ohio statewide
TRANSIT NEEDS STUDY

OHIO DEPARTMENT OF TRANSPORTATION

FINAL REPORT

JANUARY 2015

OHIO DEPARTMENT OF TRANSPORTATION
CENTRAL OFFICE • 1980 WEST BROAD STREET • COLUMBUS, OH 43223
JOHN R. KASICH, GOVERNOR • JERRY WRAY, DIRECTOR

February 18, 2015

Dear Transportation Partners:

The Ohio Department of Transportation (ODOT) has just completed a year-long assessment of Ohio's statewide transit needs. We would like to thank Ohio's 61 publicly-funded transit providers and the Steering Committee members who worked side by side with us, providing data, access to their customers and counsel as we conducted this effort.

The Ohio Statewide Transit Needs Study developed recommendations designed to address the needs of Ohio's transit riders today and position the state to meet needs of future riders. The good news is that Ohio has a strong and productive transit network, with 28 urban and 33 rural systems providing more than 115 million trips a year – the 14th highest transit ridership of any state in the U.S. in 2013.

The study confirmed what our state's transit providers and their customers already know: there is a clear need to address the system preservation backlog to continue to provide the existing service. The study has identified the need to replace over 900 urban transit vehicles and 275 rural transit vehicles which are beyond their useful life. In addition, there is a need for expanded service. Ohio will need to invest more resources in both transit capital and operations to meet the expanded need.

I invite you to learn more about the Ohio Statewide Transit Needs Study findings and recommendations at www.TransitNeedsStudy.ohio.gov. We look forward to working with all of you to meet the growing demand for safe, convenient and accessible transit service in Ohio.

Respectfully,

Jerry Wray

Jerry Wray
ODOT Director

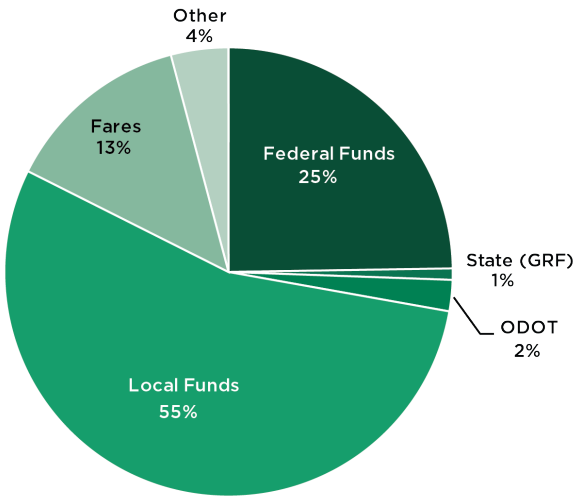
OHIO STATEWIDE TRANSIT NEEDS STUDY
SUMMARY OF FINDINGS

The Ohio Statewide Transit Needs Study was tasked with quantifying Ohio's transit needs, as well as recommending programmatic and policy initiatives to strengthen the statewide transit system.

Ohio has a strong and productive transit network, with 61 public transit agencies that carry over 115 million trips a year - the 14th highest transit ridership of any state in the U.S. in 2013.

Statewide, transit agencies in Ohio spend roughly $900 million annually providing service. Over half of the funding is raised locally though sales, business, property, and earnings taxes. A quarter of the funding comes from the federal government. The remaining 20% is raised through passenger fares, service contracts, funds provided by the State of Ohio (ODOT and the state general fund), and other miscellaneous income.

FIGURE 1 OHIO TRANSIT AGENCIES - SOURCES OF FUNDING (2012)



*Other includes advertising, contracts, and miscellaneous income.

GROWING NEEDS FOR TRANSIT INVESTMENT

The need and demand for transit is changing in response to both underlying demographic changes in Ohio's population and to cultural preferences. The evidence for these changes is clear through socio-economic and demographic data analyzed as part of this study, but also by state policy centers, such as the Greater Ohio Policy Center and the Scripps Gerontology Center at the University of Miami, and national research organizations, including the Urban Land Institute and the Brookings Institute. The Statewide Transit Needs Study also collected its own data, including surveys with transit riders, interviews with stakeholders and surveys with the members of the general public. Key findings from this collective analysis include:

Changing cultural preferences for transportation are evident from both younger (millennials) and older generations (baby boomers). A large portion of these populations express a desire to live in communities that are bikeable, walkable and have transit.

- Successful cities in the United States are investing in public transportation services and systems to respond to these preferences as part of their workforce retention and attraction strategies. In the Midwest, these cities include Minneapolis, Grand Rapids, Kansas City, and Madison.

Ohio's population is growing more slowly than many other states. In places where Ohio is adding people, the growth is largely attributable to foreign born populations. Most of these individuals are moving to urban areas.

- Foreign born populations tend to be experienced public transportation riders. Many expect and want public transportation services if they are going to make Ohio their permanent home.

Ohioans are getting older and poorer, especially in rural areas.

- Seniors and low income individuals will rely more on public transportation, putting more pressure on transit systems to meet this growing demand.

Health and human services are increasingly focused on serving people in their communities and encouraging people to stay in their homes.

- Implementing these programs requires a corresponding investment in transportation; this can be coordinated with public transportation services to reduce duplication of service and effort.

Ohioans travel across municipal and county boundaries to get to work but also for other reasons, such as shopping, school, and to access health care.

- These regional patterns include a need to travel between cities and suburbs as well as between rural areas.
- Ohio's transit agencies are largely organized around municipal and county boundaries. As a result, they are not always able to take people where they want and need to go.

URBAN TRANSIT SYSTEMS

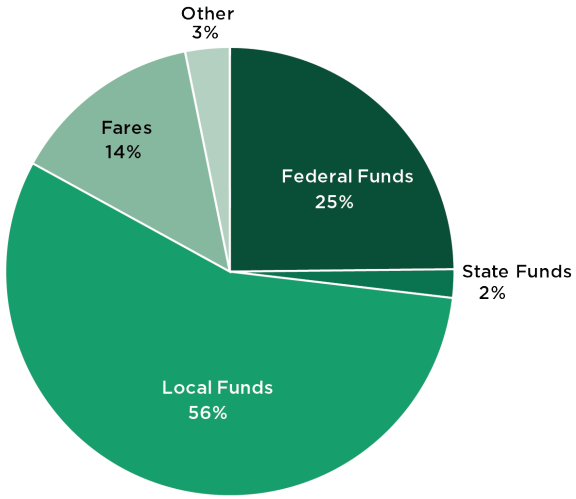
There are 27 urban transit agencies in Ohio. This network includes large transit systems operating in cities like Cleveland, Cincinnati and Columbus, as well as services in Ohio's smaller cities like Steubenville and Middletown, and suburban counties like Delaware and Medina.

The majority (96%) of Ohio's investment in transit is in its urban network. Funding for urban transit comes from a variety of sources, but local funds account for more than half of the resources. Federal funds and passenger fares also contribute significant financial resources.

There are about 2,700 vehicles (excluding rail vehicles) in the urban transit network. Nearly a third of them – or 900 - need replacing today. This backlog reflects changes in how the federal government provides funding for large investments, as well as the effects the 2008 recession had on local resources.

The analysis also shows a need for more transit service. The current system needs to provide an additional 35 million transit trips annually in 2015 to meet demand. By 2025, demand is expected to grow to 250 million annual trips. Older Ohioans will be more dependent on transit to get around, while younger, urban dwellers will choose transit over owning a car.

FIGURE 2 OHIO'S URBAN TRANSIT AGENCIES - SOURCES OF FUNDING (2012)



*Other includes advertising, contracts, and miscellaneous income.

The current (2015) investment needs for urban communities include:

- **System Preservation.** $274 million to replace vehicles already beyond their useful lives.^ After the vehicle backlog is addressed, $137 million is needed to purchase vehicles expiring in 2015 and fund others facility and infrastructure needs to maintain the existing system.
- **System Expansion.** Urban systems also require roughly $212 million to meet the unmet need. This includes operating more buses and trains for $48 million, and a corresponding investment of $165 million in vehicles and infrastructure.

FIGURE 3 URBAN TRANSIT INVESTMENT (ANNUALIZED, IN 2012$ MILLIONS)

	NEED		CURRENT/ANTICIPATED FUNDING		GAP	
	2015	2025	2015	2025	2015	2025
EXISTING SYSTEM PRESERVATION						
OPERATING	$702.5	$702.5	$702.5	$702.5	$0.0	$0.0
CAPITAL - NON-RAIL	$411.0	$98.3	$67.8*	$67.8*	$343.2	$30.5
CAPITAL - RAIL	$0.0	$240.0	$0.0	$0.0	$0.0	$240.0
SYSTEM EXPANSION						
OPERATING	$47.5	$468.8	$0	$0	$47.5	$468.8
CAPITAL	$164.6	$164.6	$0	$0	$164.6	$164.6
TOTAL	**$1,325.5**	**$1,674.2**	**$770.3**	**$770.3**	**$555.3**	**$903.9**

Note: Numbers may not add due to rounding.
Costs are shown as annualized investments to illustrate need. Investment needs are cumulative. In addition, capital project spending typically is not evenly spaced over a ten year period.
* Anticipated capital funding based on allocations rather than historical revenues to provide a known, conservative estimate of funding. Urban capital revenues have been inconsistent historically and can fluctuate widely.
^Total replacement need before consideration of anticipated funding in 2015.

RURAL TRANSIT SYSTEMS

Ohio's 34 rural transit agencies spend about $38 million a year to provide service. Although this is a small portion (about 4%) of the overall transit investment, rural services operate in 35 counties and provide more than two million trips a year.

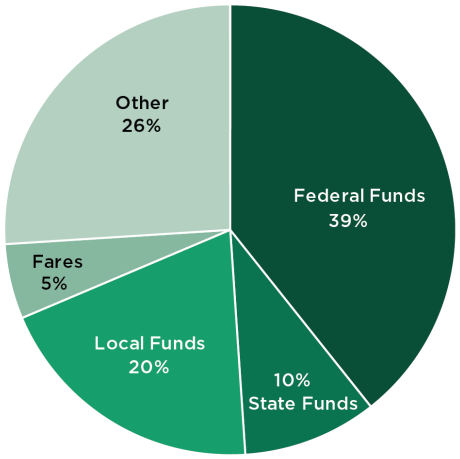
About half of existing funding for rural agencies comes from the federal government. Many rural areas also raise funds by contracting with human service agencies and other partners. Local funds, passenger fares and state funds are also important resources for the rural agencies.

There are about 550 vehicles in Ohio's rural fleet. An estimated 150 buses and vans are past their useful life and need to be replaced in the immediate term.

Rural areas also need more service. The analysis found a need for an additional one million transit trips today. By 2025, as Ohio's rural population continues to grow older and rely more on public transit, the need for service will grow to more than four million trips each year.

This estimate does not include the 27 Ohio counties that do not have any public transit service today. These communities need roughly two million trips today and are expected to need three million trips per year by 2025.

FIGURE 4 OHIO'S RURAL TRANSIT AGENCIES - SOURCES OF FUNDING (2012)



*Other includes advertising, contracts, and miscellaneous income.

The current (2015) investment needs for rural communities include:

- **System Preservation.** $22 million to replace vehicles already beyond their useful lives, and $11 million to purchase vehicles expiring in 2015 and fund other infrastructure needs.
- **System Expansion.** $18 million to operate and $11 million to purchase vehicles for additional service in areas that already have some transit.
- **New Systems.** $48 million for transit service in the 27 counties that currently have none.

FIGURE 5 RURAL TRANSIT INVESTMENT (ANNUALIZED, IN 2012$ MILLIONS)

	NEED		CURRENT/ANTICIPATED FUNDING		GAP	
	2015	2025	2015	2025	2015	2025
EXISTING SYSTEM PRESERVATION						
OPERATING	$31.5	$31.5	$31.5	$31.5	$0	$0
CAPITAL	$33.5	$21.4	$5.9*	$5.9*	$27.6	$15.5
SYSTEM EXPANSION						
OPERATING	$18.2	$37.6	$0	$0	$18.2	$37.6
CAPITAL	$10.8	$10.8	$0	$0	$10.8	$10.8
DEVELOP NEW SYSTEMS IN COUNTIES WITH NO SERVICE						
OPERATING	$30.9	$55.7	$0	$0	$30.9	$55.7
CAPITAL	$17.0	$17.0	$0	$0	$17.0	$17.0
TOTAL	**$142.0**	**$174.0**	**$37.4**	**$37.4**	**$95.3**	**$127.4**

Note: Numbers may not add due to rounding.
Costs are shown as annualized investments to illustrate need. Investment needs are cumulative. In addition, capital project spending typically is not evenly spaced over a ten year period.
* Anticipated capital funding based on historical revenues rather than allocations. Rural capital revenues have remained consistent in the recent past, and historical revenues provide a more conservative estimate of funding.

RECOMMENDATIONS

The Ohio Statewide Transit Needs Study identified a series of recommendations that will make the transit network more attractive to riders and easier to use. These include:

- **Create a performance management system** that will communicate accomplishments and benefits achieved by the individual transit systems. This data will let taxpayers know their investments are productive and worthwhile.
- **Better match service with demand** by creating more regional transit services. We know people want to travel across city and county lines and Ohio needs more of these types of transit services. As part of developing more regional services, some transit agencies will work together more closely, while others may consolidate operations.
- **Encourage transit agencies and human service programs to work together** to leverage funding and provide more service. Coordination is especially important in rural areas.
- **Engage as many partners as possible.** Encourage transit agencies to work with large employers or local universities to share costs. In some cases, transit riders may need to pay more towards the cost of their rides.
- **Invest in transit technologies** that can make running the service easier and more efficient, such as automatic vehicle location (AVL), global positioning system (GPS), automatic passenger counters (APCs) and scheduling software.
- **Improve the ways people learn about transit service** by helping transit agencies update their public information systems. This involves developing new passenger technologies, like smart phone applications, trip planners and websites, as well as ensuring system maps and schedules are also available.

BENEFITS

Investing in transit will help all Ohioans, including those who use the service and those who do not. Increased investment will:

- **Strengthen Ohio's competitive advantage.** Ohio has a tradition of strong cities with good jobs, excellent educational facilities and world class health care. These attributes make Ohio a great place to live. We also know younger generations are mobile and will move to communities where they can easily walk, bike and take transit. Other states are making investments to retain and attract talent; Ohio must do the same to remain competitive.
- **Ensure all Ohio residents have access to some public transportation**. Expanding service to areas that currently do not have public transportation would reach an estimated one million individuals.
- **Provide access to jobs, job training, health care and basic personal services.** Expanding mobility is important statewide, but especially for people living in Ohio's small towns and rural communities, and for employers needing a workforce that can get to their jobs. Transportation needs in these areas are expected to increase as their populations grow older and poorer. Investing in services now will ensure the state has infrastructure in place to support individuals, Ohio businesses and health and human service programs.
- **Increase the cost effectiveness of the existing system.** There are too many transit vehicles in Ohio that are beyond their "useful life". If these vehicles are not replaced, transit systems will become less efficient as they spend more money repairing and maintaining vehicles.

SHORT TERM APPROACH (2015-2017)

IMPROVE SYSTEM EFFICIENCY AND EFFECTIVENESS

Request an additional $2.5 million of general revenue funds for incentive grants. Funding will be used to:

- Advance a performance measurement system. Provide an annual report to the legislature on individual transit agency performance.
- Incentivize coordination between human service and public transportation. Grants may also support extending or providing service in counties where there is none today.
- Develop regional services. Provide start-up funding for collaboration and potentially centralizing administrative functions.
- Invest in technology. One-time grants to purchase technology systems and associated training that will increase service efficiency.
- Improve passenger information systems. Provide grants for agencies to improve websites, system maps and schedules. Develop templates to support transit systems throughout the state.

PRESERVE EXISTING SYSTEM (REPLACE VEHICLES)

Use flexible FHWA funds for transit capital investment; combine with toll development credits[1] to reduce local need.

- Expand opportunities to flex Federal Highway Administration (FHWA) funds to transit. Ohio already flexes some funding, as do local metropolitan planning organizations, but there is room to do more.
- Flex $50 million FHWA funds annually to help replace vehicles and use toll development credits for the 10% local match. Total investment = $62.5 million.

WORK TO ADDRESS UNMET NEEDS

Address funding issue at State policy level.

- Establish a cabinet-level Human Service Transportation Coordinating Committee to examine statewide policies to encourage coordinated transportation services. Largely aimed at rural counties and systems, this committee would include, at minimum, Job and Family Services, Medicaid, Aging, and ODOT.
- Establish a Blue Ribbon Funding Committee to identify and forward a statewide dedicated public transportation funding source. This would benefit urbanized areas and also address significant rural transit needs.

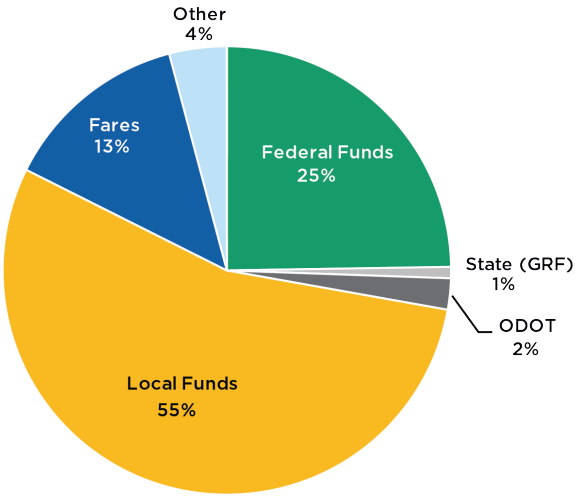
[1] Federal law allows toll development credits, or excess toll revenues, to be used by states to meet the non-Federal share of a project's cost when other state highway funds are unavailable.

LONG TERM STRATEGIES (2018-2025)

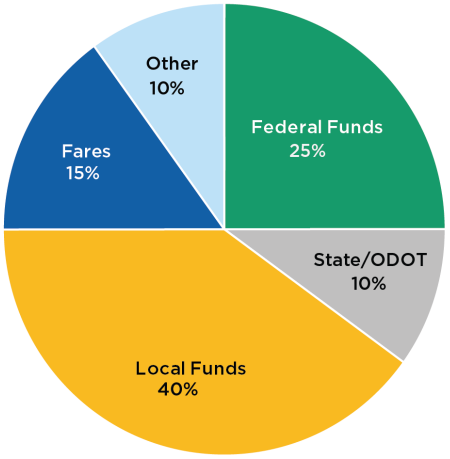
Ohio's transit investment needs are great, but the benefits are clear. Transit investment is an integral part of Ohio's future as a vibrant, dynamic community that is attractive and affordable to all generations of Ohioans.

There is no simple solution to funding transit at the needed investment level. Today, communities invest nearly $900 million with half of all funds provided locally. We know more resources are needed. All stakeholders should be working towards doubling the amount of money invested to reach $1.8 billion annually. Accomplishing this will require partnerships between the federal government, the State of Ohio, and local communities, along with local institutions and employers. A complete partnership also involves riders, who will be expected to pay their fair share of the service, reflecting its value to them.

2012 TRANSIT INVESTMENT = $893 M



2025 TRANSIT INVESTMENT GOAL = $1,842 M



*Other includes advertising, contracts, and miscellaneous income.

LONG TERM STRATEGIES (2018-2025) (CONTINUED)

In addition to working towards a funding strategy, the Ohio Statewide Transit Needs Study also recommends continuation of the policies and programs started in the Short Term Approach.

The following programs are needed to strengthen transit services, outside of financial investments:

ONGOING MONITORING AND REPORTING ON TRANSIT AGENCY PERFORMANCE AND EFFICIENCY.

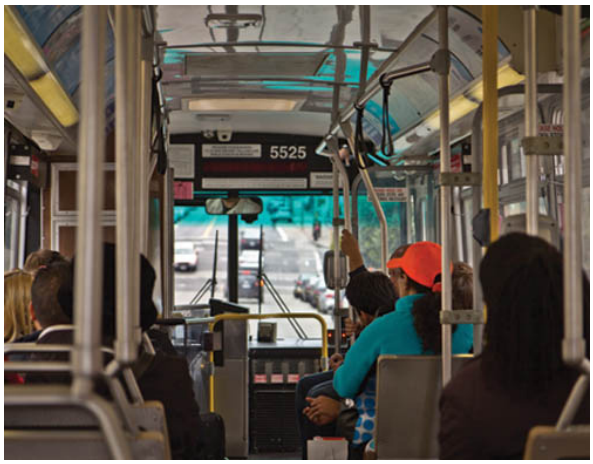
- Our goal is to strengthen taxpayer, policymaker and investor trust in the effectiveness and efficiency of our transit operators.
- Performance management will require support from all partners in terms of training and education for operators struggling to stay within range of their peers.

INCREASED COORDINATION OF PUBLIC TRANSPORTATION, HUMAN SERVICE TRANSPORTATION PROGRAMS AND AGENCIES, SO THAT INVESTMENTS WORK TOWARD A COORDINATED, STREAMLINED SYSTEM.

- Our goal is for public transit agencies and human service agencies to work together to provide and fund transportation efficiently.

MORE REGIONAL SERVICES TO BETTER ALIGN TRANSIT SERVICE DELIVERY WITH TRANSIT NEEDS, SO EVEN AS OHIO EXPANDS TRANSIT INTO NEW AREAS, THERE ARE FEWER TRANSIT AGENCIES STATEWIDE.

- Our goal is to allow people to travel to neighboring counties and regional centers.
- This will likely be achieved through a combination of increased collaboration between operators and increased shared resources among transit agencies.



INVESTMENT IN PUBLIC INFORMATION SYSTEMS AND TRANSIT TECHNOLOGIES, SO THAT OHIO'S TRANSIT SERVICES ARE EASY TO USE AND UNDERSTAND.

- Our goal is to make transit services easy to use for as many people as possible.
- This will require developing simple information systems, including technology as well as printed materials.

APPROPRIATE CAPITAL INVESTMENT IN TRANSIT VEHICLES AND TECHNOLOGIES.

- Our goal is to make Ohio's fleet safe, well maintained and modern, and support transit agencies with effective technology.
- This will be accomplished through shared investment and training.

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TABLE OF FIGURES

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1 INTRODUCTION

In 2013, the Ohio Department of Transportation (ODOT) Office of Transit retained a team of consultants led by Nelson\Nygaard Consulting Associates to conduct a statewide assessment of Ohio's public transportation needs. The study included analysis and consideration of statewide needs, spanning Ohio's urban and rural areas, including those counties in Ohio with no public transportation services.

The goal of the study was to document how well Ohio's current network of public transportation services match current needs, and what types of systems, services and investments would be needed to meet future need. The study was intended as a long term strategy to guide transit service development, including transit policy and funding, over the ten year period between 2015 and 2025.

The Ohio Statewide Transit Needs study began in October 2013 and all technical work was completed by November 2014. Reporting and final documentation continued until the end of the year, with the draft report produced in December 2014.

Study Approach

The Ohio Statewide Transit Needs Study reflects a large effort with extensive involvement provided by ODOT Transit staff and a Project Steering Committee comprised of transit agency leadership, representatives from other Ohio agencies and departments, as well as critical stakeholders. The project also involved significant data collection and analysis that was developed using a combination of qualitative input collected through interviews, meetings, site visits, and surveys and quantitative analysis. This data helps to understand and evaluate existing conditions, transit service performance, service needs, and transit funding. The data, analysis, and findings were collected through a series of eight study tasks, which were conducted over the 14 month period (see Figure 1 for the project calendar):

1. **Existing Conditions Analysis** – The existing conditions analysis focused on collecting information and building datasets that describe and quantify how transit services are developed, managed, delivered, and funded in the State of Ohio. The study team built datasets using a combination of existing plans, published statistics about transit agency performance and productivity, as well as input collected from transit agency leadership, members of the public, and other transit system stakeholders. The existing conditions analysis also included information on capital facilities and resources.
2. **Trend Analysis** – The Ohio Statewide Transit Needs Study included an analysis of how different trends are impacting the role that public transportation plays nationally and how these impacts are being felt in Ohio. The trend analysis considered national and statewide age and demographic characteristics and the impact these changes are having on people's preferences for housing and transportation services. The study team

considered how national trends are playing out in Ohio and specifically affecting the need for transit service. Another critical part of the trends analysis involved examining transit funding from a federal, state and local perspective. The goal of this part of the trends analysis was to understand the impact of these trends on transit funding nationally and locally.

3. **Needs Assessment** – One of the primary tasks assigned to the project team was to conduct a qualitative and quantitative inventory of transit needs. The qualitative needs reflect opportunities and challenges identified through existing conditions analysis and input from stakeholders and transit riders. They are designed to strengthen public transportation service in Ohio by taking advantages of best practices and policy changes. The quantitative needs assessment also reflects existing conditions and outreach tasks. This analysis estimated the need for transit service quantitatively and specifically identifies needs in terms of the gap between what is available and what is desired, or needed. The results are documented in terms of transit trips, service hours, and capital investments and include estimates for current (2015) and future years (2025).

4. **Financial Analysis** - The financial analysis focused on estimating the amount, timing, and type of funding available in Ohio. There is a gap between the existing funding, estimated needs and potential opportunities for diversifying funding and raising additional revenues to meet those needs. This analysis included estimating what funding is available, from which sources, and how it is distributed. It also compared and contrasted expected future funding needs with distribution formulas, success at the local level in raising revenue and partnership potential to gauge the amount of resources the statewide network needs.

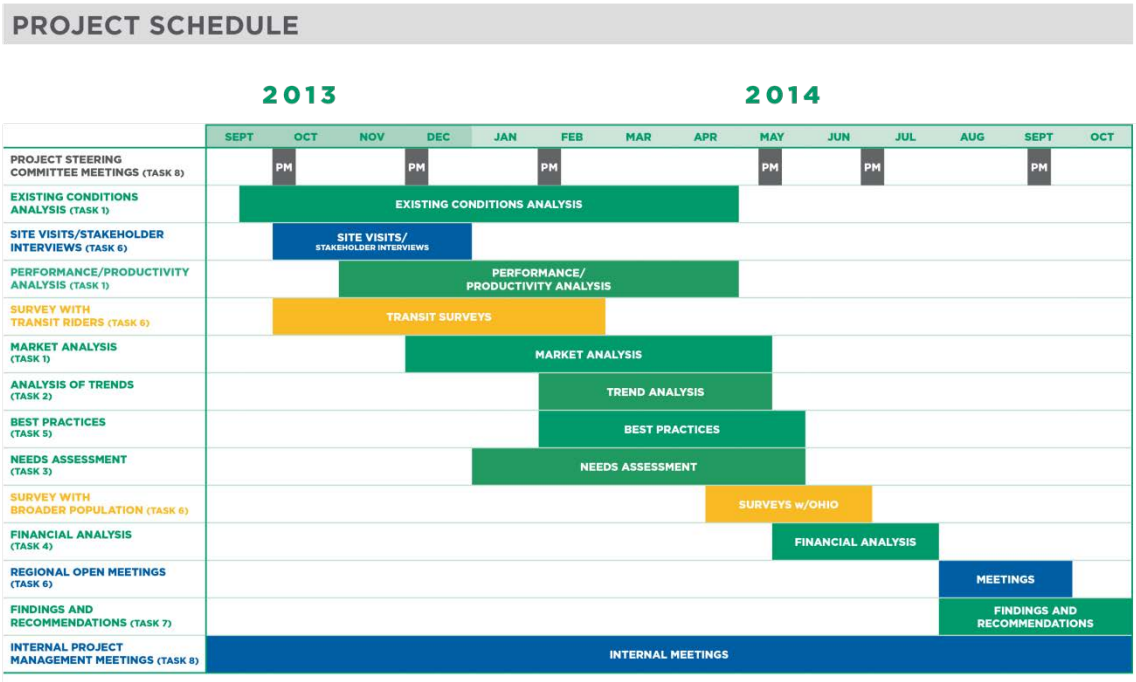
5. **Best Practices** – As part of the needs assessment, the study team collected and reviewed examples of how other states, regions and transit agencies have achieved success with their transit services. The team looked at both the way they are structured and organized as well as how they raise and distribute revenues. The best practices review was designed to help ODOT and stakeholders understand how processes have been executed in other states and regions, which strategies and approaches have helped sustain momentum and innovation, and areas or key issues where states have faced challenges.

6. **Consultation** - The Statewide Transit Needs Assessment study was developed with a significant amount of public outreach (see Appendices E, I, J, and K). The consultation effort included site visits with each of Ohio's transit agencies, interviews with stakeholders, a survey conducted with transit riders (included fixed route and demand response riders), an online survey with members of the public and a series of regional stakeholder meetings held towards the end of the project. Consultation activities included online activities, including a project specific website and a series of email blasts. These directed interested parties to project activities and advised when new material was available on the website.

7. **Deliverables** – Throughout the project, the Nelson\Nygaard team prepared a series of written and Power Point materials used to document and summarize technical information produced as part of the project. All technical reports were published on the project website and are also available as part of the final report documentation. All technical memos and summary information are available in Appendices C through M.

8. **Project Advisory and Core Team Meetings** – One of the more important and productive elements of the Statewide Transit Needs Study involved collaboration between the Project Steering Committee, ODOT staff and the consultant team. ODOT staff and the consultant team met nearly weekly via a conference call and the Project Steering Committee met eight times over the 14 month study period. In addition, the consultant team worked together as a "core team"; most of these meetings were also held with ODOT staff. The study team used the core team meetings to discuss information collected in the field and through subtasks, generate ideas, review draft study products, deliberate draft findings, and prepare for Steering Committee meetings.

Figure 1: Project Calendar



Report Organization

This report summarizes the research, analysis, findings and recommendations generated as part of the Ohio Statewide Transit Needs Study. The report is organized into four chapters, not including this introductory chapter:

- **Chapter 2: Existing Conditions in Ohio** – summarizes the background information collected and analyzed as part of this study, including an overview of existing transit services; the underlying market for transit service in Ohio; input collected from stakeholders, riders and members of the public; transit funding; and trends affecting transit demand.
- **Chapter 3: Defining Transit Needs in Ohio** - presents the quantitative transit needs analysis, including both the estimated need for transit service (trips and service hours) and the corresponding capital investment. This chapter includes the findings and describes the methodology used to estimate these needs.

- **Chapter 4: Strategies and Opportunities to Improve Transit in Ohio**– describes a series of strategies and policies that address transit needs that are not specifically related to service and capital investments. The strategies and policies reflect input collected from all sources including stakeholders and public input, as well as data analysis.
- **Chapter 5: Recommendations**– presents the recommendations developed as part of the study, included together with a series of short term action steps. The recommendations are broken down into short term strategies designed to guide transit policy development in Ohio between 2015 and 2017 and longer term strategies that will help strengthen Ohio's transit systems over the longer term (2017-2025).

Additional information is also included in three major appendices. Appendix A|B, which is attached to this report includes the documentation deemed essential to understanding the information included in the final report. Appendix C|D|E, which is published under a separate cover, is a compendium of meeting materials and major technical memorandums produced as part of this report. Appendices F through M compile all additional deliverables developed as part of this study.

Appendix A | B:

- Definitions
- Assumptions

Appendix C | D | E:

- Initiatives
- Steering Committee Meetings
- Regional Meetings

Appendix F | G | H | I | J | K| L | M:

- F1: Statewide Market Analysis
- F2: Market Analysis by County
- G1: Fixed Route Performance Analysis
- G2: Demand Response Performance Analysis
- H: Rolling Stock Assessment
- I: Rider Survey
- J: Design Your Own System Survey
- K: Stakeholder Report
- L: Funding Report
- M: Demographic Trends Analysis

2 EXISTING CONDITIONS IN OHIO

The Ohio Statewide Transit Needs Assessment began in the fall of 2013 with an initial goal of understanding transit in Ohio from a statewide perspective. With transit operations being inherently local, however, the study included a comprehensive effort to:

- Survey transit riders and non-riders throughout the state,
- Visit all local transit agencies to discuss needs, challenges and opportunities with agency managers,
- Interview representatives from several state agencies and stakeholders,
- Conduct an analysis of local and statewide demographic trends and transit markets,
- Study funding at the local, state, and federal levels, and
- Review the existing vehicles and capital investments of Ohio's transit system.

A review of the findings from each of these efforts is included in this section. All of the findings led directly into the quantification of service and investment needs in Ohio, and the development of programmatic and policy recommendation for the future.

OHIO'S TRANSIT NETWORK

Ohio has 61 transit agencies that offer a range of services, broadly categorized into fixed route or demand response service. Transit agency service areas, or the places their service travels, also vary, although most are defined along political (city or county) lines and serve an entire city or county, a portion of a county, or multiple counties. Using definitions set out by the Federal Transit Administration (FTA), in 2012 there were 26 urban transit systems in the State of Ohio and 35 rural transit systems. FTA classifications can and do change over time because they reflect the area in which the systems operate, and their proximity to large urbanized areas. In general, urban transit systems tend to operate scheduled, fixed route services, while rural areas are more likely to operate demand response, or dial-a-ride type service (see Figure 2 and Figure 3). In addition, 27 counties in Ohio have no public transportation service at all (see Figure 4). Nine of these are located in northwest Ohio along the northeast Indiana and southeast Michigan borders, seven are located in the southern tip of the state in the Ohio River Valley, and another four are located south-southwest of Cleveland-Akron-Canton.

Figure 2: Existing Fixed Route Service

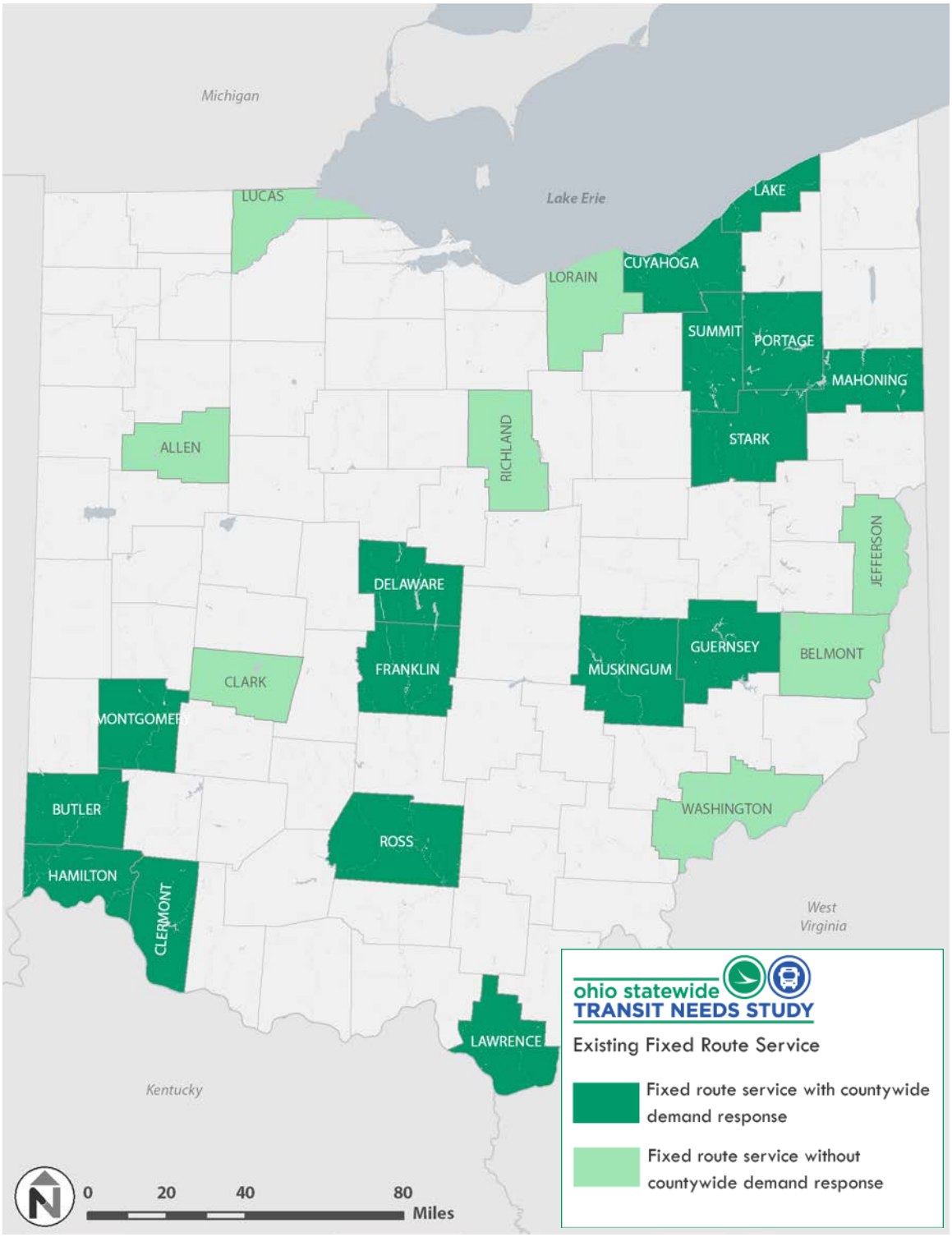


Figure 3: Existing Demand Response Only Service

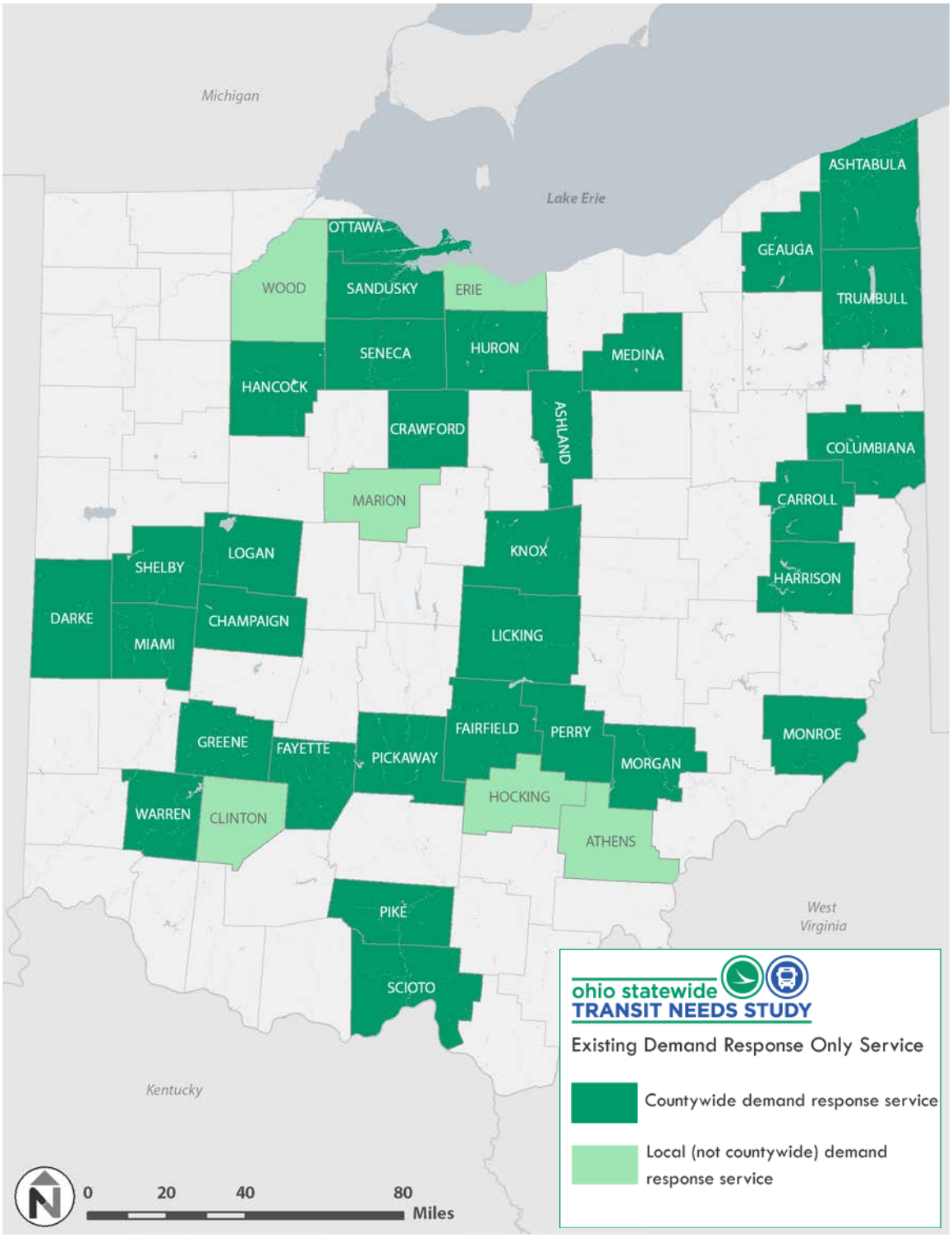
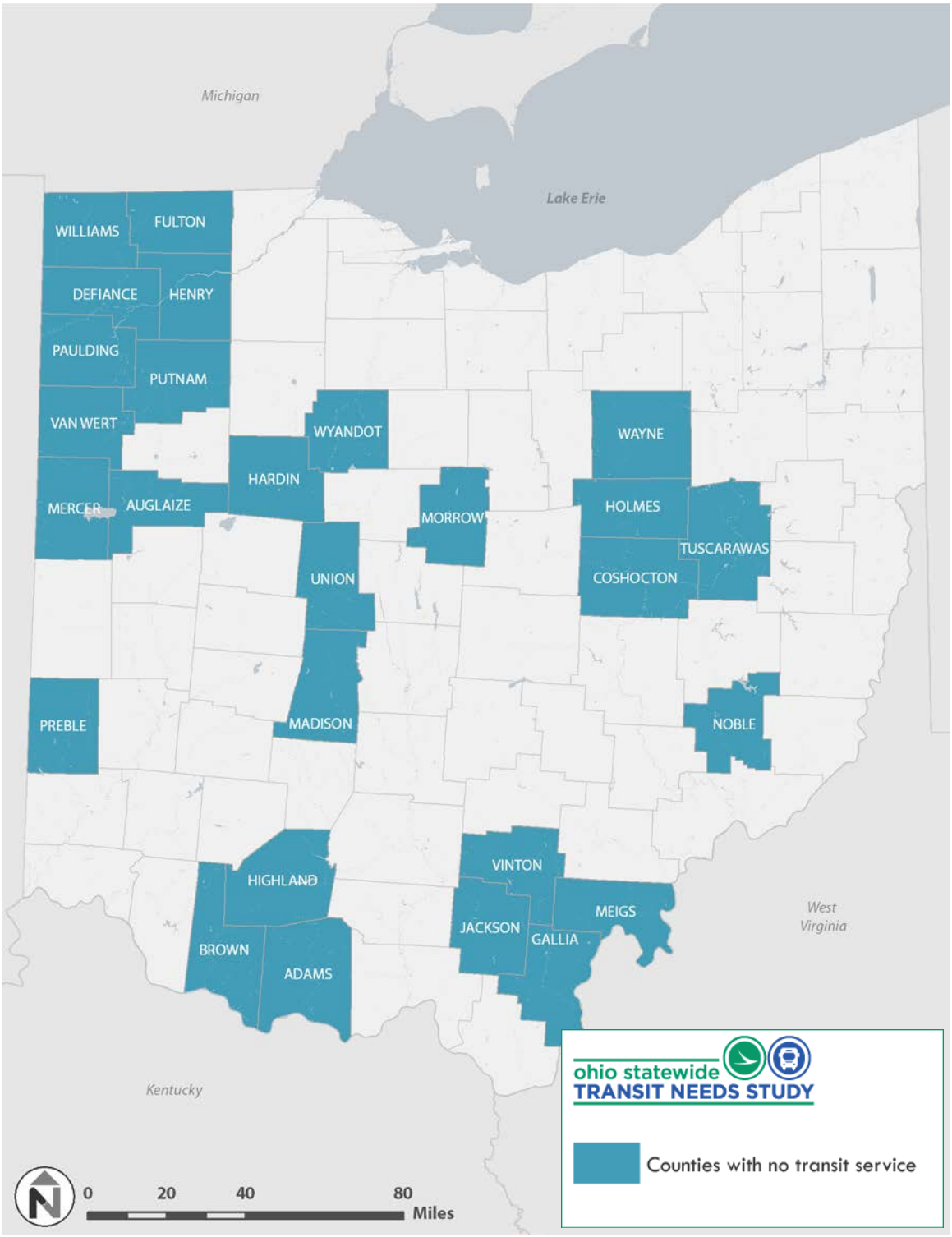


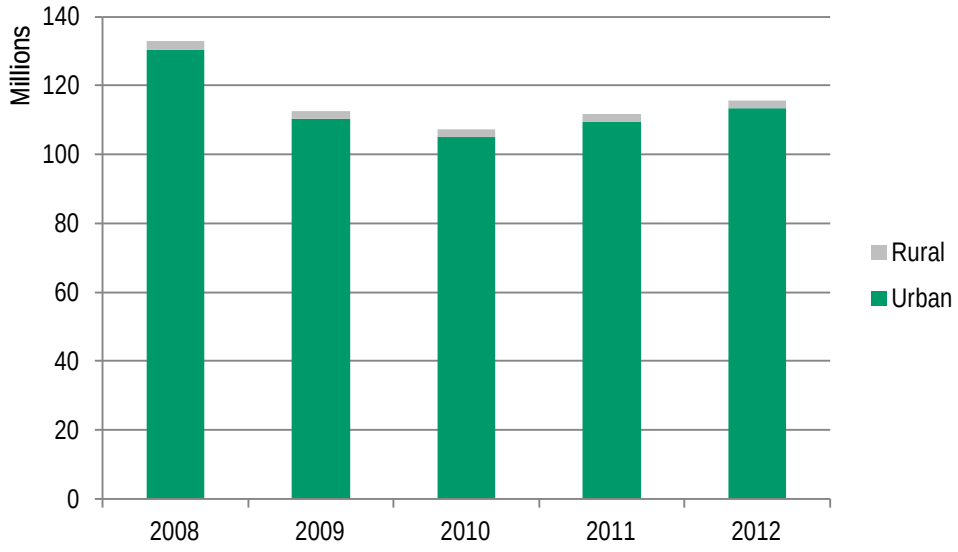
Figure 4: Counties with No Transit Service



Of Ohio's 61 public transportation providers, 12 provide fixed-route services, 31 provide demand response services, and another 18 provide a combination of both fixed route and demand response. Overall, roughly 80 percent of Ohio residents have access to some sort of public transportation service. Approximately 30 percent of Ohio's population has access to demand response service only, meaning people must reserve a trip in advance; the majority of these services are available on weekdays during normal business hours only (i.e. 8:00 am to 5:00 pm). About one-half of Ohio's population lives in communities with fixed route service, but a much smaller portion lives within walking distance to these services. However, it is important to note that living in a county or city that has public transportation service available does not reflect how much transit service is available, in terms of how many days of the week it operates, how many hours a day it operates or how frequently the service runs.

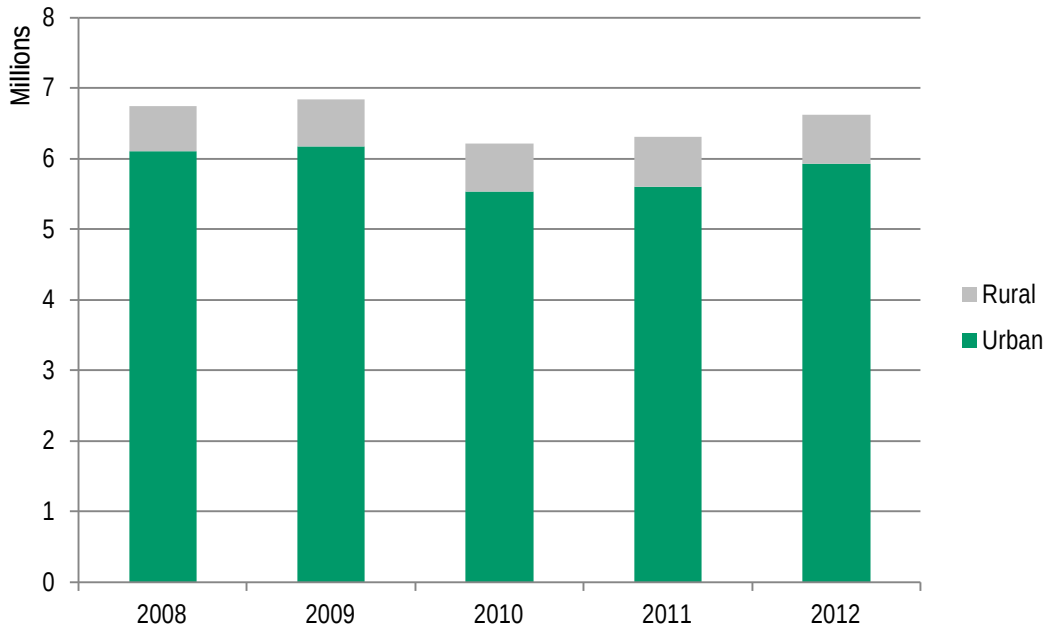
Transit ridership in Ohio has consistently been over 100 million trips since 2008 and has been rising since 2010 (see Figure 5). Between 2008 and 2010, urban ridership fell considerably, likely due to the 2008/2009 recession. With the significant impact on the economy felt in those years, investment in public transportation likewise suffered. Nearly all transit systems in Ohio depend on local funding for their services and as jobless rates increased, income levels dropped, and tax revenues declined, public funding available to support public transportation declined. In many cases, this influenced the amount of service provided and led to a decrease in the number of riders carried. This finding is reflected in the amount of service hours available over the same five year period (see Figure 6). Ridership in Ohio is still recovering to previous levels but increased in both 2011 and 2012. Rural ridership, though a small portion of overall ridership, has remained relatively steady.

Figure 5: Transit Riders in Ohio, 2008-2012



Source: Adapted from Ohio Status of Transit Database

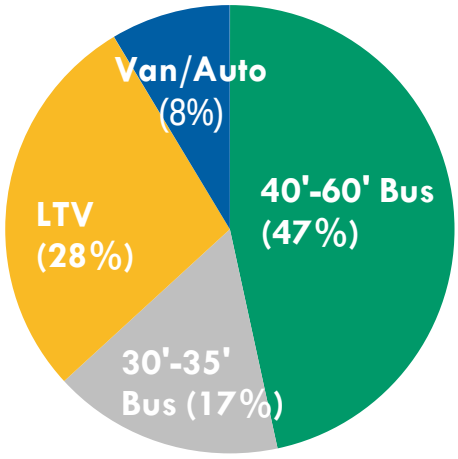
Figure 6: Hours of Transit Service Operated in Ohio, 2008-2012



Transit service requires two types of investments. The first is for operations, which includes driver wages and fuel (among other inputs) and reflects the actual service delivery. The other major investment is in transit is capital, which is mostly made up of vehicles. In 2012, there were approximately 3,200 rubber-wheeled vehicles (i.e. buses) and 109 rail vehicles in active service at Ohio's transit systems. In 2012, the Greater Cleveland Regional Transit Authority (GCRTA) was the only agency in Ohio that operated both rail and buses.

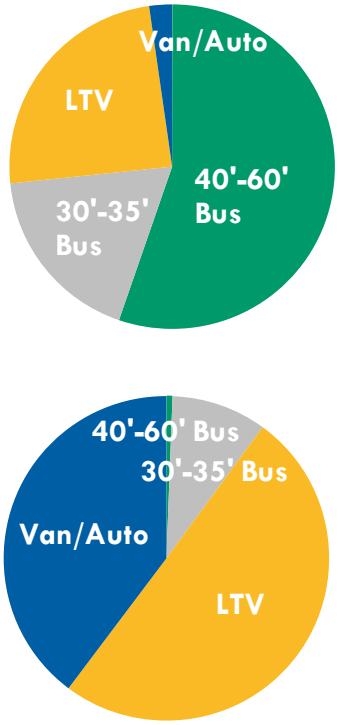
Ohio's urban transit agencies account for the majority of all transit operations and capital investment in the state. The six largest transit agencies in Ohio – Cleveland, Columbus, Cincinnati, Akron, Dayton, and Toledo – account for the majority (about 65 percent) of the transit vehicles in operation. By contrast, the 35 rural agencies, combined, have about 15 percent of the statewide fleet. The majority of the rubber wheeled vehicles across Ohio consists of large, heavy duty transit vehicles (buses) including standard 40 foot vehicles; 45 foot commuter vehicles; 60 foot articulated vehicles, and trolleybuses (see Figure 7). Smaller medium duty buses, ranging from 30 foot to 35-foot vehicles comprise 17 percent of the statewide fleet. Most of these vehicles are operated by urban agencies (see Figure 8). Light transit vehicles (LTVs) comprise the second largest category, with 28 percent of the overall fleet; LTVs are used primarily for demand response service, such as those found in many rural areas and used for ADA complementary paratransit service (see Figure 8). Some smaller systems also use LTVs in fixed route and route deviation service. Vans and autos comprise the smallest portion of the statewide fleet at 8 percent.

Figure 7: 2012 Rubber Wheeled Fleet Mix Operated by Ohio's Transit Systems



Source: PB based on data provided by Ohio Department of Transportation

Figure 8: 2012 Urban (top) and Rural (bottom) Systems Rubber Wheeled Fleet Mix



OUTREACH TO TRANSIT RIDERS, NON-RIDERS, TRANSIT AGENCIES, AND OTHER STAKEHOLDERS

The Ohio Statewide Transit Needs Study included extensive outreach with stakeholders, transit riders and members of the public. Outreach efforts were collected at different times during the year-long study effort and were designed to help the study team:

- Collect different perspectives on community interests, needs, and expectations for transit services.
- Identify transit needs, including needs related to transit services as well as structural needs, such as organization, management, and resources.
- Ensure as many groups and organizations as possible had an opportunity to participate in the study and be sure a broad range of perspectives were sought out and included.

Transit Agency Site Visits

One of the project's first tasks included a site visit to every agency in the state as one way to understand local transit service and conditions. At nearly every transit agency, the study team found a very dedicated staff that has a strong commitment to providing excellent service and remaining customer focused. Most felt as though they had given their best efforts to reach maximum efficiency under severe budget constraints, cutting service as the last resort. Transit managers expressed their desire to provide more service – more operating hours, days of the

week, and locations – so they could serve more people and places in their respective communities. Urban operators also talked about diversifying the types of service they operated while rural operators said they need to make connections to places and services outside of their usual service areas.

In nearly every case, transit agency staff identified funding as the primary obstacle to meeting local needs, including funding for operating and capital costs. From their perspective, federal funding has become increasingly unstable, state funding has declined, and local funding has been difficult to raise. The issues faced with local funding also often leads to other funding that requires matching local funds to be left on the table. Transit managers also cited complicated funding policies, human service transportation coordination, regionalization, and technical assistance as key challenges.

Stakeholder Interviews

As part of the study, members of the Nelson\Nygaard team conducted a series of stakeholder interviews. The team interviewed a variety of individuals and organizations, including representatives from planning, human service, and medical service organizations, as well as individuals representing rider groups and institutions working directly with public transportation operators (a list of organizations included in the stakeholder interview process is included in Appendix K). The most consistent themes heard from the stakeholders included:

- There is a **strong level of support for public transportation among the stakeholders**. Many stakeholders expressed an appreciation for how difficult it is for transit agencies to find funding and earn political support for public transportation services. Stakeholders said that despite these challenges, transit agencies and their staff continue to serve many of Ohio's most challenged groups.
- At the same time, many **stakeholders also expressed frustration with the availability of public transportation in Ohio**. They said there is not enough public transportation (in terms of coverage, hours of service, or frequency) and Ohio systems have not kept pace with the rest of the country. Other frustrations voiced by stakeholders included a lack of efficiency overall and not enough transit routes going to the right places, at the right times, or operating with enough frequency. Several stakeholders also noted there are several communities in the state where transit service is not available at all.
- Compared with other parts of the country, **Ohio is being left behind with regards to public transportation infrastructure and technology**. Many stakeholders discussed experiences in other cities and regions outside Ohio where public transportation systems were modern, cool, and fun. These stakeholders said Ohio needs to expand public transportation systems to become more vibrant and in turn, stimulate more economic growth.
- A wide variety of stakeholders reported **public transportation lacks strong political backing**. Comments included a lack of support from leadership at the Ohio Department of Transportation (ODOT), in the state legislature, and at the local level, including county commissioners and city managers.
- Several stakeholders also said public transportation has an image problem. Stakeholders stated there is **an impression among many community leaders and individuals that public transportation is only for people with low incomes and older adults**. They also said it is largely a misperception. Several stakeholders said they would

like to bring more attention to the fact that Ohio's public transportation system carries many riders, including people who cannot or do not drive but also people who can drive and choose to use transit.

- Nearly all stakeholders identified a **need for more multi-county or regional services and better service coordination across jurisdictional boundaries**. Many of those interviewed, including both people working in the transportation field and those in the human and medical service fields, talked about the need for their clients and constituents to be able to use public transportation to travel across city and county lines.
- Despite challenges, many stakeholders **identified examples of where public transportation has been successful**. The success stories ranged from small systems that carry many riders to large, urban agencies developing partnerships with employers.

Rider and Non-rider Surveys

Hearing from current transit customers and those in the community who may need or want to use transit but do not ride for various reasons was critical to determining final recommendations that stakeholders would support. For this effort, the team conducted two surveys; one with riders (fall 2013) and a second online survey for the broader community (summer 2014). Individual reports from each of these survey efforts are included in Appendices I and J, respectively.

Rider Survey

The first survey was primarily an outreach tool intended to gauge experience, perceptions, and priorities of current riders on a statewide level. Questions focused on how riders use their local system, rider perceptions of service quality and quantity, and rider priorities for service improvement. Data collection was not designed based on a random sample. Additional details of the survey include:

- Local transit agencies conducted most of the survey administration. In most cases, surveys were distributed to riders while they rode the bus. In a handful of cases, surveys were administered at transit stations and stops. All transit systems in the state were given the opportunity to participate and all but one did so.
- Separate survey instruments were designed for systems with fixed route service and systems with demand response service only.
- Options to participate included online and paper forms in either English or Spanish.
- *Over 5,500 Ohioans responded to the rider survey.*

Transit rider survey results indicated that a majority of respondents depend on transit to meet their mobility needs, use transit frequently, and travel to get to and from their jobs. While respondents expressed an overall high level of satisfaction with the service available to them, they also identified priorities for system improvements. Overall, respondents were most dissatisfied with the hours service is available and prioritized longer service hours over other options. Fixed route riders prioritized system expansion (frequency of service, service span, and geographic coverage), plus improved on-time performance and bus stop amenities (see Figure 9). Demand response riders were not only interested in having service available for longer hours and more days of the week, but also on-time performance and easier trip reservations (see Figure 10).

Figure 9: Customer Priorities for Improvements – Fixed Route Service (priorities with >200 responses)

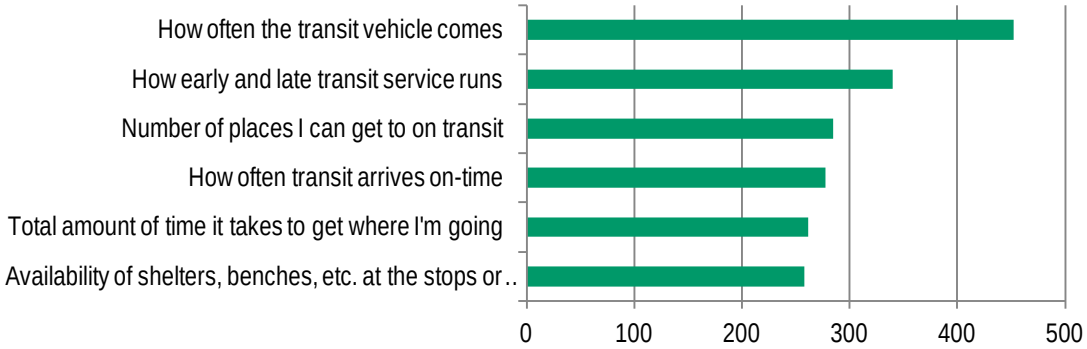
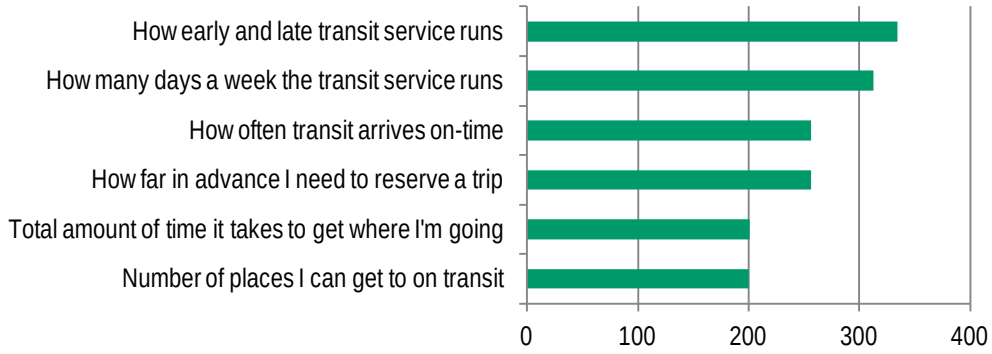


Figure 10: Customer Priorities for Improvements – Demand Response Service (priorities with >150 responses)

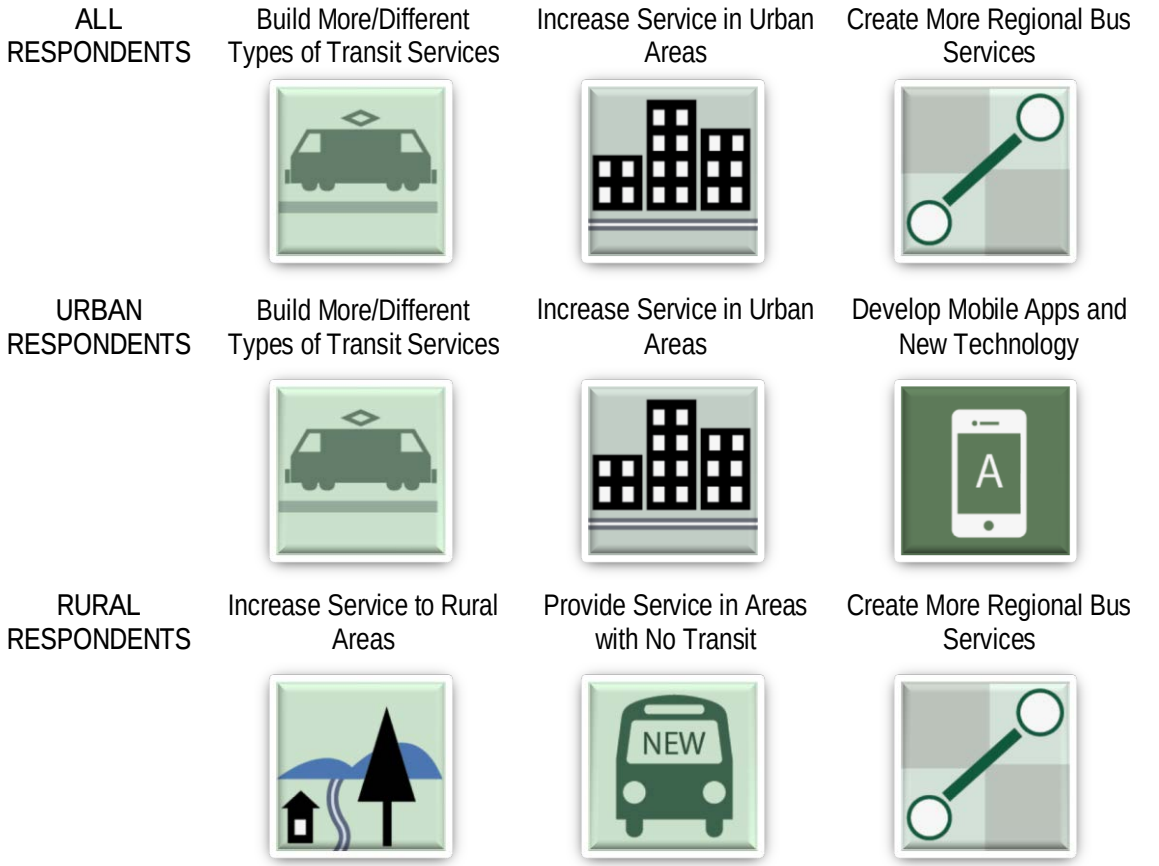


"Build Your Own Transit System" Survey

For the second survey, the study team developed an interactive "Build Your Own Transit System" web survey tool that allowed respondents to choose various transit improvements at different costs given a hypothetical budget of $100. As participants selected different investment options, they were able to see in real time how those choices created benefits in terms of access to employment, supporting economic development, reducing greenhouse gases, etc. The tool allowed respondents to understand the tradeoffs associated with transit service planning and benefits associated with how transit resources are allocated. After building their transit system, participants were asked via a more traditional web survey to answer some follow-up questions about behavior, choice, and demographics. The survey was available to the entire Ohio community and publicized via numerous media outlets.

More than 2,000 Ohioans responded to the online survey. The study team gained helpful insight through this tool about people's values and priorities, and allowed the team to compare various subgroups. As a whole, respondents expressed a preference for more and different types of transit services, like rail and bus rapid transit, increasing the availability of service in urban areas, and creating more regional bus services. These preferences varied somewhat by urban and rural areas, with respondents in urban areas also valuing development of mobile apps and new technology, and rural respondents wanting to increase service to rural areas and areas that currently do not have service (see Figure 11). The reasons guiding these choices included making service easier to use, supporting Ohio's communities, and attracting jobs and investment. Investments such as improving printed schedules and buying new vehicles were not highly prioritized by respondents.

Figure 11: Transit Improvement Top Priorities from online "Build Your Own Transit System" tool



Project Steering Committee

A steering committee made up of representatives from transit agencies, social service agencies, the business community, the legislature, unions, environmental advocates, and policy and research institutions met eight times throughout the project to give feedback at important milestones. As the ones who will ultimately be gathering support for the study's recommendations among the public, and the ones who will reap many of the benefits if they come to fruition, their involvement provided invaluable guidance and support. The steering committee's input is an implicit part of many of the reports and documents that resulted from this study. A list of the organizations represented in the Project Steering Committee is included in Appendix D, together with a record of the minutes from each of the steering committee meetings.

TRANSIT MARKET AND TRENDS AFFECTING DEMAND

Critical pieces to understanding the need and demand for transit include studying the community characteristics that influence the need for public transportation service. The study team looked at a variety of factors that influence the need for transit service, including land-use patterns, demographic and socio-economic characteristics, technology, the availability of information and opportunities, and the economy.

Trends That Brought Ohio to Where It Is Today

Population and economic activity in Ohio boomed in the early 19th century, as part of the industrial revolution when access to transport such as waterways and railways, natural resources (coal and iron ore), and a stable workforce was critical. Ohio grew rapidly until the mid-1960s, when it reached a population of about 10 million. At the time that Ohio's population plateaued, the U.S. economy began a slow transition towards a service economy and the economy started to become less dependent on transportation and natural resources. Although Ohio has been adjusting to these changes, for a complex set of reasons, Ohio's transition has been slower as compared to other parts of the country. Consequently, the state's population has grown slowly since 1970, to its current level of about 11.5 million people, making it the seventh most populous state in the U.S.[1]

Unlike most U.S. states, which typically have just one or two major cities, Ohio has three relatively large urban areas plus an additional five well established small- to medium-sized urban areas. To a large extent, this pattern of urbanization reflects the economic development in Ohio during the 20th century. By 2010, nearly 78 percent of Ohio's population lived in urban areas, and about 60 percent of the population lived in one of the state's eight largest cities – Akron, Canton, Cincinnati, Cleveland, Columbus, Dayton, Toledo, and Youngstown. This urban population lives almost entirely along the diagonal corridor cutting across northeast and southwest Ohio, anchored by Cleveland, Columbus, and Cincinnati. The remaining 40 percent of the state's population lives in small towns or rural areas. Undoubtedly, a percentage of the population in any urban area also lives in areas of lower suburban density. This pattern of urbanization means that Ohio faces a continuous challenge associated with providing appropriate levels of public transportation to each geographic area.

Ohio's Overall Growth Rate Has Been Very Low

Every major city in Ohio except Columbus has lost significant shares of its peak population since the 1950s, ranging from 20 percent in Toledo to over 50 percent in Cleveland and Youngstown. It is worth noting that even Columbus owes its singular population growth status to large-scale suburban annexation. Ten of Ohio's 14 metropolitan areas lost population between 2010 and 2013, with only Akron, Cincinnati, Columbus, and Dayton posting positive growth.[2]

Ohio's Metros Have Sprawled Even without Much New Population Growth

Ohio is experiencing a phenomenon known as "sprawl without growth." Most metropolitan areas in Ohio have increased in land area often growing across municipal and county boundaries,

[1] State-Level Census Counts, 1900-2010. StatsIndiana, http://www.stats.indiana.edu/population/PopTotals/historic_counts_states.asp.

[2] American Community Survey 2013

despite stable or declining populations (see Figure 12). Employment has also shifted away from center cities to suburban locations. The result has been legacy costs, social and economic disparities, underutilized infrastructure, and inability of the state to realize a return on investment from former infrastructure expenditures, including freeway development. Furthermore, a declining and ever dispersing tax base incentivizes unhealthy competition within and among metropolitan areas, which, in turn, undercuts overall economic competitiveness. Ohio's metropolitan areas are among the most spread out in the nation (see Figure 13).[3]

Figure 12: Population Growth Rates in Ohio's Largest Metros, 2000-2010

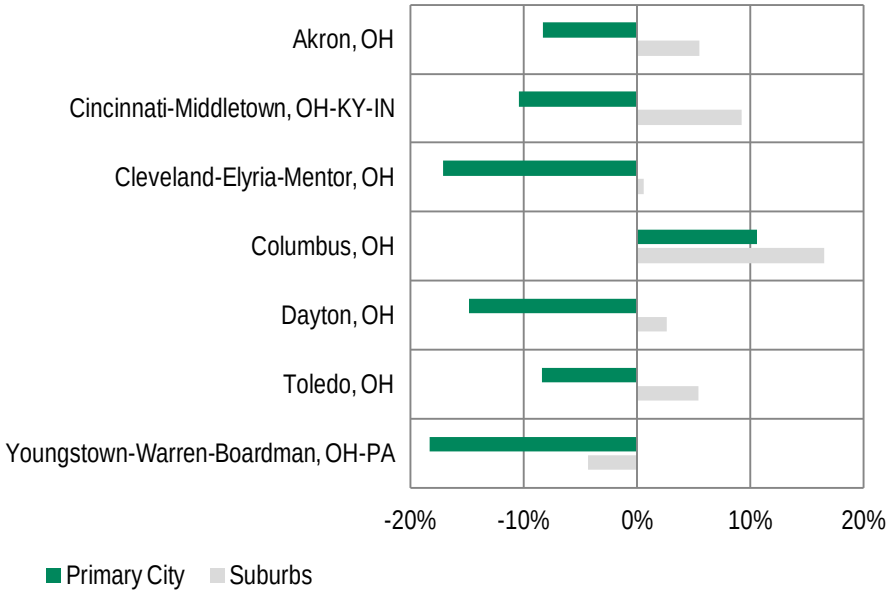
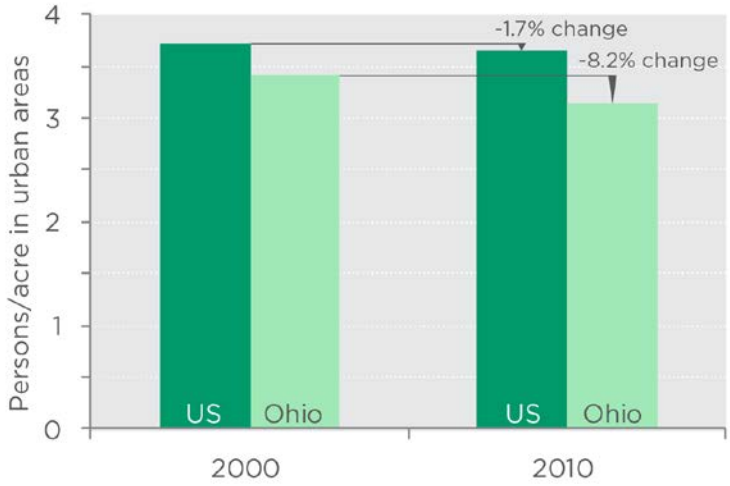


Figure 13: Persons per Acre in U.S. and Ohio Urban Areas, 2000-2010



[3] Greater Ohio Policy Center. (2010). Shaping the state. *Greater Ohio Policy Center*. Retrieved from http://www.greaterohio.org/publications/shaping-the-state

Ohio's Foreign-Born Population Grew

The number of foreign-born residents in Ohio has increased from 2.4 percent of the state's total population in 1990 to 3.9 percent of the state's total population in 2012. Overall, the foreign-born population in Ohio grew by 74 percent between 1990 and 2012, though the percentage within this cohort in Ohio was significantly less than nationwide at 13 percent.[4]

Ohio's Poverty Rate Has Increased

In 2012, the statewide poverty rate was 16.2 percent compared to a poverty rate of 9.8 percent in 2000.[5] In addition, since 2007, Ohio's poverty rate has been higher than the national average. As of 2012, the national poverty rate is 15.9 percent compared to 16.2 percent for Ohio.[6] The poverty rate is highest in urban areas, especially the central cities, and in rural Appalachian Ohio.

Employment Has Declined and Many Commute Across County Borders for Jobs

Ohio has about 5.3 million jobs today with unemployment rates at just over 5%, which means employment is back to pre-recession employment levels.[7] The 2008/2009 recession caused the loss of 423,000 jobs in Ohio, making it the state with the 4th greatest job loss in absolute numbers after California, Florida, and Illinois. This led to an unemployment rate of 11 percent in 2009, twice the rate in 2008.[8] Recent employment growth has been unsteady but slowly improving since the large decline in 2009. Broadly speaking, 2011 employment statistics show:

- About half (about 53 percent) of Ohio's workforce lived and worked in the same county.
- The other half (about 47 percent) worked outside of the county in which they resided.
- Counties that import the most workers from surrounding counties include Cuyahoga (Cleveland), Franklin (Columbus), and Hamilton (Cincinnati), as expected (see Figure 14).
- Counties that export the most workers to surrounding counties include Lorain (west of Cleveland), Clermont (east of Cincinnati), Medina (south of Cleveland), Butler (north of Cincinnati), and Fairfield (south east of Columbus).
- A small number of employed Ohio residents (< 1 percent) worked outside of the state.

[4] Migration Policy Institute. (2012). State immigration data profiles: Ohio. Retrieved from http://www.migrationpolicy.org/data/state-profiles/state/demographics/OH

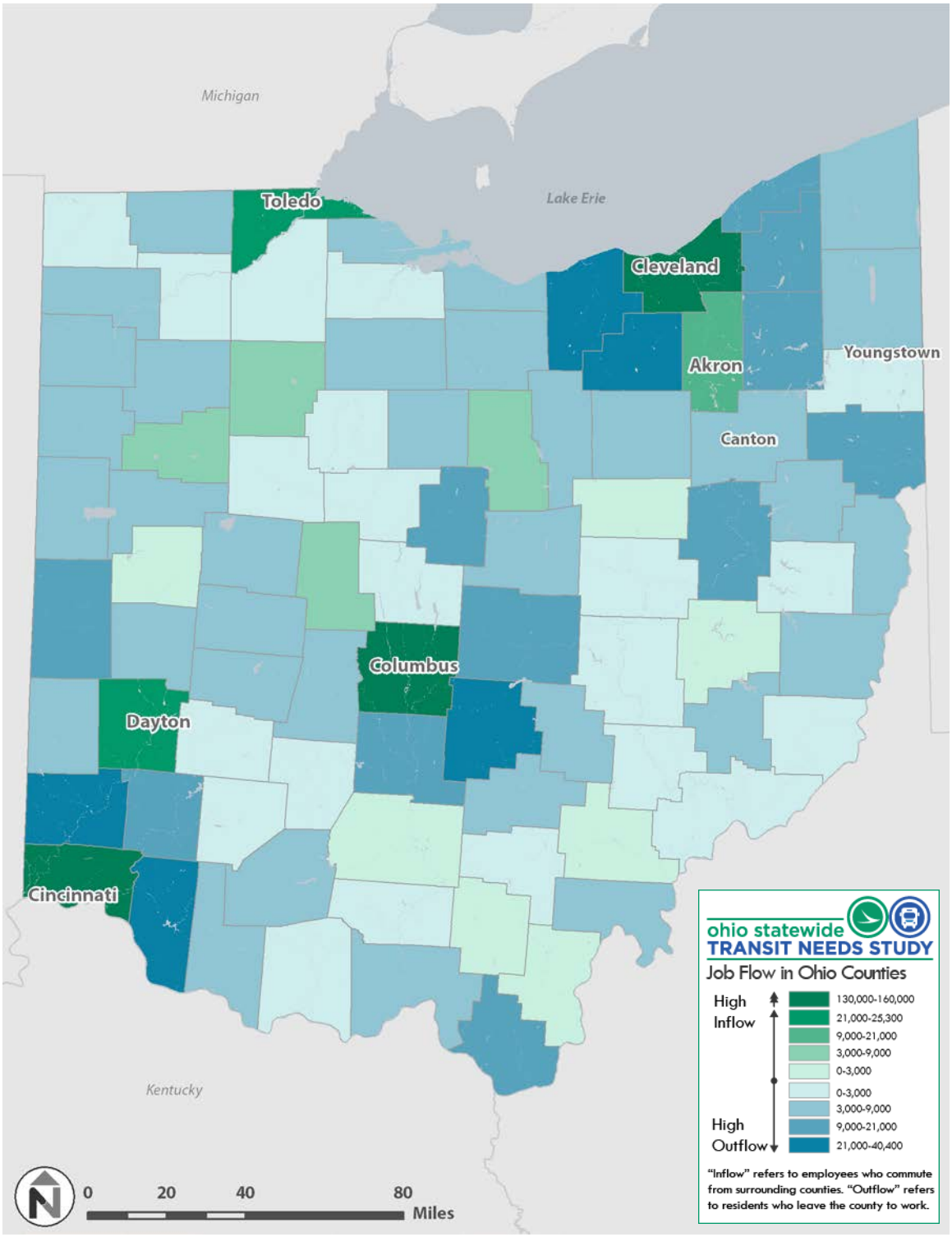
[5] Larrick, Don. (2014). *The Ohio Poverty Report*. Office of Research, Ohio Development Services Agency: Columbus, OH.

[6] Ibid.

[7] Based on Bureau of Labor Statistics, 2014.

[8] U. S. State and Regional Economic Impact of the 2008/2009 Recession, The Journal of Regional Analysis and Policy, 2012.

Figure 14: Job Flow in Ohio Counties



The Transit Market Today

To understand the market (or need) for transit in Ohio today, the study team considered existing conditions in each of Ohio's 88 counties using qualitative data, such as the site visits discussed above, and quantitative data, such as development patterns and demographics. It is always difficult to quantify the need for public transportation services absolutely. There are always exceptions to every rule and sometimes transit services succeed where you might not expect them to and fail where they should work. However, national experience suggests that two factors have more influence over the need for transit service than any other:

- **Density** – places where there are high concentrations of workers and/or residents – is the most important factor in determining transit ridership. Densely developed areas – like downtowns in large cities, university campuses, and hospitals – have many people traveling to them, so there are more people who could use transit. In addition, densely developed areas are also more likely to have safe walking environments with sidewalks and crosswalks, so people can safely get to and from transit routes.
- **Demographics** suggest that people in a community may rely on public transportation to meet their travel needs. Households with only one vehicle or people with low incomes, for example, indicate that people may be looking for public transportation to supplement their transportation options. Likewise, teenagers who may not have access to a car, or older adults who may be driving less also suggest a reliance on public transportation.

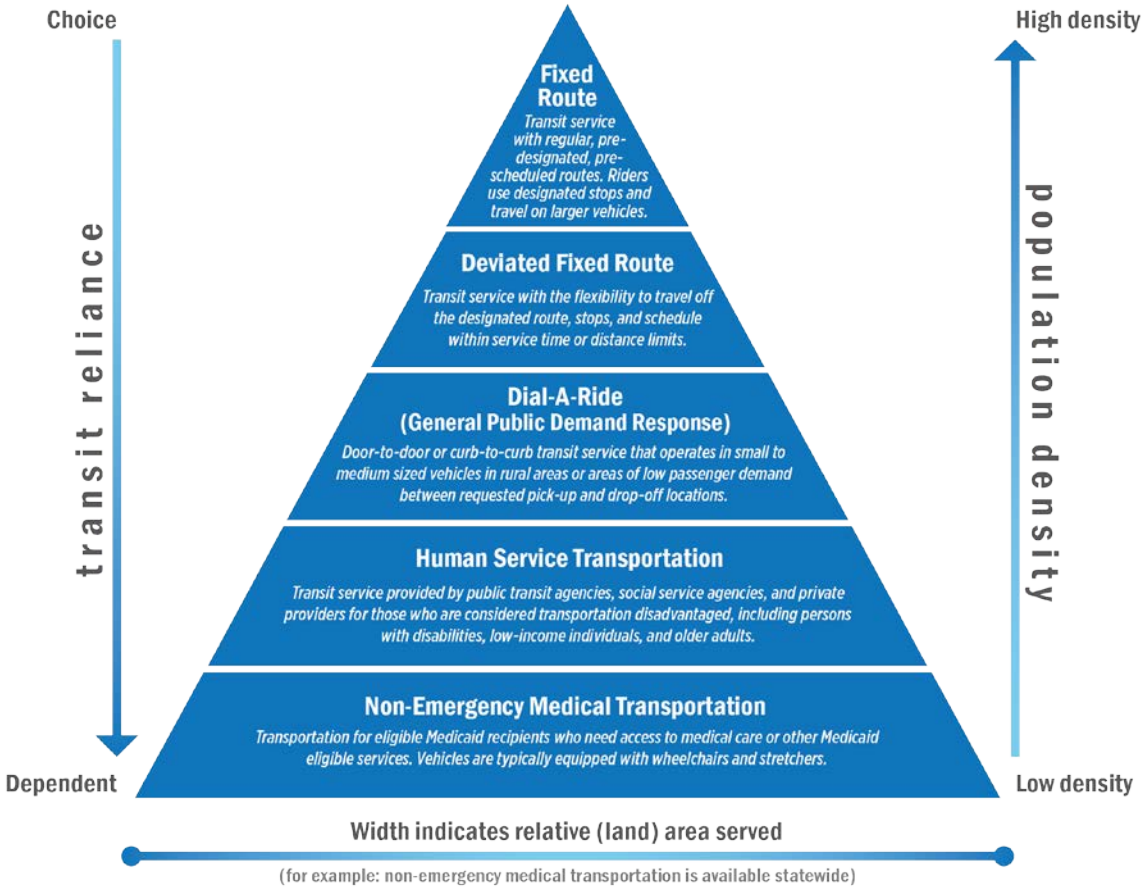
Density – places where there are high concentrations of workers and/or residents – is the most important factor determining transit ridership.

Ultimately, transportation connects people to jobs, activities, and basic services like medical appointments and shopping. Every community has people who cannot reach jobs and basic services on their own. For the most part, these individuals use transportation services provided by other federal and state human and medical service programs, like Medicaid (see bottom two levels of Figure 15). These services are typically mandated by the federal government, and are available statewide, but they are limited to trips to and from specific appointments and activities. Public transportation, on the other hand, includes transportation services available to members of the general public traveling for any purpose (see the top three levels of Figure 15). In Ohio, local communities, typically counties, decide if they want to provide general public transportation and how to provide that service.

Community demographics, such as income, access to a vehicle, disability status, and age, are also important factors in determining transit ridership.

National experience tells us that density and demographics also help determine the type of transit service that will work best in a particular region. There are a wide variety of transit services with different strengths and weaknesses. Each type of service is designed to address a community's transit need based on the type of community and riders.

Figure 15: Service Hierarchy



The following analysis considers population and employment density and demographic characteristics to estimate the need for public transportation from a statewide perspective. The analysis of each of Ohio's 88 counties is available in Appendix F2 and follows a similar methodology.

Transit Supportive Development Patterns

As discussed, density and land use patterns are the single most important factor in determining transit ridership. Regardless of demographic and socio-economic characteristics, people who live or work in areas where there are a lot of other people are more likely to use transit, not only because there is a bigger market for travel but also because density reflects other characteristics, like limited parking or more traffic congestion, that make transit more attractive to travelers. The study team linked density to transit demand by creating an index that combines population and employment density, treating each with equal weight, and then broadly relating these densities to the most appropriate types of transit service.

Generally speaking, there are no density requirements for demand response, or dial-a-ride, service. Demand response services can work in any environment but remain less efficient in areas with low density. Fixed-route service generally requires some level of density to be effective. The transit density index (see Figure 18) mapped local densities to one of two general categories of transit service: deviated fixed route, which is a hybrid between fixed route and demand response, and fixed route. The index does not make suggestions about the specific frequency of service needed or the days of the week service should be provided; instead, it suggests the type of service that would likely be productive based on density.[9]

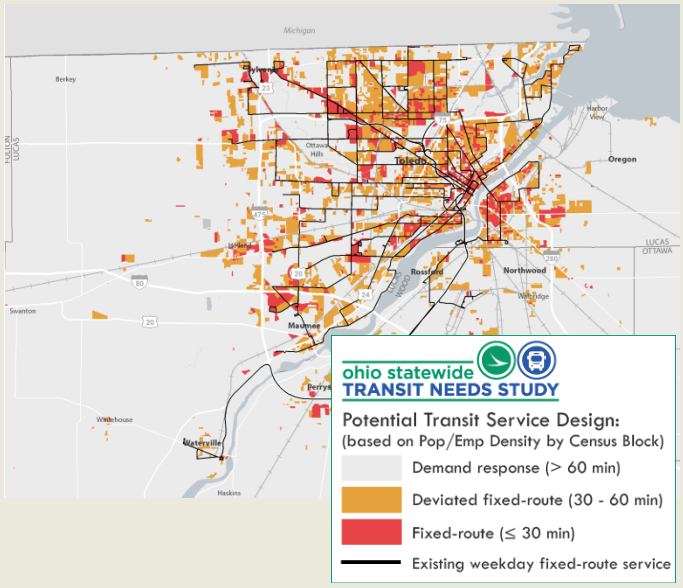
Figure 18 shows the results of matching service levels/types to population and employment density by 2010 Census block. The analysis highlights the following patterns (see map):

- Ohio's largest cities have the largest markets for transit service and are the most likely to support fixed route transit service. These areas include:
  - Akron
  - Canton
  - Cincinnati
  - Cleveland
  - Columbus
  - Dayton
  - Toledo
  - Youngstown
- Ohio's development pattern of small towns is also visible in the transit index map; nearly every county has at least one town with sufficient density to support deviated fixed route service.
- The remainder of the state has lower densities such that demand response service is likely the most appropriate, though difficulties in providing this base level of service may still exist.

[9] For the complete market analysis with detailed methodology, see Appendix F1.

Urban Example: Lucas and Wood County (Toledo Urbanized Area) The Toledo Area Regional Transit Authority, TARTA, serves Metro Toledo in parts of Lucas and Wood County. Figure 16 shows TARTA's transit routes together with the transit density index. Areas with the highest density (shown in red) include Toledo's downtown core on both sides of the Maumee River, as well as Monroe Street, the primary corridor running northwest from downtown. Outside of these two areas, development quickly transitions to a mix of densities (orange and red) that likely supports a mix of standard and deviated fixed route services. Overlaying TARTA's existing fixed route structure on the map indicates that TARTA already knows what the map demonstrates: fixed routes succeed where the highest densities occur.

Figure 16: Urban Example



Rural Example: Fairfield County and the City of Lancaster The City of Lancaster in Fairfield County, by contrast, has significantly less density as compared to Toledo (see Figure 17). Although there is a clear cluster of higher density development within the City of Lancaster, the area immediately around the city has very low density.

This data suggests that while some standard fixed route service may be needed within the city limits, the small geographic area would make it difficult to offer more than one or two routes. In addition, the data suggests it would be difficult to operate fixed route service into Lancaster because none of the surrounding areas have sufficient densities. Development patterns suggest that demand response service is the most likely to succeed outside of the city.

Figure 17: Rural Example

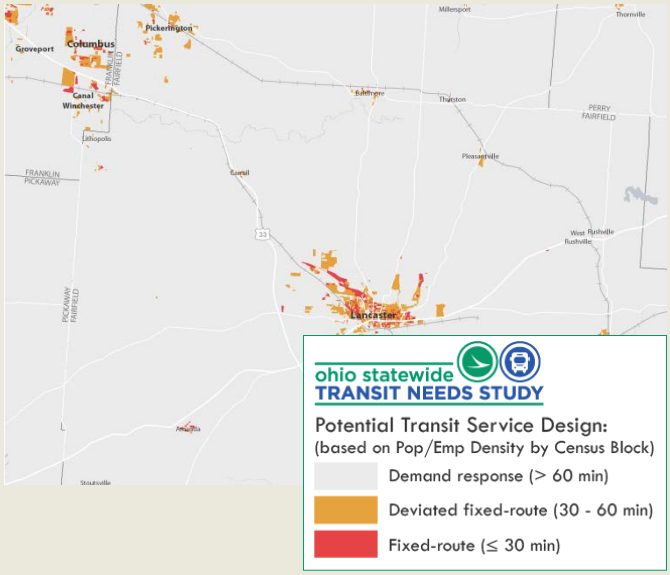
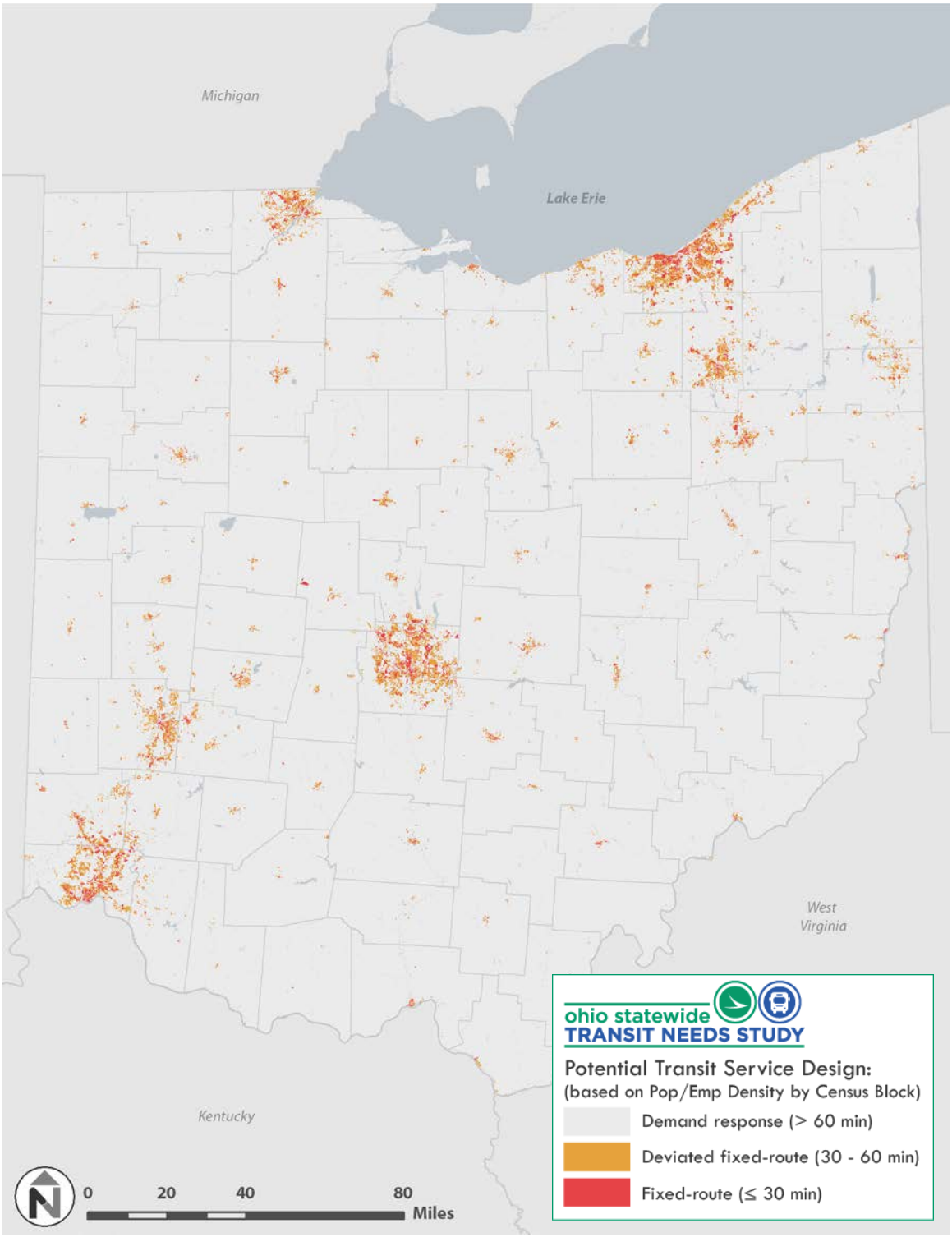


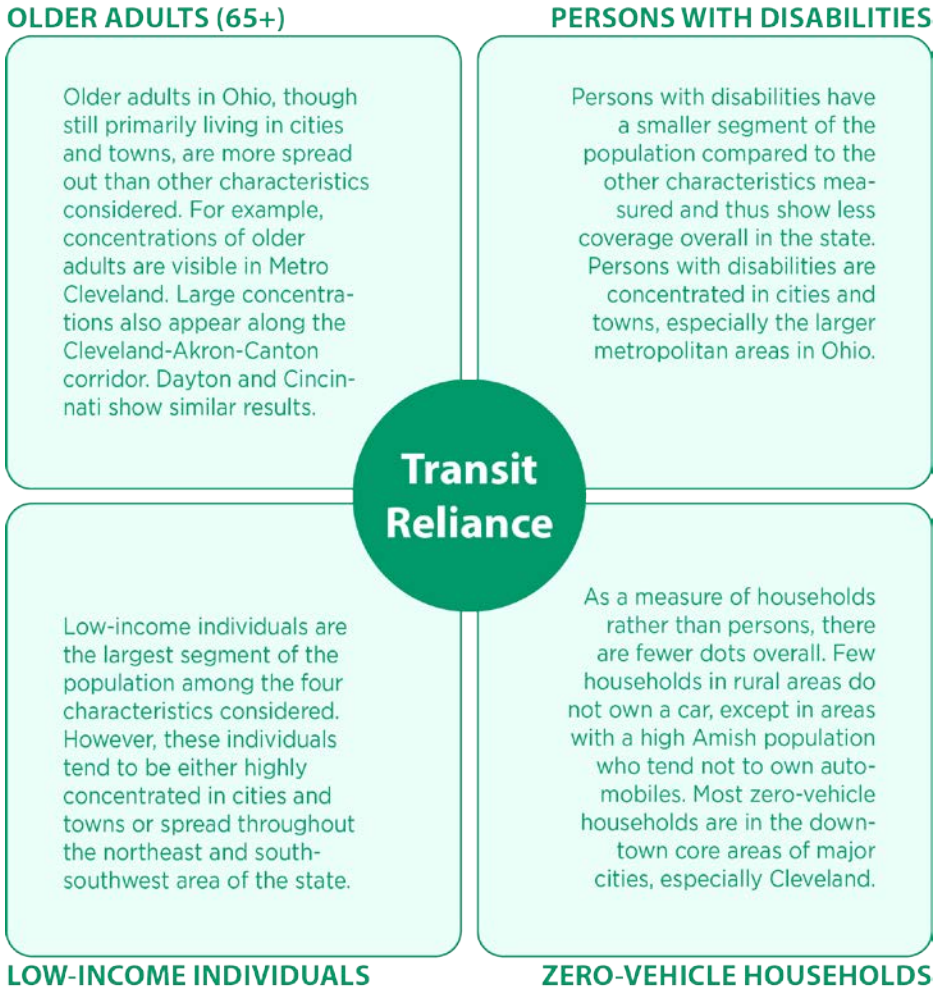
Figure 18: Potential Transit Service Design



Transit Reliance

Demographic and socio-economic characteristics, or an analysis of transit reliance, also help explain the need for transit service. For the purposes of this study, transit reliance was defined using a combination of four demographic and socio-economic characteristics into a single measure that estimates who might have a greater tendency to use transit as their primary method of transport.[10] The four characteristics were chosen based on national experience and research, and include older adults, persons with disabilities, low-income individuals, and zero-vehicle households. The reliance analysis purposefully excluded density as a factor but does consider where populations more likely to rely on transit service are concentrated.[11]

Figure 19: Transit Reliance



[10] Data is from the 2012 American Community Survey (5-Year Estimates).

[11] Completed for the entire state by Census block group, one can directly compare an area to other areas in the state. No comparisons can be made to areas outside of Ohio. This methodology used the population within each characteristic rather than normalizing over total population (percentage of the total population) or area (density). This helps to understand the absolute reliance without favoring areas of higher density, which we already considered, or areas with few people but a high percentage that fall into one or more of the characteristics analyzed.

General patterns emerge when looking at the individual characteristics that went into creating the transit reliance measure, discussed below and shown in Figure 20 through Figure 24. As expected, most of the population for each characteristic is concentrated in Ohio's largest urban areas. Outside of these areas, minor concentrations exist within the small city or town in each county. Similar concentrations occur along the Ohio River. Each of the four characteristics also shows sprawl throughout the state, though to varying degrees.

Figure 20: Older Adults

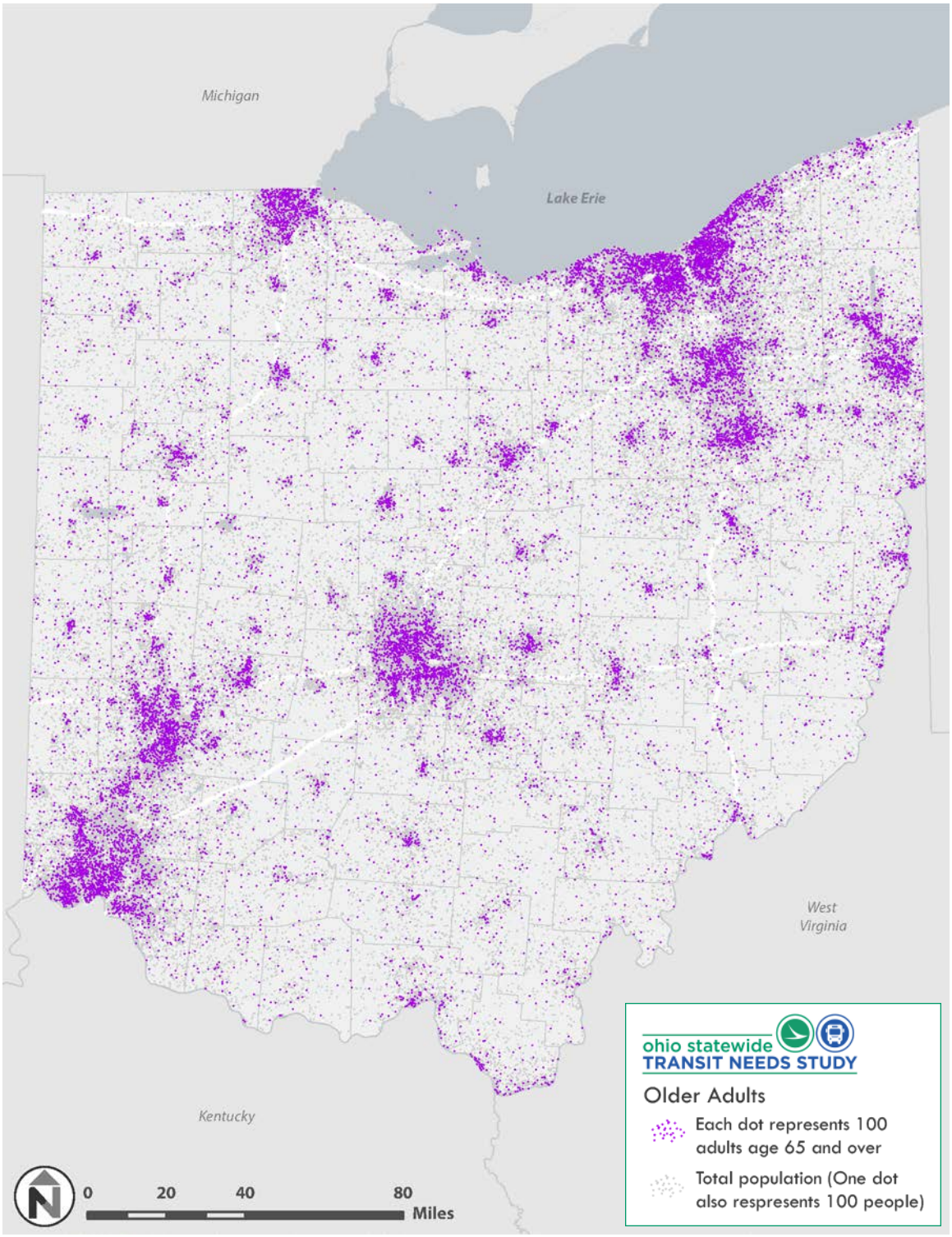


Figure 21: Persons with Disabilities

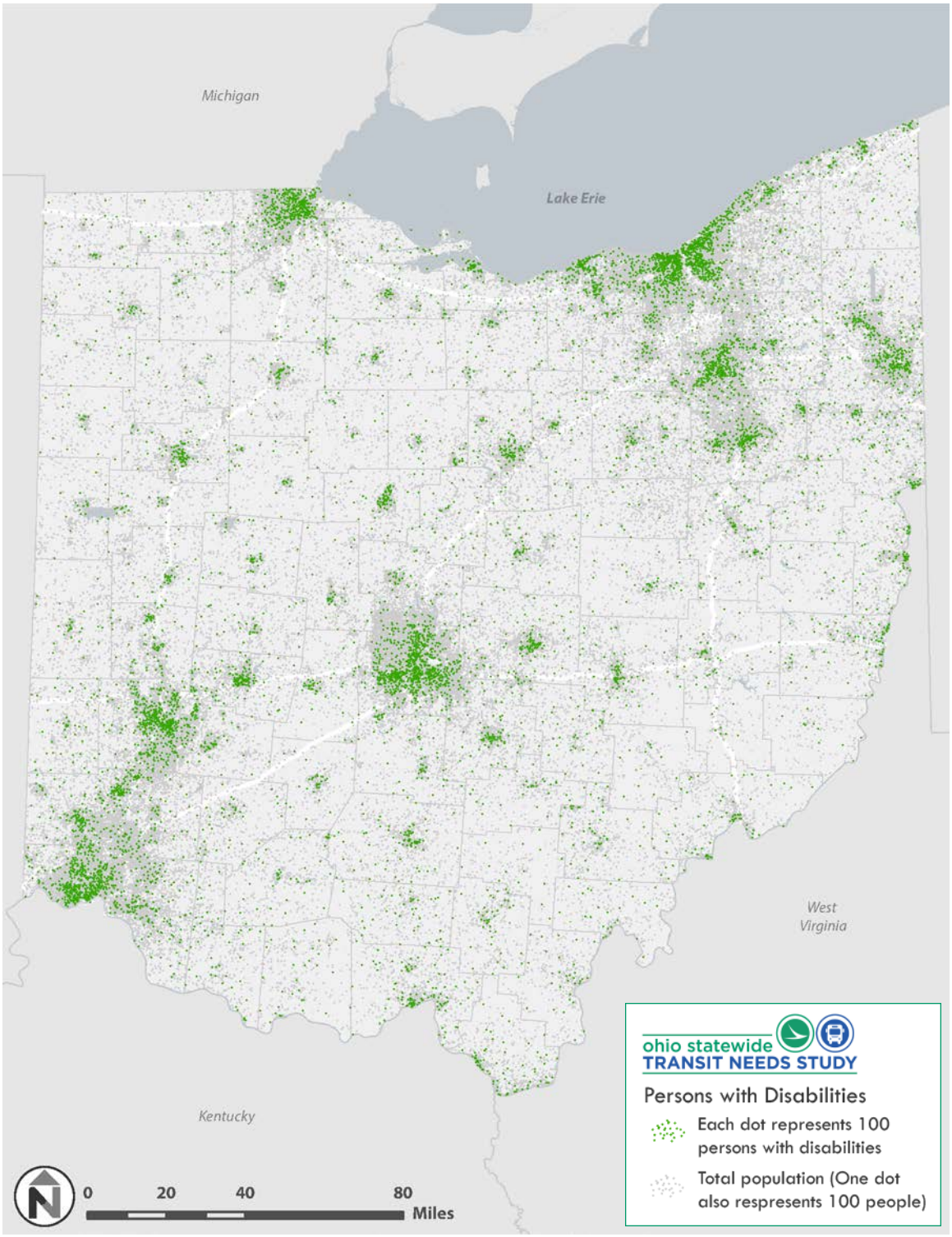


Figure 22: Low-Income Individuals

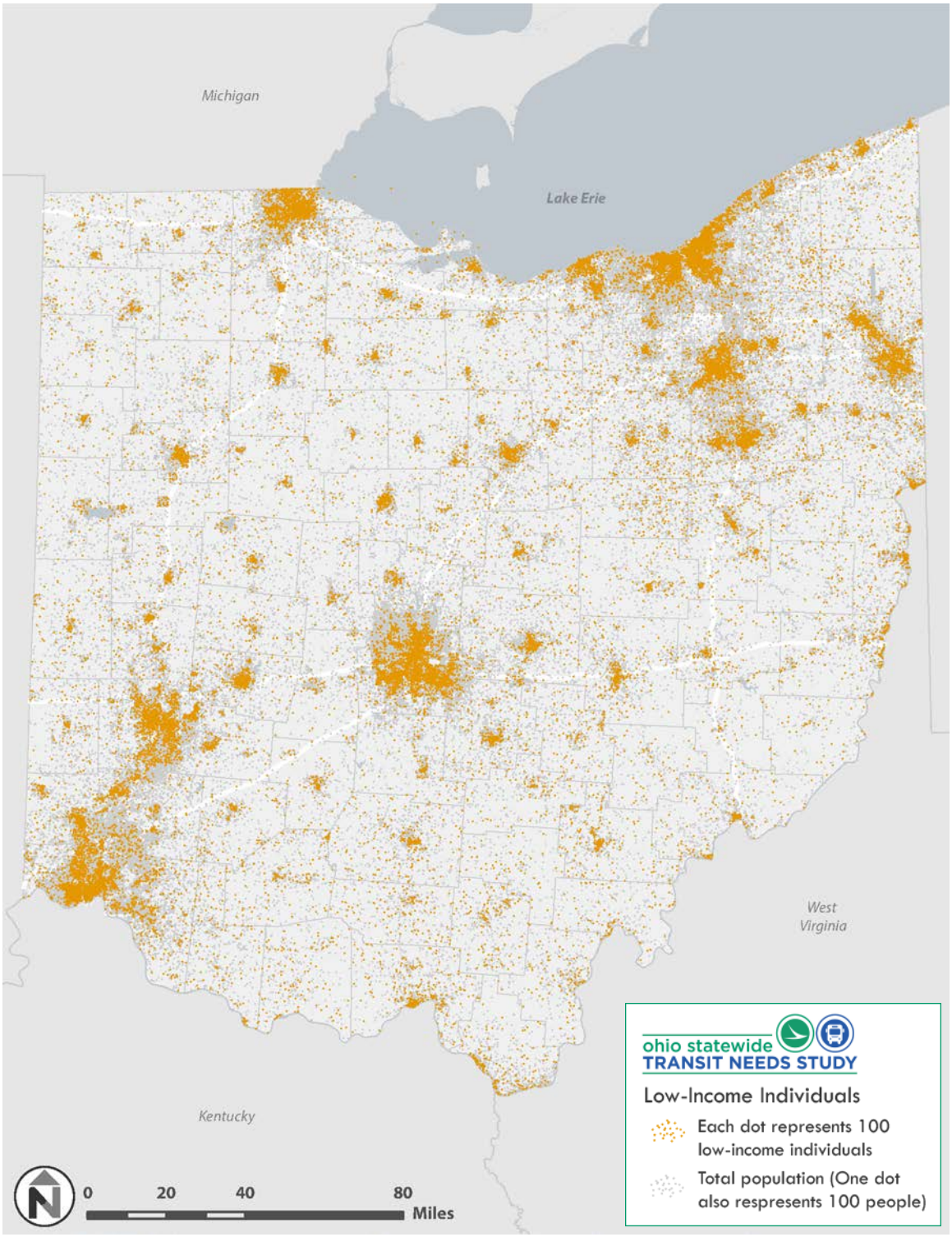
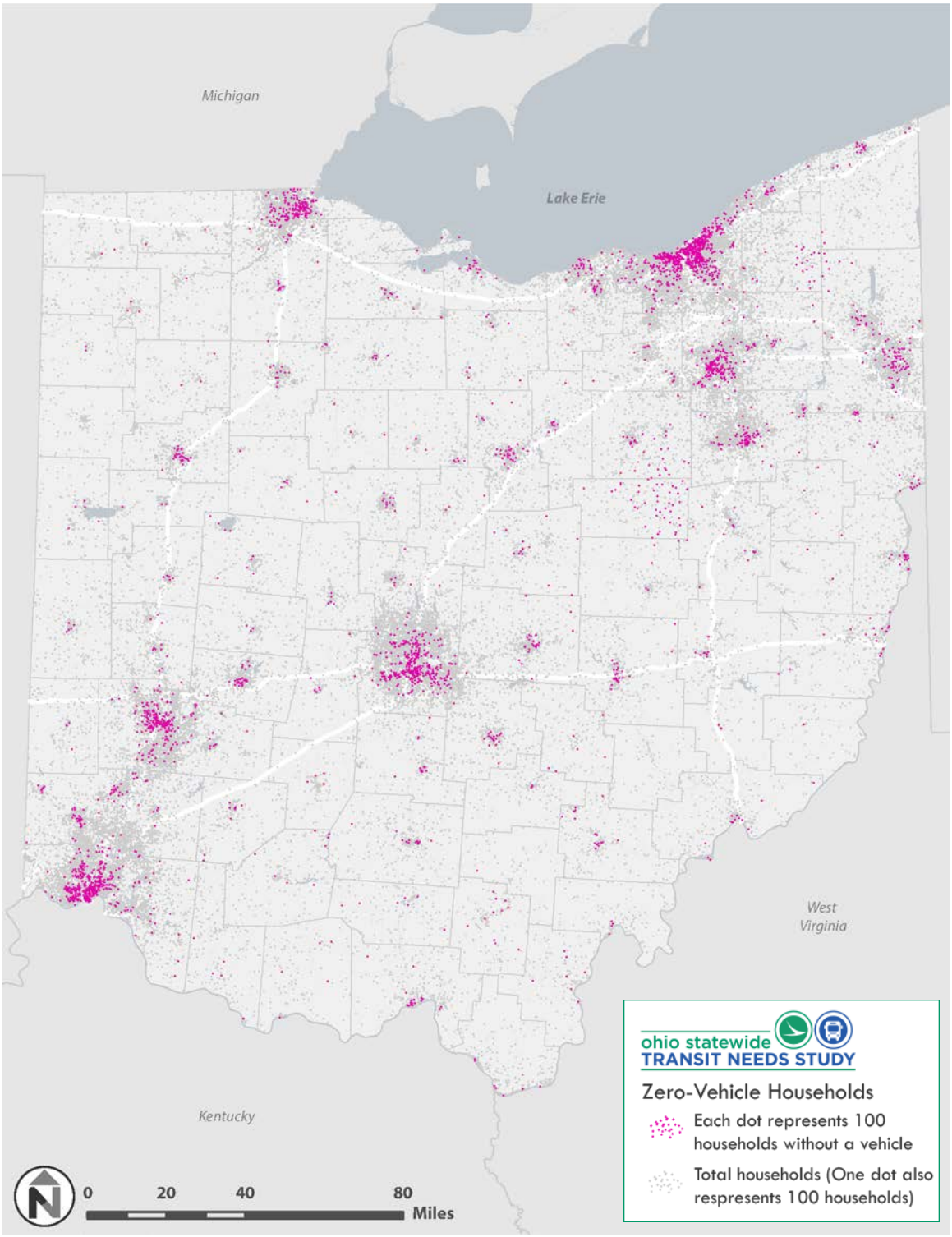


Figure 23: Zero-Vehicle Households



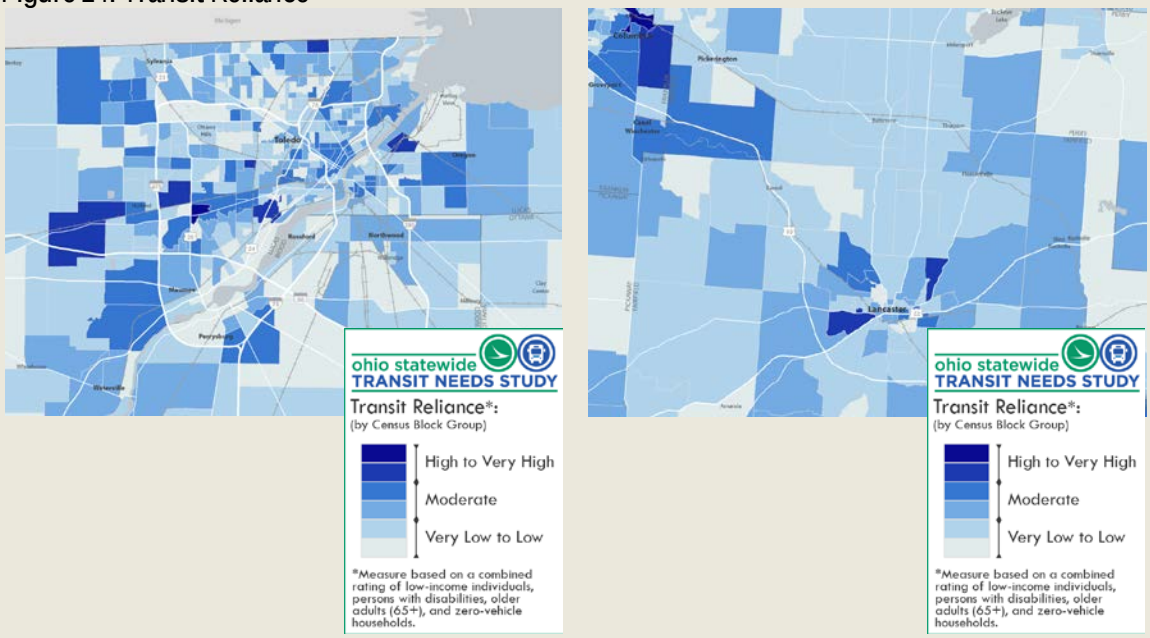
Urban and Rural Transit Reliance Examples

As part of understanding transit reliance across the state, the study team combined the four transit reliance factors into a single scale and mapped them for individual counties. Differences in census block group size across the state of Ohio make interpreting this analysis from a statewide perspective challenging; thus, a statewide map is not shown.[12] Instead, the transit reliance index shows the distribution of high reliance areas within a single county and suggests locations where transit service may be needed (see Figure 24). As a comparison, the same two areas examined in the density analysis – Toledo and Lancaster (Figure 16 and 17)– are reexamined from a transit reliance perspective.

In Toledo (Lucas County), the downtown core, major corridors, and areas on the outer edges of the city show the highest transit reliance. TARTA, the transit agency in Toledo, serves many of these corridors and areas already but may be able to identify gaps. Recommendations for the appropriate type of service are only possible, however, when the measure of transit reliance and the index of transit supportive development patterns are considered together. In Lancaster, two small areas show high transit reliance. Lancaster's county-wide demand response service provides transit to these areas.

In both cases, areas on the edges of urbanized areas (Toledo and Columbus (northwest of Lancaster)) show higher reliance than some areas closer to downtown, which can be counter-intuitive. With development patterns over the past half-century, populations that tend to rely on transit have become more dispersed along with housing and employment. Challenges exist in serving these areas with transit, and some areas may be impractical to serve, but the analysis provides a necessary understanding of where high transit reliance exists.

Figure 24: Transit Reliance



[12] Census block groups are sized to contain between 600 and 3,000 people. As a result, urban areas are typically comprised of many geographically small blocks, while rural areas tend to have fewer but geographically larger blocks. While this design is useful for data analysis, mapping the data on a large scale can distort the readers' perception of the data; our eye tends to focus on large census block groups and has a harder time seeing the relative importance of a cluster of small census block groups.

Findings from Market Analysis

Together, development patterns and transit reliance tell a compelling story about transit in Ohio. The state is a somewhat unique network of large urban areas, various well established small- to medium-sized urban areas, and a small town or city in nearly all of the 88 counties. Yet, Ohio's population remains heavily oriented towards small urban and rural areas, with about 40 percent of the population living outside of major urbanized areas. Additionally, the urban areas have lost density since at least 2000. These development patterns over the past half century mean that a key indicator of transit use, density, is below that of even the U.S. overall. Conversely, demographic characteristics suggest that more transit is needed. Thus, the challenge to serve these dispersed, high need communities is very real.

Ohio's low density development challenges the delivery of cost effective transit service. Transit agencies are serving areas with low density development in some areas. Serving these areas efficiently requires careful consideration of appropriate service type, span, and frequency to meet need and demand.

There are small towns scattered throughout Ohio, some of which have sufficient density to support fixed route service. There may be opportunities for transit services that connect to or from small towns, especially if they are located relatively close to larger urbanized areas.

Ohio's population includes individuals who likely rely on public transportation to meet part of their transportation needs. Developing transportation infrastructure that supports these individuals in their need to travel to work, school, and basic services is necessary.

Cities remain the primary areas where providing public transportation would benefit the most people and potentially attract even greater density and development. To meet more of the needs of more Ohio residents, however, strategies for providing some level of service to those who do not live in dense areas are necessary. Future trends and patterns will change the transit story to an unknown degree and in unknown areas, but transit agencies can play an integral role in shaping the story.

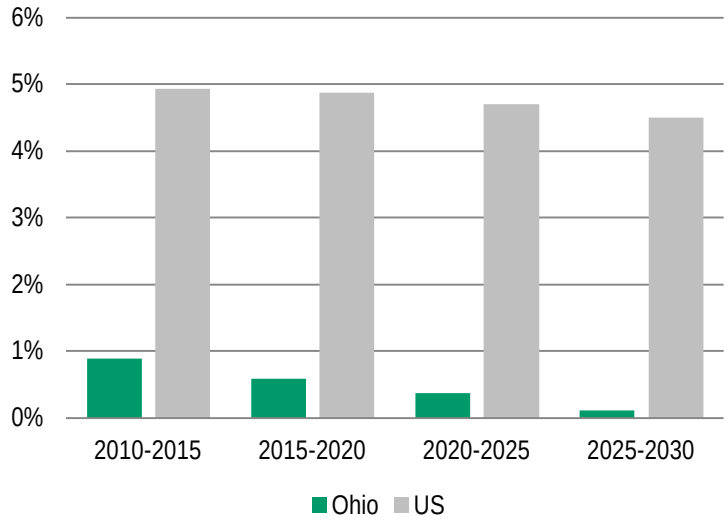
Trends That Will Bring Ohio to Where It Is Tomorrow

Many past and present trends in Ohio will likely continue into the future, but others may change slightly or new ones may appear. Predictions of the future are often limited by the assumption that things will remain more or less the same as they have been. Whether this assumption holds true is influenced by many factors, but perhaps one of the strongest is simply the preferences and values of generations as they age. Though Ohio does not always match the nation as a whole, the state must pay attention to developing trends to remain competitive and attract investment.

Ohio's Population Growth Rate Will Continue to be Less Than the National Average

As has been the case since 1970, Ohio's population is expected to grow slowly and minimally. See Figure 25 for a comparison of the estimated five-year population growth rates of Ohio and the United States between 2010 and 2030.

Figure 25: Estimated 5-Year Population Growth Rate, 2010-2030[13]



Suburban Sprawl Continues to Typify the Distribution of Ohio's Population

Suburban sprawl represents the primary growth pattern nationally and in Ohio; however, it is more typically associated with a need to accommodate significant population growth, which is not the case here. Residents of the central cities continue to migrate to lower density suburbs on the metropolitan fringe and people from more rural areas continue to move into the metro region.[14]

Ohio's Population is Aging, Particularly in Rural Counties

Ohio's population is growing significantly older overall as the Baby Boomer generation ages. Between 2010 and 2030, the state's population is estimated to grow only 2 percent. During this same time period, the state's senior population (persons aged 65 or older) is expected to increase by 66 percent. By 2015, a third of all seniors will be Baby Boomers, and that percentage jumps to nearly 9 in 10 by 2030.[15] Though Ohio is aging at a rate comparable to the rest of the nation, one in four Ohioans are estimated to be a senior in 2030, compared to one in five Americans.[16]

The increase in the percentage of people over the age of 60 in Ohio will be greatest in the most rural counties of the state. Every county in Ohio is estimated to have more people over the age of 60 as a percentage of its population through 2050. Over a third of all residents in three eastern Ohio counties – Noble, Monroe, and Columbiana – will be over the age of 60 in 2050.[17]

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[13] Ritchey, P. N., Mehdizadeh, S. & Yamashita, T. (2012). Projections of Ohio's Population 2010-2030. Scripps Gerontology Center, Miami University, Oxford, OH.

[14] Greater Ohio Policy Center. (2010). Shaping the state. *Greater Ohio Policy Center*. Retrieved from http://www.greaterohio.org/publications/shaping-the-state

[15] Ritchey, P. N., Mehdizadeh, S. & Yamashita, T. (2012). Projections of Ohio's Population 2010-2030. Scripps Gerontology Center, Miami University, Oxford, OH.

[16] Ibid.

[17] Ritchey, P. N., Mehdizadeh, S. & Yamashita, T. (2012). Maps of Ohio's 60+ Population by County 1990-2050. Scripps Gerontology Center, Miami University, Oxford, OH.

Ohio Struggles to Attract and Retain Millennials and Youth Population

From 2000 to 2010, the nation posted a modest increase in its population aged 0-14, while this age cohort declined by 6.5 percent in Ohio. Similarly, the percent of population aged 15-24 grew by 2.7 percent in Ohio, significantly less than the national average of 11.3 percent. Thus, Ohio is faced with both a rapidly aging population and a decline in its younger "replacement" population.[18] In the future, young people and Millennials (those born approximately between the early 1980s and the early 2000s) will be a smaller share of Ohio's population compared to the nation as a whole. Ohio's population aged 0-14 is expected to decrease by 6 percent between 2010 and 2030, while the nation's population aged 0-14 will increase by 17 percent. Similarly, Ohio's population aged 15-24 is expected to decrease by 8 percent by 2030, while the nation's population aged 15-24 will increase by 12 percent.[19]

Ohio's Households are Changing in Composition and Size

Single person households are the most common household composition in Ohio. These households account for nearly 30 percent of all of the households. Married couples without children (29.0 percent) and married couples with children (19.3 percent) were the other most common types of households in the state.[20] In addition, married couples with children make up a smaller portion of the total households in Ohio's metros than the national average. Nationwide, growth in households will come from those without children, including single-person households, and the share of household growth claimed by those aged 35-64 will almost halve (from 65 percent from 1990 to 2010 to only 35 percent from 2010 to 2040).[21]

Ohio's Foreign-Born Population Will Grow and High Poverty Rate Will Linger

The growth in the number of foreign-born residents in Ohio will continue to outpace the growth in the number of U.S. born residents in the state. Similarly, the increase in poverty statewide since the 2008 recession has lingered, which increased the population that has the most difficulty affording a personal vehicle and is most in need of access to jobs and other services.

The New Shared Economy is Growing, Particularly among Young Adults

The Shared Economy is defined as an increase in the use of sharing mechanisms to access tangible assets, services, information, technology, and even decision-making arrangements — as opposed to an "ownership economy" model in which individuals have permanent control vested in titles, contracts, etc. Many people have experienced the basic elements of the shared economy when they have rented tools or rug cleaners for the occasional short term use. The "shared economy" expands that concept to a much broader range of assets, services, and information.

A traditional transportation example is the car- or van-pool, but the sharing economy has expanded that to include bike-sharing, short term car rental (from companies), peer-to-peer car-sharing, peer-to-peer ridesharing services, and transportation providers that use mobile application software (apps) to link potential passengers with vehicles for hire.

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[18] US Census Bureau 2010

[19] Ritchey, P. N., Mehdizadeh, S. & Yamashita, T. (2012). Projections of Ohio's Population 2010-2030. Scripps Gerontology Center, Miami University, Oxford, OH.

[20] Greater Ohio Policy Center. (2010). Shaping the state. *Greater Ohio Policy Center*. Retrieved from http://www.greaterohio.org/publications/shaping-the-state

[21] Nelson, Arthur. (2009). Reshaping America's built environment. *Metropolitan Research Center, University of Utah.*

Technology and Shared Information Make Transit More Convenient and Attractive

Technology, particularly the smartphone and the accompanying applications, or "apps", have enabled the creation of many forums for people to share economic systems. These same technologies also provide an information gateway to link potential users with available services or resources. Sharing of assets or services among peer users is now much more feasible, enabling a person desiring a ride to connect with another individual who is willing to provide the desired ride (for payment).

Transit can be much more user friendly as a result of these types of technologies, especially real-time information. If transit vehicles are equipped with GPS, transit providers (or others if the data is shared) can let users know when a particular vehicle will be at a particular stop. One of the major impediments to transit use has been the difficulty in knowing where bus routes go, when they go, where the stops are located, how long it will take, and what the fare will be — information that can now be provided by the transit system, or by independent app developers.

Transportation Preferences are Changing

A telltale sign in changes to transportation preference has been the notable decrease in the vehicle miles traveled (VMT) per capita since 2004. This represents a dramatic departure from previous trends, which had largely been steadily upward since the age of widespread automobile ownership. Per capita VMT peaked in 2004 and has declined each year since then for a total decrease of 7.5 percent.[22] The discussion below focuses on those generations that will have the greatest transportation impacts in Ohio in the near future.

Millennials (Generation Y) – Millennials prefer to live in communities with public transportation options – more than any other generation.[23] In addition, the greatest decrease in average annual vehicle miles traveled (VMT) per capita between 2001 and 2009 was among young people (16 to 34-year olds), most of whom are Millennials.[24] The use of transportation alternatives has increased among this cohort, taking 24 percent more bike trips, walking to their destinations 16 percent more frequently, and increasing the number of public transit passenger-miles traveled by 40 percent between 2001 and 2009. The trend toward reduced driving among young people is likely to persist as a result of technological changes.[25]

Baby Boomers and the Silent Generation – Baby Boomers have a slight preference to live in communities with public transportation options, while the Silent Generation is the generation that is most likely to become less mobile and more transit dependent in the near future.

Community Preferences are Changing

Millennials have reached or are soon to reach an age of considerable mobility in terms of moving households. Data shows that this demographic group prefers living in compact neighborhoods within medium-sized or large cities. In addition, older generations show some of the same

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[22] Sivak, Michael. (2014). Has motorization in the U.S. peaked? Part 5: Update through 2012. University of Michigan Transportation Research Institute.

[23] Urban Land Institute. (2013). America in 2013: A ULI survey of view on housing, transportation and community. Retrieved from http://uli.org/research/centers-initiatives/terwilliger-center-for-housing/research/community-survey/

[24] Dutzik, Tony & Baxandall, Phineas. (2013). A New Direction: Our changing relationship with driving and the implications for America's future. Retrieved from http://www.uspirg.org/reports/usp/new-direction

[25] Ibid.

preferences for mixed-use and compact neighborhoods.[26] When strictly looking at Ohio, about 56 percent of Ohio respondents would prefer to live in a mixed-use community offering a variety of housing choices, walkable destinations, and other features. In Ohio today, no more than one in five households has this option.[27] This mismatch between supply and demand is starting to be addressed as more housing is being built in Columbus, Cleveland and Cincinnati (among other cities). Creating more housing in urban neighborhoods creates more opportunities for transit.

Housing Preferences are Changing

There is a growing preference for attached and smaller detached homes. Nationwide, research shows that about 40 percent of respondents would choose to own or rent an apartment or townhouse if it had an easy walk to shops and restaurants and offered a shorter commute to work. About 60 percent of those preferring detached options would choose smaller lots if they had the same attributes.[28]

Findings from Trends Analysis

The context provided by the market analysis and trends suggests that Ohio will need to invest in public transportation in its urban, suburban, and rural areas:

- The need to make the state and its cities more attractive to younger Ohioans, to plan for an aging population, and to stem the "sprawl without growth" phenomenon all underscore the need for concerted place-making efforts in existing Ohio neighborhoods.
- Changing demographics and the demand for walkable neighborhoods from both senior and younger demographics suggest that investments need to be targeted to make neighborhoods healthier and more attractive to these populations. Incentives need to encourage fully integrating housing, transportation, safety, and school construction.
- Re-creating vibrant neighborhoods within the core of the metro region is a critical component to helping attract new populations and to reverse sprawling growth patterns.
- Strategies for addressing the projected increases in Ohio's senior population need to be studied and considered, particularly in the areas of mobility and services.
- With roughly half of the state's population commuting across county borders to work, transit agencies should consider becoming less oriented around a specific county and more oriented around a region.

[26] Urban Land Institute. (2013). America in 2013: A ULI survey of view on housing, transportation and community. Retrieved from http://uli.org/research/centers-initiatives/terwilliger-center-for-housing/research/community-survey/

[27] Nelson, Arthur. (2009). Reshaping America's built environment. *Metropolitan Research Center, University of Utah.*

[28] Ibid.

- Twenty-seven counties in Ohio do not have access to public transportation, representing about 9 percent of the state's population. Without public transportation, only people participating in specific programs for the highest need individuals are able to reach essential services without a personal vehicle. Several counties have pockets of high need or are located close to one of Ohio's largest cities. There may be opportunities to support transportation to regional medical centers, jobs, and other services in these areas.
- In suburban areas, greater regional transit coverage will be needed to provide mobility for residents and access to suburban employment, calling for increased coverage and regional linkages. New development in suburban areas will need to be at higher densities to meet housing demand from smaller households, and transit may be a place-shaping tool linking concentrated nodes of mixed-use and higher density development.
- Rural Ohio, facing the increased demands from the aging population and increased poverty, will also need significant transit development. Many areas have no services at all and in others the service coverage, hours, and capacity are severely limited. Basic transportation to medical and social services for those unable to drive is critical to maintaining people in their communities, and improved services are needed to provide access to employment.

TRANSIT FUNDING

In addition to these larger socio-economic trends, transit agencies are also being impacted by changes in the way services are funded. The combined expenditures of Ohio's 61 transit agencies are more than $893 million including both capital projects and service operations[29]. The majority (nearly 72 percent) of that funding is raised locally through sales, property, and business and occupation taxes, as well as transfers from local general revenue funds. The federal government is also an important resource, as are contracts with other agencies (human service transportation), farebox revenues, and state resources. Urban transit systems tend to rely more heavily on local funds, while rural agencies depend on a combination of federal and contract revenues (see Figure 25 and 26).[30]

Figure 26: Funding Sources for Urban Transit Systems in Ohio, 2012

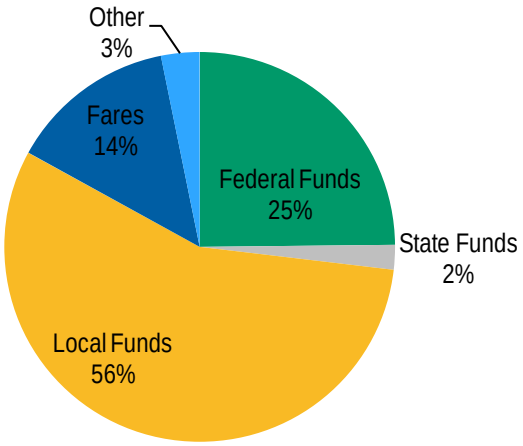
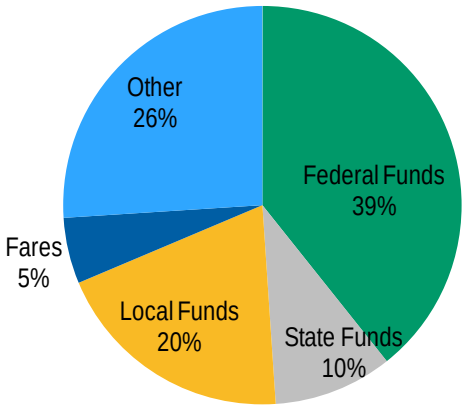


Figure 27: Funding Sources for Rural Transit Systems in Ohio, 2012



[29] ODOT Status of Transit Database, 2012

[30] ODOT Status of Transit Database, 2012

Federal Funding

The federal government has traditionally been an important funding resource for transit agencies, especially for developing new services in urban areas and supporting transit service in rural communities. The federal government's annual investment in transit nationally is roughly $10.7 billion, and in 2014, the federal government provided approximately $173.2 million[31] to transit systems in the State of Ohio.

Historically, transit agencies received federal funds through a combination of formula programs as well as through Congressional earmarks. Transit agencies around the country benefitted from earmarks, and for many years earmarks funded large capital expenditures such as vehicle purchases and developing new services or systems. However, the use of earmarks and the practice of directing funds to specific projects and institutions became controversial and in 2011, Congress largely stopped using them. For many transit agencies, the elimination of earmarks means funding programs follow a more predictable, transparent, and arguably more equitable process. However, the loss of earmarks also means many transit agencies no longer have access to large, one-time grants and instead are receiving funding as smaller annual grants.

Moving Ahead for Progress in the 21st Century (MAP-21)

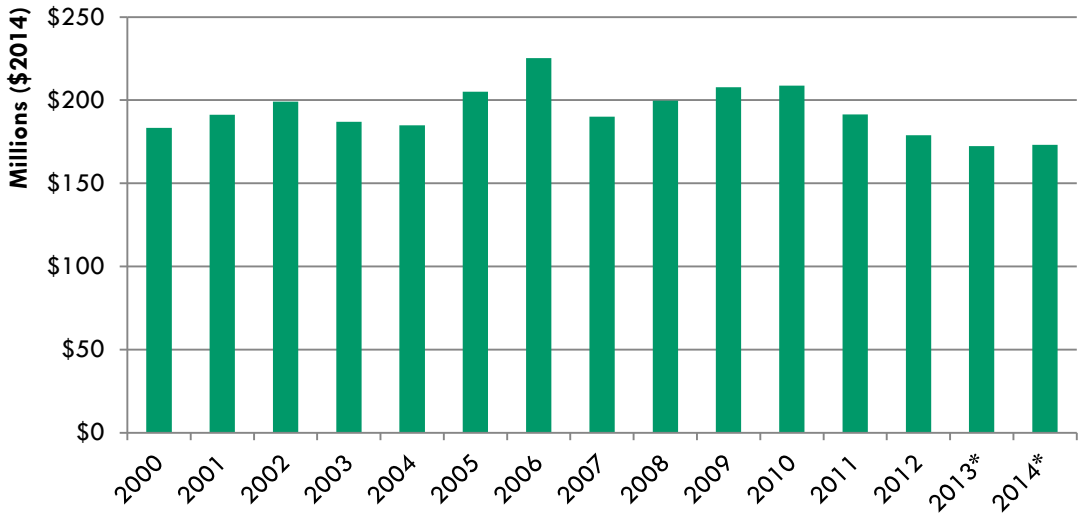
MAP-21 is the current authorizing legislation for federal transit and highway funding programs. It was enacted in July 2012, went into effect October 1 of that year, and was authorized to guide transportation funding until September 30, 2014. While MAP-21 did not significantly affect overall federal funding levels for transit, it made significant changes to program structures and associated requirements. In particular, MAP-21 allocated a larger share of the available funds by formula, and placed increased emphasis on safety and the preservation of existing resources, known as State of Good Repair.

MAP-21 allocated $10.72 billion to public transportation programs nationally in FY 2014, which are administered by the FTA and distributed to states and transit agencies. Ohio received about $173 million of the total allocation, or less than 2 percent. With a handful of exceptions, FTA programs are designed for transit agencies operating in either urban or rural areas and require that local entities contribute matching funds. Generally speaking, FTA programs will support up to 80% of capital projects and 50% of operating projects in non urbanized areas[32]; therefore, local transit agencies must raise roughly 20% of the cost of any capital project and 50% of the cost of operating services. Matching funds may consist of funds provided from any resource, except funds provided by the USDOT. The trend for federal funding levels is one of level funding; slight increases in funding levels were observed in 2009 and 2010, but these increases largely reflect the American Recovery and Reinvestment Act of 2009 (ARRA), which was a single investment but required several years to implement (see Figure 27).

[31] Federal Transit Administration, Allocation by Formula and Discretionary Program by State FY 1998 - 2014

[32] FTA provides only limited support for service operations in urbanized areas. Some exceptions apply (see Appendix L).

Figure 28: FTA Funding Allocations to Ohio (All Programs), 2000-2014



Source: Federal Transit Administration, "FTA Allocations for Formula and Discretionary Programs by State FY 1998-2014 (Excel)", http://www.fta.dot.gov/12853_88.html

Note: Data from 2013 and 2014 does not include discretionary grants, but as of June 2014, Ohio has not received any FTA discretionary funding.

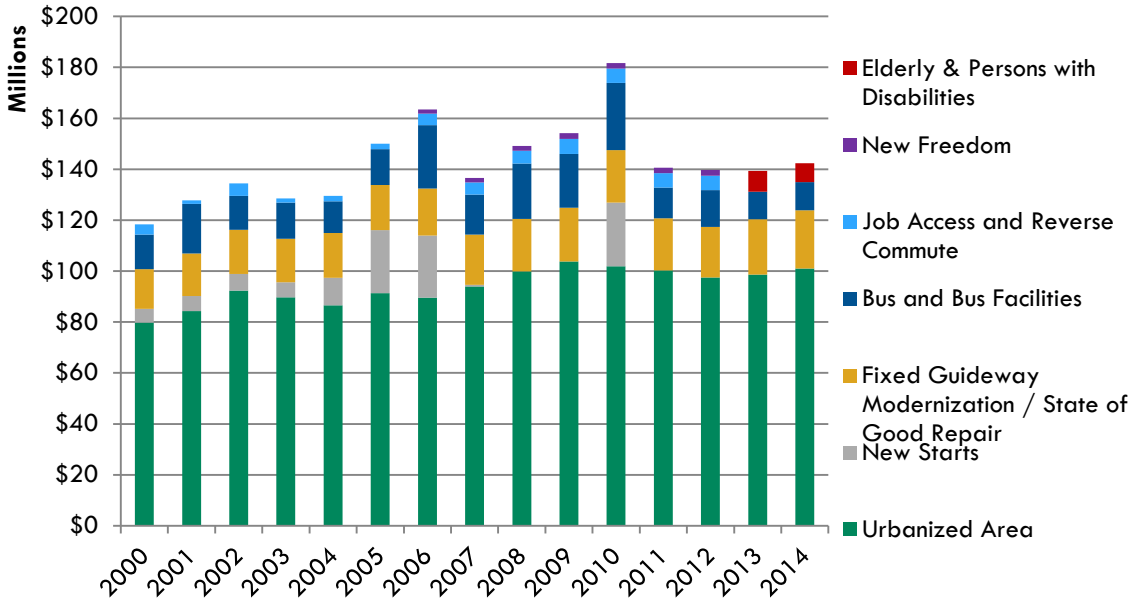
U.S. Department of Transportation Funding

In addition to funding programs administered by the FTA, both the Federal Highway Administration (FHWA) and USDOT administer grants and programs that can be used to support a variety of different transportation projects, including transit. States and metropolitan planning organizations, for example, are permitted to "flex" funds by using a portion of their FHWA allocations to invest in public transportation. The "flexible" funding programs include the Surface Transportation Program (STP), the Congestion Mitigation/Air Quality Improvement Program (CMAQ), and, in limited instances, the National Highway Performance Program (NHPP). On a national basis, the practice is fairly common with 42 states flexing some FHWA funds to support transit; however, in most cases the amount of money states flexed is small[33]. In 2012, Ohio flexed $20 million of its highway funds to public transit. ODOT will continue to flex $20 million of FHWA funds annually as a budgeted line item until 2015. MPOs are also allowed to flex FHWA funds to transit; many MPOs in Ohio take advantage of this opportunity.

The U.S. Department of Transportation also administers a handful of competitive grant programs that transit agencies or state departments of transportation (state DOTs) may submit projects for consideration. Currently, one of the largest competitive grant opportunities is the TIGER program that provides funding for transit, road, rail and port projects. As noted earlier, TIGER grants first became available under ARRA; Congress has appropriated TIGER funds in each year since enacting ARRA, including $600 million in FY 2014. The program is very competitive – in FY 2013, 585 applications competed for $474 million and just 52 projects were awarded grants.

[33] General Accounting Office (GAO), November 2012

Figure 29: FTA Funding Allocated to Urban Transit Systems in Ohio (All Programs), 2000 – 2014



Source: Federal Transit Administration, "FTA Allocations for Formula and Discretionary Programs by State FY 1998-2014 (Excel)", http://www.fta.dot.gov/12853_88.html

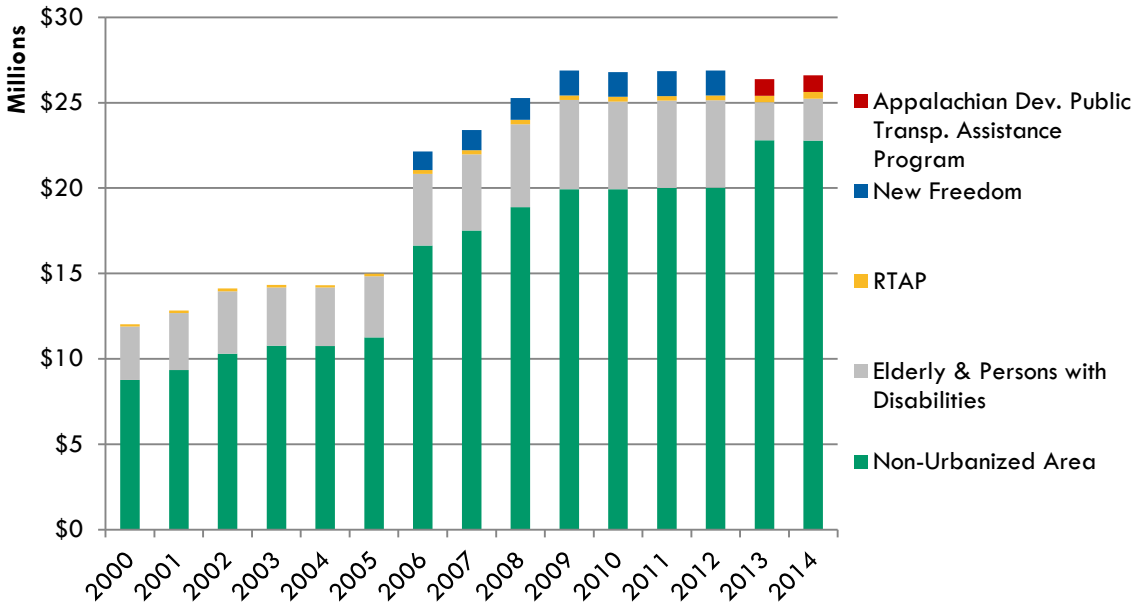
FTA Funding – Ohio's Rural Transit Systems

The amount of FTA funding available to Ohio's rural system remained relatively flat or realized slow growth between 2000 and 2014 (see Figure 29). In the early 2000s, the federal rural program was relatively small, providing roughly $10 to $15 million in funding for all rural systems in Ohio; by 2014, the 5311 program provided roughly $26 million in funding.

Consistent with urban systems, changes made to Section 5310, Section 5316 and Section 5317 under MAP-21 have an impact on rural transit funding in Ohio. Section 5316, as discussed, was eliminated and the resources were folded into the Section 5311 program. Section 5317 was also eliminated with funding folded into the Section 5310 program.

The major change, therefore, is in how the program is administered. Under SAFETEA-LU, the FTA allocates Section 5310 funds to state governments and ODOT managed the program and allocated funding. Under MAP-21, ODOT will manage the Section 5310 program for small urbanized and rural areas only. The impact of this change is not anticipated to be significant because ODOT historically awareded small urban and rural areas roughly 40% of the state's Section 5310 funds. For purposes of the graph (Figure 29), Section 5311 and 5317 funds are assigned to the urban systems because historically the programs were administered by ODOT.

Figure 30: FTA Funding Allocated to Rural Transit Systems in Ohio (All Programs), 2000 – 2014



Source: Federal Transit Administration, "FTA Allocations for Formula and Discretionary Programs by State FY 1998-2014 (Excel)", http://www.fta.dot.gov/12853_88.html

FTA Funding – Ohio's Rural Transit Systems

Federal funds for Ohio's rural programs experienced considerable growth between 2005 and 2006. Since 2006, FTA funding has largely remained relatively flat or realized slow growth (see Figure 29). In the early 2000s, the federal rural program was relatively small, providing roughly $10 to $15 million in funding for all rural systems in Ohio; by 2014, the 5311 program provided roughly $26 million in funding. As the funding for rural transit increased in Ohio during the late 1990's and through 2006, many new rural systems were developed and began providing service. However, with the flat funding over the past several years ODOT stopped funding new systems to assure adequate funding for the existing systems.

Like urban systems, rural transit agencies are also affected by inflation. As a result, even though the amount of money provided annually has not changed, the purchasing power of those funds is decreased.

State Funding

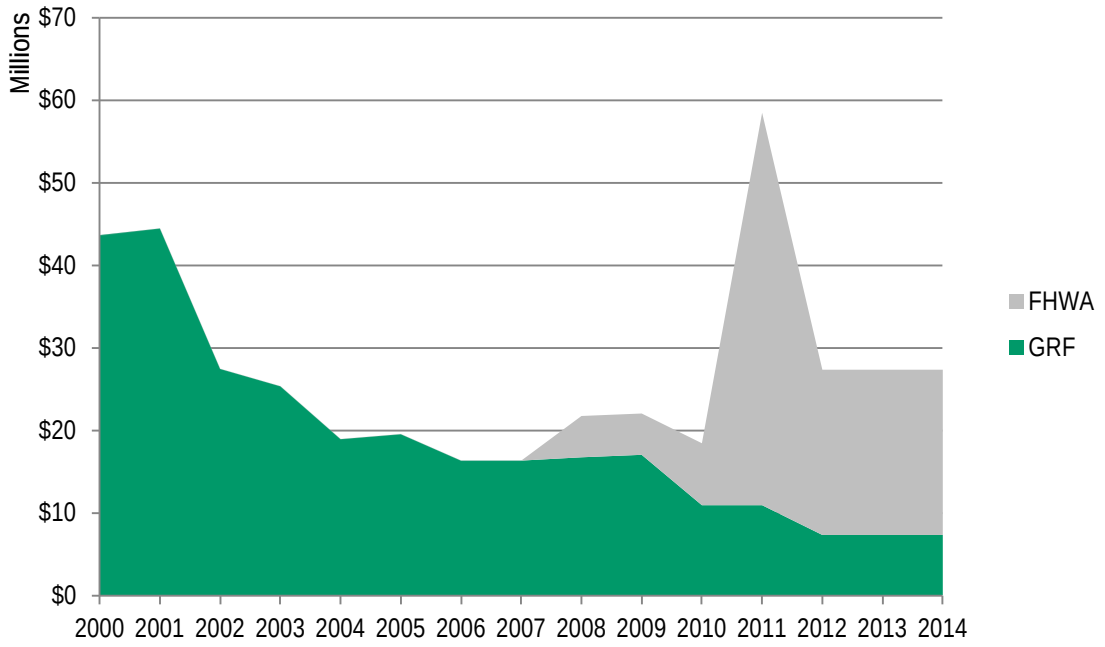
State funds have been a major source for transit funding in Ohio. In Ohio, the amount of funds designated to support public transportation has changed significantly over the past decade. In 2000, the State of Ohio contributed roughly $44 million in general revenue funds to public transportation. By 2014, funding levels are at approximately $27 million, with about $7 million (27 percent) provided through general revenue funds (GRF) and $20 million (73 percent) provided by flexing FHWA funds to transit programs. Decreases in state funding have limited the ability of local areas to support transit operations. One indicator of the funding challenge is Ohio has not had any new transit agencies form since 2004.

Historically, Ohio funded public transportation by dedicating GRF to transit and allocating the funds based on the governor and state legislature's priorities. These priorities were articulated as part of five transit programs:

- **Rural Transit Program** provides assistance to Ohio's rural transit agencies. The program includes separate funding for operating and capital programs.
- **Urban Transit Program** provides assistance to Ohio's urban transit agencies. Unlike the rural program, the urban transit program provides funds without specifying use to capital or operating.
- **Public Transportation Discretionary and Transit Capital Programs** (both defunct as of 2002) provided discretionary resources for capital projects. Transit agencies submitted projects that were reviewed, scored, and selected on a competitive basis.
- **Elderly and Disabled Fare Assistance** allows agencies to extend ADA-mandated half price fares for senior citizens and persons with disabilities during off-peak periods into peak periods. The program is divided into funds to support rural and urban agencies.
- **Coordination Grants** (defunct as of 2009) provided funds to encourage service coordination initiatives between public transit operators and human service transportation agencies.

The use of GRF in Ohio to fund public transit has been in steady decline; from more than $43 Million in 2000 to the current level of $7.3 Million in 2013. This represents a decrease of nearly 85% over the past 14 years. As GRF was cut from the transit budget, ODOT began flexing FHWA funds to support eligible transit projects as one strategy to help address the GRF shortfall. Starting in the early 2000's, the availability of FHWA funds for transit projects was at the discretion of ODOT Executive Leadership and varied depending on the circumstances, especially during the very difficult recession beginning in 2008 when $50 million was made available. Beginning with the 2012/2013 Biennium, the Governor and the legislature agreed to codify the use of FHWA funds for transit projects by including $20 Million each year in Ohio's Transportation Budget. These funds were also included in the 2014/2015 budget. The flexed FHWA funds are used in both the Urban formula program and the Ohio Transit Preservation Partnership Program, a discretionary capital grant program with a priority to replace rolling stock (vehicles) that have exceed their useful life.

Figure 31: State Funding Trend: 2000-2014



Source: ODOT data adapted by Parsons Brinckerhoff

As the total amount and sources of state transit funding changed, so did state program priorities. For example, support for rural capital projects was eliminated. Another example is state resources devoted to staffing and administration of the transit programs, i.e., ODOT Office of Transit. In the past, the majority of the staff and administration were funded using state GRF. Now not only has there been an overall reduction in the number of staff, the staff that remain are mainly paid using FTA program Administration and Planning funds since the staff time spent on state programs and projects has significantly decreased.

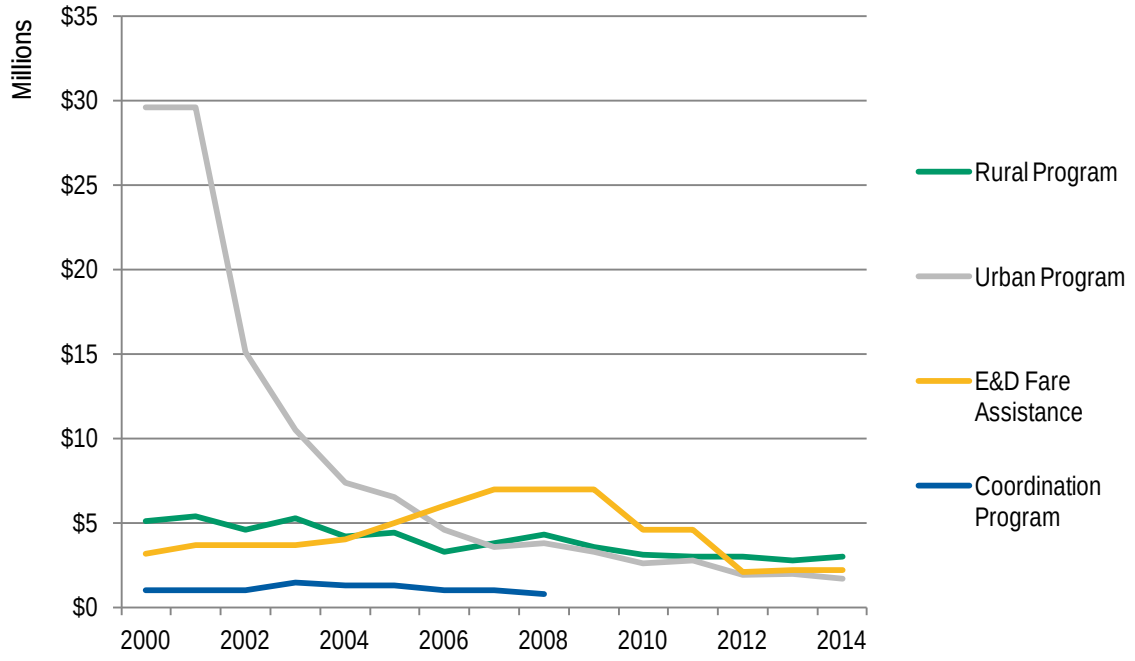
In addition, discretionary programs used to support investments in new services as well as support vehicle purchases (including both replacement and expansion vehicles), were eliminated in 2012. Another programmatic change was the elimination of state funds for the Ohio Coordination Program. Although funded at a relatively small level overall (roughly $1 million annually), this program was distributed as small grants that funded new initiatives for up to three years. The program is still funded with federal resources (Section 531) but not state funds. Other changes in the way transit programs were funded and organized include (see also Figure 31):

- **Significant reduction in the use of GRF to support urban transit services.** In 2001, GRF funds provided nearly $30 million to urban operators. Program resources were reduced over time such that by 2014, GRF revenues accounted for just $1.6 million for urban transit. It is worth noting, however, that all of the FHWA funds flexed to transit are dedicated to the urban transit operators.
- **Changes in the way urban and rural transit programs are funded.** GRF funding for the rural transit program was reduced by 25 percent between 2000 and 2014. In 2000, $4.2 million was allocated to the rural transit program; by 2014 funding was $3.1 million. This compares with the urban program, which was reduced from $29 million in 2000 to $1.6 million in 2014. Although urban transit services are now supported with

FHWA funds flexed from highway programs to transit, only the largest urban systems with local match can use these funds. Even with ODOT flex funding, Ohio's urban transit program lost roughly 24% of its funding.

- **Funding for the Elderly and Disabled Fare Assistance Program also experienced less significant cuts, especially for rural operators.** In 2000, the E&D Fare Assistance program was funded with $3.3 million; by 2014, the program allocates roughly $2.2 million, about 30% fewer resources. This compares with an 85% reduction in state funding overall. As part of cutting spending on this program, urban operators were no longer reimbursed for their fare assistance programs.
- **Elimination of funding for rural transit capital projects.** While rural funding for operations remains, funding for transit capital projects was eliminated. In 2000, the transit capital program was funded with about $1 million. Funding for this program was reduced steadily until 2006, when it was funded at $372,000. In 2007, the program was eliminated. It was restored for one year in 2008 and the eliminated again. It has not been funded since 2008.

Figure 32: ODOT Transit Programs Funding Trend: 2000-2014



Local Funding

In addition to federal and state funds, revenues raised locally are an important part of how transit agencies are funded in Ohio. Indeed, for many agencies including the largest urban transit authorities, local revenues account for most of the funding that supports the system. Overall in Ohio, local revenues – including passenger fares and contract revenues, but also contributions from local taxpayers – account for roughly 72 percent of the total investment in Ohio's transit industry. As mentioned, local funding represents a larger share of the agency budget in urban

areas (local funding accounts for 73 percent of all funding) and somewhat smaller share in rural areas, where local funding accounts for roughly half of transit agency budgets.

Figure 32 summarizes funding sources by transit agency type as reported by transit agencies to ODOT in the Status of Transit Database based on their budgets and accounting systems. As a result, the estimates listed do not match the funds allocated by the FTA or State of Ohio. Discrepancies between the sources reflect several factors, including time lapses between when funding programs and when allocations occur, especially for competitive grant programs as well as time lapses between the award of competitive grant funds and project initiation. Finally, the gaps may also reflect differences in fiscal year calendars.

Figure 33: Ohio Transit Funding by Agency Type and Source 2012 (in millions)*

	Urban	Rural	Total
FTA Funds (all programs)	$212.5	$14.7	$227.2
State Funds (GRF)	$17.5	$3.6	$21.1
Local Contributions (all sources)	$619.4	$18.8	$638.2
Other Revenues	$6.3	$0.3	$6.6
Total – all resources	$855.6	$37.5	$893.1

Source: ODOT Status of Transit Database

Note: Data shown is compiled from agency submissions to ODOT and may not match exactly with FTA estimates of funding provided.

Local Matching Requirements

The importance of local funding, in part, reflects the federal requirement that the use of federal funds must be matched by local revenue. FTA allows matching funds from any non-USDOT source; this means that transit agencies cannot use FHWA funds to match FTA grants, but they generally can use federal funds provided by other departments, especially funds provided by the Department of Health and Human Services (HHS) and Medicaid. State funds can also be used to match federal funds, as can money raised locally through taxes, fees, contracts and revenues generated through programs such as advertisements placed on buses and transit stops. Fares can also be used as a source of local revenues for urban areas. In rural areas, fare revenues can be considered as matching resources, but federal contributions to operating revenues are calculated net of fares, so the total agency operating budget is reduced by the amount of money raised through fares and federal resources are available for half of the remaining operating costs.

Transit operators that do not have a dedicated local funding stream are challenged not only with raising local funds but also the timing of how funds are awarded. Sometimes transit managers will secure local funds at the same time as they apply for federal grants. By the time federal funds are awarded, for any number of reasons, local funds are no longer available.

The inability to raise enough local funds to match the federal resources available is a real challenge for many communities in Ohio, especially transit agencies operating in small urban and rural areas. As of July, 2014, ODOT had roughly $21 million in federal funds that were obligated for spending in Ohio, but had not yet been spent due to a lack of matching funds. Nearly all of the unspent federal funds are associated with the primary FTA funding programs, such as Section 5310 and 5311 as well as the JARC and New Freedom

programs. Some of the unspent funds represent the balance or 'left over' funds from a completed project, while other unspent funds represent projects and programs that were never implemented because local transit operators were unable to raising matching funds.

Local Funding Sources

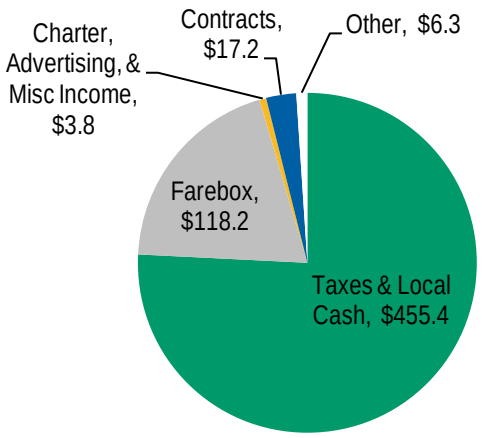
The main sources of local revenues to support transit in Ohio include:

- Passenger fares
- Sales and property taxes
- Earnings taxes
- Contract revenues
- Local government contributions from the general revenue fund
- Other miscellaneous sources, such as advertisement revenues

For agencies that have dedicated revenue sources, like sales and property taxes, this funding is by far the most important revenue source for the agency. Cleveland, Akron and Columbus, for example, fund between 70 and 80 percent of their operating budget with local tax revenues. Mid-sized agencies, such as Western Reserve (Youngstown) and Stark County (Canton), also receive between 70 and 80 percent of their operating budget from local dedicated tax revenues. Farebox and contract revenues are also important revenue sources and account for another 10 to 30 percent of operating revenue (see also Figure 33).

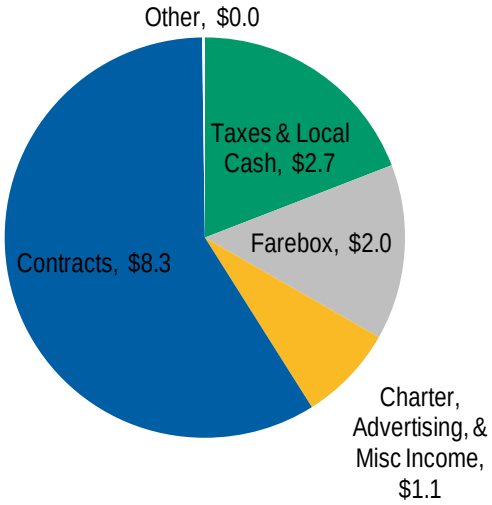
Ohio's smaller transit agencies, including agencies that operate fixed route, deviated fixed route, and demand response service, are more likely to rely on contract revenues and contributions from local governments to support their systems. These systems operate in counties that tend to have a much smaller tax base, making raising large sums through property or sales taxes challenging. Fares are also a less significant revenue source, in part because these systems carry significantly fewer riders but also because fares collected on demand response services are a much smaller portion of the service costs as compared with fares on fixed route service. Instead contract revenues are a more important revenue source for small transit agencies and agencies operating demand response service, especially as compared with Ohio's larger systems (see Figure 34).

Figure 34: Local Revenue Sources Used by Ohio's Urban Transit Agencies, 2012 (in $ millions)



Source: State of Transit Database, 2012

Figure 35: Local Revenue Sources Used by Ohio's Rural Transit Agencies, 2012 (in $ millions)



Source: State of Transit Database, 2012

Local Taxes – Sales and Property Taxes

The State of Ohio permits local jurisdictions to levy dedicated sales taxes and/or property taxes to support local transit services. Sales and property taxes are a fairly common source of revenue for transit agencies in the larger and more urbanized parts of Ohio. Currently, eight transit systems in Ohio are funded through dedicated taxes. The advantage of all dedicated revenue sources is control over funding streams. Agencies that receive general revenue contributions, by contrast, are not guaranteed funds and must work with county and city officials annually to get funding, often competing for very limited resources with several equally important local programs. The disadvantage of relying on local taxes is that tax revenues, especially sales tax revenues, fluctuate with the overall economy; for example, during the most recent recession many transit agencies experienced a considerable loss in the amount of revenue raised. The funding stream, therefore, is not always as predictable and as reliable.

Currently eight counties have dedicated sales taxes to support transit service (see Figure 35). In addition, there are a handful of municipalities that are not geographically in one of these counties, but still pay into the tax because they are part of the transit agency's service area (e.g. portions of the City of Columbus in Delaware County or the City of Reynoldsburg in Licking County, which also pays into the COTA system). Combined these taxes raise on the order of $400 million annually, with Cleveland accounting for roughly half of all revenues[34].

[34] Ohio Department of Taxation

Figure 36: Ohio Dedicated Taxes for Transit/Use of Sales Tax for Transit 2014

County	Transit Tax	County Tax	Total State and Local Sales Tax	Transit Agency
Cuyahoga	1%	1.25%	8%	Greater Cleveland Regional Transit Authority (GCRTA)
Franklin	0.5%	0.75%	7%	Central Ohio Transit Authority (COTA)
Lake	0.25%	1%	7%	Laketran
Mahoning	0.25%	1%	7%	Western Reserve Transit Authority (WRTA) (Youngstown)
Montgomery	0.5%	1%	7.25%	Greater Dayton Regional Transit Authority
Portage	0.25%	1%	7%	Portage Area Regional Transportation Authority (PARTA)
Stark	0.25%	0.5%	6.5%	Start Area Regional Transit Authority (SARTA) (Canton)
Summit	0.5%	0.5%	6.75%	METRO Regional Transit Authority (Akron)

Source: Ohio Department of Taxation, October 2013

Earnings Tax

The Southwest Ohio Regional Transit Authority (SORTA) in Cincinnati is the only large urban system not locally funded through sales and property taxes. Instead, SORTA's local funding is derived through the City of Cincinnati, through a 3/10 of one percent earnings tax dedicated to transit that was passed by city voters in 1972. Most of the revenues are transferred to SORTA, based on an agreement between the City and SORTA that was approved that same year. As part of the agreement, SORTA submits an annual budget request to the City. Although the City of Cincinnati does have budget control over SORTA, all changes in fares must be approved by the Cincinnati City Council. In addition, the agreement stipulates that any significant new service outside the City cannot be funded through the earnings tax. As a result, SORTA has contracts with Butler, Clermont, and Warren counties for service in those areas. There are no similar arrangements with Hamilton County or individual communities outside the City within Hamilton County.

The earnings tax was considered to be a temporary, emergency measure that would be replaced by a dedicated sales or property tax in Hamilton County. However, attempts to pass countywide transit taxes were not successful; the most recent attempt was in 2002.

General Revenues

Many counties in Ohio fund transit through contributions made to transit agencies from local general fund revenues. This is a fairly common form of funding for transit agencies in Ohio, especially in rural and small urban areas.

The advantages of using general revenue funds to support transit are that it demonstrates a community's commitment to funding transit service. The disadvantage is that general funding is typically not dedicated to transit, so transit managers must advocate for the funding every year and must compete for funds among other worthwhile investments. General fund revenues tend to be less stable compared with other sources of funding.

Contract Revenues

Contract revenues typically refer to revenues earned through contracts with human service agencies, universities and large institutions to provide transit services. Contract revenues tend to be more common in rural and small communities, where transit agencies will work with human service agencies to provide a single set of transportation services. Contracts with universities, which often allow students and associated university personnel to ride transit without paying a fare, tend to be more common in larger urban communities. More information on transportation service coordination and how transit agencies maximize contract revenues is provided in Appendix C.

Fares

All transit agencies in Ohio charge fares to passenger using their services and use fare revenues as part of their local funding sources. Fares for fixed route services are as high as $2.25 and as low as $1.00 for a one-way adult cash fare. Demand response services not including fares charged for ADA paratransit services range from $0.75 up to $20.00 for longer distance trips. Overall, fares accounted for 13 percent of all transit agency revenues in 2012. The urban transit operators earned 14 percent of their revenues through fares, while rural agencies earned 5 percent.

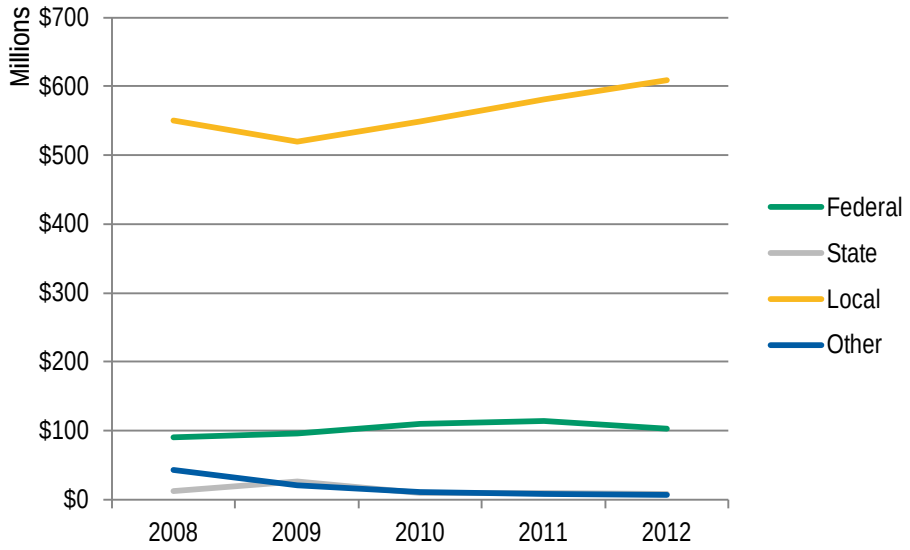
Other sources

Most of Ohio's transit agencies earn additional revenue through a variety of programs, such as advertisement sales to help cover operating costs and match federal funds. For the most part, however, these resources represent a much smaller portion of the overall budget.

Trends

The trends in transit funding demonstrate the increased importance of local funding sources between 2008 and 2012, as state funds diminish and federal funds remain relatively flat (see Figure 36). The trends for urban and rural systems are similar; the investment in transit service dropped slightly between 2008 and 2010, likely in response to the economic recession affecting nearly all of the United States. As communities and transit agencies started reinvesting in their services, most of the growth is attributable to local resources (see Figures 37 and 38). The data shows rural systems did see an increase in the amount of federal funds available, growth that is roughly evenly matched by increases in local funding.

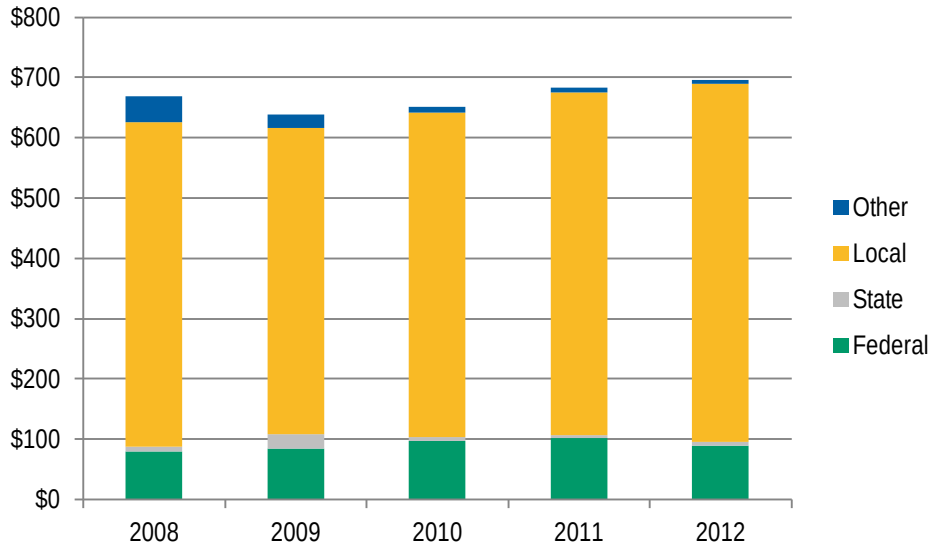
Figure 37: Ohio's Total Transit Resources by Funding Source, 2008 to 2012[35]



Source: ODOT State of Transit Database

Note: Local revenues include tax revenues, general revenue fund contributions, farebox revenue, and contract revenues

Figure 38: Ohio's Urban Transit Systems: Total Investment by Funding Source, 2008 to 2012[36]



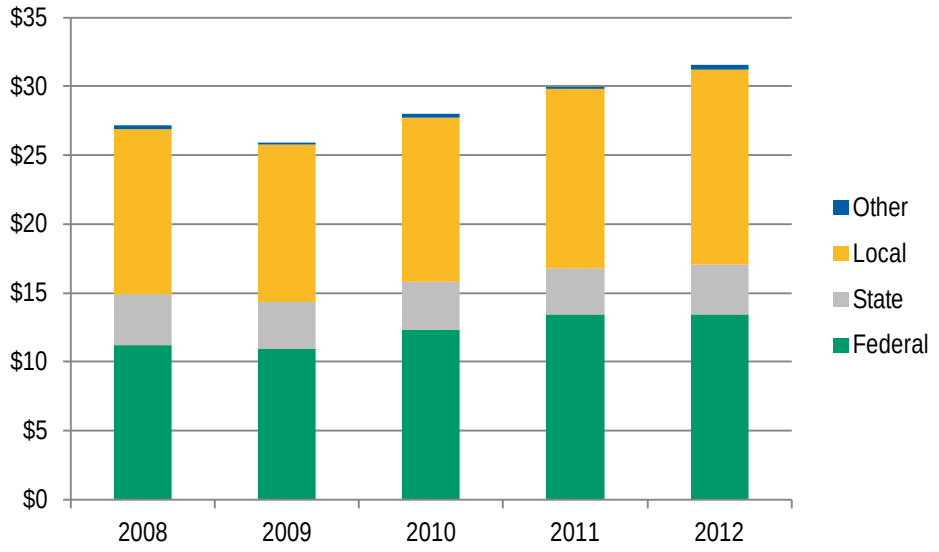
Source: ODOT State of Transit Database

Note: Local revenues include tax revenues, general revenue fund contributions, farebox revenue, and contract revenues

[35] Local revenues include operating resources only

[36] Local revenues include operating resources only

Figure 39: Ohio's Rural Transit Systems: Total Investment by Funding Source, 2008 to 2012[37]



Source: ODOT State of Transit Database

Note: Local revenues include tax revenues, general revenue fund contributions, farebox revenue, and contract revenues

Findings from Funding Analysis

In 2012, Ohio transit agencies combined invested nearly $900 million annually in their communities; this estimate includes operating and capital spending and all funding sources, including federal, state, local, farebox and contact revenues. The vast majority of this – nearly 96 percent - is spent by the urban transit agencies.

The transit funding paradigm in Ohio changed considerably between 2000 and 2014. Federal funding methods and structures evolved in response to national economic conditions (2008 recession), political priorities, and the elimination of Congressional earmarking. State funds also decreased substantially during this time for many of the same reasons. In some areas, local revenues helped meet the shortfall but not in others.

Key findings from the funding trend analysis show that **funding is the largest and most significant challenge facing transit agencies in Ohio.** Challenges include:

- **Uncertainty** over future funding persists with MAP-21 set to expire in May 2015.
- **Erosion of purchasing power** as federal funding programs are funded at the same level they were in previous years. As inflation erodes the purchasing power, transit agencies are able to buy less service with the same amount of money.
- **Loss of earmarks** requires that transit agencies restructure how they fund capital purchases, such as vehicles. New funding programs suggest that transit agencies should "save" annual grants to accumulate enough money for large purchases, such as vehicles.
- New federal programs include **competitive grants**, such as the TIGER program to fund new service development and large capital projects**.** The grants are quite competitive, with the number of projects requesting funding outpacing the amount of money available.

[37] Ibid

- **Fewer state resources** are available to fund transit**.** The State of Ohio directs roughly $27 million annually to transit systems in the state, of which less than $8 million is State GR funds. State funds account for just 2 percent of transit spending statewide.
- Local communities are funding transit but **the ability of communities to raise money locally is not equally distributed** across the state and not always in line with the need for service.
- Without state and local funds, **federal funds are going unspent.** As of July 2014, there is nearly $21 million in federal funds available to Ohio's transit agencies that cannot be spent due to a lack of local match. This is a significant opportunity cost for many of Ohio's small urban and rural communities.
- **Replacing vehicles is a critical short term problems.** The lack of opportunities to fund capital projects created a significant backlog in the need for vehicles in Ohio.

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3 DEFINING TRANSIT NEEDS IN OHIO

OVERVIEW

The Ohio Statewide Transit Needs Study set out to quantify the need for transit in Ohio. The estimate of transit investment in Ohio took into consideration existing transit service levels, existing land use patterns, demographic characteristics, population and employment growth, and the experience of other cities and transit agencies in the United States. The assessment of needs took into consideration both operating needs (driver wages and fuel) and capital needs (buses, maintenance facilities and stations and stops).

Investment Needs

Our analysis suggests that the current level of investment in transit *operations* in Ohio – roughly $734 million **– under invests in transit operations by roughly $97 million or by over 13 percent**.[1] The increased investment is needed to provide service in all 88 Ohio counties, and increase service levels in communities that have many people who rely on public transportation and in communities with sufficient densities to attract more riders. Transit needs are also growing, both because Ohio's population is becoming more urbanized and because populations who rely on public transportation are growing. There were more than 115 million transit trips taken in 2012, but the analysis suggests demand was closer to 153 million, 32 percent more service than is provided. **The estimate for future transit needs suggests that Ohio should invest close to $1.3 billion[2] annually by 2025 in transit service operations.** Increased investment in transit service would provide more than 255 million trips and operate nearly 14 million hours of service.

Capital needs are also significant. Our analysis suggests there is a backlog of investment needed to maintain the existing service, primarily to replace transit vehicles that have exceeded their "useful" life. The investment needed to maintain Ohio's existing network amounts to nearly $300 million in 2014, or about $1.8 billion over the 10-year period. In addition to the backlog of need in the existing system, Ohio's transit network would require additional investment in order to meet the service needs identified as part of this study. Meeting the service needs would require an additional investment of approximately $2.1 billion over the 10-year period. Taking into consideration the needs to **maintain the existing system and meet identified needs would require an investment of $3.9 billion over the 10-year period** (roughly $390 million annually)**.**

[1] Estimated – see text and Appendix C9 for more information; numbers reflect operating costs only.

[2] Estimated – see text and Appendix C9 for more information; numbers reflect operating costs only.

Transit Investment Benefits

As part of estimating how much Ohio should invest in public transportation, it is also important to understand the return on that investment. Benefits from public transportation are widely documented. At a very basic level, if more people use public transportation service, they will save money to spend on other goods and services. Studies completed by the Transportation Cooperative Research Program (TCRP) suggest **that every $1 billion of investment in public transportation operations annually leads to an average of 41,100 jobs supported for a year, $3.8 billion in business sales, and $530 million in tax revenues.**[3] In terms of direct service benefits, increasing investment in transit would ensure:

- **All 88 counties in Ohio will have public transportation services –** Currently, 27 Ohio counties have no public transportation service, but have individuals who need service. The needs assessment assumes public transportation service will be available statewide. The investment in public transit recommended for each county is based on local demographics and land use patterns recognizing that each county is different. The improved mobility and accessibility will help those residents reach jobs, health care, and critical services.
- **Appropriate service levels are provided to areas with existing service but have unmet demand –** Demand is dynamic and constantly changes. Nationwide, it is often difficult for agencies to respond effectively or timely to support these changes. In Ohio, the amount of investment at all levels has recently required many to revisit their system and find additional efficiencies. Other initiatives for this study have pointed out areas for improvement, but it remains the case that the largest barrier for agencies to meet needs and adequately serve an area is the low amount of investment in transit.
- **Transit agencies will expand the types of service available** – Demographic trends demonstrate the need to consider more or different type of service, such as bus rapid transit and streetcar. National trends were confirmed in the Transit Needs Study through surveys of Ohio residents (open to riders and non-riders alike). Expanded funding will allow transit agencies to respond to these needs by diversifying services and meeting the preferences of urban dwellers.

Data produced by this study also points to a number of ways the State of Ohio would benefit overall from increased investment in public transit:

- **Strengthen the vitality of Ohio's largest cities** – One of the unique aspects of Ohio's geographic landscape is that it is has three large cities (Cleveland, Cincinnati and Columbus) and a handful of medium to small ones (Canton, Akron, Dayton, Youngstown and Toledo). The largest cities are becoming more dynamic and vibrant as jobs start to move back into urban and suburban areas and cultural preferences for transit oriented communities are emerging among Millennials and baby boomers alike. These trends have not yet trickled down to Ohio's second tier cities, but the potential remains.
- **Support local economies and support Ohio's effort to attract employment** – Access to transportation has always been important for employers and industry. Ohio has a diverse economy; some sectors will make location decisions based on land prices and access to resources, including intermodal infrastructure. Other sectors, like technology, health care, and higher education – key strengths of Ohio's economy – want to be in

[3] TCRP J-11 (7) – Economic Impact of Public Transportation Investment

desirable locations with a deep talent pool. Workers need transit to access these employment markets, so they are able to draw from a strong pool of appropriate workers who can reliably get to and from work. Access to labor markets is a critical part of where employers choose to locate. Transit service in urban, small towns and rural areas can provide transportation options that make regions more attractive to employers and ensure that people can get to work and keep working.

- **Support people aging and living in their communities** – The past decade has brought a dramatic change in the way human services are provided. Both in Ohio and across the United States, human service programs are increasingly designed to keep people in their communities so they can live with disabilities and age in place. This model is a significant departure from previous service models that relied more on institutions. Encouraging people of all ages and abilities to live in their communities with their families is widely considered to be more appropriate and successful; it is also more cost efficient. But, encouraging people to live in their communities requires support services, including transportation so people can get to day programs and services.
- **Increase access to health care** – Consistent with many sectors of our economy, health care is increasingly centralized, and many hospitals are becoming regional so they can continue to offer a full range of specialist care. As a result, many people need to travel further to see their doctors, receive treatments and access general medical care. Increasing reliance on outpatient care also means that more people are traveling to medical centers as day patients, sometimes making multiple trips to see their doctors and receive treatments. While this practice offers medical benefits and is a less costly way to provide service, it creates a need for transportation services. Public transportation helps support health care, not only to ensure that individuals can access healthcare but also so that travel to and from regional facilities is cost effective and efficient.

TRANSIT SERVICE NEEDS

As part of the Ohio Statewide Transit Needs Study, our objective was to determine if the current level of investment in public transportation sufficiently meets the need for public transportation. To do this, the study team worked to identify optimal service levels. This ensures that public transportation is a viable option for people to use and productive enough to warrant public investment. In an effort to provide as objective an analysis as possible, optimal service levels were defined in conjunction with local characteristics, such as the number of people and jobs in a community, the density of these people and jobs, and demographic characteristics of the underlying population. Our analysis is also based in an assumption that public transportation investment is oriented around two primary goals:

1. **Support Ohio's most vulnerable individuals**, including older adults, people with disabilities, and people with low incomes. Public transportation services are a critical resource in ensuring access to basic services such as health care, human services, and education with or without the ability to own or operate a vehicle. Transit's role in this effort is equally important in both urban and rural areas, even if services will look and operate differently in each of these environments.
2. **Strengthen the vitality of Ohio's economy,** to provide people optimum access to Ohio's commercial centers, employment centers, tourist destinations, and educational resources. This means employers have access to Ohio's talent pool, and Ohioans have a reliable and affordable way to get to work. Access to commercial and employment centers is equally important for people living in urban and rural areas, although the systems will be different in each location.

Two primary factors influenced how the study team assessed Ohio's transit needs, both of which were discussed in existing conditions (Chapter 2). The first was the 2008/2009 recession, which had a major impact on Ohio's economy and the amount of money invested in the transit network. The recession meant that when we looked at transit ridership and services in 2012, the overall level of investment statewide was less than what it was in 2008. Part of our analysis, therefore, considered Ohio's recent experience with a higher level of transit service and how losing service over the past few years impacts needs, especially current gaps in the network.

The second factor influencing the needs assessment was trends showing how changing demographics and shifting cultural preferences are influencing the need for public transportation. Data shows that Ohio is getting older, especially in rural areas and small towns, and generally speaking, as people age, their ability to always operate a vehicle decreases, leading to an increased reliance on public transportation. In addition, more people are living below the poverty line in Ohio and much of the population growth is due to an influx of foreign born individuals. As compared with Americans, foreign born individuals are more likely to live and stay in urban areas and use public transportation. Understanding these trends helped the study team understand future needs, and in particular, how future needs for service may be different than current needs.

Estimating Unmet Transit Needs

Estimating transit needs – and any potential gap between the amount of service that is available and what Ohio residents want, need and would use - was a fundamental goal for the Ohio Statewide Transit Needs Study. Understanding needs and anticipating how people would respond to different services is challenging. However, the study team collected a lot of information about the way riders use the system and how they prioritize service investments as well as a lot of data

on the performance and productivity of existing services. The study team also collected data on existing land use patterns and demographic characteristics, population and employment growth, and the experience of other cities and transit agencies in the United States (see Appendix F, Market Analysis, for a more detailed explanation of the methodology).

Another important guide in our assessment of needs was framed in the context of the two primary transit system goals: to support Ohio's most vulnerable individuals and ensure residents have access to basic services; and to strengthen the vitality of the economy. In practical terms, this means that the "need" for transit investment reflects a priority on providing access to basic services (health care, human services and education) as well as employment and commercial centers.

Using the data collected as part of the study together with the fundamental goals, the study team developed methodology that attempted to take into consideration current experience with changing dynamics. The end product was a process – or needs assessment model - that could be applied consistently across Ohio's 88 counties and would produce a robust estimate of needs. The process consisted of:

- Starting with existing transit ridership, specifically the number of trips taken per capita (or trip rate) for each service type and area in the state.
- Adjusting trip rates to reflect transit ridership levels achieved elsewhere in Ohio. The adjustment assumes some places have higher trip rates because the quality and amount of transit service is better; as a result, areas with less service would consume more (or need more) if there was more or better service.
- Adjusting trip rates to reflect local demographic data so that places that have populations that tend to rely on transit would need more service. This adjustment assumes an increased need based on income, age, and disability status.
- Adjusting trip rates to reflect population and employment density. We know places that have higher population and employment densities can support more transit. As a result, places that have more density were assumed to need more service; the data also partially functions as a proxy for land use patterns.
- Adjusting future trip rates based on population projections for future needs to reflect changing preferences and a growing desire for transit in some of Ohio's most urbanized areas.
- Taking into account the trip rates achieved in other cities in the United States that have similar characteristics with Ohio's cities and consider the level of investment made in those communities and the level of ridership achieving.

Our analysis suggests that current level of investment in transit *operations* in Ohio – roughly $734 million in 2012 – under invests in transit operations by roughly $97 million or by over 13 percent.[4] The increased investment is needed to provide service in all 88 Ohio counties, and increase service levels in communities that have many people who rely on public transportation and in communities with sufficient densities to attract more riders. Transit needs reflect the fact that Ohio's population is becoming more urbanized and because populations who rely on public transportation are growing. The data shows that while there were more than 115 million transit trips taken in 2012, the demand was closer to 153 million, meaning demand is approximately 32 percent higher than provided (see Figure 39). It is also worth noting that the estimated need for service is only slightly higher than the amount of service provided in 2008.

Looking into the future, **the estimate for transit needs for 2025, suggests the investment for Transit in Ohio by all partners should be close to $1.3 billion annually – or nearly double the amount of currently invested in Ohio's transit services.**[5] Increasing the investment in operations will necessitate a corresponding investment in capital equipment; the accompanying required capital investment is estimated separately. By investing increased resources in transit service, the statewide transit network would provide more than 255 million trips and operate nearly 14 million hours of service.

As a check on the needs estimation, the study team also considered transit usage and investment for 2008, the last year before the recession hit (see Figure 39 and Figure 40). This data shows that the number of trips, amount of service, and financial investment in transit operations (see note) is greater than what was provided in 2012. This finding helps confirm the analysis conducted as part of this study. In addition, between 2008 and 2012, Ohio's population increased slightly while transit service levels and transit ridership declined. This suggests that the demand for travel by public transportation is at least partially constrained by the availability of service.

Figure 39: Unmet Transit Demand in Ohio – Transit Trips, Service Hours, and Operating Costs (millions)

	2008 (actual)	2012 (actual)	2015	2025
Annual Transit Trips	132.74	115.60	153.08	255.76
Annual Service Hours	6.68	6.62	9.31	13.86
Annual Operating Costs*	$742.05	$734.00	$830.64	$1,296.12

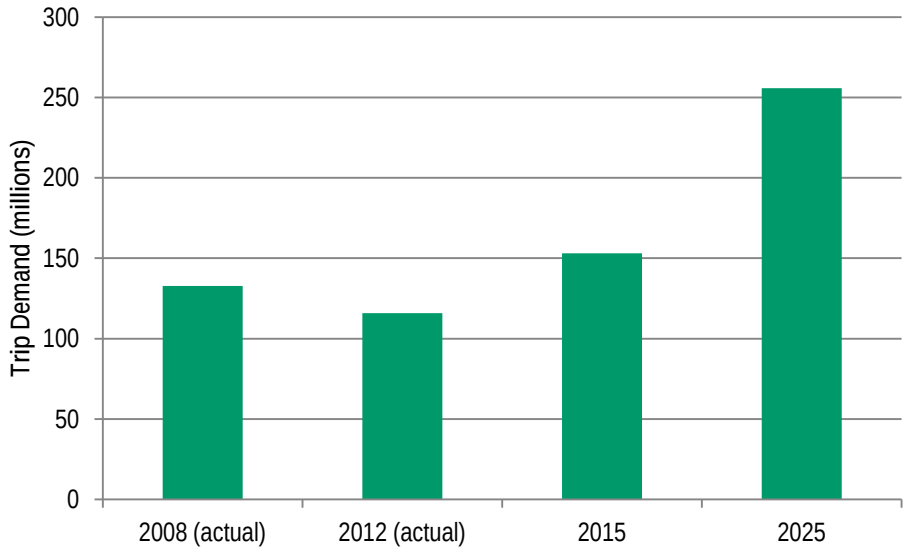
Source: Nelson\Nygaard Consulting Associates

*All years reported in 2012 dollars.

[4] The study team worked to ensure this number is as robust and reliable as possible, but as with any estimation of this kind, the needs assessment is based on a number of assumptions. More information on the methodology is available in Appendix C9 (Transit Service Needs Assessment).

[5] This estimate reflects service costs only.

Figure 40: Actual and Estimated Annual Transit Trips in Ohio (2008 – 2025)



Source: Nelson\Nygaard (2008 and 2012 data was adapted from ODOT's Status of Transit Database)

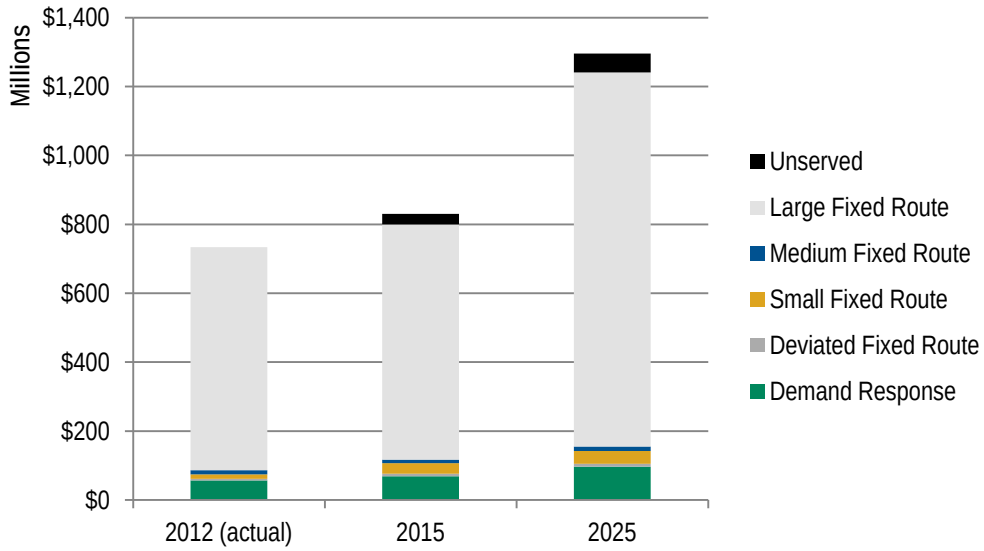
Key Findings and Benefits to Meeting the Need

The need for transit investment in Ohio is concentrated in Ohio's urban areas (see Figure 41 and Figure 42) with most of the unmet need concentrated in the state's largest transit systems. However, unmet needs are still significant in the rural and small urban areas, especially as compared to the underlying population. The analysis suggests that in **Ohio's small towns and rural communities with transit service, there is a need for roughly an additional $18 million** in investments (or roughly 50% more service increasing investment from $32 million to $50 million); future demand anticipates an investment level closer to $70 million. Likewise, bringing areas with no service in line with the other similar counties in Ohio requires an investment of roughly $31 million today, increasing to $56 million in 2025. These investments represent **operating cost needs only** and do not include the accompanying capital investments.

Figure 41: Unmet Need – Trips and Operating Costs by Agency Type in Ohio (2012 – 2025) (in millions, $2012)

	2012 (actual)	2015	2025
Annual Transit Trips			
Urban Transit Systems	113.3	148.3	248.5
Rural Transit Systems	2.3	3.1	4.3
Unserved Areas	-	1.7	3.0
Total	115.6	153.1	255.8
Annual Transit Operating Expenditures			
Urban Transit Systems	$702.5	$749.9	$1,171.3
Rural Transit Systems	$31.5	$49.8	$69.2
Unserved Areas	-	$30.9	$55.7
Total	$734.0	$830.6	$1,296.1

Figure 42: Unmet Need – Operating Costs by Agency Type in Ohio (2012 – 2025)



*Figures for some medium fixed route systems today were included in large fixed route systems to simplify the analysis (see Appendix C9).

In practical terms, investing $97 million in transit over the short-term and $1.3 billion in the long term means the following for Ohio:

- Twenty-seven counties (roughly 1 million individuals) in Ohio that currently have no public transportation services would have access to a countywide demand response service. These new services would ensure all Ohio residents have access to some sort of public transportation.
- Six counties (approximately 370,000 individuals) that only have service in the urbanized portions of their counties would have access to countywide demand response service.

Service in the rural portions of these counties means people living in these areas can use public transportation to go shopping and go to medical appointments.

- Counties that currently have demand response service would have more service that could be used to offer evening or weekend service, and/or add capacity to the system so that more people can travel to more locations. The service would still largely support transit dependent riders traveling to medical appointments, shopping and other services, although some riders may use the service to get to work.
- Counties with deviated fixed route service and small fixed route service could add vehicles to the fleet so that the systems can offer service in the evening and weekends. Many of these systems already successfully serve transit dependent riders; added investment is expected to allow people to use public transportation to reach more jobs, attend regularly scheduled events and classes, and receive services as needed.
- Increased transit investment in Ohio's largest transit systems will mean that more people living in these areas will be able to live car-free and use public transportation to meet most of their daily travel needs. The needs assessment assumes many suburban residents will use transit to travel to/from work while many urban dwellers may use transit for the majority of their travel needs.

Capital financing challenges faced by Ohio's transit systems are daunting:

1) There is a backlog of investment needed to maintain the existing service. The existing need for 2014 (single year) equates to $296 million.
2) The total investment necessary to support Ohio's existing transit network is estimated at $1.8 billion over the 10-year period.
3) Additional transit investments were identified as part of the Transit Needs Assessment. Meeting these needs would require an additional investment of nearly $2.1 billion for a total of $3.9 billion over the 10-year period.
4) There are no additional sources of funding to meet this increased need. Federal funding sources, while potential sources for capital projects are largely already being spent to maintain existing transit operations.
5) Federal funds require local matching funds. Transit agencies in Ohio, especially those in rural areas, are already hard pressed to raise enough local funds to spend available federal funds.
6) Limits on State GR Funding

CAPITAL INVESTMENT NEEDS

Operating transit service requires capital investments, including new vehicles, vehicle maintenance and storage infrastructure, and passenger facilities, such as stations and shelters. Transit agencies that operate service on fixed guideway facilities also need capital equipment to operate and maintain those systems. This section inventories Ohio's capital needs and estimates the cost of those needs in terms of both maintaining the existing statewide transit network and supporting the investments recommended as part of the transit needs assessment (see previous section).

For purposes of the Ohio Statewide Transit Needs Study, capital needs were broadly categorized to include vehicles (buses, rail cars, paratransit vehicles[6]); vehicle maintenance facilities (bus garages, fueling, vehicle wash bays, paint booths); passenger facilities (transit centers, park-and-rides, shelters, amenities); and fixed guideway systems (tracks, catenaries, busways, bus lanes). Capital needs also include technology systems; an inventory of these needs and cost estimate is discussed separately (see Chapter 5).

Capital needs are slightly different from operating needs because capital investments can be postponed even as service

[6] Does not include service vehicles

continues to operate. As discussed in this chapter, the 2008/2009 recession had an impact on the amount of transit service available in Ohio – as transit budgets grew tight, operators cut service. Another strategy that transit operators used during the recession was to use capital funds to support operations and postpone capital projects, including replacing vehicles but also investing in operations and maintenance facilities, passenger facilities and other systems. As a result, capital needs consider two types of investments:

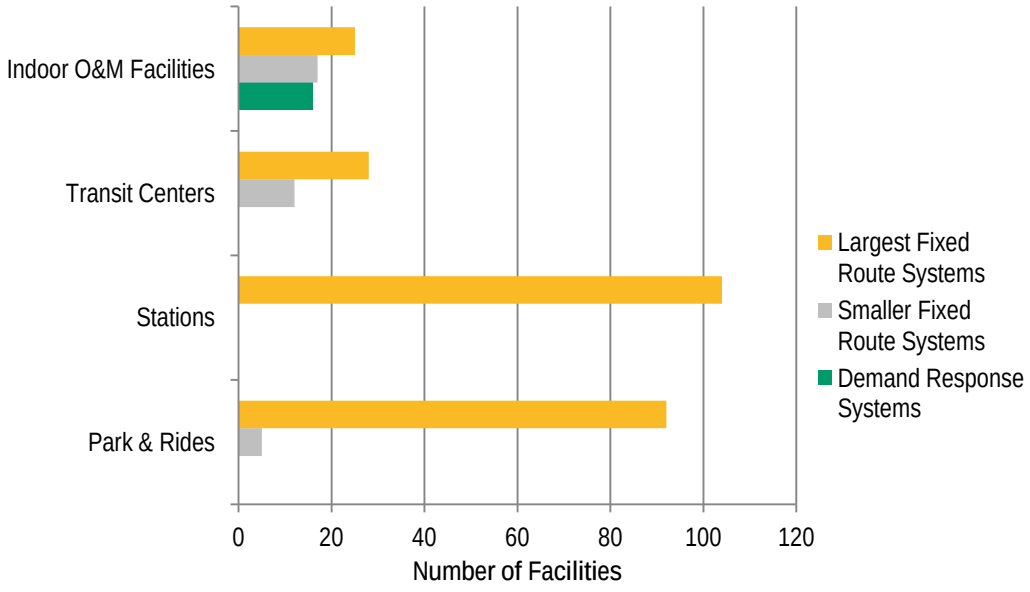
1) Required to maintain the existing transit network (System Preservation)
2) Necessary to grow the transit network in line with the identified service needs (System Expansion)

For purposes of the capital needs assessment, therefore, needs are defined in terms of system preservation and system expansion. Consistent with the Transit Service Needs Analysis, the capital needs analysis focuses on capital investments for the 10-year planning period between 2015 and 2025. Investment needs are estimated for all Ohio transit operators as well as separately for urban and rural systems.

SYSTEM PRESERVATION

Ohio's database of transit vehicles shows there are over 3,000 vehicles in the statewide fleet. In addition, a broad brush look at transit agency fixed capital assets (i.e. transit centers, train stations, operations and maintenance (O&M) facilities) of Ohio's urban systems and rural systems indicates there are nearly 200 major facilities that support transit operations and passengers (Figure 43). An inventory of existing and planned transit capital resources in Ohio is summarized in a series of tables that describes assets for urban and rural systems (see the appendix C8.1 in the Capital Investment Needs Assessment published separately).

Figure 43: Ohio's Major Non-Rolling Stock Capital Facilities (2014)



Source: ODOT, Ohio Statewide Transit Needs Study Agency Interviews, various sources

Capital planning is conducted differently for urban and rural transit agencies, primarily because each type of agency is funded differently. Urban transit agencies typically receive funding directly from the Federal Transit Administration (FTA) and negotiate their participation in other federal funding with their Metropolitan Planning Organizations (MPOs). As a result, urban transit agencies tend to develop and maintain capital plans and may also incorporate capital needs into regional transportation planning documents. The study team relied on many of these documents to prepare this analysis.

Rural transit agencies, on the other hand, receive FTA funding through the Ohio State Department of Transportation (ODOT). As a result, ODOT manages the capital planning process. Under ODOT guidance, all transit agencies must develop 4-year capital and operating plans that include vehicle needs as well as facility maintenance plans. Generally speaking, ODOT prioritizes replacement vehicles, followed by expansion vehicles and then other equipment and facilities.

Rolling Stock

Ohio's rolling stock replacement needs were documented in the Rolling Stock Assessment prepared for this study which can be found in the separately published Appendix H. The analysis identified the following replacement needs between 2015 and 2025:

- There are over 3,000 non-rail vehicles active in Ohio's transit systems. The fleet consists of a combination of large, heavy duty buses (35 ft. – 60 ft.), medium duty (30 ft.) buses and light transit vehicles (LTVs).
- The six largest transit agencies[7] in Ohio account for the majority (2,100 vehicles or 65%) of the active vehicles. By contrast, the 35 rural agencies, combined, have about 500 vehicles or approximately 15% of the statewide fleet.
- Cleveland is currently the only system in Ohio that operates rail service with a fleet of 108 vehicles. Cincinnati will be Ohio's second transit system with a rail component, with its six-vehicle streetcar line scheduled to open in 2016.
- Over the ten-year planning horizon, Ohio will need to replace approximately 5,000 rubber wheeled vehicles – more than the size of the current fleet (see Figure 44). Some vehicles, especially the smaller lighter duty vehicles, will need to be replaced more than once over the ten-year period. Cleveland's rail fleet is also due for replacement by the end of the ten-year period at an estimated cost of between $240 and $300 million
- There is currently a significant backlog in vehicle replacement needs. As of 2014, more than 1,000 vehicles needed replacing, roughly one third of the total fleet. This means, as of 2014, there was a backlog of vehicle replacement needs estimated at $296 million[8].
- **Over the ten-year period, Ohio's transit agencies will need to spend roughly $1.1 billion replacing rubber-wheeled vehicles plus another $240 million replacing rail vehicles**. The total cost, therefore, is estimated at $1.4 billion[9]. The majority (93%) of that replacement cost is needed for urban systems.

[7] Includes Cleveland (GCRTA), Columbus (COTA), Cincinnati (SORTA), Akron (METRO), Dayton (GDRTA) and Toledo (TARTA)

[8] Cost estimates are based on 2014 dollars. This estimate is likely high because vehicle data is from 2012 and some vehicles were replaced in 2013 and 2014.

[9] Cost estimates are based on 2014 dollars.

Figure 44: Ohio's Rubber Tired Vehicle Replacement Needs

Vehicles	Fleet Size 2012	Replacement Needs 2014*	Replacement Needs 2015-2025	Total Replacement Needs
Buses	2,073	584	1,612	2,196
Vans and Light Duty Vehicles	1,167	584	2,222	2,806
Total	3,240	1,168	3,834	5,002

Source: ODOT * Vehicles beyond their useful life. This estimate is likely high because 212 is the most current year where statewide vehicle data is available.

Note: Does not include rail vehicles, which are not expected to be replaced before 2025. Cleveland has 108 heavy and light rail vehicles.

Transit Operations and Maintenance Facilities

Transit and maintenance (O&M) facilities can be both an agency's operations headquarters (transit base) as well as the location where vehicles are stored, cleaned, refueled, and maintained. It is also often the place where drivers report to work, start operations and bring vehicles back at the end of the day. Most O&M facilities include some sort of building or garage because storing vehicles indoors is generally preferred by transit agencies as it provides a climate-protected and climate-controlled environment that helps maintain the operating condition and useful life of vehicles. In addition to having one or more transit bases, larger transit agencies may have more specialized facilities such as paint booths and/or capacity to perform heavy duty vehicle maintenance, while smaller agencies may contract out these types of services. As reported in the agency surveys conducted for this study, seven urbanized area agencies and 11 rural agencies do not have facilities to store vehicles indoors.

Passenger Facilities

Providing safe and comfortable places for transit riders while they wait for services is an important part of fixed route transit systems. Passenger facilities are also an important marketing resource that tells passengers where to catch the bus and how to use the system. They are typically required only for fixed route services since passengers using demand response service typically do not wait for vehicles outside and only rarely transfer between routes. For purposes of this analysis, passenger facilities are assumed to include:

- **Transit Centers:** In Ohio, transit centers are concentrated among the State's largest systems, which carry relatively high volumes of transferring passengers. There are, however; a handful of transit centers associated with smaller fixed route systems. The majority of passenger hubs are located at central transfer points in downtown settings, although some of the larger systems also have passenger hubs in outer portions of their service area, generally at major activity centers or at locations where multiple routes converge. Ohio's passenger hubs include a mix of open air facilities with substantial shelters, such as Cincinnati's downtown Government Square transit center, and large indoor, climate-controlled waiting areas, such as the Pfaff Transit Center in Akron.
- **Park-and-ride lots** are also heavily concentrated in the state's urbanized areas, most often providing a dedicated location for commuters to park and catch a commuter bus, although some of the state's park-and-ride facilities serve local bus routes as well. There are currently 92 park-and-ride facilities identified by Ohio's transit agencies. They are

either developed and owned by transit agencies or consist of existing lots at private sector sites, such as shopping centers and churches, that are secured through formal agreements by transit agencies.

- **BRT and Rail Stations:** Currently there is only one transit authority in Ohio – the Greater Cleveland Regional Transit Authority –operating rail or Bus Rapid Transit (BRT) and thus it is also the only system with transit stations. Cleveland has roughly 50 Rail and 55 BRT stations along its heavy rail Red Line, light rail Blue, Green, and Waterfront Lines, and BRT Health Line and CSU Line. Cincinnati is developing a streetcar line that is scheduled to open in 2016, MetroPlus BRT service began last August. The streetcar service will have 18 stations. The MetroPlus BRT "lite" is currently planned with 14 full-scale stations.
- **Bus shelters:** Passenger bus shelters (not included in Figure 43) are located throughout Ohio and are usually placed at stops with relatively high boarding activity and/or major activity centers. Most shelters are owned directly by transit agencies, while others are provided through contracts with advertising firms. Shelters also tend to be concentrated among the larger and more urban systems; this is especially the case because many rural systems operate as demand response service and operate door to door or curb to curb. The study team does not have an inventory of the number of bus shelters in Ohio.

Fixed Guideway Systems

Fixed guideway refers to public transportation facilities that are dedicated to transit vehicle operations, typically rail tracks, catenaries or overhead wires, or bus only lanes. Ohio's statewide transit system includes heavy and light rail, trolleybus and BRT fixed guideway systems. Most of these systems operate in Cleveland, including heavy rail (Red Line), light rail (Blue Line, Green Line, and Waterfront Line) and BRT (Health Line and CSU Line). The Greater Dayton Regional Transit Authority (GDRTA) also operates electric trolleybuses that draw electricity from overhead wires; this service also constitutes a fixed guideway system. The state's fixed guideway network will expand when Cincinnati opens its streetcar line in 2016. This system is designed to have 3.2 miles of track and catenary (overhead wire) and 18 stations.

System Preservation (Maintaining Existing System)

It is estimated that maintaining Ohio's existing transit network will require some **$1.8 billion over the ten year period between 2015 and 2025**. Roughly 77% of the costs ($1.4 billion) are associated with replacing vehicles. The remaining 23% of the costs involve maintenance and development of operational and passenger facilities. In addition, more than 90% of the costs are associated with Ohio's urban systems (see Figure 45).

Figure 45: 10-Year Capital Investment Needs for System Preservation (estimated) (in millions) (2012$)

	Urban	Rural	Total
Replacement Buses/Vans	$1,026.7	$105.3	$1,132.0
Replacement Railcars	$240.0	n/a	$240.0
O&M Facilities	$147.8	$13.5	$161.3
Passenger Facilities	$64.3	$5.0	$69.3
Fixed Guideway Systems	$185.0	n/a	$185.0
Total	$1,663.8	$123.8	$1,787.6

Source: Parsons Brinckerhoff and Nelson\Nygaard Consulting

Note: GCRTA provided passenger facilities costs estimates which are based on $52 million in rail facilities and $12.3 in bus facilities. GCRTA provided estimated costs for Fixed Guideway Systems and replacement railcars. The estimated cost for railcar replacement ranges between $240 and $300 million.

SYSTEM EXPANSION

The Ohio Statewide Transit Needs Study found that there are unmet needs in the existing system, which could be met by providing an additional 2.7 million service hours currently (2015) plus another 4.6 million service hours by 2025[10]. The additional investment breaks down so that roughly 80% of the investment will be in urban areas, 10% in rural areas and 10% in areas that do not currently have public transportation service.

Based on this analysis, the study team estimated Ohio Transit Systems needs an additional 1,450 vehicles in 2015, increasing to 3,670 by 2025. The 2015 costs are estimated at an additional $293 million and the ten-year costs at $1 billion[11] (see Figure 46). This assessment of capital needs represents a *strategic level planning analysis* and is best interpreted as order of magnitude only. Costs are based on 2014 vehicle costs, consistent with the Rolling Stock Assessment prepared as part of this study (see Appendix H, published separately). The costs are based on the typical cost per vehicle type as identified by ODOT in conjunction with its current statewide vehicle inventory. Costs for accompanying Operations and Maintenance Facilities, Passenger Facilities, and Fixed Guideway Systems were developed based on urban transit agency long range plans, rural agency four year capital plans, and for areas that are currently unserved, estimates based on rural county capital plans.

[10] For full description of the needs assessment and estimation, refer to Transit Service Needs Assessment Initiative.

[11] Cost estimates reflect a fleet mix that is 100% 40' buses in for urban systems and a mix of buses and LTVs for small systems.

Figure 46:10-Year System Expansion Capital Needs – (estimated) (in millions) (2012$)

	Urban	Rural	Unserved	Total
Vehicles	$745.8	$98.4	$165.3	$1,009.5
O&M Facilities	$919.6	$13.0	$14.0	$946.6
Passenger Facilities	$73.1	$7.0	$7.6	$87.7
Fixed Guideway Systems	$72.5	n/a	n/a	$72.5
Total	$1,811.0	$118.4	$186.9	$2,116.3

Source: Parsons Brinckerhoff (facilities and Fixed Guideway Systems), Nelson\Nygaard Consulting Associates (vehicles)

CAPITAL NEEDS – SYSTEM PRESERVATION AND EXPANSION

Total Capital Investment

Combining both the capital needs to maintain Ohio's existing transit network and the capital investment required to grow the system in line with identified transit service needs would require roughly a $3.9 billion investment over the ten-year period. This investment includes the cost associated with maintaining the existing network ($1.8 billion), plus an additional $2.1 billion to meet identified needs (see Figure 47).

Consistent with other investments identified in this analysis, the overwhelming majority of the investment – roughly 89%– is needed for Ohio's urban systems. Rural systems, by contrast, account for only 6% of the investment needs, or roughly $243 million. Unserved areas account for the remaining 5 percent of investment needs at roughly $187 million.

Figure 47: Ten Year - Total Capital Investment– System Preservation and System Expansion (estimated) (in millions) (2012$)

	Urban	Rural	Unserved	Total
Replacement Buses/ Vans	$1,722.5	$203.7	$165.3	$2,141.5
Replacement Rail Cars	$240.0	n/a	n/a	$240.0
O&M Facilities	$1,067.4	$26.5	$14.0	$1,107.9
Passenger Facilities	$137.4	$12.0	$7.6	$157.0
Fixed Guideway Systems	$257.5	n/a	n/a	$257.5
Total	$3,474.8	$242.5	$186.9	$3,903.9

Source: Parsons Brinckerhoff and Nelson\Nygaard Consulting Associates

Source: Nelson\Nygaard Consulting Associates adapted from FTA data

*Assumes 80% of the urban formula funds will be used for capitalized/preventative maintenance; ** Assumes 50% of non-urbanized formula funds will be used for transit operations.

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4 STRATEGIES AND OPPORTUNITIES TO IMPROVE TRANSIT IN OHIO

In addition to a need for more service and capital investments, the Ohio Statewide Transit Needs Study also identified a series of needs and opportunities that have potential to strengthen and improve transit in Ohio. These opportunities were identified through a variety of resources, including themes consistently raised during our visits with transit agency staff, interviews and meetings with key stakeholders, as well as through our analysis of individual transit agency operations and research on transit funding. The long list of opportunities was shared with ODOT staff and the Project Steering Committee and ultimately seven opportunities – or initiatives – were identified as offering potential to strengthen transit services and transit service development in the State of Ohio.

For each of the seven initiatives, the study team conducted additional research and prepared initiative summary documents, which were shared and discussed with both ODOT staff and the Project Steering Committee. The initiatives were structured so they outline the opportunity, describe why it was identified as a major area of concern and/or why it offers an opportunity to improve the delivery of transit services in Ohio. The initiatives also consider existing conditions in the state and compare and contrast the existing conditions with best practices used both in Ohio and by transit agencies in peer states and nationwide. Each initiative paper also included options or strategies for how the need could be addressed. Depending on the topic, some initiative papers provide more specific recommendation or outline specific strategies, but in no cases do the initiatives provide agency-specific recommendations. Together, these initiatives serve as a "toolbox" of specific strategies and actions to address transit service gaps and needs in Ohio.

Based on the feedback received and an assessment of the potential for achieving meaningful improvements, seven initiatives were identified for development in this study:

- **Performance Metrics and Guidelines:** Establish a performance measurement system to track strengths and weaknesses, demonstrate value, and expand support for transit investment.
- **Human Service Transportation:** Improve coordination between public transportation and human services transportation to reduce costs and improve access.
- **Regional Services and Organizations:** Develop regional transit services to improve access across political boundaries.
- **Dedicated Transit Funding:** Identify a dedicated source of funding for public transportation in Ohio.
- **Public Information Systems:** Improve the availability of transit information to improve ridership and customer satisfaction.

- **Transit Technology Needs:** Invest in core transit technologies at most Ohio transit agencies.
- **Fares and Partnerships:** Fare programs, partnerships, and other innovative strategies can reinforce transit agency revenue.

This chapter of the final report includes summarized versions of the initiative papers. Full copies of each initiative paper are included in Appendix C.

PERFORMANCE METRICS AND GUIDELINES

Policy makers want to fund programs that work. Being able to measure and communicate the value achieved by investing in transit, therefore, is a critical part of securing funding. Building on this theme, the Ohio Statewide Transit Needs Study included both an evaluation of Ohio's transit systems and considered how performance measurement strategies could help improve the quality of service and build support for strengthening the overall system.

Nearly all public transit agencies in the world require government assistance for service development and operations. As a result, being able to measure (and communicate) the value and benefits derived from this investment is essential to being able to attract and sustain funds and partnerships. The Ohio Statewide Transit Needs Study identified several challenges and concerns facing transit service development in Ohio. Among the strongest challenges was the ability of the transit network to develop and sustain support from political leadership and also to translate existing support into reliable and secure funding.

This challenge was balanced by other stakeholders' (including funders) desire to be assured that any future investments in transit service achieve real, measureable benefits. Surveys and interviews conducted as part of the Transit Needs Study also confirmed that while many people support transit and believe it is necessary, others were skeptical that it was widely used or produced real value for the money invested. Currently there is no avenue for transit agencies to consistently convey their performance to these stakeholders.

PROPOSED PERFORMANCE MANAGEMENT SYSTEM

1. **Classify Services** – classify services not systems to create more equitable comparisons. In Ohio, seven classifications are recommended – four for fixed routes and three for demand response.
2. **Develop Measures** – use three standard transit industry measures to understand performance, plus a fourth for demand response services only. The measures use data already collected by transit agencies and reported to ODOT:
   - Passengers per hour
   - Cost per Hour
   - Cost per Passenger
   - Customer Satisfaction (Demand Response only)
3. **Set Benchmarks** – transit services need to be measured against something. Our recommendation is to develop two standards:
   - "Successful" standard for services performing at or better than the peer group average.
   - "Acceptable" standard for services performing within one standard deviation of the average
4. **Provide Assistance** - Agencies failing to meet the acceptable standard once may be asked to work with ODOT to address local challenges. Failing to meet the acceptable standard in two consecutive years could lead to a loss of state funding.
5. **Report Annually** – create summary tables and brief overview memo to report on results annually.

Performance measures are widely used in the transit industry, with most transit agencies reporting basic information about their service to the National Transit Database (NTD); reporting data to the NTD is required for most transit agencies receiving federal transit funding. ODOT also

collects and publishes service information in the Status of Transit (SOT) database, which is updated annually. In each case, the NTD and SOT databases include data points that are performance metrics, such as cost per mile, cost per passenger, farebox recovery ratio, etc. However, the information is published as straight-forward data points and not compared or contrasted with any standards or benchmarks and does not constitute a performance measurement system. In general, the transit industry uses performance measures to: 1) understand and track service and system strengths and weaknesses; and 2) motivate and facilitate improved performance.

At a local level, many Ohio transit agencies do work with their oversight boards or committees to develop their agency's vision and articulate this vision through a series of goals. Local agencies also use performance measures to track progress towards stated goals. In many cases, goals are relatively straight-forward (i.e. increased ridership) and can be measured and used to track trends and progress; and compare against previous performance as well as against peer agencies. At the local level, this type of performance measurement system often works well. Local agencies understand their local environment well and can be sure that their goals and performance measures are appropriate and realistic; and if progress is stalled, they also have a good understanding of underlying challenges.

When applied to a statewide platform, however, performance measurement systems work differently. By definition, states measure and track a wide variety of systems and services, each of which exist in a wide range of operating environments and may be designed to respond to different local goals and needs. This makes it difficult to make comparisons that are considered equitable. State level performance measurement systems are also challenged by perceptions that performance measurement systems are punitive and in particular, could jeopardize access to funding. Despite these challenges many states around the country have performance measurement systems[1] and successfully use them to help guide and strengthen their statewide transit network.

Currently urban and rural agencies report data to ODOT on an annual basis. Reporting for urban and rural agencies is done slightly differently but in both cases, the data contains similar information – the amount of service provided (miles driven, hours operated), the amount of service consumed (number of passenger boardings), and basic information about finances (operating and capital expenses, and revenue sources). This information is published annually in the SOT. However, as discussed, the data is published without any links to stated goals or benchmarks for expectations.

The objective of the proposed performance measurement strategy is to help the State of Ohio:

- Demonstrate the value added to Ohio communities through transit services
- Understand and track system strengths and weaknesses
- Motivate and facilitate improved performance
- Create a strategy that helps achieve sustained political and financial support for transit service development in Ohio

[1] *Research Results Digest 361: State DOT Public Transportation Performance Measures: State of the Practice and Future Needs*, National Cooperative Highway Research Program, September 2011

With these goals in mind, the study team developed a performance measurement system (see sidebar on page 70). The performance measurement system will give both individual transit agencies and ODOT a tool to define the return on investment of transit service. A full description of the proposed performance measurement system, including a sample report is available in Appendix C1.

HUMAN SERVICE AND PUBLIC TRANSPORTATION COORDINATION

Transportation is a barrier to participation in health and human service programs. Recognizing this barrier, many health and human service programs created their own human service transportation (HST) networks. These networks are oriented around getting people to/from program activities only and do not transport people for other reasons. HST networks, however, often duplicate public transportation networks, increasing the costs of transportation even as there are unmet transportation needs. Strategies for coordinating HST services and integrating them with public transportation are needed to provide better mobility and reduce costs.

In addition to ODOT, there are six major agencies in Ohio that have a key role in transportation coordination[2]:

- Department of Medicaid
- Department of Developmental Disabilities
- Department of Aging
- Department of Veterans Services
- Opportunities for Ohians with Disabilities
- Department of Education

Combined, the five largest state health and human service agencies spend approximately $228 million annually on client transportation. ODOT spends $14.5 million per year on vehicles and technology for the elderly and disabled and on support for Mobility Managers who foster coordination at the local level. **In total, spending on HST activities is estimated at $247 million annually[3].**

Proposed HST and Public Transit Coordination Actions

1) Maintain Existing HST Infrastructure – ensure timely replacement of the existing Section (5310) Vehicle Fleet and maintaining existing Mobility Management Programs

2) Improve and Expand Coordination Efforts - create a State Level Coordinating Council to involve key funding agencies, expand Mobility Management statewide, Local Coordinated Planning in every county, expanded funding for travel training, funding for technology for coordination

3) Expand Public and Specialized Transportation - Use Local Coordination Plans to develop local support and lead agency(ies), provide public transit/coordination new start incentive grants to areas with no current service to build coordinated systems and then new public transit systems in counties where no systems exist, create an Older Adults and Disabled Persons Transportation Program for trips not funded by agencies

4) Dedicated Funding – for human service transportation and public transit. Examine efforts in other states to develop sources and mechanisms to support coordinated transportation, and identify appropriate strategies for Ohio.

There is a need for improved coordination and expanded services in Ohio. Many of the state's transit systems, particularly in rural areas, are involved in coordination, contracting with local

[2] RLS & Associates, Inc. and Nelson Nygaard Consulting Associates, Inc., Ohio Mobility Improvement Study, Ohio Department of Transportation Office of Research and Development, December 2012, p. 153-174.

[3] Not including $214 million spent annually by the Ohio Department of Education on special education student transportation.

agencies to provide client transportation. However, 27 counties have no public transit provider, 19 counties have no Specialized Service vehicles, and 52 counties have no Mobility Manager. Strategies to address these needs should maintain existing services and expand coordination to make the best use of all resources.

Ohio has been a leader in human service transportation coordination. This leadership has included administration of the FTA programs supporting specialized transportation (Sections 5316, 5317 and 5310), and providing federal funding for local Mobility Management programs. As a result there are many coordinated transportation services in the state, and a number of transit systems that also serve these needs. However, recent changes in federal programs have eliminated Section 5316 and 5317 programs, and revised the FTA Section 5310 program, so that 60 percent of the Section 5310 funds are transferred directly to large urban areas. The remaining 40 percent of the program is still under ODOT's control with 20 percent for small urban areas, and the remaining 20 percent for rural areas. While the program now has increased flexibility in how the funds are used, many of the decisions on use of these funds will now take place at the local level.

Given the existing state of coordination in Ohio, the significant funding and administrative role of other state and regional agencies, and the potential to do more, a number of actions are proposed:

- **Continued support for specialized vehicles.** In order to maintain the current level of coordination and service to the elderly and persons with disabilities, ODOT and the regional agencies need to be sure that available federal resources are used to maintain the fleet capacity used to meet these needs, and to maintain the network of Mobility Managers. Based on the available federal funding and the size of the fleet, this should be possible with current federal allocations.
- **Create a State level coordinating council** to bring together all the state agencies that are involved in client transportation, in order to develop consistent policies that make best use of existing resources to meet as many needs as possible.
- **Expand Mobility Manager programs** to cover as much of the state as possible, utilizing a regional approach to spread the costs and address regional trip needs. Based on the cost of the current program, expansion to provide Mobility Management statewide would cost approximately $2 million per year additional. In support of this expansion, ensuring that every county is covered by a Local Coordinated Plan would support use of available federal funds and identify unmet needs. Other initiatives include funding for expanded travel training to make best use of existing transit, and technology to improve efficiency and provide better information resources.

Beyond these efforts to improve coordination of existing resources, there is a need to expand service. In areas with no service, ODOT could work to develop new transportation resources, beginning with planning assistance, then providing incentive grants to initiate services. This program will focus first on providing coordinated human service transportation and then on public transit, using a regional approach. In addition, state funding for expanded services (trips, hours of service, etc.) for older adults and persons with disabilities would provide resources for mobility that is needed for trips other than the specific human service trip purposes tied to agency funding. Finally, there is a need for the state to develop a dedicated, stable funding source for both human service and public transportation. This could be a mission for the state-level coordinating committee, which could look at several such examples in other states for potential models.

REGIONAL SERVICES AND ORGANIZATIONS

Riders, stakeholders, and transit operators prioritized the importance of regional transit services throughout this study. The market analysis also showed demographic and developmental patterns calling for more regional services. Consequently, there is a need for transit services that travel across political boundaries to transport people to regional health facilities, educational facilities, employment centers, and other service centers.

For purposes of this study, we define regionalization as two potential opportunities: 1) the development of more regional services connecting across jurisdictions; and 2) constructing a regional structure for administering transit services or systems. Larger regional transit systems are better able to provide regional services between jurisdictions in their service areas, and offer the potential for cost-savings and improved service quality through scale economies.

Ohio already has the legal infrastructure for regionalization; therefore, strategies to encourage regional services or regional organizational structures are largely oriented around incentivizing such services and structures, largely through technical assistance and funding.

Potential benefits of regional services include

- Access to regional medical services and human service programs,
- Access to employment, and
- Meeting general trip needs that require crossing jurisdictional boundaries.

These benefits are particularly important in rural areas as specialized medical services are increasingly provided in regional facilities, and rural workers have to travel further for employment. Sixty percent of Ohio's rural workers commute to jobs outside their home county. Potential benefits of regional transit organizations include:

- Reductions in administrative costs,
- An ability to have more specialized staff, and
- The ability to support implementation of technology to enhance productivity and improve service quality.

PROPOSED STRATEGIES TO ENCOURAGE DEVELOPMENT OF REGIONAL SERVICES AND TRANSIT ORGANIZATIONS:

- **Statewide regional services study –** identify needs for regional services and potential markets, develop potential services, costs and program requirements.
- **Provide guidance and technical assistance –** Develop guidance on regionalization, addressing both strategies for implementing regional services and developing regional transit entities. Offer training and provide technical assistance to localities attempting to create regional services or organizations.
- **Program incentives –** support regional solutions in evaluating discretionary grant applications, provide funding for technology to support regional efforts, and consider ways to provide specific funding for regional services. Support for new transit organizations, development of new systems in areas without service, and information efforts should be focused on regional solutions.
- **Integrate regional solutions with human service/public transit coordination efforts –** incentive funding for development of new services, expanded Mobility Management, and use of the additional flexibility in Section 5310 funding to purchase services should all support regional solutions.

Chapter 306 of the Ohio Revised Code enables jurisdictions to develop regional transit authorities, and there are fourteen such entities in Ohio today. They have the authority to develop regional services, and to levy and collect local taxes (if supported by a majority of voters). Also

transit programs (both authorities and County Transit Boards) organized under this Chapter can enter into agreements with other jurisdictions for joint services, and can offer service into other areas if they notify that governing body of that area. Ohio has many of the tools needed to implement regional services—it is likely that the major barrier to addressing the identified need is a lack of funding. Local match is difficult to raise, and is likely focused on immediate local needs, and there is no specific state or federal funding for regional services.

In addition to the use of state enabling legislation to create regional transit authorities, many Ohio transit systems have implemented regional services. Some of these are focused on commuters, some on human service (primarily medical) trips, and others on college/university needs. In addition to regional public transit, ODOT has funded regional Mobility Manager programs to identify regional transportation resources and link those needing transportation with available resources. The Mobility Managers are also tasked with working to develop improved services. In addition, there are coordinated human service transportation programs supported by other state agencies, such as the Department of Aging, that are regional organizations and address regional trip needs.

Because Ohio already has the legal framework to address regional transit needs, and create regional transit organizations, the proposed strategies involve a more detailed analysis of the need and potential solutions, technical assistance, funding and program incentives to support and expand regional efforts by existing systems or agencies, or create new ones.

In the short-term, ODOT can provide funding for technical assistance to help local entities develop regional solutions. It could include development of guidance that includes examples and model documents, and assistance in the creation of regional entities.

Looking at the longer-term future, a statewide study will further define the need and identify appropriate strategies. While lack of funding was identified as a major need, the amount of service needed, its cost, potential revenues, and possible partnerships need further analysis to support the case for particular expansion of funding for regional services.

This study also recommends the development of a program of state incentive grants intended to support the development of new transit services in areas of the state that currently have no transit. Such grants would likely be designed to support the creation of coordinated human service transportation programs that will grow to also offer public transit service. To the extent possible these incentives should be designed to create regional transit entities, and to meet regional transit needs. Regional Mobility Management programs can have a major role in this process, identifying resources and needs, and coordinating agencies, providers and jurisdictions to create regional entities and services. In addition, ODOT can use the flexibility now available in the FTA Section 5310 program to support regional Mobility Management, or contracting for services that can address regional needs.

Regional services and entities can also be supported through incentives in other programs, providing extra weight to applications that meet regional needs, or potentially other adjustments in match requirements, etc. to provide additional support for regional services and organizations. Regional implementation of technology to provide user information, schedule and track trips, or support maintenance and training should also be a priority, and can be accomplished even without consolidation of organizations.

DEDICATED TRANSIT FUNDING

Using state general revenue funds (GRF) to support transit is challenging because transit must compete with other public investment needs. The experience in Ohio has been that transit funding has steadily eroded over time. Despite the creative attempts to improve service efficiency, increased demand for service coupled with increasing costs to provide the service, means transit agencies need more funding. One way to make sure transit agencies have the revenue they need is for the state to identify a dedicated funding source for public transportation.

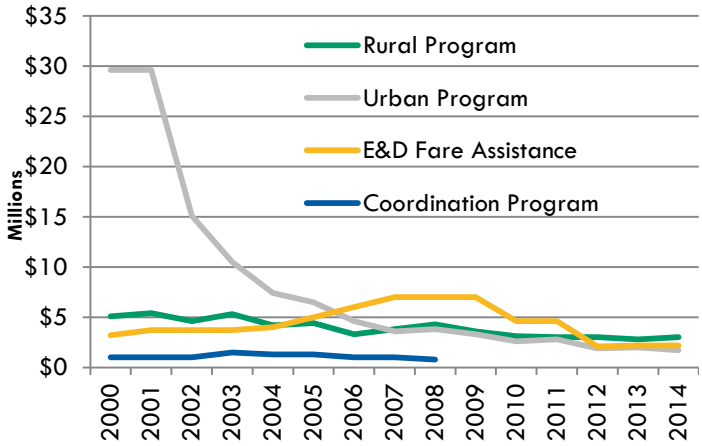
State funding for transit is an important revenue source for transit agencies nationally. The Federal Transit Administration (FTA) supports local transit agencies, but federal funds cover only a portion of the total costs. Federal funding programs also require that transit agencies match federal funds with revenues raised locally. This means transit agencies must raise a significant portion of their capital and operating funds through fares, funds provided by the state, local contributions and other sources, such as partnership agreements, service contracts and advertisement revenues.

Currently, the State of Ohio provides a limited amount of support for transit service through allocations made by the State Legislature. Ohio's transit funds are allocated through the GRF. This compares with other transportation projects in Ohio, especially roadway projects, where state funds are largely raised through vehicle fuel taxes collected statewide. In Ohio, however, a constitutional amendment bans the allocation of vehicle fuel taxes from funding public transit. This means that public transportation programs must compete with other state priorities and obligations for state funds including programs related to education, human services, health care and other essential services. As a result, transit funding in Ohio has been vulnerable to budget cuts. In 2012 the State allocated $7.3 million to transit, a decrease of nearly 80% from 2000, when $40 million was allocated to transit (see Figure 48)

STEPS TO CREATE A DEDICATED TRANSIT FUND:

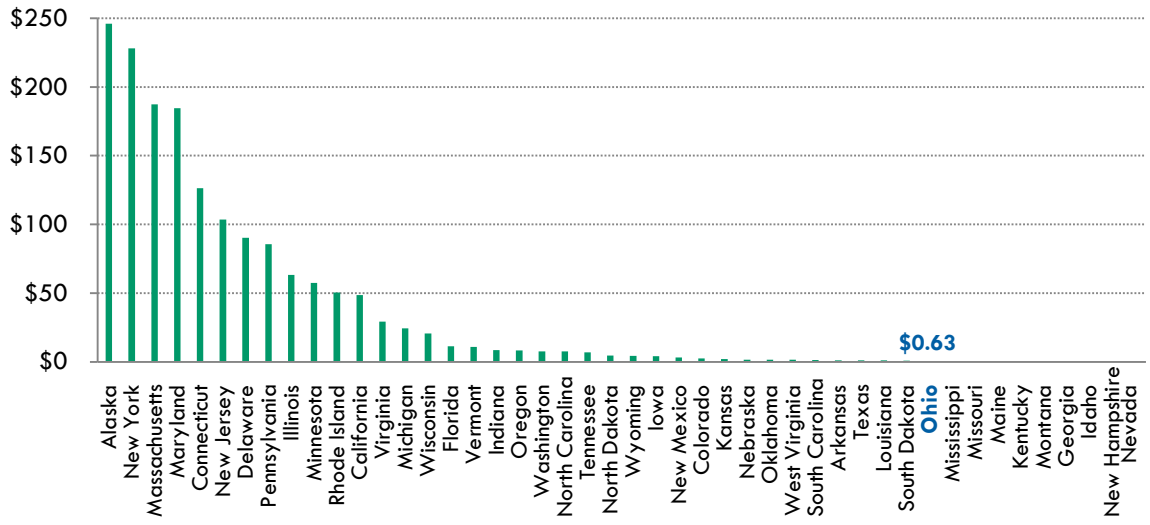
- **Determine how much funding is needed.** The Ohio Statewide Transit Needs Study estimated the amount of funding required to meet Ohio's gap in public transportation investment.
- **Gauge the Ohio State Legislature's priorities for transit investment.** There are compelling reasons and benefits associated with re-investing in Ohio's public transportation program. The Ohio State Legislature will determine how Ohio decides to address the investment gap and service needs.
- **Identify potential revenue sources.** A cabinet-level committee should form to consider which funding options make the most sense for Ohio and determine the ability of these options to meet the articulated need.
- **Develop a strategy for allocating funding and monitoring use of the funds.** Hand in hand with identifying funding is determining how the funds are best allocated across the state as well as how people providing the funds can be assured their resources are spent effectively. The Statewide Transit Needs Study has developed a recommendation for monitoring transit performance and management, which can be used to support this discussion.

Figure 48: ODOT Transit Programs Funding Trend: 2000-2014



Changes in the funding allocation over time have resulted in Ohio falling near the end of the spectrum in terms of state support for transit (see Figure 49). In addition, in the past few years, transit operators have had a hard time relying on state funding as a source of revenue. The ODOT Office of Transit's ability to maintain programs, such as the Elderly and Disabled (E&D) assistance program which is not currently fully funded, has been limited with the reduction in funds.

Figure 49: State Funding for Transit per Capita (2012)



Source: AASHTO Survey of State Funding for Public Transportation (2014)
Note: Alabama, Arizona, Hawaii, and Utah had no state funding for transit in 2012

The lingering effects of the recent recession are still being felt in state and local governments alike; state revenues are almost always fully allocated with the most readily available taxes and fees already dedicated to program use. However, there are opportunities to find and secure dedicated revenues for public transportation generally, or for special needs populations specifically. As part of strengthening the statewide transit network, the Ohio Statewide Transit Needs Study recommends that Ohio explore options that would create a dedicated funding source for public transportation.

Funding Strategies

- A tax, fee, or surcharge with all revenues raised through the tax, fee, or surcharge dedicated to public transit.
- A specific amount or percentage of an existing funding source (which is often also a dedicated funding source) that is allocated to public transit.
- A portion of the state transportation trust fund dedicated to transit.

Allocation Strategies

- Formula-based distribution (population, demographics, etc).
- Performance-based allocation (see proposed performance measurement system).
- Annual grant applications (targeting coordination programs, capital projects, employment access, etc).

PUBLIC INFORMATION SYSTEMS

For people to be able to use transit, they must first understand how to use it. As a result, offering clear, easy to understand and readily available information on existing service is critical to attracting people to the system and encouraging them to ride more.

The need for improved transit information systems in Ohio was identified by the study team through a variety of sources, including the rider survey, stakeholder interviews, and site visits with individual transit agencies. Similar to the transit industry nationally, public information practices across Ohio vary greatly; most of the State's largest transit agencies have well developed public information systems, while smaller transit agencies show more variation in the type and quality of available information.

National research helps to provide an understanding of the minimum standards and best practices in public information. Adopting minimum standards or identifying desirable best practices could help agencies to:

- Upgrade the quality of public information products (system maps, schedule cards, etc.)
- Improve the user-friendliness of many of Ohio's transit services
- Make information about transit agencies more consistent, potentially with recommendations scaled to reflect agency size and service type
- Widen the appeal of transit to new market demographic segments
- Provide better customer service to existing customers and attract new riders

PUBLIC INFORMATION OPPORTUNITIES

Opportunities to improve public information systems focus on strategies that would improve the quality of passenger information systems in Ohio and create more consistency across transit agencies.

Best practices demonstrate that public information materials should clear, easily accessible, and easy to understand by current and potential riders alike.

The State of Ohio may set standards or guidelines for the development of passenger information materials, including system maps, schedules, and websites.

Guidelines should be based on best design practices for public information materials, and may also reflect different needs and best practices based upon agency size and services offered.

The State of Ohio could identify graphic designers, web developers, and other vendors that agencies can work with to develop their own transit information materials.

A critical step is to identify strategies to engage and work with limited English proficiency populations, and ensure that transit materials are provided in several key languages.

Finally, the State of Ohio can support the work of agencies to improve their public information systems by setting up "challenge grants" or other funding opportunities.

Opportunities

The State of Ohio may develop strategies that would both improve the quality of passenger information systems generally and create more consistencies between agencies. There may be potential for the State of Ohio to set standards and expectations for passenger information systems in Ohio, or create templates that operators may use. If ODOT were to develop standards, any recommendations would need to be developed through a collaborative process that involves at least one transit agency partner and/or the Ohio Public Transit Association (OPTA); the process should also draw on best practices developed or adopted by transit agencies in Ohio. If implemented correctly, it would require a fairly substantial staff effort and should address the following:

- *Requiring all transit agencies to have a system map that shows local and regional services and connections to external systems and services.* The system map should be available online at least and maps should be posted at key transfer locations. Ideally,

maps would be available as printed materials (although this may be cost-prohibitive). There are several local best practices for how to lay out system maps.

- *Setting standards for development of system maps, passenger schedules, and transit agency websites*. Information materials and websites can be difficult for users to read and navigate. State standards can address this by setting expectations for the type of information presented as well as the formats for presenting that information. Standards can take the form of guidelines for what to include and best design practices, or templates that may be used by any transit agency in the state. ODOT may also identify a handful of "recommended" graphic designers that agencies can work with.
- *Including review of passenger information systems in ODOT's review process.* This review may consider, for example, the last time an agency had a "major" or "minor" change to its marketing materials or passenger information systems. ODOT may consider what a major or minor change involves and use this process to determine if materials are being kept up to date and are still valuable to riders.
- *Identifying strategies to engage limited English proficiency (LEP) populations.* Providing information materials in multiple languages is a key component of any public information effort. ODOT could lead this effort by providing transit materials in key languages (such as Spanish, German, and Somali), and by identifying key strategies to engage and work with limited English proficiency populations.

Recommendations

In the short-term, the Ohio Statewide Transit Needs Study recommends offering a series of challenge grants to transit agencies to improve existing public information systems. The grants may be used to develop websites, create system maps and schedules, or otherwise improve the quality and quantity of information available to the public. Challenge grants issued as part of the public information initiative may also be combined with technology investments to develop trip planning software capabilities or mobile applications (apps) that provide guidance on how to use transit.

Grants offer a "carrot" approach to encourage transit agencies to upgrade their marketing efforts and recognize that some agencies would like to improve their system but do not have the resources to do so. Challenge grant amounts may be between $10,000 and $20,000 and could require matching resources.

As part of developing and implementing public transportation information grants, ODOT may also develop standards and templates. As discussed above, creating templates and guidance will help smaller transit agencies follow best practices and more clearly understand how information may best be presented. Templates may also work towards a more unified look for transit information across the state, which will make it easier for riders.

TRANSIT TECHNOLOGY

The transit industry, like nearly every sector of the economy, has increasingly employed technology to improve service, management, and operations. Innovations in transit technology offer multiple benefits to operating agencies in terms of service planning, operating efficiency, and customer experience of transit.

Opportunities to increase the investment in transit technology investment were identified by the Ohio Transit Needs Study Team primarily through site visits with individual transit agencies and comparison of Ohio's current technology inventory with national best practices. The study team focused on a subset of six technologies that are anticipated to be among the most appropriate and offer the greatest benefit to Ohio transit agencies:

- Automatic Vehicle Location/Global Positioning Systems (AVL/GPS)
- Automated Passenger Counters (APCs)
- Scheduling Software
- Electronic Fare Collection
- Real Time Information
- Web Trip Planners/Google Transit

TECHNOLOGY INVESTMENT PLAN

Technology recommendations focus on a series of core transit technologies that should be available at most transit agencies in Ohio.

Investments in transit technology can create immediate benefits for riders and transit operations.

The need for technology investment is estimated at between $51 million and $63 million over a ten-year period. This translates to an annual investment of between $5 million and $6 million.

Roughly 10% of the investment is allocated to staff training, system maintenance, and updates.

Recommendations also call for phased implementation that target systems where new technologies will have the biggest impact on passengers and operational efficiencies first. Once high impact investments are made, the plan suggests investing in systems based on service type and/or agency size.

Some transit technologies may not be appropriate for all transit agencies, even in the future.

Recommendations also identify opportunities for the State of Ohio to support smaller transit agencies in acquiring and developing transit technologies. Support also includes staff development.

Recommendations

Innovations in transit technology offer multiple benefits to operating agencies in terms of service planning, operating efficiency, and customer experience of transit. In addition, investment in transit technology is also consistent with the larger ODOT goal of utilizing ITS solutions to improve the transportation decision making process and equip travelers with high-quality information. While several Ohio transit agencies (especially larger and urban services) have made great strides to improve the role of technology in transit services, many smaller agencies have a long way to go to achieve the emerging standards for technology in public transportation.

Overview of Technology Investment Strategy

AVL/GPS capability and scheduling software are considered to be core technologies for both fixed route and demand response agencies, and it is recommended that all Ohio transit agencies implement both technologies and have systems running within the ten year time frame of this study, or by 2024. APCs should be installed in at least a portion of the fleet of all large fixed route services, due to the more rigorous National Transit Database reporting requirements for these agencies. Developing trip planning software is recommended for all small, medium, and large fixed route services, while real-time passenger information and electronic fareboxes are recommended for most fixed route services in Ohio.

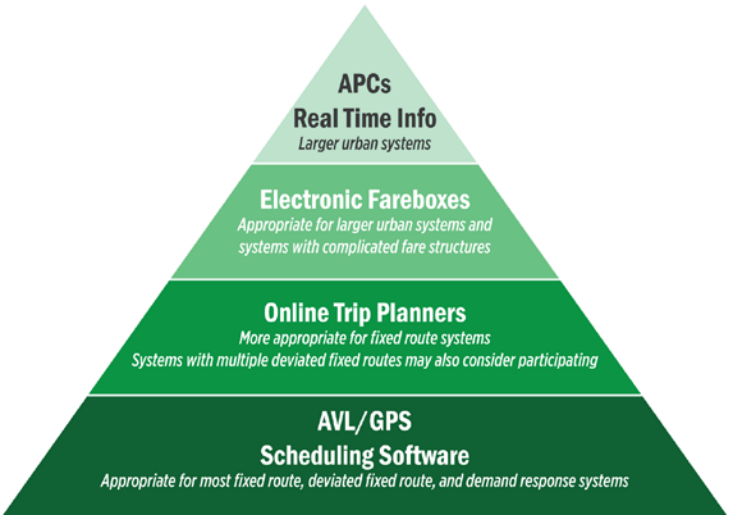


Figure 50: Summary of Technology Recommendations

Technology	Agencies with Technology Implemented	Agencies with Technology In Five Years (~2020)	Agencies with Technology In Ten Years (~2025)
AVL/GPS	23	38	61
Automatic Passenger Counters	6	7	7
Scheduling Software	46	55	61
Electronic Fareboxes	10	13	17
Real-Time Information	3	8	14
Google Transit	9	19	31

Estimated Investment

As part of the Ohio Statewide Transit Needs Study, the study team developed an investment plan that calls for between $51 million and $63 million invested in transit technology over a ten-year period. This reflects a range of $46.6 to $57.4 million to purchase technology, plus an additional 10% allocated to staff training and maintaining existing technology systems. These estimates represent a ten-year investment in transit technology, with an average investment of between $5.1 million and $6.3 million each year. The largest and most significant investments are focused on Ohio's largest and most productive systems. However, while the level and scope of investment reflects the service characteristics of each agency, all but the smallest of systems are slated for additional investment. This ten-year investment in transit assumes a phased approach, where technologies are implemented at a certain share of agencies in the next 1-5 years or the next 6-10 years.

FARES AND PARTNERSHIPS

Transit agencies would like to have more funding to improve service for their customers. A critical challenge in transit funding is the limited ability that transit agencies have to influence their largest funders – federal and state programs. However, there are a variety of potential strategies that could help transit agencies raise funds to maintain existing services as well as expand operations and invest in capital equipment. While all options pose challenges, they also present opportunities to raise revenues as well as strengthen their relationship with riders and partner organizations. There are a handful of options for transit agencies to generate revenue, including raising fares and/or developing partnerships. There are also several creative funding techniques available to transit agencies as well as options for local taxes. Fares and partnerships are discussed in more detail below. Creative funding mechanisms and tax options available to transit agencies include:

Opportunities for Transit Agency to Raise Revenue

Raise Fares
- Transit fares vary considerably by agency, and fares are low overall. There is potential to raise fares on fixed route, ADA and demand response services.

Use Transit Development Credits
- Several transit agencies are already using TDCs to support capital projects. There is potential to expand use of TDCs.

Create Partnerships
- Many transit agencies in Ohio have partnerships with universities, school districts and employers

Seek Local Tax Revenue
- Although difficult, local tax support can very effective at stabilizing agency revenues.

Transportation Development Credits – Instead of using federal funds, Ohio uses revenues collected from tolls to maintain the Ohio Turnpike. The federal government gives Ohio credit for this investment in the form of TDCs. ODOT recently started letting transit agencies in Ohio use TDC as matching revenues; this means transit agencies can use "toll credits" rather than actual dollars to match federal funds. TDCs do not increase the overall amount of available funds, but they do make it easier to spend federal funds, by reducing the need for local matching revenues.

Local Taxes – Nearly all transit agencies in Ohio are partially funded by local revenue, with many transit agencies supported by local taxes. Developing dedicated funding sources is one of the most effective strategies for stabilizing local transit funding. Many of Ohio's largest cities have dedicated taxes to support transit, such as sales taxes or property taxes.

Transit Fares

Fares are a critical revenue source for transit agencies in Ohio, raising an estimated $120 million in FY 2012 and contributing approximately 13.5% to the overall cost of transit service on a statewide basis. The proportion of revenues attributed to fares, however, varies widely by individual transit agencies. Some transit agencies have been assertive about maximizing fare revenues by consistently reviewing their fares, targeting farebox recovery rates, and periodically increasing their fares. Some agencies collect as much as 25% of revenues from fares (Cincinnati) while other smaller agencies collect as little as 2-3%. Variations reflect differences in the types and levels of service offered as well as variations in fare levels and fare structures.

As part of the discussion on transit fares, it is important to recognize that no transit agency likes to raise fares, nor is raising fares appropriate for all transit agencies. Fares may reflect local policy decisions on the role of the transit service in the community. For example, communities that subsidize transit service through local taxes or general revenue contributions may have made a

commitment to the community to offer the service for individuals in need and that includes keeping fares low. National experience also demonstrates that higher fares almost always result in lower ridership, thus the benefits of higher fares can be muted by fewer riders.

The study team examined fare structures, policies, and revenues on a broad level in order to determine if there were opportunities for transit agencies to increase funds by raising fares. The findings include:

- Statewide fixed route fares are comparable to the national average. However, the state average is significantly less when Ohio's largest fixed route systems are excluded.
- The farebox recovery ratio of demand response systems matches the national average.

This suggests, on average, Ohio's transit fares are within the national experience. However, it also means that about half of Ohio's transit agencies have fares that are lower than the national or state average.

In addition, there may be opportunities for several transit agencies to raise revenues by increasing ADA fares to the maximum allowable fare, twice the fixed route fare.

Finally, our analysis suggests there are some opportunities for agencies to restructure their fares. There are 13 agencies in Ohio that operate fixed route, ADA complementary paratransit, and general public demand response. For example, agencies that participate in the State E&D Fare Assistance Program may benefit by charging the maximum allowable fare on ADA services and then setting general public demand response fares at least four times the fixed route fare (see callout box). This creates the proper incentives, by encouraging people to use fixed route and keeping ADA fares in line with dial a ride services. People who are over the age of 60 or have a disability will still qualify for the half fare program and pay a fare equivalent to ADA. The fare will increase, however, for able bodied people under the age of 60, but there are fewer demand response riders in this group.

Portage Area Transit Authority (PARTA) has the following fare structure:

- Adult fixed route fare: $1
- Elderly and disabled fixed route fare: $0.50
- Adult dial-a-ride fare: $4
- Elderly and Disabled dial-a-ride fare: $2

PARTA fulfills all FTA and State E&D Fare Assistance Program requirements while still charging the maximum ADA fare (the Elderly and disabled dial-a-ride fare serves passengers that are eligible for ADA paratransit). Through the State reimbursement program PARTA is eligible for reimbursement of elderly and disabled rides on both their fixed route and demand response services.

Partnerships

Several Ohio transit agencies have successful partnerships with universities, public school districts, and employers. These partnerships help pay for transit service by purchasing transit passes in bulk, or paying for fares for their constituents. It is important to note that fares do not pay the full cost of transit service, so the partnerships do not generate actual revenues. Transit pass programs, however, tend to increase ridership and by selling passes in bulk or paying for fares in advance, help stabilize revenues.

UPass programs are among the most common types of partnerships, and involve universities paying transit agencies a negotiated fee for universal access to transit services for students, faculty, and staff. UPass programs represent a large potential market in Ohio due to the high

number of colleges and universities in the state. Ohio's State university system by itself consists of 14 universities, 24 branch campuses and 23 community colleges, with an estimated 600,000 students[4]. In addition, there are on the order of 80-100 non-profit, private colleges and universities with main campuses in Ohio. This strategy is widely used in Ohio's urban areas but may be expanded to smaller communities.

[4] Ohio Higher Ed website

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5 RECOMMENDATIONS

OVERVIEW

The Ohio Statewide Transit Needs Study had two primary goals. The first was to determine if there were unmet needs in Ohio's network of public transportation services and if the study team identified unmet needs, the objective was to document and estimate the scale of those needs and the corresponding investment required to meet them. The second study goal was to determine if there were other non-monetary needs, such as strategies, projects or programs that could strengthen and improve Ohio's public transportation services.

The analysis did conclude that there are unmet needs for public transportation services in Ohio. These needs include providing service in areas that currently do not have access to any public transportation services as well as areas that have service but need more. The findings also suggest Ohio's transit investment needs are significant – the estimated investment calls for an *additional* investment (i.e. on top of what is already being spent) of roughly $97 million in operating funding today (2015). The investment is also expected to grow over the 10-year period, so that by 2025, transit would need to be spending on the order of $1.3 billion annually on operations alone from all sources.[1] The Ohio Statewide Transit Needs Study also identified a series of programs, projects and strategies that offer potential to address needs by strengthening and improving local transit services. These strategies and programs would help transit agencies attract additional riders, ensure services are better aligned with needs, work to increase overall service efficiency and better position individual transit agencies and the overall network to attract funding.

The challenge facing transit in Ohio is daunting, largely because the investment is significant and public resources across all levels of government and all programs are stretched thin. Recognizing this, the recommendations are structured to help maximize the efficiency of the available resources, addressing the greatest needs first and focusing on improving existing services. Another important recommendation is to build a constituency for public transportation – the outreach efforts conducted as part of this study underscore the importance of public transportation to all types of communities in Ohio – the rural communities, small towns and villages and the state's largest cities. As a result, there is already a constituency that recognizes the value public transportation brings to their communities and understands that investment in public transportation will help Ohio with many of its other challenges, including strengthening Ohio's economic vitality; ensuring the state is positioned to compete with other U.S. cities to attract and retain young talent; and supporting Ohio's rural traditions by providing access to medical services, educational resources and human service programs. At the same time, outreach efforts also made it clear that Ohio has other stakeholders who remain skeptical about the value and benefits generated by investing in public transportation. A part of the recommendations

[1] Takes into consideration all funding sources and assumes current levels of investment. Dollar estimates are in 2012$.

included in this study, therefore, is designed to address this skepticism by demonstrating and documenting value, using incentives to encourage and reward local solutions and crafting a broad coalition of partners to support public transportation.

The Ohio Statewide Transit Needs Study's recommendations are organized into short-term recommendations that can begin as soon as 2015 and longer term strategies that require more time to execute. Despite the fact the recommendations are organized into short and longer term strategies, the recommendations are intended as a complete program designed to be implemented as a package of strategies, projects and policy changes; the recommendations are mutually reinforcing and will be stronger if carried out as an integrated strategy as opposed to independently.

This final chapter of the Ohio Statewide Transit Needs study report describes the recommended strategy or program to help address transit needs in the State of Ohio. A high level synopsis of the needs is presented first, followed by the short and longer term strategies.

Estimated Needs – Investment

As discussed, one of the primary objectives of the year-long study was to identify and document the gap between the level of transit service available in the State of Ohio and the amount of service needed. Our analysis suggests the current level of investment in transit operations should be roughly $831 million in 2015, increasing to $1.3 billion by 2025.[2] The increased investment is needed to provide service in all 88 Ohio counties, and increase service levels in communities that have many people who rely on public transportation. The investment is also needed to strengthen Ohio's urban areas and in particular support urban economic development. Urban areas have sufficient densities to support more services and attract more riders. Transit needs are also growing, both because Ohio's population is becoming more urbanized and because populations who rely on public transportation are growing. In 2012, the state invested roughly $734 million in transit operations, including funding provided from all sources (federal, state, local, fares, contracts, etc). Meeting the need, therefore, would require an increase of $97 million right now (2015). Meeting the need in 2025 would require an additional $562 million over the 2012 funding level.

Capital needs are also significant. Our analysis suggests there is currently (2015) a backlog of investment needed to maintain the existing transit service, estimated at $296 million. This backlog primarily includes replacing transit vehicles that have reached their "useful" life as defined by the FTA. The investment needed to maintain Ohio's existing capital infrastructure amounts to nearly $444 million in 2015, and about $1.8 billion over the 10-year period. In addition to the backlog of capital investment in the existing system, meeting Ohio's transit needs also requires additional investment in capital infrastructure. The study team estimated that meeting the identified service needs would require an additional investment of approximately $2.1 billion in transit vehicles, passenger amenities and O&M facilities over the 10-year period. The combined capital needs including both costs to maintain the existing system and expand the network would require an investment of $3.9 billion over the 10-year period (roughly $390 million annually). Current funding levels could support about 21 percent of these costs. The unfunded capital needs are estimated at $3.1 billion.

[2] Includes both existing investment and costs to meet unmet need; Numbers are estimated – see text and Appendix C8 and C9 for more information; numbers reflect operating costs only.

Estimated Needs – Strategies and Programs

In addition, the study also recommends several program changes to meet non-funding needs identified and to strengthen the system overall. These strategies and programs include:

- **Create a performance management system** that will communicate accomplishments and benefits achieved by the individual transit systems. This data will let taxpayers know their investments are productive and worthwhile.
- **Better match service with demand** by creating more regional transit services. We know people want to travel across city and county lines and Ohio needs more of these types of transit services. As part of developing more regional services, some transit agencies will work together more closely, while others may consolidate operations.
- **Encourage transit agencies and human service programs to work together** to leverage funding and provide more service. Coordination is especially important in rural areas.
- **Engage as many partners as possible.** Encourage transit agencies to work with large employers, local universities and other large institutions to share costs. In some cases, transit riders may need to pay more towards the cost of their rides.
- **Invest in transit technologies** that can make running the service easier and more efficient, such as automatic vehicle location (AVL), global positioning system (GPS) automatic passenger counters (APCs), and scheduling software.
- **Improve the ways people learn about transit service** by helping transit agencies update their public information systems. This involves developing new passenger technologies, like smart phone applications, trip planners and websites, as well as ensuring system maps and schedules are also available.

SHORT TERM STRATEGIES (2015-2017)

Although the size and magnitude of the transit needs are great, the study team recommends a three-fold strategy for addressing the identified needs. This strategy is organized around three main goals:

1. Improve transit system efficiency and effectiveness through a series of small investments in technology, regional systems, regional organizations and passenger information systems. Developing a performance measurement system is also critical to this strategy, both to demonstrate value and success and to show a commitment to ongoing improvement.
2. Preserve the existing transit network by replacing older, inefficient transit vehicles. If the State of Ohio doesn't replace outdated vehicles, the costs and reliability of the system will be compromised.
3. Begin to address the unmet investment needs and begin work on the funding challenge. In the short term this effort should focus on advancing coordination between public transportation and human service transportation providers; and starting the process of exploring dedicated funding to support ongoing transit needs.

Improve System Efficiency and Effectiveness

The Ohio Statewide Transit Needs Study recommends that as soon as 2015 (fiscal year 2016), ODOT may work with the Ohio State legislature to request an additional $2.5 million of general revenue funds to support transit policy changes and develop a series of incentive grant programs. This funding will be used to:

1. **Advance a performance measurement system.** As part of the Ohio Statewide Transit Needs Study, the Study Advisory Committee crafted a relatively straight-forward performance measurement structure that could be developed into a legislative report. ODOT may develop an annual report to the legislature on transit agency performance and productivity.
2. **Incentivize coordination between human service and public transportation.** Ohio used to be considered a national best practice in public transit human service transportation coordination in part because it offered incentive grants to counties looking to improve coordination. Bring back this grant program by providing incentive funds and technical assistance to counties looking to coordinate transportation services in their communities. Grants may also support extending or providing service in counties where there is none today.
3. **Develop regional services and regional institutions.** Provide start-up funding to develop regional transit services, support collaboration between transit operators and potentially centralize some transit administrative and management functions. Similar to the coordination grants, this recommendation assumes local governments understand their needs and opportunities best. The State of Ohio would use incentive grants to encourage and support regionalization efforts by encouraging local organizations to develop regional services, systems and organizations.
4. **Invest in technology.** There are a handful of transit technologies that could improve service operations with relatively small investments. Consistent with the other recommended programs, the study team suggests incentivizing technology investments with one time grants to purchase new systems and associated staff training. It may also be possible for ODOT to lead development and procurement of some technologies (such as scheduling software or trip planning programs) for smaller transit agencies that have smaller staff or limited information technology capabilities.
5. **Improve passenger information systems.** Incentive grants could also be used to help transit agencies improve how they provide information about their services. Best practices are clear that transit riders need to know transit service is available and understand how to use it before they can use it. ODOT may use new funds to create an incentive grant program that would provide funds for agencies to improve websites, system maps and schedules. Grants may also be used to develop standards or common templates for how transit information should (or could) be provided. Smaller agencies could then adopt these standards to improve local information systems but also create common systems across the state.

Preserve Existing System (Replace Vehicles)

As discussed, preserving the resources already invested in transit is one of the highest priorities. If outdated transit vehicles that are well beyond their useful lives are not replaced, the cost and reliability of the system overall will be compromised. The Ohio Statewide Transit Needs Study recommends prioritizing a vehicle replacement strategy and funding this strategy by transferring, or flexing, FHWA funds to transit capital investment. In addition to providing more federal funds to transit, the study also recommends that ODOT use Ohio Transportation Development Credits[1] to match federal resources so the financial impact on local transit operators is minimal.

1. **Expand opportunities to flex Federal Highway Administration (FHWA) funds to transit.** Ohio already flexes some funding, as do local metropolitan planning organizations, but there is room to do more, especially given the need for transit vehicles. The backlog of need is significant. However, if ODOT is able to flex $50 million of FHWA funds annually to transit and target those revenues to vehicle replacement, plus use Transportation Development Credits development credits to provide the 20% local match for a total annual investment of $60 million Ohio could address the backlog of transit vehicle need in approximately five years.

Work to Address Unmet Needs

Ultimately, Ohio's transit investment needs can only be fulfilled with participation from a broad range of partners and stakeholders, including other state and federal agencies that rely on public transportation services to make their programs work. Some of the largest and most important partners in this process are the medical, human service, and educational programs operating across Ohio. Many of these programs fund transportation and the ability to coordinate funding with ODOT's efforts to support local public transportation services offers potential to strengthen both networks. A second important strategy in addressing needs is for the State of Ohio to demonstrate a commitment to public transportation through dedicated funding. Neither of these efforts will be easy and both will require significant policy work. In the short-term, however, there are opportunities to advance both strategies:

1. **Establish a cabinet-level Human Service Transportation Coordinating Committee.** The Coordinating Committee would be tasked with examining and developing statewide policies to encourage coordinated transportation services (and remove barriers that make coordination challenging). The strategy is aimed largely at rural counties and systems, but may also help and support counties that currently do not have public transportation services. At a minimum agencies represented on this committee should include Job and Family Services, Medicaid, Aging, and ODOT.
2. **Establish a Blue Ribbon Funding Committee.** The Blue Ribbon Committee would be tasked with identifying a statewide funding source that could be dedicated to support public transportation and developing that funding source. This would benefit urbanized areas and also address significant rural transit needs.

LONG TERM STRATEGIES (2018-2025)

The Ohio Statewide Transit Needs Study documented that Ohio's transit investment needs are great, but also the benefits that would be realized through such an investment are likewise significant. Transit investment is an integral part of Ohio's future as a vibrant, dynamic community that is attractive and affordable to all generations of Ohioans.

There is no simple solution to funding transit at the needed investment level. Today, communities invest nearly $900 million with half of all funds provided locally. The funding needs developed as part of this study suggests the investment needs to double by 2025, increasing to roughly $1.8 billion annually. Accomplishing this will require a broad coalition of partners, including the federal government, the State of Ohio, and local communities, along with local institutions and employers. A complete partnership also involves riders, who will be expected to pay their fair share of the service, reflecting its value to them. While all partners will be expected to pay more, some partners may pay proportionally less, while others may pay proportionally more.

In addition to working towards a funding strategy, the Ohio Statewide Transit Needs Study also recommends continuation of the policies and programs started in the Short Term Approach. The following programs are needed to strengthen transit services, outside of financial investments:

- **Ongoing monitoring and reporting on transit agency performance and efficiency.** Our goal is to strengthen taxpayer, policymaker and investor trust in the effectiveness and efficiency of our transit operators. Performance management will require support from all partners in terms of training and education for operators struggling to stay within range of their peers.
- **Increased coordination with Human Service Transportation programs and agencies**, so that investments work toward a coordinated, streamlined system. Our goal is for public transit agencies and human service agencies to work together to provide and fund transportation efficiently. This will be achieved with the help of state policy that incentivizes coordination of human service and public transportation investments.
- **More regional services to better align transit service delivery with transit needs**, so that even as Ohio expands transit into new areas, there are fewer transit agencies statewide. Our goal is for people to be able travel to neighboring counties and regional centers. This will likely be achieved through a combination of increased collaboration between operators and increased shared resources among transit agencies.
- **Investment in public information systems and transit technologies**, so that Ohio's transit services are easy to use and understand. Our goal is for transit services to be easy to use for as many people as possible. This will require developing simple information systems that includes technology as well as printed materials.
- **Appropriate capital investment in transit vehicles and technologies.** Our goal is to make Ohio's fleet safe, well maintained and modern, and ensure that transit agencies are supported with effective technology. This will be accomplished through investment and training.

APPENDIX:

A | B

APPENDIX A

ACRONYMS

ADA	Americans with Disabilities Act of 1990
APC	Automatic Passenger Counter
APTA	American Public Transit Association
AVL	Automatic Vehicle Location
CMAQ	Congestion Mitigation and Air Quality
DOT	Department of Transportation
FHWA	Federal Highway Administration (also FHA)
FTA	Federal Transit Administration
JARC	Job Access & Reverse Commute Program
LEHD	Longitudinal Employer-Household Dynamics
LTN	Light Transit Vehicle, Narrow Body
MPO	Metropolitan Planning Organization
MSA	Metropolitan Statistical Area
ODOT	Ohio Department of Transportation

GLOSSARY OF TERMS

Accessibility: The extent to which facilities, including transit vehicles, are barrier-free and can be used by people who have disabilities, including users of wheelchairs and other mobility devices.

Activity Center: Typically, a mixed-use urban area where there is a concentration of commercial and other land uses.

ADA Complementary Paratransit Service: Demand-responsive service operated by public entities in order to accommodate persons who cannot ride fixed-route services due to a disability. Public entities operating fixed-route services are required to provide complementary paratransit services meeting a set of service characteristics specified under the Americans with Disabilities Act.

Advance Reservation Scheduling: Type of transit trip scheduling in which passengers call to reserve rides in advance for a particular date a time (in contrast to real-time scheduling). Advance reservation of trips allows the scheduler/dispatcher to identify ridesharing opportunities and assign rides to vehicles for the most efficient service delivery.

Alignment: The horizontal and vertical ground plan of a roadway, railroad, transit route or other facility.

Allocation: An administrative distribution of funds, for example, federal funds among the states; used for funds that do not have legislatively mandated distribution formula.

Americans with Disabilities Act of 1990 (ADA): Passed by the Congress in 1990, this act mandates equal opportunities for persons with disabilities in the areas of employment, transportation, communications and public accommodations. Under this Act, most transportation providers are obliged to purchase lift-equipped vehicles for their fixed-route services and must assure system-wide accessibility of their demand-responsive services to persons with disabilities. Public transit providers also must supplement their fixed-route services with paratransit services for those persons unable to use fixed-route service because of their disability.

Amtrak: A quasi-public corporation created by the federal Rail Passenger Service Act of 1970 to improve and develop intercity passenger rail service throughout the United States.

Area Agency on Aging: The local entity that plans senior services and advocates for the elderly within their communities, administering provisions of the Older Americans Act.

Automatic Passenger Counter: An automated system that counts the number of passengers boarding and alighting a transit vehicle. The information may be used for later data analysis, or for real-time activities, such as providing signal priority only to buses that are at least half full.

Automatic Vehicle Location System: A system that determines the location of vehicles carrying special electronic equipment that communicates a signal back to a central control facility. AVLs are used for detecting irregularity in service and are often combined with a computer-aided dispatch system.

Bi-Directional Service/Route: A bidirectional transit route is a route that provides service along the same route in both directions (compared to a Loop Route that operates in a circular pattern and does not provide service along the same route in both directions).

Branch: One of multiple route segments served by a single route.

Bus: A rubber-tired road vehicle designed to carry a substantial number of passengers (i.e., 10 or more), commonly operated on streets and highways for public transportation service.

Bus Shelter: A building or other structure constructed at a transit stop. A transit shelter provides protection from the weather and may provide seating or schedule information or both for the convenience of waiting passengers.

Bus Stop: An area where passengers wait for, board, alight, and transfer between transit units (vehicles or trains). It is usually indicated by distinctive signs and by curb or pavement markings and may provide service information, shelter, seating, or any combination of these. Stops are often designated by the mode offering service, for example, bus stop, car stop.

Capital Costs: Refers to the costs of long-term assets of a public transit system such as property, buildings and vehicles.

Capital Improvement Program: The list of capital projects for a five to seven year programming period.

Carpool: A type of transportation arrangement, usually for commuter trips, in which two or more individuals share a regular trip in an automobile. Carpools typically provide door-to-door service, change when a rider's travel needs change, and may be arranged on an informal basis or through a rideshare program or brokerage.

Central Business District: An area of a city that contains the greatest concentration of commercial activity, the "Downtown". The traditional downtown retail, trade, and commercial area of a city or an area of very high land valuation, traffic flow, and concentration of retail business offices, theaters, hotels and services.

Charter Service: Transportation service offered to individuals or groups on an exclusive basis and provided with a vehicle licensed to render charter service and engaged at a specific price for the trip or period of time, usually on a reservation or contractual basis (e.g. for site-seeing tours or trips to recreational destinations). Over-the-road coaches (intercity buses) with baggage compartments, comfortable seats, and restrooms are typically used in charter service. Public transportation operators that receive federal and other public subsidies may only operate charter service under limited conditions.

Circulator: A bus that makes frequent trips around a small geographic area, with numerous stops along the route.

Combined Statistical Area: A Combined Statistical Area (CSA) is a grouping of adjacent metropolitan areas based on social and economic ties measured by commuting patterns between adjacent Metropolitan Statistical Areas. CSAs are defined by the Office of Management and used by the Census Bureau and other federal government agencies for statistical purposes.

Commuter Rail: Local and regional passenger train service between a central city, its suburbs and/or another central city, operating primarily during commutes hours. Designed to transport passengers from their residences to their job sites. Differs from rail rapid transit in that the passenger cars generally are heavier, the average trip lengths are usually longer, and the operations are carried out over tracks that are part of the railroad system.

Congestion Mitigation and Air Quality Improvement Program (CMAQ): CMAQ funds are administered by the Federal Transit Administration with the objective of improving the Nation's air quality and managing traffic congestion. CMAQ projects and programs are often innovative solutions to common mobility problems and are driven by Clean Air Act mandates to attain national ambient air quality standards. Eligible activities under CMAQ include transit system capital expansion and improvements that are projected to realize an increase in ridership; travel demand management strategies and shared ride services; pedestrian and bicycle facilities and promotional activities that encourage bicycle commuting.

Contract/Contract Income: A written agreement between a transit agency and another community agency or organization for transportation services, most often some type of demand-response service, in exchange for funding.

Coordinated Transportation Plan: Coordinated Public Transit Human Services Transportation Plan: Federal Transit Law, as amended by SAFETEA-LU requires that projects selected for funding under the Elderly Individuals and Individuals with Disabilities (Section 5310), Job Access and Reverse Commute (JARC) (Section 5316) and New Freedom (Section 5317) programs be derived from a locally developed, coordinated public transit-humans services transportation plan and that the plan be developed through a process that includes representatives of public, private and non-profit transportation and human services providers and participation by members of the public. These plans identify the transportation needs of individuals with disabilities, older adults and people with low incomes, provide strategies for meeting these needs, and prioritize transportation services for funding and implementation.

Corridor: A broad geographical band that follows a general directional flow or connects major sources of trips. It may contain a number of streets and highways and many transit lines and routes.

Cost Effectiveness: Cost effectiveness is the cost per passenger trip. More precisely, it is the amount of money a transit agency spends to provide its service (either as a system or a particular mode of travel, such as bus or rail) divided by the total number of passenger trips. This only takes into account what it costs to provide the service, and does not deduct fare revenues from the cost of providing the service.

Cost Efficiency: Cost efficiency of transit measures the economy by which transit operators deliver service; ability to provide service outputs within constraints of service inputs; and the ability to provide service outputs (i.e. vehicle hours, miles, etc.) as a function of the service inputs (i.e. labor, capital, etc.). These measures include operating expense per vehicle revenue mile of service and operating expense per vehicle revenue hour.

Curb-to-Curb Service: A common designation for transit services in which the vehicle picks up and discharges passengers at the curb or driveway in front of their home or destination. In curb-to-curb service the driver does not assist the passenger along walks or steps to the door of the home or other destination, in contrast to door-to-door service, in which passengers may be provided with an escort from the door of their origin to the door of their destination.

Cutaway Vehicle: A cutaway transit vehicle consists of a bus-body attached to a small- or medium-sized truck chassis. Cut-away buses are typically smaller than standard buses and are used for lower ridership routes or dial-a-ride or paratransit services.

Deadhead: Term to describe of a transit vehicle while not generating fare revenue or without passengers aboard, often to and from a garage, or from one route to another.

Demand Response Service: A type of transit service where individual passengers can request transportation from a specific location to another specific location at a certain time. Transit vehicles providing demand-response service often do not follow a fixed route, but travel throughout the community transporting passengers according to their specific requests. These services usually, but not always, require advance reservations. See also Deviated Fixed Route and Flexible Routing and Scheduling.

Density: Density refers to the number of people or the number of employees per square mile.

Deviated Fixed Route Service: This type of transit is a hybrid of fixed-route and demand-response services. A bus or van passes along fixed stops and keeps to a timetable, but can deviate its course between two stops to go to a specific location for a pre-scheduled request. Often used to provide accessibility to persons with disabilities.

Disabled Individual: Any person who by reason of illness, injury, age, congenital malfunction, or other permanent or temporary incapacity or disability is unable, without special facilities, to use local transit facilities and services as effectively as persons who are not so affected.

Discretionary: Subject to the discretion of legislators or an administrator. The federal Section 5309 New Starts Program is an example of a discretionary program.

Door-to-Door Service: A form of paratransit service that includes passenger assistance between the vehicle and the door of his or her home or other destination. Door-to-door service provides a higher level of assistance than curb-to-curb service, yet not as much as "door-through-door" service, in which the driver actually provides assistance within the origin or destination.

Employment Transportation: Transportation specifically designed to take passengers to and from work or work-related activities.

Express Service: Service that has fewer stops and a higher operating speed than regular service. Often used an alternative term for limited-stop service; when agencies provide both types of service, the express service tends to have much longer sections of non-stop running.

Fare: Payment in the form of coins, bills, tickets and tokens collected for transit rides.

Fare Structure: The system set up to determine how much is to be paid by various passengers using the system at any given time.

Farebox Recovery Ratio: The ratio of fare revenue to direct operating expenses.

Farebox Revenue: A public transportation term for the monies or tickets collected as payments for rides. Farebox revenue may include cash, tickets, tokens, transfers, and pass receipts. Farebox revenues rarely cover even half of a transit system's operating expenses.

Federal Highway Administration (FHWA): The FHWA is an agency within the U.S. Department of Transportation. The FHWA provides stewardship over the construction, maintenance, and preservation of the Nation's highways, bridges, and tunnels and conducts research and provides technical assistance to state and local agencies in an effort to improve safety, mobility, and livability.

Federal Highway Administration (FHWA) Flexible Funds: FWHA Flexible Funds (or flex funds) fund transit related activities. Flex funds are certain legislatively specified funds that may be used either for transit or highway purposes. The idea of flex funds is that a local area can choose to use certain Federal surface transportation funds based on local planning priorities, not on a restrictive definition of program eligibility. Flexible funds include Federal Highway Administration (FHWA) Surface Transportation Program (STP) funds and Congestion Mitigation and Air Quality Improvement Program (CMAQ) and FTA Urban Formula Funds.

Federal Transit Administration (FTA): A component of the U.S. Department of Transportation that regulates and helps fund public transportation. FTA provides financial assistance for capital and operating costs and also sponsors research, training, technical assistance and demonstration programs.

Fiscal Year: A yearly accounting period designated by the calendar year in which it ends (e.g. FY 2000). The fiscal year for the federal government runs from October 1 to September 30.

Fixed Cost: An indirect cost that remains relatively constant irrespective of the level of operational activity.

Fixed Route Service: Transit services in which vehicles run on regular, pre-designated, pre-scheduled routes, with no deviation. Typically, fixed-route service is characterized by printed schedules or timetables, designated bus stops where passengers board and alight and the use of larger transit vehicles.

Flex Service: Flex service, or "flexible" service refers to route-deviated service or point deviated service that combines the reliability and predictability of fixed-route service with the curbside convenience of demand response.

Frequency of Service: The number of transit units (vehicles or trains) on a given route or line, moving in the same direction, that pass a given point within a specified interval of time, usually 1 hour; also known as *headway*.

General Public: Refers to residents, employees, and visitors in the community.

Hail and Ride System: Hail and Ride refers to boarding or alighting a mode of public transportation by signaling the driver or conductor that one wishes to board/alight, rather than the more conventional system of using a designated stop.

Headway: The scheduled time interval between any two revenue vehicles (buses, LRVs, trolleys, etc.) operating in the same direction on a route. See also *frequency of service*.

Human Services Transportation: Transportation related to the provision of human or social services, including transportation for the elderly, people with disabilities, and low-income individuals when the transportation is provided by an arrangement other than public service available to all. Examples may include dial-a-ride (responding to individual door-to-door transportation requests), the use of bus tokens and/or transit passes for fixed route scheduled services, accessing taxi vouchers and/or mileage reimbursement to volunteers or program participants.

Intercity Bus Service: Provides long distance service between cities, often as part of a large network of intercity bus operators (e.g., Greyhound, Trailways). Both express and local bus service may be provided.

Interline: Transfer of transit vehicles or trains between routes during a day to improve staff or vehicle assignment efficiency.

Intermodal: The ability to connect, and make connections between, modes of transportation.

Jitney Service: A service that is operated on a fixed route but not on a fixed schedule, and that often allows passengers to be picked up anywhere along the route. Frequencies are generally high on jitney service. This type of service is often tailored toward tourists or seasonal travel needs.

Jobs Access and Reverse Commute Program (JARC): A federal funding program for work-related transportation for low-income individuals, authorized in the TEA-21 transportation funding act. The purpose of this grant program is to develop transportation services designed to transport welfare recipients and low income individuals to and from jobs and to develop transportation services for residents of urban centers and rural and suburban areas to suburban employment opportunities. Emphasis is placed on projects that use mass transportation services.

Layover: Layover time serves two major functions: recovery time for the schedule to ensure on-time departure for the next trip and, in some systems, operator rest or break time between trips. Layover time is often determined by labor agreement, requiring "off-duty" time after a certain amount of driving time.

Local Match: For many Federal, State, and other grants, “local match” is required, meaning funding (public or private) that is generated in local places and/or by local agencies that is used to “match” other funds, per the grant requirements.

Local Service: Transit service that involves frequent stops and consequent low average speeds, the purpose of which is to deliver and pick up transit passengers close to their destinations or origins.

Longitudinal Employer-Household Dynamics (LEHD): The Longitudinal Employer-Household Dynamics (LEHD) program is part of the Center for Economic Studies at the U.S. Census Bureau. The LEHD program produces new, cost effective, public-use information combining federal, state, and Census Bureau data on employers and employees under the Local Employment Dynamics (LED) Partnership.

Loop Route: A route that operates in a circular pattern and does not provide service along the same route in both directions (compared to Bidirectional Routes that provide service along the same corridor in both directions).

Low-floor Bus: A low-floor bus is a bus that has no steps between the place of boarding and the bus. Low-floor buses improve accessibility, particularly for people with disabilities and older adults.

Medicaid: A healthcare program for low-income and other medically needy persons, jointly funded by state and federal governments. The Medicaid program pays for transportation to non-emergency medical appointments if the recipient has no other means to travel to the appointment.

Medicare: Medicare is a national social insurance program administered by the U.S. federal government since 1966. Medicare provides health insurance for Americans aged 65 and older who have worked and paid into the system. It also provides health insurance to younger people with disabilities.

Metropolitan Planning Organization: The organizational entity designated by law with lead responsibility for developing transportation plans and programs for urbanized areas of 50,000 or more in population. MPOs set coordination standards and manage processes for selecting projects to be funded through federal transportation programs.

Metropolitan Statistical Area: A Metropolitan Statistical Area (MSA) is a geographic region with a relatively high population density. MSAs are defined by the Office of Management and used by the Census Bureau and other federal government agencies for statistical purposes.

Micropolitan Statistical Area: A Micropolitan Statistical Area is a geographic region with a population of 10,000 to 49,999. Micropolitan Statistical Areas are defined by the Office of Management and used by the Census Bureau and other federal government agencies for statistical purposes.

Mobility Management Program: Mobility management is a strategic approach to service coordination and customer service that allows transit service operators to collaborate, create partnerships, and expand the range of viable transit options in communities.

Mode: A transport category characterized by specific right-of-way, technological and operational features. A particular form of travel, for example, walking, traveling by automobile, traveling by bus, traveling by train.

Mode Split: The proportion of total person trips that uses each of various specified modes of transportation.

New Freedom Program: A new program under the SAFETEA-LU federal transportation funding act, New Freedom is intended to provide capital and operating funding for service and facility improvements that go beyond those required by the ADA in addressing transportation needs of persons with disabilities.

Ohio Coordination Program: The Ohio Coordination Program funds local and regional mobility managers -- professionals who work to enhance and expand transportation options at both a community and a personal level. Mobility managers are transportation providers, planners, and community stakeholders that collaborate, plan, implement and maintain a family of transportation services. The Ohio Coordination Program funds projects derived from a coordinated transportation plan that demonstrate some level of interagency coordination.

Ohio Department of Transportation (ODOT): ODOT is the administrative department of the Ohio state government responsible for developing and maintaining all state and federal roadways in the state of Ohio with exception of the Ohio Turnpike.

Ohio General Revenue Fund: The Ohio General Revenue Fund is the State's largest state fund from which all major state agencies receive funding.

Operating: Maintaining the ongoing functions of an agency or service. "Operating expenses" include wages, benefits, supplies, and services. "Operating assistance" is used to pay for the costs of providing public transit service.

Operating Assistance: Funding that helps support the day-to-day costs of operating or providing services; in transportation settings, this category often includes driver salaries and operating staff expense, as well as fuel, and other routine, ongoing costs of having and operating a transportation service.

Operating Costs: Non-capital costs associated with operating and maintaining a transit system, including labor, fuel, administration, and maintenance.

Operating Expenditure per Capita: Operating expenditure per capita refers to the amount of transit operating dollars spent per person in a city, region, or state. This metric is often used to compare funding levels across different regions or locales.

Paratransit: Types of passenger transportation that are more flexible than conventional fixed-route transit and as such are able to meet a variety of more specialized transportation needs. Paratransit includes demand-response transportation services, shared-ride taxis, carpooling and vanpooling, jitney services and other service models. This term is most often used to refer to wheelchair accessible, demand-response van service.

Park-and-Ride: An access mode to transit in which patrons drive private automobiles or ride bicycles to a transit station, stop, or carpool/vanpool waiting area and park the vehicle in the area provided for that purpose (park-and-ride lot, park-and-pool lot, commuter parking lot, bicycle rack or locker). They then ride the transit system or take a car or vanpool to their destinations.

Pass: A means of transit prepayment, usually a card that carries some identification that is displayed to the driver or conductor in place of paying a cash fare.

Passenger: A person who rides a transportation vehicle, excluding the driver.

Passenger Miles: The total number of passengers carried by a transit system for a unit of time multiplied by the number of miles (kilometers) they travel. The ratio of passenger miles (kilometers) and seat or place miles (kilometers) provides a measure of efficiency.

Peak/Off-Peak: "Peak" refers to the period of time when the maximum amount of travel occurs—usually also the time when the demand for transportation is the highest. The morning and evening peaks occur when the majority of commuters are traveling to and from school or work. "Off-peak" refers to the time outside peak travel periods.

Propensity/Transit Propensity: Transit propensity is a concept that measures the likelihood of using public transit. Indicators of transit propensity typically include low-income households, minority status, households with zero cars, and age.

Purchased Transportation: A specific transportation service provided to a public agency by a public or private transportation provider based on a written contract.

Recovery Time: Recovery time is distinct from layover, although they are usually combined together. Recovery time is a planned time allowance between the arrival time of a just completed trip and the departure time of the next trip in order to allow the route to return to schedule if traffic, loading, or other conditions have made the trip arrive late. Recovery time is considered as reserve running time and the operator will typically remain on duty during the recovery period.

Revenue Mile: Miles operated by vehicles available for passenger service.

Revenue Service: Transit service excluding deadheading or layovers or any service scheduled for passenger trips. Also known as *service hours*.

Reverse Commute: A commute in the direction opposite to the main flow of traffic, for example, from the central city to a suburb during the morning peak. Increasingly common with growth in suburban employment. Valuable to operator as provides additional passengers and revenue at little or no marginal cost.

Ridership: The number of rides taken by people using a public transportation system in a given time period.

Ridesharing: A form of transportation, other than public transit, in which more than one person shares in the use of the vehicle, such as a bus, van, or automobile, to make a trip.

Rideshare/Ridematch Program: A rideshare program facilitates the formation of carpools and/or vanpools, usually for work trips. A database is maintained of ride times, origins, destinations, and driver/rider preferences of users and potential users. Persons requesting to join an existing pool or looking for riders are matched with others by program staff. In rural areas, a rideshare programs is often used to coordinate Medicaid transportation.

Rolling Stock: The vehicles used by transit agencies to operate service, such as buses, vans, cars, railcars, locomotives, trolley cars and buses, and ferry boats, as well as vehicles used for support services.

Route: A specified path taken by a transit vehicle usually designated by a number or a name, along which passengers are picked up or discharged.

Route Deviation: A type of transit service that operates as conventional fixed route bus service along a fixed alignment or path with scheduled time, points at each terminal point, and key intermediate locations. Route deviation service is different from conventional fixed route bus service in that the bus may deviate from the route alignment to service destinations within a prescribed distance of the route. Following an off-route deviation, the bus must return to the point on the route it left.

Running Time: The actual, expected, or scheduled time required for a transit unit (vehicle or train) to move from one point to another, excluding time for stops.

Scheduling: The planning of vehicle arrivals and departures and the operators for these vehicles to meet consumer demand along specified routes.

Section 5307: The section of the Federal Transit Act that authorizes grants to public transit systems in urban areas. Funds authorized through Section 5307 are awarded to states to provide capital and operating assistance to transit systems in urban areas with populations between 50,000 and 200,000. Transit systems in urban areas with populations greater than 200,000 receive their funds directly from FTA.

Section 5309: The section of the Federal Transit Act that authorizes discretionary grants to public transit agencies for capital projects such as buses, bus facilities and rail projects.

Section 5310: The section of the Federal Transit Act that authorizes capital assistance to states for transportation programs that serve the elderly and people with disabilities. States distribute Section 5310 funds to local operators in both rural and urban settings, who are either nonprofit organizations or the lead agencies in coordinated transportation programs.

Section 5311: The section of the Federal Transit Act that authorizes capital and operating assistance grants to public transit systems in areas with populations of less than 50,000.

Service Area: A geographic area which is provided with transit services. Service area is now defined consistent with ADA requirements.

Service Span: The span of hours over which service is operated, e.g., 6 a.m. to 10 p.m. or 24 hr (owl). Service span often varies by weekday, Saturday, or Sunday.

Shared Ride Taxi: A service that provides taxi transportation in which more than one passenger is in the vehicle at one time. This type of service is a way of using taxis to provide paratransit service.

Shuttle Service: Fixed-route service that connects a small number of fixed stops and operates at a high frequency, over a repetitive route. (Shuttles tend to travel in a more linear route than circulators.)

Surface Transportation Program (STP): The Surface Transportation Program is the largest potential source of flexible funds from the Federal Highway Administration. It can be used for a broad array of highway purposes and flexibly used for major transit purposes. A few examples include buying buses, rail vehicles, or constructing fixed guideway systems like light rail or heavy rail.

Time Point: A designated location and time that a bus or LR vehicle can arrive before – but not leave earlier than – the stated time as indicated in the route schedule.

Total Miles: The total miles include revenue, deadhead, and yard (maintenance and servicing) miles.

Transfer: A passenger's change from one transit unit (vehicle or train) or mode to another transit unit or mode.

Transit Center: A transit stop or station at the meeting point of several routes or lines or of different modes of transportation. It is located on or off the street and is designed to handle the movement of transit units (vehicles or trains) and the boarding, alighting, and transferring of passengers between routes or lines (in which case it is also known as a *transfer center)*.

Transit Dependent: Those having to rely on transit services instead of the private automobile to meet one's travel needs; also known as a *captive rider*.

Transit Reliant: Someone is transit reliant when they have no other option for transportation.

Transit Riders per Capita: The number of people who ride transit compared to the total population in a city, region, or state.

Trip: A one-way movement of a person or vehicle between two points. Many transit statistics are based on "unlinked passenger trips," which refer to individual one-way trips made by individual riders in individual vehicles. A person who leaves home on one vehicle, transfers to a second vehicle to arrive at a destination, leaves the destination on a third vehicle and has to transfer to yet another vehicle to complete the journey home has made four unlinked passenger trips.

Unlinked Trip: The boarding of one transit vehicle in revenue service; also known as an unlinked passenger trip, or any segment of a *linked trip*.

Useful Life: The expected lifetime of property, such as vehicles, or the acceptable period of use in service when properly and regularly maintained. Useful life is used interchangeably with "service life."

Vanpool: A prearranged ridesharing service in which a number of people travel together on a regular basis in a van. Vanpools may be publicly operated, employer operated, individually owned or leased.

Variable Cost: A cost that varies in relation to the level of operational activity.

Vehicle Hour: Vehicle hours include revenue hours plus the time it takes a vehicle to travel from the garage to the end of the line.

Vehicle Miles: The number of miles traveled by a vehicle, usually calculated by mode.

Vehicle Revenue Hour: The measure of scheduled hours of service available to passengers for transport on the routes, equivalent to one transit vehicle traveling in one hour in revenue service, excluding deadhead hours but including recovery/layover time.

Vehicle Revenue Mile: Miles operated by vehicles available for passenger service.

Wheelchair Lift: A device used to raise and lower a platform in a transit vehicle for accessibility by individuals using wheelchairs.

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APPENDIX B

ASSUMPTIONS AND DATA SOURCES

The Ohio Statewide Transit Needs Study included extensive analysis on a variety of data sources throughout the year-long effort. With 61 transit agencies and 88 counties, Ohio is a large and complex state that required many different manipulations, groupings, and assumptions to complete the analysis. The study team made every attempt to stay consistent with how data was manipulated and grouped, though concessions had to be made based on the data available. The following discussion provides an overview of our major data sources and their uses. In addition, any assumptions made to complete an analysis are documented within this final report or within the full report/memorandum created for the study (attached as separate appendices). Most assumptions are specific to a particular analysis and are thus not reviewed here; however, a discussion of those that carried throughout the study or affected multiple reports follows.

Data Sources

Status of Public Transit in Ohio, 2012 (DOT) – this database collected by the Ohio Department of Transportation (ODOT) each year includes basic information about each transit agency in Ohio, service characteristics, performance data, funding, and a vehicle inventory. This was the study team's primary source of data, with the latest data available from 2012. Thus, 2012 was our "base" year for analysis. The database relies on self-reported data from each agency. ODOT creates a report based on this data; the latest report available is based on 2011 data.[1]

National Transit Database (NTD)[2] – this database includes detailed information on every public transportation system in the U.S. that receives funding through the Federal Transit Administration (FTA) under the Urbanized or Non Urbanized (Rural) Area Formula Programs (§5307 and §5311). Collected yearly, it is the primary source of information and statistics for transit. The latest NTD available was 2012 when this study began. NTD was a secondary data source after the SOT, since most of the information was similar between the two databases.

U.S. Census Bureau[3] – The team gathered Ohio demographic and socio-economic data from both the 2010 Decennial Census and 2008-2012 5-Year American Community Survey for the study, primarily to conduct the market analysis. Historical population data from past decennial censuses was also used.

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[1] Status of Public Transit in Ohio, Ohio Department of Transportation, July 2012. http://www.dot.state.oh.us/Divisions/Planning/Transit/Documents/Programs/Publication/StatusOfPublicTransitinOhio2012.pdf

[2] http://www.ntdprogram.gov/ntdprogram/

[3] http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml

Other major sources –

- Greater Ohio Policy Center[4] – trend, demographic, and socio-economic data
- Scripps Gerontology Center, Miami University[5] – trend, demographic, and socio-economic data
- Office of Research, Ohio Development Services Agency[6] – trends and population forecasts
- ODOT – state funding, vehicle database, assistance with SOT
- FTA[7] – federal apportionments, information on funding
- Minnesota Department of Transportation – projected transit service needs methodology (adapted)[8]

Assumptions

Urban and Rural – The most important designation made throughout the study was that of rural versus urban. In most cases, a county's designation was based on the FTA and ODOT definitions. If a data source did not use the same designations, the study team made every attempt to remain consistent by updating the source. The FTA uses U.S. Census Bureau definitions to define urbanized and non-urbanized (rural) areas, defining an urbanized area as an incorporated area with a population of 50,000 or more. Using these definitions set out by the Federal Transit Administration (FTA), ODOT then designates each county in Ohio as urban or rural based on whether or not the county seat is within the urbanized boundary. A county's designation can and does change over time because they reflect the area in which the systems operate, and their proximity to large urbanized areas.

Horizon Years – When the study began in October 2013, the team anticipated to forecast needs for the period between 2014 and 2024. However, the study ran through the end of 2014, and population forecasts are only available every five years between 2015 and 2040, so the study team created forecasts for the 10-year period between 2015-2025. With a base year of 2012, there is a two year gap (2013 and 2014) where data and results are unavailable.

Appropriations/allocations, Expenditures, and Revenues – Funding for transit is very complex and comes from a multitude of sources. When possible, the study team used the SOT database for all data on funding. The SOT database reports operating funding (revenues) by source, operating expenditures, and capital funds expended by local, state, and federal assistance. Certain assumptions had to be made when using these fields:

- For rural agencies, operating revenues and expenditures reported were equal. However, this was not the case for urban agencies, particular the large fixed route operators. Often, revenues were higher than expenditures; however, this does not mean that agencies had excess revenues. The study team found that reporting practices differ by agency, meaning that the costs considered as "operating expenditures" varied from agency to agency. Agencies spent all revenues but did not cleanly delineate costs as capital and operating.

[4] http://www.greaterohio.org/

[5] http://miamioh.edu/cas/academics/centers/scripps/

[6] http://development.ohio.gov/reports/reports_research.htm

[7] http://www.fta.dot.gov/

[8] http://www.dot.state.mn.us/transit/reports/transitplan/

For the purposes of our analysis and projections, the study team used operating revenues rather than expenditures to understand actual costs.

- Yearly federal and state appropriations/allocations, defined as the amount of funding budgeted to a transit agency based on formula or discretionary programs, often did not equal total federal and state revenues reported. Revenues could be greater or smaller than allocations because allocation information did not come from the SOT database, capital revenues are not necessarily spent in the year in which they are received, or differences in reporting practices exist.

Other major assumptions

- *Rolling Stock:* Any analysis on vehicles was based on databases provided by ODOT and NTD for 2012. These two sources did not match perfectly, but each provided necessary information, and so we had to assume that they were similar enough. NTD provided data on peak vehicles and spares, while the ODOT data provided vehicles by agency, vehicle type, and year acquired. We assumed the FTA definition to determine useful life.
- *Market Analysis:* As discussed briefly in the report, development patterns (density) and demographics/socio-economic characteristics (reliance) are primarily what analysts use to determine the propensity, or likelihood, of transit use. Density is often the strongest predictor; however, need exists everywhere. ODOT and the study team, therefore, wanted to remove density from the analysis on reliance. This led to challenges in reporting the results because removing density favors rural areas. However, we assume that readers of the report will consider both the maps of development patterns and reliance together to understand the full picture of transit need in Ohio. Based on experience and research, we assumed that older adults, persons with disabilities, low-income individuals, and zero-vehicle households had the strongest reliance on transit to meet mobility needs.
- *Transit Service Needs:* The transit service needs analysis used per capita trips rates for each agency based on the number of trips reported in the SOT database and a service area population calculated from NTD and Census data. Target per capita trip rates were then calculated using the median trip rate in each peer group. However, the study team assumed that the eight largest urban areas would increase in population and densify, which is contrary to population forecasts for all metros but Columbus. This is due to trends seen in the U.S. that are still developing in Ohio. Population forecasts were thus adjusted, and target trip rates were adjusted to those of aspirational cities (based on trip rates from NTD data). The projected number of trips were also adjusted based on the results of the density and reliance analysis completed for the market analysis.
- *Capital Investment Needs:* The need for capital investment was based mostly on the rolling stock and transit service needs assessments because vehicles are typically a high percentage of capital costs. Costs for system preservation and expansion for operations and maintenance facilities, passenger facilities, and fixed guideways were based on input from transit agencies and a review of each agency's capital investment plan. If the plan extended past the 10-year horizon used for this study, the cost was divided proportionately (e.g. if an agency estimated capital needs of $60 million over the next 20 years, the team assumed a need of $30 million in the next 10). GCRTA in Cleveland, as the only system in Ohio with operating rail, estimated a need of $240 million by 2025 to replace its railcars and has the highest fixed guideway capital investment needs.