. It should be noted that for both counties, the transit supportive areas cover a good portion of the urbanized area. The City of Toledo, for instance, is about 14% of the land area in Lucas County.

Figure 45: Proportion of County Acreage Supportive of Fixed-Route Transit

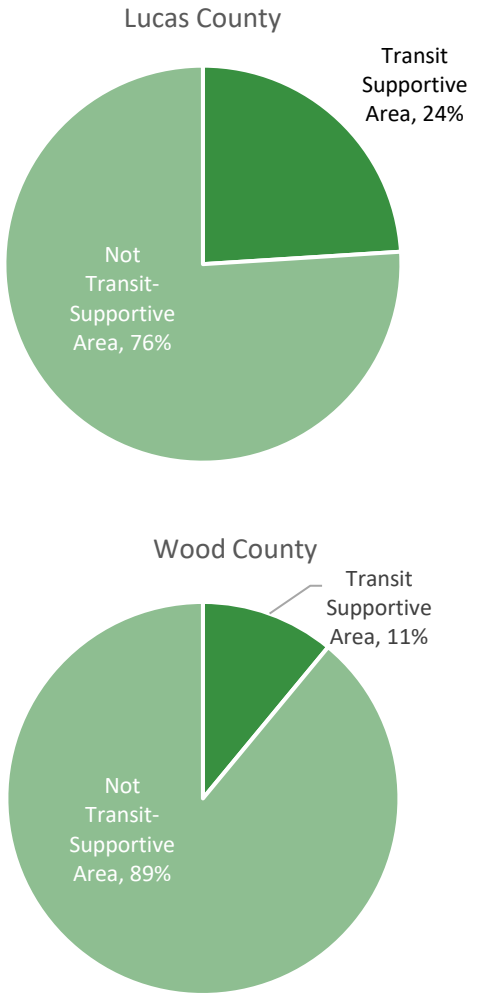
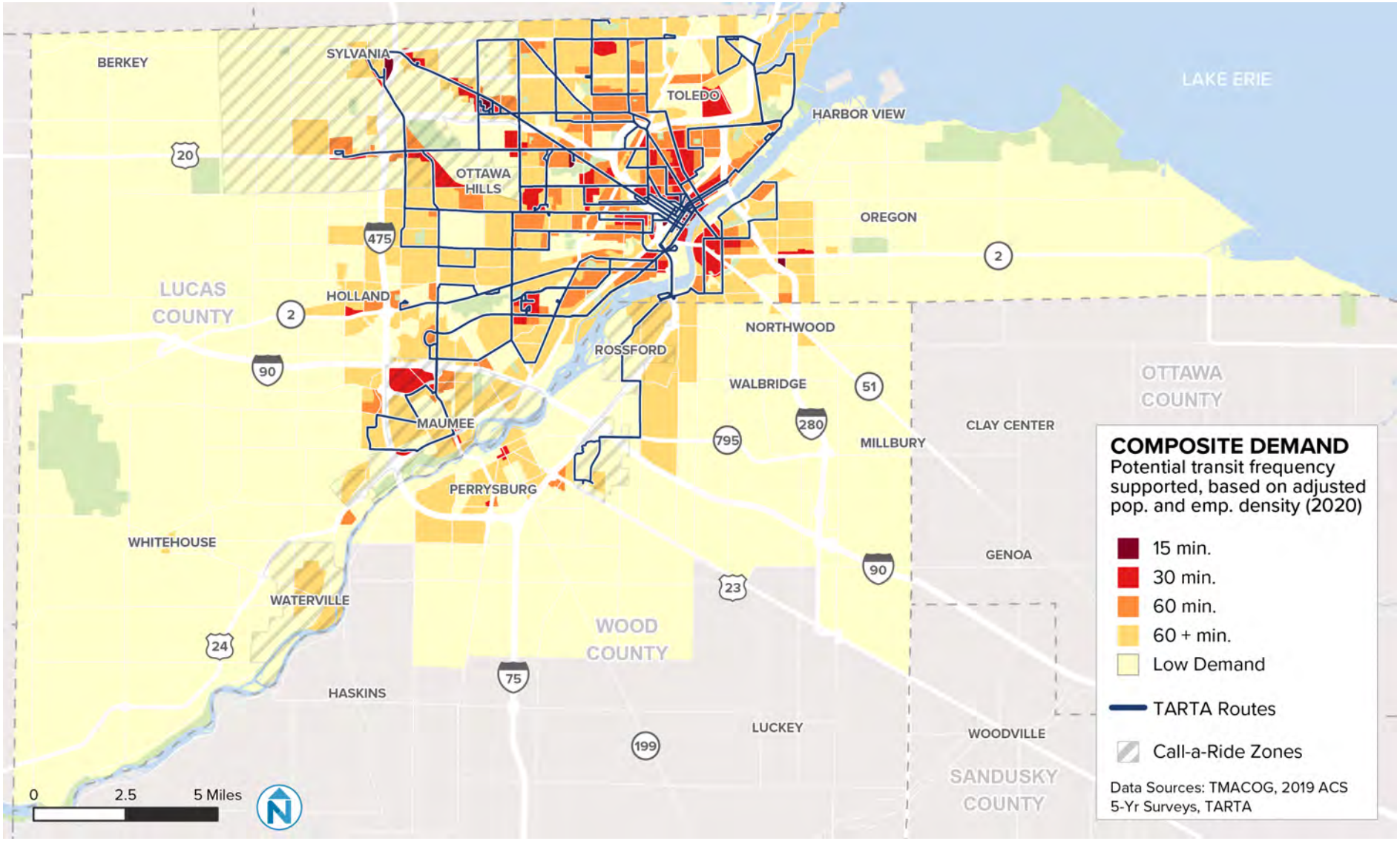


Figure 46: Composite Demand (2020)



Looking Forward to 2035

Population Density in 2035

Since most transit investments are for the long term, it is important to understand future development patterns and changes in population so that TARTA can adequately plan for the future. By 2035, it is projected that the region will continue to experience some loss in population.

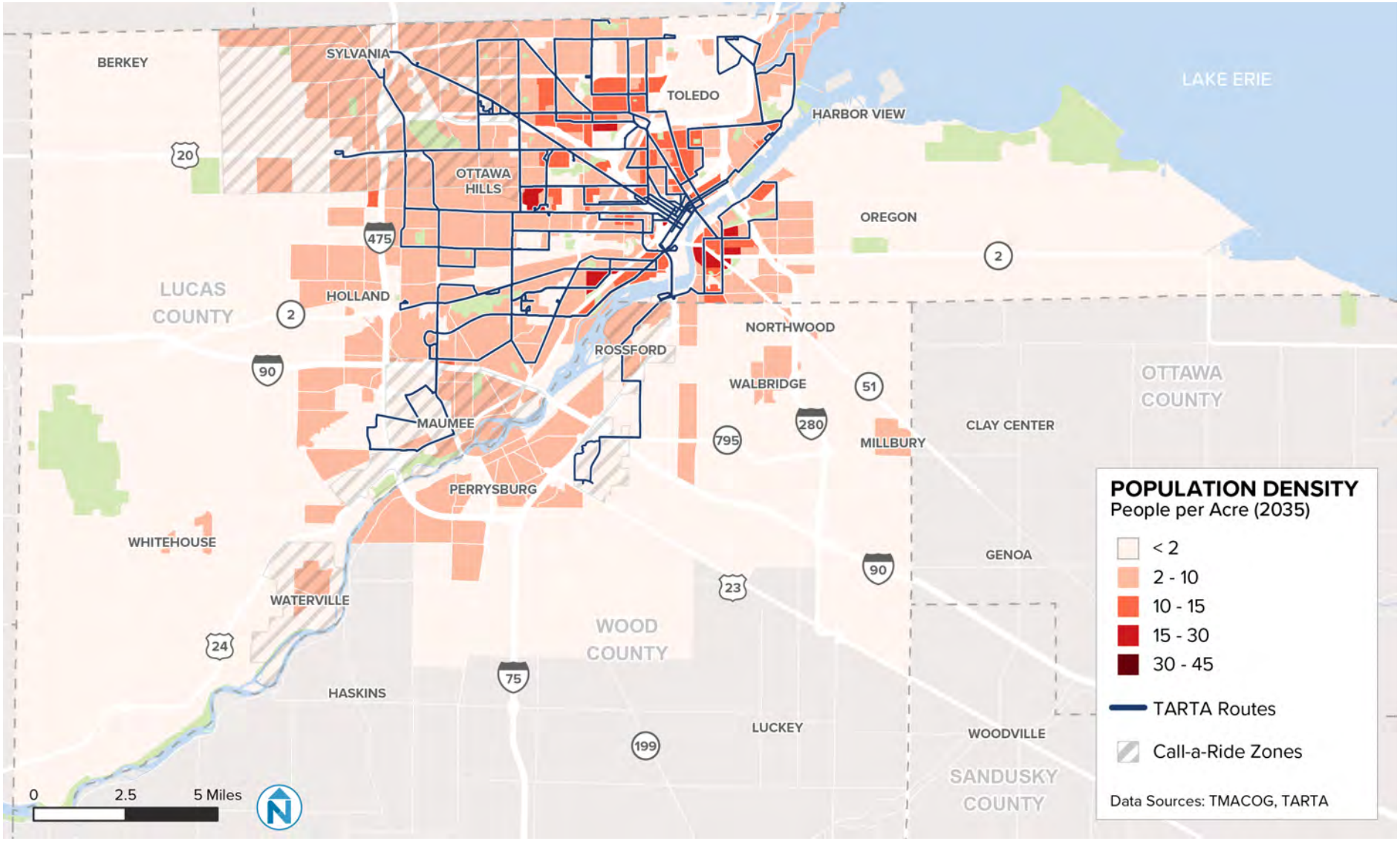
As shown in the following map, population density will remain about the same in 2035, although with a slightly declining population, densities in some neighborhoods is expected to decline as well. The areas that are forecasted to have the greatest changes in population density by 2035 include:

- West Toledo and East Toledo will continue to have moderate population densities, but both areas are expected to decline somewhat
- Parts of the Southside neighborhood in Toledo will still have moderate population densities but are expected to lose population
- Some neighborhoods in south Rossford and Perrysburg are expected to have slightly more population density, though will remain low density

Figure 47: Lucas County and Northern Wood County Population in 2010, 2020, and 2035

Source: Decennial Census (2010), TMACOG (2020 and 2035)

Figure 48: Population Density (2035)



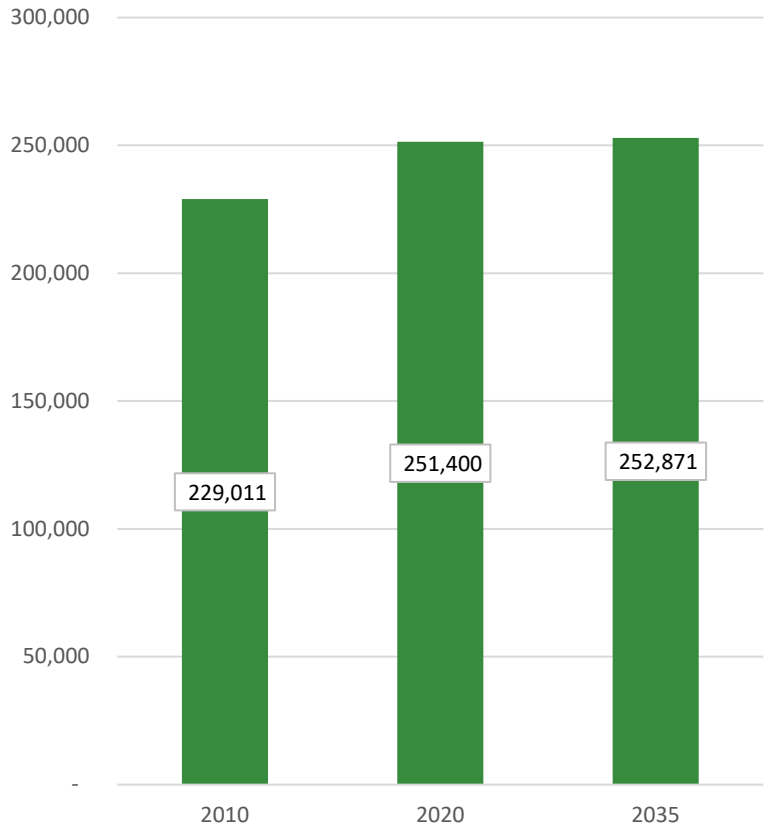
Employment Density in 2035

Between 2010 and 2020, employment increased by about 32,000 jobs, as shown in the figure to the right. However, between 2020 and 2035, employment is expected to increase only slightly to about 252,000 jobs.

The following map shows the modest increase in employment density throughout the region in 2035. As with 2020, employment density in 2035 will remain concentrated in the following areas:

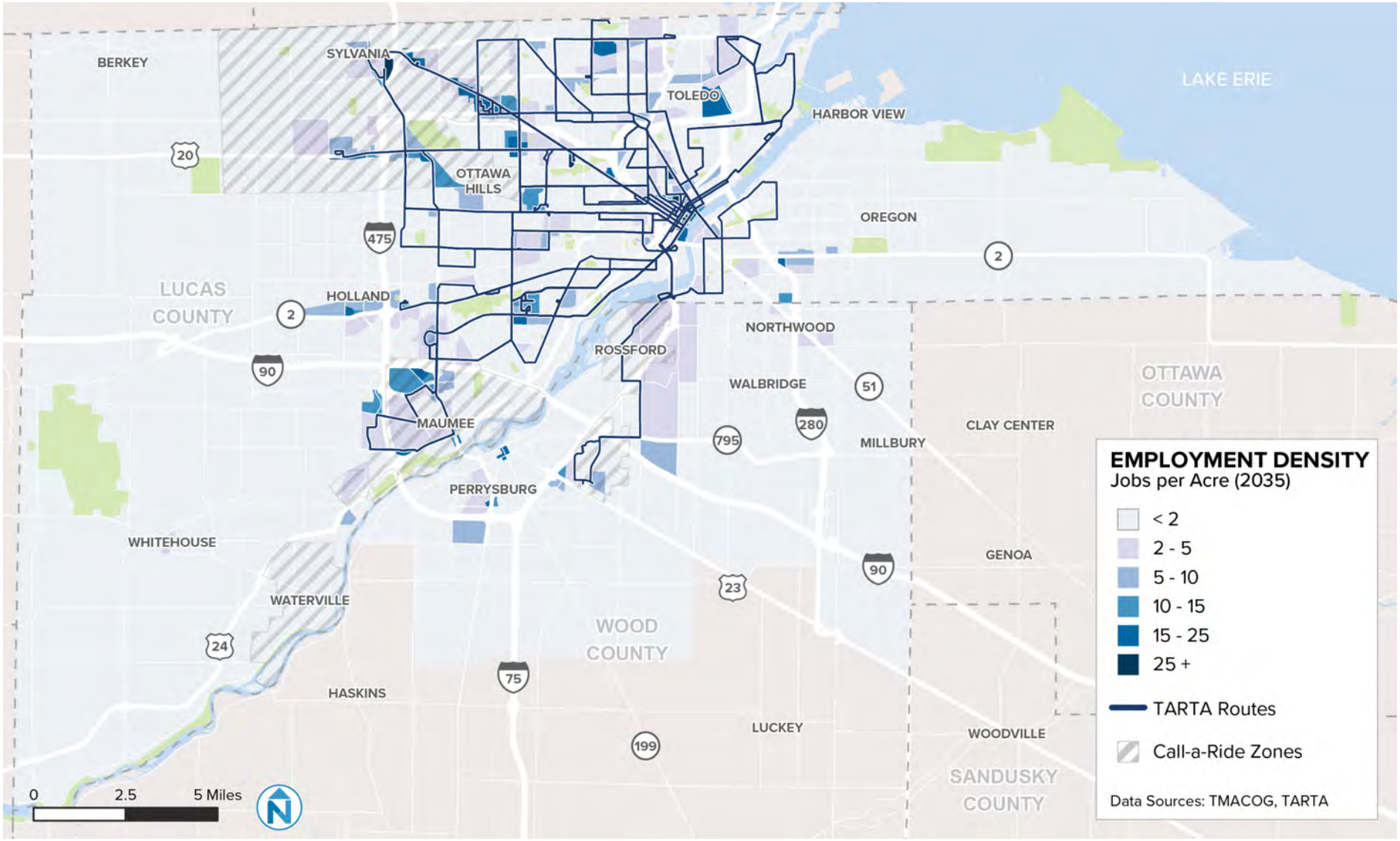
- Downtown Toledo, including the Cherry Street corridor to St. Vincent Medical Center
- The Monroe Street corridor from the ProMedica Toledo Hospital to the Franklin Park Mall area and continuing to Flower Hospital in Sylvania
- The University of Toledo main campus and health sciences campus
- The Fiat-Chrysler assembly plant
- The GM Powertrain plant
- The northern part of Maumee near I-90 and I-475

Figure 49: Lucas County and Northern Wood County Employment in 2010, 2020, and 2035



Source: U.S. Census Bureau, OnTheMap Application and LEHD Origin-Destination Employment Statistics (2010) and TMACOG (2020 and 2035)

Figure 50: Employment Density (2035)



Composite Density in 2035

Combining the adjusted population and employment densities in 2035 into a composite density shows a modest decrease in transit demand in the Toledo region in the future, as seen in the following map. Though most of the Lucas and northern Wood Counties will still have very low density, the more dense and urban areas indicate that transit demand will remain in many of the same locations.

A few changes in composite density are forecasted for region:

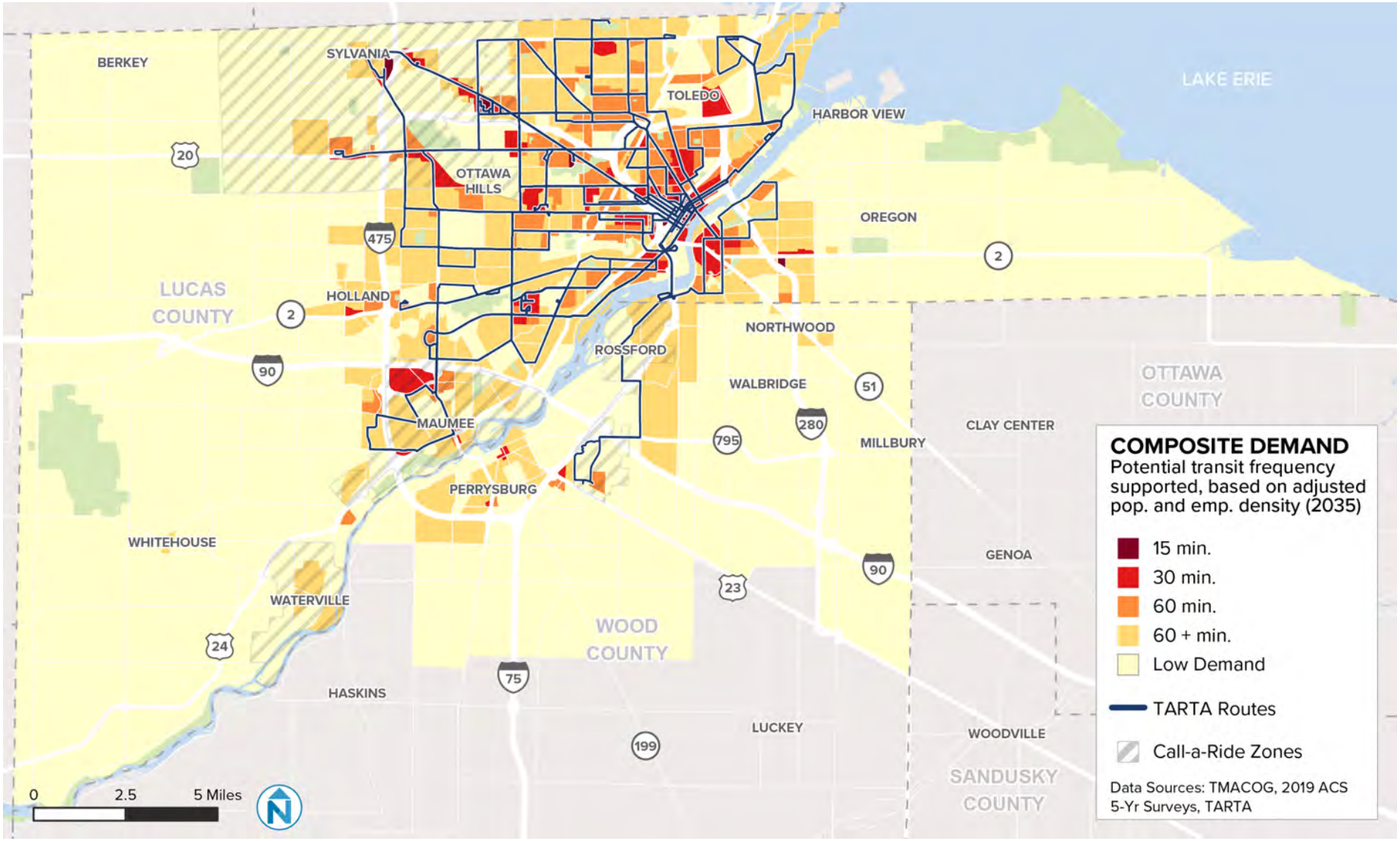
- Central Toledo and the older neighborhoods on the south side will have slightly less composite density
- Several areas in south Rossford are forecast to have higher composite density in 2035
- Small pockets in central Maumee and Northwood (in Wood County) are forecast to have modest increases in composite density.

The aerial maps shown at right illustrate high composite density areas in the Toledo region. Downtown Toledo, East Toledo and many of the older neighborhoods are good examples of areas with high composite density, but so are other areas like the Franklin Park Mall and north Maumee areas. While these areas were developed later and have development patterns that are less transit supportive, they are also major draws for regional jobs, shopping and entertainment. There are also relatively dense housing complexes located throughout the region that are less transit supportive but because of socioeconomic factors and access to a vehicle, exhibit strong demand for transit.

Figure 51: Strong Composite Density in the Franklin Park Mall Area

Figure 52: Strong Composite Density in the North Maumee Area

Figure 53: Composite Demand (2035)



Other Factors Affecting Transit Demand

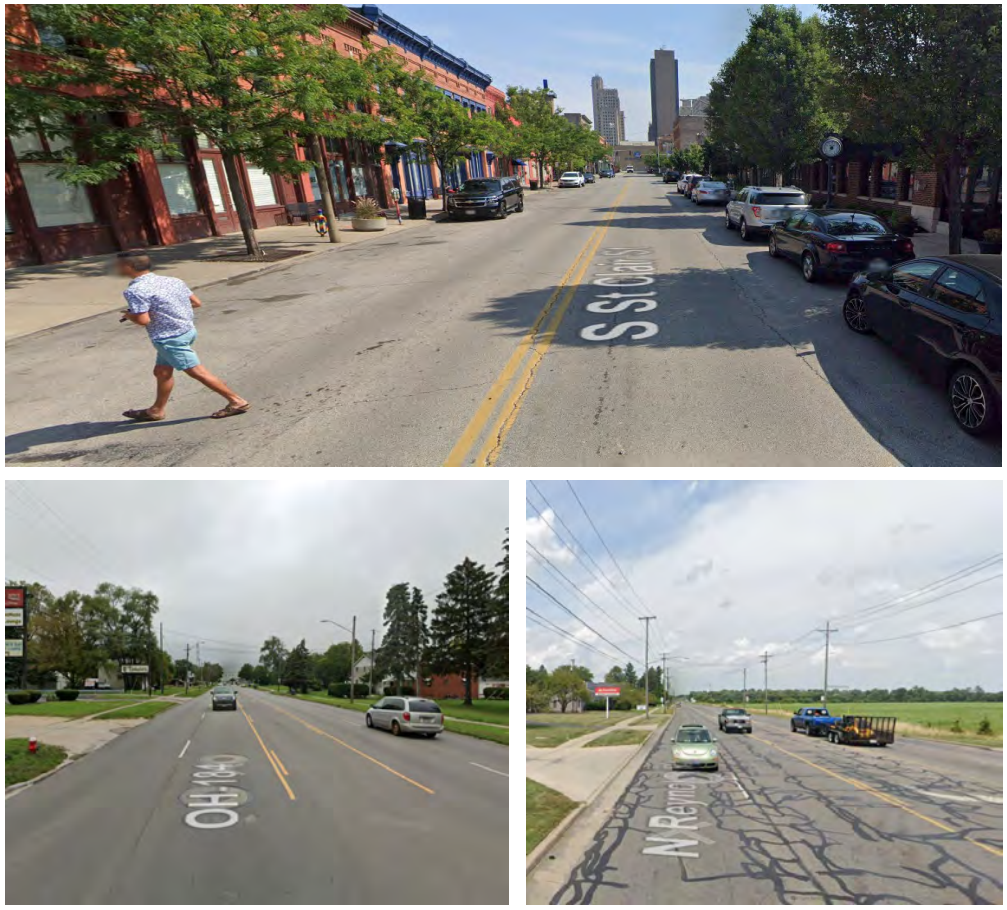
Pedestrian Environment

The pedestrian environment is a major consideration for transit usage since most transit riders walk between their origin or destination and their bus stop. A safe, comfortable, walkable environment is more conducive to transit ridership. Additionally, buses run faster and more reliably when stops can be made on a major street rather than weave in and out of parking lots, but for the former to be convenient for riders, the final destinations must be within close walking distance to the bus stop. Factors that affect walkability and transit ridership include, but are not limited to:

- Sidewalks, crosswalks, signalized intersections and lighting
- Proximity to diverse sets of housing, services, offices, and other employment sites
- Intersection density, or the number of intersections within a defined area
- Transit availability and parking prices

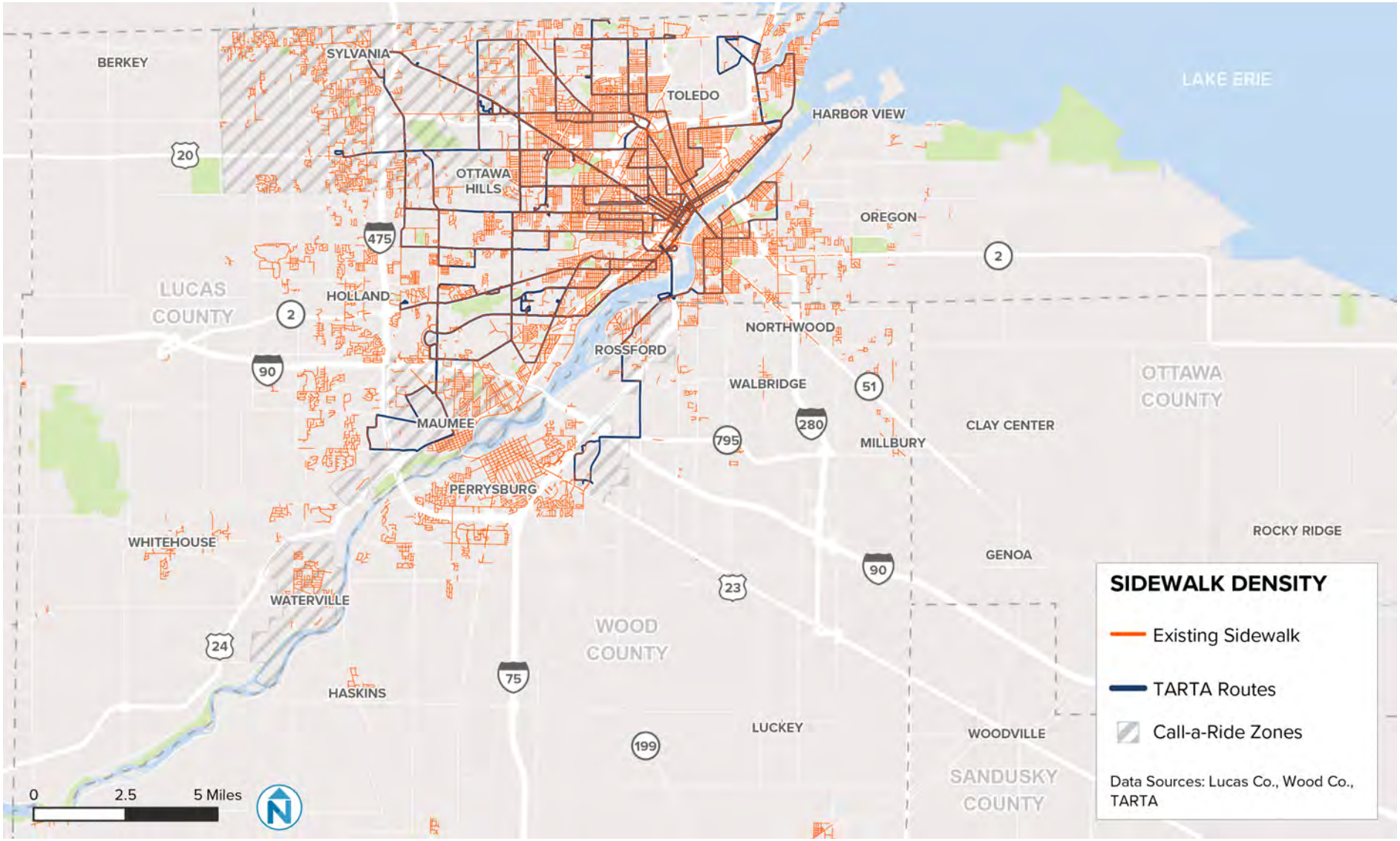
Due to the large geographic scope of this study, the project team will be evaluating walkability and pedestrian access and how these factors correlate to transit usage. While many neighborhoods in Toledo, the areas on and around the University of Toledo, and the older neighborhoods or towns in the region have relatively extensive sidewalks (as shown on following page), many other areas of the region have relatively long distances between signalized intersections, few crosswalks and/or disconnected pedestrian facilities. These hostile pedestrian environments make bus transfers extremely difficult throughout TARTA's service. Additionally, these environments may not be as supportive for pedestrians – or may even prohibit pedestrians – and will be more difficult to serve safely and effectively with transit without major capital improvements.

Figure 54: Pedestrian Environment in Downtown Toledo (top) versus North Toledo – Alexis Road (Bottom Left) and Reynolds Corner – Reynolds Road (Bottom Right)



Source: Google Maps Street View

Figure 55: Sidewalk Density (2020)



Activity Centers

Some activity centers generate additional demand for transit that are not captured by the previous density analyses. As shown in the following map, the region's major activity centers and points of interest include:

- **Hospitals**, such as Flower Hospital, St. Vincent Medical Center, ProMedica Toledo, and UT Medical Center
- **Shopping and entertainment**, such as grocery stores, the Franklin Park Mall, Westgate and Springfield Commons
- **Major employers and job centers**, such as the Chrysler and GM Powertrain plans, Owens-Corning, Amazon distribution and fulfillment facilities, and Franklin Park Mall

Colleges and universities are also major activity centers and are generally good generators of transit demand. In general, colleges and universities differ in terms of their environment and ability to be served by transit. For example, the main campus of the University of Toledo and Mercy College of Ohio are relatively walkable and can be well served by fixed-route transit. In contrast, the University of Toledo Health Science campus and Owens Community College in Perrysburg are more difficult to serve with fixed-route traffic due to its office park nature, longer distances between facilities, and fewer pedestrian connections.

While some of these activity centers are in more urban environments, many are in rural or suburban areas, which may not be as easy to serve with fixed route transit. The figure to the right shows other service types that may better fit low-density areas, such as demand-response services and circulators.

Figure 56: Potential Transit Service Types for Low Density Areas

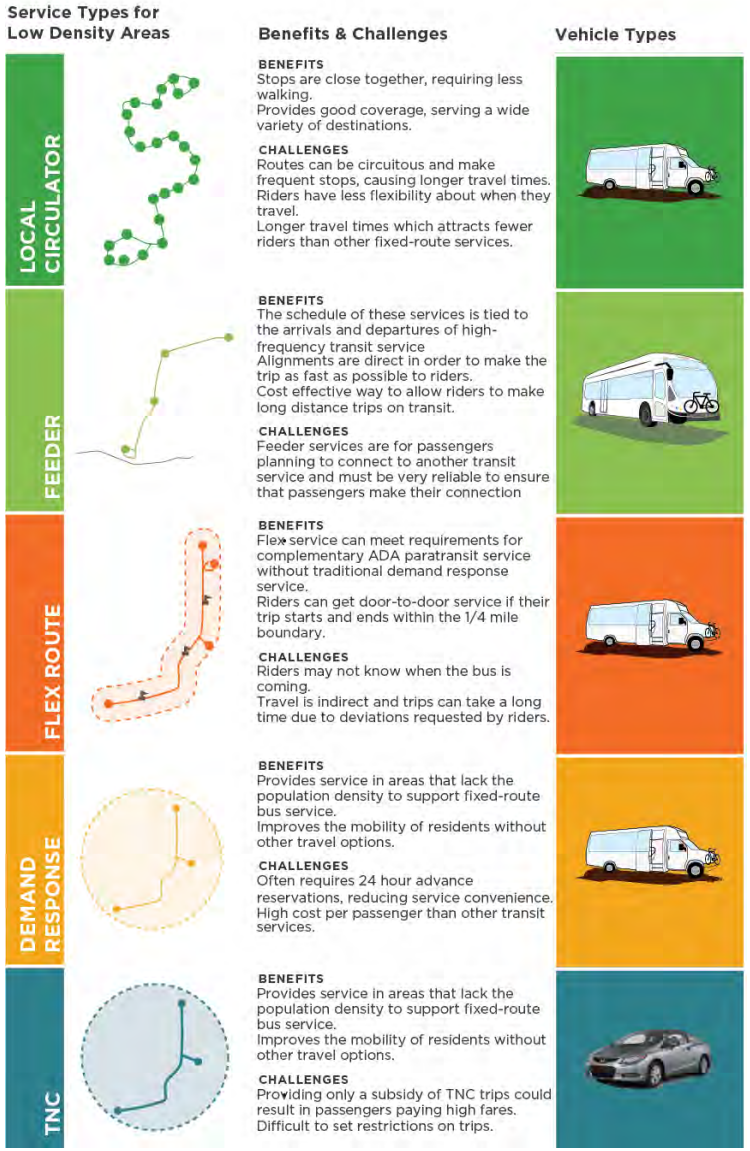
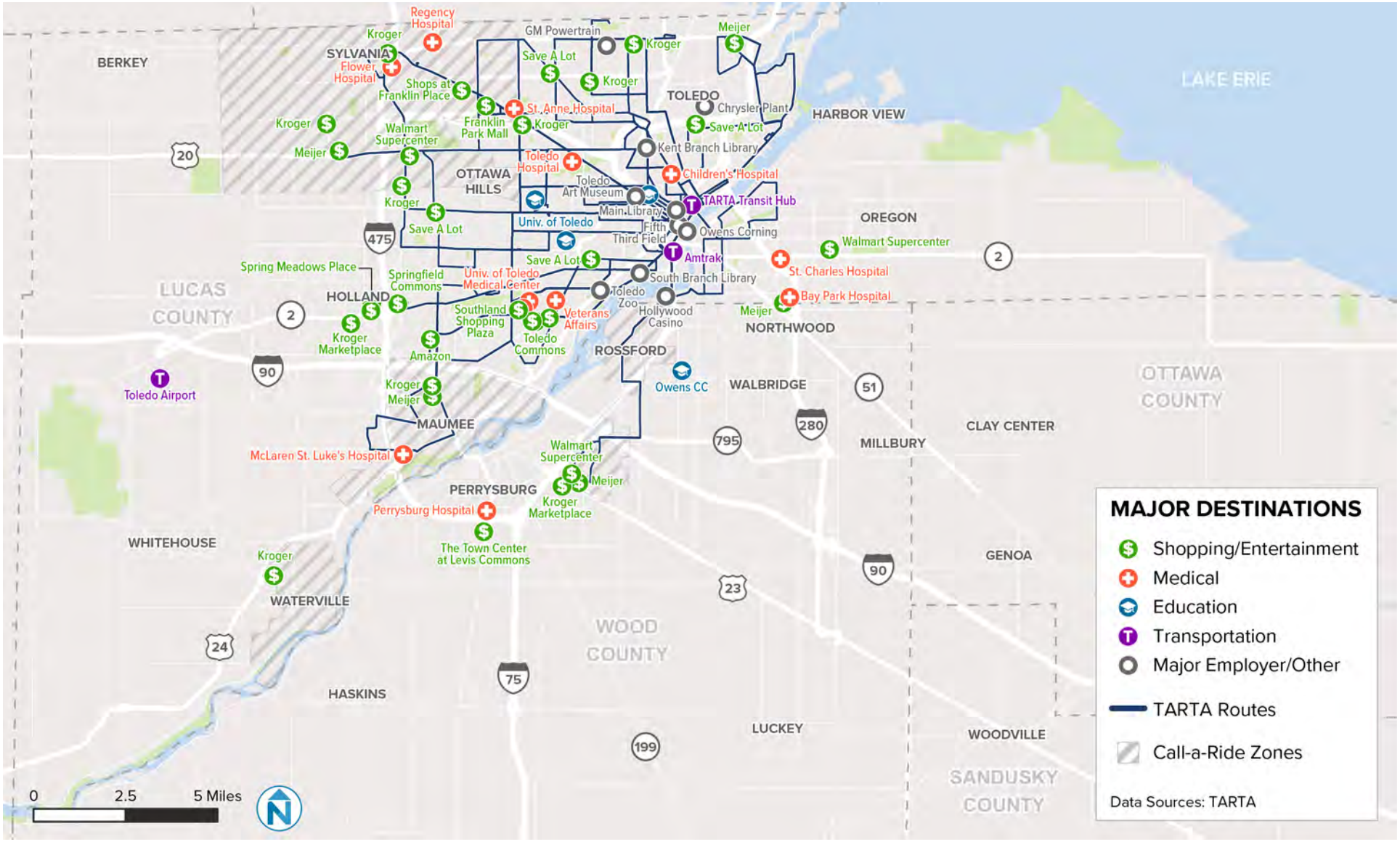


Figure 57: Major Destinations (2021)



Travel Flows

Travel Flows

Travel flows show the places that people travel between, within, and outside of Lucas County and the northern part of Wood County. For this analysis, the project team divided the region into travel zones based on existing towns, cities, and neighborhoods. The following maps show the average daily trips made on all transportation modes within (shown as circles) or between the zones (shown as lines), with 2020 as the base year and 2035 as the future year. Visualizing these travel flows can provide an understanding of where markets may exist for transit.

Based on data from the Toledo Metropolitan Area Council of Governments (TMACOG), the total number of daily trips for Lucas County and the northern portion of Wood County is projected to stay mostly stable between 2020 and 2035 (decreasing slightly by 2.6%).

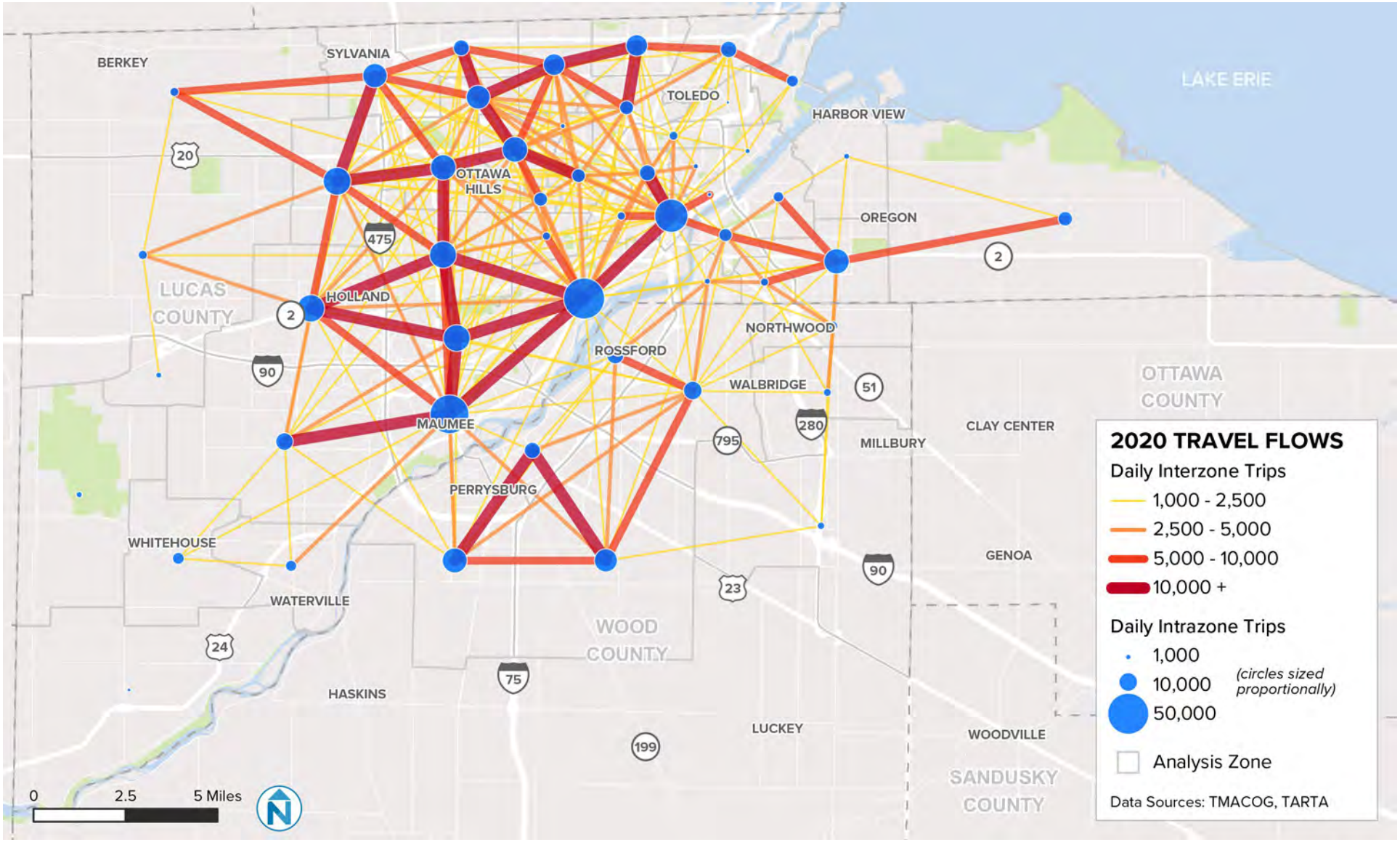
However, the change in travel flows is not consistent throughout the region. Some of the strongest travel flows, both in 2020 as well as in 2035, are estimated to be north-south between the Maumee area zone and Franklin Park zone, generally along Reynolds Road (or east of I-475). Other strong north-south travel flows are between the Maumee zone and downtown Toledo via the Southside and Southwyck neighborhoods of south Toledo.

The strongest east-west travel patterns are from the south side of Toledo to Holland as well as from the Franklin Park and Ottawa Hills zones to Sylvania and Sylvania Township. Travel flows between Lucas County communities and Wood County are not as strong, except for weaker connections between east Toledo and northern Rossford.

It is important to note that while downtown Toledo is an important destination in the region, it is not the major destination. Intra-zone travel, however, is expected to grow somewhat in downtown Toledo, as well as in the Franklin Park area, the southside of Toledo, and Maumee.

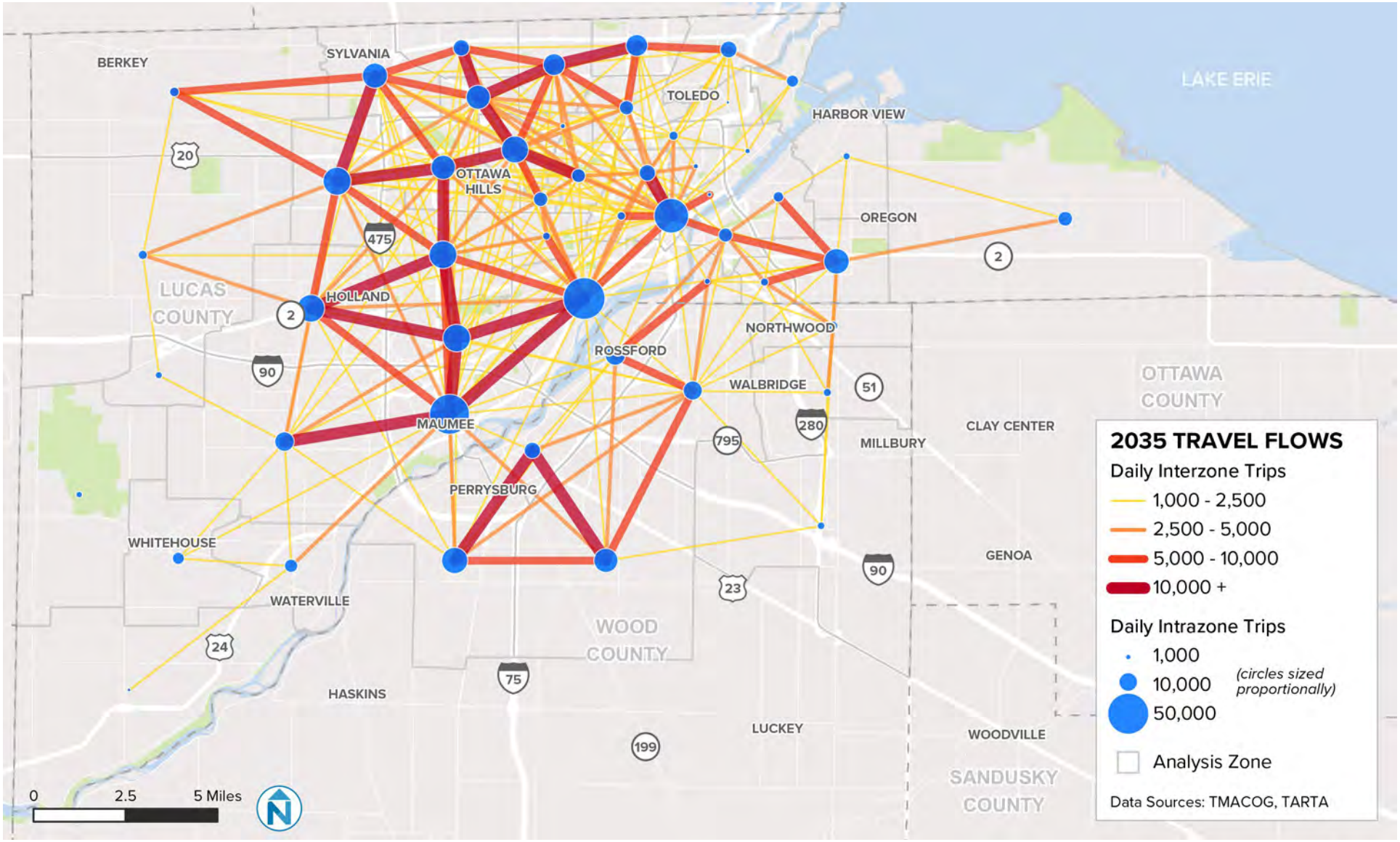
Figure 58: Regional Trips in 2020 and 2035

Figure 59: Travel Flows (2020)



Source: TMACOG (www.tmacog.org)

Figure 60: Travel Flows (2035)



Source: TMACOG (www.tmacog.org)

Travel Flows

To supplement the modeled travel flows provided by TMACOG, twelve specific locations in the Toledo area were evaluated using recent (2021) travel data. The analysis indicates where all trip types originate for the selected areas. The locations that were evaluated, and key findings for each location, is provided below. Samples of two travel flow maps are provided in the figures to the right. All evaluated areas are included in the Appendix.

- **Amazon (Rossford).** Trips to and from this zone are regional in nature, drawing from northern Wood County, East Toledo, Maumee, downtown Toledo and the Franklin Park area.
- **Chrysler/Fiat Plant (Toledo).** Trips to this zone are very localized, mostly originating north/northeast of the plant as well as from the Lagrange neighborhood in Toledo.
- **Downtown Toledo.** Trips to downtown Toledo draw from all Toledo neighborhoods and is very much a regional destination.
- **Flower Hospital (Sylvania).** Trips to this zone are mostly from Sylvania and northwest Toledo. Some trips also originate in Holland and downtown Toledo.
- **Franklin Park Mall (Toledo).** This zone has trips from all over the region, but especially the areas surrounding the mall in Toledo and Sylvania.
- **Hollywood Casino (Toledo).** This zone mostly attracts local trips originating in East Toledo as well as downtown and the northern part of Wood County.
- **Miracle Mile Shopping Center (Toledo).** This zone attracts fewer regional trips but has a relatively large draw from northern Toledo and eastern Sylvania.
- **Navarre Avenue Commercial District (Oregon).** This zone attracts many local trips in Oregon and East Toledo, but also regional trips in Toledo and Wood County.
- **Southwyck (Toledo) and North Maumee.** Trips to this zone are largely from southwest Toledo, Maumee, Holland and Sylvania, as well as Perrysburg in Wood County.
- **Spring Meadows Commercial Area (Holland).** This zone attracts trips from most of southwest Toledo, Holland, Maumee and Sylvania.
- **The University of Toledo (Toledo).** Trips to this zone are more localized in western Toledo, Ottawa Hills and Sylvania.
- **The University of Toledo Medical Center (Toledo).** This zone is more regional in nature, with trips originating in central and southwest Toledo, as well as Holland, and Maumee.

Figure 61: Travel Flows to Franklin Park Mall Area (2021)

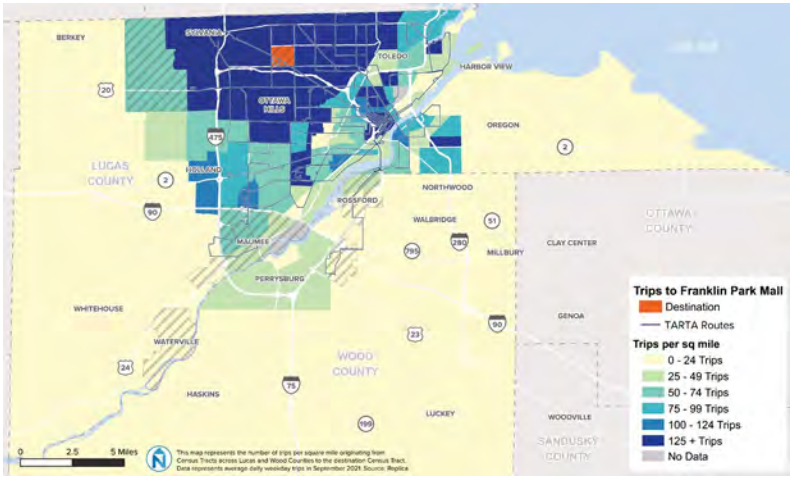
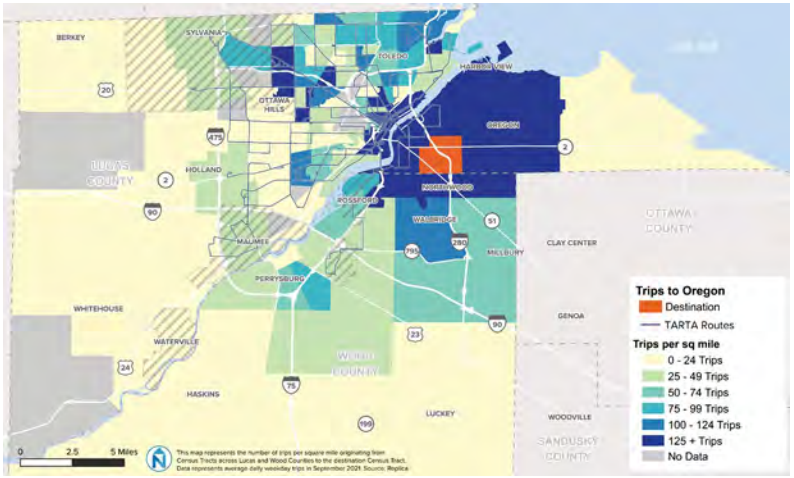


Figure 62: Travel Flows to Oregon Area (2021)



Transit Opportunities

Transit Opportunities

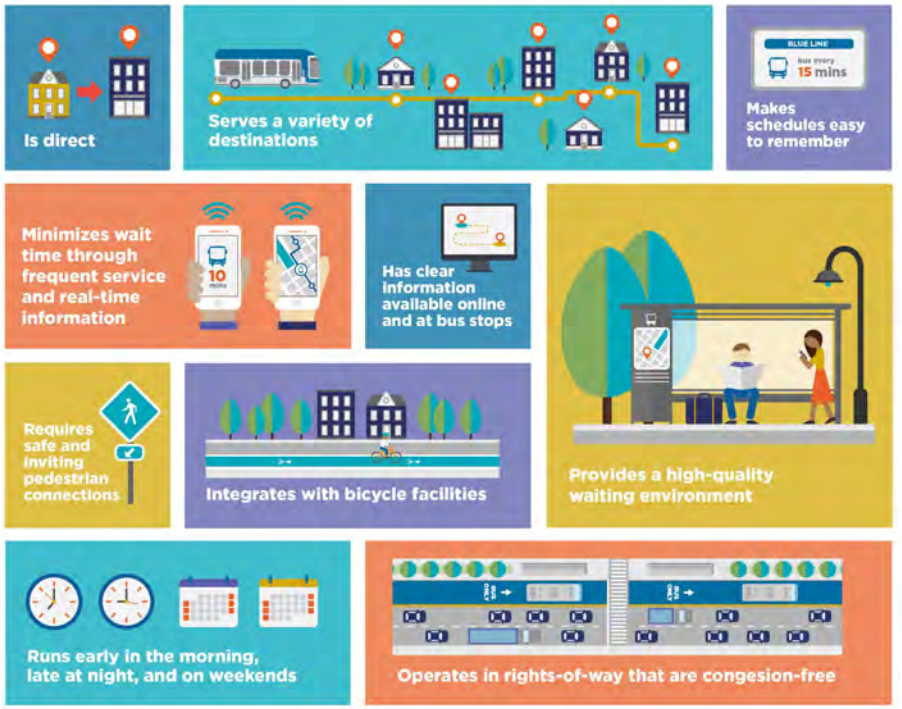
ALIGNING TRANSIT SERVICE WITH DEMAND

Transit services work best when they connect areas with the highest concentrations of people and jobs, especially residents and employees who are more likely to use transit service. This is especially important for fixed route services that can efficiently move large numbers of people.

This evaluation of opportunities for improving TARTA concludes by overlaying TARTA's existing ridership with the transit propensity map (Figure 64). In general, transit ridership is strongest in areas with the highest composite demand, especially downtown Toledo, near the Franklin Park Mall, and around the University of Toledo. The southwest part of Toledo and northern Maumee has a lot of jobs, high-density housing complexes, but relatively poor transit access. East Toledo also has strong transit ridership and high demand but relatively low levels of existing service.

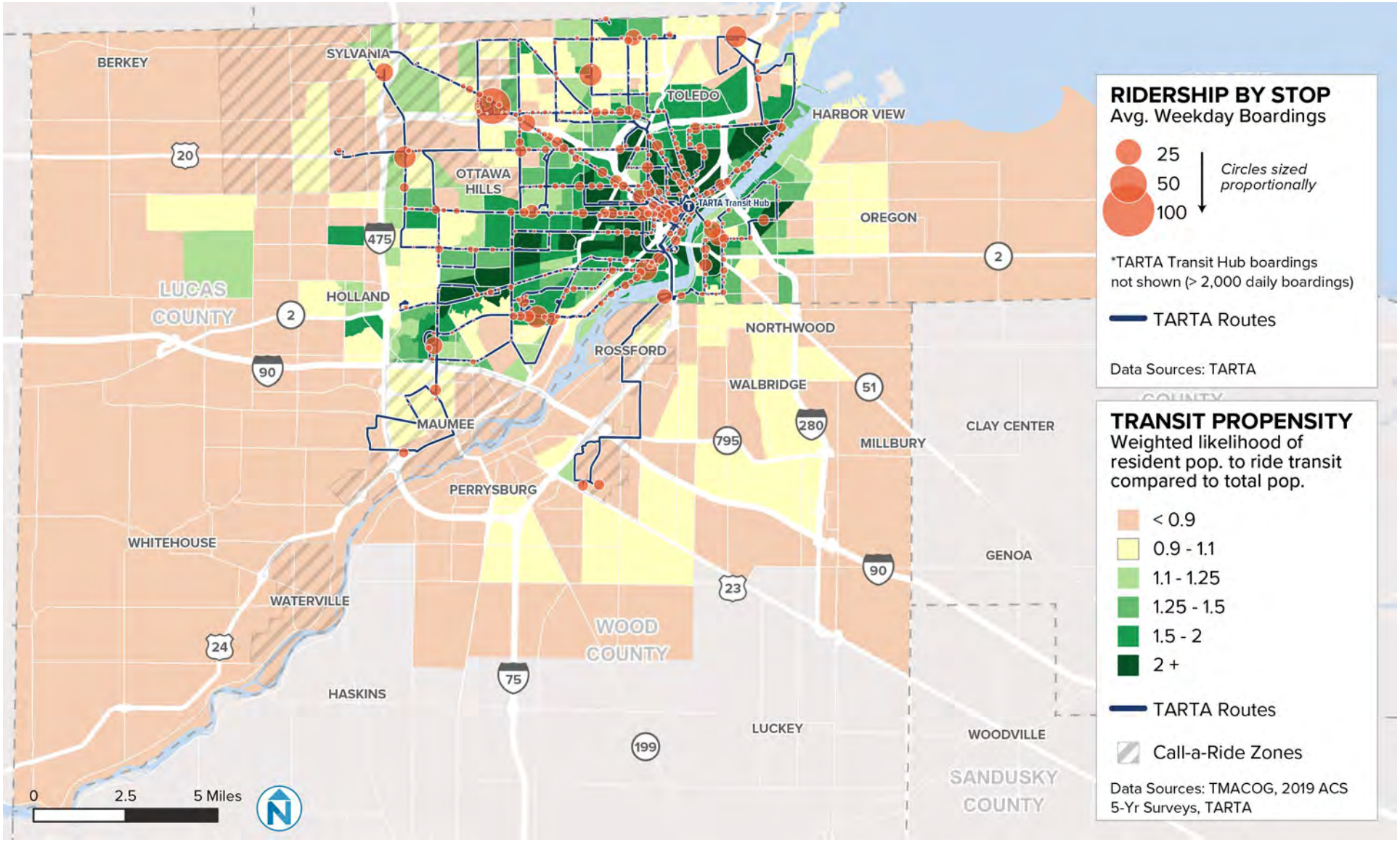
Transit ridership, however, is relatively low on TARTA. The lack of riders reflects a variety of factors that will be evaluated throughout this process and a focus for potential service improvements. Focusing on improvements from the customer's standpoint, there are several characteristics of high-quality transit service (also summarized in Figure 63):

Figure 63: Characteristics of High-Quality Transit Service



- Schedules should operate with **simple, repeating patterns** (e.g., every hour or half hour)
- Routes should be **direct** and **easy to understand**
- Routes should **serve a variety of destinations**, both along the route as well as at the end of the route
- Amenities should be **comfortable** and **safe** for customers
- **Information should be clear** and identifiable
- Access to transit should be **safe for pedestrians and cyclists**
- Service should be **easy to pay for** and **affordable**

Figure 64: Weekday Systemwide Ridership and Transit Propensity Index



Adapting Transit Services to Current Challenges

LAND USE, SLOW GROWTH AND ERODING COST EFFECTIVENESS

TARTA faces a handful of systematic challenges that will shape TARTA Next:

1. **Transit is important to the Toledo region –** voters demonstrated their support for transit at the ballot in November 2021. The data – evidenced through the market analysis – underscores the need for public transportation services in the Toledo region. The market analysis shows neighborhoods with high concentrations of low income, zero vehicle households and historically disadvantaged populations that would be isolated from key services, such as employment, shopping, including grocery stores, medical services, and education.

2. **Slowing ridership is undermining service efficiency** – TARTA's existing transit network has been losing transit riders for several years, including before the COVID pandemic. There are many reasons why transit ridership has been softening, including that transit services have not kept pace with changing land use and development patterns. TARTA Next will need to balance the need to orient services around new markets while maintaining existing system strengths. Moving towards this rebalancing will need to recognize that changing the network is challenging, but without change, the transit network will continue to lose riders and erode service efficiency (i.e., increasing the cost of each individual rider carried).

3. **Low productivity services and service segments** – a handful of TARTA's existing bus routes and segments of TARTA's services don't carry a lot of riders and are not productive in terms of cost per rider or riders carried per hour. The challenge facing TARTA Next is to both update TARTA's network of services and in some cases, re-energize existing transit routes to be more attractive to riders. Adapting TARTA's network and individual routes means change, which can be challenging, especially when routes with low ridership have community support. The challenge facing TARTA Next is to recommend changes that are based in data and industry best practices, but also reflects community input.

4. **Toledo is experiencing sprawl without growth -** population and economic growth is stable but the urbanized area is not adding large numbers of people. At the same time, new growth is locating at the fringe of the urbanized area using low-density development models. Low density development is challenging for productive fixed-route transit services, even when new development provides access to essential jobs and services, including grocery stores. This is a fundamental challenge facing TARTA, but there are opportunities. For example, TARTA could expand its role in influencing land use and development patterns and/or explore new service models that better address low density land uses.

5. **Implementation of new service models** – on-demand transit services, like microtransit, offer potential to serve high need low density areas that are difficult to serve with fixed route transit services. While national experience shows that these services can be effective, experience also demonstrates they need to be implemented carefully. Microtransit services will almost certainly be a part of TARTA's network redesign, but TARTA will need to consider how best to use these new service models, in part through lessons learned with its existing tools, like Call-A-Ride. The goal with on-demand transit service is to create a service that is easy to understand and use and functions as a productive, effective extension of TARTA's network.

Service Improvement Considerations

This section compiles the findings from this report – as well as field observations and input from community engagement activities – to present a series of service improvement considerations for TARTA. These improvement considerations are not presented in order of importance or priority, but all are elements of making TARTA a more complete transit system that considers the customer first.

BUILD ON STRENGTHS OF THE SYSTEM

While the goal of this study is to consider all options for improving the system to meet the changing needs and travel patterns of customers today, several of TARTA's existing routes (e.g., Routes 2, 5 and 19) are well-designed and well utilized. All three of these routes are direct, serve a primary corridor (e.g., Monroe Avenue, Dorr Avenue, Lagrange/Sylvania), have strong destinations on both ends, and operate on regular headways that have appropriate service frequencies. While some minor changes to routing, stop locations, connections, or interlines with other routes may be recommended, existing customers respond well to these routes and therefore they should form the foundation of the system moving forward.

SUNDAY AND EVENING SERVICE

More than any other improvement, existing customers (as well as potential customers) have noted the importance of reinstating Sunday service. As such, TARTA is already planning to implement this service as part of the first round of service improvements in 2022. Like Sunday service, later service hours was noted as a high priority by existing customers who rely on the service.

ENHANCED CROSSTOWN SERVICE

The Hub and transfers between routes will likely remain an important part of the system in the future. And while downtown Toledo remains an important regional destination, travel patterns and activities have changed in the region and most of the shopping and services are now spread throughout the region rather than concentrated in downtown. For this reason, more crosstown opportunities will be explored as part of the future service plan.

DIRECTNESS AND SIMPLICITY

Many routes in the existing system have one-way loops, route variations, or a long and short line (e.g., Routes 5 and 5C). While it is sometimes difficult to avoid these design features (especially in low-density areas), fixed route services that are direct and bidirectional service is easier to understand for both existing and new customers.

Service Improvement Considerations

TERMINATE ROUTES AT STRONG ANCHORS

Routes with strong destinations are more attractive to customers and usually generates higher ridership. While many of TARTA's routes already have strong anchors (such as Franklin Park Mall or large grocery stores), several routes terminate at locations that may be convenient to turn the bus around (or provide operator relief) but are not strong destinations.

ENHANCE SAFETY OF TRANSFERS AT THE HUB

The Hub will likely remain TARTA's most prominent and visible facility for many years and is where most riders both wait and transfer between connecting routes. While TARTA works hard to promote safe connections, and customers are encouraged to use the crosswalk at Cherry and Huron, it is natural for transferring customers to take the most direct path and cross Huron Street mid-block. Because this is a low-volume street, TARTA and the City of Toledo should consider restricting access on this section of Huron Street to transit vehicles only.

SCHEDULE CONSISTENCY

An important element of high-quality transit service is schedule consistency – both in terms of headways (time between trips) as well as consistency of service on weekdays and weekend days. Consistent service is how people plan their lives, and consistent service all days of the week is increasingly important for transit riders. TARTA should be commended for having "clockface" headways on most routes (as shown in the Route 19 weekday schedule to the right). However, several routes do not have consistent headways – and more importantly many of them vary on route variants or on weekends. Maintaining as much schedule consistency as possible will be a focus of the service planning phase.

19 Monday-Friday Outbound (from Downtown)

Continues From	TARTA Transit Hub [1]	Cherry & Central [2]	Sylvania & Jackman [3]	Franklin Park Mall [4]	Continues As
2	6:00	6:09	6:20	6:30	51
19	**6:30**	**6:39**	**6:50**	**7:00**	**19**
2	7:00	7:09	7:20	7:30	51
19	**7:30**	**7:39**	**7:50**	**8:00**	**19**
2	8:00	8:09	8:20	8:30	51
19	**8:30**	**8:39**	**8:50**	**9:00**	**19**
2	9:00	9:09	9:20	9:30	51
19	**9:30**	**9:39**	**9:50**	**10:00**	**19**
2	10:00	10:09	10:20	10:30	51
19	**10:30**	**10:39**	**10:50**	**11:00**	**19**
2	11:00	11:09	11:20	11:30	51
19	**11:30**	**11:39**	**11:50**	**12:00**	**19**
2	12:00	12:09	12:20	12:30	51
19	**12:30**	**12:39**	**12:50**	**1:00**	**19**

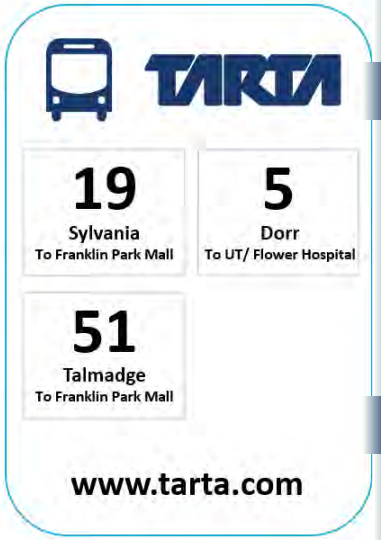
Service Improvement Considerations

BUS STOP INFORMATION AND AMENITIES

As the “front door” to transit, bus stops are perhaps the most visible element of transit besides the buses themselves. While not unique to TARTA, many bus stops throughout the Toledo region lack proper amenities and visibility. TARTA understands the importance of making bus stop improvements and is currently focusing on stop locations, stop amenities, and access issues along certain routes. TARTA Next will assist in this process by refining standards for future bus stop amenities and placement, including where benches, shelters, etc. should be located.

CUSTOMER INFORMATION

Another important feature of high-quality transit is marketing and information. Signage at bus stops should clearly identify the bus stop and convey important information that customers need, as illustrated in the graphic to the right. Because stop locations and route alignments inevitably change, signage should be simple and easy to update. While static information like bus stop signage and schedules are important, digital platforms have arguably become the most effective way to disseminate transit information to most customers. Several digital platforms are already available for TARTA services, including Moovit, Google Maps and the Transit app as well as EZfare for electronic fare payment. These platforms should continue to be supported and be seamlessly integrated with static information to ensure consistency of the brand.



PEDESTRIAN AND BICYCLE ACCESS

In some parts of the region, sidewalks and bicycle infrastructure are lacking, which makes using transit much more challenging and could result in making route alignment decisions that facilitate safe access over direct service. It is important to emphasize the importance of this issue and to advocate for better access to and from transit throughout the region.

Alternative Service Models and Partnerships

ON-DEMAND SERVICES (CALL-A-RIDE AND MICROTRANSIT)

Operating effective, efficient on-demand transportation services is an important opportunity for TARTA in the immediate term. Opportunities reflects both designing and implementing on-demand services in new areas and strengthening existing on-demand services (call-a-ride) to increase awareness and more aligned with customer needs.

As TARTA refines their service model for where and how to best implement on-demand services, these models will likely be a key strategies for TARTA as it expands its service area. These additional opportunities also include mingling on-demand, rural, human service transportation agencies and potentially ADA paratransit trips.

TARPS PARATRANSIT

TARPS' ADA complementary paratransit service is directly aligned with fixed route services. As TARTA Next moves forward with changes to the fixed route network, the TARPS service area will also change. A key challenge for TARTA Next moving forward will be to make sure service needs for people with disabilities continue to be met even as the underlying fixed route network changes. An opportunity for TARTA is to learn from and build on the successes that TARPS has achieved in effective service delivery and meeting rider needs.

PARTNERSHIPS

Partnerships are an important element to all successful transit agencies. TARTA has developed community and stakeholder partners in the Toledo region, which helped bring the region's successful ballot initiative. Broadening and continuing to strengthen these partnerships will be fundamental to TARTA Next's success.

Appendix A:
Sample Travel Flows