COTA
CENTRAL OHIO TRANSIT AUTHORITY

LONG RANGE TRANSIT PLAN

2016-2040 Long-Range Transit Plan

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Table of Contents

Table of Contents iii

Table of Tables vii

Table of Figures vii

ES 1. Executive Summary xi

1. Introduction 1

1.1. Background of COTA 1

1.2. Growing Community 2

1.3. Responding to Growth 5

1.3.1. Transit System Redesign 5

1.3.2. NextGen 6

1.4. Fixed-Route Bus Service 7

1.5. CMAX Cleveland Avenue Bus Rapid Transit 8

1.6. Mobility Services 9

1.7. Intelligent Transportation Systems (ITS) 10

1.8. Strategic Transit Investments 10

1.9. Financing the LRTP 11

2. Need for Plan Update and Goals 13

2.1. Goals of the LRTP 14

2.2. Transporting People to Jobs 14

2.3. Growing Special-Needs Community 16

2.4. Future Growth Projections 16

3. Public Involvement 25

3.1. TSR Public Involvement 25
3.2. NextGen Outreach 26
3.2.1. Community Engagement Methods 27
3.2.2. Phase 1 Summary 29
3.2.3. Phase 2 Summary 30
3.2.4. Summary of NextGen Findings 33
3.3. CMAX Cleveland Avenue Bus Rapid Transit 33
4. Long-Range Service Plan 35
4.1. Expanding COTA's Service 35
4.2. Fixed-Route Bus Service and the TSR 38
4.3. The Transit System Redesign (TSR) 39
4.3.1. Service Investment Strategy 45
4.3.2. Developing the Proposed Bus Network 45
4.3.3. Planned Implementation 47
4.3.4. Planned Park and Ride Changes 47
4.4. TSR Fixed-Route Network 49
4.4.1. TSR Maps 51
4.4.2. TSR Express Network 65
4.4.3. TSR Frequency and Spans 68
4.5. COTA NextGen 68
4.5.1. Phase 1 – Vision, Needs and Opportunities 69
4.5.2. Phase 2 – Define and Evaluate Alternatives 71
4.5.3. Phase 3 – Recommendations and Implementation Plan 76

4.6. Mobility Services 76
4.6.1. Mobility Coordination 77
4.6.2. Travel Training 78
4.6.2.1. How the Program Works 79
4.6.3. System Technology 80
4.7. Intelligent Transportation Systems 81
4.7.1. Automatic Vehicle Location 82
4.7.2. On-Board Automated Stop Announcements 84
4.7.3. Traveler Information Systems 85
4.7.4. Automatic Passenger Counters 86
4.7.5. Fleet Maintenance 87
4.7.6. Traffic Signal Priority 87
4.7.7. Fare Collection Enhancements 88
4.8. CMAX 89
4.9. Strategic Transit Investments 94
4.9.1. Transit Center and Park and Ride Facilities 95
4.9.2. Transit Oriented Development 98
4.9.3. Decreasing Travel Times 99
4.9.4. Bus on Shoulder Program 99
4.9.5. Dedicated Traffic Lanes 100
4.10. Types of Federal Funding 100
4.11. Strategic Property Acquisition 103
4.11.1. Strategic Initiatives 104

4.11.1.1. Park and Rides 104
4.11.1.2. Transit Centers 104
4.11.1.3. ROW and Fixed-Guideway Purchase 104
4.12. Other Service Improvements 105
4.12.1. Combining Bicycling with Transit 105
4.12.2. Environmental Initiatives 106
4.12.3. Facility Improvements 107
4.13. Safety and Security 108
4.13.1.1. Security and Technology 108
4.13.1.2. Security Services/Initiatives 110
4.13.1.3. Regional and Local Coordination 110
5. Financial Plan 113
5.1. Introduction 113
5.2. Financial Analysis Methodology 113
5.3. Cash Flow Analysis 115
5.3.1. Uses of Funds 115
5.3.1.1. COTA Capital Improvement Program Uses of Funds 115
5.3.1.2. LRTP Life-Cycle Costs 119
5.3.1.3. Sources of Funds 119
5.3.1.4. Cash Flow Statements 121
5.3.1.5. Conclusion 122
6. Conclusion 125
Appendix A 127

Table of Tables

Table 2-1 Population, Households, Employment for Years 2015 and 2040 in Developing Employment Nodes 15

Table 2-2 Area Population Growth Projections 17

Table 3-1 NextGen: Summary of Phase 1 Outreach Activities 31

Table 3-2 NextGen: Summary of Phase 2 Outreach Activities 32

Table 4-1 TSR Line Names and Numbers 44

Table 4-2 Frequency Comparison Table: Pre-TSR to TSR 51

Table 4-3 NextGen Phase 1 Public Involvement Survey Responses 71

Table 4-4 NextGen Tier 2 Measurements 74

Table 5-1 COTA Capital Improvement Program Cost Assumptions 116

Table 5-2 COTA Operating Cost Allocation Model 118

Table 5-3 Cash Flow Statement 123

Table 5-4 Cash Flow Statement 124

Table of Figures

Figure 1-1 COTA's Service Area 3

Figure 1-2 Central Ohio Population Growth 4

Figure 1-3 CNG Fixed-Route Bus 7

Figure 1-4 Increase in Annual Fixed-Route Bus Service Hours 8

Figure 1-5 CMAX Station Rendering 9

Figure 1- 6 Northland Transit Center 9

Figure 1-7 Mainstream Vehicle 10

Figure 1-8 Linden Transit Center 11
Figure 1-9 Easton Transit Center 11
Figure 2-1 Population Density 2015 18
Figure 2-2 Population Density 2040 19
Figure 2-3 Employment Density 2015 20
Figure 2-4 Employment Density 2040 21
Figure 2-5 Traffic Congestion 2015 22
Figure 2-6 Traffic Congestion 2040 23
Figure 3-1 NextGen Phase 1 Public Meeting 27
Figure 4-1 Increase in Annual Fixed-Route Bus Service Hours 36
Figure 4-2 COTA's Sales Tax Projections Comparison 37
Figure 4-3 Fixed-Route CNG Bus 39
Figure 4-4 TSR Proposed Bus Network All Day and Weekend Service 42
Figure 4-5 TSR Proposed Express, Reverse Commute and Peak only service 43
Figure 4-6 TSR Timeline 46
Figure 4-7 Northland Transit Centers Concept 47
Figure 4-8 TSR Proposed Park and Ride 49
Figure 4-9 TSR Proposed Park and Rides Labels 49
Figure 4-10 Pre-TSR Bus Network Midday and Peak Only Service 53
Figure 4-11 TSR Proposed Bus Network Midday and Peak Only Service 54
Figure 4-12 Pre-TSR High Frequency Network 55
Figure 4-13 TSR High Frequency Network 56
Figure 4-14 Pre-TSR Northwest Quadrant 57

Figure 4-15 TSR Northwest Quadrant 58
Figure 4-16 Pre-TSR Northeast Quadrant 59
Figure 4-17 TSR Northeast Quadrant 60
Figure 4-18 Pre-TSR Southeast Quadrant 61
Figure 4-19 TSR Southeast Quadrant 62
Figure 4-20 Pre-TSR Southwest Quadrant 63
Figure 4-21 TSR Southwest Quadrant 64
Figure 4-22 Pre-TSR Express Network 66
Figure 4-23 TSR Express Network 67
Figure 4-24 NextGen Values 70
Figure 4-25 NextGen Non-High Capacity Corridor Transit Investment Results 72
Figure 4-26 NextGen Phase 2 Potential High Capacity Transit Corridors 73
Figure 4-27 NextGen Tier 2 High Capacity Transit Corridors 75
Figure 4-28 COTA's Mainstream Vehicle 76
Figure 4-29 Wheel Chair Lift 76
Figure 4-30 PassWeb Interface 80
Figure 4-31 Real-Time Vehicle Location 81
Figure 4-32 Dispatch watching AVL 82
Figure 4-33 Trapeze ViewPoint Dashboard 84
Figure 4-34 On-Board Automated Stop Announcements 85
Figure 4-35 Google Trip Planner 86
Figure 4-36 APC Counters 86
Figure 4-37 Traffic Signal Priority 87

Figure 4-38 Mobile Fare Payment....89
Figure 4-39 CMAX Bus Rapid Transit Alignment....91
Figure 4-40 CMAX Station Rendering....92
Figure 4-41 CMAX Bus Rendering....92
Figure 4-42 Northland Transit Center....93
Figure 4-44 Reynoldsburg Park and Ride....95
Figure 4-43 Easton Transit Center....95
Figure 4-45 Easton Transit Center....96
Figure 4-46 Linden Transit Center....97
Figure 4-47 Before Linden Transit Center....97
Figure 4-48 Near East Transit Center....98
Figure 4-49 COTA bus on I-70....99
Figure 4-50 Small Starts Process....101
Figure 4-51 New Starts Process....101
Figure 4-52 Loading Bicycle on Bus....105
Figure 4-53 Bicycle Racks at COTA Spring Street Terminal....106
Figure 4-54 Security Cameras on Buses....108
Figure 4-55 Mobile Incident Command Center....109
Figure 4-56 Visible Intermodal Protection Response....111

ES 1. Executive Summary

COTA's 2016-2040 Long-Range Transit Plan (LRTP) serves as an update to the 2012-2035 Long-Range Transit Plan, and continues a comprehensive strategy for enhancing public transit in the central Ohio region over the next 24 years. By 2040 the Mid-Ohio Regional Planning Commission (MORPC) anticipates that population and employment within COTA's service area will grow by 13 percent and 15 percent respectively. Through public input and analysis of future demographic data, the LRTP was developed to respond to the growing transportation needs of the central Ohio region by providing an expanded, reliable, and safe transit system.

In early 2016, COTA developed three goals to guide the agency into the future to better serve the central Ohio community. The components of the 2016 LRTP move COTA forward to achieve these goals.

Ridership

Goal: Achieve ridership of 25 million passenger trips annually by 2025.

Expansion

Goal: Plan and invest in a multi-modal, high-capacity, mass transit system connecting central Ohio residents to opportunity, economic prosperity and to each other.

Perception

Goal: Be recognized in our communities, our region, and nationally, as an essential partner in economic development and mobility solutions and as a leader in technological innovation and sustainability.

ES 1.1. Background of COTA

Formed as a public agency in 1974, COTA is the primary provider of public transit services in central Ohio. Since this time, the bus system has grown into an integral part of the transportation network of central Ohio. Not only has the City of Columbus continued to grow and prosper, but so has its adjoining suburban communities.

COTA is governed by a Board of Trustees, which currently consists of thirteen members; seven appointed by the City of Columbus, two by the Franklin County Commissioners, and four city appointed slots rotated among other member cities. COTA's existing level of transit service is funded through a 0.5 percent local sales tax, half of which is a temporary, 10-year renewable sales tax. Federal and state assistance as well as farebox receipts further supplement local sales tax receipts. Although the majority of funding (69% as of 2015) is generated from the local sales tax. Figure 0-1 illustrates COTA's current service and sales tax boundaries.

ES 1.2. Growing Community

Extensive analysis regarding the region's growth, development, and related impact on the transportation system has been conducted by MORPC. The Urban Land Institute (ULI) and MORPC are undertaking an initiative to determine how central Ohio and surrounding areas could grow called insight2050. This initiative projects that by 2050 the region will grow by 300,000 jobs and 500,000 residents[1].

Figure 0-1 illustrates the population growth that occurred in the seven county central Ohio area between 1970 and 2010 and projected growth out to 2040. During this time, population increased 57 percent from 1,149,432 to 1,801,709 residents.

[1] insight2050. getinsight2050.org/

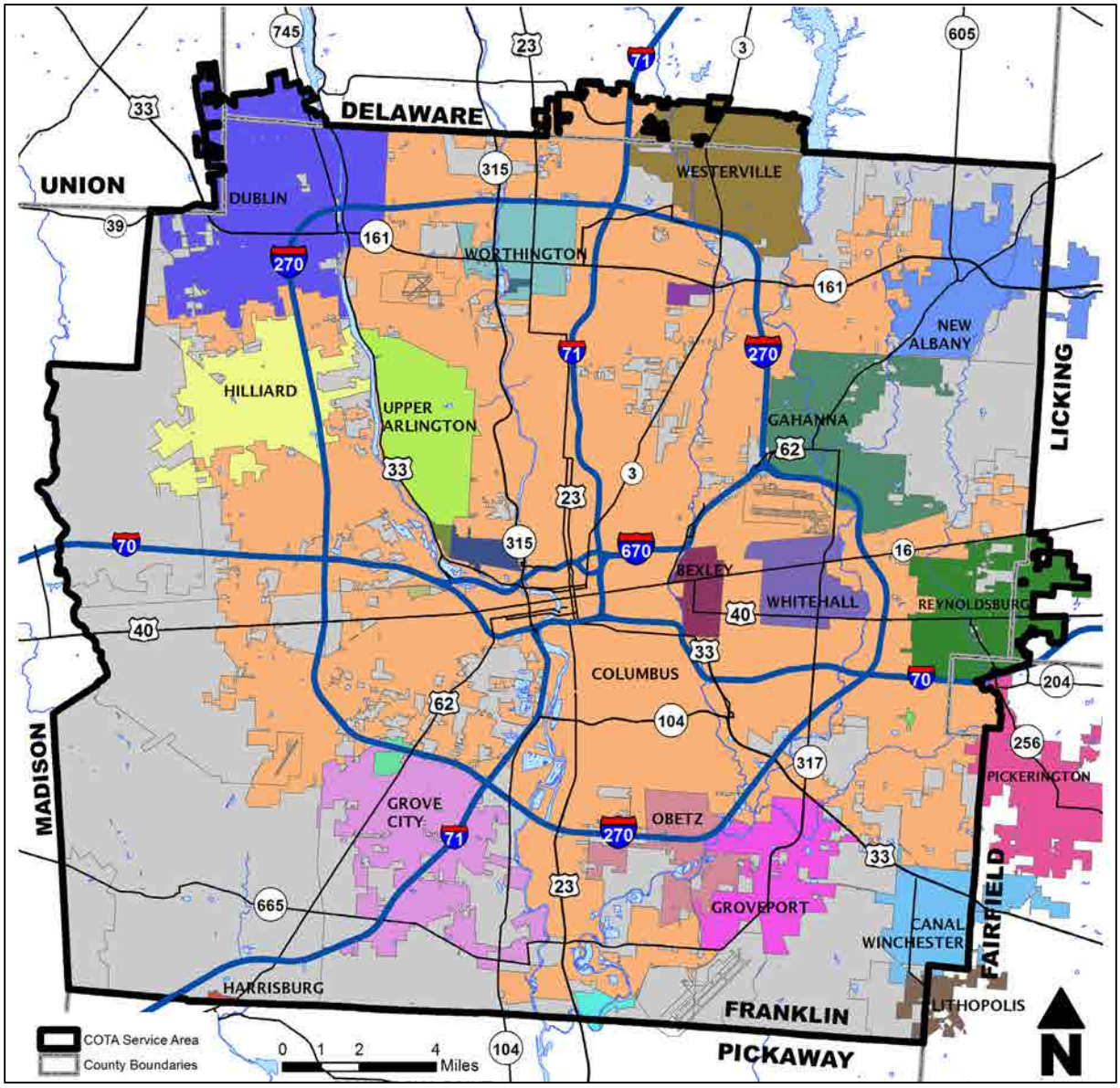

Figure 0-1 COTA's Service Area

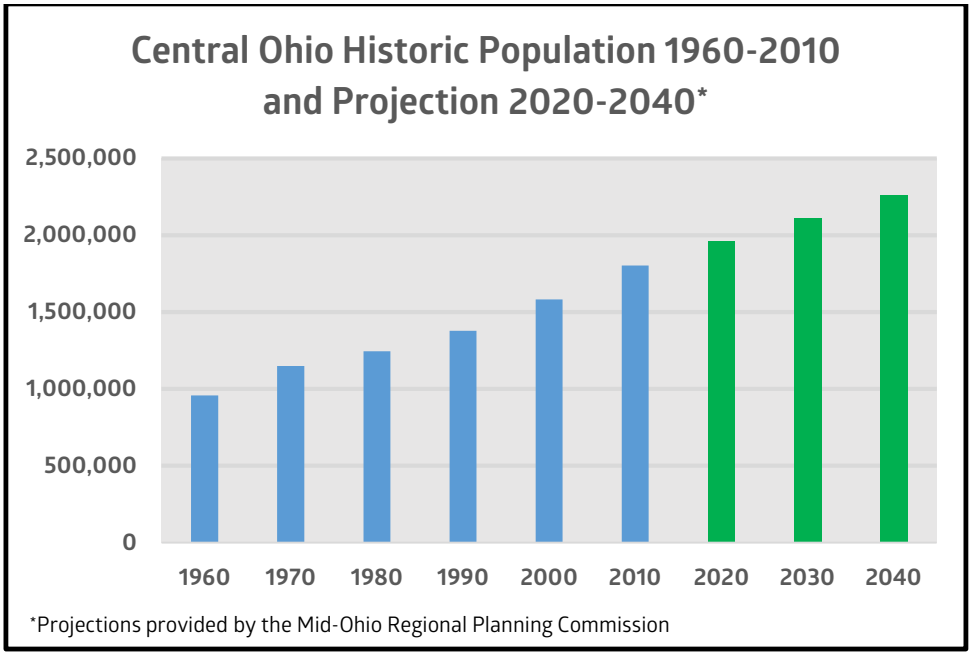

Figure 0-2 Central Ohio Population Growth

As central Ohio's population and employment grew over the past few decades, much of that growth occurred, and continues to occur farther into outlying communities, characterized by lower-density commercial, retail, and housing development. As a result, greater pressures have been placed upon all modes of the region's transportation system to move people to and from employment centers and suburban residential areas.

Future population, employment, and traffic congestion levels are projected to increase over the next 24 years in central Ohio. MORPC has projected that by 2040 COTA's service area can expect to see a:

- 13 percent increase in population;
- 15 percent increase in employment; and
- 13 percent increase in highway traffic congestion.

The region is growing in both urban and suburban areas, increasing congestion on the freeway and arterial road networks throughout. Job growth is occurring in the urban core, such as Downtown and Ohio State University (OSU), as well as in concentrated areas in Dublin, New Albany, Polaris Fashion Place area, Easton Town Center area and Rickenbacker Airport area. Population growth is happening throughout the region with the heaviest increase in the Downtown area and northern suburban areas. These development patterns will increase demand for transit.

ES 1.3. Responding to Growth

To respond to this growth, COTA launched two planning initiatives since the previous 2012-2035 Long-Range Transit Plan. The Transit System Redesign (TSR) is a short-term plan through 2019, which substantially changes COTA's bus network. This modernization plan is aimed at crafting a bus system that better serves our customers and stakeholders, while remaining within COTA's current and projected funding limits.

The second initiative, COTA NextGen, looks towards the extended future of transit in central Ohio. This initiative asks the question of "What should the role of transit be in 2025, 2040 and 2050?" Scheduled for completion in the second quarter of 2017, the final results will be a report with transit projects and improvements that will help guide stakeholders in making decisions about what, how and when to implement these projects.

ES 1.3.1. Transit System Redesign

Over the last 40 years, the central Ohio region has grown tremendously. COTA recognizes that to better serve the current and near-future region its bus network must change and adapt.

Since COTA's formation in 1974, its bus network has grown incrementally, building upon the original network, focusing most of its service on downtown Columbus. However, since the region has changed over the past 40 years, demand for transit has changed.

To meet this evolving demand for transit and ensure that COTA's resources are being effectively utilized, COTA undertook a strategic review of its system via the TSR, in October of 2013. The TSR analyzed the entire bus network and services, land use changes, the road network, operating budget and the use of technology. The TSR Final Report (November 2014), recommends improvements for positive changes to COTA's bus service and network over the next three years, taking into consideration the needs of central Ohio residents, riders and businesses. Changes include more weekend service, increased frequencies on crosstown and local lines, seven day a week service to employment centers such as Rickenbacker and Polaris and similar span of service on most local lines.

Figure 0-3 and 0-4 show the midday pre-TSR and TSR network. The maps visually show how the network is growing, increasing frequencies and serving new locations. Displayed frequencies are the midday and weekend frequencies along with the peak only services such as the express network and select local lines. The core of the network is comprised of fifteen high frequency corridors, providing 15 minutes or better service. Prior to implementation of the TSR, in September 2014, COTA operated seven high frequency lines, including the CBUS Downtown circulator, which collectively carried over 50% of COTA's ridership. This increase in high-frequency service will not only grow ridership, but provide

stronger crosstown connections, reduce travel times for riders and minimize the reliance on schedules.

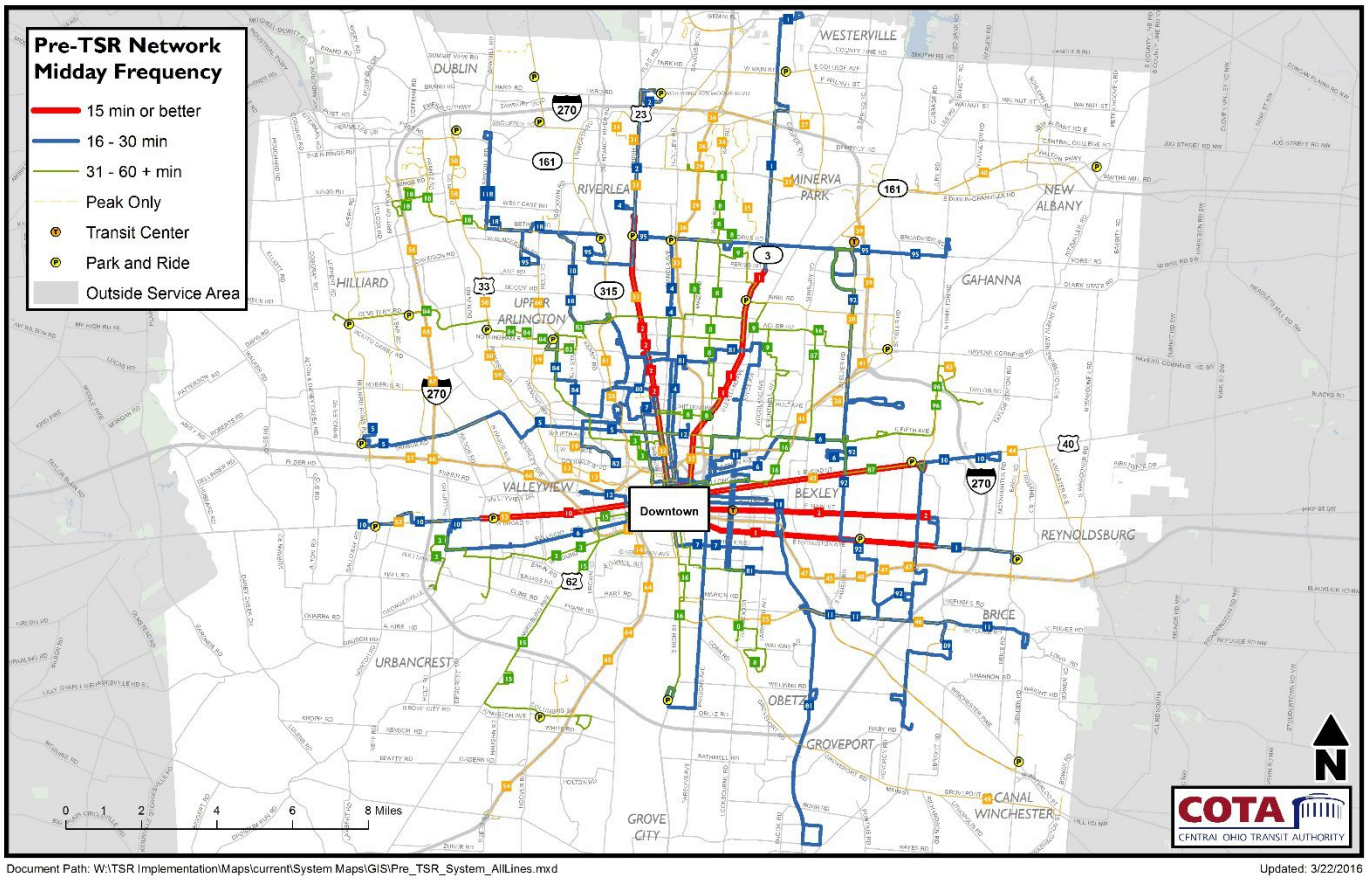

Figure 0-3 Current Weekday Network

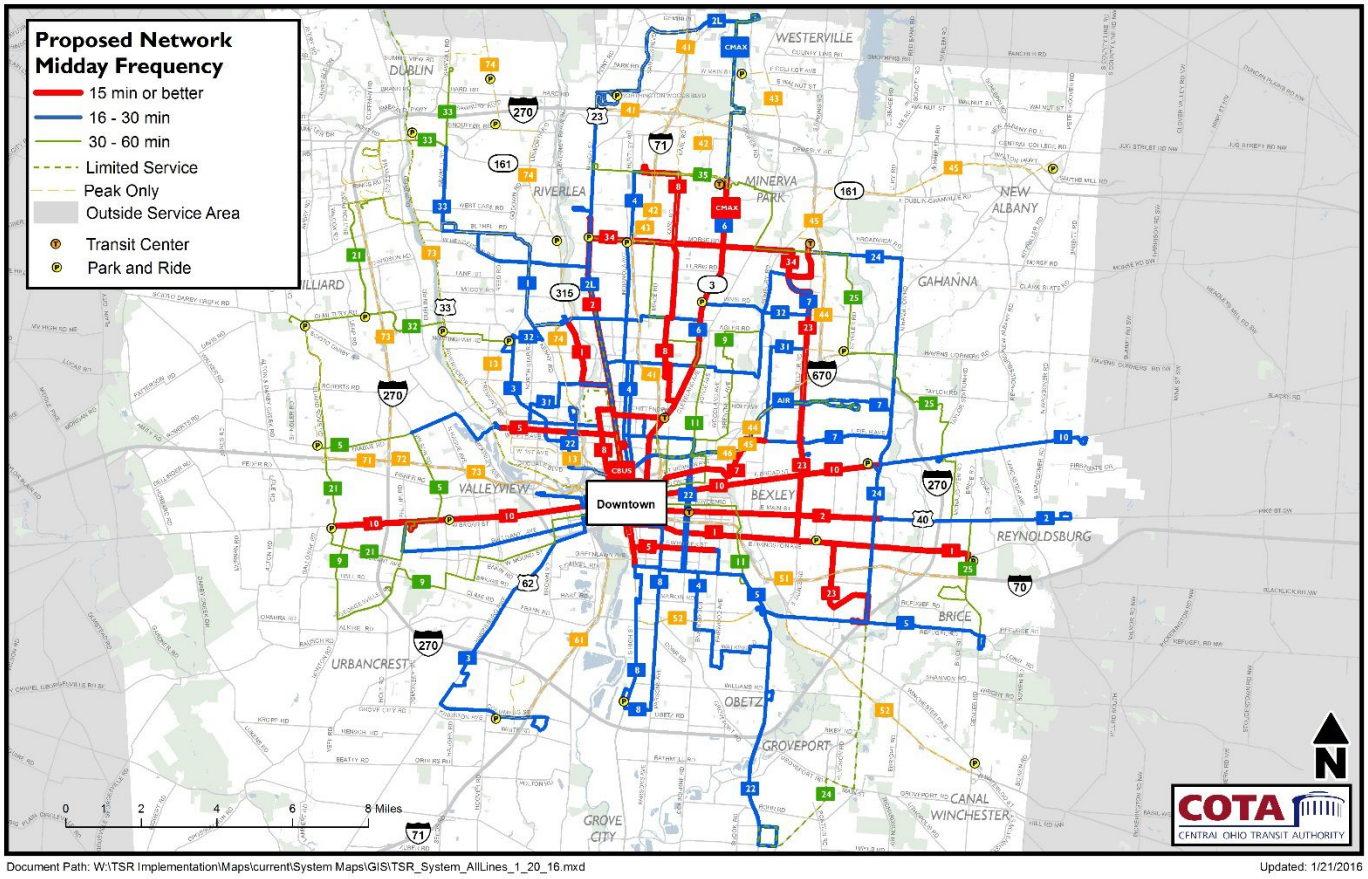

Figure 0-4 TSR Weekday Network

ES 1.3.2. NextGen

As the primary provider of public transit services in central Ohio, COTA is undertaking a long-range planning effort - NextGen - to identify public transportation needs and opportunities through 2050.

Central Ohio is growing and changing as the region adds new residents and the preferences and priorities of current residents change. While other efforts have helped evaluate these trends and translate them into plans for community growth and development, NextGen will comprehensively consider how these trends will shape opportunities and demand for public transportation. Visit www.cota.com/nextgen

NextGen goals:

- Lead the community in envisioning what our public transportation system needs to accomplish in the coming decades to ensure central Ohioans have access to jobs, housing, education, and services.
- Prepare central Ohio for future growth by identifying transit investments that integrate with regional plans and goals. Critical regional goals include maintaining regional competitiveness, minimizing sprawl, and responding to demographic preferences.
- Create transit investment options to support local and regional efforts to develop transit-oriented and multi-modal communities.
- Identify conventional and creative revenue options that offer potential to support the recommended plan and ensure the plan can be implemented.

To ensure a comprehensive approach, NextGen incorporates public input, technical analysis and local planning efforts.

The project is divided into three phases, Phase 1 - Vision, Needs and Opportunities, Phase 2- Define and Evaluate Alternatives and Phase 3 - Recommendations and Implementation Plan. Currently the project is in Phase 2 with an estimated completion date of the second quarter of 2017.

The outcome of COTA NextGen will be a document, NextGen Vision 2050, that contains a list of high-capacity projects as well as improvements to the fixed-route bus network and other potential transportation services. Each project will have detailed descriptions, estimated costs, a conceptual operating plan, a recommended timeline for implementation, either by 2025, 2040 or 2050, along with various ways to fund the service.

This project is being completed in coordination with Connect ColumbUS and MORPC's 2040 Metropolitan Transportation Plan (MTP), planned to be completed in May 2016.

ES 1.4. Fixed-Route Bus Service

Fixed-route bus service is the backbone of the COTA system, and includes local, express, crosstown, and neighborhood circulator bus lines. The LRTP calls for an aggressive, system-wide expansion of COTA's fixed-route bus service. The plan calls for an 11.3 percent increase in service hours by 2019. In 2019, COTA reaches the maximum amount of service hours projected to be supported by the existing 0.5 percent sales tax. Based on COTA's existing sales tax rate, the 2016 LRTP projects annual service hours remain unchanged during 2019-2040. Figure 0-4 displays the post and projected growth of service in service hours. The TSR will improve service frequencies to add capacity and enhance convenience by reducing wait times between buses to meet existing and future demand. New or extended lines will provide extended coverage to growth areas around the region and will provide direct transit service between suburban communities and activity centers. Extended hours of operation will provide improved access to jobs. Simplification of alignments allows more direct service, reducing travel times.

Alternative service delivery methods and partnerships will continue to be pursued. One example of an alternative service delivery method includes partnering with the Ohio Department of Transportation (ODOT) to implement a project to operate express buses on freeway shoulders. The freeway shoulder pilot program on I-70 east began in late 2006 followed by an expansion of the program to I-670, east of downtown Columbus in 2015. Under established conditions, buses traveling on I-70 and I-670 are able to merge onto the freeway shoulder to avoid congestion delays.

Figure 0-5 CNG Fixed-Route Bus

COTA has formed partnerships with New Albany and Groveport to provide connection to specialized shuttle services that transport riders from designated stops to places of employment. The New Albany service, SmartRide New Albany, began in September 2014 and connects with express and reverse commute service. In September 2015, the Groveport Rickenbacker Employee Access Transit (GREAT) shuttle service was introduced, operated and funded by the City of Groveport with additional financial assistance from the Village of Obetz. This service connects with COTA's line 81 service to the Rickenbacker area in order to provide last mile connections to businesses within the industrial park and its many warehousing jobs.

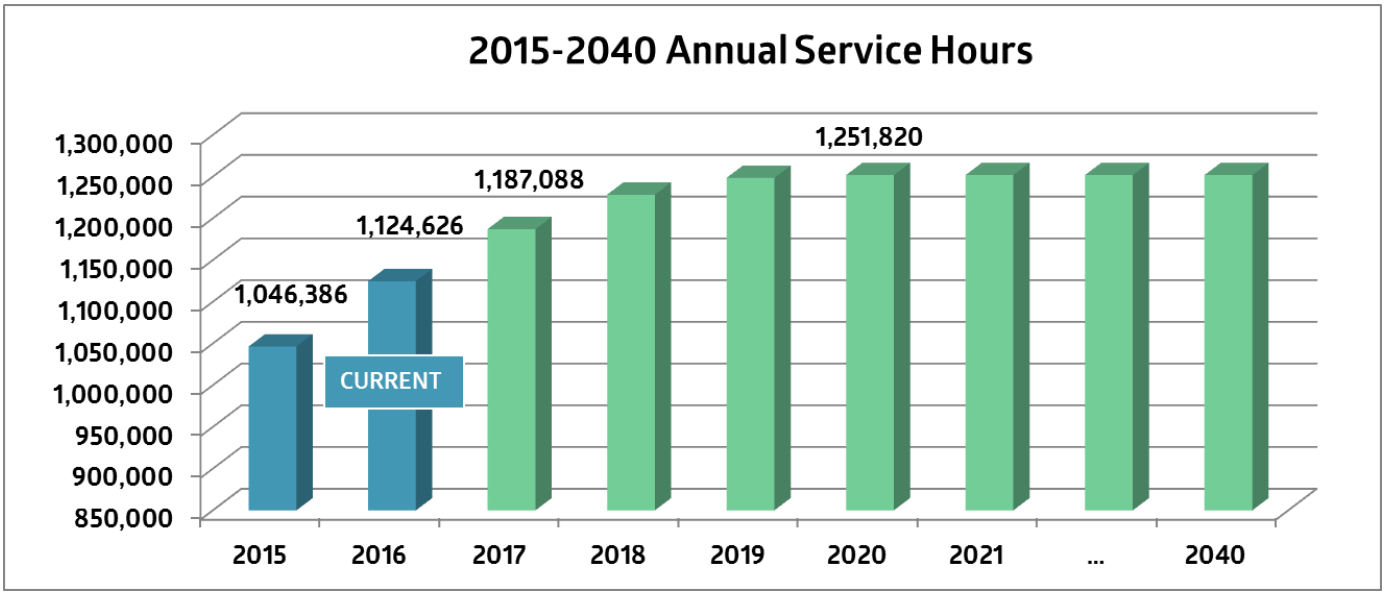

Figure 0-6 Increase in Annual Fixed-Route Bus Service Hours

ES 1.5. CMAX Cleveland Avenue Bus Rapid Transit

Connecting downtown Columbus and Ohio Health's Westerville Medical Campus in the City of Westerville, COTA is in the process of implementing the CMAX Cleveland Avenue bus rapid transit (BRT) line. Following a period of station, transit center, and park and ride construction activities during 2016-2017, service is scheduled to begin in January 2018.

BRT offers a variety of tools to help increase the speed and convenience of transit service and improve mobility, including but not limited to:

- Traffic signal priority to shorten red lights or lengthen green to keep buses running on schedule;
- Fewer stops than traditional local routes to improve travel speeds;
- Uniquely branded and designed stations and vehicles to make the service easy to identify;
- Real-time next bus arrival information; and
- Improved pedestrian amenities.

Project benefits include:

Figure 0-7 CMAX Station Rendering

- Improved transit service
- Improved mobility and reliability in a congested corridor
- Travel time savings of approximately 21 percent
- More travel options for corridor residents, visitors and customers
- Improved pedestrian access and safety
- Creates opportunities for economic development within the corridor
- Premium platforms featuring next-bus arrival information screens

Major capital items include 14 new, uniquely branded CNG powered buses, 64 stations, construction of a park and ride in the Northern Lights area and the Northland Transit Center/Park and Ride (Figure 0-8) located on the west side of Cleveland Avenue just south of SR-161/Dublin Granville Road, resurfacing of curb lanes along Cleveland Avenue between Westerville Road and SR-161, implementation of signal priority for buses along Cleveland Avenue, and real-time passenger information displays at BRT stations.

For project updates visit www.cotabrt.com.

Figure 0-8 Northland Transit Center

ES 1.6. Mobility Services

Mainstream is COTA's demand-response mobility option for persons with disabilities that are prevented from using regular fixed-route services. The LRTP provides a substantial increase in Mainstream service as the fixed-route network expands via the TSR. Disability services will become increasingly important as the average age of central Ohio residents increases. Improvements to Mobility Services described in the LRTP include:

- To reflect historical trends and the anticipated growth in the region's elderly and disabled population, service funding will increase a total of 16 percent by 2019 when fixed-route growth will reach maximum service levels;
- Mainstream will emerge as a technologically advanced system so that customers experience faster and more reliable information to and from their destinations;
- Mainstream will continue to partner with community organizations to maximize available funding and resources that can strengthen the efficiency of mobility services; and

Figure 0-9 Mainstream Vehicle

- An ongoing service evaluation system will continue to review existing operations, and new service delivery methods implemented to improve both service and effectiveness.

ES 1.7. Intelligent Transportation Systems (ITS)

ITS are technological enhancements to providing and using COTA's services that are designed to make bus travel easier and more convenient, provide timely and comprehensive transit information, improve on-time performance and facilitate integration of COTA's operations into a regional transportation network. The LRTP details implementation of a variety of ITS technologies, including:

- Automatic vehicle location;
- Onboard automated stop announcements;
- Traveler information systems;
- Automatic passenger counters;
- Fleet maintenance technologies;
- Transit signal priority; and
- Fare collection enhancements.

ES 1.8. Strategic Transit Investments

Strategic Transit Investments are capital initiatives that seek to minimize future expenses and for future expansion to the transit network by obtaining right of way, land and other capital resources as opportunities arise. This approach minimizes COTA's expenses by developing partnerships with local municipalities, private sector developers, and funding partners that recognize demand for transit services increase as employment and population increase. Identifying initiatives that promote higher density and transit-oriented development (TOD) will leverage the greatest return on investments and enhance the quality of life for central Ohio residents. The concept of strategic investments is based around providing convenient, reliable and responsive transit options to customers. These investments could include:

- Strategic property acquisition for potential fixed-guideway service; transit centers and park and ride facilities; and
- Alternative transit modes, such as Bus Rapid Transit (BRT) and investigating potential fixed-guideway service options, as studied in the COTA NextGen initiative.

Figure 0-10 Linden Transit Center

Figure 0-11 Easton Transit Center

ES 1.9. Financing the LRTP

As part of the update of the 2016-2040 LRTP, overall revenue and cost estimates from 2016 to 2040 have been prepared and are considered to be reasonable for planning purposes. Contingency factors have been applied to recognize the uncertainties associated with projecting costs and revenues over a 24-year period. It is important to note that revenue and expense projections were based on the latest economic data available at the time, and that uncertainties exist in the economy that can alter the current level of projections in a positive or negative manner. Periodic adjustments and updating of the plan will be required to respond to changing conditions and new information.

The funding sources in the LRTP include COTA's current 0.25 percent permanent sales tax, the additional ten (10) year renewable 0.25 percent sales tax passed by voters in 2006, and the

assumption that the renewable tax is continued every ten years. COTA's taxing area is identified in Figure 0-1. COTA collects sales tax in all of Franklin County and in parts of Delaware, Licking, Union and Fairfield Counties.

1. Introduction

COTA's 2016-2040 Long-Range Transit Plan (LRTP) serves as an update to the 2012-2035 Long-Range Transit Plan, and continues a comprehensive strategy for enhancing public transit in the central Ohio region over the next 24 years. By 2040 the Mid-Ohio Regional Planning Commission (MORPC) anticipates that population and employment within COTA's service area will grow by 13 percent and 15 percent respectively. Through public input and analysis of future demographic data, the LRTP was developed to respond to the growing transportation needs of the central Ohio region by providing an expanded, reliable, and safe transit system.

1.1. Background of COTA

COTA is the primary provider of public transit services in central Ohio. In 1970, the Columbus and Southern Ohio Electric Company, the parent corporation of the Columbus Transit Company (CTC), announced its decision to dispose of the bus company. In order to preserve transit in the central Ohio region, a group of citizens formed the Advisory Committee on Transit. One of the Committee's first actions was to lobby the State legislature to permit the formation of regional transit authorities. Once enacted, the next step was the creation of the Central Ohio Transit Authority (COTA), as an entity.

The agreement creating COTA was authorized by the Franklin County Commissioners and the City Councils of Bexley, Columbus, Gahanna, Grandview Heights, Grove City, Hilliard, Reynoldsburg, Upper Arlington, Westerville, Whitehall, and Worthington. A thirteen member Board of Trustees was created for COTA. The Board of Trustees was composed of eleven trustees appointed by the mayors of the eleven member cities, and two trustees selected by the Franklin County Commissioners.

On June 29, 1973, an agreement for COTA to purchase the privately owned bus company from CTC and the Columbus and Southern Ohio Electric Company was signed. The acquisition was effective, and COTA began providing transit service on January 1, 1974. Ridership in the last year of CTC ownership (1973) was 12,975,000 rides total for the entire year.

Since COTA began operating in 1974, the system has grown into an integral part of the transportation network of central Ohio. During this time, not only has the City of Columbus continued to grow and prosper, but so has its adjoining suburban communities. At the time of the creation of COTA, Dublin was not an incorporated city. While in 1970 a rural village with a population of 681 people, today the City of Dublin stretches into three counties (Franklin, Delaware, and Union), and boasts over 43,000 residents. Having grown to the second largest city in Franklin County behind Columbus, COTA and Dublin recognized the importance of the growing northwest travel corridor and its impact on the region's transportation system. In 2008, the agreement creating the Central Ohio Transit Authority was modified to include the City of Dublin as a COTA member city. The Board of Trustees currently consists of thirteen

members; seven appointed by the City of Columbus, two appointed by the Franklin County Commissioners, and four city appointed slots rotated among the other member cities.

COTA's existing level of transit service is funded through a 0.5 percent local sales tax. In 1999, central Ohio voters passed a ballot initiative, which established for the first time a permanent, local funding source for COTA. In 2006, voters approved an additional 0.25 percent temporary 10-year renewable tax, which this plan assumes will be renewed every 10 years effective November 2016. Federal and state assistance as well as fare box receipts further supplement the local sales tax receipts. The majority of the funding (69% as of 2015) is generated from the local sales tax. Figure 1-1 illustrates COTA's current service and sales tax boundaries.

1.2. Growing Community

Extensive analysis regarding the region's growth, development, and related impact on the transportation system has been conducted by MORPC. The Urban Land Institute (ULI) and MORPC are undertaking an initiative to determine how central Ohio and surrounding areas could grow called insight2050. This initiative projects that by 2050 the region will grow by 300,000 jobs and 500,000 residents[2].

Figure 1-1 illustrates the population growth that occurred in the seven county central Ohio area between 1970 and 2010. During this time, population increased 57 percent from 1,149,432 to 1,801,709 residents.

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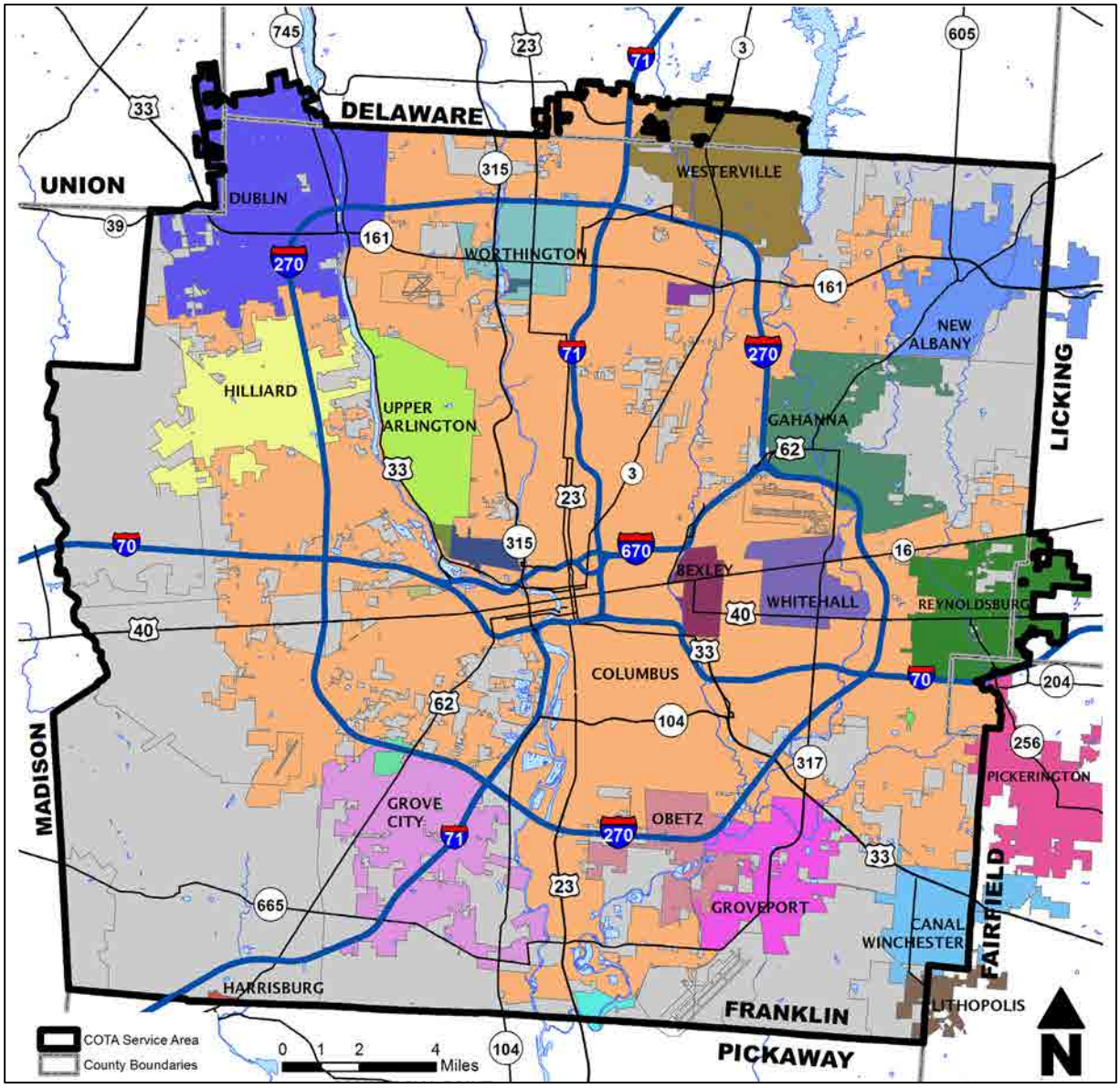

Figure 1-1 COTA's Service Area

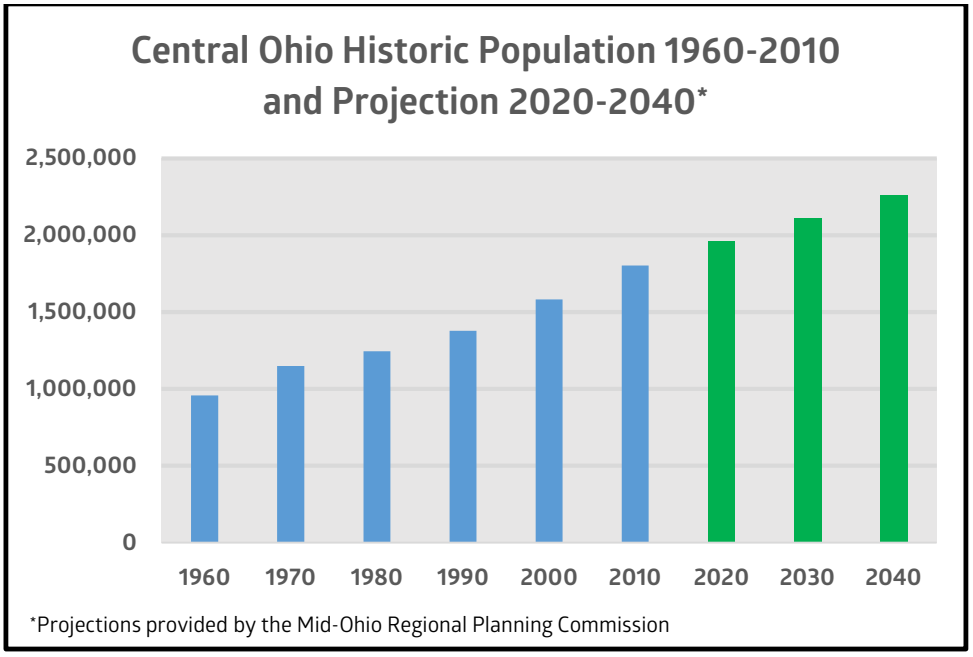

Figure 1-2 Central Ohio Population Growth

As central Ohio's population and employment grew over the past few decades, much of that growth occurred farther into outlying communities, characterized by lower-density commercial, retail, and housing development. As a result, greater pressures have been placed upon all modes of the region's transportation system to move people to and from employment centers and suburban residential areas.

While traffic congestion and air quality problems have not risen to the levels seen in larger cities such as New York, Chicago, or Los Angeles, congestion is worsening in central Ohio. The Texas Transportation Institute's 2015 Urban Mobility Report revealed that roadway congestion in 2014 cost Columbus area residents $921 million, or $933 per person per year.

Future population, employment, and traffic congestion levels are projected to increase over the next 24 years in central Ohio. MORPC has projected that by 2040 COTA's service area can expect to see a:

- 13 percent increase in population;
- 15 percent increase in employment; and
- 13 percent increase in highway traffic congestion.

The region is growing in both urban and suburban areas, increasing congestion on the freeway and arterial road networks throughout. Job growth is occurring in the urban core, such as Downtown and Ohio State University (OSU), as well as in concentrated areas in Dublin, New

Albany, Polaris Fashion Place area, Easton Town Center area and Rickenbacker Airport area. Population growth is happening throughout the region with the heaviest increase in the Downtown area and northern suburban areas. These development patterns will increase demand for transit.

See Chapter 2 for more details about regional growth.

The following sections provide details about the long-range service plan and its various components, including fixed-route bus service, mobility services, intelligent transportation systems (ITS), and strategic transit investments.

1.3. Responding to Growth

To respond to this growth, COTA launched two planning initiatives since the previous 2012-2035 Long-Range Transit Plan. The Transit System Redesign (TSR) is a short-term plan through 2019 for the fixed-route bus service, which substantially changes COTA's bus network. This bus network modernization plan is aimed at crafting a system that better serves our customers and stakeholders, while remaining within COTA's current and projected funding limits. See Section 1.3.1 for a summary and Section 4.6 for a detailed explanation.

COTA NextGen looks towards the extended future of transit in central Ohio. The initiative asks the question of "What should the role of transit be in 2025, 2040 and 2050?" Scheduled for completion in the second quarter of 2017, the final results will be a report with transit projects and improvements that will help guide stakeholders in making decisions about what, how and when to implement these projects. See Section 1.3.2 for a summary and Section 4.5 for further details.

1.3.1. Transit System Redesign

Over the last 40 years, the central Ohio region has grown tremendously. According to the MORPC, this growth is expected to continue; by 2050, the region will add more than 500,000 more residents and 300,000 more jobs[3] . COTA recognizes that to better serve the current and near-future region its bus network must change and adapt.

Since COTA's formation in 1974, its bus network has grown incrementally, building upon the original network, focusing most of its service on downtown Columbus. However, since the region has changed over the past 40 years, demand for transit has changed.

To meet this evolving demand for transit and ensure that COTA's resources are being effectively utilized, COTA undertook a strategic review of its system via the TSR, in

[3] *insight2050. http://getinsight2050.org/*

October of 2013. The TSR analyzed the entire bus network and services, land use changes, the road network, operating budget and the use of technology. The TSR Final Report (November 2014), recommends improvements for positive changes to COTA's bus service and network over the next three years, taking into consideration the needs of central Ohio residents, riders and businesses. Changes include more weekend service, increased frequencies on crosstown and local lines, seven day a week service to employment centers such as Rickenbacker and Polaris and similar span of service on most local lines.

See Section 4.2 for more details.

1.3.2. NextGen

As the primary provider of public transit services in central Ohio, COTA is undertaking a long-range planning effort - NextGen - to identify public transportation needs and opportunities through 2050.

Central Ohio is growing and changing as the region adds new residents and the preferences and priorities of current residents change. While other efforts have helped evaluate these trends and translate them into plans for community growth and development, NextGen will comprehensively consider how these trends will shape opportunities and demand for public transportation. Visit www.cota.com/nextgen

NextGen goals:

- Lead the community in envisioning what our public transportation system needs to accomplish in the coming decades to ensure central Ohioans have access to jobs, housing, education, and services.
- Prepare central Ohio for future growth by identifying transit investments that integrate with regional plans and goals. Critical regional goals include maintaining regional competitiveness, minimizing sprawl, and responding to demographic preferences.
- Create transit investment options to support local and regional efforts to develop transit-oriented and multi-modal communities.
- Identify conventional and creative revenue options that offer potential to support the recommended plan and ensure the plan can be implemented.

This project is being completed in coordination with Connect ColumbUS and MORPC's 2040 Metropolitan Transportation Plan (MTP). See Section 4.5 for more details.

1.4. Fixed-Route Bus Service

Fixed-route bus service is the backbone of the COTA system, and includes local, express, crosstown, and neighborhood circulator bus lines. The LRTP calls for an aggressive, system-wide expansion of COTA's fixed-route bus service. The plan calls for an 11.3 percent increase in service hours by 2019. In 2019, COTA reaches the maximum amount of service hours projected to be supported by the existing .5 percent sales tax. Based on COTA's existing sales tax rate, the 2016 LRTP projects annual service hours remain unchanged during 2019-2040. Figure 1-4 displays the post and projected growth of service in service hours. The TSR will improve service frequencies to add capacity and enhance convenience by reducing wait times between buses to meet existing and future demand. New or extended lines will provide extended coverage to growth areas around the region and will provide direct transit service between suburban communities and activity centers. Extended hours of operation will provide improved access to jobs. Simplification of alignments allows more direct service, reducing travel times.

Alternative service delivery methods and partnerships will continue to be pursued. One example of an alternative service delivery method includes partnering with the Ohio Department of Transportation (ODOT) to implement a project to operate express buses on freeway shoulders. The freeway shoulder pilot program on I-70 east began in late 2006 followed by an expansion of the program to I-670, east of downtown Columbus in 2015. Under established conditions, buses traveling on I-70 and I-670 are able to merge onto the freeway shoulder to avoid congestion delays.

COTA has formed partnerships with New Albany and Groveport to provide connection to specialized shuttle services that transport riders from designated stops to places of employment. The New Albany service, SmartRide New Albany, began in September 2014 and connects with express and reverse commute service. In September 2015, the Groveport Rickenbacker Employee Access Transit (GREAT) shuttle service was introduced, operated and funded by the City of Groveport with additional financial assistance from the Village of Obetz. This service connects with COTA's line 81 service to the Rickenbacker area in order to provide last mile connections to businesses within the industrial park and its many warehousing jobs.

Figure 1-3 CNG Fixed-Route Bus

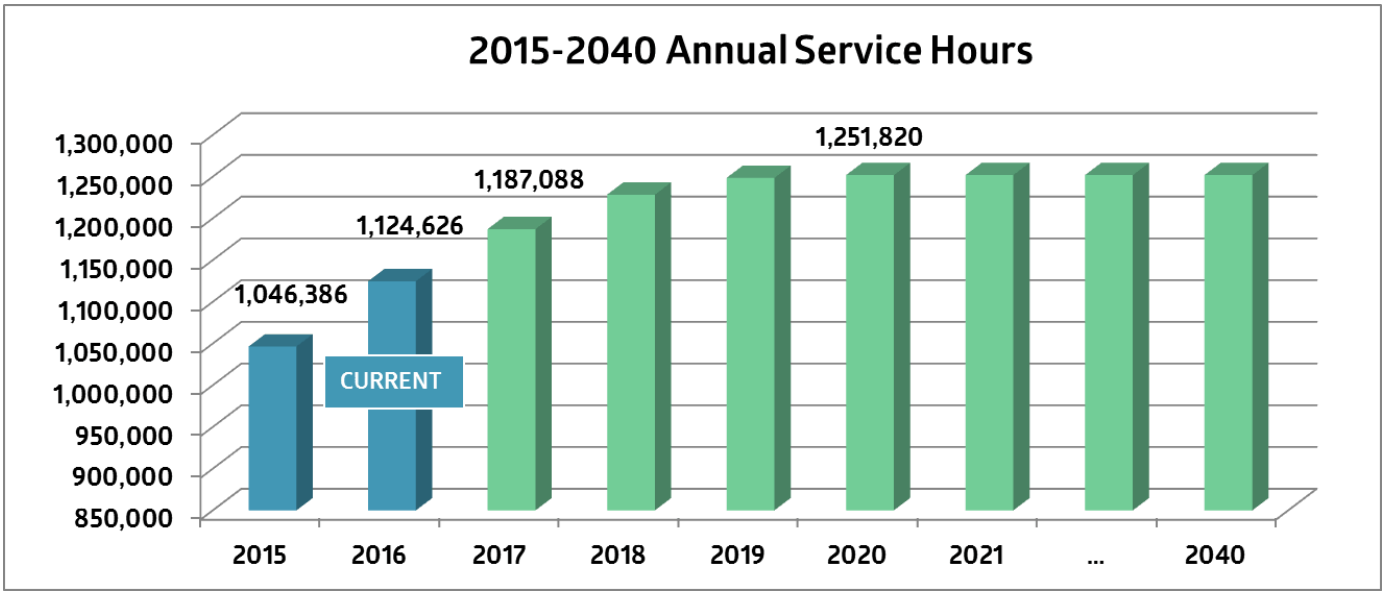

Figure 1-4 Increase in Annual Fixed-Route Bus Service Hours

1.5. CMAX Cleveland Avenue Bus Rapid Transit

Connecting downtown Columbus and Ohio Health's Westerville Medical Campus in the City of Westerville, COTA is in the process of implementing the CMAX Cleveland Avenue bus rapid transit (BRT) line. Following a period of station, transit center, and park and ride construction activities during 2016-2017, service is scheduled to begin in January 2018.

BRT offers a variety of tools to help increase the speed and convenience of transit service and improve mobility, including but not limited to:

- Traffic signal priority to shorten red lights or lengthen green to keep buses running on schedule;
- Fewer stops than traditional local routes to improve travel speeds;
- Uniquely branded and designed stations and vehicles to make the service easy to identify;
- Real-time next bus arrival information; and
- Improved pedestrian amenities.

Project benefits include:

Figure 1-5 CMAX Station Rendering

- Improved transit service
- Improved mobility and reliability in a congested corridor
- Travel time savings of approximately 21 percent
- More travel options for corridor residents, visitors and customers
- Improved pedestrian access and safety
- Creates opportunities for economic development within the corridor
- Premium platforms featuring next-bus arrival information screens

See Section 4.8 for more information about the CMAX project and Section 3.3 for information about CMAX public involvement. For project updates visit www.cotabrt.com.

Figure 1- 6 Northland Transit Center

1.6. Mobility Services

Mainstream is COTA's demand-response mobility option for persons with disabilities that are prevented from using regular fixed-route services. The LRTP provides a substantial increase in Mainstream service as the fixed-route network expands via the TSR. Disability services will become increasingly important as the average age of central Ohio residents increases. Improvements to Mobility Services described in the LRTP include:

- To reflect historical trends and the anticipated growth in the region's elderly and disabled population, service funding will increase a total of 16 percent by 2019 when fixed-route growth will reach maximum service levels;
- Mainstream will emerge as a technologically advanced system so that customers experience faster and more reliable information to and from their destinations;
- Mainstream will continue to partner with community organizations to maximize available funding and resources that can strengthen the efficiency of mobility services; and
- An ongoing service evaluation system will continue to review existing operations, and new service delivery methods implemented to improve both service and effectiveness.

Figure 1-7 Mainstream Vehicle

See section 4.6 for more information.

1.7. Intelligent Transportation Systems (ITS)

ITS are technological enhancements to providing and using COTA's services that are designed to make bus travel easier and more convenient, provide timely and comprehensive transit information, improve on-time performance and facilitate integration of COTA's operations into a regional transportation network. The LRTP details implementation of a variety of ITS technologies, including:

- Automatic vehicle location;
- Onboard automated stop announcements;
- Traveler information systems;
- Automatic passenger counters;
- Fleet maintenance technologies;
- Transit signal priority; and
- Fare collection enhancements.

1.8. Strategic Transit Investments

Strategic Transit Investments are capital initiatives that seek to minimize future expenses and for future expansion to the transit network by obtaining right of way, land and other capital

resources as opportunities arise. This approach minimizes COTA's expenses by developing partnerships with local municipalities, private sector developers, and funding partners that recognize demand for transit services increase as employment and population increase. Identifying initiatives that promote higher density and transit-oriented development (TOD) will leverage the greatest return on investments and enhance the quality of life for central Ohio residents. The concept of strategic investments is based around providing convenient, reliable and responsive transit options to customers. These investments could include:

- Strategic property acquisition for potential fixed-guideway service; transit centers and park and ride facilities; and
- Alternative transit modes, such as Bus Rapid Transit (BRT) and investigating potential fixed-guideway service options, as studied in the COTA NextGen initiative.

Figure 1-8 Linden Transit Center

Figure 1-9 Easton Transit Center

1.9. Financing the LRTP

As part of the update of the 2016-2040 LRTP, overall revenue and cost estimates from 2016 to 2040 have been prepared and are considered to be reasonable for planning purposes. Contingency factors have been applied to recognize the uncertainties associated with projecting costs and revenues over a 24-year period. It is important to note that revenue and expense projections were based on the latest economic data available at the time, and that uncertainties exist in the economy that can alter the current level of projections in a positive or negative manner. Periodic adjustments and updating of the plan will be required to respond to changing conditions and new information.

The funding sources in the LRTP include COTA's current 0.25 percent permanent sales tax, the additional ten (10) year renewable 0.25 percent sales tax passed by voters in 2006, and the assumption that the renewable tax is continued every ten years. COTA's taxing area is identified in Figure 1-1. COTA collects sales tax in all of Franklin County and in parts of Delaware, Licking, Union and Fairfield Counties. See Chapter 5 for details about funding the LRTP.

2. Need for Plan Update and Goals

COTA has identified four primary drivers initiating an update to the 2012 Long-Range Transit Plan (LRTP).

1. Funding for service expansion and maintenance changes as the state of the economy fluctuates. Since the 2012 LRTP, COTA has been able to adjust its expansion plan to increase the amount of maximum service it can sustain by 19% from approximately 1.05 million hours (projected in 2012) to 1.25 million hours. Service will increase every year up through 2019 (Figure 1-3). The passing of COTA's 0.25 percent 10-year renewable sales tax in 2006 has provided for 2016 annual service hours to increase by 80%, and by 2019, an estimated 100% over 2006 service hour levels.

Adjusting the plan based upon current and new projections of economic conditions allows COTA to accurately present a plan based upon expected budget constraints.

2. MORPC is responsible for updating the central Ohio region's transportation plan, the Metropolitan Transportation Plan (MTP), which is updated every four years. The MTP includes long-range plan updates to various modes of transportation, including public transit. For the public transit update, MORPC relies on local transit agencies within their planning boundary area, such as COTA, to submit their long-range planning document for inclusion in the MTP.

As such, COTA's 2016-2040 LRTP will be included in the 2016-2040 MTP. Updates include COTA's expansion plans for fixed-route bus service as part of the Transit System Redesign (TSR), mobility services (e.g. services for people with disabilities which prevent them from riding a fixed-route bus), the CMAX BRT project, and the COTA NextGen. The MTP is then, in turn, submitted by MORPC to the Federal Transit Administration and used in the federal funding process. Coordination between COTA's LRTP and MORPC's MTP helps ensure a well-integrated planning document, preventing disconnects between COTA's and MORPC's planning goals.

3. Since the 2012 LRTP update, COTA has undertaken two major initiatives that examine how the region has grown, through the TSR, and how the region will grow, through the COTA NextGen. The TSR was developed in response to the growth of development that has occurred in the region over the past 40 years. Changes to the fixed-route bus service in the near-term from the TSR will improve how COTA delivers service to the region. More jobs and more residents will be served once the TSR is fully implemented.

COTA NextGen was launched in response to expected growth in the region through 2050. Projections provided by MORPC expect the region to continue to add both jobs and population, particularly in neighborhoods near the urban core, OSU and northern suburbs. Congestion is expected to increase as a result of this growth. To respond to this growth, COTA

NextGen includes potential, unfunded improvements to COTA's current services as well as high-capacity transit projects such as light rail, streetcar and bus rapid transit.

4. In December 2015, a new transportation bill was passed, the Fixing America's Surface Transportation Act, or FAST Act, replacing the previous bill, MAP-21, the predecessor to the expired SAFETEA-LU. The FAST Act provides slightly more funding for transportation per year than MAP-21 but is a five-year funding bill unlike MAP-21, which was funded for only two years and required multiple extensions. The stability of funding under the FAST Act will allow transit agencies and providers to better plan their future resources.

2.1. Goals of the LRTP

In early 2016, COTA developed three goals to guide the agency into the future to better serve the central Ohio community. The components of the 2016 LRTP move COTA forward to achieve these goals.

Ridership

Goal: Achieve ridership of 25 million passenger trips annually by 2025.

Expansion

Goal: Plan and invest in a multi-modal, high-capacity, mass transit system connecting central Ohio residents to opportunity, economic prosperity and to each other.

Perception

Goal: Be recognized in our communities, our region, and nationally, as an essential partner in economic development and mobility solutions and as a leader in technological innovation and sustainability.

2.2. Transporting People to Jobs

As the metropolitan region grew over the last few decades, job centers developed in suburban communities away from downtown Columbus while COTA's bus service remains primarily focused on Downtown. Tremendous population and employment growth has occurred in these communities, although recent trends show job and population growth is again strong in the urban core and surrounding communities.

According to MORPC, between 2015 and 2040 the region will add over 132,000 jobs, an increase of 15 percent. Newer developed areas such as Easton, Tuttle, Polaris, and Rickenbacker saw an explosion in commercial, retail, and residential development since the early 2000's and continue to grow steadily with growth expected to continue through 2040 (see Table 2-1).

Figure 2-2 shows projected population and job growth occurring both in and around downtown Columbus and in the suburban areas outside of I-270. The TSR positions COTA to better serve employment centers in suburban areas, providing 7 day a week service to places such as Polaris and Rickenbacker areas.

Population growth is expected to continue to occur in suburban areas, particularly to the north of the region. Downtown and surrounding neighborhoods are also expected to grow in population as residential investment expands into areas such as Franklinton and the Brewery District.

Table 2-1 Population, Households, Employment for Years 2015 and 2040 in Developing Employment Nodes

NODE	POPULATION		HOUSEHOLDS		EMPLOYMENT	
Total	**2015**	**2040**	**2015**	**2040**	**2015**	**2040**
Easton	4,246	5,348	2,007	2,532	27,256	29,147
Downtown	9,670	21,660	7,074	17,157	81,663	91,441
Ohio State	36,573	46,139	12,557	17,648	62,866	67,401
Polaris	5,052	7,334	2,325	3,306	28,736	35,602
Rickenbacker	5,575	7,171	1,933	2,510	15,965	18,924
Tuttle/Dublin Metro Center	5,892	6,923	2,832	3,346	38,655	42,029
Change	**Change**	**% Change**	**Change**	**% Change**	**Change**	**% Change**
Easton	1,102	25.95%	525	26.16%	1,891	6.94%
Downtown	11,990	123.99%	10,083	142.54%	9,778	11.97%
Ohio State	9,566	26.16%	5,091	40.54%	4,535	7.21%
Polaris	2,282	45.17%	981	42.19%	6,866	23.89%
Rickenbacker	1,596	28.63%	577	29.85%	2,959	18.53%
Tuttle/Dublin Metro Center	1,031	17.50%	514	18.15%	3,374	8.73%

Improvements to outlying area transit services should not come at the expense of COTA's existing Downtown service levels. In fact, downtown Columbus remains the largest job center in central Ohio with approximately 81,000 jobs.[4]

Development efforts in Downtown include the Arena District, various new apartment buildings along High St. near Columbus Commons, renovation of historic buildings into residential units, such as the Atlas Building and Mayor Coleman's Downtown Strategic Plan, which called for 10,000 new housing units by the year 2012. MORPC estimates the current population of Downtown at approximately 9,670 with 7,074 households.

Home to the Columbus Convention Center and more than 30,000 students who attend Columbus State Community College, Franklin University, Columbus College of Art & Design,

[4] MORPC 2015 Land Use by Grid data, www.morpc.org

and Capital University Law School, downtown Columbus continues to be a major destination center for central Ohio area residents and visitors.

Public transit's role in enhancing the quality of life in the central Ohio area will be important as the region continues to grow, providing transportation alternatives to and from employment centers, reducing congestion and improving air quality.

2.3. Growing Special-Needs Community

In 1990, the federal Americans with Disabilities Act (ADA) was enacted. The Act required transit systems nationwide to provide access for persons with disabilities and to establish a transportation system that is complementary to its fixed-route services. ADA mobility service is provided for riders whose disability or health condition prevents them from using fixed-route services for some or all of their travel. COTA's current mobility service program, named Mainstream, has and will continue to expand to complement COTA's fixed route bus service. The organization continues to be committed to serving persons with disabilities and seniors with accessible, courteous and reliable service.

Since the 2012 LRTP COTA's Mainstream ridership has grown 5.5 percent. Between 2012 and 2050, however, the number of senior citizens in the United States is expected to double to 83.7 million from 43.1 million[5]. As a result, as part of the LRTP, COTA will continue to expand and create an innovative mobility program that continues to meet mobility service demands.

2.4. Future Growth Projections

COTA, with the assistance of MORPC, has studied projections for future population and employment growth in the central Ohio area, and their corresponding impacts on traffic congestion and overall quality of life. In particular, MORPC projects by 2040 the central Ohio area can expect to see a:

- 13 percent increase in population;
- 15 percent increase in employment; and
- 13 percent increase in highway traffic congestion.

Based on MORPC 2040 projections found in Table 2-2, Franklin County alone will grow in population to 1,366,200, representing a 14 percent increase from 2015.

5 An Aging Nation: The Older Population in the United States. Ortman, Velkoff and Hogan. May 2014. https://www.census.gov/prod/2014pubs/p25-1140.pdf

Table 2-2 Area Population Growth Projections

Population	2015	2040	% Increase
Delaware	182,457	282,160	55%
Fairfield	144,683	210,910	46%
Franklin	1,172,433	1,366,200	17%
Licking	165,220	212,370	29%
Madison	38,351	48,700	27%
Pickaway	51,320	63,100	23%
Union	51,962	77,360	49%
TOTAL	**1,806,426**	**2,260,800**	**25%**

Figures 2-1 and 2-2, on the following page, shows population density in 2015 and 2040. Each grid square represents one quarter of a square mile. The darker red the grid square the higher the population growth within that quarter mile square, while a grey square represents no substantial change. Figures 2-3 and 2-4 show job density in 2015 and 2040. The darker blue the grid square the higher the employment growth within that quarter mile square.

Figure 2-6 graphically illustrates the impact future growth will have on the central Ohio area transportation network. The map depicts congestion in three colors: green – indicating very light to no congestion; yellow – indicating areas of moderate congestion; and red – indicating heavy congestion is occurring, causing stop and go traffic and significant delays in traffic flow movement.

Figure 2-5 reflects current peak-period highway conditions, while Figure 2-6 displays projected congestion levels by 2040. As Figure 2-6 indicates, heavy congestion levels will increase significantly over the next 24 years, indicating a need for future investment in transportation alternatives. As such, this document serves as a blueprint for how public transit can effectively serve as a key component in meeting the transportation needs of the region.

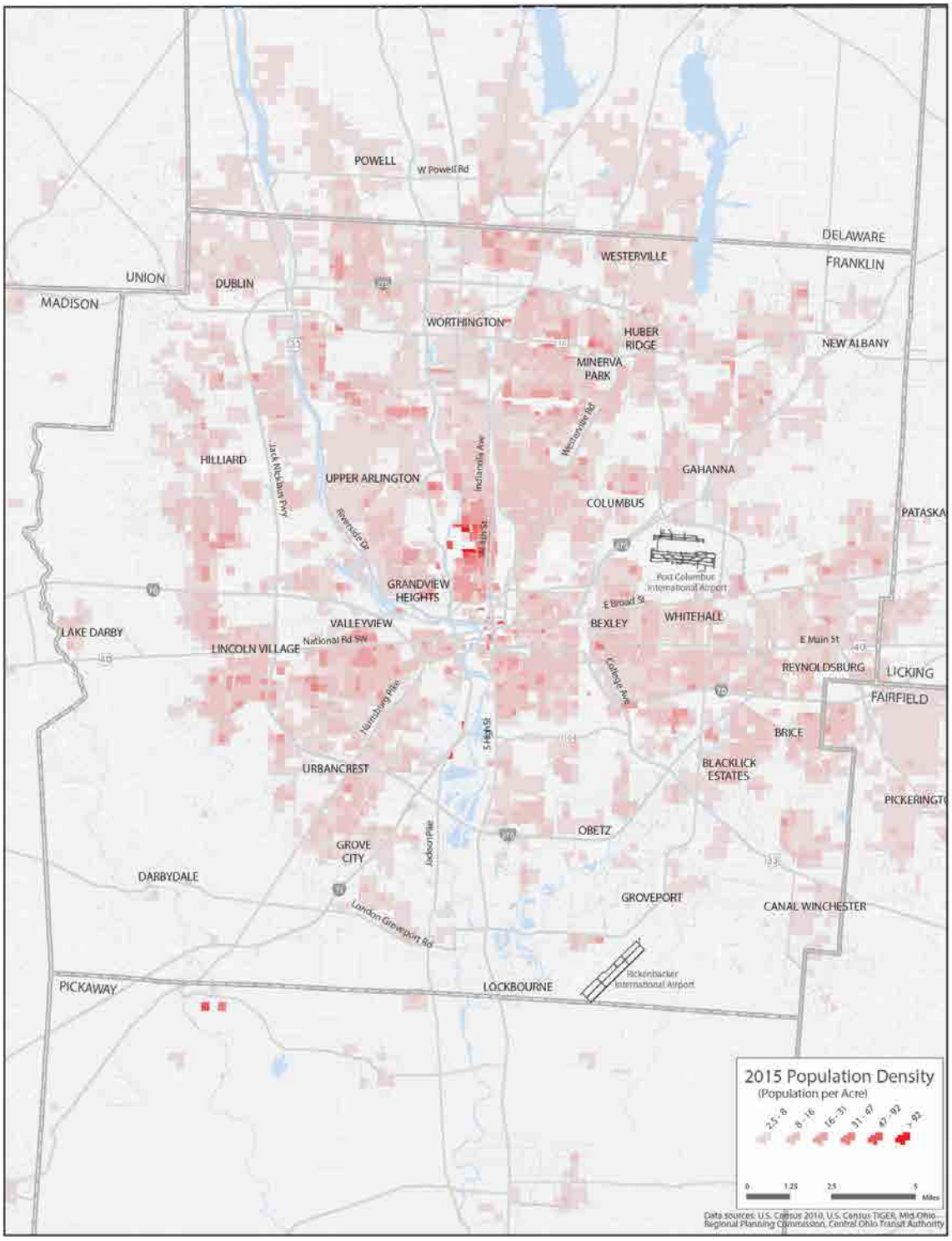

Figure 2-1 Population Density 2015

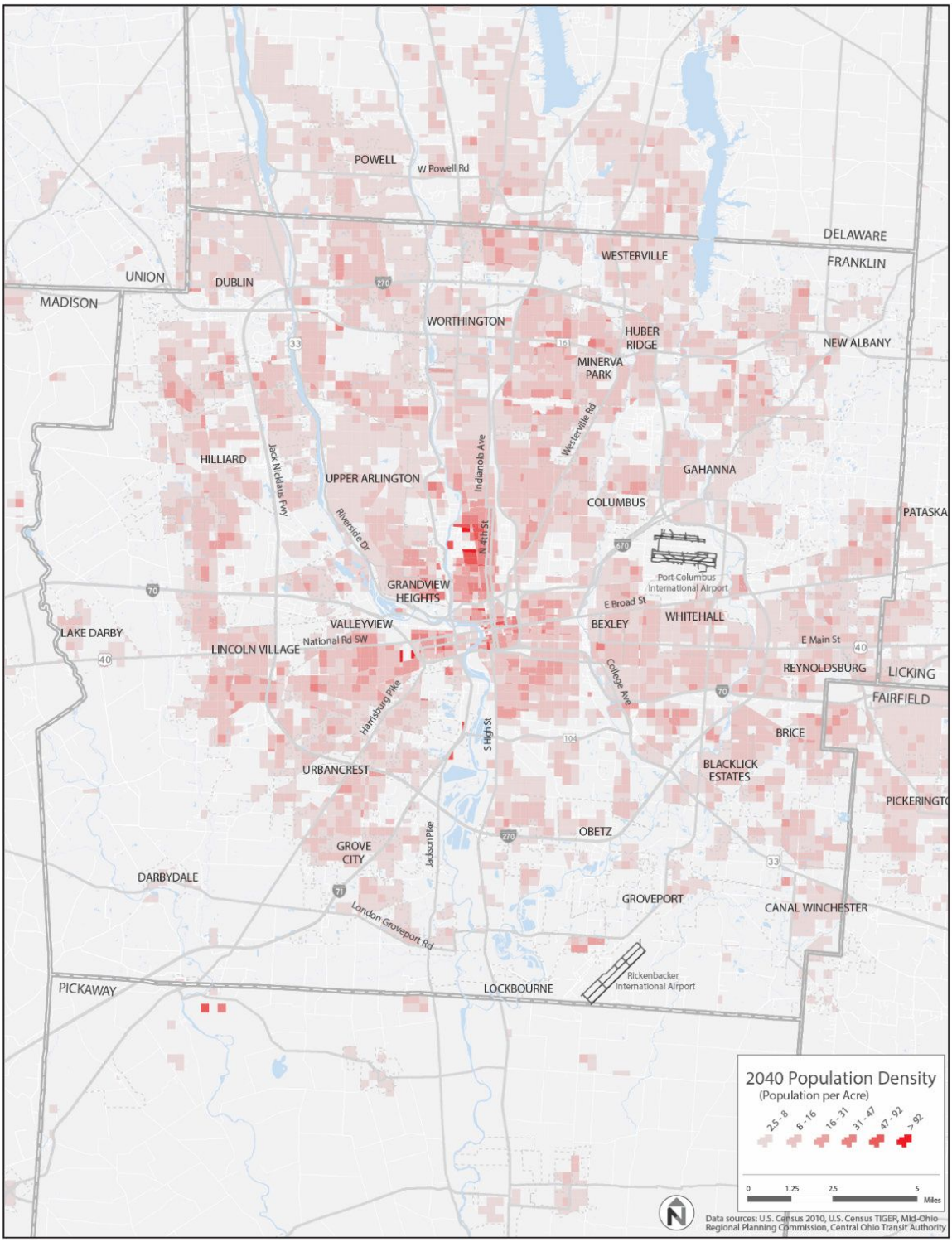

Figure 2-2 Population Density 2040

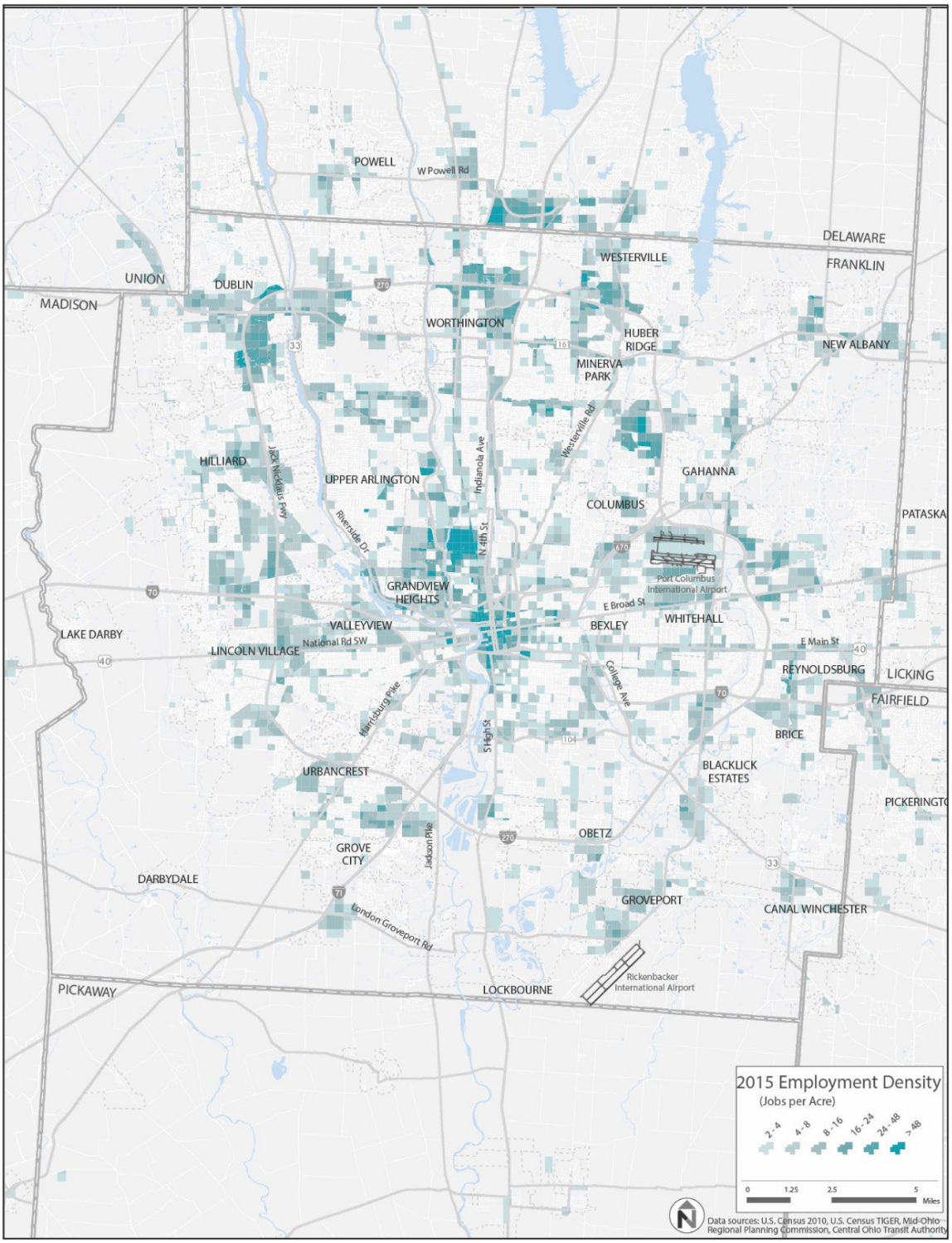

Figure 2-3 Employment Density 2015

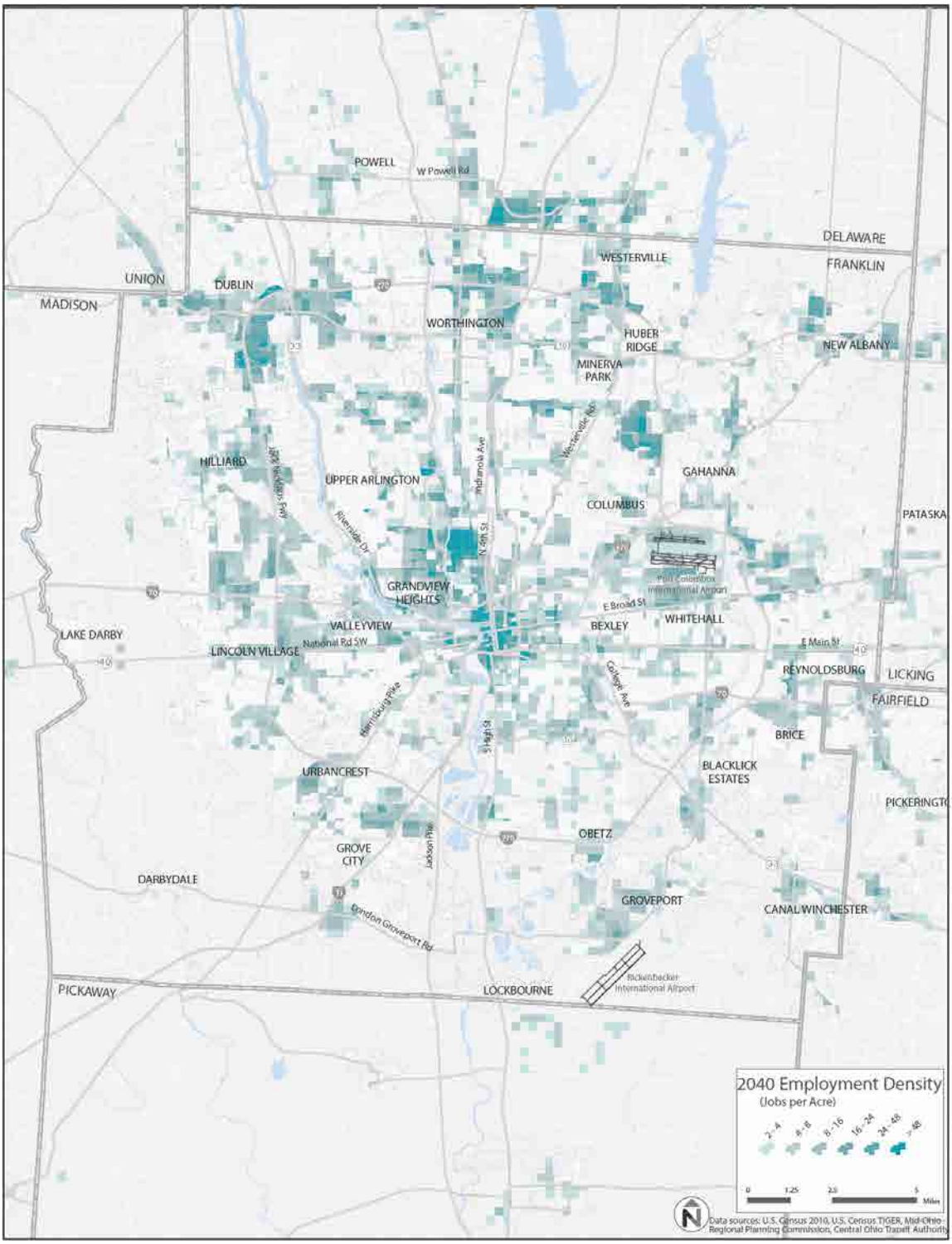

Figure 2-4 Employment Density 2040

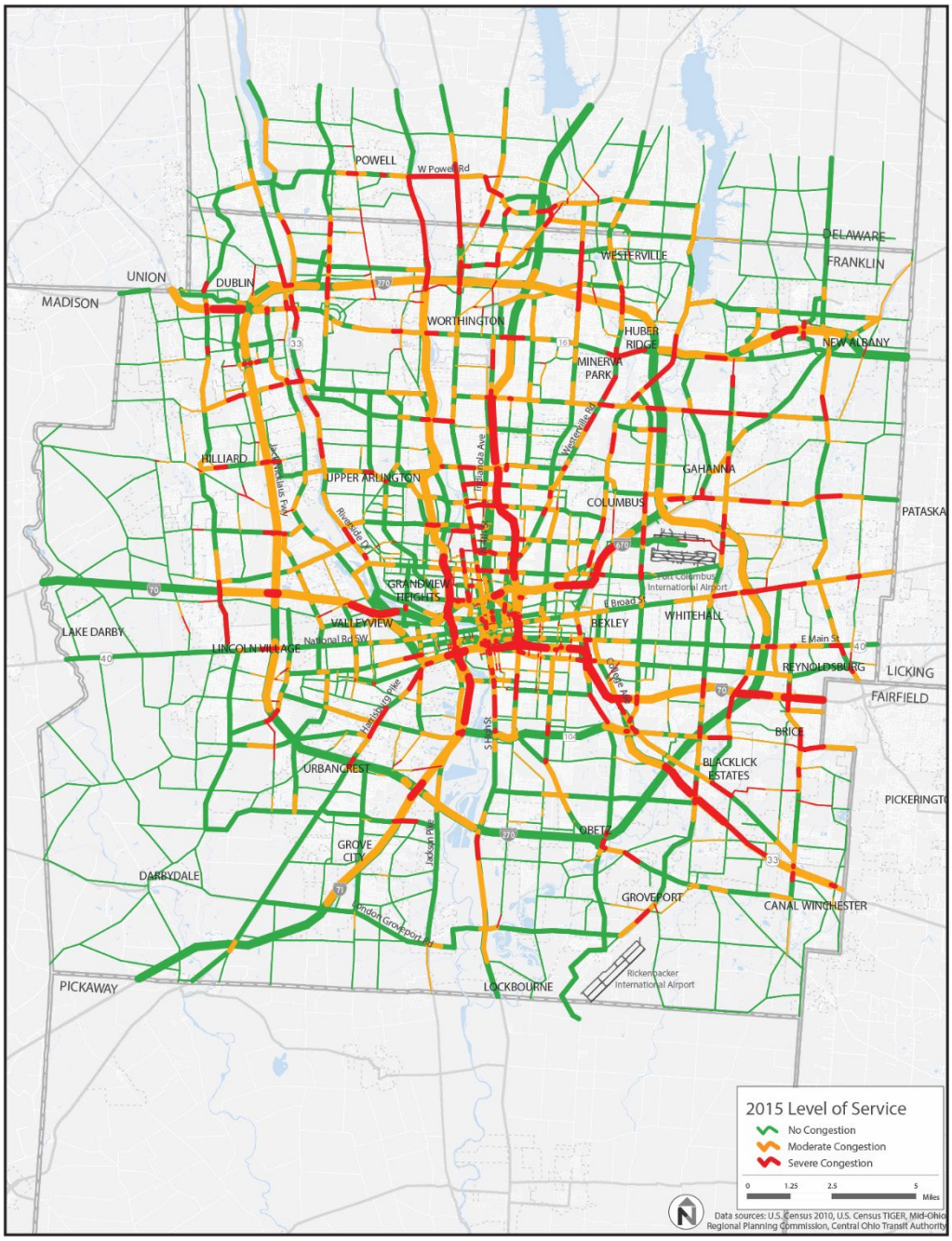

Figure 2-5 Traffic Congestion 2015

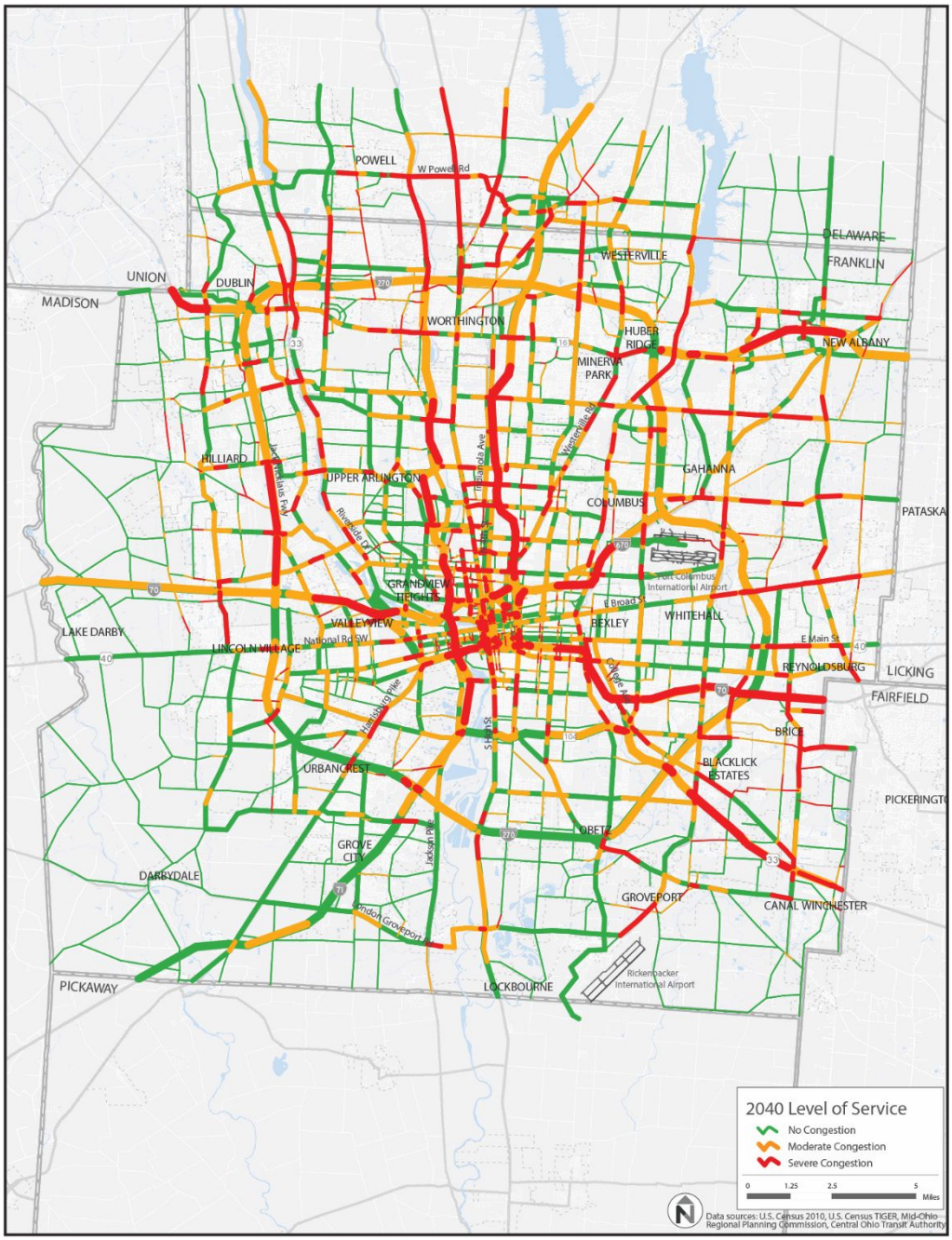

Figure 2-6 Traffic Congestion 2040

3. Public Involvement

A robust, inclusive and responsive public input and public involvement process is essential for the long-range planning process. The public involvement process was focused on obtaining input from riders and the general public on the types of new and improved services desired in the future. The 2016 Long-Range Transit Plan (LRTP) was shaped by what COTA heard from customers, employees, the general public, business and community leaders and other opinion leaders, particularly in regards to both the planned Transit System Redesign (TSR) and NextGen initiatives.

As mentioned in Chapter 2, the LRTP is incorporated into the Mid-Ohio Regional Planning Commission's (MORPC) 2040 Metropolitan Transportation Plan (MTP), as such COTA participates in MORPC's public involvement process. On March 15, 2016, COTA attended the 2040 MTP open house. MORPC also provides comments about COTA and transit service in the region that are collected during the MTP public involvement process.

3.1. TSR Public Involvement

Transit System Redesign (TSR) is a comprehensive realignment of the COTA network, designed to better meet the needs of our growing community. The TSR will make COTA service simpler, more convenient and easier to use. Section 4.3 has more details regarding the TSR.

In 2014, COTA conducted a comprehensive review of our system to evaluate the entire bus network and recommend how to maximize service and resources to substantially update and improve service.

The resulting plan that was accepted by COTA's Board of Trustees places a strong emphasis on high frequency service in high density corridors, connecting major destinations while maintaining coverage service to suburban and less dense areas and reallocating service to areas currently underserved.

The TSR is intended to better meet the needs of the community, and make COTA service more appealing and responsive to both current and potential riders. Once fully implemented COTA will be easier to use and more convenient for more people, leading to more use of the system and higher ridership.

The public involvement program for the review, included:

- Establishing a **transit advisory committee** (TAC) with representation of a cross-section of COTA and community stakeholders while maintaining a workable number of participants.

- **Small focus group meetings** held at the beginning and at the end of the study to receive input from difficult to reach market segments.
- **A web based survey** available to the public from January to April 2014 to introduce and seek input on the TSR. Over 1,250 people responded with 75% of those having used COTA in the past year.
- **Five public meetings** held across the COTA service area at the mid-point of the study (March) with an additional five public meetings held across the region at the end of the study (May/June) to present the initial proposed plan and to receive comments.
- **A steering committee** consisting of COTA staff. Regular meetings were held with this committee as well as updates on study progress provided through conference call and email communications during the course of the study. Members of the committee were invited to participate in the Core Planning activities, to assist in identifying stakeholders for the TAC, and to help identify the market segments for Focus Group participation.
- **Input and feedback from COTA employees** such as bus operators and supervisors, and customer service representatives through one-on-one discussions and on-road visits.
- **Presentations to and involvement** by the COTA Board of Trustees in order to both inform them as well as seek their direction. The Board was consulted at three points in the study.

The network has been further revised according to public input since the review was complete. COTA hosted 10 public meetings across central Ohio in 2015, including four community meetings in Downtown Columbus to specifically discuss the Downtown Operations Plan. Meetings were also held with community leaders and stakeholder groups to seek targeted feedback.

In 2016 and 2017, COTA will execute a robust public involvement, community relations and marketing campaign to provide customers and other stakeholders with information about the new network.

3.2. NextGen Outreach

In 2015, COTA began the Next Generation 2050 (branded as "NextGen") to explore central Ohio's future public transportation needs. The plan is designed to create a long-term perspective on transit investment opportunities and will guide transit development through 2050.

Central Ohio, like urban areas everywhere, is changing. Changes reflect, in part, an increase in the number of people and jobs in the region, as well as societal and demographic changes, as the region responds to shifting societal values, emerging technologies, and evolving opportunities. As the region adapts, there will be demand for more and different types of regional services, including schools and housing, but also public transportation. Preparing for these changes gives central Ohio residents an opportunity to rethink the role transit plays in the overall transportation network. NextGen is designed to explore and guide that process.

Figure 3-1 NextGen Phase 1 Public Meeting

Within this context, the overarching goals of NextGen are to:

- Lead the community in a visioning exercise to determine what central Ohio's public transportation system needs to accomplish in the coming decades to ensure current and future residents have access to jobs, housing, education, and services;
- Prepare central Ohio for future growth by identifying transit investments that integrate with regional plans and goals, including regional competitiveness, minimal sprawl and demographic preferences;
- Create transit investment options to support local and regional efforts to develop transit oriented development and communities; and
- Identify conventional and creative revenue options that offer potential to support the recommended plan and ensure the plan can be implemented.

The NextGen project was designed to be developed with extensive input from members of the community, including stakeholders and elected officials, but also people who live and work in central Ohio.

3.2.1. Community Engagement Methods

As part of achieving these goals, the public involvement and outreach process is organized around three rounds of engagement, each of which is tied to specific technical phases of the project.

- Phase 1: Vision, Needs & Opportunities

  The first phase of the NextGen plan was designed to establish the overall vision and goals for the future of public transit in central Ohio. The first phase involved a technical assessment of transit needs to reflect community input, regional

forecasts for growth and development, and local and regional projects developed through other community planning efforts. This assessment identified a list of corridors, communities and neighborhoods where additional investment in public transit is desired in the short- and long-term. An evaluation framework was also developed to rank and prioritize geographic areas for high-capacity transit investments.

The public involvement efforts that accompanied and supported the technical analysis included organizing a Project Advisory Group (PAG), developing a website, and extensive meetings and events with stakeholders and members of the public. This phase of outreach began in March 2015 and ended in June 2015.

- Phase 2: Define and Evaluate Alternatives

  The second phase of the NextGen project involved developing a series of transit projects and initiatives designed to strengthen the overall system. The team will also prioritize the geographic areas identified for high-capacity transit investment into a shorter, more focused list. The draft projects – or alternatives – will be brought to the public for comment and input.

  Like all phases of the NextGen effort, public engagement was critical to the success of Phase 2. The public involvement team worked with the technical team to describe and present the alternatives to the community. The team developed a series of exercises for the public to identify preferences and suggest new or different ideas. The team used web-based tools including an online survey. This phase began in July 2015 and will continue throughout 2016.

- Phase 3 Recommendations and Implementation Plan

  The third and final phase of the NextGen project will translate the preferred alternatives into a transit investment plan, including a phased implementation schedule and project funding recommendations. The final product of the effort will be the NextGen Transit Plan.

  The public involvement team will engage the community to review and refine project recommendations, phasing and funding options. The public involvement materials will detail how public input shaped the analysis and outcomes. The goal is to build support and momentum for the recommendations, as COTA moves toward implementation.

  This final phase will occur in 2017.

3.2.2. Phase 1 Summary

NextGen's Phase 1 community engagement efforts included in-depth leader interviews, small stakeholder group discussions, workshops, public meetings, Project Advisory Group meetings, and presenting information at pre-existing community events.

The project team used the early outreach activities (interviews and small group discussions) to broadly collect ideas for the future of central Ohio and perceptions of the role that transit plays in that future. The team used these conversations to understand and define community values surrounding transit investment (i.e. why transit is important). In subsequent outreach activities, the team worked with community members and stakeholders to refine and prioritize these values.

In total, COTA staff and the NextGen team sponsored, participated, and/or staffed 40 public engagement activities between March 1, 2015 and June 15, 2015. Activities were held in downtown Columbus, the South Side, Short North, Grove City, Dublin, Westerville, Gahanna and Worthington.

More than 500 comments were received through Phase 1 outreach activities from people who attended a meeting, participated in an interview, or submitted comments either online or in paper formats. Specific strategies used in the Phase 1 community engagement process included:

- Project Advisory Group Meetings – This approximately 30 member group includes representatives from broad geographic and diverse interests. The group met twice during Phase 1 activities. Meeting materials and summaries from the two PAG meetings are included in the appendices. Roughly 22 unique individuals participated in PAG meetings.[6]

- Key Leader Interviews – The NextGen team conducted key leader interviews. The goal of these interviews was to tell stakeholders about NextGen and collect insights into their expectations for transit service development. Eighteen interviews were conducted.

- Targeted Stakeholder Small Group Meetings – Young professionals, older adults, people with disabilities, new Americans, low income and other under-represented voices can be challenging to engage using traditional outreach methods. Recognizing the importance of these groups, the study team facilitated five targeted stakeholder group meetings with representatives of agencies who

[6] PAG membership was not counted in the number of people participating in the public engagement activities.

specialize in working with these groups and/or with representatives of these target groups. A total of 24 individuals participated in these meetings.

- Public Meetings – The NextGen team held six public meetings, including meetings in Downtown Columbus (2), Dublin, Westerville, the South Side and Grove City. An online version of the public meeting materials was also posted to the project website and promoted heavily. The meetings were designed in a workshop format. The team provided an overview presentation explaining the meeting purpose and expectations, followed by interactive discussion exercises designed to solicit focused, practical input on priority values and where to locate future transit investments. Publicity efforts included news releases, fliers, web postings, social media notifications, email blasts, and paid advertisements in Columbus Underground, Columbus Post and an online news platform that included the Columbus Dispatch, local television stations, CNN, Wall Street Journal, and USA Today. PAG members and local hosts in Dublin, Westerville, Columbus, and Grove City also spread the word through their networks. In total, 95 people participated in at least one of the public meetings.

- Targeted Workshops – As a complement to the public meetings, the NextGen team hosted three workshops with economic development staff, transportation and planning professionals, and suburban stakeholders. The workshops presented similar information to what was used for the public meetings, but the approach was tailored towards each audience. While the meetings were open to any member of the public, the study team emailed invitations to targeted members of these groups. A combined total of 46 people participated in the three workshops.

- Neighborhood Sessions – The public involvement team also held three neighborhood sessions that consisted of project booths or tables that were located and staffed in high traffic areas as part of community events. These events included an Earth Day celebration, a young professional's conference, and a Latino job fair. Roughly 129 people provided input to the plan at these events.

- Presentations, Other Public Meetings and Online Input – The NextGen team made presentations and distributed materials about the project at stakeholder group meetings and Connect Columbus public meetings. The public was also invited to provide comments or ask questions on the project website. An estimated 225 individuals provided comments through these forums.

3.2.3. Phase 2 Summary

NextGen's Phase 2 community engagement efforts included workshops, public meetings, presenting information at pre-existing community events (neighborhood sessions), and an online survey. The project team used these outreach activities to broadly identify and

prioritize which local service investments and High Capacity Transit corridors are most important to the community.

In total, COTA staff and the NextGen team sponsored, participated, and/or staffed 15 public engagement activities between September 28 and November 3, 2015.

Table 3-1 NextGen: Summary of Phase 1 Outreach Activities

Outreach Activity	Number of Events	Location	Dates (2015)	Number of Participants
Project Advisory Group Meetings	2	Downtown Columbus	March 12 May 20	22 18
Community Leader Interviews	18	Various	March and May	18
Targeted Stakeholder Meetings	4	Downtown Columbus	March	24
Public Meetings	6	Columbus, Dublin, Westerville, South Side and Grove City	April and June	95
Stakeholder Workshops	3	Columbus Dublin	April and June	46
Neighborhood Sessions	3	Dublin Worthington Columbus, Gahanna	May	129
Presentations, Online Comments and Connect Columbus	5 (not including online)	Various (and online)	March – June	225
Total	**42**	-	-	**537**

Activities were held in Downtown Columbus, Columbus State Community College, the Far East Side, the Hilltop, Northland, Dublin and Gahanna. More than 1,750 comments were received through Phase 2 outreach activities from people who attended a public meeting or submitted comments online. Specific strategies used in the Phase 2 community engagement process included:

- **Public Meetings** – The NextGen team held four public meetings, including meetings in Downtown Columbus, the Far East Side, the Hilltop and Gahanna. An online version of the public meeting materials was also posted to the project website and heavily promoted. The meetings were designed in a workshop format. The team provided an overview presentation explaining the meeting purpose and expectations, followed by interactive discussion exercises. This format was designed to solicit focused, practical input on potential service improvements and

preferred High Capacity Transit corridors. Publicity efforts included news releases, fliers, web postings, social media notifications, email blasts and paid advertisements. Project Advisory Group members also spread the word through their networks. In total, 62 people participated in at least one of the public meetings.

- **Stakeholder Workshops** – As a complement to the public meetings, the NextGen team hosted two workshops with community developers/planning officials and campus officials. The workshops presented similar information to what was used for the public meetings, but the approach was tailored towards each audience. The study team emailed invitations to these targeted groups. A combined total of 28 people participated in the two workshops.
- **Neighborhood Sessions** – COTA staff made presentations and distributed materials about the project at pre-existing community events and meetings around central Ohio. An estimated 76 individuals participated through these forums.
- **Online Survey** – An interactive online survey was launched to engage the public and give them an opportunity to select their investment priorities and preferred transit corridors. The survey tool included interactive map capabilities that allowed respondents to view proposed transit corridors. Similar to the public meetings, the online survey was heavily publicized and accessible through a link to COTA's website. The online survey was available to the public between September 28 and November 3, 2015. Approximately 1,635 individuals participated through the online survey.

Table 3-2 NextGen: Summary of Phase 2 Outreach Activities

Outreach Activity	Number of Events	Location	Dates (2015)	Number of Participants
Public Meetings	4	Downtown Columbus, Far East Side, Hilltop, Gahanna	September	62
Stakeholder Workshops	2	Downtown Columbus, Columbus State University	September	28
Neighborhood Sessions	8	Downtown Columbus, Columbus State University, Northland, Dublin	October - November	344
Online Survey	1	Website	September-October	1,635
Total	**15**		-	**2,071**

3.2.4. Summary of NextGen Findings

Throughout Phase 1 and 2 of the NextGen visioning effort, the public highlighted demand for more frequent bus service and the upgrade of corridors to high-capacity transit, preferably rail.

Convenience was consistently discussed, particularly in the Downtown Columbus core. Participants expressed a desire for COTA to expand on proven concepts – such as the CBUS urban circulator – and expanded service for job access. Responding the region's growth toward surburban job centers, participants requested more Express service to these emerging markets and decentralization of service throughout the region. Participants expressed a desire for pilot projects before launching new concepts, such as flex service and surburban circulators.

Among high-capacity corridors, service to the northern population and job centers – including Polaris and Easton – as well as connections to Port Columbus airport arose as the most desired corridors. The High Street corridor received the highest preference among the northern connections. A downtown Columbus corridor between Franklinton and Columbus State Community College – with a link to the CMAX Cleveland Avenue – also achieved a high level of support. Along with service upgrades for these corridors, participants called for customer amenity technological advancements, such as alternative payment systems and real-time information.

COTA will continue to evaluate these needs and desires in Phase 3 in 2017.

3.3. CMAX Cleveland Avenue Bus Rapid Transit

In January 2018, COTA will introduce a new transit mode and technology to central Ohio, Bus Rapid Transit (BRT).

Construction will begin in 2016 on CMAX, COTA's first BRT line along the Cleveland Avenue corridor between downtown and Polaris Parkway at Africa Road. CMAX represents a $48.6 million investment in the community resulting in upgraded transit and spurring economic development, of which Congress has approved nearly $38 million toward the project.

CMAX will result in substantial benefits for the more than 200,000 residents in the corridor and more than 170,000 people working along the corridor. CMAX will feature faster travel times along the corridor along with specially branded buses, upgraded transit stations and bus stops and other customer amenities.

Since 2010, the investment has been featured prominently at all community meetings, including with the general public, elected officials, Area Commissions and other

stakeholder group meetings. COTA also hosts quarterly meetings with government officials and community leaders through the CEO Advisory Group and Stakeholder Group.

As the project moves into construction, COTA is conducting targeted outreach to property owners along Cleveland Avenue and expanding upon past efforts during the final design phase that concluded in fall 2015. COTA will host four pre-construction open houses in May 2016 as well as present to area commissions. Monthly newsletters will be sent to community stakeholders and property owners to ensure timely information leading up to and during construction. Community stakeholders will also receive informational cards with contact information for a dedicated phone line, monitored by Public Involvement (PI) staff. The website will feature an interactive map with regular updates on construction activities, as well as information about project benefits. COTA will also maintain the robust media campaign, both in traditional and social media.

Groundbreaking will be in June 2016, and service will be launched in January 2018.

4. Long-Range Service Plan

This section of the LRTP contains the implementation strategy for the Transit System Redesign (TSR), potential future plans related to delivering and supporting transit services, such as COTA NextGen, and facilities and technologies that support COTA's transit network.

The following goals serve as the framework for implementation of the LRTP service plan:

Ridership

Goal: Achieve ridership of 25 million passenger trips annually by 2025.

Expansion

Goal: Plan and invest in a multi-modal, high-capacity, mass transit system connecting central Ohio residents to opportunity, economic prosperity and to each other.

Perception

Goal: Be recognized in our communities, our region, and nationally, as an essential partner in economic development and mobility solutions and as a leader in technological innovation and sustainability.

To help assure that the LRTP is responsive to community needs and desires, these goals were developed by COTA and presented to the Board of Trustees, who represent the central Ohio community.

Implementation of the TSR, planned growth of COTA's fixed route bus network and mobility services, implementation of the CMAX Cleveland Avenue BRT line, and enhancements to COTA's facilities and ITS are detailed below, along with a description of COTA NextGen. Each component is designed to move COTA forward towards meeting its three goals.

The TSR and NextGen comprise the core of COTA's current and potential service plans. The TSR guides COTA through 2019, restructuring the fixed-route bus network with paratransit, mobility services growing along the way. See Section 4.3 and 4.4 for more details regarding the TSR.

NextGen extends COTA's vision process through 2050; Section 4.5 describes this initiative in further detail.

4.1. Expanding COTA's Service

The 2016-2040 LRTP continues to expand COTA's fixed-route bus network and assumes maintaining current funding levels of ¼ percent permanent and ½ percent temporary sales tax.

Expansion of service under this funding scenario will take place during the 2016-2019 timeframe, at which time COTA will reach its estimated maximum capacity of 1,251,820 annual service hours. See Section 5 for more details about funding the LRTP. Figure 4-1 displays the total annual service hours per year, with an expected 11 percent increase between 2016 and 2019, from 1.12 million hours to 1.25 million hours.

Annual service hours are a measurement of the total amount of time every bus spends providing transit service throughout the entire year. For instance if one bus runs for 10 hours a day for 365 days a year then the number of hours spent providing service would equal 3,650 service hours.

In 2019, service levels will reach the maximum affordable level COTA can maintain under the current economic environment and funding level. As the economy fluctuates, however, COTA will adjust its projected affordable service levels.

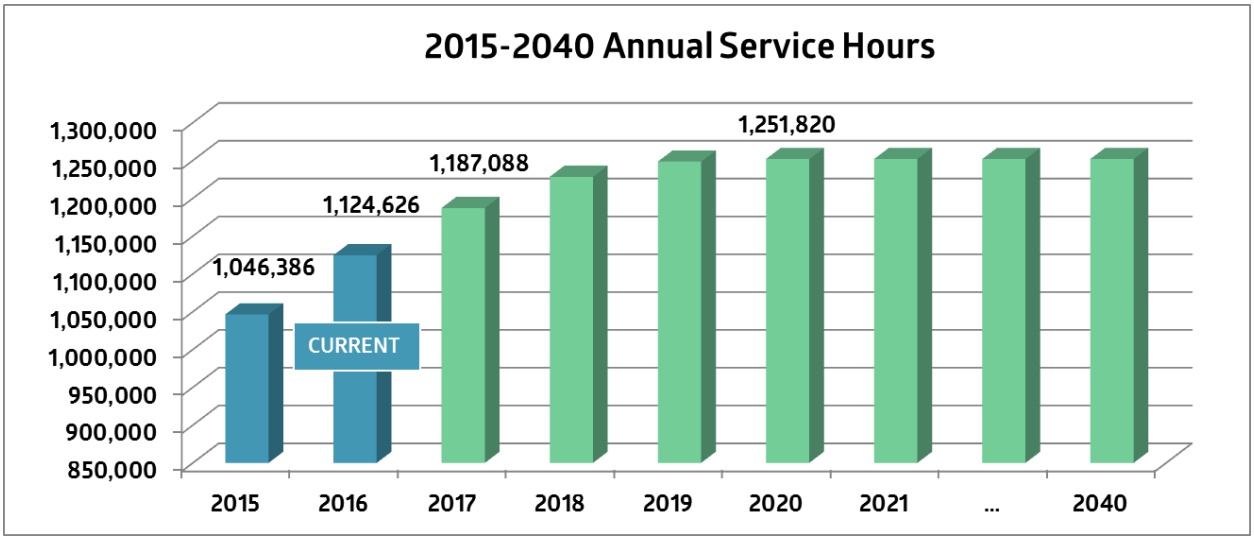

Figure 4-1 Increase in Annual Fixed-Route Bus Service Hours

A comparison of projected sales tax revenue from the 2012 LRTP updated with current projections can be seen in Figure 4.2. The growth in the local economy since 2012 has generated more revenue than previously expected, allowing COTA to afford a higher level of service. By 2019, COTA is projecting about $33 million over the 2012 projections, changing the maximum level of service COTA can afford from 1.05 million hours to 1.25 million annual service hours, a 19% increase.

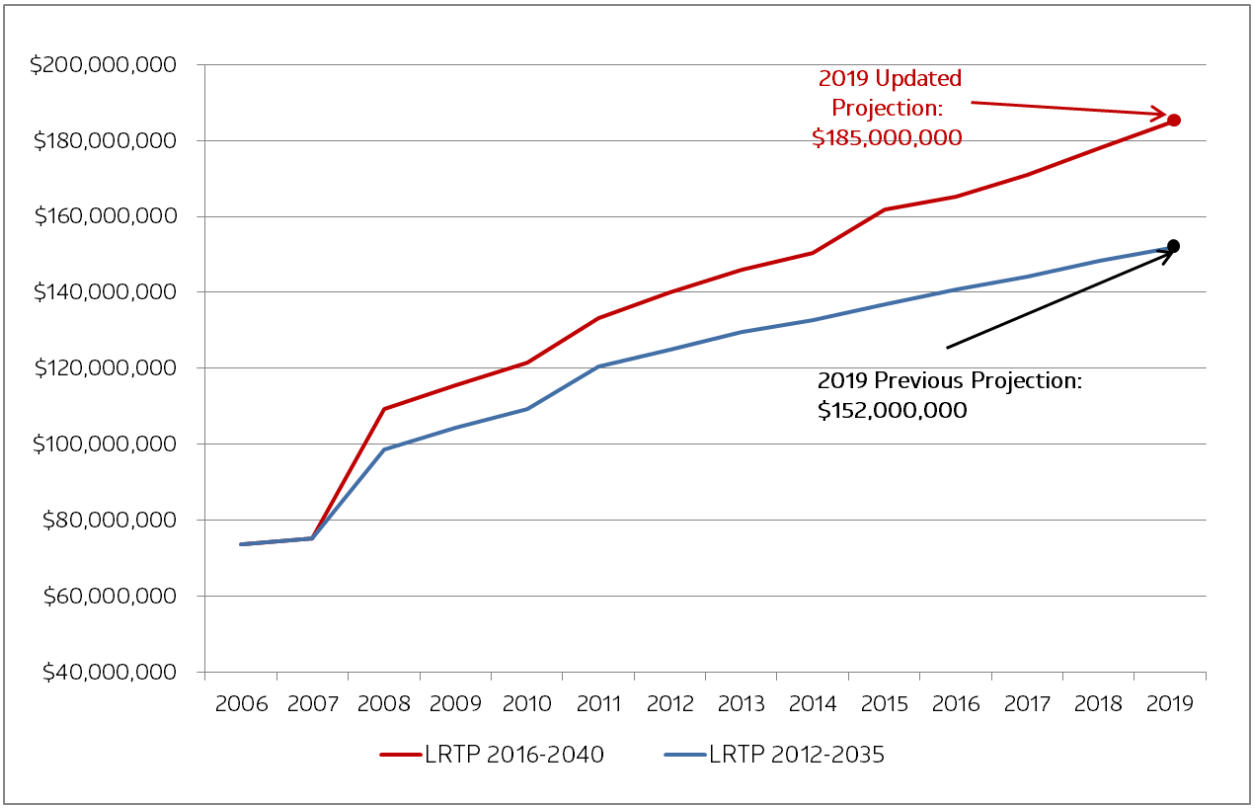

Figure 4-2 COTA's Sales Tax Projections Comparison

One major goal of the TSR is to improve the efficiency of COTA's current fixed-route bus network in order to expand service in a more productive method. This will be achieved through removing duplicative service, simplifying alignments and reallocating service from low-performing lines to higher performing lines. Sections 4.3 and 4.4 provides more details regarding the TSR.

To develop changes to fixed-route bus service in the TSR, including service expansion, a robust public involvement effort was conducted. In total, 20 public meetings were held to create and refine the fixed-route bus network plan (see Section 3.1.).

Although expansion of service beyond 2019 is not projected under COTA's current funding levels, COTA NextGen will propose how service could expand by 2025, 2040 and 2050, including potential strategies to fund future expansion. The NextGen contemplates high-capacity projects and services, such a bus rapid transit and light rail, as well as non-high capacity services. Expansion of non-high capacity services include not only fixed-route bus service but a suite of options such as flexible local shuttle services and on-demand service akin to COTA's Mainstream options. The plan is expected to be completed by the end of the second quarter of 2017. See Section 4.4 for further explanation of COTA NextGen.

In conjunction with expansion of fixed-route service through 2019, COTA also plans to expand Mainstream, COTA's transportation services for individuals with disabilities which prevent them from riding the fixed route buses.

4.2. Fixed-Route Bus Service and the TSR

The backbone of COTA's public transit system is fixed-route bus service. Service is provided on a repetitive, fixed-schedule basis along a specific alignment, with vehicles stopping to pick up passengers at, and deliver passengers to, specific locations. The TSR is restructuring the fixed-route bus network; with the bulk of the changes occurring on May 1, 2017, and expansion of service continuing to May 2019.

COTA's existing network provides fixed-route bus service in a number of ways:

- *Local lines,* make all stops and operate between downtown Columbus and various neighborhoods or townships within COTA's service area (see Figure 1-1). The vast majority of COTA vehicle service hours are operated on local routes;
- *Express lines,* operate to provide fast service between downtown Columbus and suburban areas and park and ride facilities. Service is usually operated during the AM and PM peak travel time periods in the primary direction of travel. However, some routes serve "reverse commute" markets and operate in the non-peak direction of travel (i.e., from downtown to outlying employers in the AM). Between downtown Columbus and the outlying segments of the route, most buses operate with "closed doors" (i.e., no stops);
- *Crosstown lines*, operate between various neighborhoods or townships within COTA's service area and do not serve the downtown area and
- *LINK lines*, are generally short routes operated by smaller vehicles that are intended to serve short, non-work trips or serve as feeders to local and/or express routes, as well as neighborhood activity centers, including COTA transit centers. COTA operates only one LINK route, the CBUS downtown circulator.

Figure 4-3 Fixed-Route CNG Bus

The TSR network will introduce two new service types

- *Limited Stop lines,* will operate along major transit corridors with stops only at major transfer points and destinations. Limited-stop service operates at a lower frequency and span of service than Local service, but provides reduced travel times between major destinations.
- *Bus-Rapid Transit (BRT)*, which is form of limited-stop service that incorporates higher service frequency. BRT service provides the use of technologies to increase speed of service such as traffic signal priority and off-board payment options. BRT also offers unique route branding and increased passenger amenities.

The TSR will change COTA's fixed-route network, introducing limited stop service as well as expanding local and crosstown service. The CMAX Cleveland Avenue BRT will introduce BRT as a line type in January 2018. See Section 4.8 for more information about the CMAX.

4.3. The Transit System Redesign (TSR)

Over the past 40 years, our region has changed tremendously. Communities have expanded - first growing away from Downtown Columbus into suburban job centers, and then recently, revitalizing the city core with an influx of urban enthusiasts. COTA's bus network has kept up with this growth through incremental changes to our radial system centered on Downtown Columbus, but it is due time for a modern transportation system in central Ohio.

The TSR was developed through a comprehensive review of the existing bus system, conducted by international transit system experts IBI Group. This modernization plan is aimed

at crafting a system that better serves our customers and stakeholders, while remaining within COTA's current and projected funding limits.

COTA will continue to make significant improvements to the bus network through May 2017, with expansion of service continuing through May 2019. These planned improvements are based on recommendations from the Transit System Review, a yearlong study of COTA's bus network completed in October 2014. The recommendations in the TSR were developed with input collected through substantial public outreach, including public meetings, focus groups, an advisory committee, COTA Board of Trustees, an online survey, and social media.

After the plan was completed, COTA took the proposed changes back to the public in 2015 to refine the bus network. Ten public meetings were held along with numerous stakeholder discussions and input from customer feedback through customer service, social media, emails, events and other activities. Section 3.1 has more details regarding public involvement and the TSR. The TSR plan report and recent updates can be found on COTA's website at www.cota.com/tsr.

The proposed bus network in the TSR forms the foundation of the planned service changes in the LRTP. Figures 4-4 displays the network as of March 2016; colors indicate the frequency of the line as shown in the map legend.

The network was designed to focus on making COTA's fixed-route bus service easier and more convenient for both current and potential riders. The changes will substantially improve the bus network, including the following:

MORE direct service–grid-like network focused around using major roadways

- Easy-to-use system for customers, visitors and potential riders
- Simplified routes reduce confusing deviations
- Faster connections

MORE frequency–high-frequency lines (15 min. or better) more than double from 6 to 13

- More than twice as many residents (126,100 more residents) are within 1/4 mile of frequent service
- 5,100 more residents are within 1/4 mile of any service
- More weekend service along Northwest Boulevard, Sawmill Road, between OSU and Upper Arlington, and in the Rickenbacker area

MORE consistency–Local and Crosstown lines operate on the same schedules, seven days a week

- Expanded weekend service, reflecting the all-week nature of retail and service employment
- Clock-face frequency – most buses will come every 15 (or less), 30, or 60 minutes

MORE destinations–new service to employment centers, such as Polaris, Rickenbacker and New Albany

- Frequent network serves 100,600 more jobs (+69%)
- 22,500 more jobs are within 1/4 mile of any service (+5.5%)

MORE efficiency– routes avoid unnecessary delays to improve on-time service

- Expanded Crosstown service, relieving the need to transfer Downtown for service to destinations outside of Downtown
- Easier Express service connections to Local and Crosstown lines at climate-controlled transfer stations designed for customer comfort
- Even distribution of Local stops throughout Downtown, improving service to new destinations along Third, Fourth and Front streets
- Reduced congestion along busy corridors, such as High Street

MORE fiscal responsibility – fulfilling our promises to taxpayers and stakeholders

- Expanded use of newly-renovated COTA Transit Terminals
- Greater level of service to our customers with fewer buses in fleet
- Less need for future additional storage and maintenance facilities

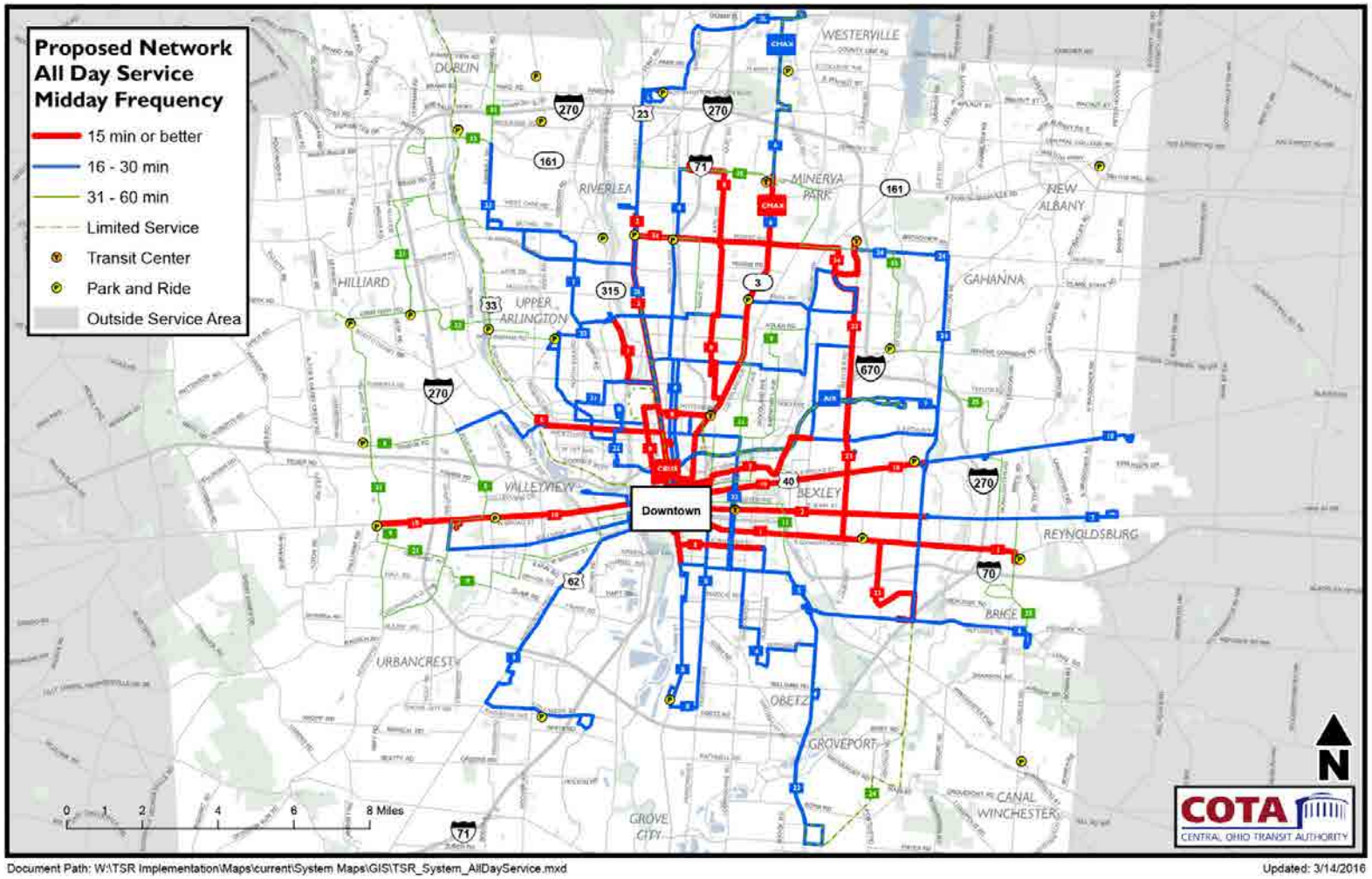

Figure 4-4 TSR Proposed Bus Network All Day and Weekend Service

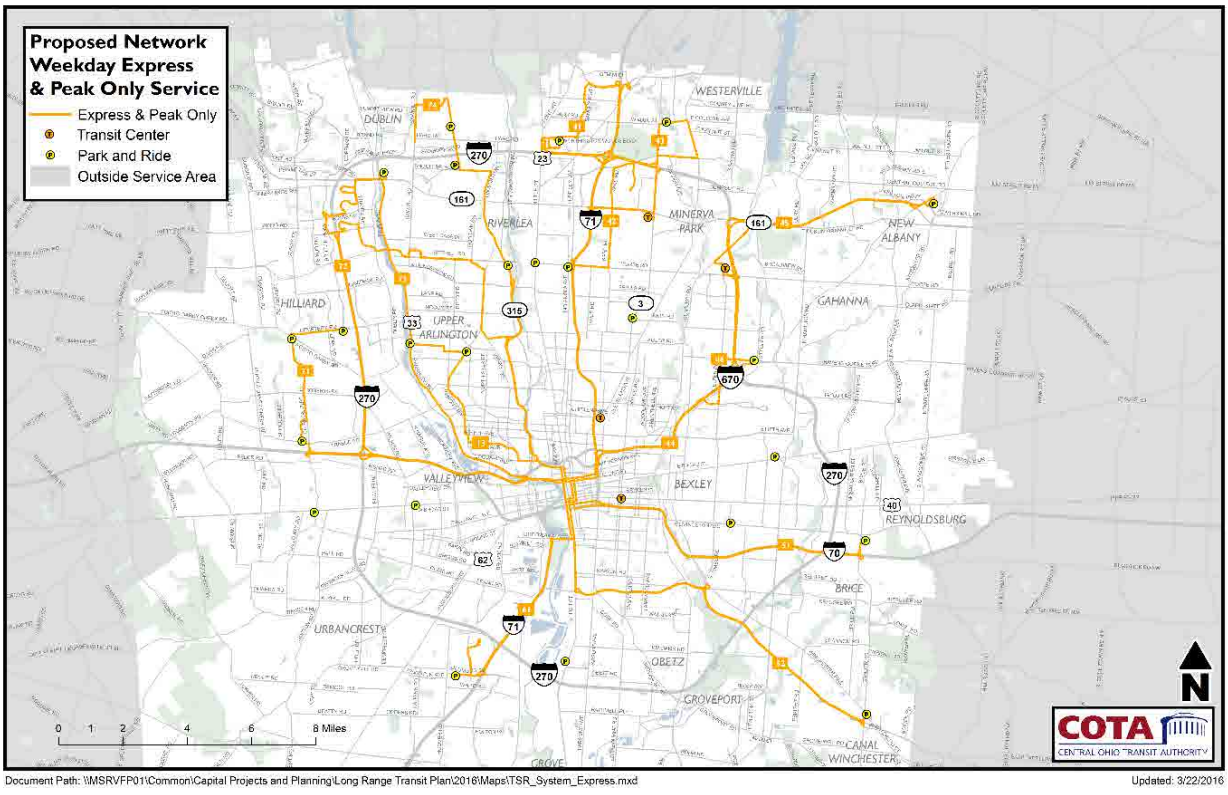

Figure 4-5 TSR Proposed Express, Reverse Commute and Peak only service

To guide the creation and implementation of the proposed network, the consultant team recommended that COTA adopt a policy as to how to allocate its bus service. COTA is often asked to provide both high-ridership, efficient service in busy corridors, such as High Street, and coverage service to regionally important locations, such as job centers and low-income neighborhoods in less dense areas, that generate low-ridership.

As such, the proposed network allocates approximately 70% of bus service to high-ridership service and 30% to coverage service, mirroring the current network. This allocation policy will be used when modifying or expanding the bus network following full implementation of the TSR recommendations scheduled for May 2017.

The TSR will change how lines are numbered, the table below lists the line numbers and names of the proposed new lines.

Table 4-1 TSR Line Names and Numbers

Local Lines		Crosstown Lines	
Line Name	**TSR #**	**Line Name**	**TSR #**
CMAX	CMAX	Hilliard-Rome	21
COTA AirConnect	AIR	OSU/Rickenbacker	22
Livingston/Kenny	1	James-Stelzer	23
E Main/N High	2	Hamilton	24
N High/Polaris Pkwy	2L	Brice	25
Harrisburg/Northwest	3	Hudson	31
Indianola/Lockbourne	4	N Broadway	32
W 5th Ave/Refugee	5	Henderson	33
Sullivant/Cleveland	6	Morse	34
Mt. Vernon	7	Dublin-Granville	35
Karl/S High	8	**Other Lines**	
W Mound/Brentnell	9	CBUS	
East/West Broad	10	Night Owl	
Bryden/Maize	11	Zoo	
McKinley/Fields	12	OSU/Airport	
Express, Reverse Commute & Peak Only			
Northwest Lines	**TSR #**	**Northeast Lines**	**TSR #**
Arlington/1st Ave	13	Crosswoods/Polaris (X & R)	41
Hilliard (X & R)	71	Sharon Woods	42
Tuttle/Bethel (X & R)	72	Westerville (X & R)	43
Blazer Pkwy/Riverside (X & R)	73	Easton (X & R)	44
Smoky Row (X)	74	New Albany (X & R)	45
		Gahanna	46
Southwest Lines	**TSR #**	**Southeast Lines**	**TSR #**
Grove City (X & R)	61	Reynoldsburg	51
		Canal Winchester	52

*These lines will remain in service but are not mapped

4.3.1. Service Investment Strategy

In November 2014, COTA's Board of Trustees adopted the recommendation service allocation policy, directing staff to invest approximately 70% of bus service into high-ridership lines and 30% into coverage lines, service in regionally important areas that likely generate low-ridership. This policy is meant as a guideline to be applied when the final implementation of the TSR is complete and for all future changes to the bus network beyond that point. This strategy reflects COTA's current bus network, which also invests approximately 70% of service in high-ridership lines and 30% in coverage.

High-ridership lines serve corridors such as N. High St., E. Broad St., W. Fifth Ave., E. Main St., Cleveland Ave., and Livingston Ave. This service and the surrounding corridor exhibit universal characteristics that generate high-ridership:

- Walkability – Service is easy and safe to access, such as a prevalence of sidewalks and pedestrian crossings;
- Density – There are many people living and jobs located around the service;
- Linearity – Service can travel in a reasonably straight line that riders and potential riders perceive as direct;
- Continuity – The corridor service travels along has few gaps where there are no potential riders, such as parking lots, vacant lots and rural green space;
- Uniqueness – Service does not overlap or compete with other service within ¼ mi. unless the demand within the overlapping and competing area is high.

Coverage lines serve areas that do not exhibit characteristics of high-ridership service, but yet are important to serve. These areas include low-density suburban communities, e.g., the Rickenbacker area, New Albany Business Park, Hilliard-Rome Rd., and Polaris Fashion Place.

The methodology for determining if a service falls into the ridership or coverage category is found in COTA's 2016-2019 Short-Range Transit Plan (SRTP) in Section 4.5. Visit www.cota.com to view the document.

4.3.2. Developing the Proposed Bus Network

The process to complete the TSR was divided into three main phases with the review completed in October 2014 (See Figure 4-6). In the first phase, the consultant team assessed the current conditions of COTA's bus network as well as regional demographic information, such as population and job locations. The assessment provided line-by-line narrative describing factors that contribute to the performance of each line.

Using this information, in the second phase the consultant team led a three-day workshop to develop three alternative transit networks. Each network demonstrated what the bus network could look like if service was allocated in different ways between high-ridership and coverage lines. The three alternatives presented a bus system allocating 90% of service to high-ridership lines and 10% to coverage, 50% to high-ridership lines and 50% to coverage and 70% to high-ridership lines and 30% to coverage. In January 2014, a project advisory committee comprised of business, social service and advocacy leaders from across central Ohio and focus groups were formed to guide the project.

The three alternatives were presented to several public and stakeholders for input. Five public meetings were held in March 2014 as well as a project advisory committee meeting. The preferred alternative was the third that allocated 70% of service to high-ridership lines and 30% to coverage, similar to COTA's existing system.

Guided by public and stakeholder input, a single, proposed bus network was developed in the third phase. The consultant team led a workshop with staff and a separate workshop with COTA's Board of Trustees to create the proposed network. In May and June of 2014, the network was taken back to the public, advisory committee and focus groups. Comments received were incorporated into refinement of the network.

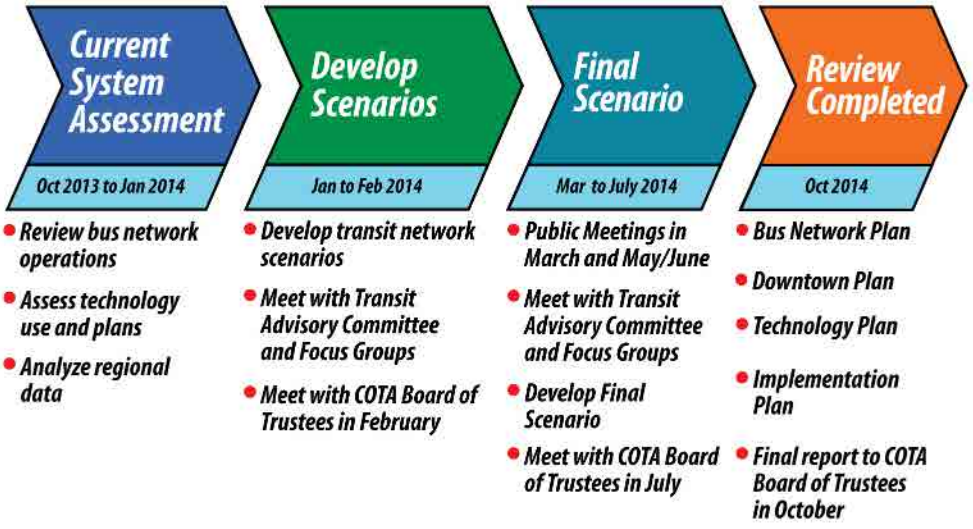

Figure 4-6 TSR Timeline

In October 2014, a final report was delivered to COTA from the consultant team. In November 2014, COTA's Board of Trustees accepted the report, noting the quality of work complete, but did not officially adopt the plans within. The intent is to allow COTA staff to

refine the proposed plans and present the refined plans to the public for an additional opportunity to provide feedback.

4.3.3. Planned Implementation

COTA is implementing the TSR network in two phases. Phase I implements changes that have relatively minor impacts on current riders and the bus network during COTA's service changes every January, May and September between January 2015 and January 2017. Public meetings will continue to be held to solicit comments as per COTA's service change practice.

The remainder of the changes not implemented in Phase I will be implemented in Phase II, on May 1, 2017. Phase II will include major realignments that are too complex to integrate into a normal service change process, renumbering of many lines, consolidation of duplicative service, discontinuation of service and restructuring of express service. On-time performance and any other operational issues identified after implementation will be adjusted in September 2017 and after. Through May 2019, COTA will continue to expand service and make improvements to frequencies, slight adjustments to alignments and other changes that may need to occur due to the TSR.

Near the end of 2016 and throughout the first two quarters of 2017 an extensive outreach effort will be developed to inform riders of final changes and provide necessary information to current and potential users.

4.3.4. Planned Park and Ride Changes

As part of the CMAX Cleveland Avenue Bus Rapid Transit project, COTA plans to construct the Northland Transit Center and Park and Ride on the west side of Cleveland Avenue just south of SR-161/Dublin-Granville Road, and relocate the existing leased Northern Lights Park and Ride to a new, COTA owned location immediately north of its current location. This facility will include an indoor waiting area, ticket vending machine, real-time next bus arrival information displays, 63 parking spaces, and six bus bays designed to accommodate standard 40' as well as 60' articulated buses should COTA utilize these larger vehicles in the future.

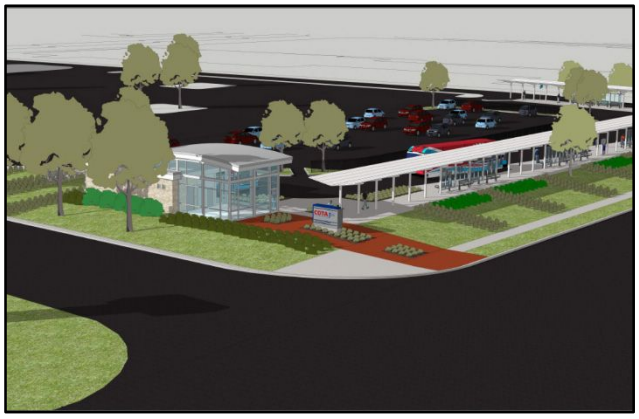

Figure 4-7 Northland Transit Centers Concept

In the southeast area, the currently leased Gender Road Park & Ride will be

relocated further south on Gender Road to a new, COTA-owned location at Winchester Pike. COTA is currently seeking developers to purchase the available out lots before design and construction commences. COTA anticipates the new park and ride will be constructed and in service in 2017.

In the northwest area, the Dublin Park & Ride is planned to relocate back to Dale Drive in September 2016. This park and ride was temporarily relocated from Dale Drive to Village Parkway in 2015 after COTA was approached by the City of Dublin regarding the City's Bridge Street District mixed-use development plan, which included use of the COTA- owned park and ride land. As COTA desires to align its goals with those of local communities, an agreement was reached selling the land to Dublin. In parallel with this transaction, Dublin assisted COTA in finding a new permanent location for the park and ride, which Dublin will also construct in 2016. During this transition period, and to facilitate moving forward with the Bridge Street development, a temporary park and ride was constructed by Dublin at Village Parkway. The new, COTA-owned park and ride will be located on Dale Drive adjacent to the former Dale Drive park and ride site. The efforts between COTA and Dublin serve as an example of collaboration that best serve our customer's mobility needs, while supporting Dublin's efforts to attract new businesses, jobs, residents, and visitors.

Additionally, due to the proposed changes in the TSR select park and rides will be discontinued. This includes the leased Berwick and Eastland Mall park and rides. Figures 4-8 below shows the planned changes to park and rides.

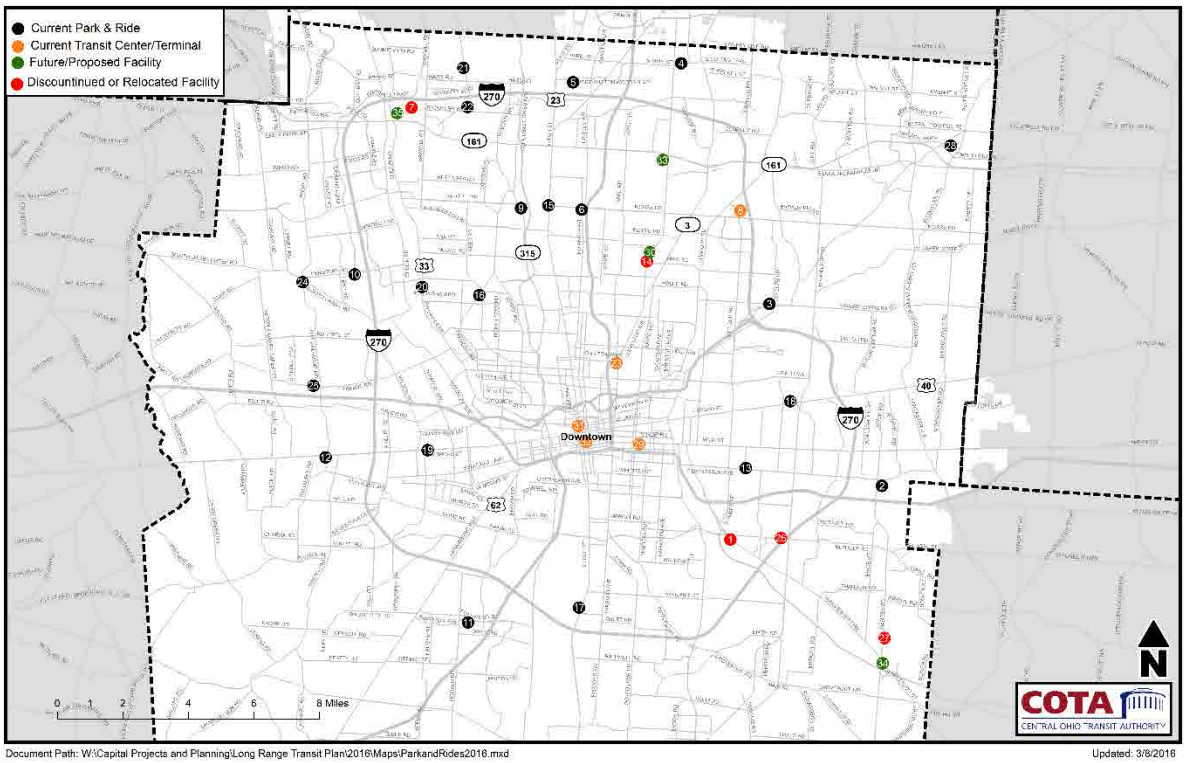

Figure 4-8 TSR Proposed Park and Ride

Site	Name
1	Berwick Plaza
2	Reynoldsburg
3	Royal Plaza (Gahanna)
4	Westerville
5	Crosswoods
6	Indianola & Morse
7	Dublin (Temporary)
8	Easton Transit
9	Olentangy & Bethel
10	Hilliard Cemetery Rd
11	Grove City
12	Westwoods

Site	Name
13	Livingston & Barnett
14	Northern Lights
15	Delawanda
16	Kingsdale
17	Great Southern
18	Whitehall
19	Broad & Southampton
20	Griggs Dam
21	St Andrew
22	St Peters
23	Linden Transit Center
24	Hilliard United Methodist Church

Site	Name
25	Renner Rd
26	Eastland Mall
27	Gender Rd
28	New Albany
29	Near East Transit Center
30	Northern Lights (Relocated)
31	Spring Street Terminal
32	COTA Transit Terminal
33	Northland Transit Center
34	Canal Winchester
35	Dale Drive (Dublin)

Figure 4-9 TSR Proposed Park and Rides Labels

4.4. TSR Fixed-Route Network

The proposed fixed-route bus network was developed through extensive public outreach and analysis of existing demographic, economic, traffic and physical conditions. Designed with the

customer in mind, the new network simplifies alignments, provides easier to understand schedules and all local and crosstown service will operate seven days a week. To do so the plan allocates service hours more efficiently to achieve the goal of investing 70% of service in ridership lines and 30% in coverage. Along with the expansion of service, duplicative, meandering and unproductive service was reinvested into service that better achieves these goals.

In May 2017, most bus lines will be renumbered and renamed, requiring thousands of new bus stop signs throughout the service area, as well as relocation, installation and removal of bus stops and shelters. As TSR changes are introduced into the bus network, continued extensive public outreach will take place as the major implementation scheduled in May 2017 approaches.

Overall, the network provides a stronger local and crosstown network, increasing frequencies in many communities. Table 4-2 shows the number of lines per frequency category in the pre-TSR network and the TSR network. The table counts through-routed lines as a single line, for example the 2 N. High and 2 E. Main are considered one line.

Existing Line 21 Night Owl, 98 Zoo Bus and 52 OSU/Airport will be retained (with new line numbers) in the TSR but are not listed on the maps due to the seasonal or restricted schedules.

	2014 (September)			2019 (May)		
Line Type	Number of lines	Peak	Midday	Number of lines	Peak	Midday
Local	1	10	10	1	10	10
	1	10	12	1	10	12
	2	10	15	3	10	15
	0	15	15	3	15	15
	2	15	30	1	15	30
	1	20	20	1	20	20
	5	20	30	0	20	30
	3	30	30	4	30	30
	1	30	45	0	30	45
	0	30	60	1	30	60
	0	60	60	1	60	60
Crosstown	0	15	15	2	15	15
	9	30	30	5	30	30
	1	45	45	1	45	45
	1	60	60	2	60	60

	Number of lines	Number of Commute lines	Number of Reverse Commute line	Number of lines	Number of Commute lines	Number of Reverse Commute line
Express	1 trip	1	3	1 trip		
	2 trips	12	5	2 trips	3	2
	3 trips	7	0	3 trips	1	4
	4 trips	3	0	4 trips	1	3
	5 trips	2	1	5 trips	1	1
	6 trips			6 trips	3	
	7 trips	1		7 trips	3	
	8 trips			8 trips	1	
	9 trips			9 trips	1	

Lines 13,14,19 and 21 not included in Sept. 2014

Table 4-2 Frequency Comparison Table: Pre-TSR to TSR

4.4.1. TSR Maps

While Table 4-2 shows the total number of lines by frequency category, it does not show how service is changing in various communities. The following maps show the proposed bus network (with new line numbers) in a variety of ways such as the midday and weekend network, high-frequency network, express network and service by quadrant of COTA's service area.

Figure 4-10 and 4-11 show the midday pre-TSR and TSR network. The maps visually show how the network is growing, increasing frequencies and serving new locations. Displayed frequencies are the midday and weekend frequencies along with the peak only services such as the express network and select local lines. As shown in Table 4-2 above, many lines have more frequencies in the a.m. and p.m. peak travel times, during rush hour. The high-frequency network is slightly larger in the peak hour than the midday and weekend.

The 21 Night Owl, CBUS, 98 Zoo Bus and 52 OSU/Airport are not displayed on the maps but will continue to operate. The TSR network shown may be modified prior to implementation.

The core of the network is comprised of fifteen high frequency corridors, providing 15 minutes or better service. Prior to implementation of the TSR, in September 2014, COTA operated seven high frequency lines, including the CBUS, which collectively carried over 50% of COTA's ridership. This increase in high-frequency service will not only grow ridership, but provide stronger crosstown connections, reduce travel times for riders and minimize the reliance on schedules. Figure 4-12 and 4-13 show the comparison between the pre-TSR high-frequency network and TSR high frequency network.

Following the high frequency network maps are Figures 4-14 through 4-21 that show pre-TSR and TSR midday frequencies by quadrant.

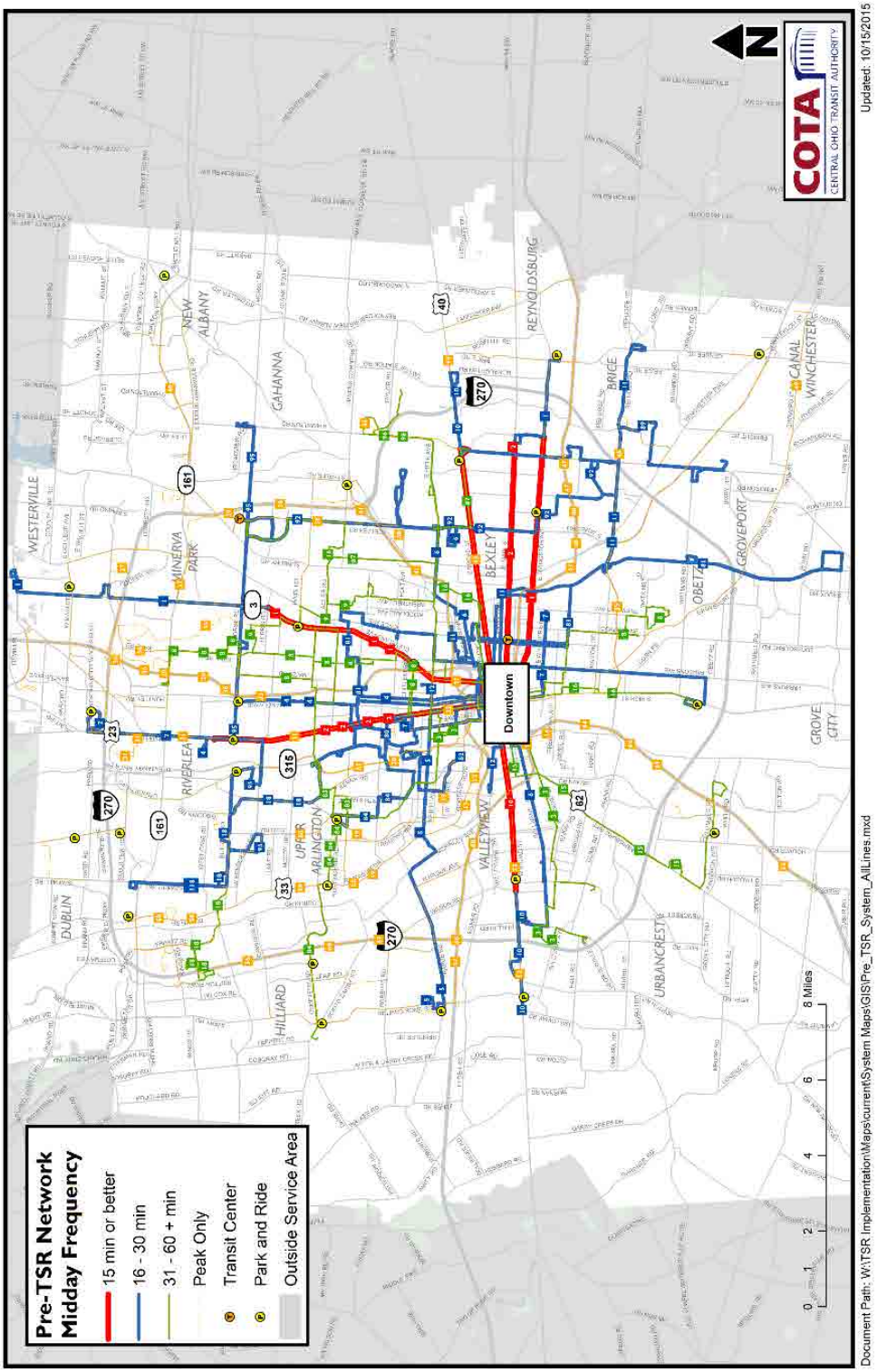

Figure 4-10 Pre-TSR Bus Network Midday and Peak Only Service

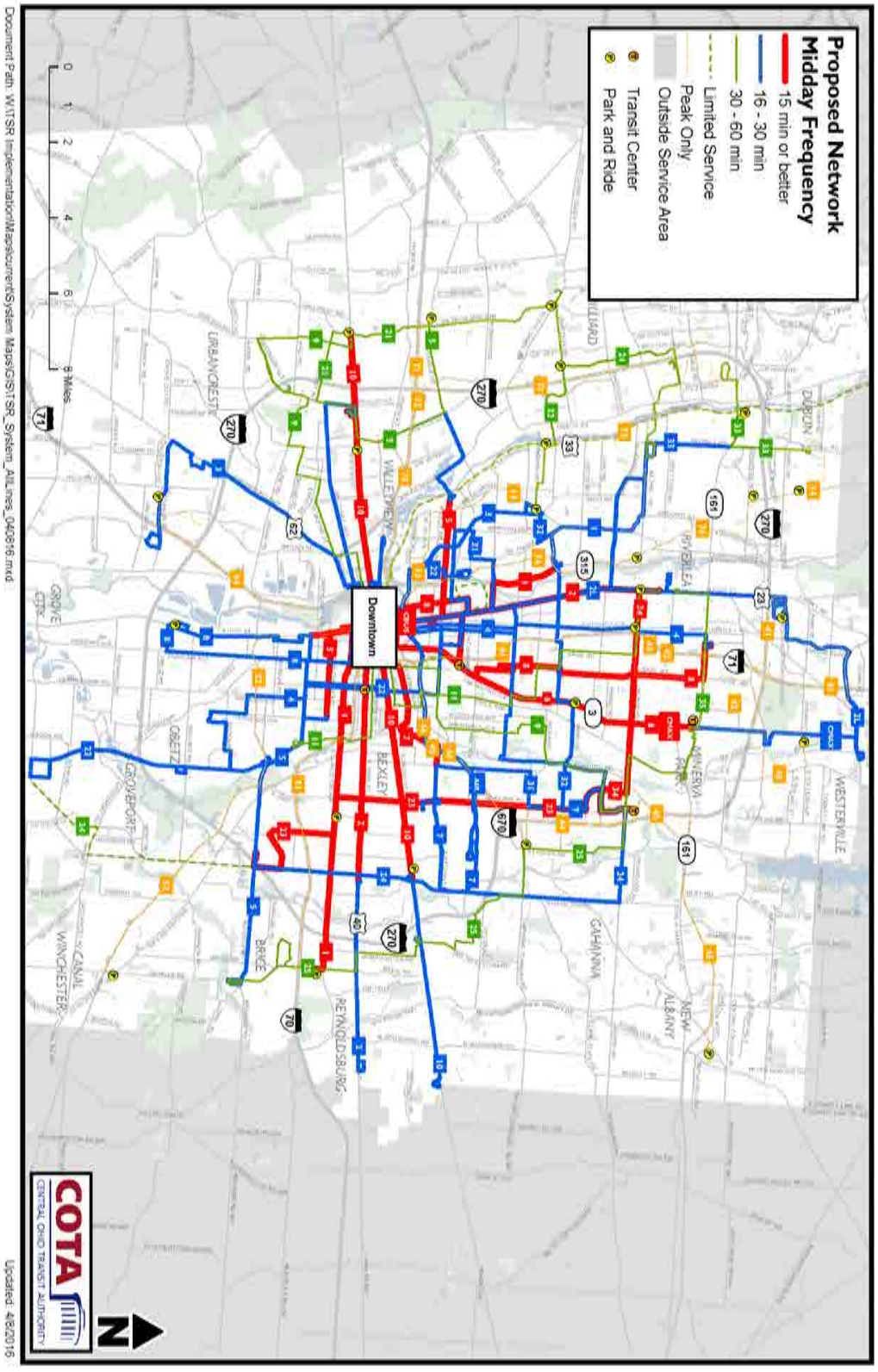

Figure 4-11 TSR Proposed Bus Network Midday and Peak Only Service

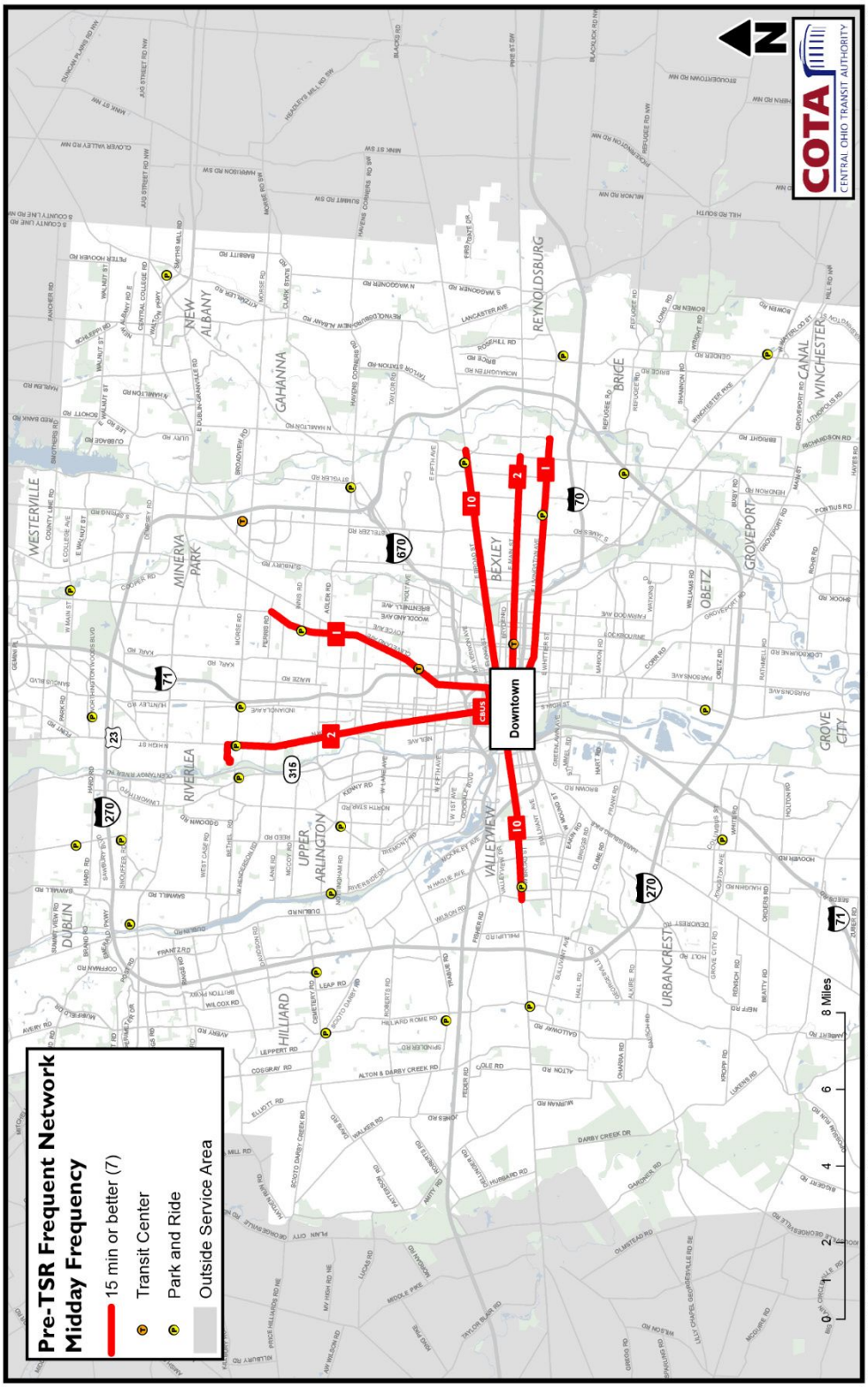

Figure 4-12 Pre-TSR High Frequency Network

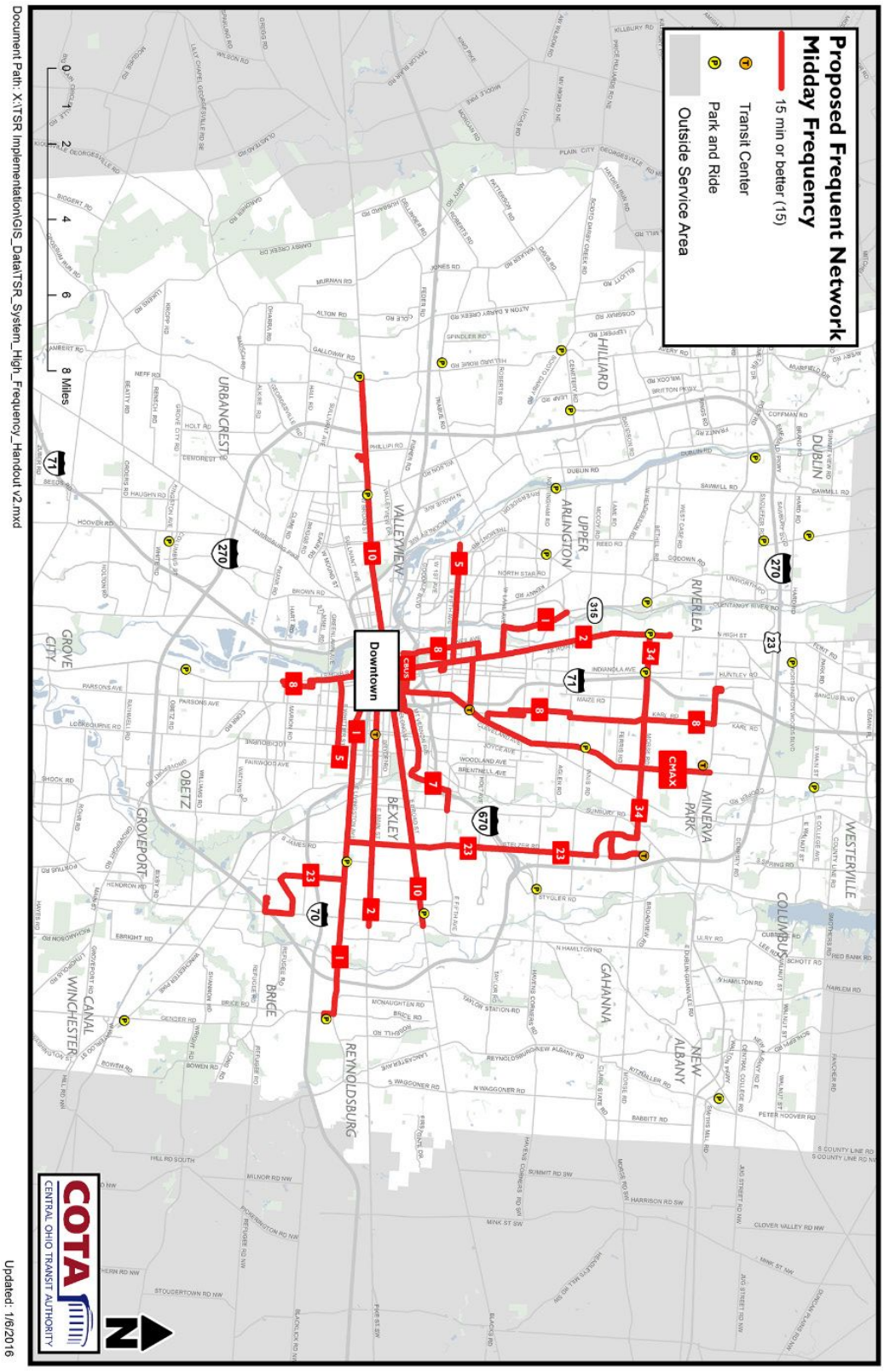

Figure 4-13 TSR High Frequency Network

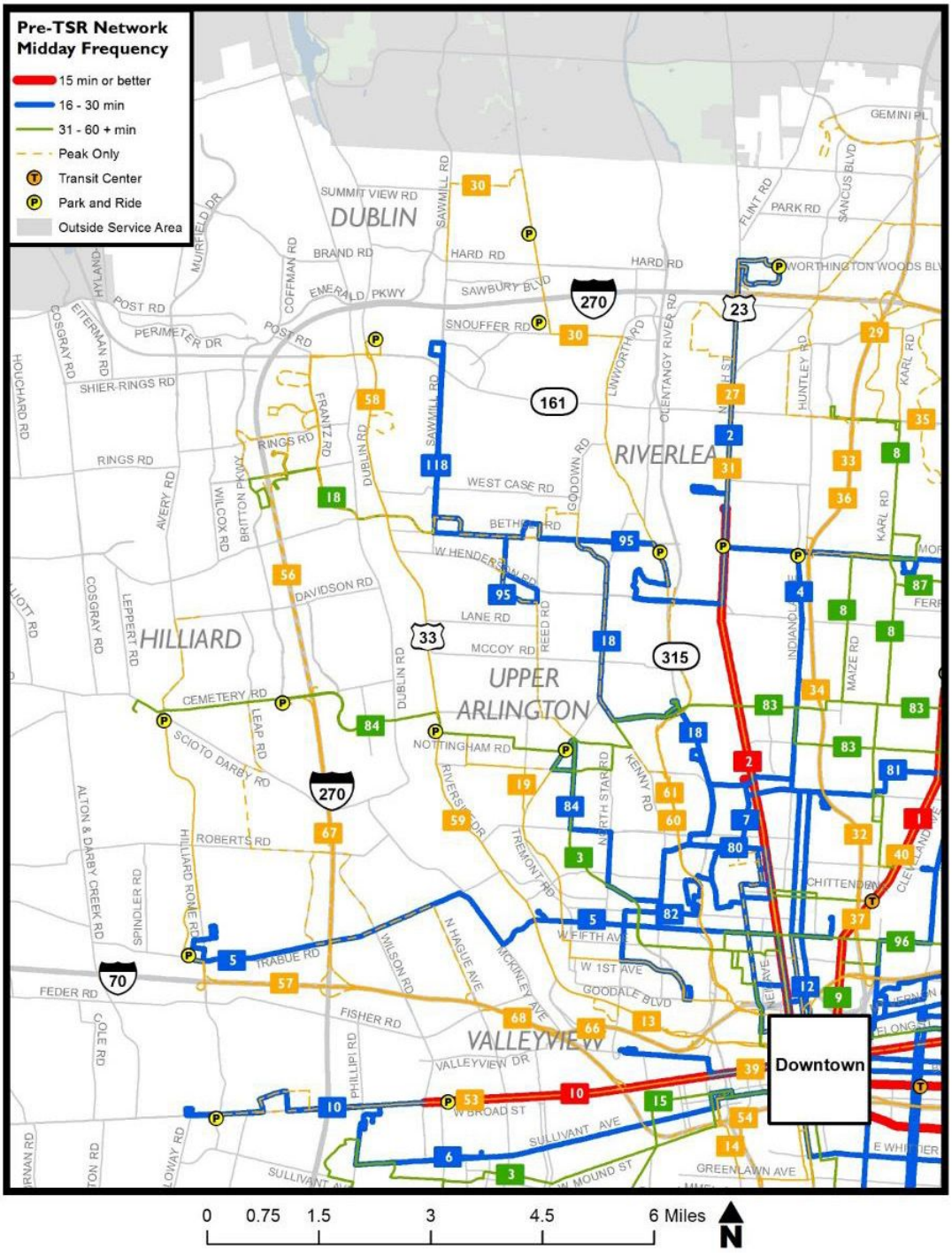

Figure 4-14 Pre-TSR Northwest Quadrant

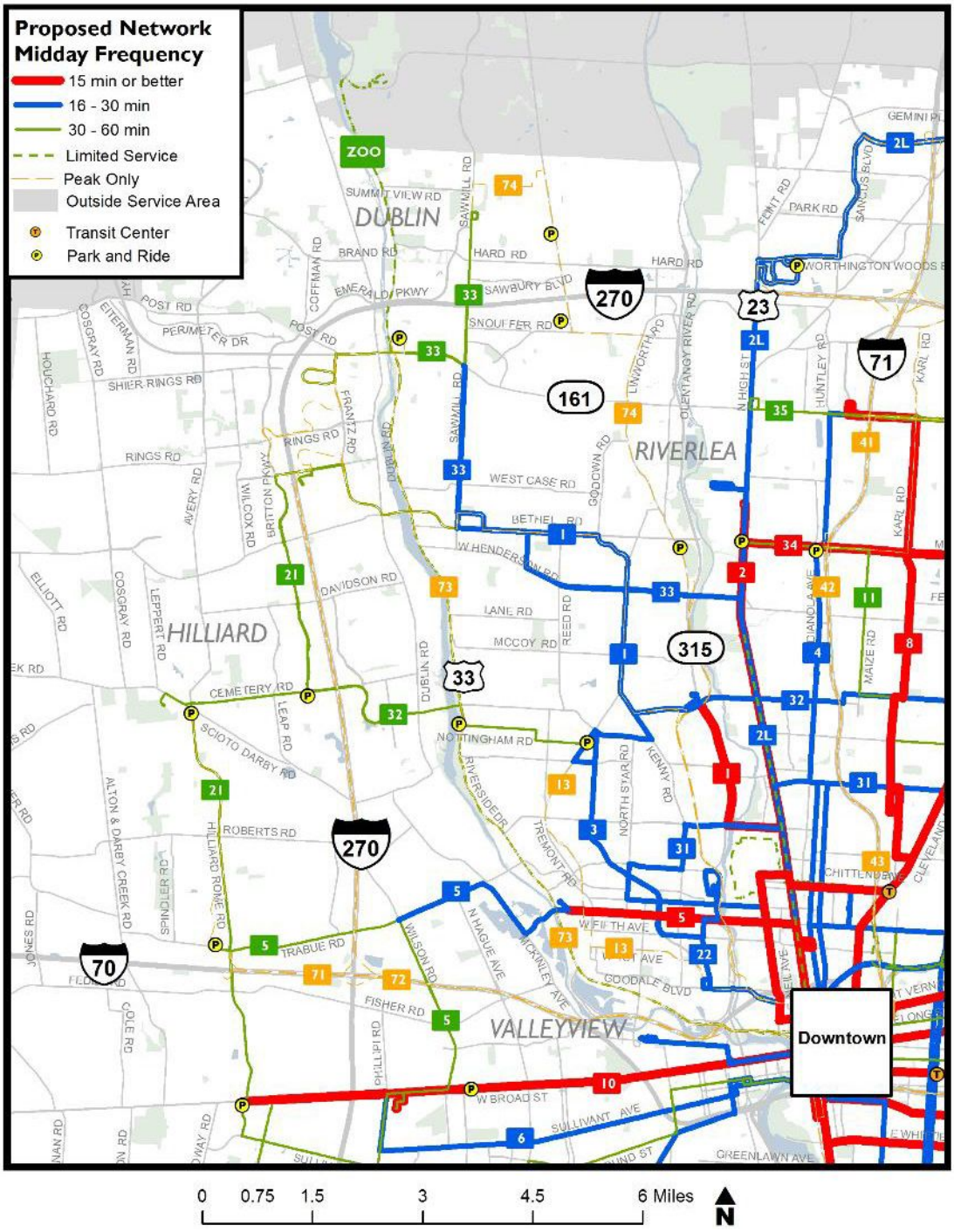

Figure 4-15 TSR Northwest Quadrant

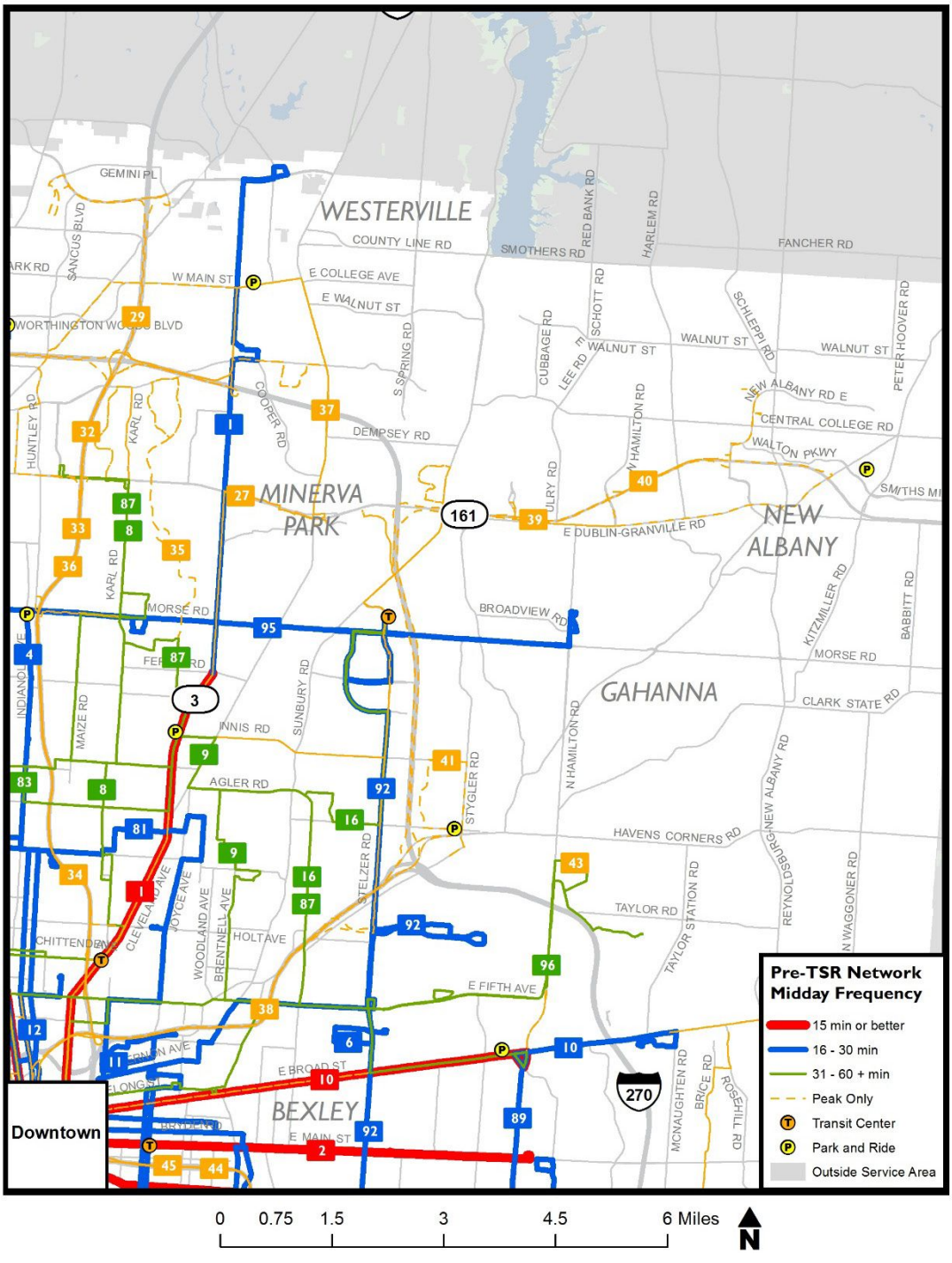

Figure 4-16 Pre-TSR Northeast Quadrant

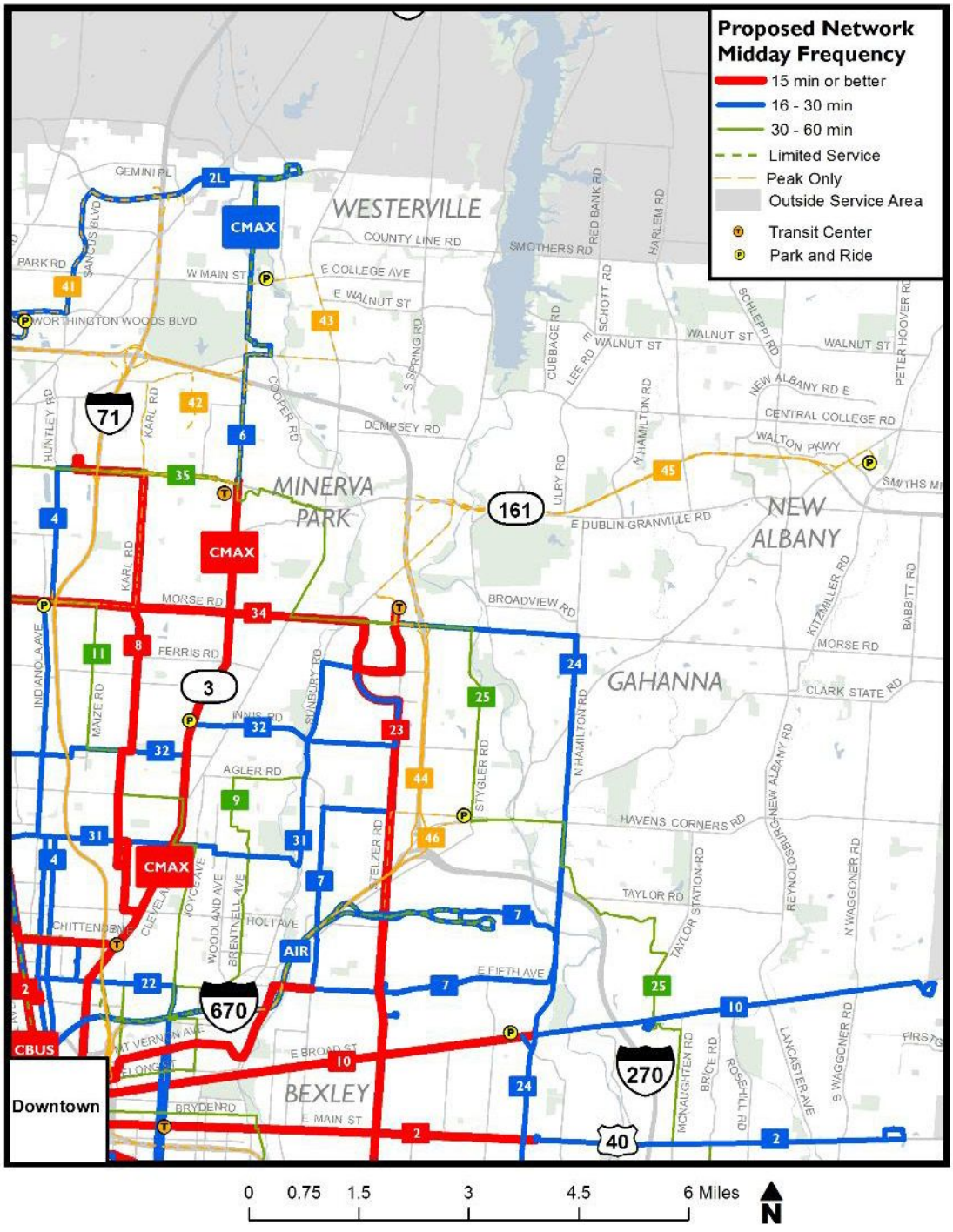

Figure 4-17 TSR Northeast Quadrant

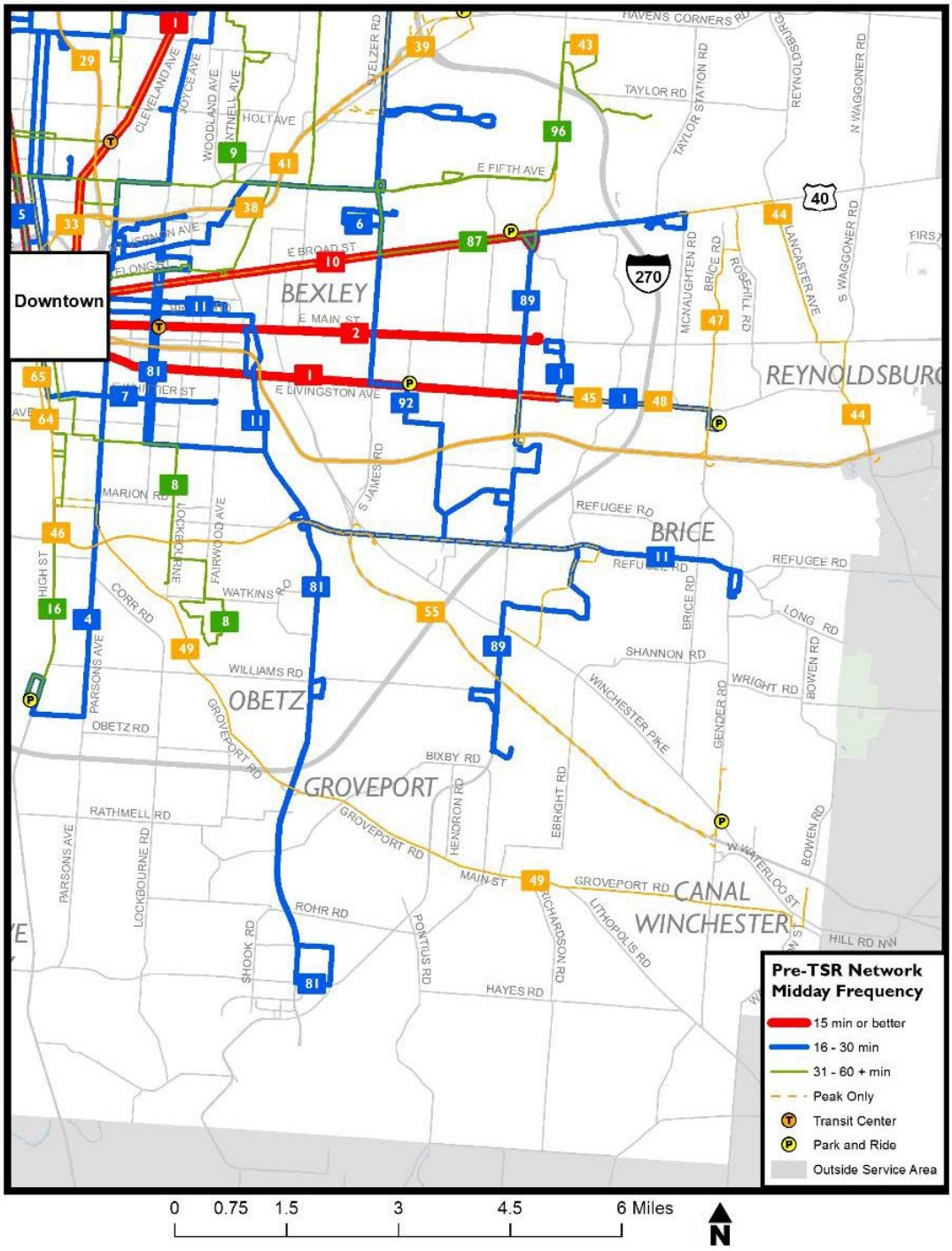

Figure 4-18 Pre-TSR Southeast Quadrant

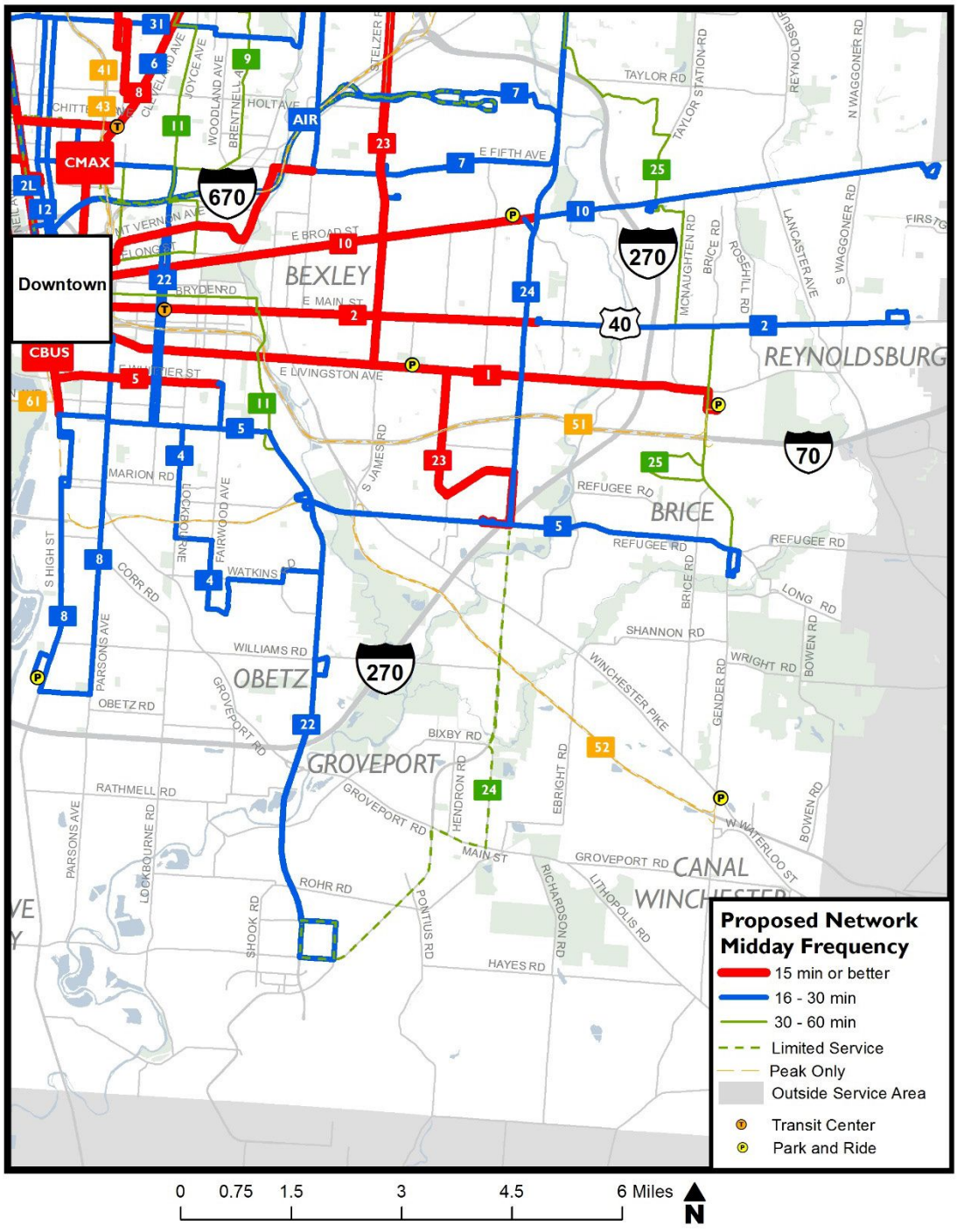

Figure 4-19 TSR Southeast Quadrant

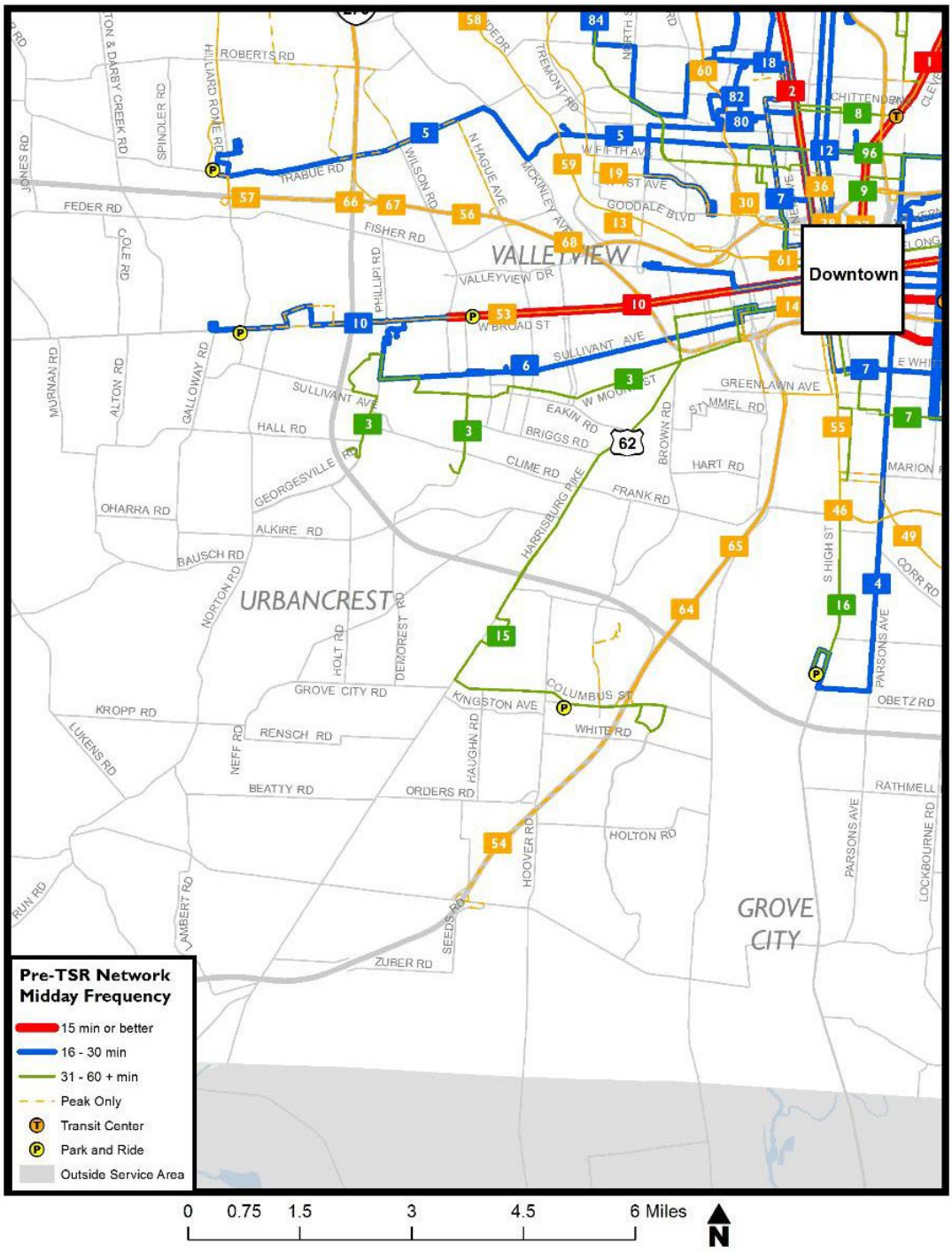

Figure 4-20 Pre-TSR Southwest Quadrant

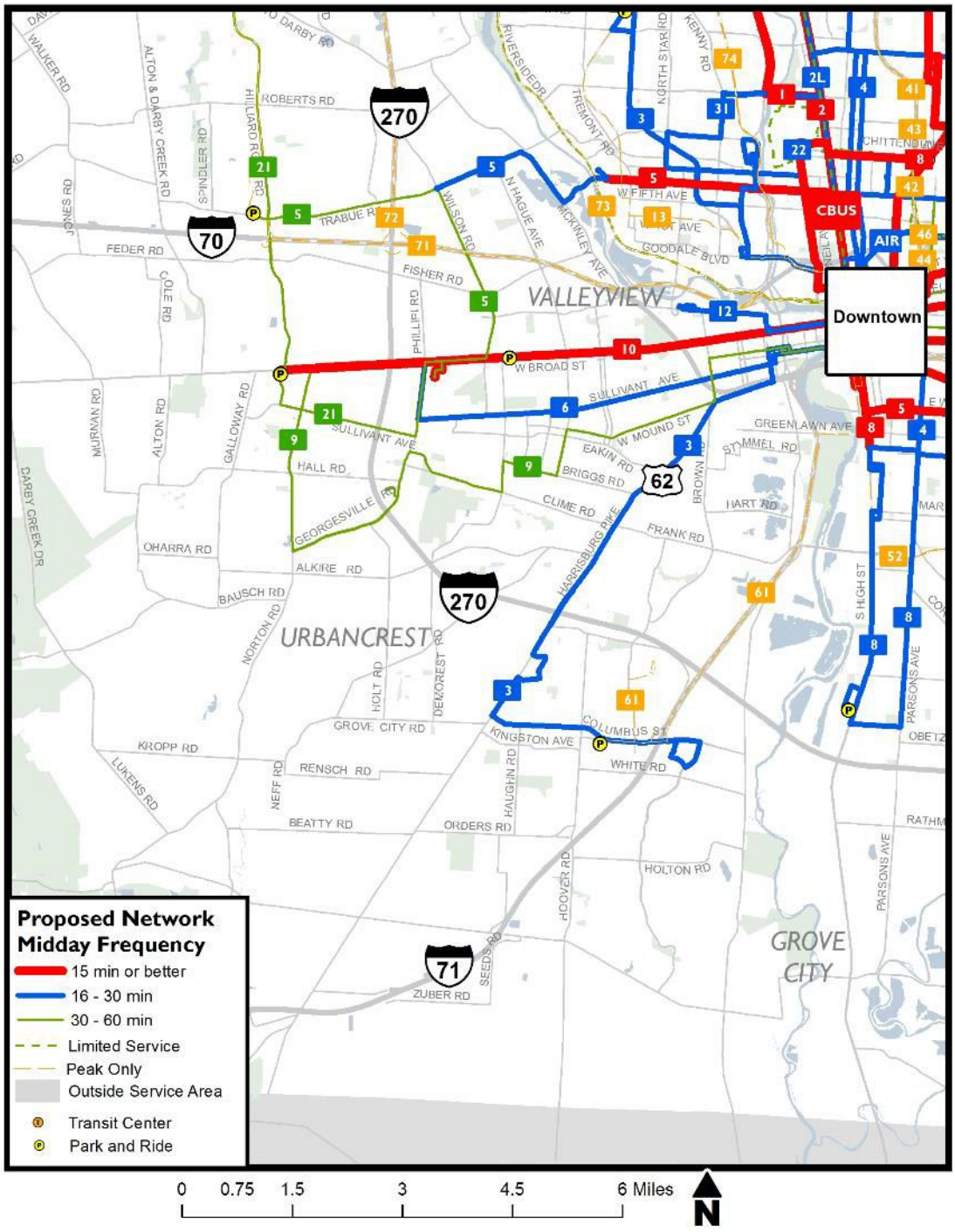

Figure 4-21 TSR Southwest Quadrant

4.4.2. TSR Express Network

The express, peak hour only bus service is collectively referred to as the express network. On May 1, 2017, the TSR express network will change substantially. During the development of the TSR report, the original guiding document, the consultant team, and COTA evaluated the express network. Based on consultant recommendations, the proposed TSR fixed-route network consolidates many express lines based off of two major criteria:

- Low-performing express services are proposed to be discontinued and service hours reinvested elsewhere.
- Lines that served the same area were consolidated together.

The pre-TSR network operated 26 express lines and 9 reverse commute lines (service that operates from Downtown to suburban locations in the a.m. and the opposite in the p.m.). The TSR network will provide 14 express lines and 10 reverse commute lines. However the total number of express trips provided in the TSR network is only one less than the pre-TSR network, a total of 74 commute trips compared to 75.

The number of express trips will increase on many of the TSR express lines. Typically express lines with more trips are much more productive than express lines with fewer trips. The following example provides insight into why and how changes to the express network were developed, in the pre-TSR network, in September 2014, the subsidy per passenger, or how much one trip costs COTA, on line 58 Dublin was $2.72 per passenger. This was only slightly higher than the average for all local lines, which is $2.31 per passenger, excluding peak only local lines, and well below the average subsidy for all express lines, which was $4.71 per passenger. Line 58 Dublin operated six a.m. and five p.m. trips.

Figures 4-22 and 4-23 below show the pre-TSR and TSR express networks.

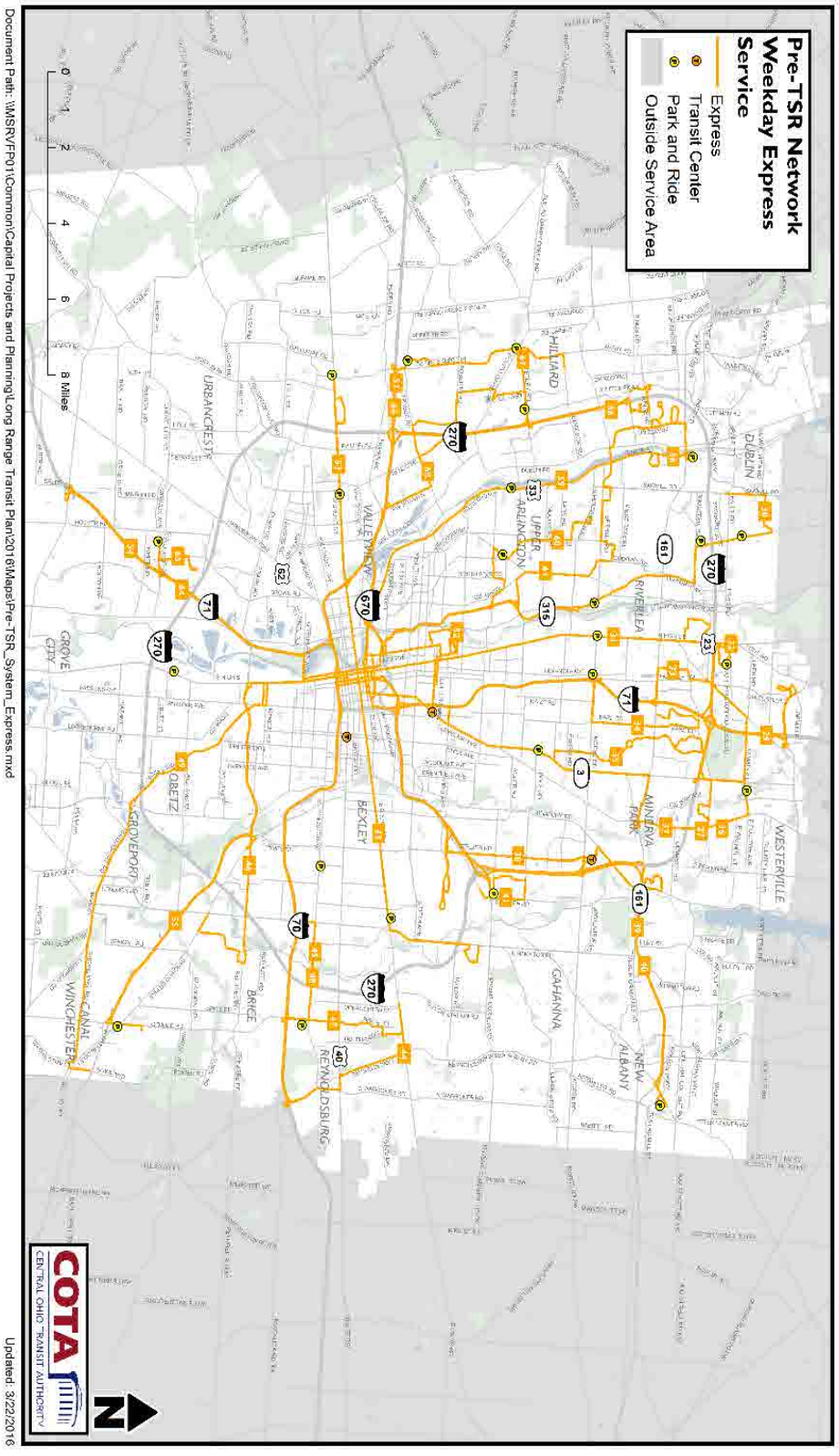

Figure 4-22 Pre-TSR Express Network

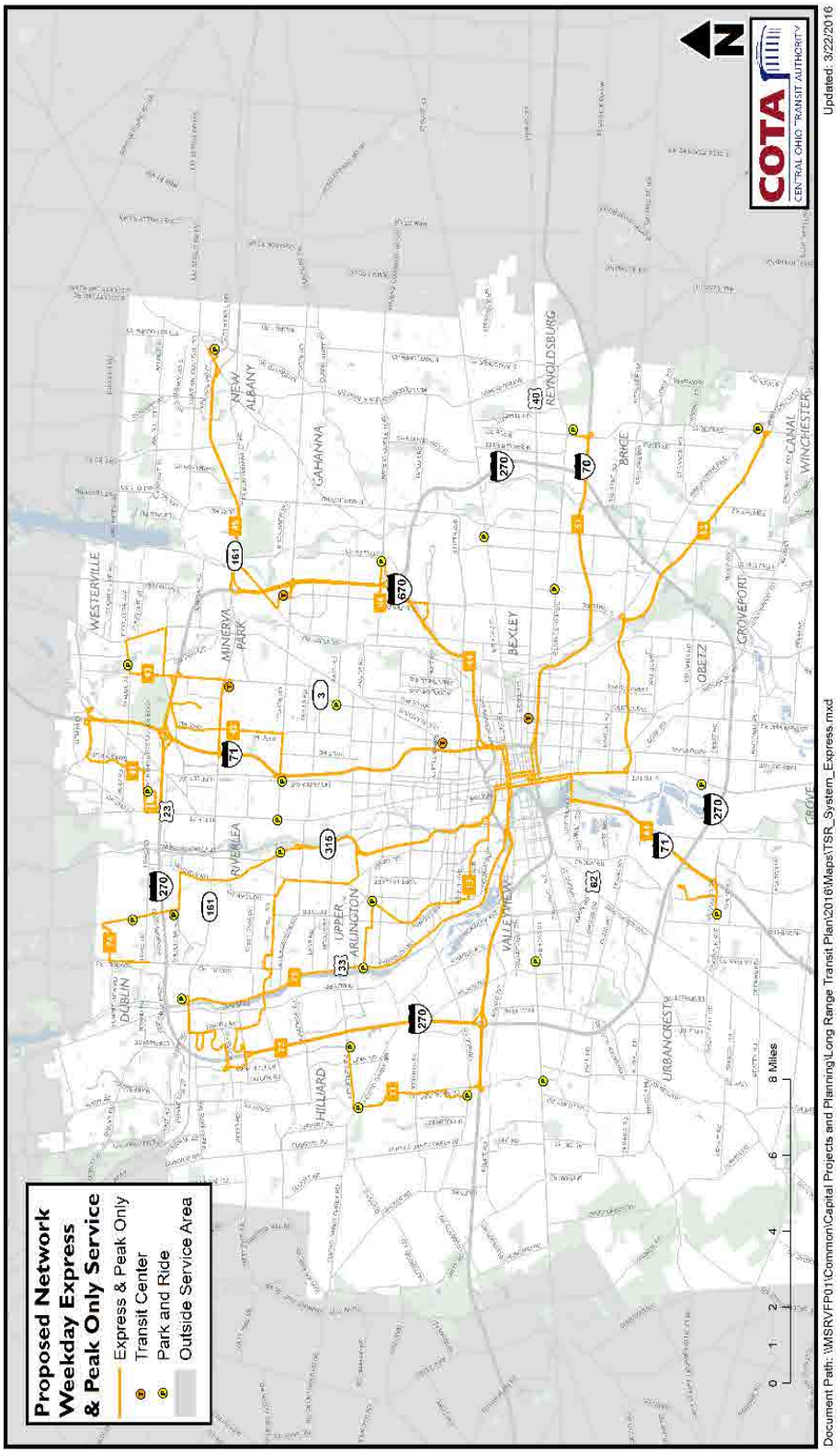

Figure 4-23 TSR Express Network

4.4.3. TSR Frequency and Spans

The TSR fundamentally changes how COTA provides service throughout the day. The network is designed to match weekend frequencies with that of midday frequencies during the weekday. This provides a much greater level of service on the weekends than in the pre-TSR network (Sept. 2014).

4.5. COTA NextGen

As the primary provider of public transit services in central Ohio, COTA is undertaking a long-range planning effort - NextGen - to identify public transportation needs and opportunities through 2050.

Central Ohio is growing and changing as the region adds new residents and the preferences and priorities of current residents change. While other efforts have helped evaluate these trends and translate them into plans for community growth and development, NextGen will comprehensively consider how these trends will shape opportunities and demand for public transportation. Visit www.cota.com/nextgen

NextGen goals:

- Lead the community in envisioning what our public transportation system needs to accomplish in the coming decades to ensure central Ohioans have access to jobs, housing, education, and services.
- Prepare central Ohio for future growth by identifying transit investments that integrate with regional plans and goals. Critical regional goals include maintaining regional competitiveness, minimizing sprawl, and responding to demographic preferences.
- Create transit investment options to support local and regional efforts to develop transit-oriented and multi-modal communities.
- Identify conventional and creative revenue options that offer potential to support the recommended plan and ensure the plan can be implemented.

To ensure a comprehensive approach, NextGen incorporates public input, technical analysis and local planning efforts. The below graphic simply illustrates COTA's desired process.

The project is divided into three phases, Phase 1 - Vision, Needs and Opportunities, Phase 2- Define and Evaluate Alternatives and Phase 3 - Recommendations and Implementation Plan. Currently the project is in Phase 2 with an estimated completion date of the second quarter of 2017.

The outcome of COTA NextGen will be a document, NextGen Vision 2050, that contains a list of high-capacity projects as well as improvements to the fixed-route bus network and other potential transportation services. Each project will have detailed descriptions, estimated costs, a conceptual operating plan, a recommended timeline for implementation, either by 2025, 2040 or 2050, along with various ways to fund the service.

The NextGen process is designed to be developed with extensive input from members of the community, including stakeholders and elected officials, the public, current riders and partners in other municipalities and government entities. Chapter 3 has more information about the NextGen public involvement process.

Coordination with the City of Columbus's Connect ColumbUS effort and MORPC's 2040 Metropolitan Transportation Plan is vital to the success of NextGen. Members for all three projects meet at various points throughout each project to coordinate the use of data, development of projects and discuss how to integrate future plans.

Below, each phase is outlined, including a description of what has been completed

4.5.1. Phase 1 – Vision, Needs and Opportunities

A fundamental objective of the NextGen plan is to identify transit needs and projects that will support growth and development in the region. A combination of technical analysis and community input were used to identify potential projects to move forward into Phase 2 for evaluation and further review. The technical analysis examined existing transit ridership, historical and forecasted growth in population, employment and congestion, socio-economic and demographic trends and local planning efforts.

The Phase 1 process was broken down as follows:

1. Overview of existing conditions and market analysis– Examined projected growth and changes in the region. Data was provided by MORPC and analyzed at each planning horizon, 2025, 2040 and 2050.
2. Review of local and regional planning efforts – Assessment of recent planning efforts from municipalities around the region.
3. Public outreach and incorporation into analysis – Collect feedback on existing conditions and vision of transit in the future. Asked the vital question of "Where should public transit investment go and what should it connect?"

From this effort a list of values to guide the NextGen were developed and draft alignments of potential corridors were created. The values found below in Figure 4-24 were developed to evaluate potential high-capacity transit corridors in Phase 2.

Figure 4-24 NextGen Values

Table 4-3 NextGen Phase 1 Public Involvement Survey Responses

#1	8 N High Street	29% (34)
#2 (T)	9 Columbus-Dublin	25% (29)
#2 (T)	22 Downtown-Polaris	25% (29)
#2 (T)	24 Downtown-Airport-Easton	25% (29)
#5	17 Polaris-Easton	24% (28)

From the Phase 1 effort, 26 potential corridors were identified to move forward into Phase 2 to be evaluated based on the above values. Figure 4-26 displays these corridors and along with draft alignments.

4.5.2. Phase 2 – Define and Evaluate Alternatives

Tier 2 is broken into two main steps, the first is the Tier 1 screening of the original 26 high capacity transit corridors and second is Tier 2 screening of corridors that score well in Tier 1. Public involvement during this phase was focused on the Tier 1 screening process and asking the public and stakeholders to prioritize transit investments, ranking the top high capacity corridors and non-high capacity transit improvements.

The top five corridors to come out of the public involvement are found in Table 4-3. Along with high capacity corridors, improvements to the fixed-route bus network and other transportation options were ranked. Figure 4-25 shows which improvements rose to the top.

Along with the public comments the 26 corridors were evaluated based on criteria developed from the five values above. Those that were considered feasible moved onto Tier 2.

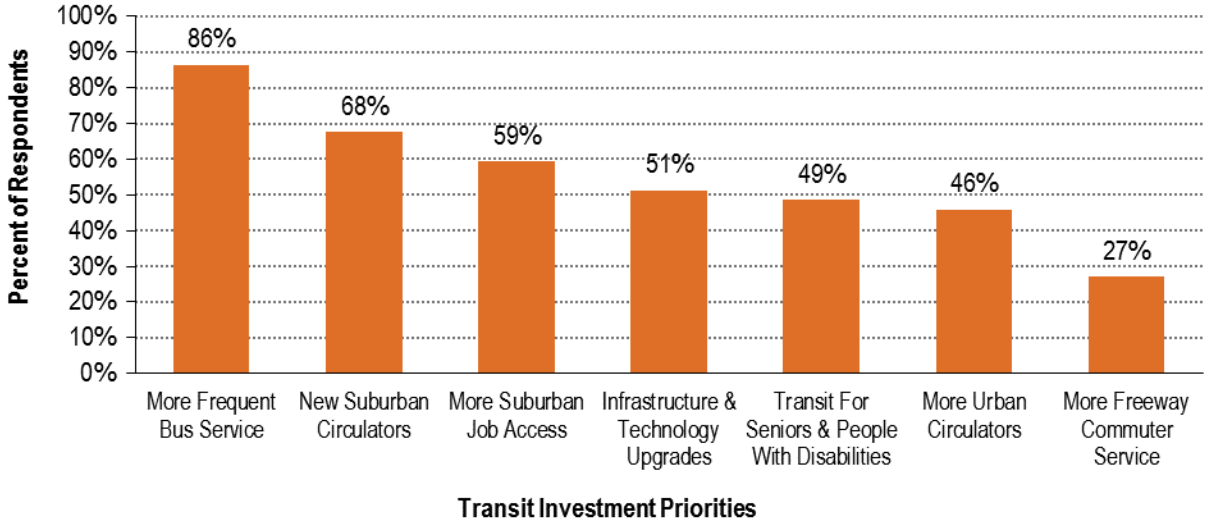

Figure 4-25 NextGen Non-High Capacity Corridor Transit Investment Results

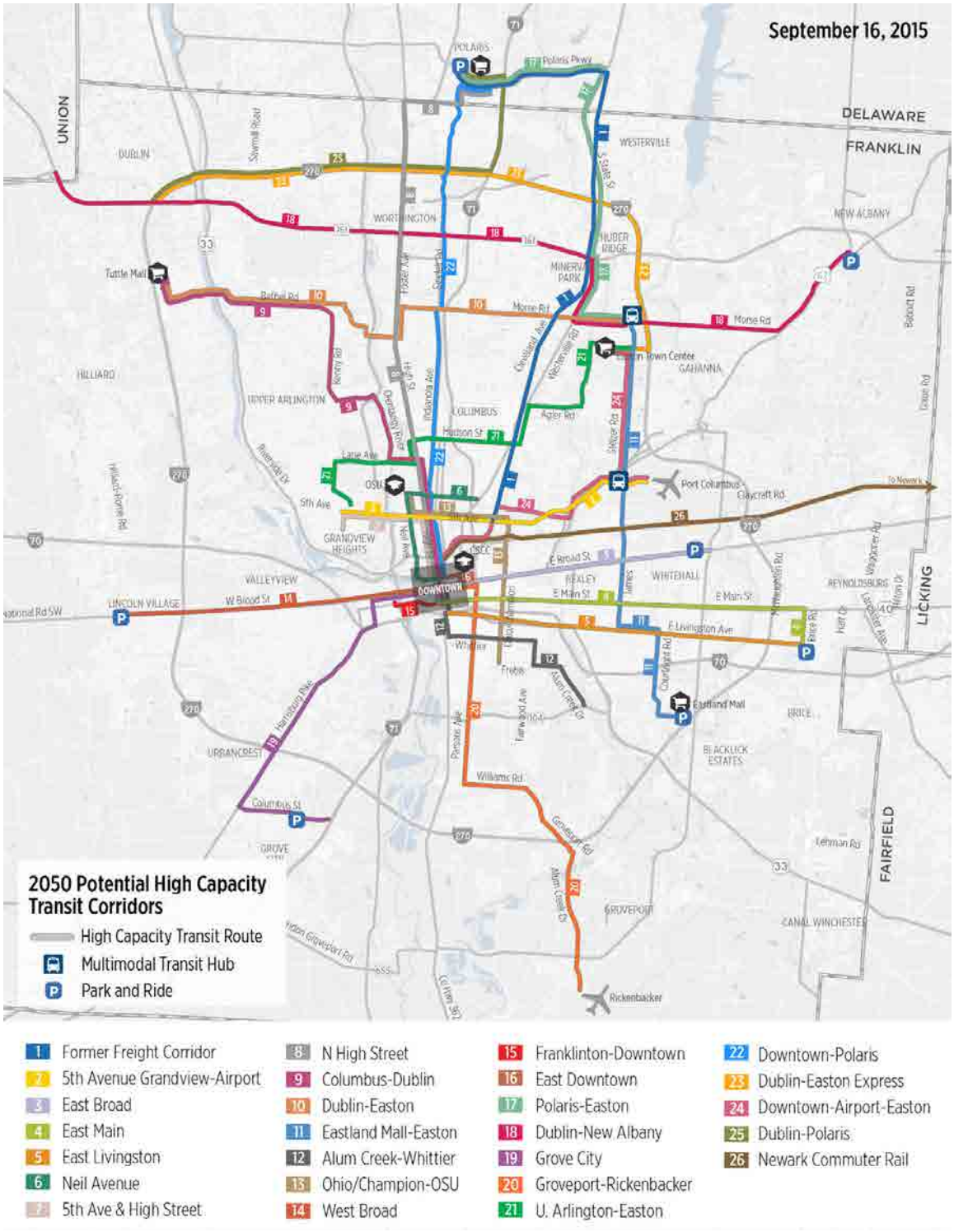

Figure 4-26 NextGen Phase 2 Potential High Capacity Transit Corridors

Tier 2 is currently underway and is evaluating 13 transit corridors; however corridor 26 Newark Commuter Rail is being evaluated differently due to the analysis criteria not accounting for long, regional corridors (Figure 4-27). The Tier 2 evaluation criteria, found in Table 4-4, was carefully designed to incorporate select evaluation criteria that is also used in the Federal Transit Administration (FTA) New Starts program. See Section 4-10 for more information about New Starts and Federal Funding. This was done to better position projects that score well in Tier 2 to potentially move forward into the first step of entering the FTA New Starts or Small Starts process.

Tier 2 includes estimation of capital and operating costs, ridership projections, identifying development opportunities, congestion mitigation and affordable housing, along with a host of other measurements. The intent is to score each corridor and evaluate the feasibility of the projects moving forward. Projects that score well will move into Phase 3 to be further refined and developed.

As part of Phase 2, non-high capacity transit improvements will be developed after the Tier 2 screening is completed. Tier 2 screening is expected to be completed by the end of 2016.

Table 4-4 NextGen Tier 2 Measurements

Value	Tier 2: Measurement
Make Better Connections *Extend transit's reach further into the communities it already serves*	Estimated average service speed
	Number of intersecting TSR high frequency routes
	Intersection density within ½ mile
Invest in Underserved Communities *Direct investment to specific corridors and neighborhoods*	Ratio of zero vehicle households to all households located within ½ mile of corridor
	Ratio of minority residents to all residents living within ½ mile of corridor
	Ratio of legally binding affordability restricted housing units to all housing units within ½ mile of corridor
Build on Success *Make existing transit service more compelling*	Projected transit ridership
	Estimated operating cost per projected passenger
	Estimated capital cost per projected passenger
Coordinate with Growth *Encourage inward growth and serve existing neighborhoods. Strengthen fast growing areas.*	Qualitative assessment of civil/community/cultural trip generators
	Population and jobs in 2040 within ½ mile (total and per corridor mile)
	Number of identified and potential redevelopment nodes intersected by corridor
Sustainability *Protect the environment and reduce greenhouse gases*	Vehicle Miles Traveled reduction (as a function of passenger miles)
	Corridor volume to capacity ratio for 2040

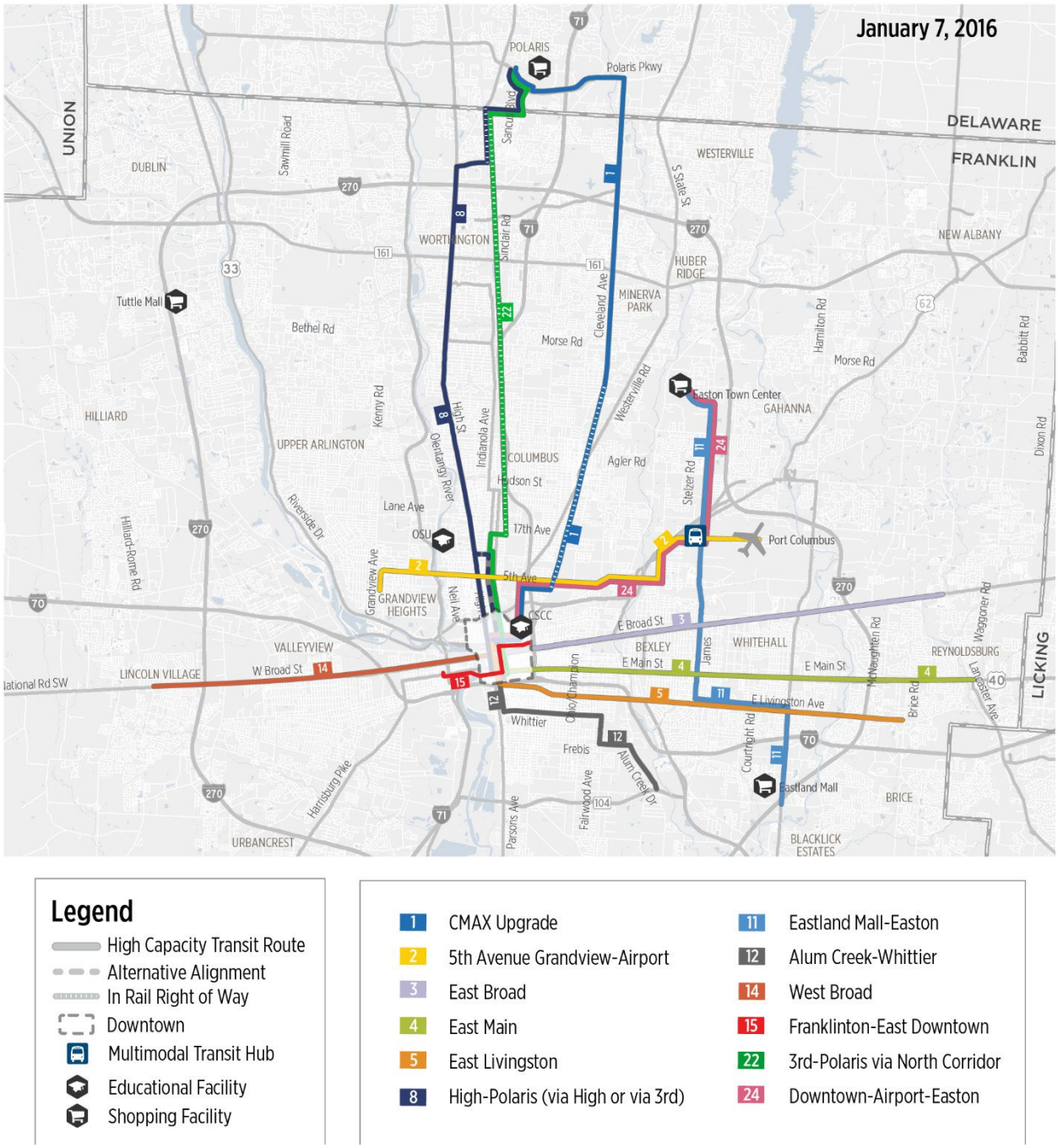

Figure 4-27 NextGen Tier 2 High Capacity Transit Corridors

4.5.3. Phase 3 – Recommendations and Implementation Plan

Phase 3 consists of determining when the corridors that move from Phase 2 and non-high capacity transit improvements could potentially be implemented. The consultant team will recommend what is possible to be implemented by 2025, 2040 and 2050. Additionally, creative funding opportunities will be recommended beyond that of COTA's sales tax or typical federal funding mechanisms.

The final report will be a list of high capacity and non-high capacity projects that will be prepared to move forward towards implementation. The intent is not to implement every project and improvement but allow COTA and the region to make the best decisions possible as to what are the most feasible options to undertake.

The final report is planned to be released in the second quarter of 2017.

To learn more about COTA NextGen visit www.cota.com/nextgen.

4.6. Mobility Services

The 2016 – 2040 LRTP continues COTA's commitment to provide efficient and expanding mobility options, particularly to diverse markets such as the elderly, disabled, and low-income individuals who need transportation to work, job training, and childcare. Directly, and in collaboration with others, COTA will continue to provide a full range of mobility options throughout this 25-year planning cycle.

Figure 4-28 COTA's Mainstream Vehicle

The implementation of the TSR will change the service area of ADA service, which is ¾ mi. from a bus stop when that service is operating. COTA estimates that the service area for ADA service will grow during the middle of the day, evenings and weekends.

In addition to the federal Americans with Disabilities Act (ADA), which requires comparable origin-to-destination mobility service be provided to persons who cannot use the fixed-route system due to a disability, COTA understands there are growing populations who have few transportation options. As fixed-route service changes and expands in conjunction with implementation of the Transit System Redesign bus network, people with disabilities who use COTA will have new and greater mobility options. Similar improved options occur when changes such as such as extended hours of operation or an expanded service area are implemented.

Figure 4-29 Wheel Chair Lift

COTA's mobility services program, named Mainstream, has expanded over the past decade to complement COTA's fixed-route bus service expansion. Since the previous 2012 LRTP Mainstream annual ridership has grown 5.5 percent. During 2015, Mainstream provided over 247,052 trips, and from 2013-2015, ADA mobility services ridership grew by an average of 6.5% per year during that span. Due to the increase in mobility ridership and the high cost per-trip of paratransit relative fixed route service, COTA continues to face the challenge of identifying and evaluating cost effective measures to provide transportation solutions for the growing population of older adults and persons with disabilities.

One component in providing alternative method to traditional mobility service delivery is COTA's Non-ADA service. Non-ADA service is offered to customers who reside or travel outside of the ¾ mile fixed-route service, but within COTA's taxing district. This service is provided upon space availability and is not a required service mandated by the ADA. The LRTP provides a substantial increase in COTA's Mainstream service that addresses existing and future needs of the mobility services community:

- To reflect historical trends and the anticipated growth in the region's elderly and disabled population, service funding will increase a total of 16 percent by 2019 when fixed-route growth will reach maximum service levels;
- Mainstream will emerge as a technologically advanced system so that customers experience faster and more reliable information to and from their destinations;
- Mainstream will continue to partner with community organizations to maximize available funding and resources that can strengthen the efficiency of mobility services; and
- An ongoing service evaluation system will continue to review existing operations, and new service delivery methods implemented to improve both service and effectiveness.

4.6.1. Mobility Coordination

The Mobility Advisory Board will strive to be the Nation's premier community Advisory Board, utilizing diverse skills and organizational resources to assist COTA with the development of transportation solutions that meets the needs of underserved, low-income, disabled and senior citizen populations. The Mobility Advisory Board will continue to serve as a valuable complement to COTA's Management Team to promote targeted strategies with clear and effective value propositions in order to assist COTA in delivering effective and efficient service.

The Mobility Advisory Board is defined as:

- A group of strategic partners gathered to offer perspectives concerning transportation products, programs, services and industry issues.
- Unlike a user group, the Mobility Advisory Board is intended to build relationships with customers or segments that will most directly impact the future of the organization regarding mobility service initiatives.
- A group who provides insight into the needs of the customers. A group who understands that COTA customers' success depends upon the organization's products, programs or service delivery.
- A group who provides feedback, helps to assess, guide and define outcomes and evaluate results.
- A group of outside experts who represent a variety of business disciplines who act as a sounding board for COTA's mobility strategic plan initiatives.
- A group who influences the industry and is willing to rally and assemble colleagues to discuss critical issues facing the transportation industry, which includes supporting or advocating for COTA initiatives.
- A group who brings an outside perspective and understands the needs for transportation in the community. The Mobility Advisory Board's input may help define organizational mobility services standards.

4.6.2. Travel Training

Travel Training is a program designed for older adults and persons with disabilities, although is open to anyone. The program provides the assistance necessary for each person to successfully learn how to use COTA's fixed-route bus service. This customized instruction enables the customer to broaden their involvement and social interaction in the community. A significant improvement in self-esteem is frequently one of the many benefits.

Travel Training is customized to meet the individual needs. The various levels and formats of the program are designed to maximize each person's ability. The consumer's training is coordinated with their daily activities. One-on-One training takes place on a daily basis, during all types of weather, in a real environment using resources as they exist in the community. The customer learns to cope with variables of their environment by walking to and from the bus, crossing intersections, and riding public transportation.

Travel Training is provided at no cost to the customer and participation in the program is strictly voluntary. Personal Care Attendants may also attend the training sessions at no cost. COTA believes that mobility training should be available to anyone who needs assistance with learning to ride public transportation.

For example, older adults who are new to the community or have never had a prior need for public transportation are often in need of an introduction to public transportation. Persons with physical disabilities may need training on the safe and proper use of accessible buses, wheelchair securement devices and/or other specialized equipment. Persons with mental disabilities are usually limited in their transportation options and often rely on the bus as a main source of transportation. Persons with developmental disabilities may also be successfully trained to ride the fixed-route bus system independently.

4.6.2.1. How the Program Works

The goals of the Travel Training program are to increase the customers' capabilities and promote self-sufficiency while facilitating the most suitable and efficient transportation service for each individual. We recognize the fact that riding COTA independently opens more doors of opportunity for individuals who would have otherwise stayed home or had to rely on others for their community outings.

It is important to remember that all individuals learn differently, and travel training attempts to teach according to each individual's strength rather than weakness or disability. With this in mind, travel training is flexible and creative when choosing the most appropriate method of training and mold the specific activities chosen to fit the need of the individual. All training is designed to be easily modified to successfully train anyone who is in need of travel training.

Travel Training is focused on the following key elements:

- Safety as the foremost concern;
- Sensitivity to different learning needs, styles and patterns;
- Involving the trainee in planning their own travel goals;
- Structuring lesson sequence so that each succeeding task is built upon previous successes;
- Training steps short and simple;
- Confirming the trainee has understood the explanation by asking for restatement or demonstration;
- Take cues from the trainee as to the speed and conditions of training;
- Reinforce skills taught and provide positive encouragement;
- Turn potential negative bus travel experience into a possible travel training experience;

- Use psychological motivators (i.e. freedom, independence, money) to encourage the trainee to learn to use the fixed route;
- Foster independence, and remain an advocate; and
- Make the learning process fun.

The end goal of the Travel Training program is to maximize each individual's ability to travel safely and independently on COTA's fixed-route bus service.

4.6.3. System Technology

PassWeb also known as "web booking", is a product that allows customers to securely log in to a website and manage their trips. This includes booking new trips, reviewing currently-booked trips, and cancelling trips. Web booking reduces reservations call volume, is available after-hours, and provides an alternative to relay calls for deaf customers who use screen-reader software.

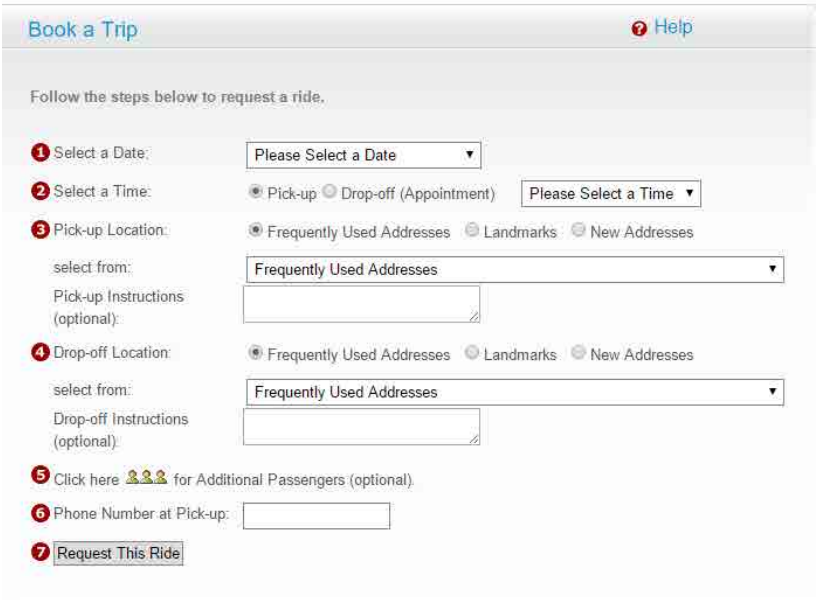

Figure 4-30 PassWeb Interface

Interactive Voice Response (IVR) is a generic name for automated phone tree technologies. The IVR product interfaces directly with system data, allowing customers to do basic tasks like reviewing or canceling currently-booked trips without speaking to a reservationist or dispatcher, and as a result reduces agent call volumes.

IVR also has an outbound automatic call function (also known as "robocalling"). The automatic call function is used to provide customers who opt-in the option of receiving nightly trip reminder calls and/or vehicle arrival calls. The latter detects when a driver arrives at a customer's pickup location and generates an automatic call to the customer letting them know their vehicle is outside. Outbound calls can reduce dispatcher call volume and potentially reduce pickup dwell time and no-shows.

Real-time tracking technologies allow customers to use their smartphones or computer to receive estimated arrival time information for their pickups. This can either be a simple texting service, an IVR function, or a more elaborate app with map display. Providing

customers with automatic arrival estimates reduces dispatch call volume and slightly improves customer readiness.

4.7. Intelligent Transportation Systems

Technology can provide a way to improve the transit riding experience, from providing real-time information to counting passengers boarding buses to improving safety. Intelligent Transportation Systems (ITS) provides technological enhancements to providing and using COTA's bus service. ITS enables people to make smarter travel choices; continued deployment of ITS strategies is an important component of COTA's long-range plan.

Figure 4-31 Real-Time Vehicle Location

ITS encompasses a broad range of systems and technologies creating new opportunities for transportation professionals to respond proactively to increasing demand for effective transportation services, and to convey information to the traveling public. This can include global positioning technology that provides real-time schedule information to riders, electronic fare payment for greater customer convenience, and devices that integrate with traffic signal systems allowing transit vehicles priority over other vehicles. An example may include use of COTA's website to answer the question, "When will my bus arrive?".

Satellites are used to determine the location of the bus, sending information to dispatch and, ultimately, could feed into real-time bus location displays, such as a digital map.

COTA's ITS plan is focused to improve passenger convenience, vehicle operations, and mechanical systems. This includes advances in vehicle dispatching, tracking, and telecommunications that translate into real transit-user benefits: safer, more reliable, more responsive and more accessible service. Further, COTA's ITS enhancements are designed to:

- Make traveling by bus easier for all passengers, including those with hearing and vision disabilities;
- Improving traffic flow, which in turn will improve on-time performance;
- Provide timely and comprehensive transit information such as real-time "next bus" arrival information on variable message signs located at park and rides, transit centers and selected shelters;
- Make schedules and a host of itinerary-planning features available through COTA's web site and web-equipped devices such as smart phones, and tablet PC's ; and

- Provide real-time transit performance and customer data via automated reports and dashboards for COTA management decision making.

Specifically, components of COTA's ITS plan include:

- Automatic vehicle location;
- Onboard automated stop announcements;
- Traveler information systems;
- Automatic passenger counters;
- Fleet maintenance technologies;
- Transit signal priority; and
- Fare collection enhancements.

4.7.1. Automatic Vehicle Location

The heart of COTA's ITS program is its CAD/AVL system (Computer Aided Dispatch/Automatic Vehicle Location). This system provides COTA dispatchers and supervisors with the capability of real-time location tracking of each bus. Global Positioning System (GPS) devices placed on each fixed-route, demand-response, supervisor and maintenance vehicle allow dispatchers to monitor a particular vehicle's location. Additionally, the system can automatically calculate important operational metrics for fixed-route vehicles, such as whether the bus is running on-time, early, or late compared to scheduled times. The system, which is integrated with Franklin County's 800 MHz radio system, sends and receives fleet data over the same radio frequencies used by dispatchers to communicate with COTA operators. COTA's future plans include moving the data communications to 4G cellular technology. The addition of 4G technology on the vehicles will enable COTA to provide customer Wi-Fi capabilities a popular transit amenity.

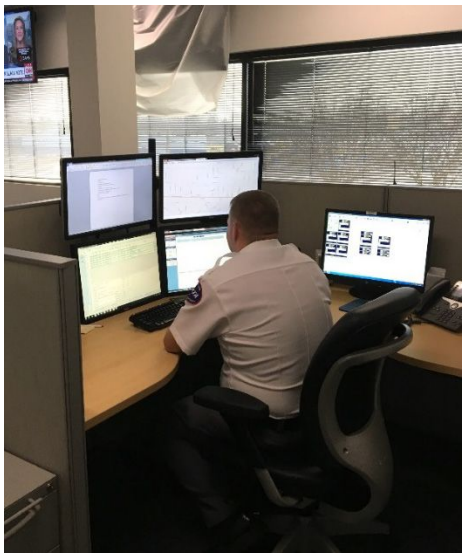

Figure 4-32 Dispatch watching AVL

In addition to tracking a vehicle's location in real time, the CAD/AVL system also archives information for future performance analysis, and to assist in incident/dispute resolutions. This archive function provides the ability to "playback" events on a computer, allowing staff to review and remedy where buses encountered delays or other operational issues along a line. Further, data retrieval allows

for a wide range of incidents and disputes to be resolved quickly and easily; eliminating the need to spend numerous hours of limited staff time resolving issues. Additional analysis includes the ability to determine if the current route structure is providing the greatest efficiencies, and if recent service changes are having the intended effect on line efficiency and customer convenience.

COTA's CAD/AVL technology forms the basis for all other ITS components that are built upon and integrated with this system. The system, both software and hardware, have been upgraded to newer technology in order to maintain compatibility with other newer ITS technologies, and to allow COTA to move forward with additional ITS initiatives which include advanced, modern components.

COTA will complete the transition to the new CAD/AVL system in 2016; a system from Trapeze ITS, a division of Trapeze Group, a leading global provider of solutions for public urban passenger transportation. COTA will continue to install this newer technology that also incorporates and completes several planned ITS components:

- Electronic manifest for paratransit operations;
- Driver training and on-board vehicle component and performance monitoring;
- Transit intelligence system named Trapeze ViewPoint. ViewPoint is a reporting, monitoring and analysis solution which will allow staff to access, analyze and distribute operational data, and comes equipped with over 200 standard reports and dashboards;
- Wf-fi enabled buses; and
- Paratransit demand response systems (IVR and Internet based reservation communication and automated notification).

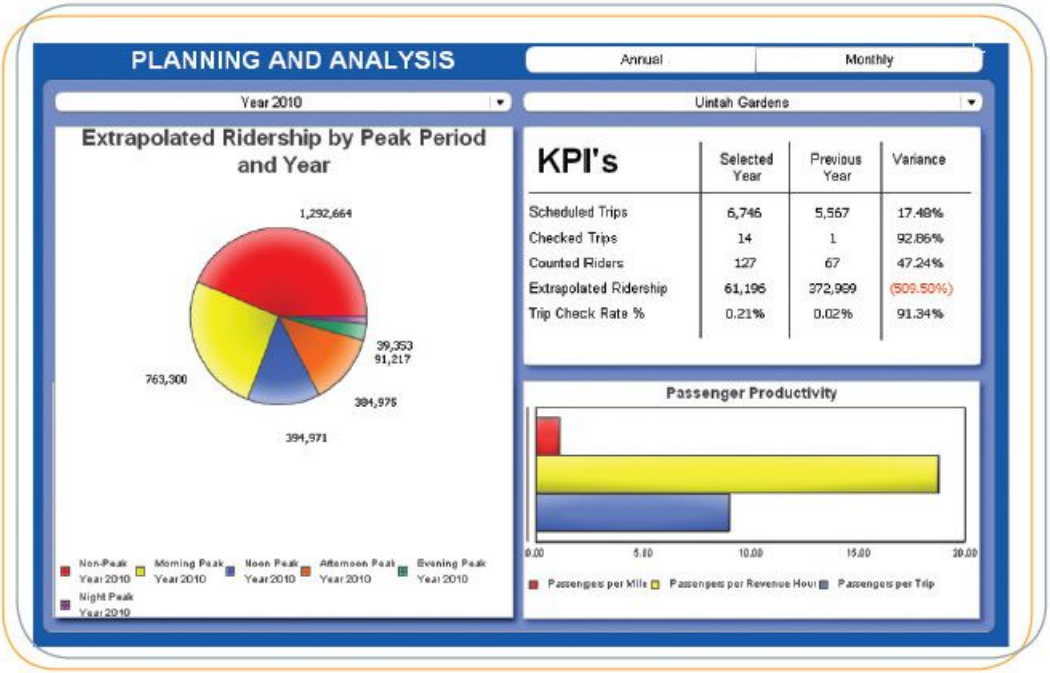

Figure 4-33 Trapeze ViewPoint Dashboard

4.7.2. On-Board Automated Stop Announcements

Enhancing a rider's experience on a COTA vehicle is a major objective of the ITS program. All buses are equipped with an Automated Voice Annunciator (AVA) system to make travel easier for all passengers, especially those with hearing and vision disabilities, by announcing upcoming stops, the rules of riding public transit, and other important updates from COTA.

As a bus approaches a stop, the AVA system automatically announces the next stop, as well as displaying it on a variable message sign inside the bus. The announcements are made using the bus' existing public address system that has speakers inside and outside the bus. The variable message signs are ceiling-mounted at the front of each bus inside the vehicle.

Utilizing a CAD/AVL system, which tracks locations of all buses, COTA's fixed-route-fleet AVA system provides benefits, not only for to passengers with hearing and vision disabilities, but also to other riders who may not be familiar with the stops of a particular line. These benefits would also apply to individuals who, due to poor or limited visibility caused by night or inclement weather conditions, have difficulty identifying their bus stop location.

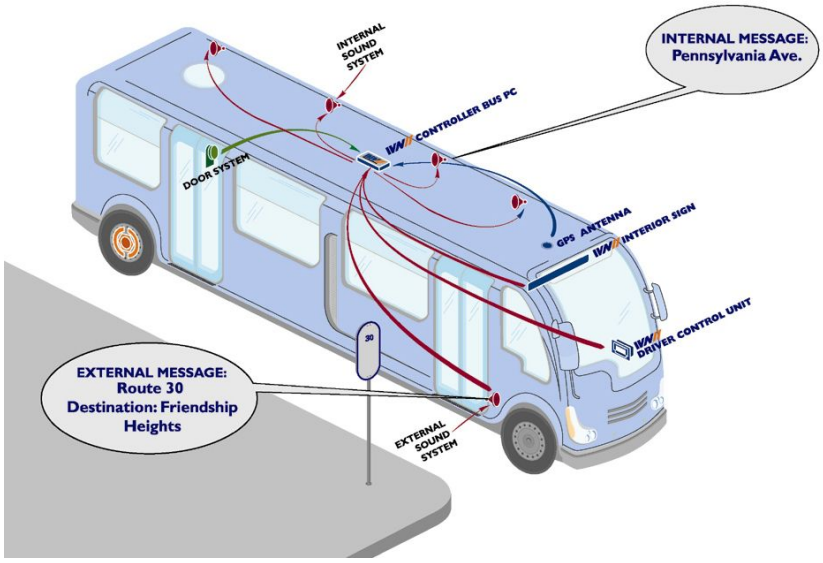

Figure 4-34 On-Board Automated Stop Announcements

4.7.3. Traveler Information Systems

This ITS application makes available a web-based itinerary planner through which customers can access interactive screens on the COTA web site to input origin/destination and arrival/departure information. A trip itinerary can be quickly generated, as well as providing the ability to look-up popular destinations and print itineraries, including maps, transfers, stop locations, fares, and written travel instructions. In 2016, travel information initiatives are planned to feature "next bus" information throughout the service area. Since this information can be displayed on any Internet-ready device, real-time data could be sent to devices including flat panel displays at bus shelters and transit centers.

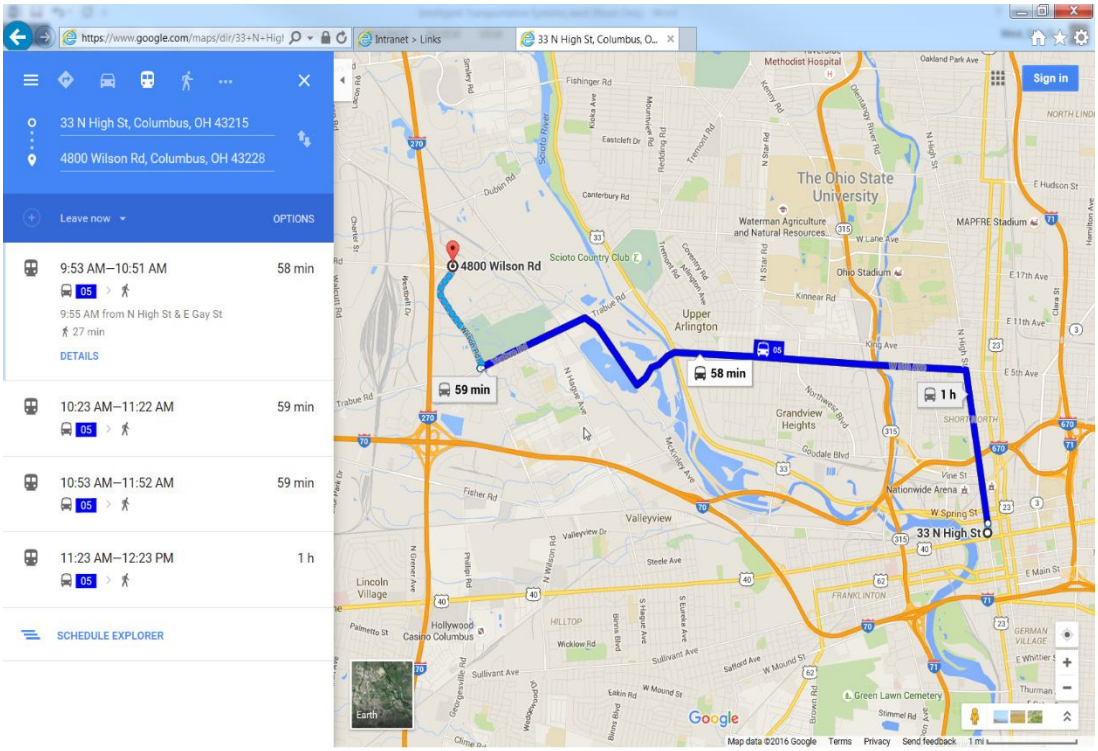

Figure 4-35 Google Trip Planner

4.7.4. Automatic Passenger Counters

ITS applications will continue to significantly enhance COTA's ability to ensure that public transit serves as many customers as possible. Automatic Passenger Counters (APC) provide COTA with the ability to count alightings and boardings remotely. Electronic sensors near the front and rear doors of selected COTA fixed-route vehicles count passengers, while also recording at which bus stop this activity takes place. All future bus purchases will include APC units. Utilizing APC data, COTA planners can make timely decisions affecting line alignments and improved vehicle on-time performance, all with a goal to increase ridership, improve system efficiency and reliability and ultimately, customer satisfaction levels.

Figure 4-36 APC Counters

4.7.5. Fleet Maintenance

Included with the Trapeze CAD/AVL upgrade is the ability to provide enhanced maintenance capabilities to the fleet through vehicle component monitoring (VCM). VCM, or preventive maintenance software, enables automatic monitoring of transit vehicle engine components and provides warnings to COTA's maintenance personnel if failures are about to occur. This element is planned to be integrated with COTA's existing maintenance software that manages the maintenance records of transit vehicles.

To monitor a vehicle, an on-board microcomputer will be connected to various input devices: engine sensors, GPS receiver, ramp deployment signals, and odometer sensors, which can record characteristics such as acceleration/deceleration, speed/RPM, engine run time, and cumulative distance traveled. When the vehicle returns to the garage, the data can be downloaded via the wireless local area network to the maintenance system in order to help maintenance personnel conduct proactive fleet maintenance in a more timely and efficient manner, reducing overall maintenance costs.

4.7.6. Traffic Signal Priority

Transit signal priority (TSP) is the process of altering traffic signal timing at intersections to give a priority to transit operations.

As part of the CMAX Bus Rapid Transit (BRT) on Cleveland Avenue project, COTA will be implementing TSP. TSP allows transit vehicles to communicate with traffic signals to allow transit vehicles priority through intersections. If behind schedule, the CMAX will be able to request that a green signal be extended or a red signal be shortened to improve the on-time performance of the vehicle. For further information about the CMAX see Section 4.8.

Another potential area of ITS integration includes the ability to interface with the city of Columbus' traffic signal system in other corridors to provide more lines with TSP.

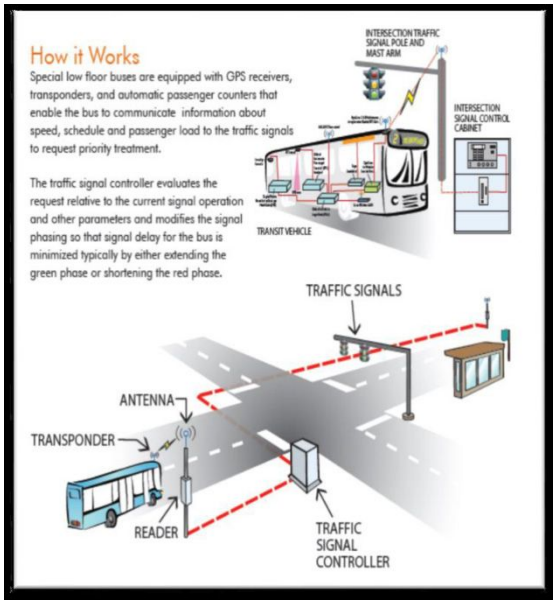

Figure 4-37 Traffic Signal Priority

The signal system in the Columbus region had become outdated and in need of constant repair. In response, the city implemented a multiyear, multiphased project to create a modern, open-architecture, computerized traffic signal system and communications network. As part of each corridor's signal system upgrades, the city is installing extra fiber

conduits which will allow COTA to install the necessary technology to help implement future TSP. Phase C of the City's project has been completed, which included much of the Cleveland Avenue corridor. The CMAX project includes additional funding to help complete the infrastructure within the corridor to allow use of TSP as part of the BRT project. COTA, in coordination with the City of Columbus and MORPC, will investigate additional opportunities to provide transit signal priority to COTA buses within major travel corridors as the region's signal system continues to be upgraded.

COTA will continuously pursue diverse ITS technologies to increase mobility and enhance transit operations by making travel safer, more efficient, cost effective, and convenient.

4.7.7. Fare Collection Enhancements

COTA recognizes the importance of providing alternatives methods of conveniently purchasing transit passes with ease. An alternative fare collection system is currently being investigated by COTA, including smart cards and smartphone applications.

Fare collection systems are an integral part of ITS systems, integrating between other ITS systems onboard of vehicles. The integration enables programming of the farebox for accurate ridership statistics and details about fare payment methods including boarding location information which can assist in decision making when planning service improvements and changes.

COTA's current fareboxes were installed in 1996 and upgraded in 2011. The 2011 upgrade increased the memory and processing speed of the equipment allowing COTA to expand the OSU student program to include validation of the ID's and capturing transaction details for all passengers.

In 2015, COTA began an effort to study available and emerging fare collection technologies. The options being investigated include smartcards, mobile ticketing and upgrades to the fareboxes. These new technologies provide customer's a convenient way to purchase passes via "self-service" features including uploading and activation of tickets and passes via a website and/or directly onto handheld devices such as smartphones or tablets.

A decision on which technologies to pursue is expected mid to late 2016. Depending upon the fare collection system selected, implementation will begin in 2017 or 2018COTA recognizes the importance of providing alternatives methods of conveniently purchasing transit passes with ease. An alternative fare collection system is currently being investigated by COTA, including smart cards and smartphone applications.

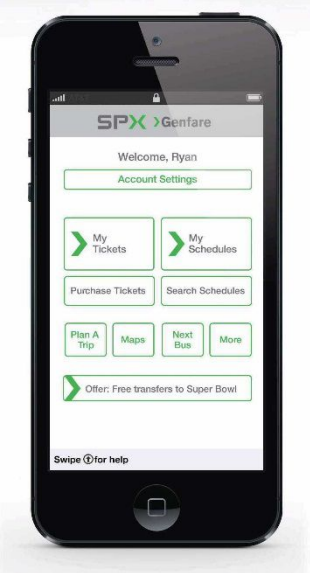

Figure 4-38 Mobile Fare Payment

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4.8. CMAX

Connecting downtown Columbus and Ohio Health's Westerville Medical Campus in the City of Westerville, COTA is in the process of implementing the CMAX Cleveland Avenue bus rapid transit (BRT) line. Following a period of station, transit center, and park and ride construction activities during 2016-2017, service is scheduled to begin in January 2018.

Figure 4-39 displays the CMAX Cleveland Avenue BRT alignment, stations, and transit facilities (Northern Lights Shopping Center area park and ride and Meijer Transit Center).

BRT offers a variety of tools to help increase the speed and convenience of transit service and improve mobility, including but not limited to:

- Traffic signal priority to shorten red lights or lengthen green to keep buses running on schedule;
- Fewer stops than traditional local routes to improve travel speeds;
- Uniquely branded and designed stations and vehicles to make the service easy to identify;
- Real-time next bus arrival information; and
- Improved pedestrian amenities.

Over the past three years, COTA has conducted design, engineering and environmental clearance for BRT project. During project development, COTA received environmental review approval from the Federal Transit Administration (FTA) in July 2014, indicating no significant impacts. In addition, COTA informed and engaged participation on key elements including working closely with project stakeholders and the public to develop unique BRT identity that will be incorporated into CMAX Cleveland Avenue BRT corridor as well as potential future high-capacity corridors.

Figure 4-39 CMAX Bus Rapid Transit Alignment

The project is comprised of a combination BRT service operating in mixed traffic primarily along Cleveland Avenue between downtown Columbus and SR-161 (10.3 miles), with enhanced local service continuing north to Polaris Parkway (5.3 miles). The new service will complement the existing Local Line 1 Cleveland – COTA's second busiest line – and stop at 64 designated

platforms in both directions along the corridor. It should be noted that in conjunction with implementation of BRT service on Cleveland Avenue, the Cleveland Local will be modified to operate between Downtown and SR-161 (rather than to Ohio Health's Westerville Campus on Polaris Parkway), with 30-minute frequency of service all day, and will serve all local stops along the modified route.

Figure 4-40 CMAX Station Rendering

CMAX will operate on High Street in dedicated bus lanes during rush hours in downtown Columbus. CMAX will operate on weekdays at 10-minute frequency during peak hours and 15-minute frequency during off-peak hours between downtown Columbus and SR-161, and on weekends/holidays at 30-minute frequency. When service begins, passengers will pay to ride CMAX the same as the local bus service fare in effect in January 2018.

CMAX buses will operate within existing traffic lanes along the corridor. Traffic signals will be coordinated along Cleveland Avenue between Fort Hayes and SR-161 to allow buses priority through intersections if buses are running off schedule. This will improve on-time performance. With fewer stops, CMAX travel times can be reduced by 21% over current Local Line 1 Cleveland trip times.

Figure 4-41 CMAX Bus Rendering

Powered by compressed natural gas (CNG), buses will feature a vibrantly-colored, movement-inspired exterior design, with sleek, platinum and bright blue fiberglass seats. On-board Global Positioning Satellite (GPS) systems will tie into the next-bus arrival information screens. Customers will also enjoy personal technology upgrades, such as Wi-Fi and power charging ports. Additionally, COTA will include a Public Arts Program within the new CMAX stations and is seeking public assistance in development of artwork within the rear windows of shelters.

Project benefits include:

- Improved transit service;
- Improved mobility and reliability in a congested corridor;
- Travel time savings of approximately 21 percent;
- More travel options for corridor residents, visitors and customers;

- Improved pedestrian access and safety;
- Creates opportunities for economic development within the corridor; and
- Premium platforms featuring next-bus arrival information screens.

Inter-agency collaboration consists of the FTA, cities of Columbus and Westerville, Franklin County, Clinton and Blendon Townships, Village of Minerva Park, ODOT and MORPC. The final estimate for the project has been completed with a projected cost of $48.6 million dollars. $37.4 million dollars of the project cost was appropriated by Congress in December 2015 for the project from FTA's Section 5309 New Starts program for federal Fiscal Year 2016. The remaining $11.2 million, will be funded from COTA's local sales tax receipts.

Projected costs and service hours are programmed into MORPC's 2016-2019 Transportation Improvement Program (TIP) and included in MORPC's 2016 update to their 2016-2040 Metropolitan Transportation Plan (MTP). Major capital items include 14 new, uniquely branded CNG powered buses, 64 stations, construction of a park and ride in the Northern Lights area and the Northland Transit Center/Park and Ride located on the west side of Cleveland Avenue just south of SR-161/Dublin Granville Road, resurfacing of curb lanes along Cleveland Avenue between Westerville Road and SR-161, implementation of signal priority for buses along Cleveland Avenue, and real-time passenger information displays at BRT stations.

Figure 4-42 Northland Transit Center

Final design for the project was completed in March 2016. Final design includes completing engineering and design to the 100% level, acquisition of real estate, development of cooperative agreements with the City of Columbus, Franklin County, City of Westerville and the Ohio Department of Transportation, and several other tasks necessary to complete prior

to start of construction, which is scheduled to begin in early summer 2016. Additional information, including CMAX Cleveland Avenue BRT project can be found at www.cotabrt.com.

4.9. Strategic Transit Investments

By 2040, MORPC forecasts that population is expected to rise by 15 percent and employment by 13 percent in COTA's service area. More importantly, development patterns indicate that besides the central business district, the majority of the population and employment growth will occur along I-270 in the suburbs Hilliard, Dublin, Westerville, New Albany, Gahanna, Reynoldsburg, and Grove City. A significant portion of this growth will occur in clusters, with new housing and jobs often increasing together.

Although employment centers are growing in the suburbs, the largest concentration of jobs will remain in the Central Business District (CBD). The City of Columbus' initiative to increase housing and jobs, through tax incentives for homeowners and employers, has resulted in significant growth in the residential market and employment opportunities returning to the CBD. As a result, office vacancy rates have decreased from 26 percent in the first quarter of 2003 to 16.5 percent in 2010 to 12.1 percent as of 2015. [7]

For residents of central Ohio, this growth means significant increases in traffic congestion, as shown in Figure 2-6. These factors offer COTA a unique opportunity to explore strategic transit investments that provide transportation options in the most congested travel corridors in the region. COTA NextGen is looking at these specific challenges and proposing potential improvements to the transit system. (Section 4.5).

Strategic transit investments include alternative transit modes and other investments such as:

- Fixed-guideway options;
    - Bus Rapid Transit (BRT), light rail, commuter rail, streetcar, etc.
- Non-fixed-guideway options;
    - BRT light, a type of BRT service with fewer service amenities than full BRT. See the CMAX BRT Section 4.8 for more details.
- Advanced purchase of property for future park and rides and transit stations; and
- Other capital investments that directly support transit use.

COTA's commitment to improving transit in the region includes the pursuit of funds for alternative modes of transit; however, the current funding levels, both at the federal, state

[7] downtowncolumbus.com/wp-content/uploads/2016/03/SID-2015-End-of-Year-Report-2MB.pdf

and local levels limit future initiatives. Additionally, COTA pledged to use the current temporary 0.25 percent sales tax to fund fixed-route bus service and mobility services expansion. For rail alternatives or an exclusive guideway system to be possible, additional funding would have to be sought and approved by the voters. However, in combination with COTA's local funding, discretionary grant funding through various federal and State programs will continue to be sought after. COTA NextGen will include potential methods for funding both high capacity, fixed guideway projects and improvements to the current transit system.

4.9.1. Transit Center and Park and Ride Facilities

COTA operates 27 park and ride sites as well as three transit centers located throughout Franklin County. While each transit center is COTA-owned, the park and ride network is formed through a combination of COTA-owned and leased properties.

These facilities support the fixed-route bus network by providing indoor waiting environments at transit centers and safe places for riders to park their vehicles for free prior to boarding the bus. Through implementation of the TSR, COTA will discontinue the use of two leased park and rides (Section 4.3.4); however the CMAX BRT project will include relocating the existing leased Northern Lights Park and Ride to a newly constructed COTA-owned park and ride lot, and a new transit center/park and ride will be constructed on Cleveland Avenue just south of SR-161/Dublin Granville Road (Section 4.8). Additionally, the Dublin and Gender Road park and rides will be relocated.

Park and ride lots allow commuters from throughout the area to conveniently access COTA's service. Parking is free, which promotes multi-modal transportation options as well as help reduce road congestion. Riders can drive, bike or walk to a park and ride, park their cars and board a bus, saving gas and parking costs.

Figure 4-44 Easton Transit Center

Figure 4-43 Reynoldsburg Park and Ride

The primary purpose of a transit center is to provide an enhanced, indoor waiting environment for riders while providing a direct connection to COTA's services. Transit centers serve a variety of uses from providing riders with schedule information to promoting local development. Amenities such as childcare, healthcare or banking services can be provided in certain locations. This allows riders, especially seniors and people with disabilities, the ability to easily access businesses and services right near a bus stop. Bicycle parking is provided at all transit centers as well sidewalk connections.

Easton Transit Center offers park and ride spaces alongside an indoor waiting environment connected to covered bus bays. Opened in 2002, it houses a childcare center with a shared parking lot. This facility allows commuters to park their car, drop their children off at the childcare center, and then board the bus. This center will undergo significant renovation and expansion of bus bays as part of the TSR implementation project. The TSR network will increase from six to 11 lines that will be serving the facility. At a cost of approximately $2 million, enhancements include expanding the number of bus bays from four to eight, and updating passenger information displays, wayfinding, and operator restrooms.

Figure 4-45 Easton Transit Center

Easton Transit Center is also being proposed as a site to test first mile/last mile connections with driverless vehicles through a US Department of Transportation (DOT) Smart Cities grant. The City of Columbus has partnered with COTA to apply for approximately $50 million to implement various technology focused pilot improvements to the transportation network in the region. The City of Columbus will submit a proposal in May 2016 with the winning city being announced later in the year.

COTA's two other transit centers emphasize transit-oriented development (TOD), dense development that is easily accessible by walking, biking and transit. The Linden Transit Center opened in 1999 through a partnership between COTA, the Columbus Urban Growth Corporation, and the Greater Linden Development Corporation. The center includes a bus boarding area, childcare center, healthcare clinic, and a community space for job fairs. It was the first building completed as part of the "Four Corners" revitalization project at Cleveland and 11th avenues in Columbus. Additional development at this intersection includes a Columbus Police substation, Columbus Metropolitan Housing Authority headquarters, retail establishments, offices, and a cafe.

The Linden Transit Center demonstrates how public transit's presence in a neighborhood can raise property values and serve as a catalyst for further development that offers a mix of uses and is pedestrian-friendly. The Linden area has experienced almost $10 million in new and renovated buildings since the Linden Transit Center was built[8]. New single-family townhouses near the Linden Transit Center have sold for over $100,000 in the formerly neglected area[9].

Figure 4-47 Before Linden Transit Center

Figure 4-46 Linden Transit Center

Good Jobs First, a non-profit, non-partisan resource center that promotes smart growth for working families, named the Linden Transit Center as one of the top 25 TOD projects in the nation[10]. Projects such as the Linden Transit Center provide increased access to transit, quality jobs, and community services.

[8] Volinski, Joel. "Developing Bus Transfer Facilities for Maximum Transit Agency and Community Benefit." National Center for Transit Research. Dec. 2004.
[9] Franklin County Auditor. www.co.franklin.oh.us/auditor/
[10] Grady, Sarah and Greg LeRoy. "Making the Connection: Transit-Oriented Development and Jobs." Good Jobs First. Mar. 2006.

Similar to the Linden Transit Center, the Near East Transit Center was a result of partnerships between several entities: the Building Responsibility Equity and Dignity organization (BREAD), Children's Hospital, City of Columbus, Columbus Compact Corporation, Federal Transit Administration (FTA), Main Street Business Association, MORPC, Near East Area Commission, ODOT, U.S. Department of Housing and Urban Development, and U.S. Department of Transportation. The facility includes a medical clinic and retail spaces in addition to a passenger waiting area.

Figure 4-48 Near East Transit Center

In addition to local service along Cleveland Avenue, the CMAX Cleveland Avenue BRT line will begin serving this facility in January 2018. Facility enhancements as part of CMAX include installation of a branded, well-lit BRT pylon which includes a large monitor for display of next-bus arrival information and other COTA and community-related news.

4.9.2. Transit Oriented Development

Nationally, the importance of integrating transit into dense, walkable, mixed-use development has been of rising interest. Transit Oriented Development (TOD) seeks to maximize public access to transit by focusing density and uses of buildings close to transit stops. This form of development creates vibrant, livable and sustainable neighborhoods that promotes economic and public health. For more information about TOD visit the TOD Institute at www.tod.org.

Recognizing the importance of TOD development, COTA is committed to working with communities to promote development that encourages transit use. This partnership can come in the form of community planning, such as the City of Westerville's recent comprehensive plan update[11], which COTA was an active participant in providing guidance on development or project specific development, such as the Linden Transit Center area.

COTA partners with municipalities to encourage zoning codes that support more transit supportive development. The City of Columbus has a Traditional Neighborhood Development zoning overlay that encourages neighborhoods to development in a more compact, pedestrian friendly manner with a mix of uses. Columbus also has an Urban Commercial Overlay that encourages more pedestrian friendly, and transit friendly, development along busy corridors such as High Street. COTA plans to seek partnerships

[11] http://www.westerville.org/services/planning-development/planning-zoning/comprehensive-plan

that use these zoning tools in Columbus and similar ones in the surrounding suburbs to create higher-density development around new transit centers.

Frequently, COTA is asked to provide input on site plans by developers and governments that are seeking to incorporate more transit access into their designs. This includes design components from integration with streetscapes to pedestrian and vehicle access to orientation of buildings.

The CMAX Cleveland Avenue BRT encourages transit oriented development by investing in upgraded bus service and enhanced pedestrian waiting environments that include larger shelters, more lightning and improve sidewalk connections. This includes a new park and ride just north of Northern Lights and a new transit center at SR-161 and Cleveland Avenue. The desire is to demonstrate the value that transit plays in the development of communities along Cleveland Avenue. See Section 4.8 for more details about the CMAX.

As the region grows and demands for transit increase, COTA will pursue projects and partnerships that encourage TOD as resources become available.

4.9.3. Decreasing Travel Times

To offer a service competitive with the personal automobile, COTA's fixed-route bus serve must provide comparable benefits to users. An individual that has the option of how to travel will choose transit if it goes to their destination within a reasonable amount of time when they want to go. Cost also plays a factor, but typically to a lesser degree.

While the TSR tackles each of those characteristics, that are additional ways to ensure that buses provide a competitive travel time with the automobile. Various strategies can be implemented to decrease travel times that are based on both technology and infrastructure rather than the alignment of a line or the bus itself.

This includes use of freeway shoulders, dedicated travel lanes and intelligent transportation systems (ITS). Information about ITS can be found in Section 4.7.

4.9.4. Bus on Shoulder Program

In coordination with ODOT and MORPC, in 2006, COTA began operating express buses on freeway shoulders. Buses traveling on I-70 between downtown Columbus and SR-256 east of Downtown are able to merge onto the freeway shoulder to avoid congestion delays. Buses may use the shoulder when traffic speeds drop below 35 mph, and buses may not exceed traffic speeds by more than 15 mph.

Figure 4-49 COTA bus on I-70

Utilized under bus operator discretion, the I-70 Bus on Shoulder (BOS) project has resulted in reduced travel times and improved schedule adherence for the express routes using this freeway. As such, following planning efforts with ODOT, MORPC, the Ohio State Highway Patrol and City of Columbus Police staff, in May 2015, COTA began operating on the inside shoulder of I-670, east of Downtown. COTA worked with ODOT to ensure the inside shoulder was wide enough to accommodate a bus and is kept clear of debris.

Buses merge back into traffic when they encounter vehicle breakdowns on the shoulders, law-enforcement actions, or when forced to do so by the roadway configuration.

Over the next twenty four years, COTA will continue to work with the coordination partners to investigate the feasibility for implementation of additional bus on shoulder highway corridors.

4.9.5. Dedicated Traffic Lanes

Having a dedicated traffic lane where only transit vehicles are allowed to operate allows vehicles to stay on-time and reduces overall travel times as vehicles do not have to operating with personal automobiles. Currently, during peak hours on High Street between Spring and Mound streets the curb running lane is restricted to bus and taxi vehicles only.

Columbus's thoroughfare plan, Connect ColumbUS[12], is investigating the potential for bus only lanes on Spring and Third streets. This proposal includes a contraflow lane, which would allow buses to travel against traffic on one-way streets in its own lane, as well as a lane traveling in the same direction of traffic.

COTA will continue to pursue opportunities for bus only lanes as they arise.

4.10. Types of Federal Funding

Constructing high-capacity transit projects are not typically realized without assistance from a variety of funding sources outside of local funding, particularly federal sources. In December 2015, Congress authorized a five-year transportation bill, FAST Act, that provides steady, predictable transit funding for five years with annual growth of approximately $1 billion. High-capacity transit projects, or fixed-guideway projects, are funded through a portion of the Fixed Guideway Capital Investment Grants (5309) program (CIG).

The FAST Act allocates $2.3 billion per year from the General Fund to the Fixed Guideway Capital Investment Grants (5309) program. Transit projects are funded through the New

[12] https://www.columbus.gov/connectcolumbus/

Starts and Small Starts programs within the CIG program. How funding will be allocated to both programs from the $2.3 billion per year have not yet been determined.

FTA funding can significantly reduce the amount of funding required from local and state governments and the transit agency itself. This, in turn, allows a transit agency such as COTA to reserve more of its budget for other operational or capital projects.

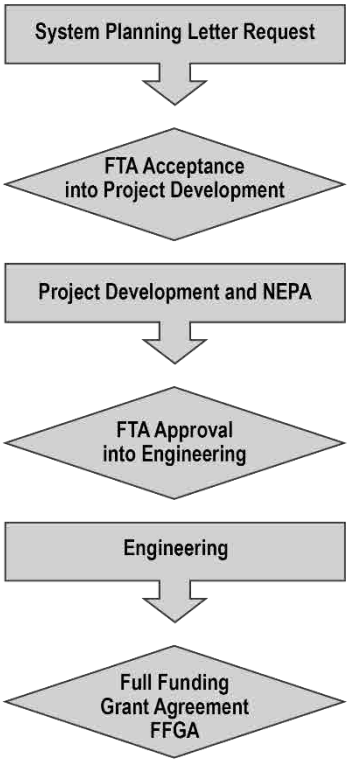

Figure 4-51 New Starts Process

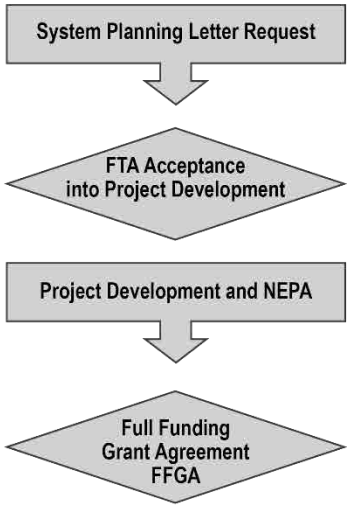

Figure 4-50 Small Starts Process

In 2012, MAP-21 simplified the New Starts and Small Starts processes. FAST Act did not further modify the process but did change the funding parameters for projects. New Starts projects are now projects that have a total estimated cost of $300 million or more or that are seeking $100 million or more in CIG funding. Additionally, the maximum Federal share for New Starts is capped at 60 percent. Small Starts projects can have a total estimated cost up to $300 million with a maximum share of $100 million.

Besides the cost differentiation, New Starts and Small Starts projects differ in the required steps taken from project conception through construction to operations. New Starts projects typically include substantial construction, land acquisition and potential environmental and equity issues, including natural, historical, racial and socio-economic. As such, the New Starts process has more FTA oversight, Conversely, Small Starts projects have fewer impacts and less extensive construction. Figures 4-50 and 4-51 show the difference in the two processes.

To begin the FTA New Starts or Small Starts process, a letter of intent and request for approval to enter project development must be submitted by the project sponsor. This letter includes a description of the desired project area developed through public involvement, stakeholder outreach as well as analysis of existing and future conditions, cost estimates, funding strategies, a proposed timeline, and preliminary environmental review. The letter is sent to the FTA Associate Administrator for Planning and Environment, where a written response to the project sponsor is required within 30 days.

Project Development and NEPA

Once approval from the FTA has been granted, the agency or project sponsor can enter into project development and environmental review. Agencies have two years from approval to complete project development. The following work must be completed during project development:

- The project sponsor must select a locally preferred alternative (LPA);
- The project sponsor must get the LPA adopted into the fiscally constrained metropolitan transportation plan;
- The environmental review process required under the National Environmental Policy Act (NEPA) must be completed as signified by a final FTA environmental decision (e.g., categorical exclusion, finding of no significant impact, combined final environmental impact statement/record of decision, or record of decision) covering all aspects of the project proposed for FTA funding; and
- The project sponsor must develop sufficient information for FTA to develop a project rating.

In addition, a minimum of 30% of the engineering and design must be completed[13].

Once project development is completed and approved by the FTA, the project can move into engineering.

Engineering

The engineering phase is when the project is designed more thoroughly, looking at specific details of what needs to be constructed, how to mitigate environmental impacts and a plan on how to construct the project. The sponsor must obtain 50 percent of financial commitments within three years of beginning engineering.

[13] Capital Investment Program: New Starts, Small Starts and Core Capacity Improvements. http://www.fta.dot.gov/12304.html

To complete the Engineering phase, project sponsors must complete sufficient engineering and design to develop a firm and reliable cost, scope, and schedule for the project, obtain all non-CIG funding commitments, complete all critical third party agreements, and meet other FTA readiness requirements related to technical capacity, staffing, and oversight to be eligible for a construction grant agreement.

Once all requirements of the engineering phase are complete and the FTA accepts the work completed the sponsor can seek a full funding grant agreement (FFGA).

Full Funding Grant Agreement

An FFGA is a commitment by the FTA to fund the project, allowing the sponsor to move forward with construction. In order to obtain an FFGA and enter into construction, a project must be listed in the FTA's Annual Report on Funding Recommendations. Once listed the project is recommended by the FTA to be included in the President's annual budget, which must then be passed by Congress. Additional work is needed during this phase, including completing sufficient engineering and design to ensure the costs are reliable, the construction schedule is fully developed, any remaining funding is secured and other necessary agreements and work is completed. Once completed, construction can begin.

For more information regarding the New Starts and Small Starts processes visit www.fta.dot.gov/12304.html.

4.11. Strategic Property Acquisition

In support of COTA NextGen and continuing efforts to meet future transportation needs of the central Ohio area, the agency will continue to identify strategic property acquisitions that support current transit services and potential future transit modes. As the central Ohio region is expected to continue to grow through the foreseeable future, demand for mobility options will follow. COTA must position itself to respond to this growth by making strategic purchases that will strengthen the region's transportation network.

Purchasing property in advance allows COTA to select locations that offer a "best fit" with future service expansion, creating a more effective system. This strategy could include purchasing land for transit centers and park and rides, abandoned right of way for future bus rapid transit or land for potential transit terminals. As COTA NextGen is completed in 2017, COTA, with input from the community and stakeholders, will decide what next steps to take regarding expanding public transit in the region.

4.11.1. Strategic Initiatives

4.11.1.1. Park and Rides

Future projects and network expansion may warrant additional park and rides, such as the CMAX Cleveland Avenue BRT, which calls for a new transit center and park and ride on Cleveland Avenue just south of SR-161. NextGen will further identify potential park and ride needs as transit improvements and high capacity corridors are identified.

Park and ride facilities offer a significant opportunity to improve transit service by providing a safe location for customers to park vehicles and an enhanced bus stop waiting environment. Locations are generally selected within suburban communities near arterial roads with high visibility and easy accessibility.

4.11.1.2. Transit Centers

Included in this LRTP plan update is construction of the new COTA-owned Northland Transit Center as part of the CMAX project. The transit center and associated park and ride are scheduled to open in 2018, prior to implementation of CMAX, and will be served initially by local and crosstown service.

Transit centers' primary purpose are to provide an enhanced, indoor waiting environment for riders that provide a direct connection to COTA's services. Outside of that purpose, transit centers serve a variety of uses from providing riders with schedule information to promoting local development. In combination with transit service, transit centers provide locations for businesses in a transit oriented land use. Examples could be child care facilities, such as at the Easton and Linden transit centers, health care and banking services, or other service related fields.

As the COTA NextGen project is finalized, locations for potential transit centers will be identified. One potential partnership included in NextGen is a multi-modal transportation hub on E. 17th Avenue and Stelzer Road near Port Columbus International Airport. The City of Columbus's Jobs, Expansion and Transportation Task Force (JET) developed potential transportation improvements to the region, including this multimodal hub[14].

4.11.1.3. ROW and Fixed-Guideway Purchase

High capacity fixed-guideway transit options, such as light rail transit (LRT) or bus rapid transit (BRT), are frequently implemented within a utility Right of Way (ROW),

[14] https://columbus.gov/planning/jettaskforce/

usually a freight railroad line. Within a built environment, such as a suburb or city, these ROWs generally offer the only opportunity to provide an exclusive route in which transit can run separately from auto traffic, achieving higher speeds and better schedule adherence. Because fixed-guideways are utilized by transit vehicles only, they allow for the quick and timely transport of people to and from key urban centers. These service improvements are necessary to attract a significant number of transit riders necessary for the fixed-guideway service to be successful.

Central Ohio has some unique opportunities with respect to railroad ROW. With consolidation of rail-freight carriers over the last 20 years, Class I railroads have sold their lower volume lines to Short Line operators and railroads have reduced the number of tracks in most corridors. Railroad corridors are particularly attractive as they often present sufficient width, length and opportunities to partner with freight carriers who lack the necessary capital to improve the infrastructure. Active rail-freight corridors that carry heavy volumes of freight are more complex, but it is possible to investigate shifting rail-traffic patterns in the region if a capacity study is undertaken that supports more efficient movements for freight carriers. COTA will investigate opportunities as they arise and strategically determine if action or feasibility studies might be warranted in the future; however, COTA's current funding stream does not support a major investment without additional funding.

4.12. Other Service Improvements

In addition to the major components described above, other important enhancements to COTA's operations will be an integral part of shaping future transit services. Each of the following service elements are focused towards attracting new riders and encouraging existing riders to take advantage of a more user-friendly and accessible mass transit system.

4.12.1. Combining Bicycling with Transit

Integrating bicycles with transit provides numerous benefits. Bicycling increases bus stop accessibility and provides greater mobility to customers at the beginning and end of their transit trips. Bicycle on transit services provide bicyclists with option to use transit to avoid riding after dark, in poor weather, or in areas that do not provide comfortable bicycle access.

Figure 4-52 Loading Bicycle on Bus

COTA supports and encourages bicycle access to its terminals, facilities, and services by providing accommodations for customers using bicycles when practicable. All COTA fixed-route buses are equipped with a bicycle rack that holds two bicycles, allowing customers to take their bicycle with them while using public transit. During the LRTP timeframe, all fixed route bus purchases will include a bike rack, and COTA will continue to build on the progress of its successful Bike &

Bus program through collaboration with partners such as MORPC and bicycling advocate groups. In addition, bicycle parking is included, where feasible, when upgrading or building new facilities.

COTA will continue to be a sponsor of MORPC's Columbus Metro Bike Map. The map depicts bicycling routes throughout the central Ohio region based on bikeway levels of service. A printed map is updated and distributed, free to the public, every few years. The map is also available in an interactive online format, which is routinely updated. More information is available online at: http://www.morpc.org/transportation/bicycle-pedestrian/columbus-metro-bike-map/index.

Figure 4-53 Bicycle Racks at COTA Spring Street Terminal

4.12.2. Environmental Initiatives

Purchasing of CNG powered buses and constructing Leadership in Energy and Environmental Design (LEED) certified buildings are examples of COTA's commitment to improving the quality of life for central Ohio residents. Reducing air pollution via expanded use of CNG vehicles (including non-revenue CNG vehicles such as supervisor and maintenance vehicles), helps reduce respiratory irritations and infections, reduces the occurrence of acid rain and the amount of ozone in the atmosphere. LEED buildings use less energy and promote recycling of materials as well as reuse of water.

The Environmental Protection Agency (EPA) has mandated a reduction in the emissions of nitrous oxide, sulfur dioxide, and hydrocarbons. In April 2004, the EPA designated the central Ohio region as "non-attainment" for failing to meet minimum air quality standards for ozone, which is still in effect today. In addition, Franklin, Delaware, Licking, and Fairfield counties are designated as "non-attainment" regions for particulate matter (2.5 microns).

To improve air quality, COTA is continuing its transitioning its fleet from diesel to CNG powered buses. CNG has various environmental advantages including 15-30 percent lower greenhouse gas emissions and easy disposal since natural gas can be slowly released into the atmosphere from storage tanks if a danger is posed. CNG buses produce 90% less particulate matter, 70-90% less carbon monoxide, 50-75% less non-methane organic gas, 75-95% less nitrogen oxide and 20-30% less carbon dioxide.

Additionally, CNG gas can be sourced domestically under known environmental regulations rather than foreign. This allows customers of CNG suppliers, such as COTA, to be sure that the gas is being collected in an environmentally sound method.

COTA is invested in construction and renovating buildings to be LEED compliant. LEED certification requires buildings to use less water and energy and reduce greenhouse gas emissions. This is accomplished through the materials used in construction, the electrical and heating/cooling systems, plumbing systems, recycling and other factors. An example of this is COTA's administrative offices are equipped with motion sensitive lighting that turns off when no one is near to use the light. The US Green Building Council administers the certification based on a scoring system.[15]

Currently, COTA has six buildings that are either LEED certified or seeking certification. To track updates to this process visit: www.cota.com/Company/Environmental-Innovation.aspx

Additionally, COTA is proposing to install solar panels on select shelters throughout its service area.

COTA will continue its commitment to improving the environment through the use of CNG buses or similar fuel source and LEED certified green buildings.

4.12.3. Facility Improvements

COTA's facilities support the delivery of its fixed-route and paratransit services. To provide the best support possible facilities must be kept in a state of good repair and renovated to support changing technologies and uses. COTA operates two bus garages, Fields Avenue and McKinley Avenue, a paratransit facility, Mainstream, administrative offices in downtown Columbus and a Street and Remote maintenance facility that houses maintenance and installation equipment for bus stops and shelters and paving equipment.

The McKinley Avenue Facility is currently in the midst of a projected $97.7 million renovation and construction project. Because of the size, complexity, and cost of the project, the work is being executed in three phases. The renovation began in 2010 with upgrading vehicles lifts and other safety equipment. The facility was updated to support CNG vehicles and a CNG fueling station was constructed. Besides replacing aging infrastructure the renovation will also:

- Improve energy efficiency;
- Reduce greenhouse gas emissions;
- Meet all code requirements for CNG operations and ADA accessibility;
- Improve operational flow efficiencies and best practices;
- Expand fleet storage capacity to 275 buses; and

[15] http://www.usgbc.org/leed

- Accommodate current and long-term facility administration programming needs.

During this LRTP timeframe, the Fields Avenue fixed route bus garage is proposed to undergo an update to allow for the storage and maintenance of CNG vehicles beginning in 2017.

The Mobility Services facility, which houses Mainstream vehicles, will also undergo a similar update to Fields Avenue in order to support either CNG or standard gasoline vehicles. Currently the facility supports diesel vehicles. This facility was constructed in 2011 and does not require major renovation.

COTA will continue to maintain its facilities as necessary into the future in an environmentally responsible manner. Additionally, as needs arise for additional facilities, COTA will pursue federal, state and local funding sources to support the construction. COTA NextGen will contemplate additional facilities based on the proposed improvements to the current transit network as well as potential high capacity projects.

4.13. Safety and Security

Passenger, employee and public safety and security are one of COTA's top priorities. Through a variety of various security initiatives and technologies, COTA ensures the agency is prepared to respond to a variety of security-related incidents and emergencies.

COTA's security initiatives include security technology components, services and regional and local coordination.

4.13.1.1. Security and Technology

Safety-related technology is critical to providing a safe environment on buses, in COTA facilities, and on all streets where buses operate. A network of closed-circuit television cameras (CCTV's), access control systems, a security monitoring control center and a command center are the technological components that comprise the core of COTA's security tools.

Figure 4-54 Security Cameras on Buses

Camera systems

COTA's bus fleet is monitored by a video surveillance system which incorporates five to six cameras in each fixed-route bus, images from which are stored automatically to hard drives on the buses. On-board security features also include emergency alarms and other sensitive security features which allow dispatchers to monitor situations on the bus and act accordingly. Additionally, COTA monitors its facilities with a CCTV surveillance system.

As technology continues to improve, included in this LRTP timeframe COTA plans on upgrading its Pelco, CCTV, Safety Vision, and Identipass systems. These upgrades will provide state of the art cameras with improved quality as well as capabilities of real-time information and adequate storage for future viewing. In addition, COTA will explore installing cameras in shelters. The installation of cameras in shelters will provide additional security to passengers and help with crime prevention and criminal apprehensions. COTA started upgrades in 2016 and is working toward camera positioning throughout the system by the year 2020.

Mobile EOC, Incident Command Center

COTA currently has a Mobile Incident Command Center used as an Emergency Operations Center (EOC). As technology continues to develop, the Incident Command Center will be updated with the state of the art equipment on an annual basis. In the event of a catastrophic event whereas COTA primary facilities are damaged and temporarily or permanently damaged, the EOC is used by incident command staff to communicate and run service.

Figure 4-55 Mobile Incident Command Center

Security Control Center

As access to COTA's various facilities has increased, and to better facilitate visitors, COTA will explore a state of the art Visitor Management System at all of its facilities. As part of the current radio command center, this system will be able to monitor visitors and individuals throughout COTA facilities and properties. Real-time imagery will help identify with facial recognition who and where individuals are in the buildings at all times. COTA is currently working on upgrades to its radio room and projecting to have this type of system up and running by 2020.

4.13.1.2. Security Services/Initiatives

Currently, COTA contracts security guard services to protect its main headquarters at 33 North High Street, and the two bus storage and maintenance garages twenty-four hours a day, seven days a week.

Transit Police

To help minimize crime and provide increased security for passengers, employees and facilities, COTA will investigate the feasibility of establishing a transit police department. COTA currently contracts with the Columbus Division of Police to perform security, respond to incidents on coaches, patrol park and rides, and monitor transit centers. With an internal transit police department, COTA will maintain general security control over its bus network, as well as improve response times to incidents, provide improved facility security, and focus more resources on minimizing transit related incidents. If advanced, the goal is to have a transit police department in place within the next five years.

4.13.1.3. Regional and Local Coordination

COTA is an active community partner in regional security and emergency response planning, playing a vital role in response to and recovery from emergencies and other unexpected catastrophic events. Such emergencies, especially those that call for the mobilization of transportation resources, require effective and efficient coordination across a broad spectrum of agencies.

The capability to mobilize resources is profoundly affected by the decisions and directives of others, including law enforcement, fire, and emergency medical services, and local and state planning agencies. To better manage these effects, COTA is actively involved with local central Ohio communities in planning and preparing for emergencies. COTA is prepared to provide specific functions that are identified in local emergency operations plans. Those functions may include but are not limited to:

- The emergency evacuation of citizens from disaster affected areas;
- Identification and transportation of citizens with disabilities;
- Evacuation of schools and day care centers;
- Temporary/in-place sheltering of evacuated citizens; and
- Transportation of meals, goods, and supplies to an affected area for victims, emergency responders, or to support recovery operations, planned security, and emergency preparedness activities.

Homeland Security

COTA has initiated several additional standards to improve its ability to detect and deter terrorist activities within its system. These deterrents include, but are not limited to:

Bomb-sniffing, canine detection teams

Members of the Transportation Security Administration (TSA), Columbus Division of Fire Bomb Squad, and the Ohio Highway Patrol Canine Teams work hand in hand with COTA to search coaches at pre-determined checkpoints and COTA facilities to ensure the safety of passengers, employees, and equipment during heightened security conditions. The searches serve as a deterrent for anyone that may be considering plans to cause harm to the transit system; and

Figure 4-56 Visible Intermodal Protection Response

Visible Intermodal Protection Response (VIPR)

The TSA, Ohio Highway Patrol, the Ohio State University Police and the Columbus Division of Police coordinate with COTA to provide a VIPR during OSU football games, Arnold Classic and Columbus' Red, White, and Boom activities. VIPR provides up to 75 federal agents and police officers to improve the security of COTA passengers, employees, and equipment during the busiest days of the year. VIPR officers ride with passengers, check parked vehicles at park and rides, conduct canine searches on buses, and scout crowds for suspicious activities.

Evacuation transportation group

COTA, the Mid-Ohio Regional Planning Commission (MORPC), Franklin County Emergency Management and Homeland Security Agency (FCEMHS), and the City of Columbus are members of a regional evacuation transportation group to discuss emergency response, evacuation routing, signage, and transportation resources with agencies in the greater Columbus area that have a stake in evacuation planning. On a regular basis, this group discusses the following topics:

- Transportation resources;
- Evacuation routing and signage;
- Review of existing evacuation plans; and
- Incident management.

FCEMHS's vision is to continue to develop and update a regional transportation evacuation plan that adds to and complements existing emergency preparedness plans. This strategy contains a summary of transportation options in the event of an evacuation, including evacuation routes out of the area, fuel and food supply provision routes to the area, shelter provisions, flexible and static signage, use of various Intelligent Transportation Systems (ITS) such as radio communications, traffic signal coordination, etc., and law enforcement.

COTA also coordinates closely with the Franklin County Emergency Management Agency (FCEMA) and Chemical Emergency Preparedness Advisory Council (CEPAC) on evacuation training in the event of an emergency. This training includes an annual simulated plane crash at Port Columbus International Airport, Rickenbacker Air Base, or Bolton Field. In addition, COTA has been involved in several emergency evacuations (actual and simulated) in Franklin County in recent years.

During disaster events, it may become necessary to protect citizens by moving or relocating them from areas of the county that are threatened to areas that are more secure. Conducting these types of movements is COTA's primary responsibility as Franklin County's #1 Emergency Support Function (ESF) Transportation Coordinator, assisted by support agencies charged through an ESF as part of the Franklin County Emergency Operations Plan.

"ESF 1 Transportation" is responsible for management of transportation systems and management of transportation infrastructure during threats or in response to actual incidents. Activities under this ESF are directed by the Franklin County Engineer's Office (FCEO) and COTA with support from many other transportation industry entities. Transportation encompasses all transit surface modes, including land-based wheeled vehicles, trucks, and buses traveling on streets, roads, highways, and bridges; air travel, rail routes; transportation infrastructures (roads, routes, and bridges) and assets that move people and supplies in and out of Franklin County.

ESF 1 presents a coordinated approach to manage surface transportation support, services, and infrastructure essential for emergency response, and to provide public transportation to temporarily replace or augment services affected in an emergency. It is also responsible for restoration of the transportation infrastructure following a public emergency and for ensuring the existence of routes designed to promote the movement of goods, services, equipment, and personnel toward emergency staging areas and any emergency location.

Evacuation will be undertaken when it is perceived that there is or may soon become an unacceptable level of risk to health and/or safety of people in a given area.

5. Financial Plan

This section of the plan presents the results of the financial analysis undertaken to determine the ability of COTA to deliver the components of the LRTP.

5.1. Introduction

This report examines the financial capacity of COTA to deliver the components of the LRTP and operate and maintain its existing system in a state of good repair. The results of this financial analysis serve as a critical input to the LRTP.

COTA conforms to a calendar year-based fiscal year beginning January 1 and ending December 31. This differs from fiscal years for the State of Ohio (July 1 through June 30) and the federal government (October 1 through September 30). For clarity in presentation to stakeholders and interested parties, information presented hereinafter refers to COTA's January-December fiscal year. For example, FY 2016 refers to the period January 1, 2016 through December 31, 2016.

5.2. Financial Analysis Methodology

The objective of the financial analysis is to project annual expenses and revenues, both capital and operating, over a 24-year period from 2016 to 2040 to examine the financial capacity of COTA to deliver the components of the LRTP. To provide a base to which to compare the projections, actual 2015 financial information is provided in the projection tables as well. The financial planning process that is applied in the financial analysis emphasizes a comprehensive approach to the integration of expenses and revenues, both capital and operating, for major transportation investments. This approach was considered prudent, given the magnitude of revenues to be applied.

Four major data inputs form the basis for describing the characteristics of the transit system in the base year and design year and for stating the resulting transit system costs and revenues:

- Implementation dates of capital investments and service elements of the LRTP;
- Transit fleet: A projection of the annual cost for acquiring new buses for routine replacement and for service expansion. This makes use of the following information:
    - Description of the existing fleet: for each subfleet (buses of a specific manufacturer and purchase year), data regarding the subfleet size and anticipated retirement year.

- Committed purchases: for already-programmed purchases, the number, size, cost, and anticipated retirement year of each planned new subfleet.
- Proposed future purchase parameters: for all future subfleets, average bus costs, useful lives, and spare requirements. Fleet size requirements are based on the travel demand forecasts and operational analysis, which considers the assumed spare ratio across the fleet or by subfleet.
- In each year, the analysis considers the prior year fleet size, subtracts current year retirements, and compares the balance to the current year total fleet requirement (peak plus 20% for spares). If a shortfall exists, additional vehicles are assumed to be "purchased" and these vehicles are considered a part of the fleet for their specified useful life, at which point they are assumed to be retired.

- Operating costs: Operating and Maintenance (O&M) costs are estimated using a direct\indirect cost allocation model found in Table 5-2.
- Operating revenues: Growth in passenger fare revenues is projected on the basis of growth in service hours and associated estimated increase in ridership. Assumptions include:
  - Base year 2015 annual fare revenue;
  - Projected fare increases;
  - Growth in level of service; and
  - Estimated fare and service elasticity.

The computation of costs and revenues is governed by two major implementation assumptions:

- Rate of growth in transit service: including growth in annual hours of operation and growth in fleet size, which in turn drive growth in new vehicle costs, operating costs, and fare revenues.
- The analysis is performed in year-of-expenditure (YOE or inflated) dollars. Base year (2015) Capital and Operating costs are inflated along with projected revenue sources to arrive upon estimated cash flow.

The sources and uses of funds analysis is then undertaken and year-end cash balances are examined to assure that neither capital nor operating shortfalls occur. Throughout the financial planning process, reviews are undertaken to assure that underlying assumptions in the financial analysis are internally consistent.

5.3. Cash Flow Analysis

This section discusses the assumptions contained in the financial plan regarding the uses and sources of funds evaluated in the financial analysis. It begins with a description of capital and operating uses of funds, and continues by addressing sources of funding available to COTA for the LRTP and its other operating and capital programs.

5.3.1. Uses of Funds

Described below is the basis for determining operating and capital program expenditures.

5.3.1.1. COTA Capital Improvement Program Uses of Funds

The COTA Capital Improvement Program (CIP) includes capital investments to assure that fixed assets remain in a state of good repair, technological and other improvements are made to maintain and improve operating efficiency and effectiveness, and customer service and convenience is maintained and improved. The modeled CIP is comprised of the following major elements:

Rehabilitation and replacement: These requirements address routine renewal of COTA's fixed assets beyond the level of maintenance included in the operating budget. This typically includes maintenance actions whose cycle length is greater than every three to five years. Examples include transit center and administrative facility maintenance and rehabilitation; computer hardware investments, etc.

Buses: Future bus purchases are projected based on the following assumptions:

- Age distribution and retirement schedule for the existing COTA fleet;
- Assumed retirement age of buses to be purchased in the future;
- Projected growth in service hours requiring additional buses; and
- The life expectancy of fixed route buses is assumed at 12 to 14 years. A 20 percent spare ratio is assumed based on the peak-hour bus fleet requirement. The financial analysis anticipates that future bus purchases would have the same unit cost in 2015 dollars adjusted for inflation as purchases presently under contract.

New initiatives: These investments address improvements to service and opportunities to implement new technologies.

The COTA capital improvement program costs are illustrated in Table 5-1.

Table 5-1 COTA Capital Improvement Program Cost Assumptions

FY 2015 THROUGH FY 2027 IN MILLIONS	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
SOURCES													
State Funding	$ 1.38	$ 1.38	$ 1.73	$ 1.75	$ 1.76	$ 1.06	$ 1.06	$ 1.10	$ 1.17	$ 1.14	$ 1.21	$ 1.19	$ 1.26
Federal Funding	$ 24.63	$ 28.76	$ 39.77	$ 21.70	$ 12.93	$ 21.47	$ 21.47	$ 21.67	$ 21.68	$ 21.69	$ 21.70	$ 21.72	$ 21.73
TOTAL SOURCES	**$ 26.01**	**$ 30.13**	**$ 41.50**	**$ 23.44**	**$ 14.70**	**$ 22.53**	**$ 22.79**	**$ 22.77**	**$ 22.85**	**$ 22.83**	**$ 22.92**	**$ 22.91**	**$ 22.99**
USES													
Fixed Route Buses- CNG	$ 18.46	$ 9.64	$ 13.00	$ 14.93	$ 15.38	$ 15.84	$ 16.41	$ 16.90	$ 17.34	$ 17.86	$ 18.37	$ 18.92	$ 19.57
Non-revenue Support Vehicles	$ 0.20	$ 0.92	$ 0.64	$ 0.69	$ 0.57	$ 0.81	$ 0.64	$ 0.72	$ 0.56	$ 0.58	$ 0.92	$ 0.94	$ 0.66
Bus Rapid Transit	$ 2.80	$ 16.07	$ 21.95	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tranist Centers; P&R improvements	$ 0.67	$ 1.09	$ 1.05	$ 0.48	$ 0.35	$ 0.91	$ 2.00	$ 0.97	$ 2.00	$ 1.03	$ 2.00	$ 1.10	$ 2.00
ITS	$ 0.04	$ 1.75	$ 5.65	$ 4.00	$ 0.25	$ 2.07	$ 2.07	$ 2.08	$ 2.08	$ 2.08	$ 2.08	$ 2.09	$ 2.09
Computer Hardware/ Software	$ 1.00	$ 2.38	$ 6.52	$ 0.25	$ -	$ 4.63	$ 4.77	$ 4.92	$ 5.07	$ 5.24	$ 5.40	$ 5.57	$ 5.75
Facility Improvements	$ 14.31	$ 9.17	$ 14.37	$ 47.50	$ 43.50	$ 1.42	$ 1.46	$ 1.51	$ 1.55	$ 1.60	$ 1.66	$ 1.71	$ 1.76
Shop / Other Equipment	$ 0.25	$ 0.50	$ -	$ -	$ -	$ 0.83	$ 0.86	$ 0.89	$ 0.91	$ 0.94	$ 0.97	$ 1.00	$ 1.03
Strategic Investments- Property	$ -	$ 4.75	$ 2.06	$ 1.00	$ 1.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Paratransit Vehicles	$ -	$ 2.90	$ 1.75	$ 1.98	$ 2.31	$ 1.42	$ 1.46	$ 1.50	$ 1.55	$ 1.60	$ 1.65	$ 1.70	$ 1.76
Non-Operating Expenses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Transit Enhancements	$ -	$ -	$ 0.82	$ 0.42	$ 0.43	$ 0.44	$ 0.45	$ 0.47	$ 0.48	$ 0.50	$ 0.51	$ 0.53	$ 0.54
TOTAL USES	**$ 37.73**	**$ 49.17**	**$ 67.80**	**$ 71.24**	**$ 63.79**	**$ 33.37**	**$ 35.14**	**$ 34.95**	**$ 36.55**	**$ 36.43**	**$ 38.56**	**$ 38.56**	**$ 40.17**
LOCAL CAPITAL REQUIREMENT	**$ (11.72)**	**$ (19.04)**	**$ (26.30)**	**$ (47.80)**	**$ (49.09)**	**$ (10.84)**	**$ (12.35)**	**$ (12.19)**	**$ (13.70)**	**$ (13.59)**	**$ (15.64)**	**$ (15.65)**	**$ (17.18)**

Table 5-1 COTA Capital Improvement Program Cost Assumptions (continued)

FY 2028 THROUGH FY 2040 IN MILLIONS	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040
SOURCES													
State Funding	$ 1.24	$ 1.30	$ 1.29	$ 1.37	$ 1.35	$ 1.44	$ 1.51	$ 1.59	$ 1.67	$ 1.75	$ 1.84	$ 1.93	$ 2.03
Federal Funding	$ 21.75	$ 21.76	$ 21.78	$ 22.32	$ 22.88	$ 23.45	$ 24.04	$ 24.64	$ 25.25	$ 25.89	$ 26.53	$ 27.20	$ 27.88
TOTAL SOURCES	**$ 22.98**	**$ 23.07**	**$ 23.07**	**$ 23.69**	**$ 24.23**	**$ 24.89**	**$ 25.55**	**$ 26.23**	**$ 26.92**	**$ 27.64**	**$ 28.37**	**$ 29.13**	**$ 29.91**
USES													
Fixed Route Buses- CNG	$ 20.07	$ 20.67	$ 21.29	$ 21.30	$ 21.94	$ 22.70	$ 23.28	$ 23.97	$ 24.69	$ 24.70	$ 25.44	$ 26.32	$ 26.99
Non-revenue Support Vehicles	$ 0.72	$ 0.67	$ 1.29	$ 1.32	$ 1.35	$ 1.39	$ 1.42	$ 1.46	$ 1.49	$ 1.53	$ 1.57	$ 1.61	$ 1.65
Bus Rapid Transit	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Tranist Centers; P&R improvements	$ 1.17	$ 2.00	$ 1.24	$ 2.00	$ 1.30	$ 2.00	$ 1.37	$ 2.00	$ 1.44	$ 2.00	$ 1.51	$ 2.00	$ 1.59
ITS	$ 2.09	$ 2.09	$ 2.10	$ 2.15	$ 2.20	$ 2.26	$ 2.32	$ 2.37	$ 2.43	$ 2.49	$ 2.56	$ 2.62	$ 2.68
Computer Hardware/ Software	$ 5.93	$ 6.12	$ 6.31	$ 6.47	$ 6.63	$ 6.80	$ 6.97	$ 7.14	$ 7.32	$ 7.50	$ 7.69	$ 7.88	$ 8.08
Facility Improvements	$ 1.82	$ 1.88	$ 1.93	$ 1.98	$ 2.03	$ 2.08	$ 2.14	$ 2.19	$ 2.24	$ 2.30	$ 2.36	$ 2.42	$ 2.48
Shop / Other Equipment	$ 1.07	$ 1.10	$ 1.14	$ 1.16	$ 1.19	$ 1.22	$ 1.25	$ 1.29	$ 1.32	$ 1.35	$ 1.38	$ 1.42	$ 1.45
Strategic Investments- Property	$ 5.00	$ 5.00	$ 5.00	$ 5.13	$ 5.25	$ 5.38	$ 5.52	$ 5.66	$ 5.80	$ 5.94	$ 6.09	$ 6.24	$ 6.40
Paratransit Vehicles	$ 1.81	$ 1.87	$ 1.93	$ 1.98	$ 2.03	$ 2.08	$ 2.13	$ 2.19	$ 2.24	$ 2.30	$ 2.35	$ 2.41	$ 2.47
Non-Operating Expenses	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Transit Enhancements	$ 0.56	$ 0.57	$ 0.59	$ 0.61	$ 0.62	$ 0.64	$ 0.65	$ 0.67	$ 0.69	$ 0.70	$ 0.72	$ 0.74	$ 0.76
TOTAL USES	**$ 40.24**	**$ 41.98**	**$ 42.83**	**$ 44.10**	**$ 44.56**	**$ 46.55**	**$ 47.05**	**$ 48.93**	**$ 49.67**	**$ 50.82**	**$ 51.68**	**$ 53.67**	**$ 54.56**
LOCAL CAPITAL REQUIREMENT	**$ (17.25)**	**$ (18.91)**	**$ (19.76)**	**$ (20.41)**	**$ (20.33)**	**$ (21.66)**	**$ (21.50)**	**$ (22.71)**	**$ (22.75)**	**$ (23.19)**	**$ (23.31)**	**$ (24.54)**	**$ (24.65)**

O&M Uses of Funds

Long-term projections of COTA's operating budget were performed utilizing cost allocation models relating line-item costs to specific cost drivers. The O&M cost projection applied in the financial analysis is based on the unit costs from the O&M cost table. The financial analysis assumes growth is projected to be consistent with COTA LRTP service model projections.

Operating Costs

Operating costs are projected using a direct\indirect cost allocation model that increases object costs both by their applicable inflation percentage and increases in bus service hours, if applicable, based upon the percentage that is deemed direct with the indirect percentage being inflated only by the general inflation percentage. The direct\indirect cost allocation model is displayed in Table 5-2.

The analysis grows bus service hours consistent with the LRTP. Annual service hours are assumed to grow 78,000 hours in FY's 16 and 17, 25,000 hours in FY 18 and 19, to a total of 1.25 million service hours. Following the service hour increase in 2019, based on the financial model, COTA will have reached its maximum service hour limit based on the ½ percent local sales tax. As a result, annual service hours are assumed to remain constant from 2019-2040.

Mobility (Mainstream paratransit operations) service hours are assumed to grow roughly 3.5 percent from FY16 to FY19 and continuing with minimal growth through 2040 to reflect increases in the population served.

Table 5-2 COTA Operating Cost Allocation Model

Expense Object Class	Direct allocation %	Indirect allocation %
Operating Labor	91%	9%
Administrative Labor	20%	80%
Benefits	74%	26%
Services	40%	60%
Fuel	100%	0%
Material & Supply	80%	20%

Expense Object Class	Direct allocation %	Indirect allocation %
Utilities	0%	100%
Casualty & Liability	100%	0%
Other	10%	90%

5.3.1.2. LRTP Life-Cycle Costs

Prudent business planning for transit agencies that are considering undertaking major capital investments must take into account "life-cycle" costs. This approach to major investment planning insures that adequate consideration is given to the full extent of the costs associated with the acquisition and use of transportation facilities and rolling stock.

COTA's CIP contains elements that represent longer life-cycle activities, such as replacing radios, fare boxes, and maintenance equipment as well as the replacement of major structural elements, such as new roofs, paving, and bus shelters. Bus purchases are projected based on a retirement schedule of the existing fleet and the annual service expansion plans that underlie annual O&M costs and fare revenue. Every existing bus in the COTA fleet is replaced at least twice in the financial plan.

5.3.1.3. Sources of Funds

This section describes the basis for the projection of funds applied to the operating and capital programs.

Sources of Funds for Capital

The financial analysis applies projections of the following sources of capital funding:

Dedicated taxes: The major local funding source proposed for the LRTP is the sales tax currently levied in the COTA service area. COTA receives revenue from a permanent sales tax of 0.25 percent passed in November 1999. An additional 0.25 percent, ten-year renewable tax was approved by voters in November 2006, bringing the total collections to 0.50 percent. Furthermore, the analysis assumes that the ten-year sales tax increase is subsequently renewed in 2016, 2026 and 2036.

COTA's sales tax base is projected to grow an average of 3.0 percent annually over the period of analysis. This projection is based on FY 2015 Congressional Budget

Office's Economic Outlook where GDP & CPI are projected over a 20 year horizon. The 3.0 percent projection represents a simple average of those two key drivers of taxable sales plus an increment representing the stronger than average growth in the Central Ohio Region.

State grants: COTA is assumed to continue to receive a state matching grant, subject to annual caps, of 10 percent on capital projects funded with federal Congestion Mitigation and Air Quality (CMAQ) and Section 5309 Bus and Bus Related grants, described below.

Federal grants: The financial analysis addresses the following sources of Federal grants:

- Section 5307 Urban Formula grants: These urbanized area formula grants are based on various demographic, service level, and ridership variables. Factors in the formula that allocates grants to urbanized areas are estimated based on an assumed annual growth in total Section 5307 funds, adjusted to account for increases in COTA's transit service and demographic base over which these grants are applied, to the extent necessary.

- Section 5309 Bus and Bus Related Grants: These discretionary grants are applied to the purchase of buses and bus-related assets. COTA is assumed to receive matching grants on bus purchases subject to an annual cap of $1.0 million in base-year dollars.

- Funding for CMAX Cleveland Avenue BRT Project: Funds for the project will be distributed through FTA Section 5309 Capital Investment Grant Program Small Starts category. Congressional appropriation in the amount of $37,454,000 has been approved for the project. This equates to 77% of the total project capital costs of $48,617,000. Funding will be finalized through a Single Year Grant Agreement expected to be finalized in May 2016. The remainder of the funds will utilize revenue from COTA's sales tax.

- Congestion Mitigation\Air Quality (CMAQ) Grants: CMAQ grants may be applied toward transportation projects in Clean Air Act non-attainment areas for ozone and carbon monoxide. Projects must contribute to meeting attainment of national ambient air quality standards. In general, the capital costs of transit system expansions and improvements that are projected to increase ridership are eligible under the CMAQ program. COTA is assumed to receive a matching grant on bus purchases subject to an annual cap of $2.5 million in base-year dollars.

Other funds:

- Interest on capital fund: These are interest earnings on the capital fund (if any), which is maintained at a minimum level of working capital (defined as two months of operating). A portion of interest earnings on the capital funds may be applied to capital.

Sources of Funds for Operations

The financial analysis applies the following sources of operating funding:

Dedicated local revenues: A large portion of COTA's existing dedicated sales tax revenue, a 0.25 percent permanent tax and 0.25 percent ten-year renewable tax is applied to support COTA operations.

Passenger revenue: Fare revenues are based on COTA's projected ridership for existing bus services, as well as projected ridership for the LRTP. Average fare paid per passenger is assumed to grow with inflation, adjusted every three years.

Other transit related revenue: These revenues, based on current budget values, are adjusted annually to account for growth in inflation, level of service, ridership, and/or demographics. Additional operating revenues include the following:

- Lease income: Rents collected from tenants in COTA owned facilities.
- Miscellaneous income: Proceeds from disposal of assets beyond their useful life and other miscellaneous revenue sources.

State and local assistance: COTA receives a small amount of operating funding from the State of Ohio in the form of a fuel tax refund and from state funds for elderly and handicapped assistance. These grants are assumed to remain constant in YOE dollars.

Interest on capital fund: These are interest earnings on the capital fund (if any), which is maintained at a minimum level of working capital (defined as two months of operating budget). A portion of interest earnings on the capital funds may be applied to operations.

5.3.1.4. Cash Flow Statements

Table 5-3 on the following page presents COTA's cash flow statements for the LRTP over a 24-year period of analysis.

5.3.1.5. Conclusion

This section establishes a strategy to fund the capital and operating needs of the LRTP. LRTP annual operating needs would be funded with fare revenue, as well as COTA's other dedicated revenue sources.

The analysis finds that with the continued renewal of the ten-year 0.25 percent sales tax, COTA funds would be sufficient to implement the components of the LRTP.

Uncertainties associated with fluctuating economic conditions and other factors may result in the actual results of COTA's financial program varying from the projections in the financial analyses, and the variations could be material.

Future financial results presented are intended to chart a general course of action regarding plan implementation, transit service expansion, and initiation of activities to establish new funding and financing approaches.

Table 5-3 Cash Flow Statement

FY 2015 THROUGH FY 2040 IN MILLIONS	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Beginning service hours	974,100	1,045,171	1,123,960	1,202,638	1,226,690	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837
Change in hours	71,071	78,789	78,677	24,053	25,147	-	-	-	-	-	-	-	-
Ending service hours	1,045,171	1,123,960	1,202,638	1,226,690	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837
Passengers	19,175,251	19,455,102	20,521,938	21,413,102	23,305,871	23,538,930	23,393,968	24,012,062	24,252,183	24,102,829	24,739,652	24,987,048	24,833,169
BEGINNING BALANCE	**$ 115.08**	**$ 137.46**	**$ 146.55**	**$ 141.92**	**$ 120.85**	**$ 98.30**	**$ 113.35**	**$ 126.98**	**$ 140.61**	**$ 152.50**	**$ 165.64**	**$ 176.86**	**$ 187.55**
REVENUE SOURCES													
Total Sales and Use Tax	$ 125.44	$ 127.89	$ 131.72	$ 135.67	$ 139.74	$ 143.94	$ 148.25	$ 152.70	$ 157.28	$ 162.00	$ 166.86	$ 171.87	$ 177.02
Passenger Revenues	$ 20.04	$ 20.35	$ 21.47	$ 24.19	$ 26.33	$ 26.59	$ 28.01	$ 28.75	$ 29.04	$ 30.59	$ 31.40	$ 31.72	$ 33.41
Federal Asst.(JARC, 5307, Misc Grants)	$ 0.27	$ 0.42	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
State Assistance	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Fuel Tax Refund (State)	$ 0.63	$ 0.73	$ 0.73	$ 0.69	$ 0.60	$ 0.54	$ 0.44	$ 0.33	$ 0.16	$ 0.11	$ -	$ -	$ -
Investment Income	$ 0.20	$ 0.49	$ 0.51	$ 0.49	$ 0.57	$ 0.68	$ 0.74	$ 0.80	$ 0.82	$ 0.86	$ 0.95	$ 1.02	$ 1.08
Lease Income	$ 0.77	$ 0.77	$ 0.77	$ 0.77	$ 0.77	$ 0.79	$ 0.81	$ 0.83	$ 0.85	$ 0.87	$ 0.89	$ 0.91	$ 0.93
Other (Miscellaneous)	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.37	$ 0.38	$ 0.39	$ 0.40	$ 0.41	$ 0.42	$ 0.43	$ 0.44	$ 0.45
TOTAL SOURCES	**$ 147.71**	**$ 151.01**	**$ 155.56**	**$ 162.18**	**$ 168.38**	**$ 172.91**	**$ 178.64**	**$ 183.80**	**$ 188.56**	**$ 194.85**	**$ 200.53**	**$ 205.95**	**$ 212.90**
USES													
Operating Labor	$ 38.12	$ 41.91	$ 45.92	$ 48.16	$ 51.01	$ 53.56	$ 56.24	$ 58.49	$ 17.34	$ 17.86	$ 18.37	$ 18.92	$ 19.57
Adminstrative Labor	$ 14.84	$ 16.52	$ 17.50	$ 18.24	$ 19.02	$ 19.68	$ 20.37	$ 21.09	$ 0.56	$ 0.58	$ 0.92	$ 0.94	$ 0.66
Benefits	$ 24.25	$ 24.09	$ 26.66	$ 28.43	$ 30.32	$ 31.84	$ 33.43	$ 35.10	$ -	$ -	$ -	$ -	$ -
Services	$ 8.13	$ 10.60	$ 12.02	$ 9.13	$ 9.45	$ 9.69	$ 9.93	$ 10.18	$ 2.00	$ 1.03	$ 2.00	$ 1.10	$ 2.00
Paratransit	$ 7.74	$ 8.08	$ 8.48	$ 8.70	$ 8.91	$ 9.14	$ 9.37	$ 9.60	$ 2.08	$ 2.08	$ 2.08	$ 2.09	$ 2.09
Fuel	$ 7.46	$ 7.27	$ 7.74	$ 7.50	$ 7.25	$ 6.85	$ 6.65	$ 6.45	$ 5.07	$ 5.24	$ 5.40	$ 5.57	$ 5.75
Other Materials and Supplies	$ 8.14	$ 8.60	$ 9.33	$ 9.72	$ 10.14	$ 10.39	$ 10.65	$ 10.91	$ 1.55	$ 1.60	$ 1.66	$ 1.71	$ 1.76
Utilities	$ 2.10	$ 2.25	$ 2.31	$ 2.36	$ 2.42	$ 2.48	$ 2.55	$ 2.61	$ 0.91	$ 0.94	$ 0.97	$ 1.00	$ 1.03
Casualty & Liability Costs	$ 0.24	$ 0.20	$ 0.22	$ 0.23	$ 0.24	$ 0.25	$ 0.25	$ 0.26	$ 5.00	$ 5.00	$ 5.00	$ 5.00	$ 5.00
Other	$ 2.59	$ 3.35	$ 3.72	$ 2.99	$ 3.07	$ 3.14	$ 3.22	$ 3.30	$ 1.55	$ 1.60	$ 1.65	$ 1.70	$ 1.76
SUBTOTAL OPERATING USES	**$ 113.61**	**$ 122.88**	**$ 133.89**	**$ 135.45**	**$ 141.84**	**$ 147.02**	**$ 152.66**	**$ 157.99**	**$ 162.96**	**$ 168.12**	**$ 173.67**	**$ 179.61**	**$ 185.77**
NET (OPERATIONS)	**$ 34.10**	**$ 28.13**	**$ 21.67**	**$ 26.73**	**$ 26.54**	**$ 25.89**	**$ 25.98**	**$ 25.81**	**$ 25.60**	**$ 26.73**	**$ 26.86**	**$ 26.34**	**$ 27.13**
LOCAL CAPITAL REQUIREMENT	**$ (11.72)**	**$ (19.04)**	**$ (26.30)**	**$ (47.80)**	**$ (49.09)**	**$ (10.84)**	**$ (12.35)**	**$ (12.19)**	**$ (13.70)**	**$ (13.59)**	**$ (15.64)**	**$ (15.65)**	**$ (17.18)**
ENDING CASH BALANCE - In Current Dollars	**$ 129.96**	**$ 139.05**	**$ 134.42**	**$ 113.35**	**$ 90.80**	**$ 105.85**	**$ 119.48**	**$ 133.11**	**$ 145.00**	**$ 158.14**	**$ 169.36**	**$ 180.05**	**$ 190.00**

Table 5-4 Cash Flow Statement

FY 2015 THROUGH FY 2040 IN MILLIONS	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040
Beginning service hours	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837
Change in hours	-	-	-	-	-	-	-	-	-	-	-	-	-
Ending service hours	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837	1,251,837
Passengers	25,489,288	25,744,181	25,585,638	26,261,639	26,524,255	26,789,498	26,624,518	27,327,967	27,327,967	27,327,967	27,327,967	27,327,967	27,327,967
BEGINNING BALANCE	**$ 197.50**	**$ 207.29**	**$ 214.70**	**$ 221.99**	**$ 228.34**	**$ 233.81**	**$ 236.89**	**$ 240.65**	**$ 242.62**	**$ 243.22**	**$ 241.93**	**$ 240.78**	**$ 237.45**
REVENUE SOURCES													
Total Sales and Use Tax	$ 182.33	$ 187.80	$ 193.44	$ 199.24	$ 205.22	$ 211.38	$ 217.72	$ 224.25	$ 230.98	$ 237.90	$ 245.04	$ 252.39	$ 259.96
Passenger Revenues	$ 34.29	$ 34.64	$ 36.49	$ 37.45	$ 37.83	$ 38.21	$ 40.25	$ 41.31	$ 41.73	$ 42.14	$ 44.40	$ 45.57	$ 46.03
Federal Asst.(JARC, 5307, Misc Grants)	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
State Assistance	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
Fuel Tax Refund (State)	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00	$ 0.00
Investment Income	$ 1.15	$ 1.21	$ 1.27	$ 1.31	$ 1.34	$ 1.37	$ 1.41	$ 1.44	$ 1.48	$ 1.52	$ 1.55	$ 1.59	$ 1.63
Lease Income	$ 0.96	$ 0.98	$ 1.01	$ 1.03	$ 1.06	$ 1.08	$ 1.11	$ 1.14	$ 1.17	$ 1.20	$ 1.23	$ 1.26	$ 1.29
Other (Miscellaneous)	$ 0.46	$ 0.47	$ 0.48	$ 0.49	$ 0.51	$ 0.52	$ 0.53	$ 0.55	$ 0.56	$ 0.57	$ 0.59	$ 0.60	$ 0.62
TOTAL SOURCES	**$ 219.20**	**$ 225.11**	**$ 232.69**	**$ 239.53**	**$ 245.95**	**$ 252.56**	**$ 261.02**	**$ 268.69**	**$ 275.91**	**$ 283.33**	**$ 292.81**	**$ 301.41**	**$ 309.53**
USES													
Operating Labor	$ 20.07	$ 20.67	$ 21.29	$ 21.30	$ 21.94	$ 22.70	$ 23.28	$ 23.97	$ 24.69	$ 24.70	$ 25.44	$ 26.32	$ 26.99
Adminstrative Labor	$ 0.72	$ 0.67	$ 1.29	$ 1.32	$ 1.35	$ 1.39	$ 1.42	$ 1.46	$ 1.49	$ 1.53	$ 1.57	$ 1.61	$ 1.65
Benefits	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Services	$ 1.17	$ 2.00	$ 1.24	$ 2.00	$ 1.30	$ 2.00	$ 1.37	$ 2.00	$ 1.44	$ 2.00	$ 1.51	$ 2.00	$ 1.59
Paratransit	$ 2.09	$ 2.09	$ 2.10	$ 2.15	$ 2.20	$ 2.26	$ 2.32	$ 2.37	$ 2.43	$ 2.49	$ 2.56	$ 2.62	$ 2.68
Fuel	$ 5.93	$ 6.12	$ 6.31	$ 6.47	$ 6.63	$ 6.80	$ 6.97	$ 7.14	$ 7.32	$ 7.50	$ 7.69	$ 7.88	$ 8.08
Other Materials and Supplies	$ 1.82	$ 1.88	$ 1.93	$ 1.98	$ 2.03	$ 2.08	$ 2.14	$ 2.19	$ 2.24	$ 2.30	$ 2.36	$ 2.42	$ 2.48
Utilities	$ 1.07	$ 1.10	$ 1.14	$ 1.16	$ 1.19	$ 1.22	$ 1.25	$ 1.29	$ 1.32	$ 1.35	$ 1.38	$ 1.42	$ 1.45
Casualty & Liability Costs	$ 5.00	$ 5.00	$ 5.00	$ 5.13	$ 5.25	$ 5.38	$ 5.52	$ 5.66	$ 5.80	$ 5.94	$ 6.09	$ 6.24	$ 6.40
Other	$ 1.81	$ 1.87	$ 1.93	$ 1.98	$ 2.03	$ 2.08	$ 2.13	$ 2.19	$ 2.24	$ 2.30	$ 2.35	$ 2.41	$ 2.47
SUBTOTAL OPERATING USES	**$ 192.16**	**$ 198.78**	**$ 205.65**	**$ 212.77**	**$ 220.15**	**$ 227.81**	**$ 235.76**	**$ 244.00**	**$ 252.56**	**$ 261.44**	**$ 270.65**	**$ 280.21**	**$ 290.13**
NET (OPERATIONS)	**$ 27.04**	**$ 26.33**	**$ 27.05**	**$ 26.76**	**$ 25.80**	**$ 24.75**	**$ 25.26**	**$ 24.68**	**$ 23.35**	**$ 21.90**	**$ 22.16**	**$ 21.20**	**$ 19.39**
LOCAL CAPITAL REQUIREMENT	**$ (17.25)**	**$ (18.91)**	**$ (19.76)**	**$ (20.41)**	**$ (20.33)**	**$ (21.66)**	**$ (21.50)**	**$ (22.71)**	**$ (22.75)**	**$ (23.19)**	**$ (23.31)**	**$ (24.54)**	**$ (24.65)**
ENDING CASH BALANCE - In Current Dollars	**$ 199.79**	**$ 207.20**	**$ 214.49**	**$ 220.84**	**$ 226.31**	**$ 229.39**	**$ 233.15**	**$ 235.12**	**$ 235.72**	**$ 234.43**	**$ 233.28**	**$ 229.95**	**$ 224.69**

6. Conclusion

As the primary provider of public transit in central Ohio, COTA must prepare to respond to the population, employment and congestion growth expected to occur in the next 24 years and beyond. Projections from the Mid-Ohio Regional Planning Commission (MORPC) expect a 13 percent increase in population, 15 percent increase in jobs and 13 percent increase in highway congestion within COTA's service area by 2040. The 2016-2040 Long-Range Transit Plan (LRTP) includes COTA's strategies and initiatives to respond to this growth as well as a summary of public involvement activities and how COTA will fund its plans.

Early in the LRTP plan timeframe, the Transit System Redesign (TSR) – a major restructuring of COTA's existing bus network – includes expanding COTA's fixed-route service hours by 11.3 percent by 2019. Paratransit service for people with disabilities also expands in conjunction with the TSR, including a 16 percent increase in funding for Mainstream paratransit service through 2019. The TSR will improve service frequencies on many lines to add capacity and enhance convenience by reducing wait times between buses to meet existing and future demand. Fixed-route annual service hours are projected to grow from 1,124,626 to 1,251,820 by 2019, at which time COTA will reach the maximum amount of service hours that can be supported by the current 0.5 percent sales tax. It is projected that service levels will remain unchanged from 2019-2040, and that COTA will maintain both its permanent 0.25 percent sales tax and 0.25 percent 10-year renewable sales tax throughout the LRTP timeframe.

The new CMAX Cleveland Avenue Bus Rapid Transit (BRT) will improve connectivity in the Cleveland Avenue travel corridor by providing high frequency service at new, uniquely branded stations, and technology enhancements such as traffic signal priority. With an estimated 20 percent reduction in trip times compared to current local service, CMAX is expected to begin in January 2018. The BRT line will offer improved travel times and reliability, new pedestrian amenities and real-time, next bus arrival display information. The project's estimated capital cost is $48.6 million, of which $37.4 million has been appropriated by Congress from the FTA's Section 5309 New Starts program for federal Fiscal Year 2016.

Currently underway, COTA NextGen looks towards the future through 2050, developing potential transit improvements that could occur in the region. Improvements include both high-capacity projects, such as BRT and rail options, as well as how to expand the fixed-route network and new services, such as on-demand, last mile options connecting riders to job sites. Although the project has not identified additional funding required to implement, the final report will include strategies for funding and recommendations for when to implement the improvements. The initiative will better position COTA to pursue federal funding. NextGen is scheduled to be completed in the spring of 2017.

Additionally, the LRTP contains initiatives and projects required to support COTA's transportation services and improve the rider experience. Intelligent Transportation System (ITS) improvements include an alternative method of fare payment such as a smart phone or smart card application to purchase passes, and next bus, real-time arrival information that will tell a waiting rider when

their bus is expected to arrive at their stop. Future facility improvements include renovation of the Easton Transit Center and Park and Ride in conjunction with the implementation of the TSR, renovation of the Fields Avenue campus to support expansion of COTA's CNG bus fleet and paratransit vehicles, and a new Northland Transit Center and Park and Ride near Cleveland Avenue and SR-161/Dublin Granville Road as part of the CMAX BRT project.

COTA's 2016-2040 LRTP prepares the agency to respond to long-term, future growth in central Ohio. The TSR, NextGen and CMAX were developed in response to feedback received through extensive public involvement, local planning efforts and outcomes of data analysis and trends. COTA will continue to seek ways to improve transit for the residents and visitors of central Ohio, enhancing economic vitality and quality of life.

Appendix A

List of Acronyms

Acronyms	Name
4G	fourth-generation technology
ADA	Americans with Disabilities Act
APC	Automatic Passenger Counter
AVA	Automated Voice Annunciator
BOS	Bus On Shoulder
BREAD	Building Responsibility Equity and Dignity
BRT	Bus Rapid Transit
CEPAC	Chemical Emergency Preparedness Advisory Council
CIG	Capital Investments Grants
CIP	Capital Improvement Program
CMAQ	Congestion Mitigation and Air Quality
CNG	Compressed Natural Gas
CO	Carbon monoxide
COTA	Central Ohio Transit Authority
CTC	Columbus Transit Company
DOT	US Department of Transportation
EOC	Emergency Operations Center
EPA	Environmental Protection Agency
ESF	Emergency Support Function
FAST Act	Fixing America's Surface Transportation Act
FCEMA	Franklin County Emergency Management Agency
FCEMHS	Franklin County Emergency Management and Homeland Security Agency
FCEO	Franklin County Engineer's Office
FFGA	Fully funding grant agreement
FTA	Federal Transit Administration
GPS	Global Positioning System
GREAT	Groveport Rickenbacker Employee Access Transit
HVAC	Heating, ventilation and air conditioning
ID	Identification
ITS	Intelligent Transportation System
IVR	Interactive Voice Response
LEED	Leadership in Energy and Environmental Design
LPA	Locally Preferred Alternative
LRT	Light Rail Transit
LRTP	Long-Range Transit Plan
Map-21	Moving Ahead for Progress in the 21st Century
MHz	MegaHertZ

Acronyms	Name
MORPC	Mid-Ohio Regional Planning Commission
MTP	Metropolitan Transportation Plan
NEPA	National Environmental Policy Act
NOx	Nitrogen oxide
O&M	Operations and Maintenance
ODOT	Ohio Department of Transportation
OSU	The Ohio State University
PAG	Project Advisory Group
PI	Public Involvement
ROW	Right of Way
RPM	revolutions per minute
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (Federal surface transportation authorization for 2005-2009)
SRTP	Short-Range Transit Plan
SWACO	Solid Waste Authority of Central Ohio
TAC	transit advisory committee
TIP	Transportation Improvement Program
TOD	Transit-Oriented Development
TSA	Transportation Security Administration
TSP	Traffic signal priority
TSR	Transit System Redesign
ULI	Urban Land Institute
VIPR	Visible Intermodal Protection Response
VOC	Volatile organic compounds
YOE	Year of Expenditure