

Reinventing Metro Service Implementation Study

February 2019



AECOM

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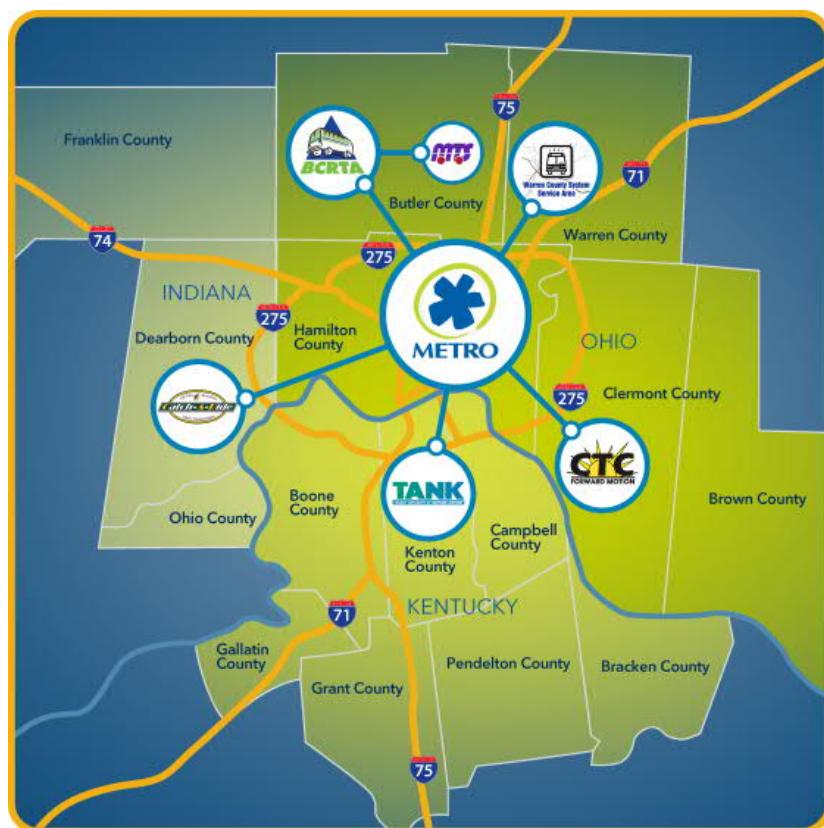
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1 Introduction/Creating a Connected Region

Reinventing Metro is a plan of action to significantly improve transit service within the Cincinnati Metropolitan Region. The plan is based on changing SORTA's funding source from an earnings tax collected by the City of Cincinnati that is allocated to SORTA to a sales tax throughout Hamilton County that is collected directly by SORTA. The change in funding for SORTA is projected to allow for significant increases in service levels, reversing the recent trend of service decreases due to budget deficits.

While the Reinventing Metro is focused on service in Hamilton County, it is recognized that changes to Metro services in Hamilton County will affect demand for service provided by regional transit partners in neighboring counties, specifically the Transit Authority of Northern Kentucky (TANK), Butler County Regional Transit Authority (BCRTA), Warren County Transit Services, Clermont Transportation Connection (CTC), and Catch-A-Ride in Dearborn County. The integrated region for transit travel is reflected on Figure 1-1. Because of travel patterns, regional transit partners have begun coordinating to improve the overall travel experience for customers, especially those who travel using multiple transit systems.

Figure 1-1: The Integrated Region



Coordination among operators takes many forms and a working group of all the regional operators has been formed for the purposes of coordination. Coordination begins with service and the Reinventing Metro plan does have conceptual service options to improve regional travel. These conceptual routes should be considered as part of each transit service operator's planning process. Paratransit coordination is an important part of service coordination, as each operator has their own policies regarding paratransit eligibility and service provision. Service and paratransit integration and coordination are presented later in this document. Other ways service providers are coordinating are in fare policy and fare media along with other customer service enhancements.

This study presents the Reinventing Metro plan that is predicated on the change from an earnings tax to a sales tax. The remainder of this chapter provides background on the Reinventing Metro plan, specifically efforts that have led to the plan, the process and regional demographics. Chapter 2 presents the Reinventing Metro Plan for Hamilton County services. The conceptual regional transit network is presented in Chapter 3. Chapter 4 presents fare policy and revenue allocation. The economic analysis of the Reinventing Metro plan is presented in Chapter 5. Chapter 6 presents the capital program and Chapter 7 presents the financial plan. The next steps are presented in Chapter 8.

1.1 Planning Process

Reinventing Metro is a financially constrained plan that has a realistic implementation schedule. The process for the Reinventing Metro started in 2015 with the SORTA Service Evaluation, Development, and Management Study which identified most of the route alternatives. In parallel SORTA convened the Metro Futures Task Force to study the issues affecting ridership and funding issues facing SORTA. The findings from the task force was that current funding would not be sustainable for current SORTA operations and a new funding paradigm would be needed to support bus services. A sales tax to support SORTA would not only allow current service to be maintained, but also grow the system to meet the needs of Hamilton County, including Bus Rapid Transit.

The Reinventing Metro plan began by identifying service alternates that can be supported with the sales tax revenue. An implementation program was developed that takes into account the realities of available funding and time to purchase vehicles and train drivers. Therefore the earlier year improvements require fewer new buses to allow for future year bus procurements. It can take up to six months to train a bus operator, therefore alternatives that require a significant number of additional bus operations personnel are also not included in the first year.

A proper plan is designed to be flexible. As SORTA continually hires additional personnel to support current services, the pool of available bus operators may increase. Along with deferring the retirement of buses, this may create an opportunity to fast-track service improvements, allowing for certain services to be implemented faster than this implementation plan suggests. The potential services that could be implemented sooner would depend on the priorities of SORTA and the Board of Trustees. Conversely, if the amount of funding available from the sales tax is less than expected then elements of this plan can be slowed to match available revenue.

1.2 Regional Overview

Part of the planning process was to look at regional demographics to identify areas where transit service improvements would be most effective. The demographic analysis was not limited to Hamilton County; rather it included the entire region as travel patterns and transit need is a regional issue. From the demographic analysis, areas where transit improvements should occur were identified, which include a mix of new routes and improvements to current routes.

The first demographic indicator that was analyzed is population density. Transit use is higher in areas that have a higher population density. Regional population density is presented on Figure 1-2. This map shows that population in the urban portions of Hamilton County, which are served by SORTA bus routes, have the highest population density. In neighboring counties higher population density is located in the cities in each county and along major highway corridors.

People who identify as minority tend to use transit at a higher rate. Also, areas that have a high percentage minority population or are more subject to protections under Title VI of the 1964 Civil Rights Act. Minority population percent is presented on Figure 1-3. This map shows that the census tracts that have the highest percentage of minority population are primarily located in the more urban parts of Hamilton County. That being said, there are isolated tracts with high minority population located throughout the region, with most located in areas that are served by the regional transit network.

Low income people are more likely to use transit due to the affordability of an automobile. Therefore the demographic analysis looked at areas with a high percentage of people living in poverty. Figure 1-4 presents the percentage of persons in poverty by census tract. This map shows that there are higher percentages of people in poverty in cities and towns throughout the region, specifically in tracts closer to the center of the city.

People who do not own a car are likely users of transit therefore percent of zero-car households is an indicator of transit demand. Percent of zero-car households is presented in figure 1-5. This figure shows very similar patterns to the percent poverty statistic, as people in poverty are less likely to be able to afford a car. In areas that have a high zero-car household percent, robust transit service is available.

The most common use of transit is for access to jobs. Figure 1-6 presents the total number of jobs by census tract. This figure shows that there are a number of job hubs in the region including Downtown Cincinnati, Uptown, Blue Ash, Southern Butler County, Southern Warren County, Covington, and the airport area. While there are a lot of jobs in southern Boone and Kenton Counties, these are in large census tracts therefore these jobs are spread over a large area.

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Figure 1-2: Population Density by Census Tract

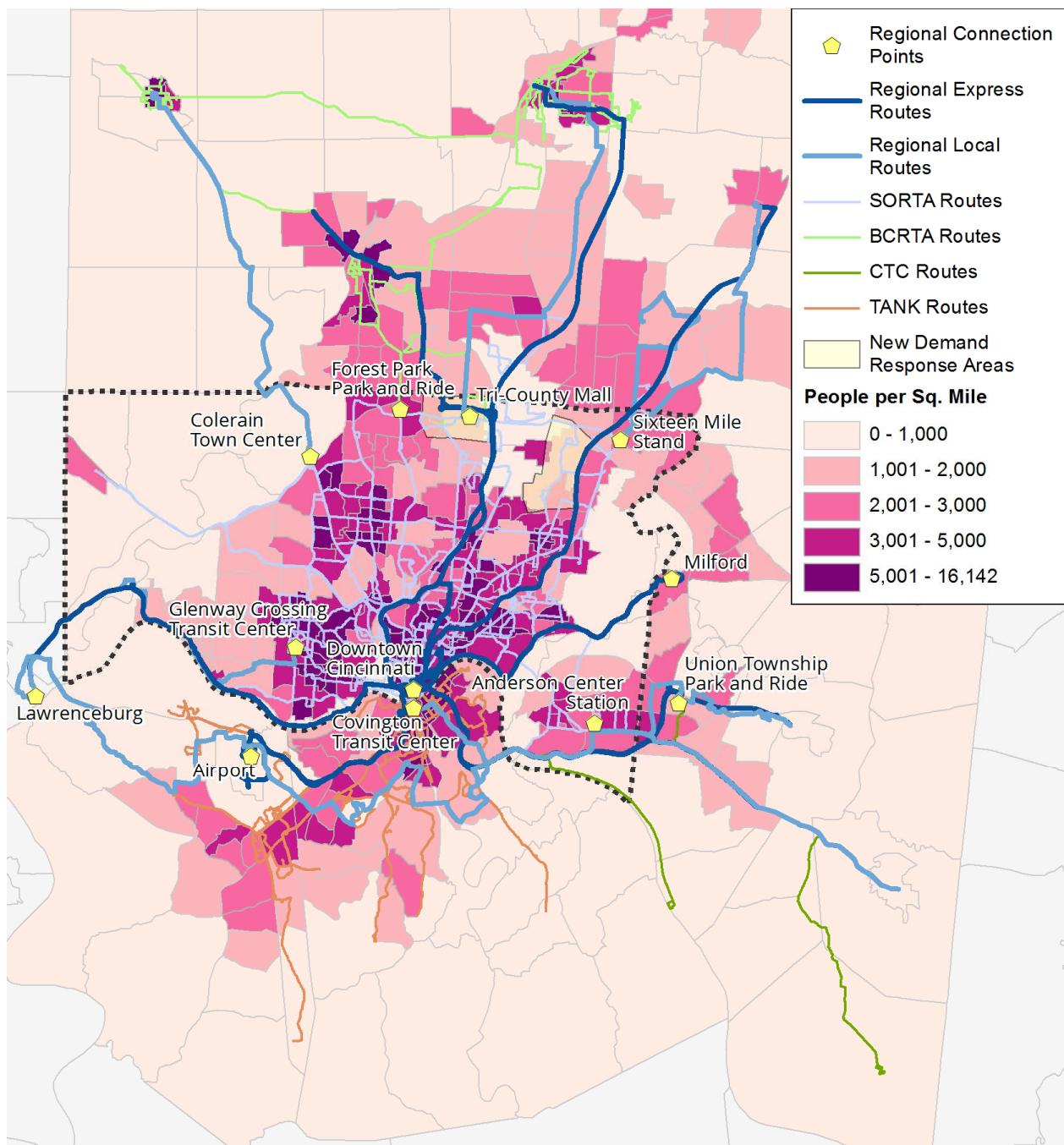


Figure 1-3: Percent Minority Population by Census Tract

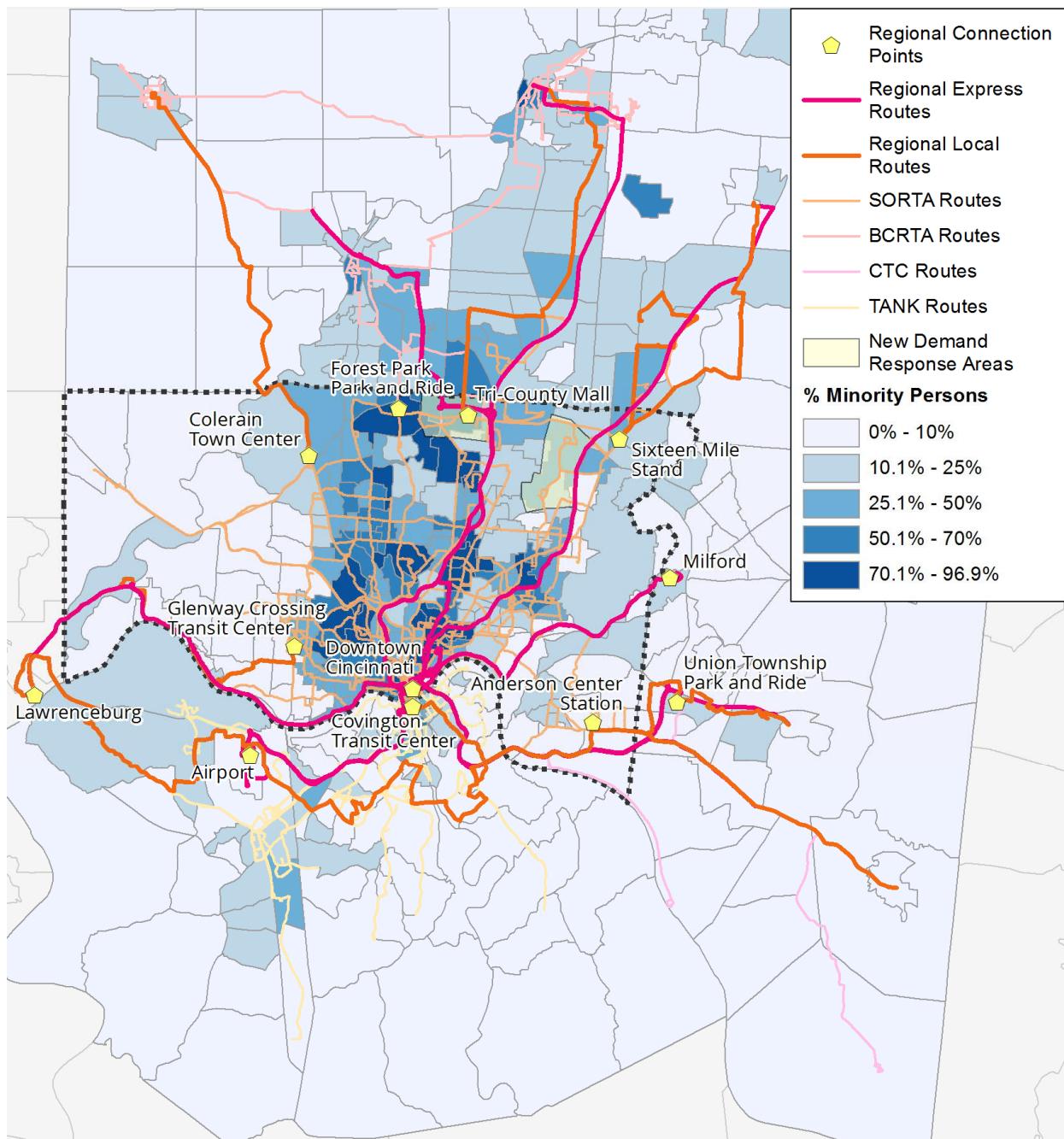


Figure 1-4: Percent of Population Living in Poverty by Census Tract

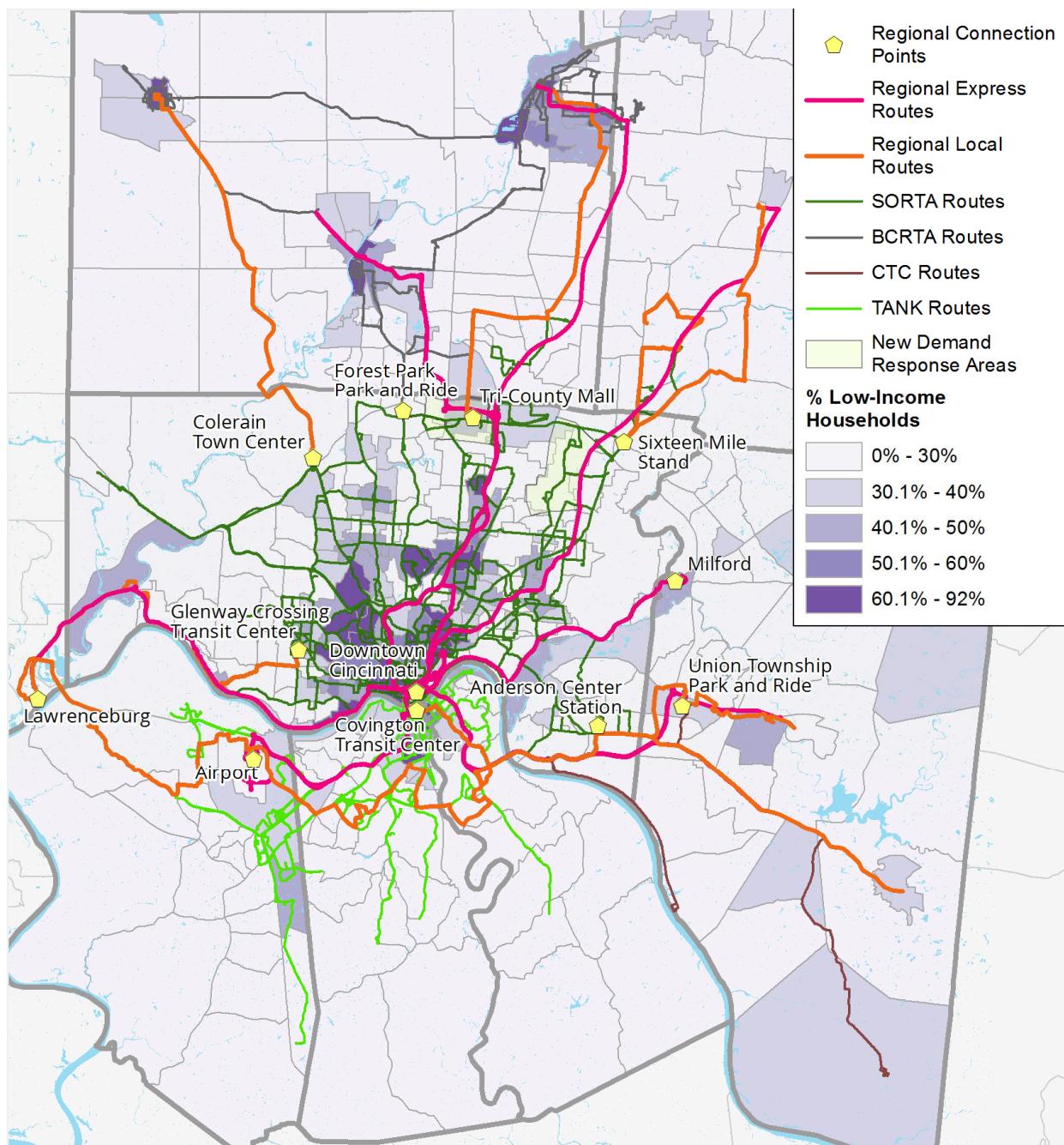


Figure 1-5: Percent of Zero Car Households by Census Tract

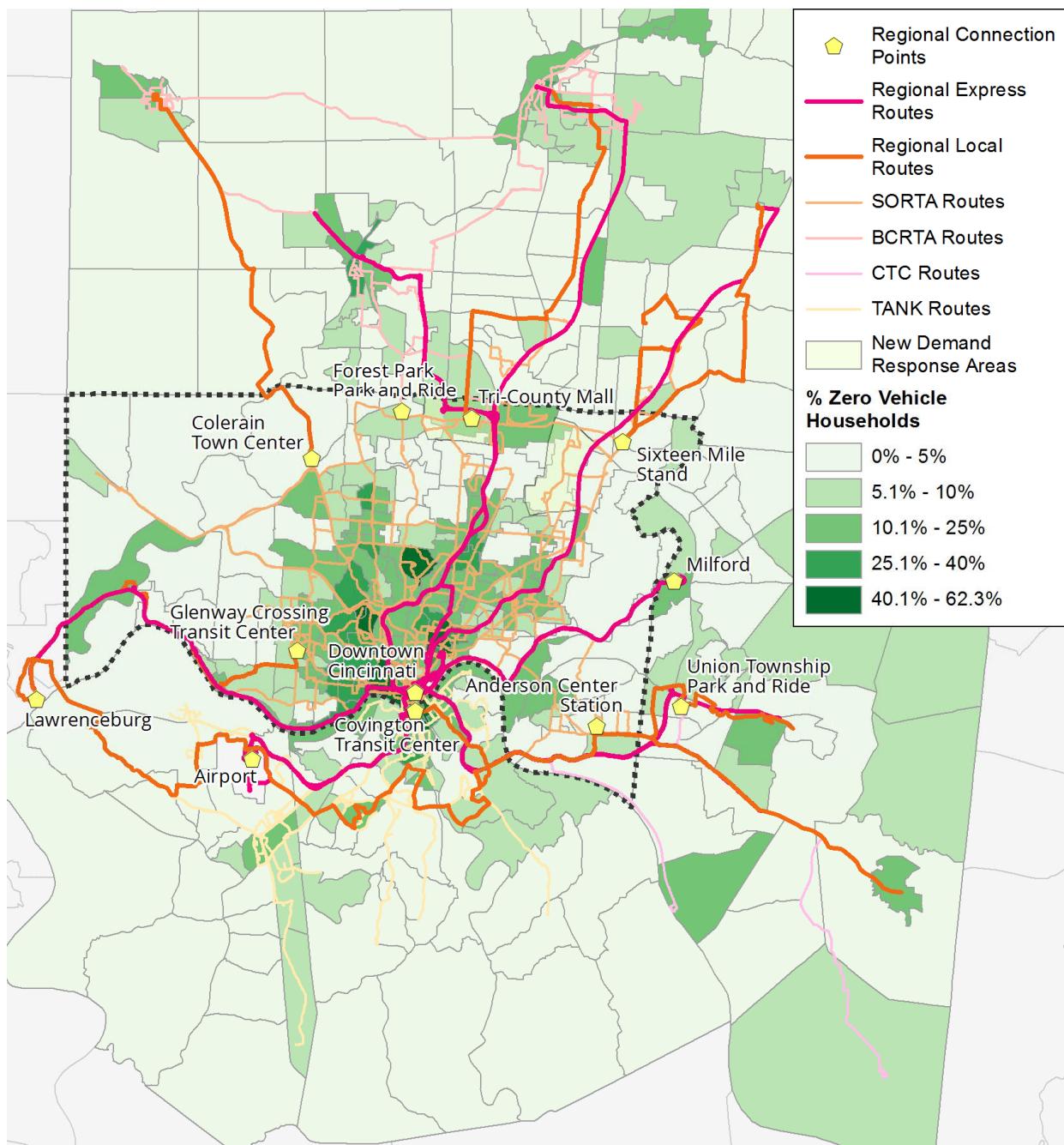
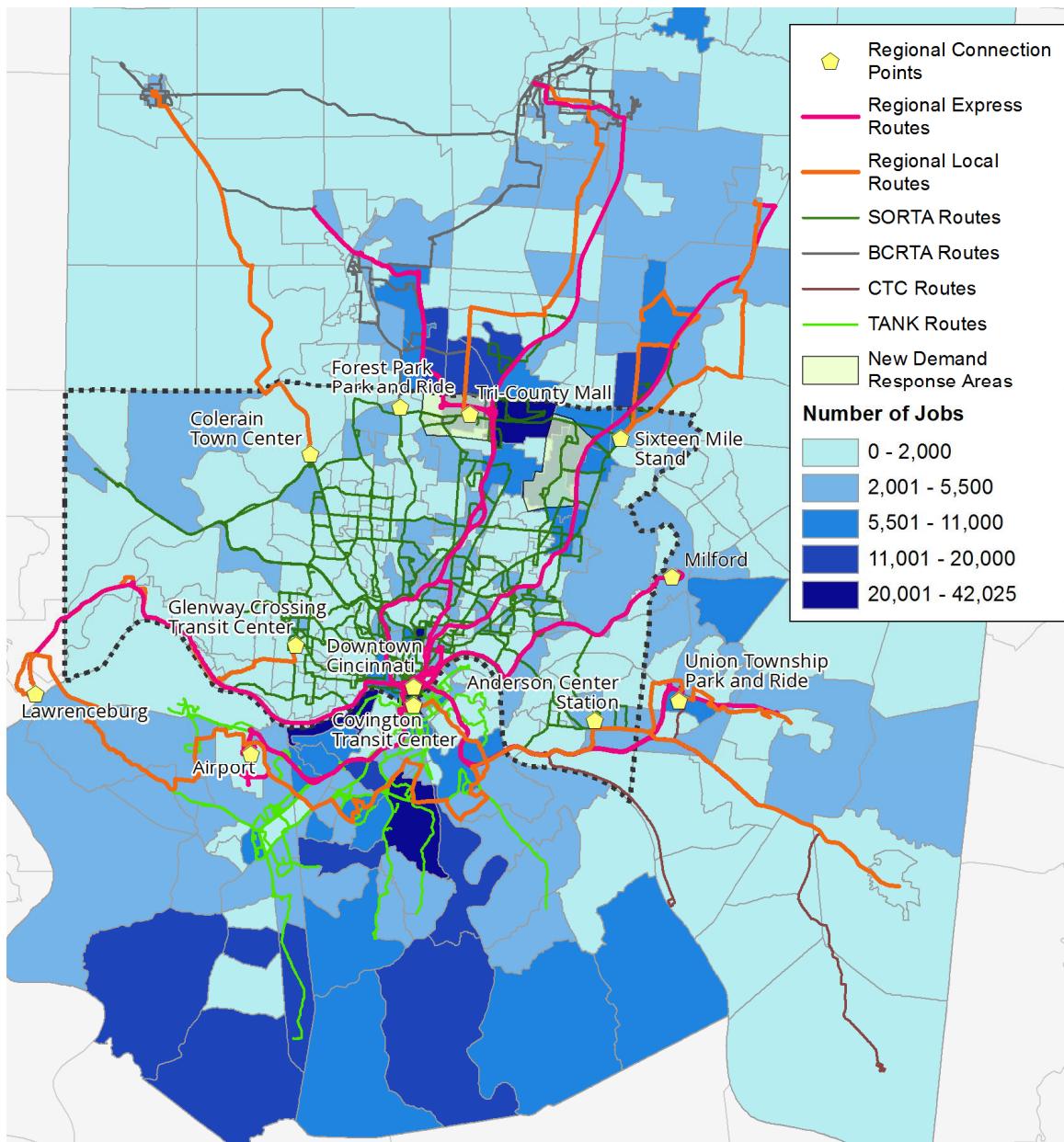


Figure 1-6: Total Jobs by Census Tract



1.3 Benefits of Reinventing Metro

The Reinventing Metro plan will significantly improve transit service throughout Hamilton County. This will improve regional mobility by improving connections not only within Hamilton County but to services in neighboring counties. While the primary benefit will be more frequent service along for more convenient, and quicker, access to jobs, there are other benefits as well. More frequent services will make transfers easier for passengers who need to take more than one bus to complete their trips. Improvements to midday, nighttime, and weekend services will allow for more flexible travel allowing for transit to be used not only for traditional job shifts, but for people working overtime or non-standard

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job hours. Improved area coverage, from new and extended routes, will allow for access to jobs at more locations and for service to other trip generators. The improvements will also allow more people to use the bus for entertainment and shopping purposes, improving the local area economy.

2 Reinventing Bus Network

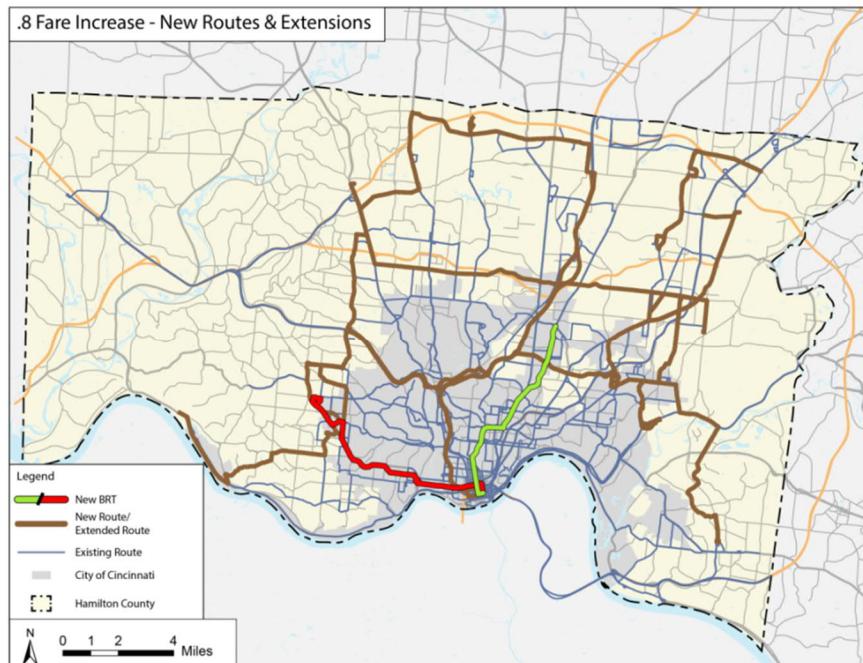
The Reinventing Metro plan is based on a 0.8% sales tax and is presented in this chapter. This is the culmination of a process where many preliminary service plans were developed, and presented, based on various potential tax levels and fare levels. The sales tax level that is recommended to be put on the ballot is a 0.8 sales tax levy that does include annual fare increases. This memorandum also includes discussion regarding improving regional coordination of transit services and operations to improve overall regional transit mobility.

The 0.8 sales tax does include introducing two Bus Rapid Transit (BRT) corridors. These would be high quality BRT services that are an improvement over the current Metro*Plus service. The two BRT lines will be along Reading Road and Glenway Avenue.

The 0.8 sales tax does allow for service improvements on most routes, including 24-hour service along major corridors, high frequency services along major corridors, improved off-peak service levels on most SORTA routes, new crosstown routes, and extension of routes into new service areas. Figure 2-1 presents new routes and route extensions that are a part of this service plan. Figure 2-2 presents service frequency improvements. Service span improvements are presented on Figure 2-3.

This proposed service plan requires approximately 91 additional buses for local and express buses. This does not include buses for BRT, which would add another 20 buses. Even with many of the new buses being smaller buses, it is still expected that either a significant expansion of the current garages, or a new garage will be needed to store and maintain this expanded fleet. The construction of a new garage or the expansion of a garage would be accomplished with a combination of local and federal funds. The financial plan presented here does set funding aside for the local match for a new or expanded garage.

Figure 2-1: 0.8 Penny Sales – New Routes and Route Improvements



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Figure 2-2: 0.8 Penny Sales – Service Frequency Improvements

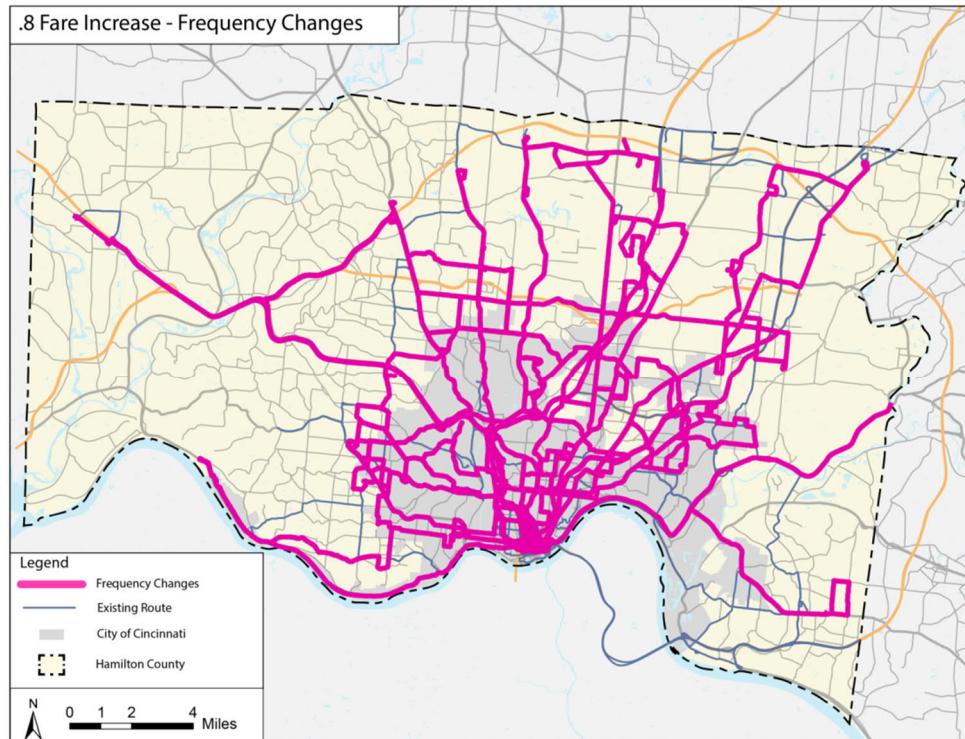
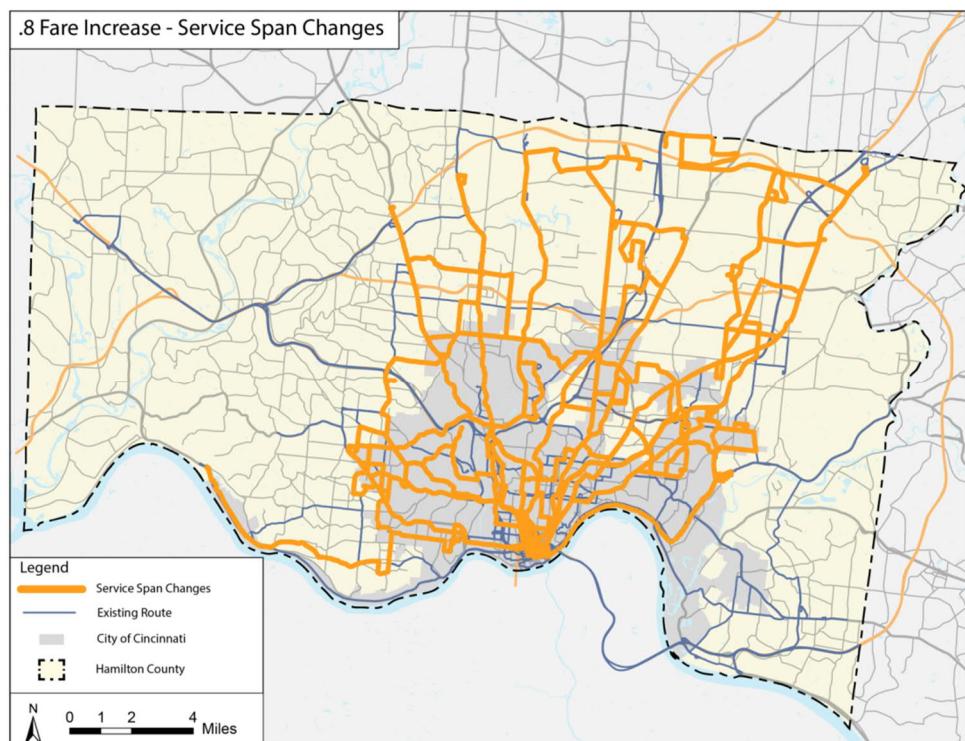


Figure 2-3: 0.8 Penny Sales – Service Span Improvements



2.1 Implementation

The implementation program has to properly balance short and long term financial levels, staffing, and availability of capital resources. The financial plan does show that once SORTA transitions from an earnings tax based funding source to a 0.8 sales tax, there will almost immediately be available funding to support the current capital program, an expanded capital program that will include BRT, increase the amount in SORTA's reserve fund, and allow for immediate increases in service.

All of the service increases will happen within the first four years beyond 2020 through 2022. This will allow for a sustainable increase in service, along with time to acquire buses and train bus operators. This will allow for latter years to focus on implementing Bus Rapid Transit and service monitoring of all bus services.

Part of the schedule changes should be that each of the routes will need a completely new schedule created. The operating plans assume recalibrating schedules to reflect updated running time and that route headways will be evenly spaced at control points along the trunk of a route at all times. This will be important to maintain a consistent and reliable service for SORTA's passengers, a key to maintaining and growing ridership.

The service improvements for each route each year are presented on Table 2-1.

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Table 2-1: Route Improvements by Year

Route	Span				Frequency				New or Modified Routes				No Change
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023	
1													X
2X								X					
3/3X			X					X					
4	X								X		X		
6				X					X				
11	X								X				
12X/25X			X					X				X	
14X			X										
15X			X					X					
16	X				X								
17	X								X				
19		X				X							
20	X				X								
21				X					X				
23/23X			X										
24									X			X	
27													X
28									X				
29X			X					X					
30X			X					X					
31			X					X					
32			X					X					
33	X				X								
35												X	
37X/38X												X	
40X			X										
41			X					X					
42/42X													X
43	X											X	
46	X				X							X	
49													X
50									X				
51			X					X					
52X			X					X				X	
61											X		
62											X		
64									X				
67		X				X					X		
71/71X													X
72													X
73												X	
74X			X									X	
75X/81X			X									X	
77X			X									X	
78	X				X			X					
82X													X
84											X		
85													X
Metro*Plus 90													X
Blue Ash Circulator											X		
Springdale Circulator											X		

2.1.1 Implementation Process

The service plan assumes that the sales tax is passed in a May 2019 special election. SORTA's customers will want to see improvement to bus service as soon as possible after the sales tax is passed. There are number of steps that SORTA will need to undertake between the May 2019 election and the implementation of the first service changes. A timeline is presented below:

- May 2019: sales tax is approved by the voters
- May 2019: Planning for new services begins immediately:
 - Testing of routes and development of finalized alignments
 - Identify bus stop locations
- June 2019: Public outreach begins to inform the public of service changes and analysis of the Title VI impacts of service changes
- Summer 2019:
 - Advertise and begin hiring process for additional staff
 - Schedule development for Year 2020 services
- September 2019: Begin training of new staff
- November 2019: Start receiving sales tax revenue
- January 2020: 2020 services begin

The improvements that will be implemented in 2020 will not require additional buses, however in subsequent years additional buses will be needed. Procurement of buses can take up to 18 months so the procurement of buses for 2021 may need to start very soon after the passage of the sales tax. Also, implementation needs to be flexible so additional buses may be needed earlier if certain elements of the Reinventing Metro plan are fast-tracked.

2.2 Hamilton County Bus Network

The Reinventing Metro plan assumes funding for the Hamilton County bus network. This network includes the routes that serve all areas of Hamilton County. What is not included in this plan are routes that have outside funding sources such as the XTRA services and express services that are primarily funded by neighboring counties. The neighboring county routes are further discussed in the regional transit service section.

Besides the regular Hamilton County network, the Reinventing Metro plan introduces flexible services. These are services that can range from route deviation services which are fixed routes that passengers can call and request the route stop anywhere within $\frac{3}{4}$ miles of the fixed route, for an additional fare, to a general public dial-a-ride/microtransit where passengers make trip reservations and the bus picks up passengers at a designated location within the zone and delivers that passenger to another designated location. Flexible services are ideal for serving low density areas and generators that have large setbacks that traditional bus services cannot adequately serve without inconveniencing passengers who are going a longer distance. Flex service zones are also ideal to serve areas where traditional transit bus service is carrying high passenger volumes. Ideally the flex services will be coordinated with fixed routes to provide first and last mile connections to the fixed bus route network.

The implementation of each service by year is presented in the following subsections. The implementation provides the service parameter for each route and service that is improved each year. New services are also included. Maps of each route are included as well as tables that present span, how early and late service operates, and bus service headway, the time between buses.

2.2.1 Year 2020

The expectation is that any ballot measure will be passed in the spring of 2019; therefore, the Year 2020 improvements are those that expand of Metro service without adding significant amount additional resources such as buses and additional bus operators. First year of service is expected to be 2020. The first year service improvements are focused on improving off-peak service on key corridors routes and restoring some of the service cuts that were made over the last ten years. This includes improving the span of service on major corridor routes so that service is available 24-hours a day seven days per week. The improvements also include restoration of service along Routes 16 and 20. A restructuring of Routes 43 and 46 will occur to simplify the service patterns along Reading Road. No fixed route buses will need to be purchased in Year 2020. An additional 40 transit operations, maintenance, and administration personnel will need to be hired to support the service improvements. The description of each service change is presented below and shown on Figure 2-4, with the change in hours, miles, and vehicles presented in Table 2-2.

Figure 2-4: Year 2020 Service Improvements

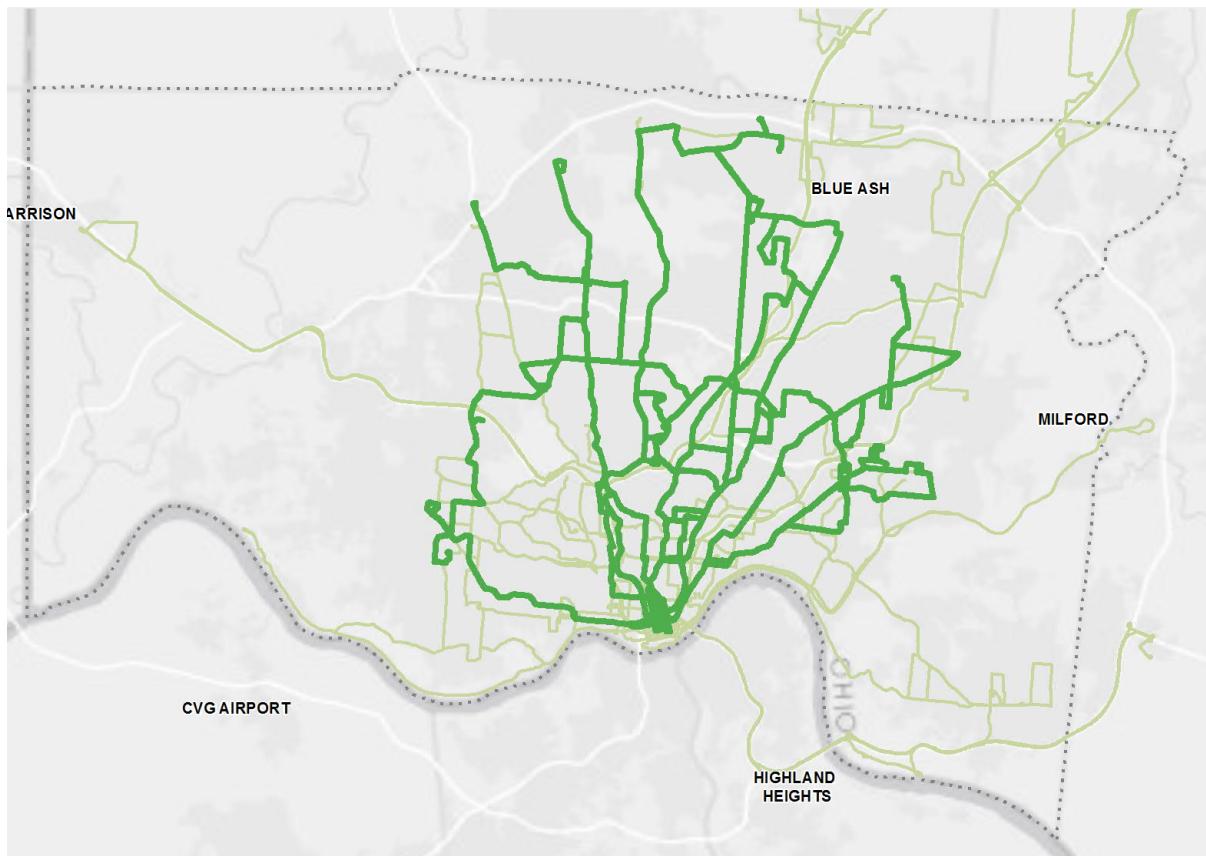


Table 2-2: Year 2020 Service Improvement Implications

Route	Additional Hours	Additional Miles	Additional Peak Buses	Additional Spare Buses	Total Additional Buses
4	4,826	57,117	0		
11	3,765	48,214	0		
16	16,499	223,352	3		
17	5,905	75,863	0		
20	13,362	201,045	3		
33	3,661	40,851	0		
43	-34,224	-421,717	-10		
46	30,110	248,665	4		
78	5,741	75,774	0		
Total	49,645	549,646	0	0	0

2.2.1.1 Route 4

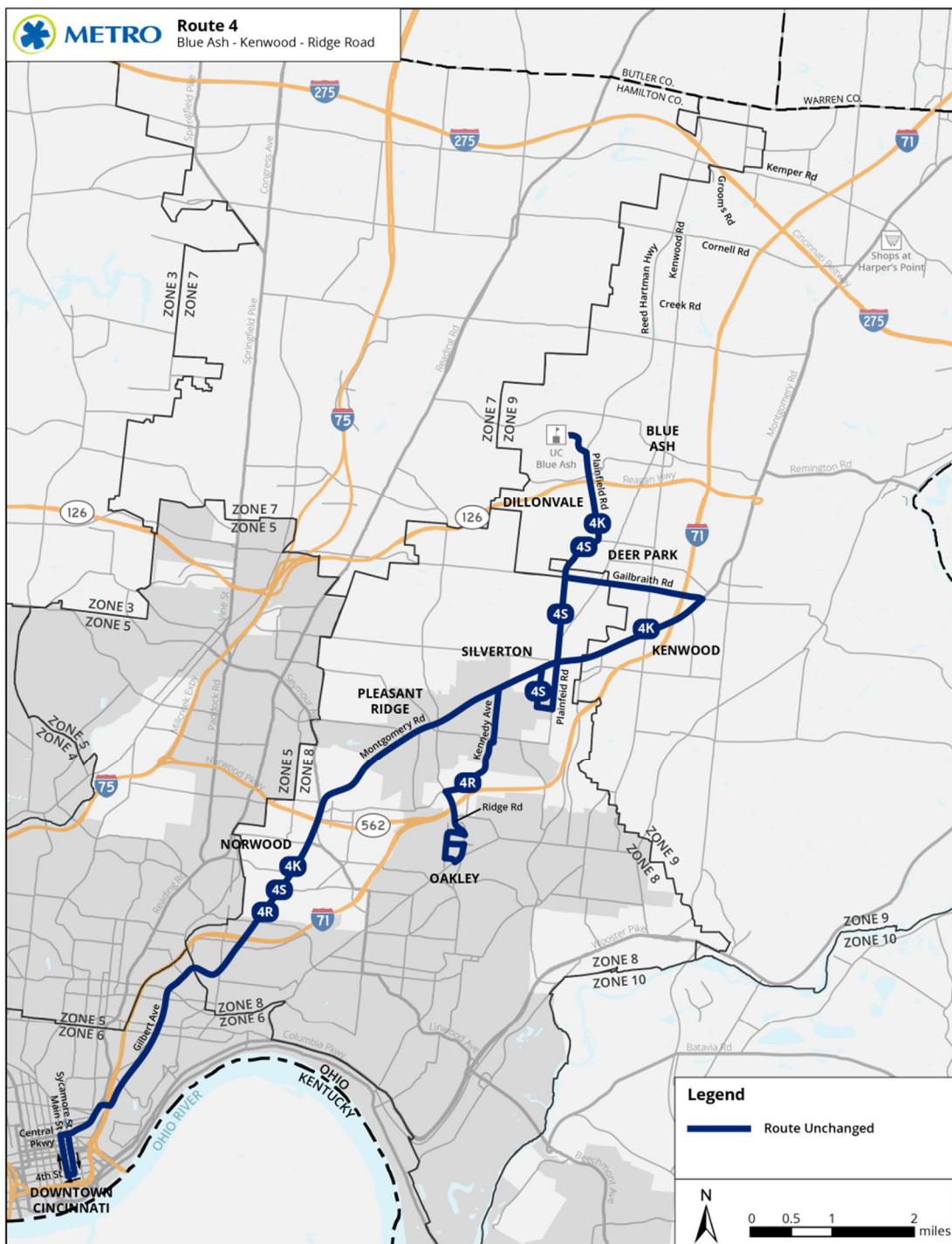
The improvements to Route 4 include providing 24-hour service seven days a week. The implication is that Route 4 service will be available at all times regardless of time of day or day of week. Route 4 would continue to operate with standard 40 foot buses. Table 2-3 presents the service parameters for Route 4 in Year 2020. A map of Route 4 is presented on Figure 2-5.

Table 2-3: Route 4 – Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	4:11AM to 12:55AM	24-Hour
Peak Headway	10 Minutes	10 Minutes
Midday Headway	20 Minutes	20 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	5:10AM to 12:30AM	24-Hour
Saturday Headway	20 Minutes	20 Minutes
Sunday Span	5:06AM to 12:30AM	24-Hour
Sunday Headway	30 Minutes	30 Minutes

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Figure 2-5: Route 4 in Year 2020



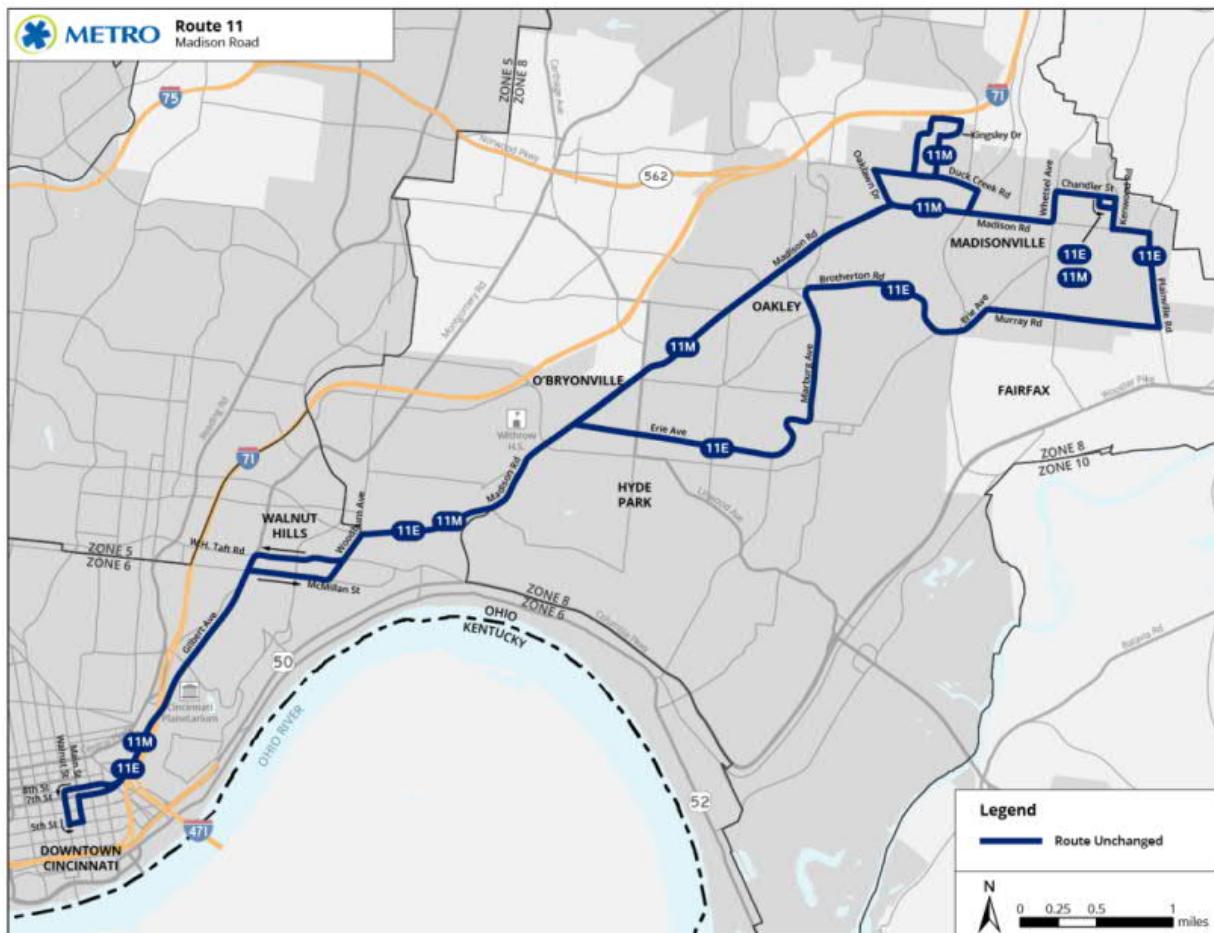
2.2.1.2 Route 11

The improvements to Route 11 include providing 24-hour service seven days a week. The implication is that Route 11 service will be available at all times regardless of time of day or day of week. Route 11 would continue to operate with standard 40 foot buses. Table 2-4 presents the service parameters for Route 11 in Year 2020. A map of Route 11 is presented on Figure 2-6.

Table 2-4: Route 11 - Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	4:43AM to 12:55AM	24-Hour
Peak Headway	10 Minutes	10 Minutes
Midday Headway	25 Minutes	25 Minutes
Evening Headway	40 Minutes	40 Minutes
Saturday Span	5:45AM to 12:45AM	24-Hour
Saturday Headway	15 Minutes	15 Minutes
Sunday Span	6:10AM to 11:40AM	24-Hour
Sunday Headway	30 Minutes	30 Minutes

Figure 2-6: Route 11 in Year 2020



2.2.1.3 Route 16

The improvements to Route 16 include restoration of Sunday service that was previously eliminated, improvements to weekday and Saturday span, and improvements to headways. On weekdays service will operate one hour later, with the last trip departing at 10:30PM instead of 9:30PM. On Saturday service will start approximately 30 minutes earlier, starting at 6:30AM and end two hours later than it does now, with the last trip departing at 10:00PM. During the weekday peak periods headways will improve from 55 minutes to 30 minutes and during midday period the headway will improve from 55 minutes to 30 minutes. During weekday evenings, and on Saturdays, the headway will decrease from 70 minutes to 60 minutes. Sunday service will be available from 7:00AM to 7:00PM with the headway being 60 minutes. Route 16 will continue to operate with standard 40 foot buses, although this route would be a candidate for 30 foot buses. Table 2-5 presents the service parameters for Route 16 in Year 2020. A map of Route 16 is presented on Figure 2-7.

Table 2-5: Route 16 - Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	4:38AM to 9:30PM	4:30AM to 10:30PM
Peak Headway	55 Minutes	30 minutes
Midday Headway	55 Minutes	30 Minutes
Evening Headway	70 Minutes	60 Minutes
Saturday Span	7:07AM to 7:50PM	6:30AM to 10:00PM
Saturday Headway	70 Minutes	60 Minutes
Sunday Span	No service	7:00AM to 7:00PM
Sunday Headway	No service	60 Minutes

2.2.1.4 Route 17

The improvements to Route 17 include providing 24-hour service seven days a week and improvements to service headway on Sunday. The implication is that Route 17 service will be available at all times regardless of time of day or day of week. Also, headways will improve on Sunday reducing from every 35 minutes to every 15 minutes. Route 17 would continue to operate with standard 40 foot buses.

Table 2-6 presents the service parameters for Route 17 in Year 2020. A map of Route 17 is presented on Figure 2-8.

Table 2-6: Route 17 - Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	4:11AM to 12:55AM	24-Hour
Peak Headway	10 Minutes	10 Minutes
Midday Headway	15 Minutes	15 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	4:48AM to 12:55AM	24-Hour
Saturday Headway	15 Minutes	15 Minutes
Sunday Span	5:38AM to 12:30AM	24-Hour
Sunday Headway	35 Minutes	15 Minutes

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Figure 2-7: Route 16 in Year 2020

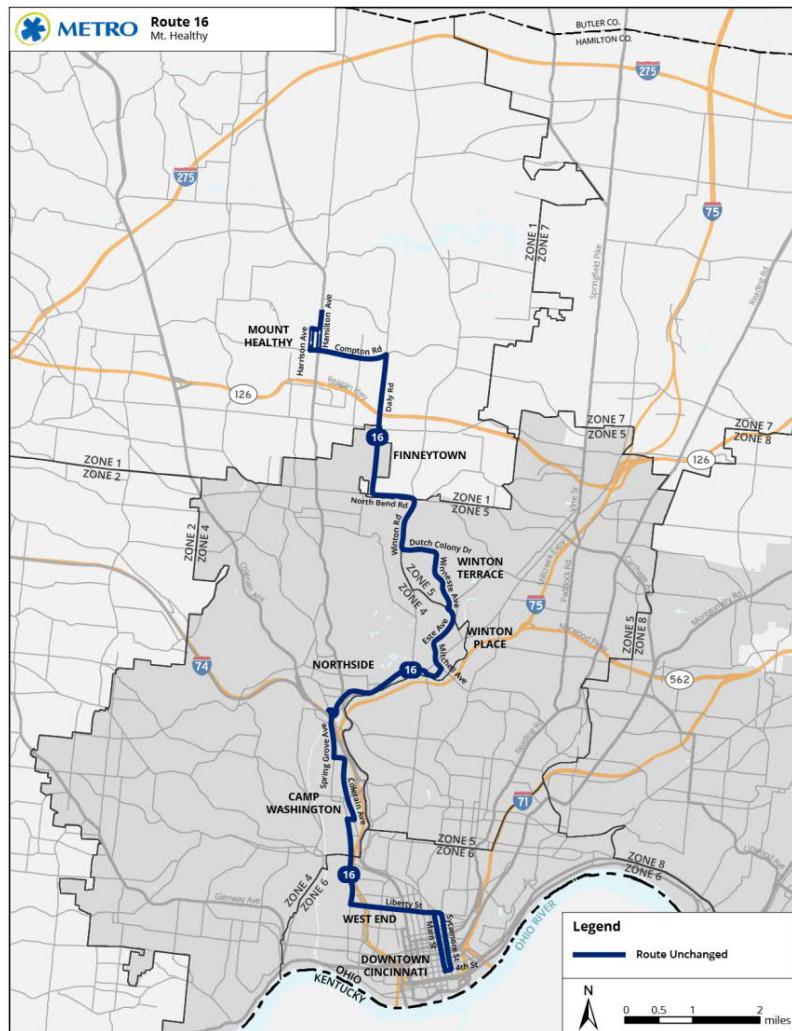
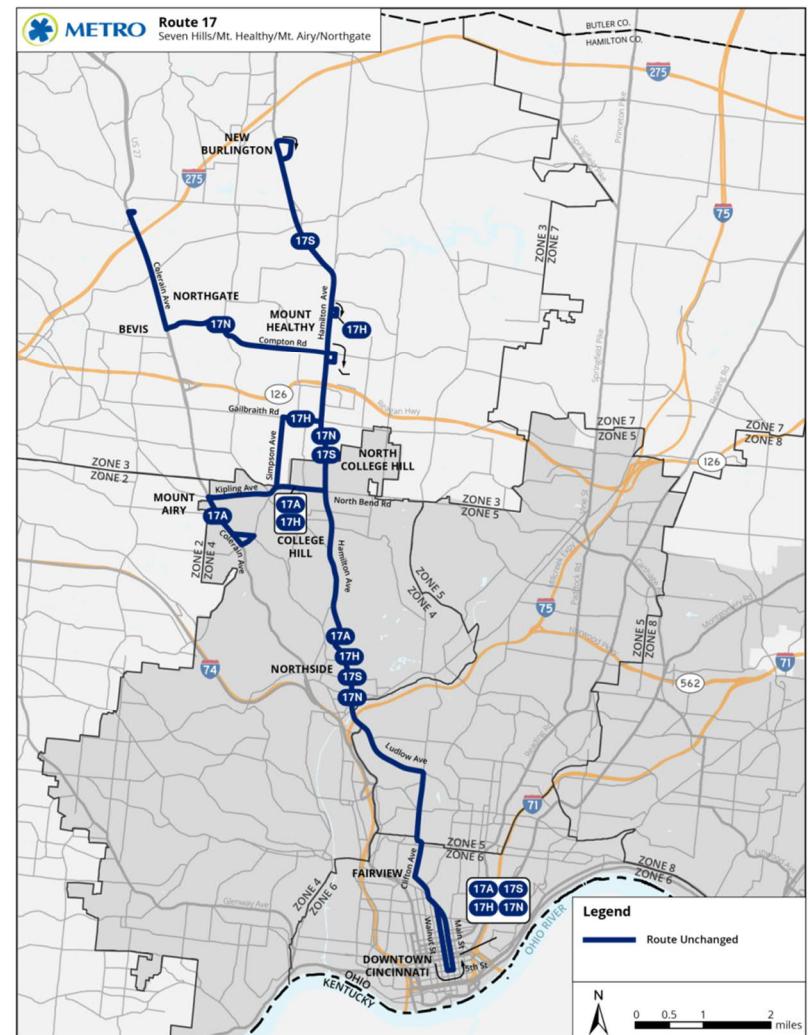


Figure 2-8: Route 17 in Year 2020



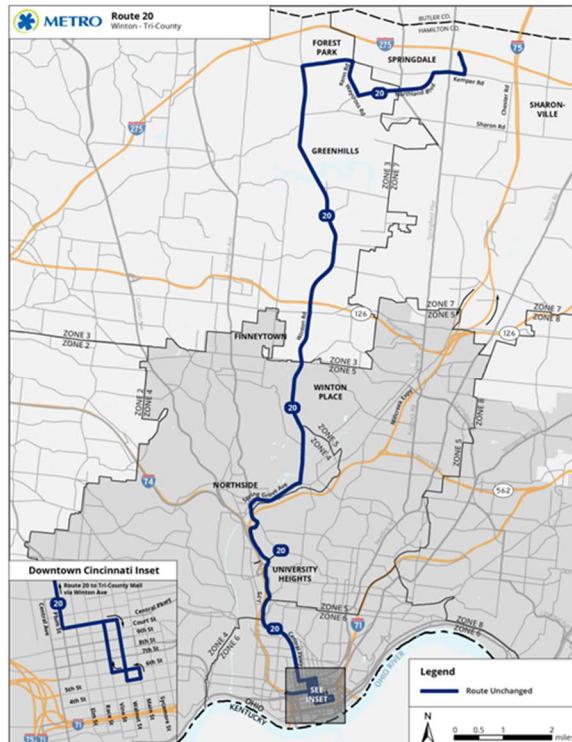
2.2.1.5 Route 20

The improvements to Route 20 include improvement to weekday service, Saturday service and the reintroduction of Sunday service. Weekday and Saturday service improvements include the extension of span on weekdays to operate between 5:30AM and 10:30PM while on Saturdays buses will be available from 6:30AM and 10:00PM which represents approximately a half hour later service. The weekday headway will also improve from 55 minutes to 30 minutes during peak periods and midday periods. During the evenings the headway will improve from 85 minutes to 60 minutes. Sunday service will operate from 7:00AM to 10:00PM with headways of 60 minutes. Table 2-7 presents the improvements to Route 20, with a map of the route shown on Figure 2-9. These service improvements would allow for better connections between Route 20 and Butler County Routes R4 and R6.

Table 2-7: Route 20 - Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	5:35AM to 8:25PM	5:30AM to 10:30PM
Peak Headway	55 Minutes	30 Minutes
Midday Headway	55 Minutes	30 Minutes
Evening Headway	85 Minutes	60 Minutes
Saturday Span	6:39AM to 9:32PM	6:30AM to 10:00PM
Saturday Headway	60 Minutes	30 Minutes
Sunday Span	No service	7:00AM to 10:00PM
Sunday Headway	No service	60 Minutes

Figure 2-9: Route 20 in Year 2020



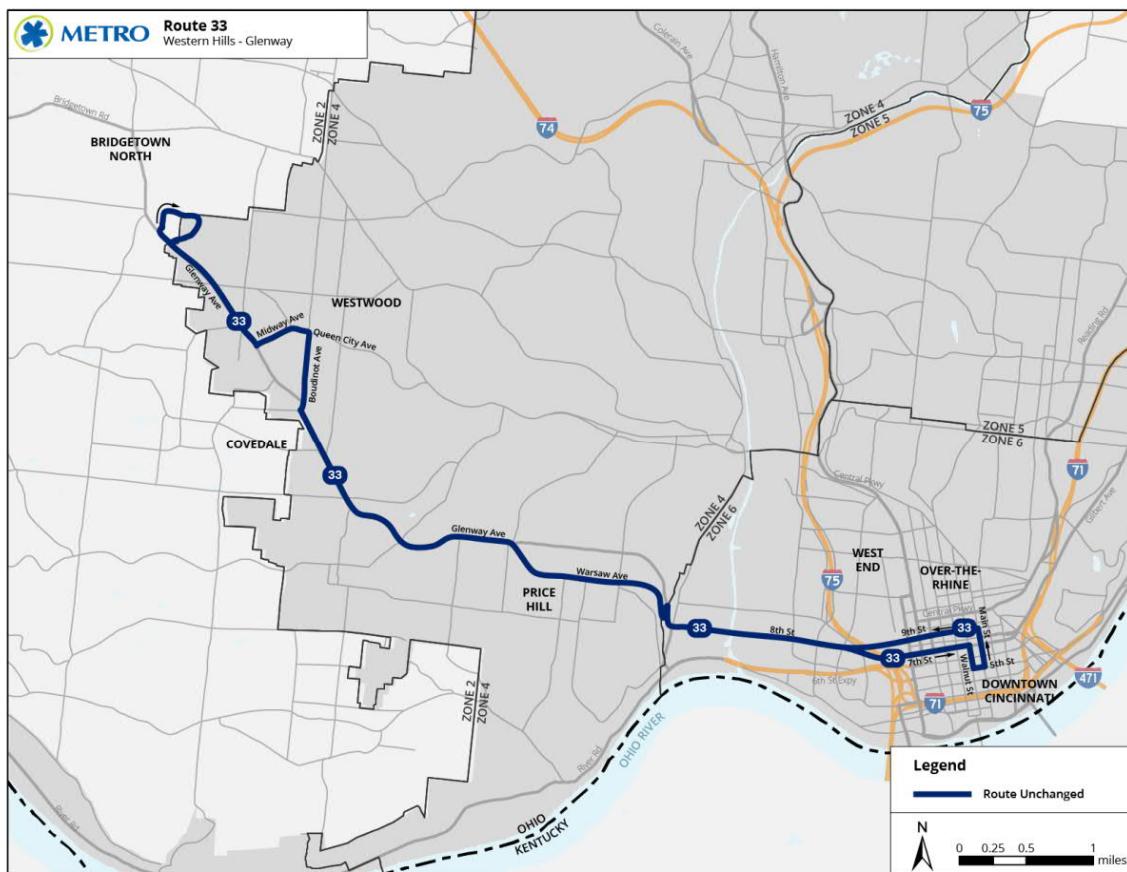
2.2.1.6 Route 33

The improvements to Route 33 include providing 24-hour service seven days a week and improvements to service headway on Saturday. The implication is that Route 33 service will be available at all times regardless of time of day or day of week. Also, headways will improve on Saturday from every 25 minutes to every 20 minutes. Route 33 would continue to operate with standard 40 foot buses. Table 2-8 presents the service parameters for Route 33 in Year 2020. A map of Route 33 is presented on Figure 2-10.

Table 2-8: Route 33 - Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	4:39AM to 12:55AM	24-Hour
Peak Headway	12 Minutes	12 Minutes
Midday Headway	18 Minutes	18 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	6:10AM to 12:15AM	24-Hour
Saturday Headway	25 Minutes	20 Minutes
Sunday Span	6:08AM to 11:40PM	24-Hour
Sunday Headway	30 Minutes	30 Minutes

Figure 2-10: Route 33 in Year 2020



2.2.1.7 Route 43 and 46

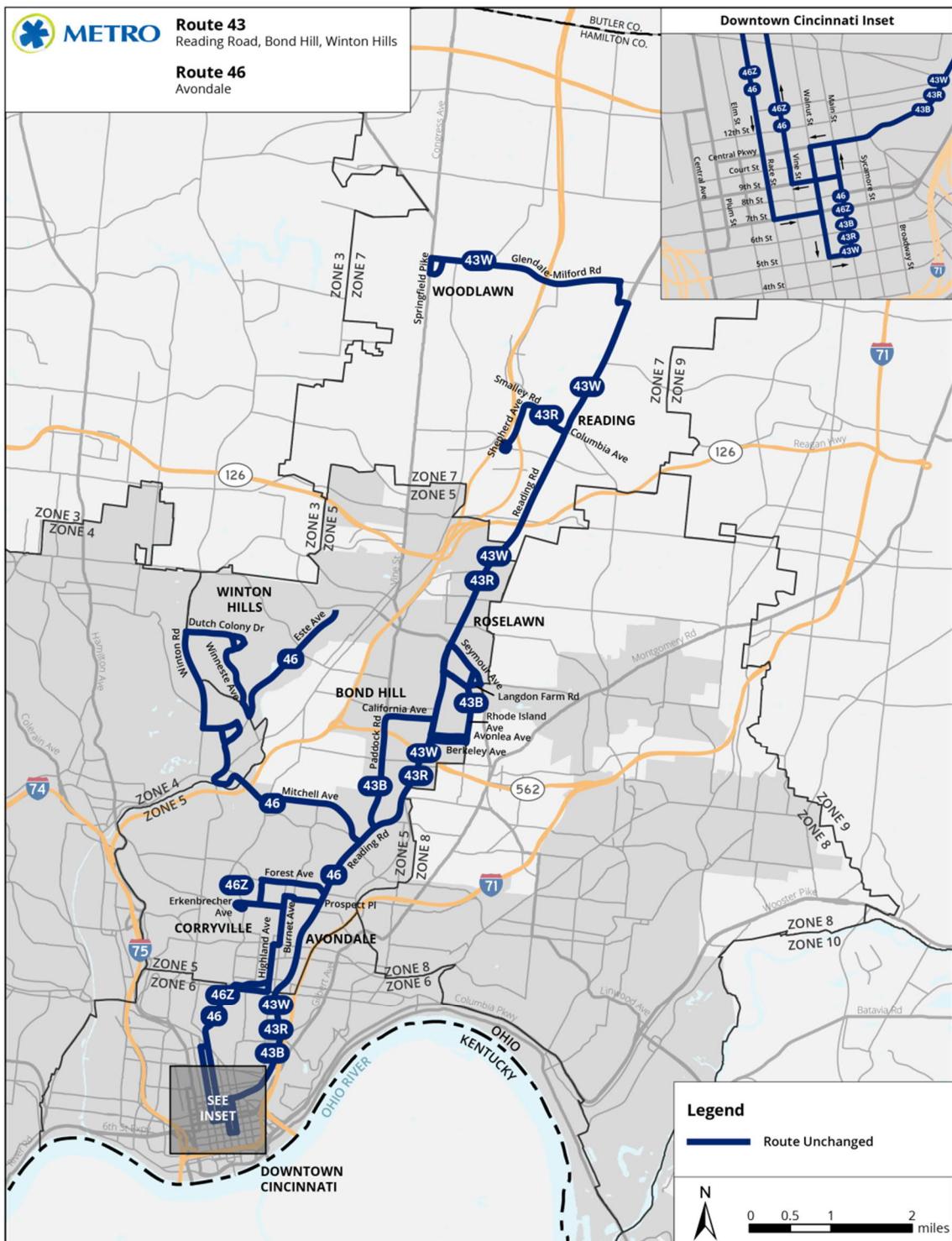
In Year 2020 Routes 43 and 46 will be restructured and simplified. Route 43 will no longer operate along the Winton Hills branch, that service will be operated by an extended Route 46. This will simplify Route 43 and allow the route to be focused along the Reading Road corridor. As part of the restructured service Route 43 will operate 24-hours a day meaning that service on this route will always be available. There will be changes to the headway due to the restructuring, as shown on Table 2-9. Route 46 will start earlier in the morning on all days to reflect the start times of the current Route 43 Winton Hill service. The headway will be less during the peak period and midday period, improving from every 20 minutes to every 15 minutes during the peak, and from every 23 minutes to every 20 minutes during the midday. These routes will continue to operate with standard 40 foot buses. The new headways reflect Route 43 without Winton Hills service, which will be operated by an extended Route 46. The restructured Route 43 and 46 is presented on Figure 2-11.

Table 2-9: Route 43 - Year 2020 Service Parameters

	Current		Year 2020	
	Route 43	Route 46	Route 43	Route 46
Weekday Span	4:55AM to 12:55AM	5:57AM to 12:55AM	24-Hour	5:30AM to 1:00AM
Peak Headway	8 Minutes	20 Minutes	8 Minutes	15 Minutes
Midday Headway	12 Minutes	23 Minutes	10 Minutes	20 Minutes
Evening Headway	20 Minutes	50 Minutes	20 Minutes	60 Minutes
Saturday Span	5:08AM to 12:50AM	6:20AM to 12:50AM	24-Hour	5:00am to 1:00AM
Saturday Headway	30 Minutes	30 Minutes	20 Minutes	30 Minutes
Sunday Span	5:45AM to 12:40AM	6:45AM to 11:50PM	24-Hour	6:00AM to 12:00AM
Sunday Headway	30 Minutes	30 Minutes	30 Minutes	30 Minutes

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Figure 2-11: Route 43 in Year 2020



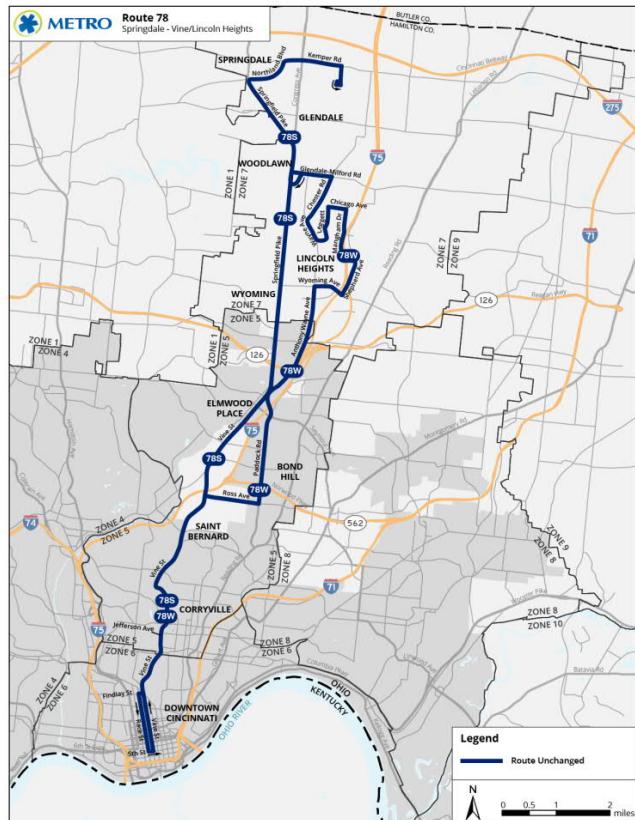
2.2.1.8 Route 78

The improvements to Route 78 include providing 24-hour service seven days a week and improvements to service headway on Sunday. The implication is that Route 78 service will be available at all times regardless of time of day or day of week. Also, headways will improve on Sunday reducing the headway from every 40 minutes to every 30 minutes. Route 78 will continue to operate with standard 40 foot buses. Table 2-10 presents the service parameters for Route 78 in Year 2020. A map of Route 78 is presented on Figure 2-12. These service improvements would allow for better connections between Route 20 and Butler County Routes R4 and R6.

Table 2-10: Route 78 - Year 2020 Service Parameters

	Current	Year 2020
Weekday Span	4:35AM to 12:55AM	24-Hour
Peak Headway	15 Minutes	15 Minutes
Midday Headway	30 Minutes	30 Minutes
Evening Headway	45 Minutes	45 Minutes
Saturday Span	5:08AM to 12:35AM	24-Hour
Saturday Headway	30 Minutes	30 Minutes
Sunday Span	6:15AM to 12:35AM	24-Hour
Sunday Headway	40 Minutes	30 Minutes

Figure 2-12: Route 78 in Year 2020



2.2.2 Year 2021

In 2021 service will expand in Hamilton County. New crosstown routes and circulator routes will be implemented. Three improvements in the Blue Ash area will be implemented, a restructuring of Route 67 to circulate through Blue Ash, a new flex Blue Ash flexible service zone, and an extension of Route 4. A flexible service zone will also be developed in the Springdale area. To support these service increases 30 additional buses will need to be purchased and an additional 65 transit operations and maintenance staff members will need to be hired. The description of each service change is presented below, with the change in hours, miles, and vehicles presented on Table 2-11 and shown on Figure 2-13.

Figure 2-13: Year 2021 Service Improvements

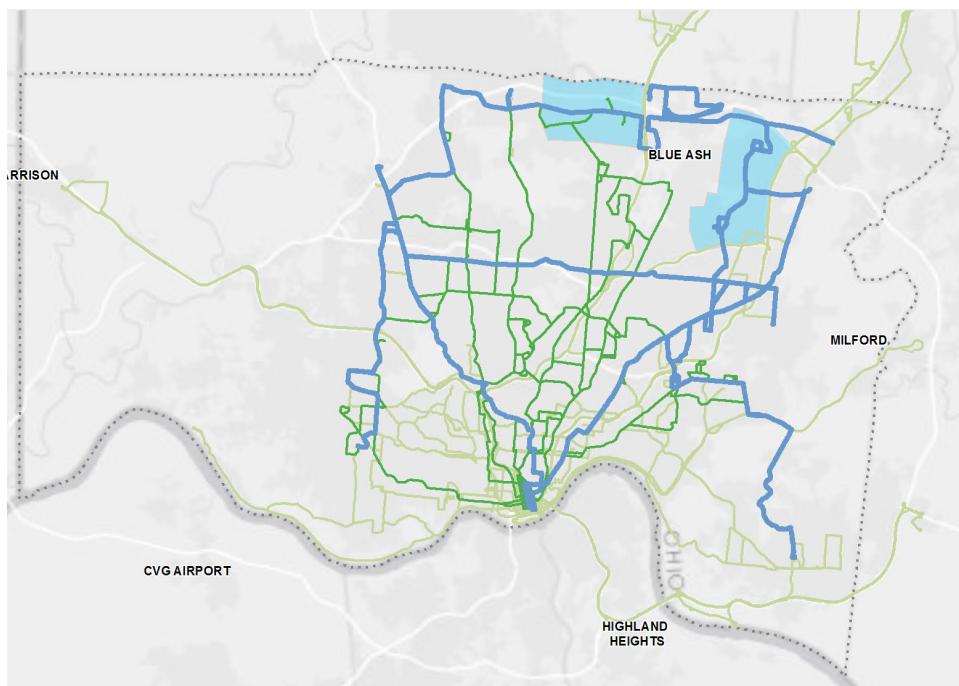


Table 2-11: Year 2021 Service Improvement Implications

Route	Additional Hours	Additional Miles	Additional Peak Buses	Additional Spare Buses	Total Additional Buses
4	9,139	121,297	2		
19	13,212	188,051	2		
61	33,725	445,170	8		
62	16,063	373,824	4		
67	13,118	204,969	3		
84	14,603	370,417	4		
Blue Ash Circulator	6,559	78,708	2		
Springdale Circulator	6,559	78,708	2		
Total	112,977	1,861,143	27	5	32

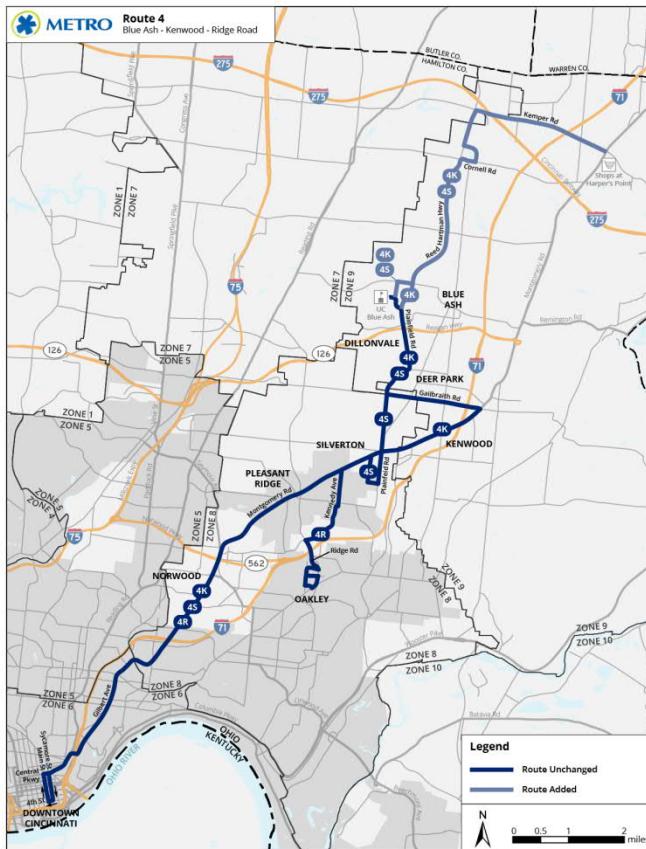
2.2.2.1 Route 4

The Year 2021 improvement to Route 4 is an extension further into Blue Ash and continuing to Sixteen Mile Stand. Only trips that currently terminate at UC-Blue Ash will be extended. There will be no change in route headways and service will continue to operate 24 hours a day, seven days a week. Service will continue to operate with standard 40 foot buses. Table 2-12 presents the service parameters for Route 4 in Year 2021. A map of Route 4 is presented on Figure 2-14. The extended Route 4 to Sixteen Mile Stand would be a good location to interface with transit services from Warren County.

Table 2-12: Route 4 - Year 2021 Service Parameters

	Year 2020	Year 2021
Weekday Span	24-Hour	24-Hour
Peak Headway	10 Minutes	10 Minutes
Midday Headway	20 Minutes	20 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	24-Hour	24-Hour
Saturday Headway	20 Minutes	20 Minutes
Sunday Span	24-Hour	24-Hour
Sunday Headway	30 Minutes	30 Minutes

Figure 2-14: Route 4 in Year 2021



2.2.2.2 Route 19

Route 19 will be improved during all days and periods. During weekdays service will operate later in the evening with service terminating at midnight. During peak periods headway will be reduced from every 17 minutes to every 15 minutes. During midday periods headway will be reduced from every 50 minutes to every 20 minutes. On Saturday the headway will improve from every 50 minutes to every 30 minutes and operate until 11:00PM. On Sunday the headway will improve from every 45 minutes to every 30 minutes and operate until 12:30AM. Sunday service will start earlier in the morning, starting 5:00AM instead of 5:21AM. Service will continue to operate with a standard 40 foot bus. Table 2-13 presents the service parameters for Route 19 in Year 2021. A map of Route 19 is presented on Figure 2-15.

Table 2-13: Route 19 - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	3:57AM to 11:59PM	4:00AM to 12:00AM
Peak Headway	17 Minutes	15 Minutes
Midday Headway	50 Minutes	20 Minutes
Evening Headway	60 Minutes	30 Minutes
Saturday Span	5:01AM to 10:41PM	5:00AM to 11:00PM
Saturday Headway	50 Minutes	30 Minutes
Sunday Span	5:21AM to 12:22AM	5:00AM to 12:30AM
Sunday Headway	45 Minutes	30 Minutes

Figure 2-15: Route 19 in Year 2021



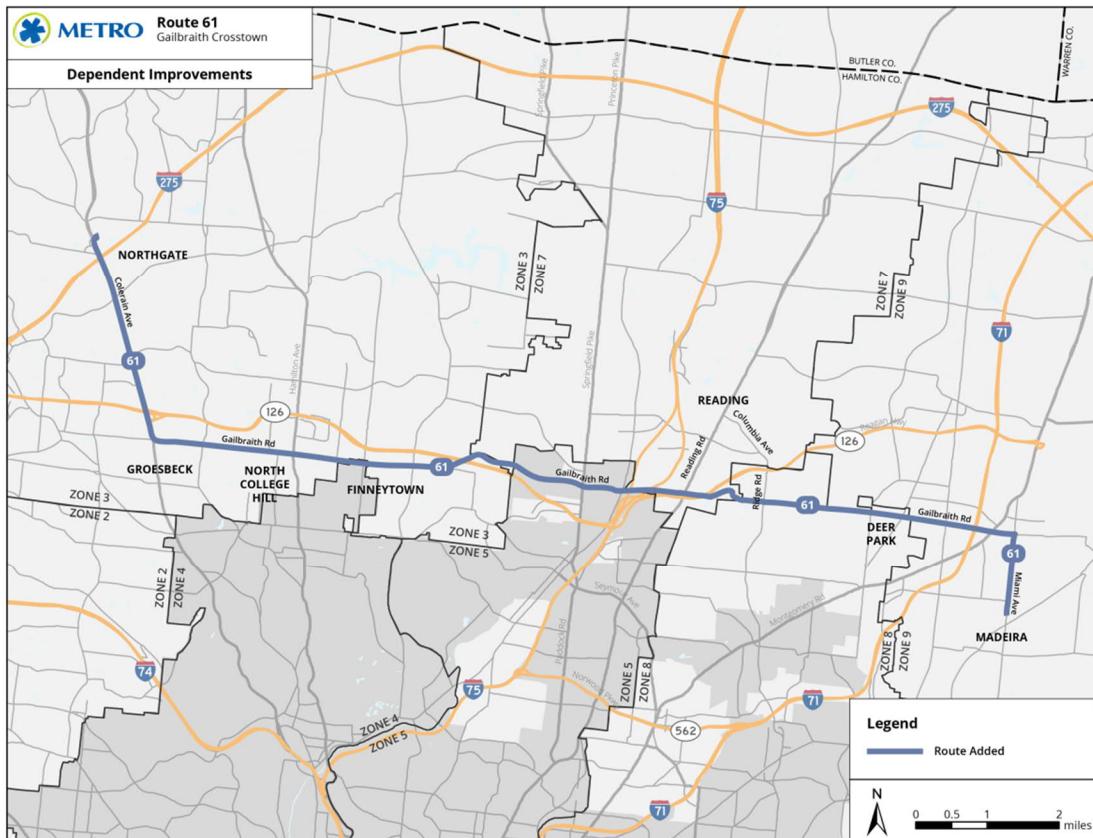
2.2.2.3 Route 61

Route 61 is a new route that will operate along Galbraith Road, creating a new crosstown corridor service that does not serve Downtown Cincinnati. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot bus as it serves lower density suburban areas. Table 2-14 presents the service parameters for this route. A map of Route 61 is presented on Figure 2-16.

Table 2-14: Route 61 - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	No service	6:00AM to 10:00PM
Peak Headway	No service	20 Minutes
Midday Headway	No service	30 Minutes
Evening Headway	No service	30 Minutes
Saturday Span	No service	6:00AM to 10:00PM
Saturday Headway	No service	30 Minutes
Sunday Span	No service	6:00AM to 10:00PM
Sunday Headway	No service	30 Minutes

Figure 2-16: Route 61 in Year 2021



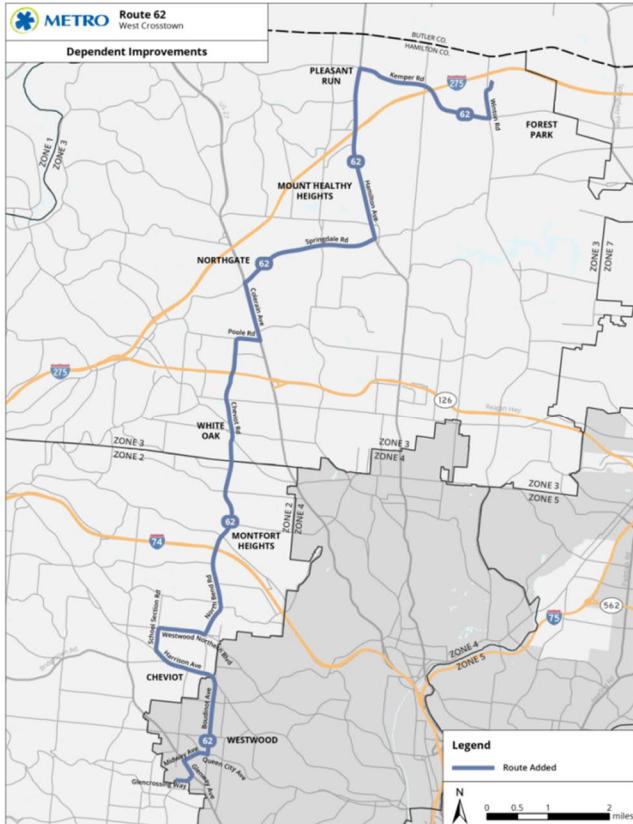
2.2.2.4 Route 62

Route 62 is a new route that will operate along North Bend Road and Cheviot Road, creating a new crosstown corridor service that does not serve Downtown Cincinnati. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-15 presents the service parameters for this route. A map of Route 61 is presented on Figure 2-17. Route 62 is proposed to serve Forest Park Park-and-Ride where a connection will be available to Butler County Route R4 and Route 62 should be timed in order to facilitate connections to Route R4.

Table 2-15: Route 62 - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	No service	6:30AM to 10:30AM
Peak Headway	No service	30 Minutes
Midday Headway	No service	30 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	7:00AM to 8:00PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:00AM to 8:00PM
Sunday Headway	No service	60 Minutes

Figure 2-17: Route 62 in Year 2021



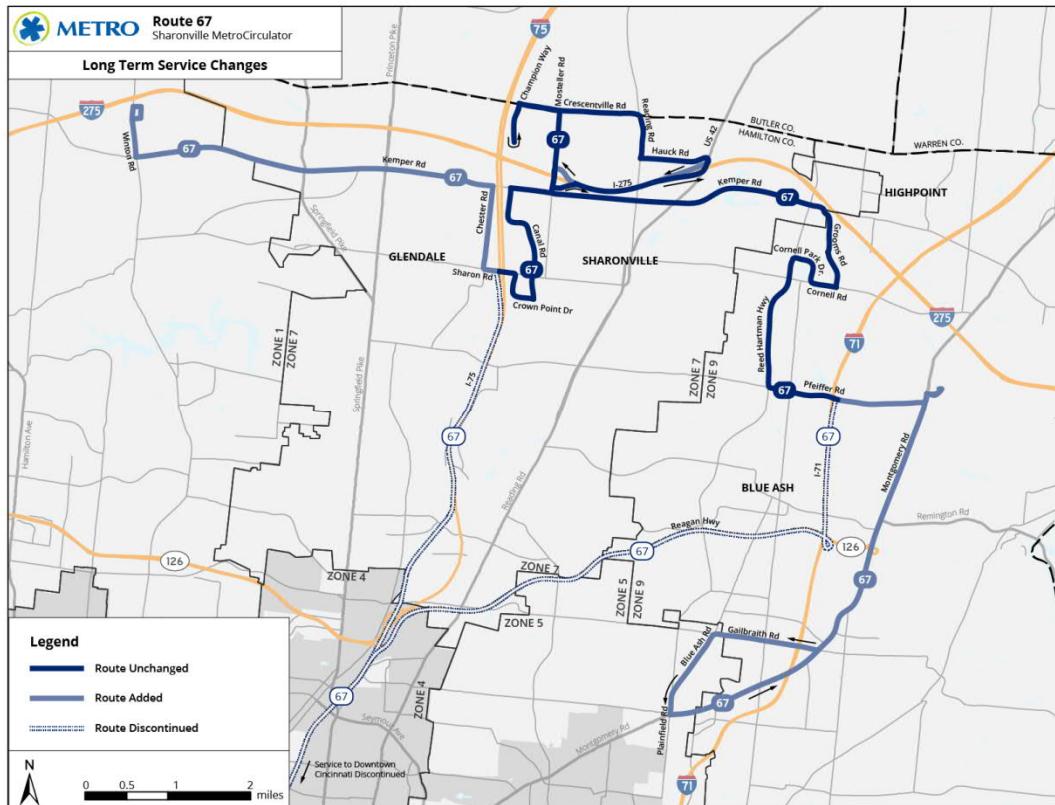
2.2.2.5 Route 67

Route 67 will be restructured and expanded in Year 2021. The route will go from a two trip per day job connector service to a fixed route circulator that connects Blue Ash to high speed and frequent services at Kenwood Towne Center. Service will be expanded to operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-16 presents the service parameters for this route. A map of Route 67 is presented on Figure 2-18. Route 67 will serve Tri-County Mall which is also served by Butler County Routes R4 and R6; Route 67 should be timed to meet these Butler County services.

Table 2-16: Route 67 - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	5:49AM to 3:30PM	5:30AM to 7:00PM
Peak Headway	1 AM and 1 PM Trip	30 Minutes
Midday Headway	No service	60 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	7:30AM to 5:30PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:30AM to 4:30PM
Sunday Headway	No service	60 Minutes

Figure 2-18: Route 67 in Year 2021



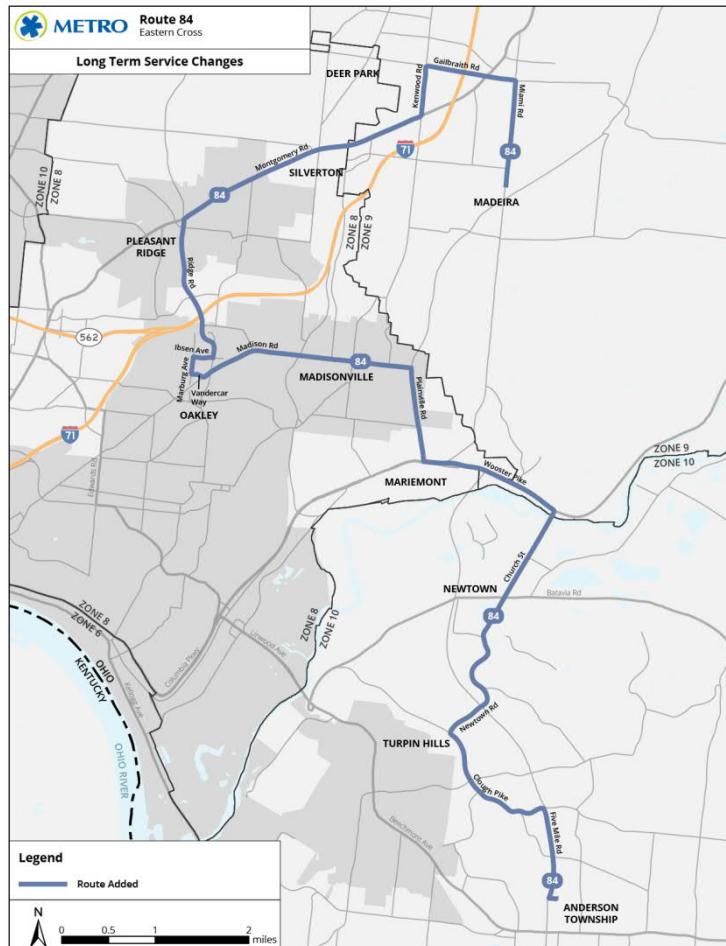
2.2.2.6 Route 84

Route 84 is a new route that will operate in eastern Hamilton County, creating a new crosstown corridor service that does not serve Downtown Cincinnati. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-17 presents the service parameters for this route. Route 84 is presented on Figure 2-19.

Table 2-17: Route 84 - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	No service	6:30AM to 10:00PM
Peak Headway	No service	30 Minutes
Midday Headway	No service	30 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	7:00AM to 8:00PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:00AM to 8:00PM
Sunday Headway	No service	60 Minutes

Figure 2-19: Route 84 in Year 2021



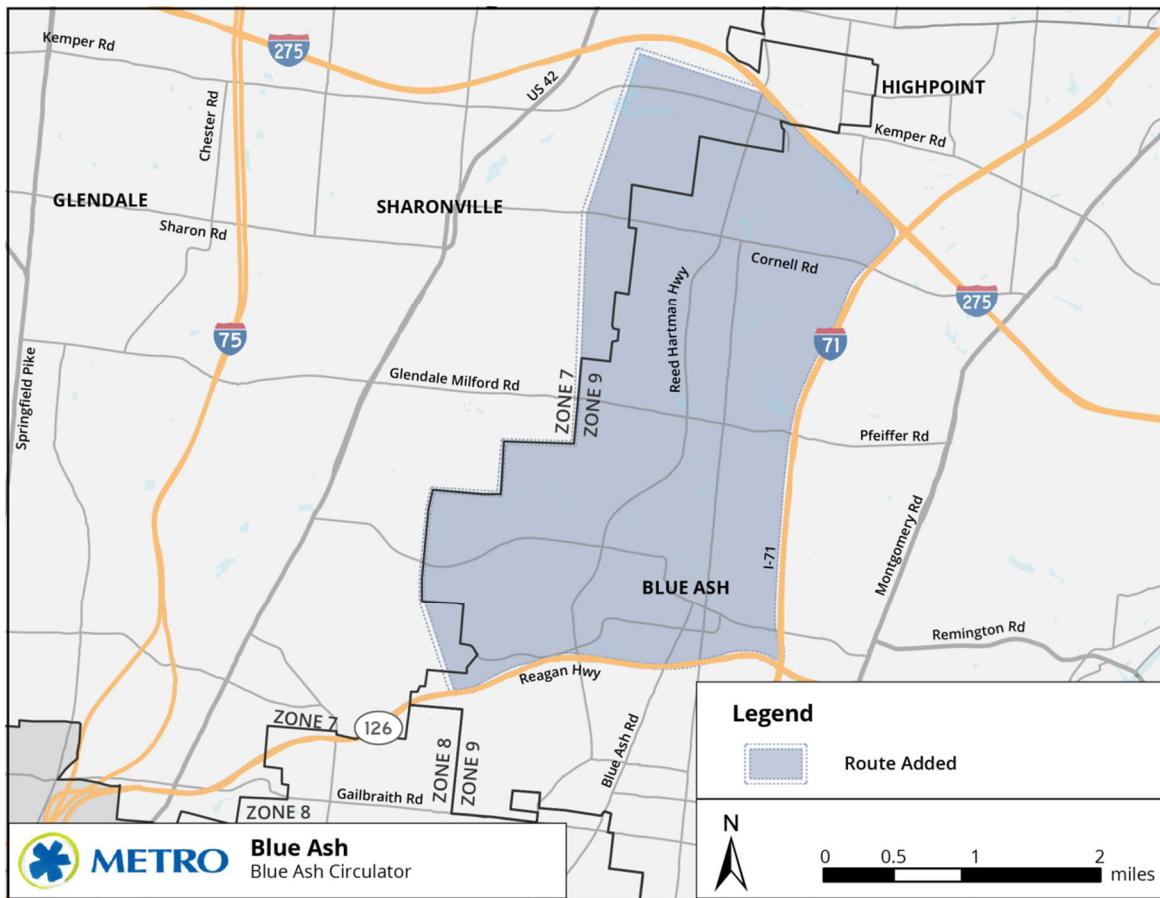
2.2.2.7 Blue Ash Circulator

The Blue Ash Circulator is a new circulator route serving the Blue Ash area. This route could be a route deviation or demand response circulator. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-18 presents the service parameters for this SERVICE. A map of the Blue Ash service area is presented on Figure 2-20. This route could connect to Butler and Warren County services.

Table 2-18: Blue Ash Circulator - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	No service	6:00AM to 8:00PM
Peak Headway	No service	30 Minutes
Midday Headway	No service	60 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	7:00AM to 7:00PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:00AM to 6:00PM
Sunday Headway	No service	60 Minutes

Figure 2-20: Blue Ash Circulator in Year 2021



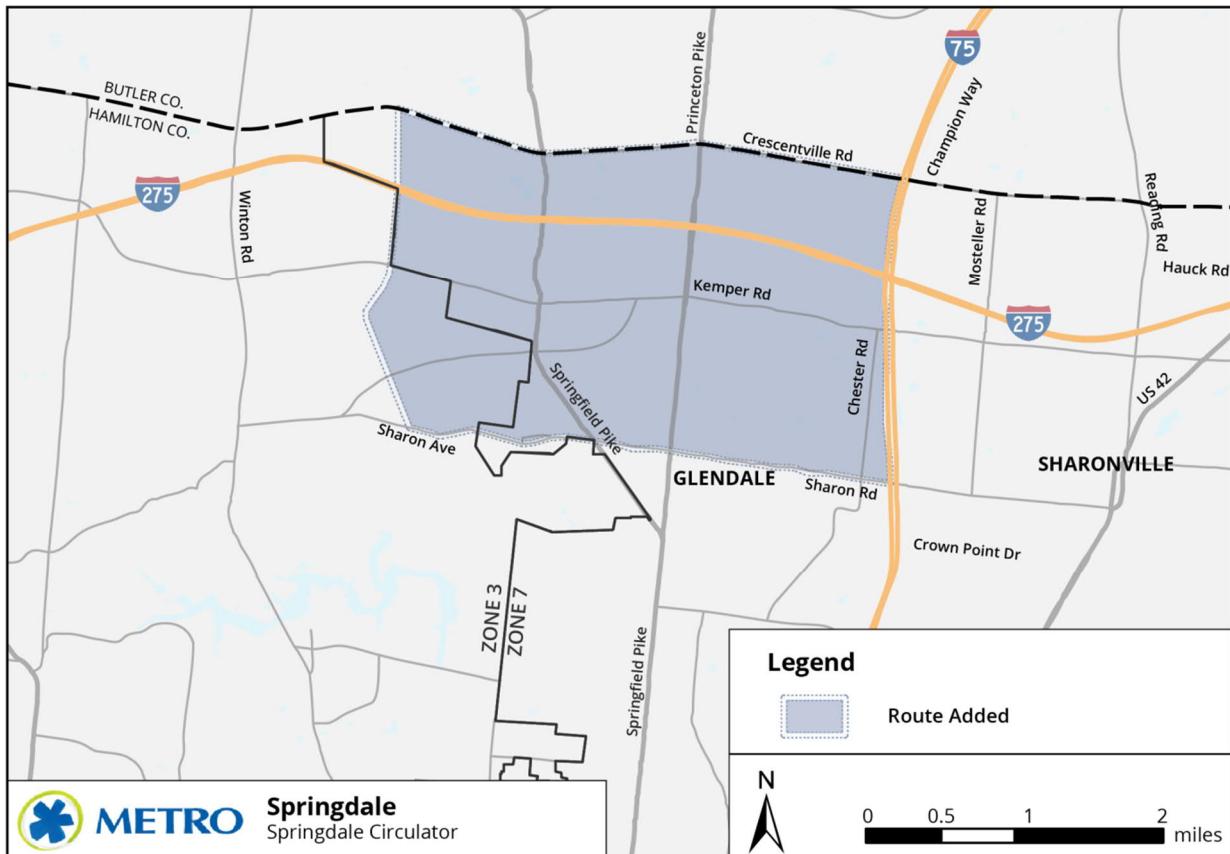
2.2.2.8 Springdale Circulator

The Springdale Circulator is a new circulator route serving the Springdale area. This route could be a route deviation or demand response circulator. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-19 presents the service parameters for this service. The service area of this route is presented on Figure 2-21. This route could connect to Butler County services.

Table 2-19: Springdale Circulator - Year 2021 Service Parameters

	Current	Year 2021
Weekday Span	No service	6:00AM to 8:00PM
Peak Headway	No service	30 Minutes
Midday Headway	No service	60 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	7:00AM to 7:00PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:00AM to 6:00PM
Sunday Headway	No service	60 Minutes

Figure 2-21: Springdale Circulator in Year 2021



2.2.3 Year 2022

The third year will improve service on express commuter routes, improve the existing crosstown routes, and a new suburban circulator route will be implemented. Additional trips will be operated along express routes that will improve the availability and/or headway. Some of the express bus route alignments will also change. A new circulator route will be implemented that primarily serves Delhi. Finally a new express crosstown route will be implemented that will replace the current 38X express crosstown. To support these service increases 41 additional buses will need to be purchased. SORTA staff will expand by 88 transit operations and maintenance positions. The description of each service change is presented below on Figure 2-22, with the change in hours, miles, and vehicles presented on Table 2-20.

Figure 2-22: Year 2022 Service Improvements

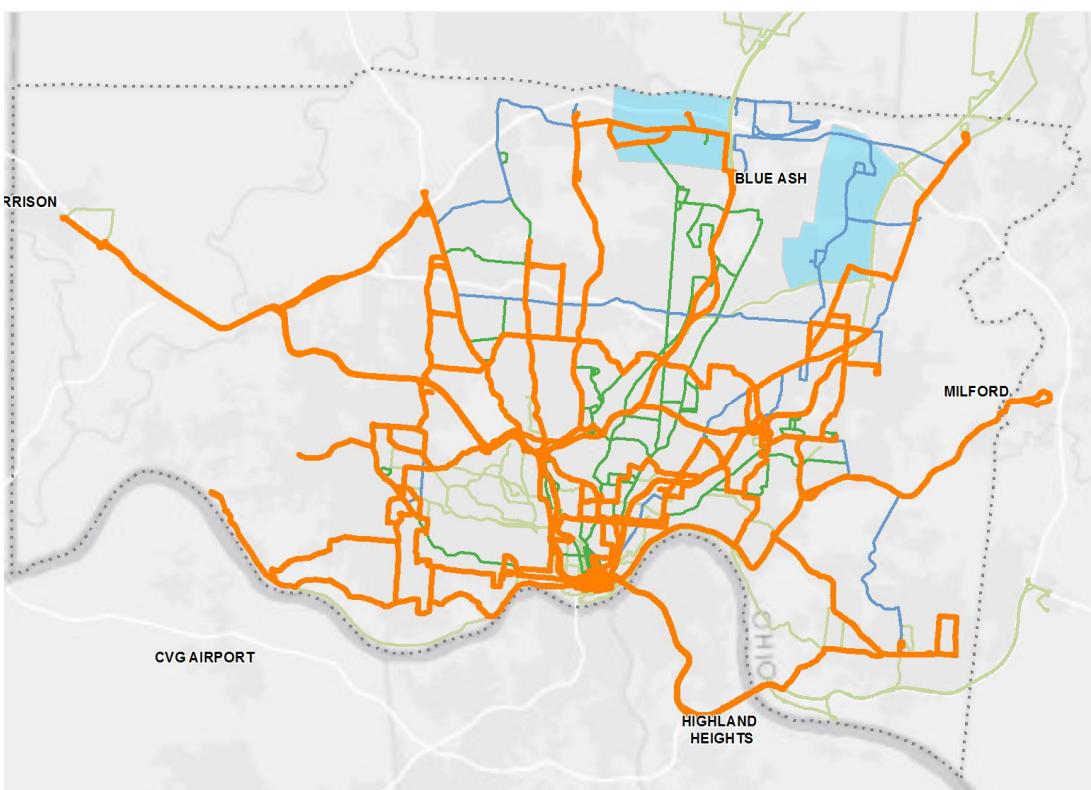


Table 2-20: Year 2022 Service Improvement Implications

Route	Additional Hours	Additional Miles	Additional Peak Buses	Additional Spare Buses	Total Additional Buses
2X	704	15,978	1		
3/3X	4,039	96,145	1		
14X	1,734	34,639	1		
15X	1,550	28,642	1		
23X	949	19,523	1		
12X/25X	10	-7,385	-2		
29X	1,173	26,948	1		
30X	673	16,024	1		
31	10,468	117,296	2		
32	17,295	253,916	3		
35	10,222	171,336	3		
37X	16,065	257,040	4		
38X	-2,877	-43,796	0		
40X	1,163	21,134	1		
41	31,232	485,567	5		
51	27,072	330,532	4		
52X	2,096	66,892	2		
73	7,776	123,708	2		
74X	1,520	36,343	1		
75X/81X	1,374	-85,630	-1		
77X	3,279	47,902	1		
Total	137,516	2,012,754	32	6	38

2.2.3.1 Route 2X

The improvement to Route 2X will be that the headway will improve from 30 minutes to 20 minutes. Service on Route 2X will continue to operate with a standard 40 foot transit bus. Table 2-221 presents the service parameters for this route. A map of Route 2X is presented on Figure 2-23.

Table 2-21: Route 2X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	6:37AM to 7:57AM 4:03PM to 5:31PM	6:30AM to 8:00AM 4:00PM to 5:30PM
Peak Headway	30 Minutes	20 Minutes

Figure 2-23: Route 2X in Year 2022



2.2.3.2 Route 3/3X

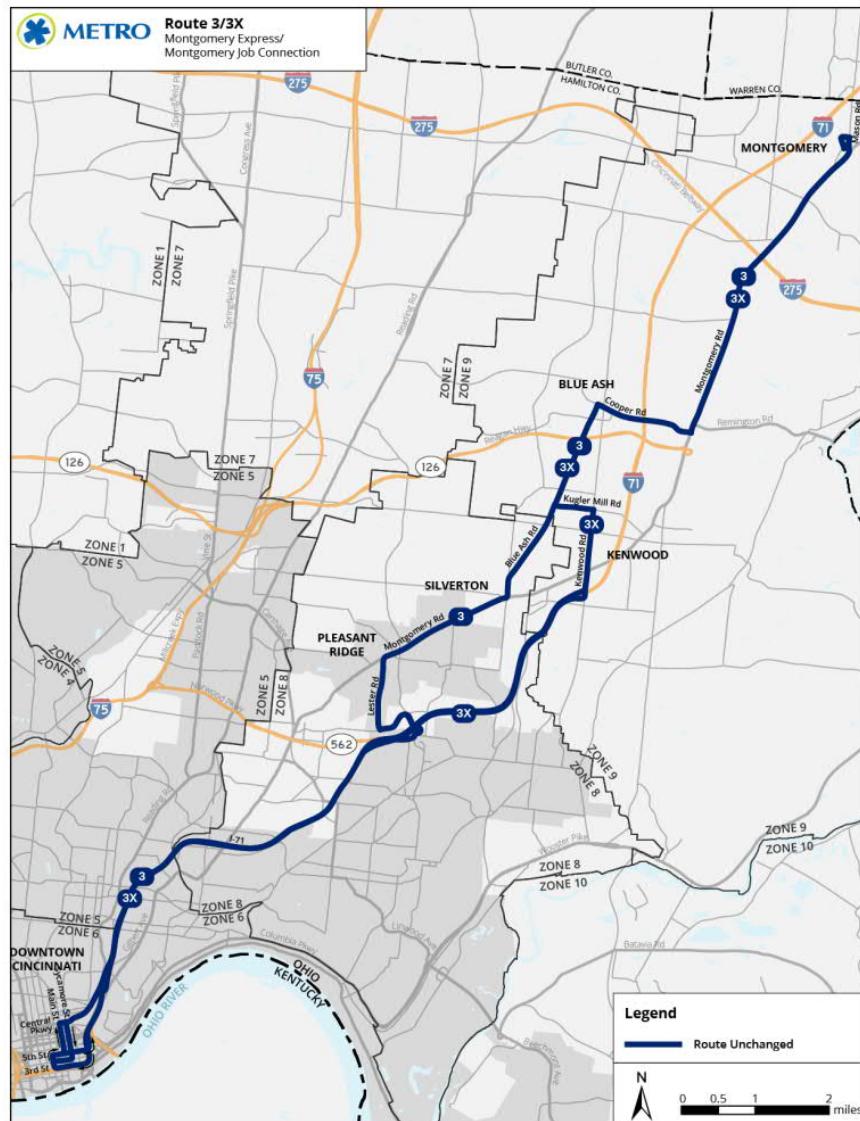
There are three improvements to Route 3/3X. The first improvement is that the headway will improve from every 15 minutes to every 12 minutes. The second improvement is that midday service will be introduced on Route 3 to provide a midday express option; this service will operate both towards Downtown and away from Downtown. This will allow for access to jobs in Blue Ash, access jobs that don't start and end during regular commuting hours, and potentially allow for all day connections to

transit services serving Warren County that would ideally occur in the vicinity of Sixteen Mile Stand. The final improvement is that service will operate earlier in the morning and later in the afternoon. All trips will operate with standard 40 foot transit buses. Table 2-22 presents the service parameters for this route. A map of Route 3/3X is presented on Figure 2-24.

Table 2-22: Route 3/3X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:24AM to 7:53AM 3:07PM to 6:19PM	5:00AM to 6:30PM
Peak Headway	15 Minutes	12 Minutes
Midday Headway	No service	60 Minutes

Figure 2-24: Route 3/3X in Year 2022



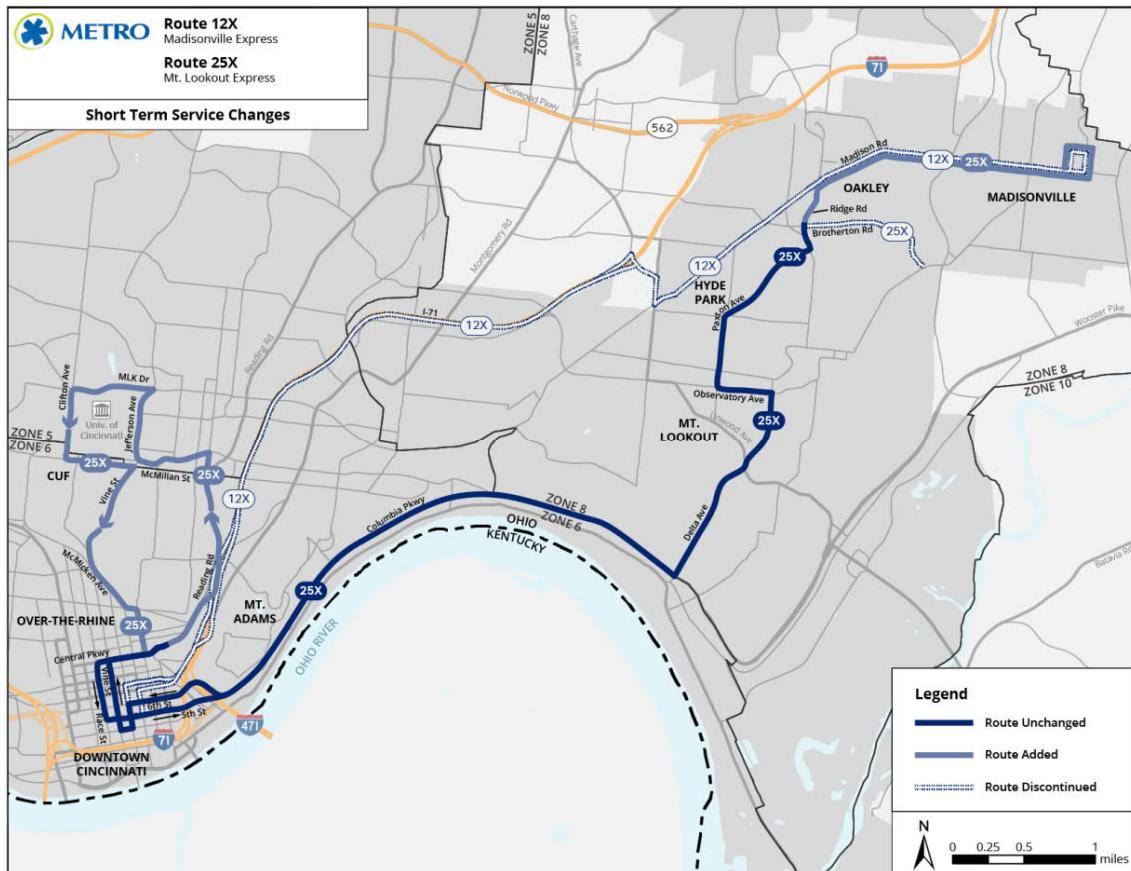
2.2.3.3 Route 12X/25X

Routes 12X and 25X will be restructured in Year 2022 and combined into a single route serving both Madisonville and Mount Lookout. The combined route will start earlier in the morning and end later in the evening. Service will also operate later in the morning peak period and start earlier during the afternoon peak period. Finally the headway will improve from 25 minutes on the current Route 12X and 27 minutes on the current Route 25X to 20 minutes on the combined route. The final improvement is that service will be extended to the Uptown area to serve this job market, buses will continue to Uptown after serving Downtown. Service will use a standard 40 foot transit bus. Table 2-23 presents the service parameters for this route. A map of Route 25X is presented on Figure 2-25.

Table 2-23: Route 25X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	7:07AM to 7:42AM (12X) 7:04AM to 7:31AM (25X) 5:06PM to 5:31PM (12X) 4:39PM to 5:39PM (25X)	6:30AM to 8:00AM 4:00PM to 6:00PM
Peak Headway	25 Minutes (12X)/27 Minutes (25X)	20 Minutes

Figure 2-25: Route 25X in Year 2022



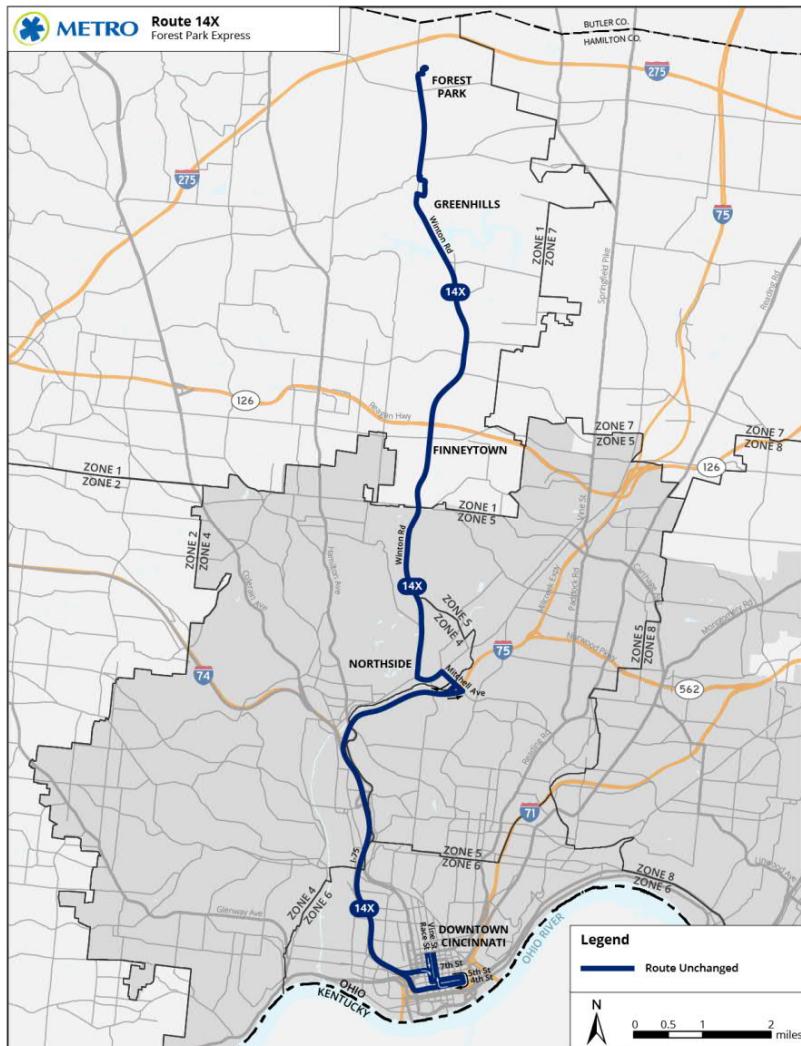
2.2.3.4 Route 14X

The improvement to Route 14X will be that service will end later in both the morning and afternoon peak commute period. Service on Route 14X will continue to operate with a standard 40 foot transit bus. At Forest Park Park and Ride a connection is available to Butler County RTA Route R6 and schedules should be coordinated at this location, which may mean an adjustment to the Route 14X timetable. Table 2-24 presents the service parameters for this route. A map of Route 14X is presented on Figure 2-26.

Table 2-24: Route 14X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:52AM to 7:17AM 4:09PM to 5:33PM	5:45AM to 8:30AM 4:00PM to 6:00PM
Peak Headway	30 Minutes	30 Minutes

Figure 2-26: Route 14X in Year 2022



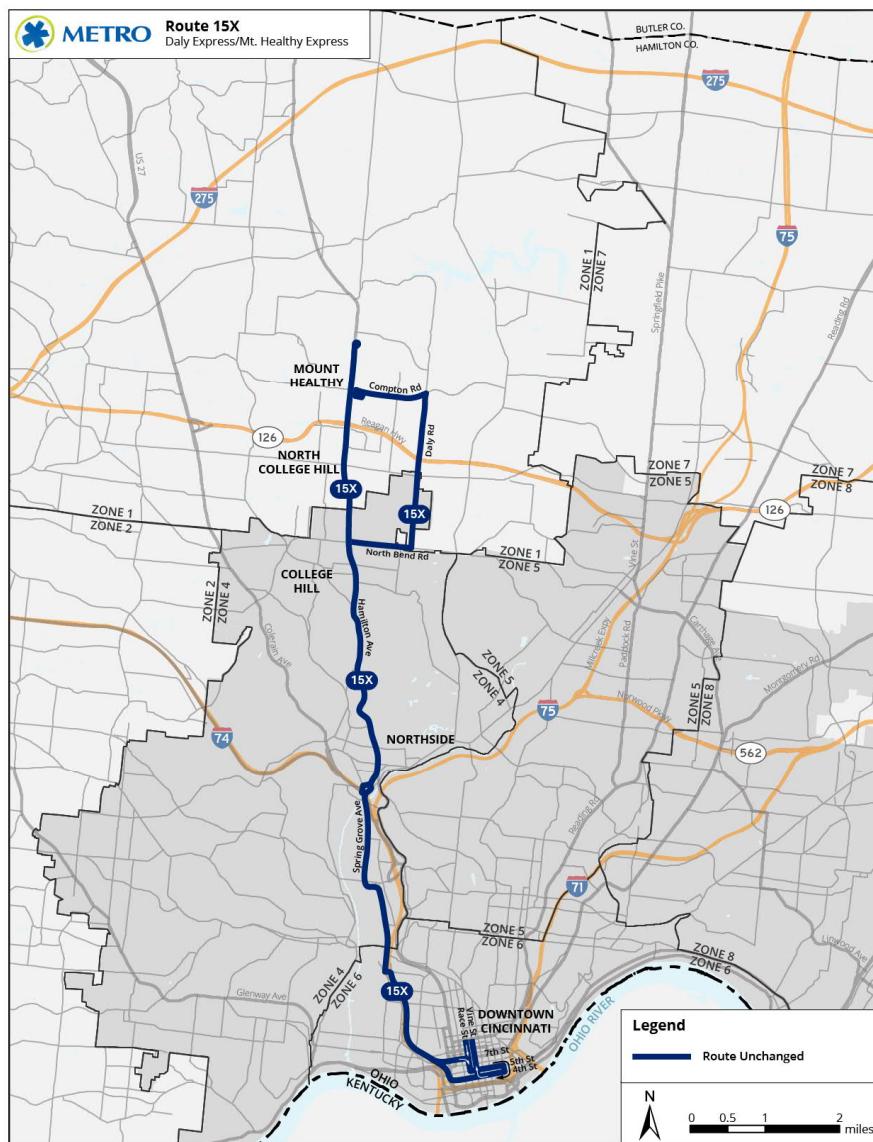
2.2.3.5 Route 15X

The improvements to Route 15X will be that service will end later in both the morning peak commute period and the headway will improve from 15 minutes to 12 minutes. Service on Route 15X will continue to operate with a standard 40 foot transit bus. Table 2-25 presents the service parameters for this route. A map of Route 15X is presented on Figure 2-27.

Table 2-25: Route 15X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	6:06AM to 7:40AM 4:00PM to 6:00PM	6:00AM to 8:30AM 4:00PM to 6:00PM
Peak Headway	15 Minutes	12 Minutes

Figure 2-27: Route 15X in Year 2022



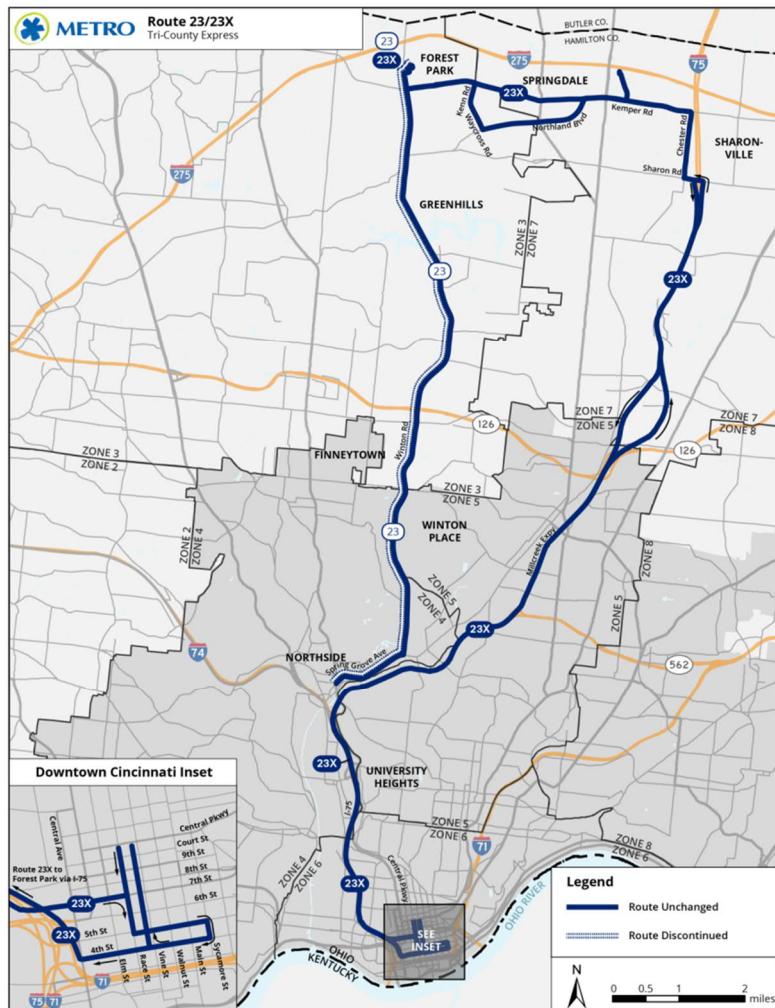
2.2.3.6 Route 23X

There are two changes to Route 23X. The first change is that the 23X Job Connector service will be eliminated as it duplicates Route 20 service. The second change is that the service hours will expand during both the morning and afternoon peak commute times, with service starting earlier and ending later during both peak periods. The 23X should be scheduled to allow Butler County R4 and R6 passengers to transfer to this route, with schedules coordinated at Tri-County Mall. Service on Route 23X will continue to operate with a standard 40 foot transit bus. Table 2-26 presents the service parameters for this route. A map of Route 23X is presented on Figure 2-28.

Table 2-26: Route 23X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:26AM to 7:53AM 3:43PM to 6:50PM	5:00AM to 8:30AM 3:30PM to 7:00PM
Peak Headway	15 Minutes	15 Minutes

Figure 2-28: Route 23X in Year 2022



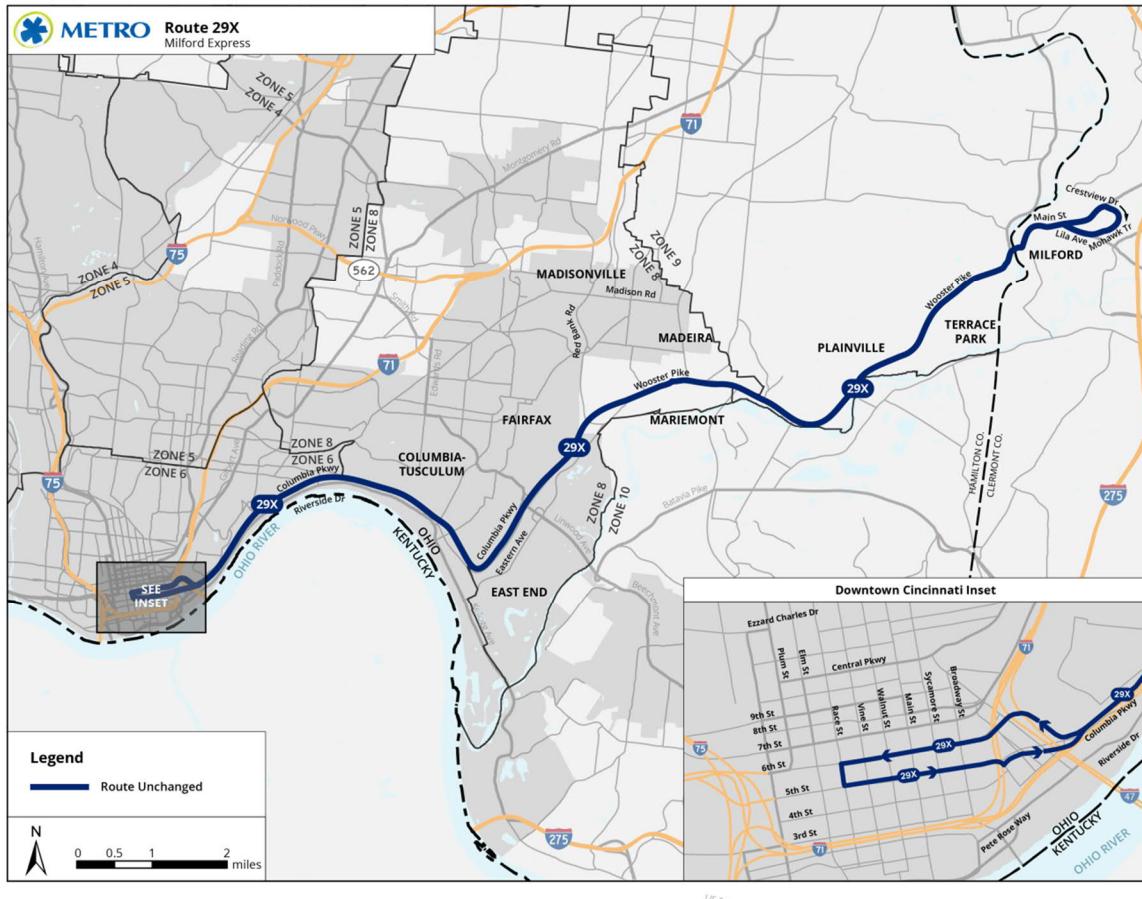
2.2.3.7 Route 29X

The improvements to Route 29X will be that service will end later in both the morning peak commute period and the headway will improve from 15 minutes to 12 minutes. Service on Route 29X will continue to operate with a standard 40 foot transit bus. Route 29X serves Milford in Clermont County and Clermont County CTC services should connect to Route 29X services in Milford. Table 2-27 presents the service parameters for this route. A map of Route 29X is presented on Figure 2-29.

Table 2-27: Route 29X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	6:02AM to 7:32AM 3:33PM to 5:39PM	5:30AM to 8:30AM 3:30PM to 6:00PM
Peak Headway	15 Minutes	12 Minutes

Figure 2-29: Route 29X in Year 2022



2.2.3.8 Route 30X

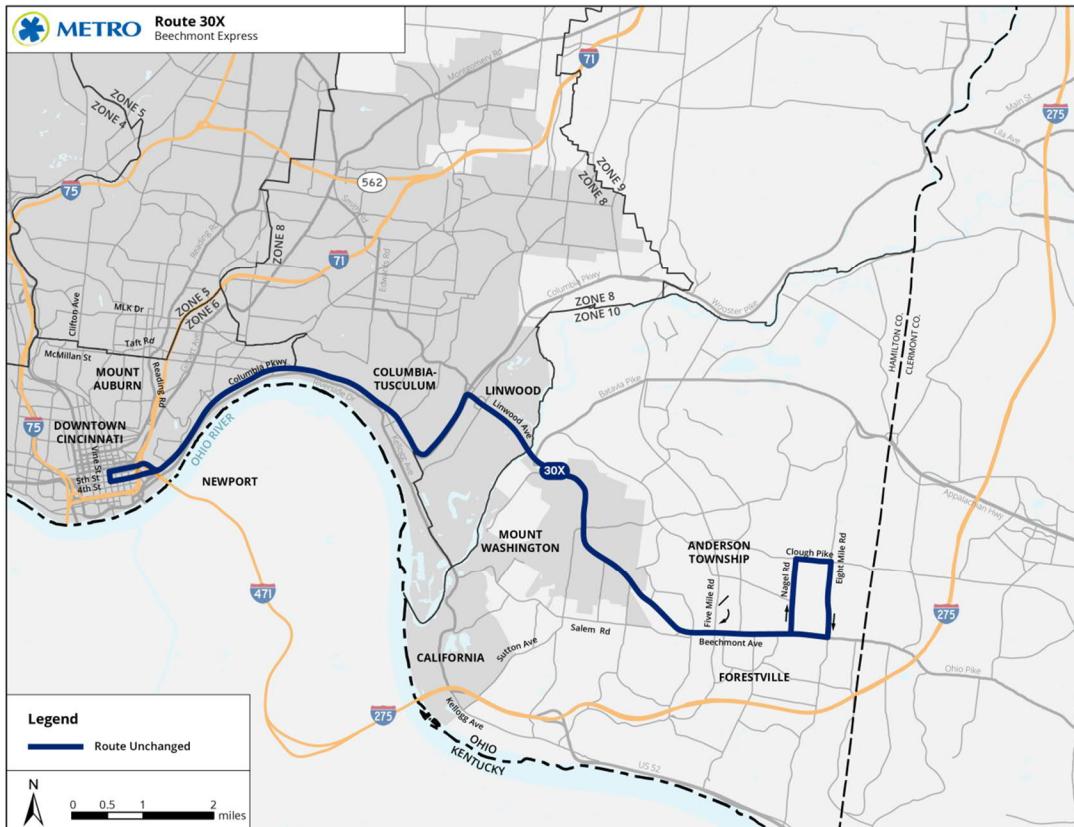
The improvements to Route 30X will be that service will end later in both the morning peak commute period, start earlier in the afternoon peak commute times, and end later during the afternoon peak

commute times. Also the headway will improve from 21 minutes to 20 minutes. Service on Route 30X will continue to operate with a standard 40 foot transit bus. Route 30X serves neighborhoods close to the border with Clermont County. Route 30X does not serve the Anderson Park and Ride, which would be a logical location to connect to Clermont County services and even potential TANK services. It may be prudent to serve the Park and Ride if it emerges as a regional transit hub. Table 2-28 presents the service parameters for this route. A map of Route 30X is presented on Figure 2-30.

Table 2-28: Route 30X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:58AM to 7:55AM 4:03PM to 5:48PM	6:00AM to 8:00AM 4:00PM to 6:00PM
Peak Headway	21 Minutes	20 Minutes

Figure 2-30: Route 30X in Year 2022



2.2.3.9 Route 31

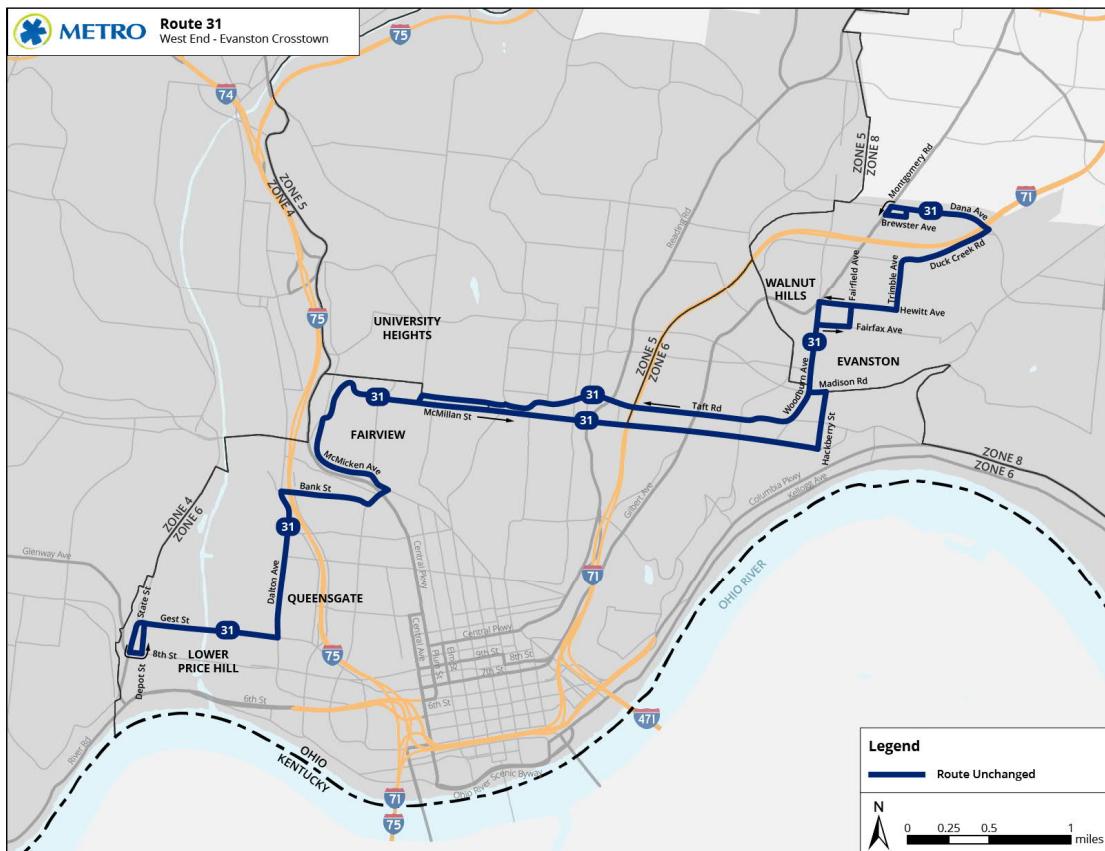
In Year 2022 Route 31's spans of service span and headway will improve. Service will start earlier in the morning on weekdays and end later in the night during weekdays and Saturday. The headway will also improve during all time periods seven days a week. Service on Route 31 could operate with shorter 30

foot transit buses. Table 2-29 presents the service parameters for this route. A map of Route 31 is presented on Figure 2-31.

Table 2-29: Route 31 - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	4:28AM to 12:44AM	4:00AM to 1:30AM
Peak Headway	20 Minutes	15 Minutes
Midday Headway	20 Minutes	15 Minutes
Evening Headway	37 Minutes	30 Minutes
Saturday Span	5:23AM to 12:20AM	5:30AM to 12:30AM
Saturday Headway	35 Minutes	20 Minutes
Sunday Span	5:50AM to 12:33AM	6:00AM to 12:30AM
Sunday Headway	35 Minutes	20 Minutes

Figure 2-31: Route 31 in Year 2022



2.2.3.10 Route 32

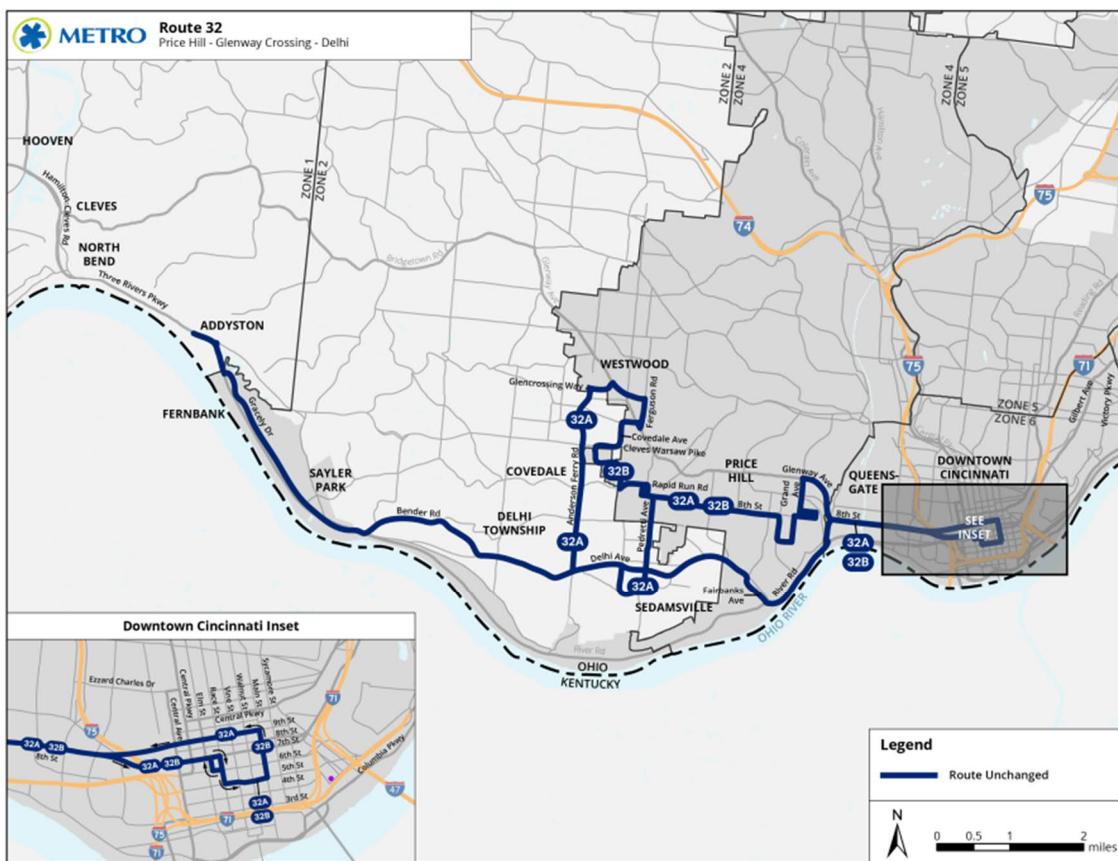
In Year 2022 Route 32's spans of service and headway will improve. Service will start earlier in the morning on weekends and end later in the night on all days. The headway will also be improved during all time periods seven days a week. Service on Route 32 will continue to operate with 40 foot transit

buses. Table 2-30 presents the service parameters for this route. A map of Route 32 is presented on Figure 2-32.

Table 2-30: Route 32 - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	4:26AM to 12:55AM	4:30AM to 1:00AM
Peak Headway	25 Minutes	10 Minutes
Midday Headway	25 Minutes	20 Minutes
Evening Headway	60 Minutes	30 Minutes
Saturday Span	5:37AM to 8:39PM	5:30AM to 10:00PM
Saturday Headway	35 Minutes	30 Minutes
Sunday Span	6:40AM to 5:56PM	6:00AM to 9:00PM
Sunday Headway	35 Minutes	30 Minutes

Figure 2-32: Route 32 in Year 2022



2.2.3.11 Route 35

Route 35 is a new fixed circulator route serving the Delhi and Covedale area. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-31 presents the service parameters for this route. Figure 2-33 presents a map of Route 35.

Table 2-31: Route 35 - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	No service	6:30AM to 10:30PM
Peak Headway	No service	20 Minutes
Midday Headway	No service	30 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	7:00AM to 8:00PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:00AM to 8:00PM
Sunday Headway	No service	60 Minutes

Figure 2-33: Route 35 in Year 2022



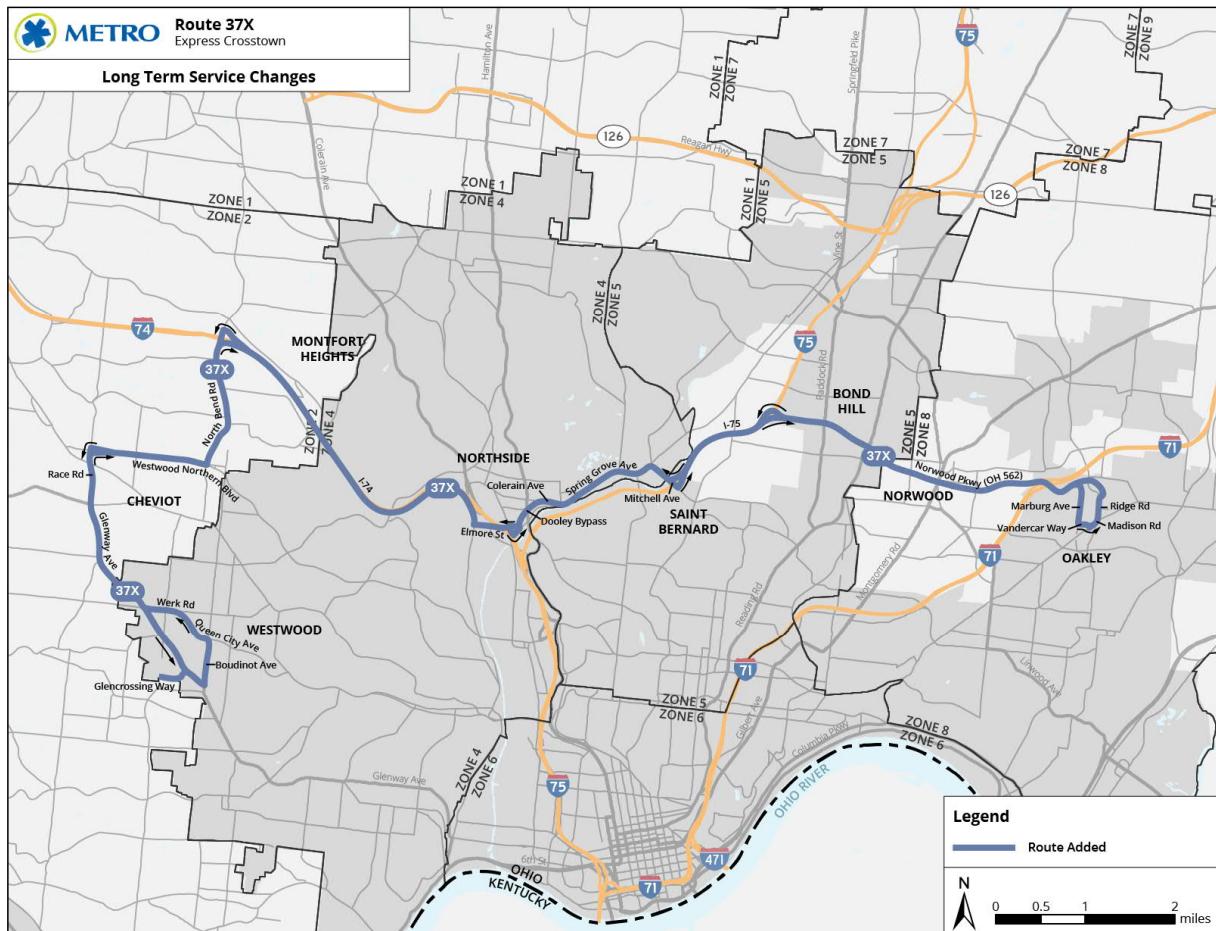
2.2.3.12 Route 37X

Route 37X is a new express crosstown service that will connect major transfer points and generators without going into Downtown Cincinnati. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot transit bus. This Route will replace the current Route 38X crosstown service. Table 2-32 presents the service parameters for this route. Figure 2-34 presents a map of Route 37X.

Table 2-32: Route 37X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	No service	6:00AM to 9:00PM
Peak Headway	No service	20 Minutes
Midday Headway	No service	60 Minutes
Evening Headway	No service	60 Minutes

Figure 2-34: Route 37X in Year 2022



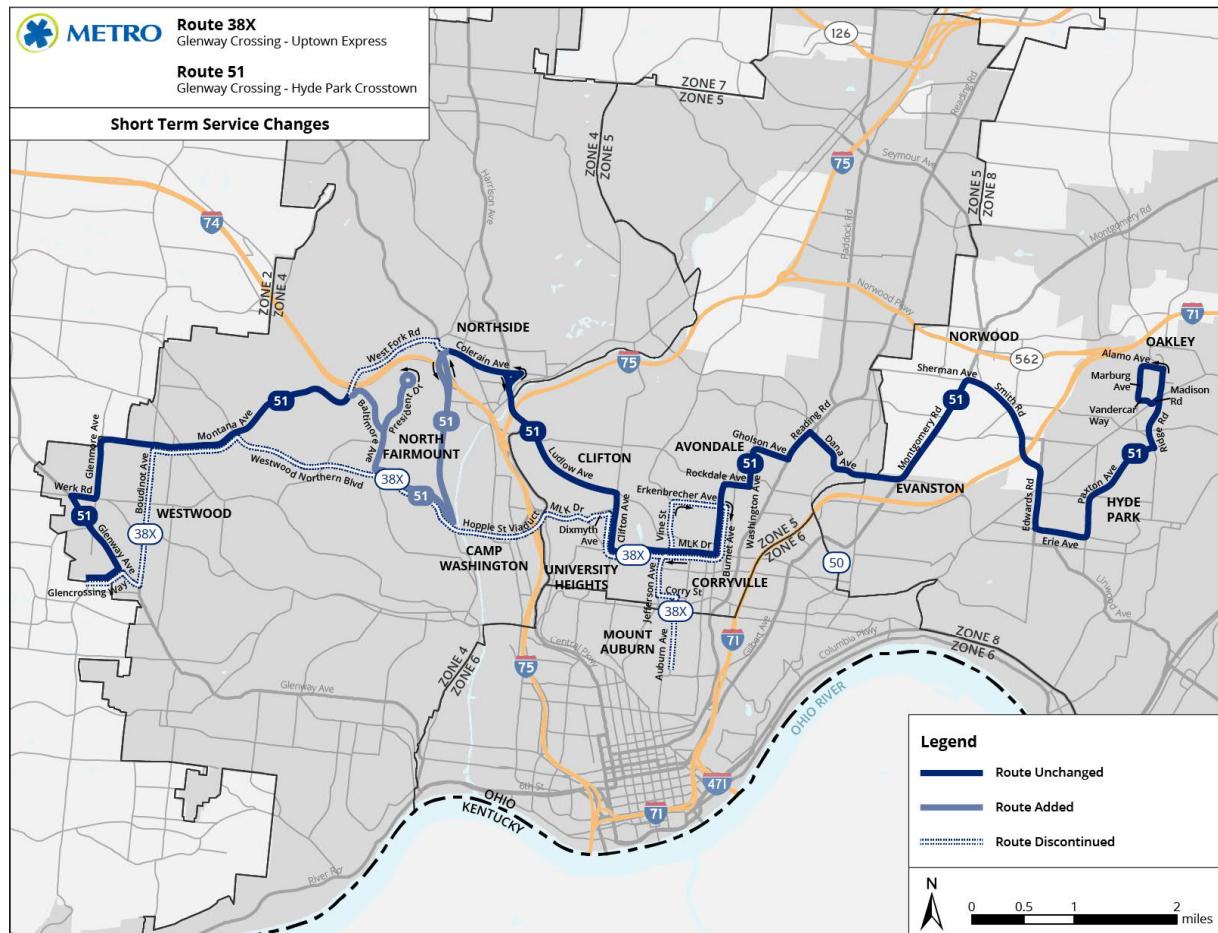
2.2.3.13 Route 38X

The current Route 38X crosstown service will be discontinued in Year 2022. It will be replaced with the new Route 37X express crosstown route which will operate with more frequent service and provide all-day service on weekdays and weekend service. Changes to Route 38X service parameters are presented on Table 2-33. A map of 38X is presented on Figure 2-35.

Table 2-33: Route 38X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:37AM to 8:03AM 3:15PM to 5:45PM	No service
Peak Headway	30 Minutes	No service

Figure 2-35: Route 38X in Year 2022



2.2.3.14 Route 40X

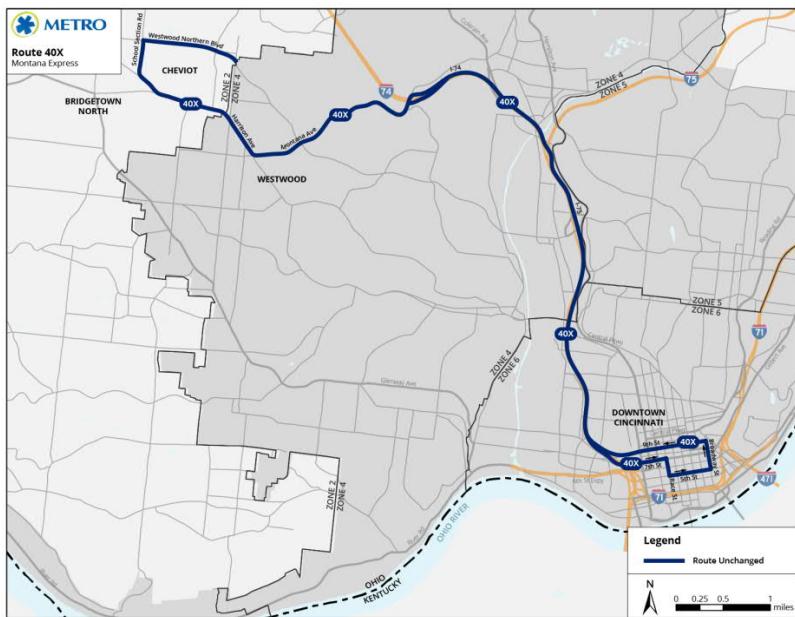
The improvement to Route 40X will be that service will end later in both the morning and afternoon peak commute period. Service on Route 40X will continue to operate with a standard 40 foot transit

bus. Table 2-34 presents the service parameters for this route. A map of Route 40X is presented on Figure 2-36.

Table 2-34: Route 40X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	6:09AM to 7:37AM 3:43PM to 5:22PM	6:00AM to 8:30AM 3:30PM to 6:00PM
Peak Headway	20 Minutes	20 Minutes

Figure 2-36: Route 40X in Year 2022



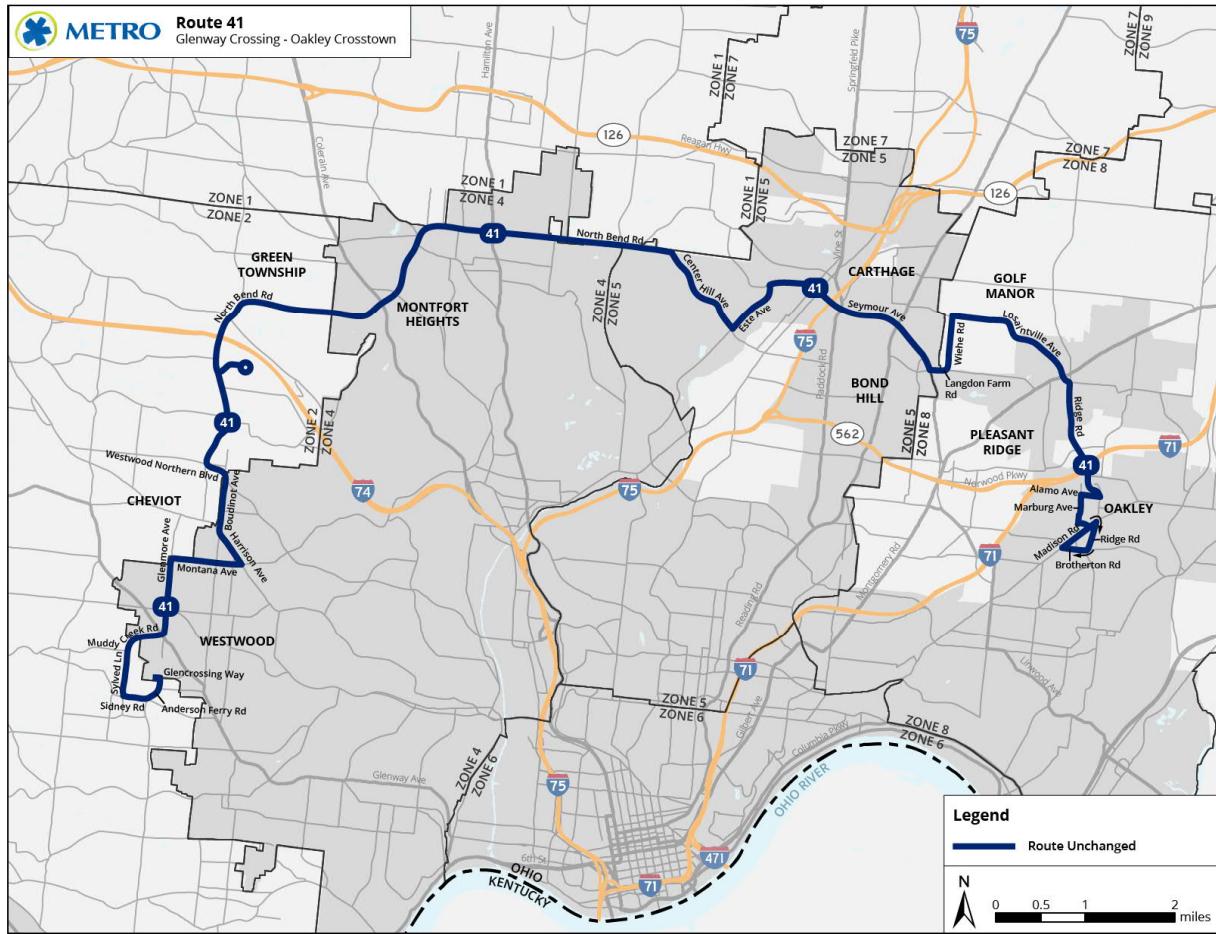
2.2.3.15 Route 41

In Year 2022 Route 41's spans of service and headway will improve. Service will start earlier in the morning on Sunday and end later in the night on all days. The headway will also be improved during all time periods on weekdays. Service on Route 41 could operate with shorter 30 foot transit buses. Table 2-35 presents the service parameters for this route. A map of Route 41 is presented on Figure 2-37.

Table 2-35: Route 41 - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:00AM to 9:35PM	5:00AM to 10:30PM
Peak Headway	60 Minutes	20 Minutes
Midday Headway	60 Minutes	30 Minutes
Evening Headway	60 Minutes	60 Minutes
Saturday Span	6:00AM to 9:00PM	6:00AM to 10:00PM
Saturday Headway	60 Minutes	60 Minutes
Sunday Span	8:30AM to 6:30PM	7:00AM to 10:00PM
Sunday Headway	60 Minutes	60 Minutes

Figure 2-37: Route 41 in Year 2022



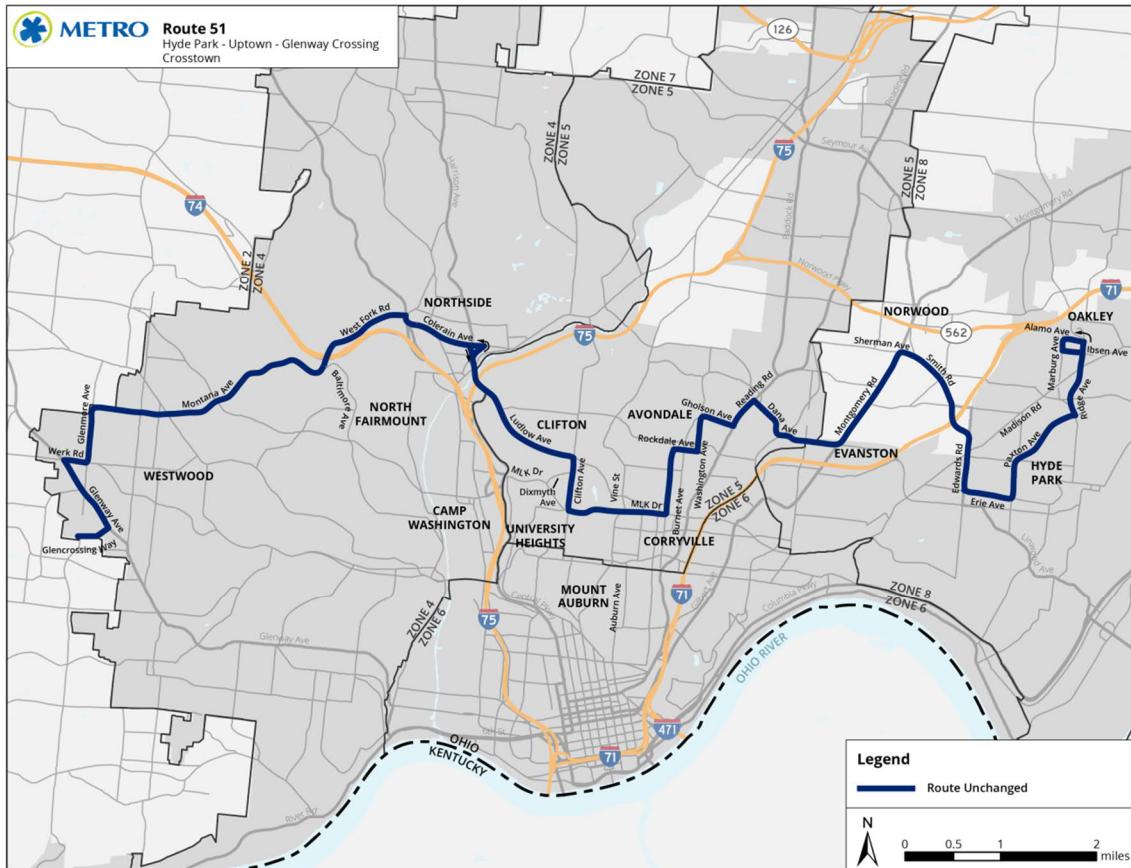
2.2.3.16 Route 51

There will be a number of changes to Route 51 in Year 2022. The span of service is being extended so that service is available later into the evenings, and on Sunday service will operate earlier in the morning. The headway will be improved during all periods, except weekday evenings. Service on this route could operate with shorter 30 foot standard buses. Route 51 service parameters are presented on Table 2-36. A map of Route 51 is presented on Figure 2-38.

Table 2-36: Route 51 - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	4:03AM to 9:35PM	4:00AM to 10:30PM
Peak Headway	35 Minutes	20 Minutes
Midday Headway	35 Minutes	30 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	5:35AM to 10:15PM	5:30AM to 10:30PM
Saturday Headway	60 Minutes	30 Minutes
Sunday Span	8:33AM to 7:50PM	7:00AM to 10:00PM
Sunday Headway	69 Minutes	60 Minutes

Figure 2-38: Route 51 in Year 2022



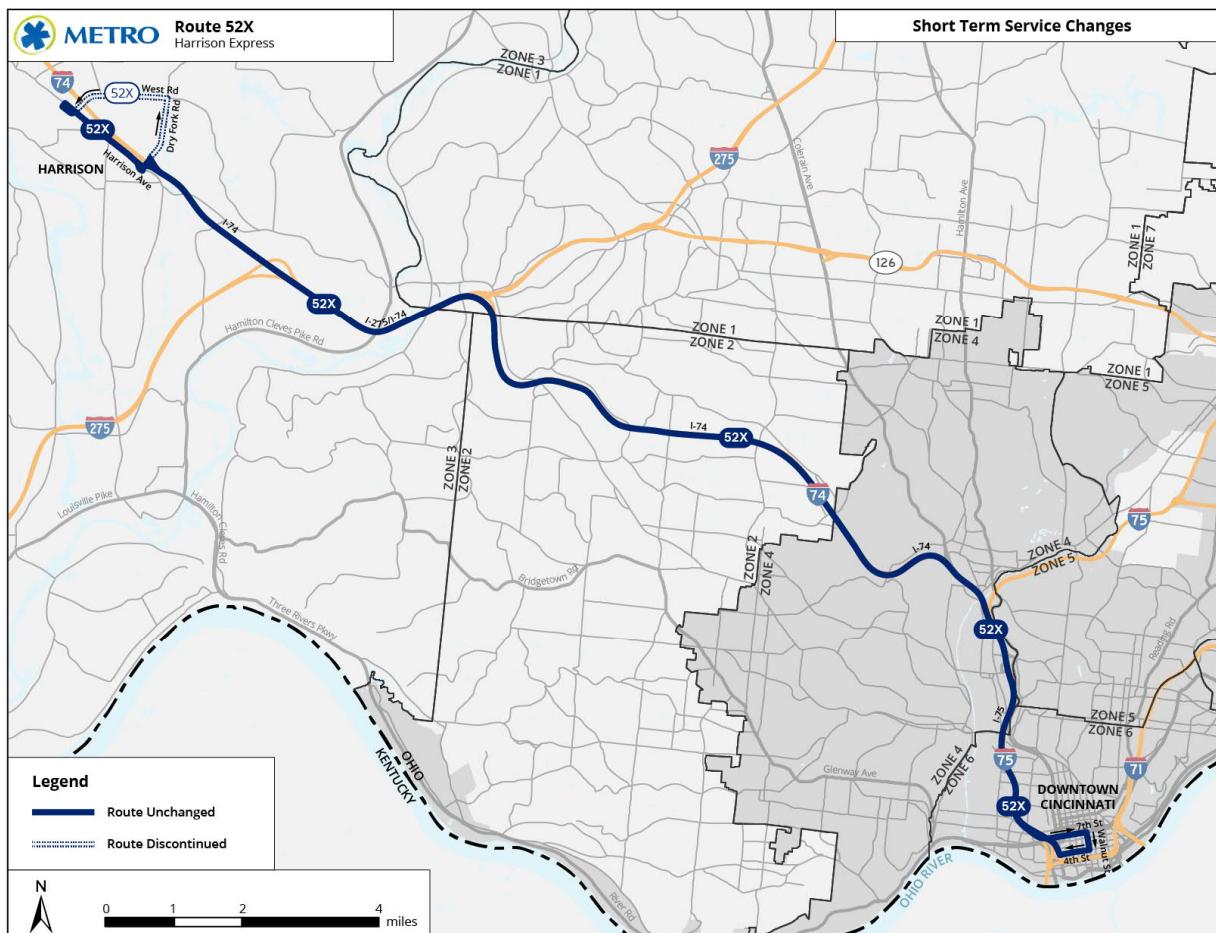
2.2.3.17 Route 52X

In Year 2022 Route 52X changes will include a change to the routing, improved headways, and span improvements. In Harrison, the route will be changed to be more direct between the park and ride and the highway, reducing circulation in Harrison where there are very few riders. The headway will be reduced from 30 minutes to 20 minutes. The span will be changed during both peak periods so service is available earlier and later. Route 52X will continue to operate with a standard 40 foot transit bus. Service parameters for Route 52X are presented on Table 2-37 and a route map is presented on Figure 2-39.

Table 2-37: Route 52X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	6:06AM to 7:31AM 3:34PM to 5:07PM	6:00AM to 8:30AM 3:30PM to 6:00PM
Peak Headway	30 Minutes	20 Minutes

Figure 2-39: Route 52X in Year 2022



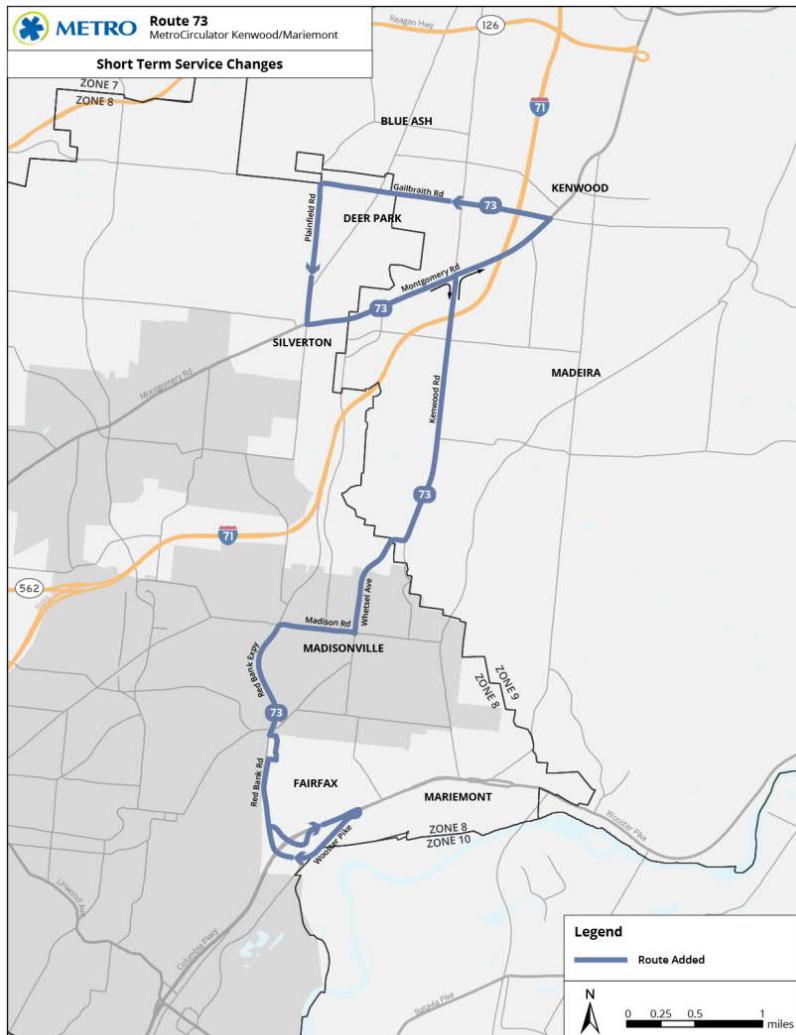
2.2.3.18 Route 73

Route 73 is a new fixed circulator route operating along Kenwood Road between the Kenwood and Mariemont areas. Service on this route will operate seven days a week. This route would operate with a shorter 30 foot cutaway bus as it serves lower density suburban areas. Table 2-38 presents the service parameters for this route. Figure 2-40 presents a map of Route 73.

Table 2-38: Route 73 - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	No service	6:00AM to 8:00PM
Peak Headway	No service	30 Minutes
Midday Headway	No service	60 Minutes
Evening Headway	No service	60 Minutes
Saturday Span	No service	8:00AM to 7:00PM
Saturday Headway	No service	60 Minutes
Sunday Span	No service	8:00AM to 7:00PM
Sunday Headway	No service	60 Minutes

Figure 2-40: Route 73 in Year 2022



2.2.3.19 Route 74X

A new super-express route variation will be introduced to Route 74X in Year 2022. This route variation will serve the Northgate Park and Ride and use Interstates 275, 74, and 75 to access Downtown Cincinnati. This will allow the span of service to be adjusted so that service operates a little later in the morning and afternoon. Service on Route 74X will continue to utilize a standard 40 foot transit bus. Depending on how transit services grow in Butler County, Northgate park and ride could eventually be a location where SORTA and BCRTA services can meet to facilitate transfers. Service parameters for Route 74X are presented on Table 2-39 and a route map is presented on Figure 2-41.

Table 2-39: Route 74X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:55AM to 8:00AM 3:10PM to 5:45PM	6:00AM to 9:00AM 3:00PM to 6:00PM
Peak Headway	15 Minutes	15 Minutes

Figure 2-41: Route 74X in Year 2022



2.2.3.20 Route 75X/81X

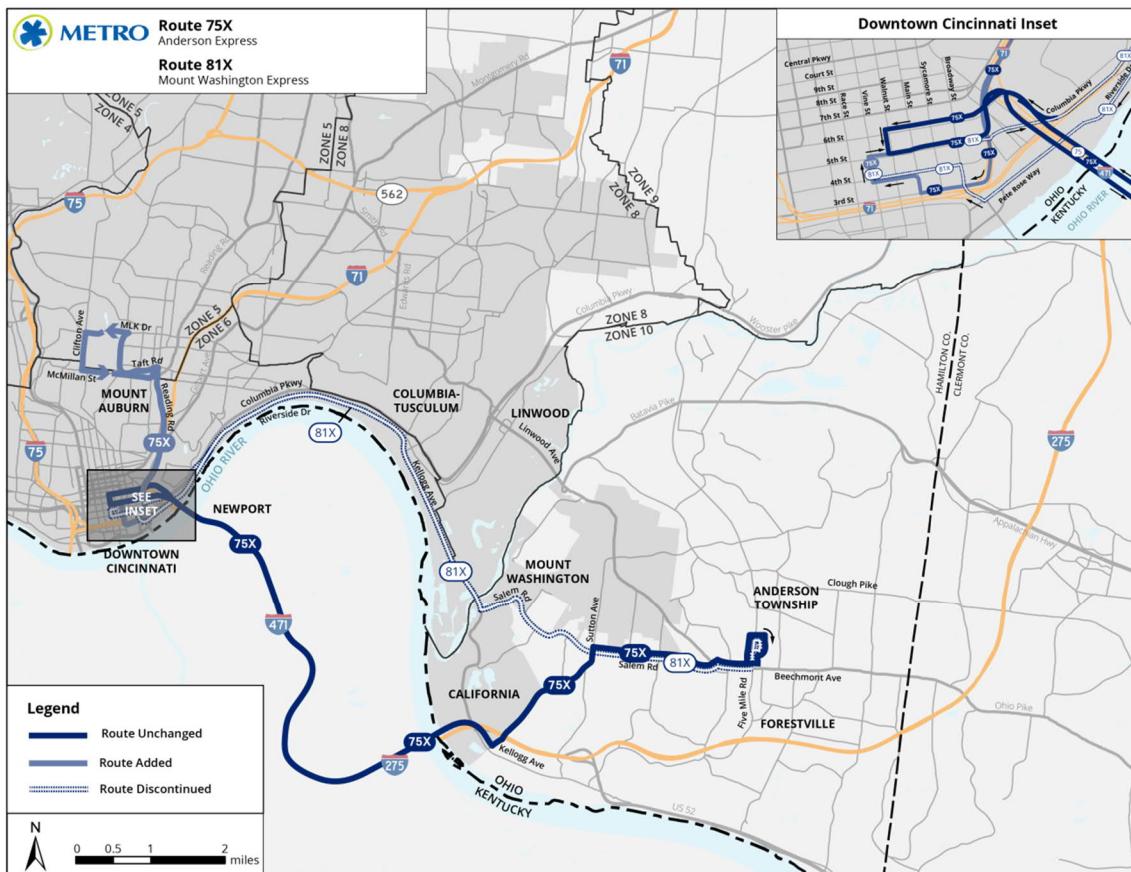
Routes 75X and 81X will be restructured and combined into a single route in Year 2022. This route will be called Route 75X and no job connector services will be operated on this route. As part of the restructuring, the route will be extended to Uptown, providing service to a second job hub for passengers in the Anderson Township area, serving Uptown after serving Downtown in the morning, while in the afternoon buses will start in Uptown, continue to Downtown before going to Anderson Township. The headway will match the current Route 75X headway of 20 minutes, which is better than the current headway on Route 81X. Service will operate later in the morning and evening. Route 75X would operate with a standard 40 foot transit bus. The park and ride in Anderson Township, where this route will originate/terminate can in the long term become a connection point for service into Clermont

County and possibly into Northern Kentucky if TANK were to extend service to this location. Service parameters for Route 75X are presented on Table 2-40 and a route map is presented on Figure 2-42.

Table 2-40: Route 75X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	5:54AM to 8:18AM (75X) 6:35AM to 7:29AM (81X) 3:43PM to 5:58PM (75X) 4:06PM to 5:06PM (81X)	6:00AM to 9:00AM 4:00PM to 6:00PM
Peak Headway	20 Minutes (75X)/60 Minutes (81X)	20 Minutes

Figure 2-42: Route 75X in Year 2022



2.2.3.21 Route 77X

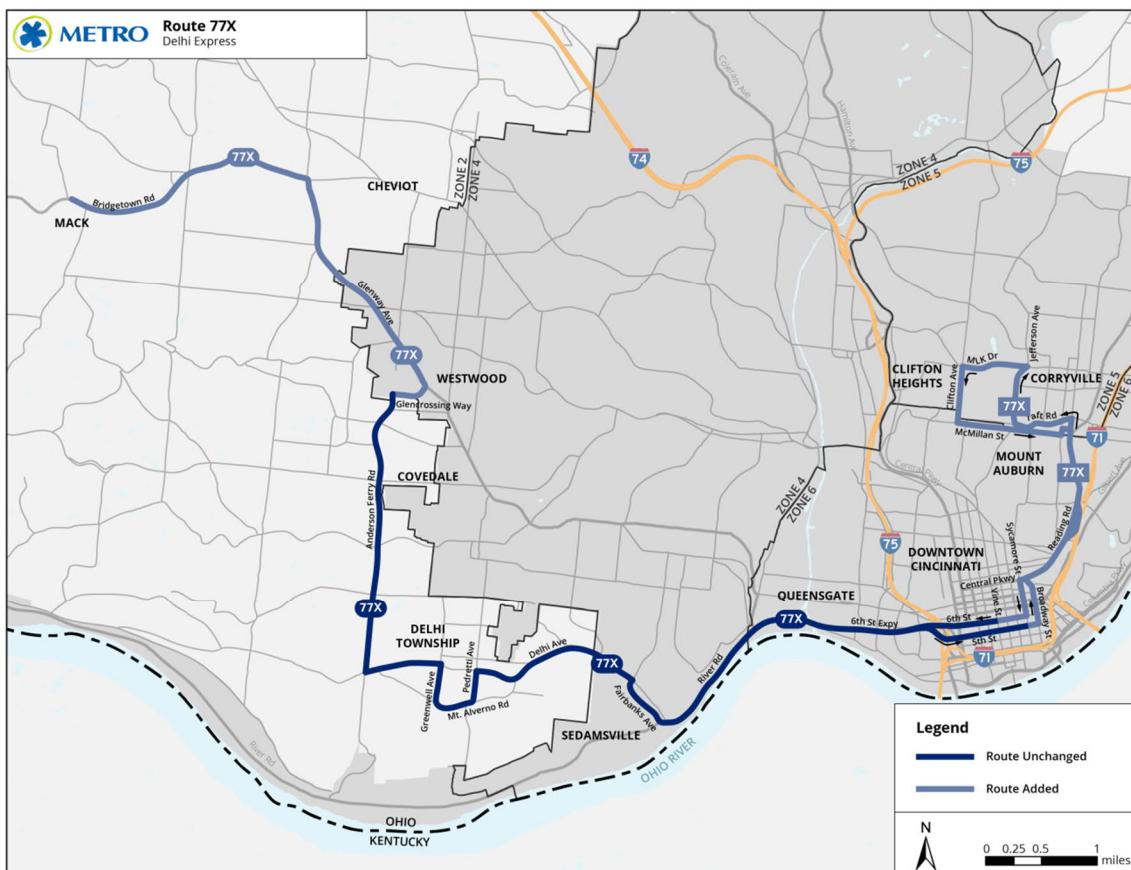
Route 77X improvements in Year 2022 include route extensions and changes in span of service. There are two route extensions proposed; the first being an extension into Green Township to serve a new park and ride, and the second being an extension into Uptown to serve a second job hub. In the mornings service would operate to Downtown then to Uptown, and in the afternoons buses would start

in Uptown and continue to Downtown before going to Green Township. Service will also operate later in the morning and later into the evening. Service would operate with a 40 foot transit bus. Service parameters for Route 77X are presented on Table 2-41 with a route map presented on Figure 2-43.

Table 2-41: Route 77X - Year 2022 Service Parameters

	Current	Year 2022
Weekday Span	6:07AM to 7:47AM 3:41PM to 5:20PM	6:00AM to 8:30AM 3:40PM to 6:00PM
Peak Headway	30 Minutes	30 Minutes

Figure 2-43: Route 77X in Year 2022



2.2.4 Year 2023

The fourth year will improve service along local routes. Weekday peak and midday headways will be improved on major corridor services. Other local routes will see improvements to span of service and frequency of service. Route 24 will be modified to support future BRT services. An additional 20 buses will need to be needed and 6 additional transit operations and maintenance staff members will be

needed to support the expansion of service in 2023. The description of each service change is presented below and shown on Figure 2-44, with the change in hours, miles, and vehicles presented on Table 2-42.

Figure 2-44: Year 2023 Service Improvements

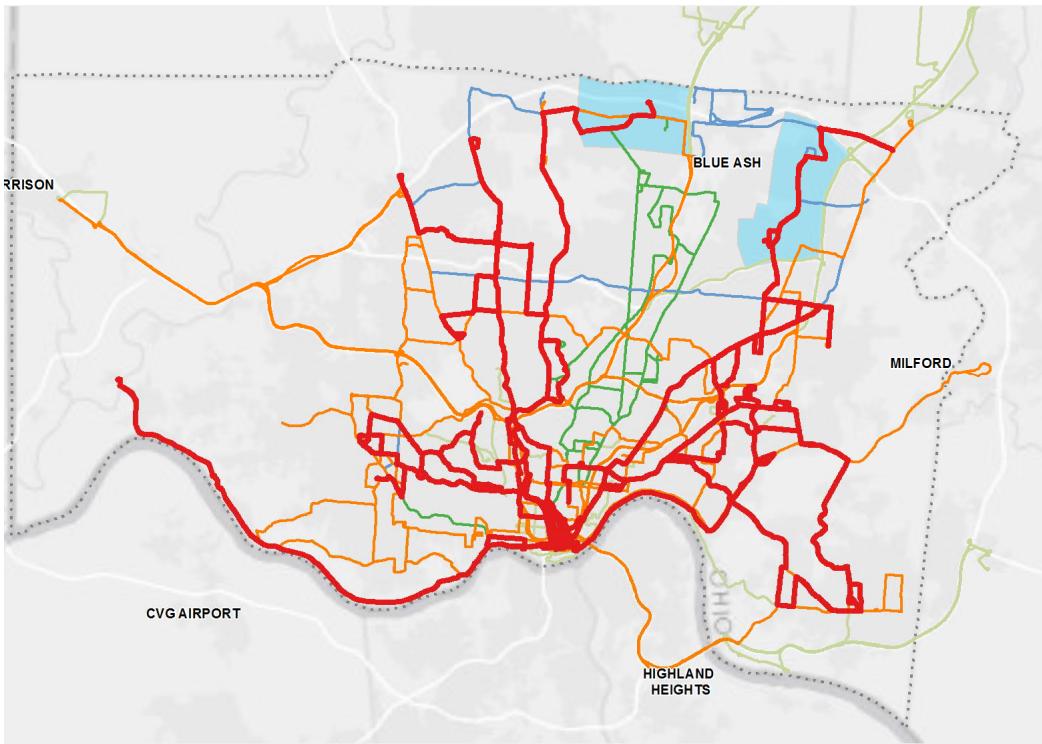


Table 2-42: Year 2023 Service Improvement Implications

Route	Additional Hours	Additional Miles	Additional Peak Buses	Additional Spare Buses	Total Additional Buses
4	8,874	105,035	2		
6	12,717	155,351	2		
11	6,923	88,664	2		
17	8,492	109,089	2		
21	9,964	118,468	2		
24	4,677	95,894	1		
28	6,577	125,703	1		
50	944	20,171	0		
64	12,717	155,351	2		
78	12,668	167,214	3		
Total	84,552	1,140,937	17	3	20

2.2.4.1 Route 4

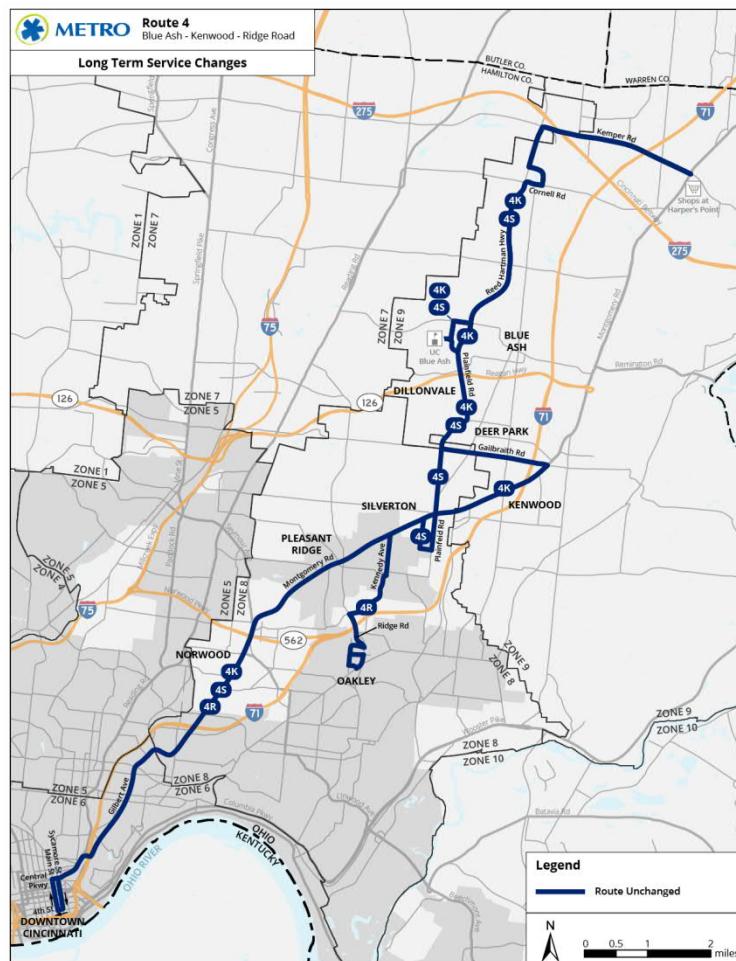
The Year 2023 improvements to Route 4 are reductions of headway during weekday peak and midday periods. During peak periods the headway will be reduced from 10 minutes to 8 minutes. During

midday periods headways will be reduced from 20 minutes to 15 minutes. Service will continue to operate 24 hours a day, seven days a week. Service will continue to operate with standard 40 foot buses. Table 2-43 presents the service parameters for Route 4 in Year 2023. A map of Route 4 is presented on Figure 2-45. The extended Route 4 to Sixteen Mile Stand would be a good location to interface with transit services from Warren County.

Table 2-43: Route 4 - Year 2023 Service Parameters

	Year 2021	Year 2023
Weekday Span	24-Hour	24-Hour
Peak Headway	10 Minutes	8 Minutes
Midday Headway	20 Minutes	15 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	24-Hour	24-Hour
Saturday Headway	20 Minutes	20 Minutes
Sunday Span	24-Hour	24-Hour
Sunday Headway	30 Minutes	30 Minutes

Figure 2-45: Route 4 in Year 2023



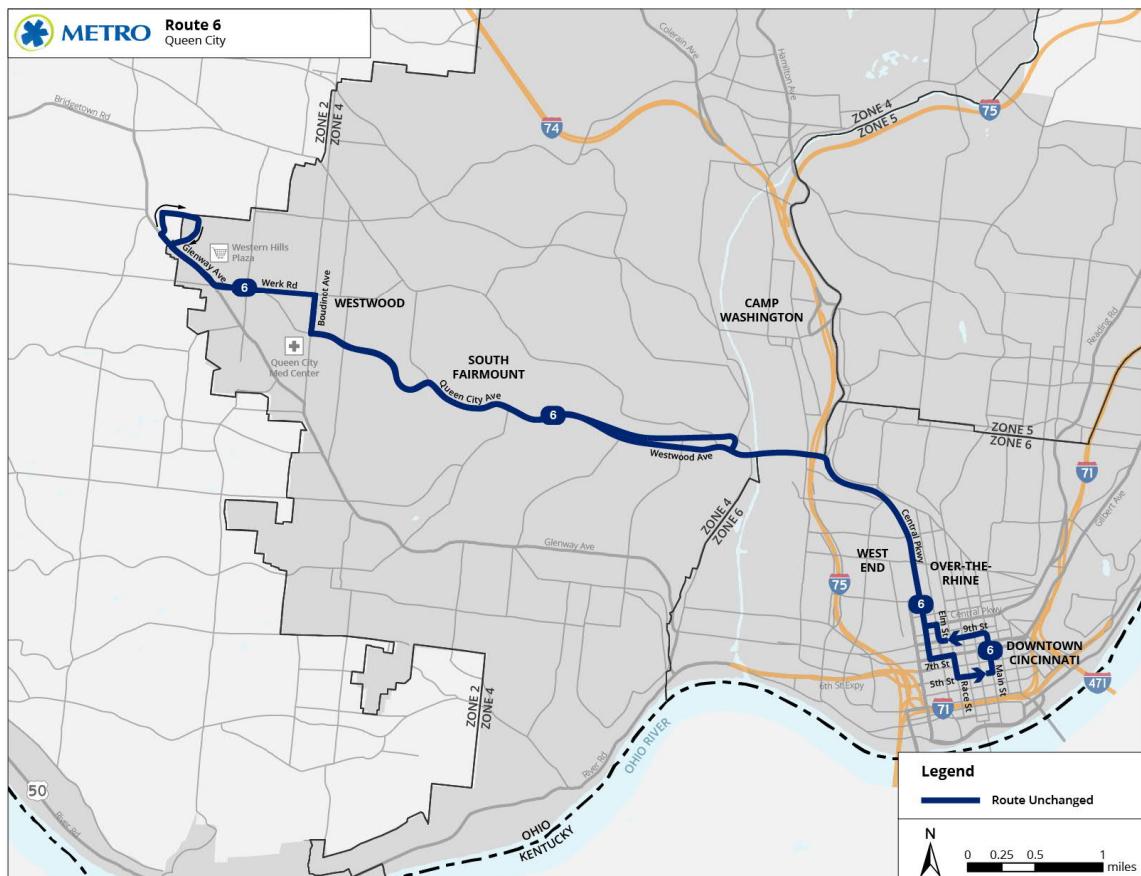
2.2.4.2 Route 6

In Year 2023 span and frequency improvements to Route 6 will be implemented. This includes service operating earlier in the morning on weekdays and Saturday and ending later in the evening on all days. Headways will improve during all periods on weekdays and on Saturday. Service will continue to operate with a standard 40 foot transit bus. Service parameters for Route 6 are presented on Table 2-44 and a route map is presented on Figure 2-46.

Table 2-44: Route 6 - Year 2023 Service Parameters

	Current	Year 2023
Weekday Span	5:05AM to 11:05PM	5:00AM to 11:15PM
Peak Headway	18 Minutes	15 Minutes
Midday Headway	25 Minutes	20 Minutes
Evening Headway	60 Minutes	60 Minutes
Saturday Span	5:51AM to 10:50PM	6:00AM to 11:00PM
Saturday Headway	48 Minutes	30 Minutes
Sunday Span	7:10AM to 6:10PM	7:00AM to 10:00PM
Sunday Headway	45 Minutes	45 Minutes

Figure 2-46: Route 6 in Year 2023



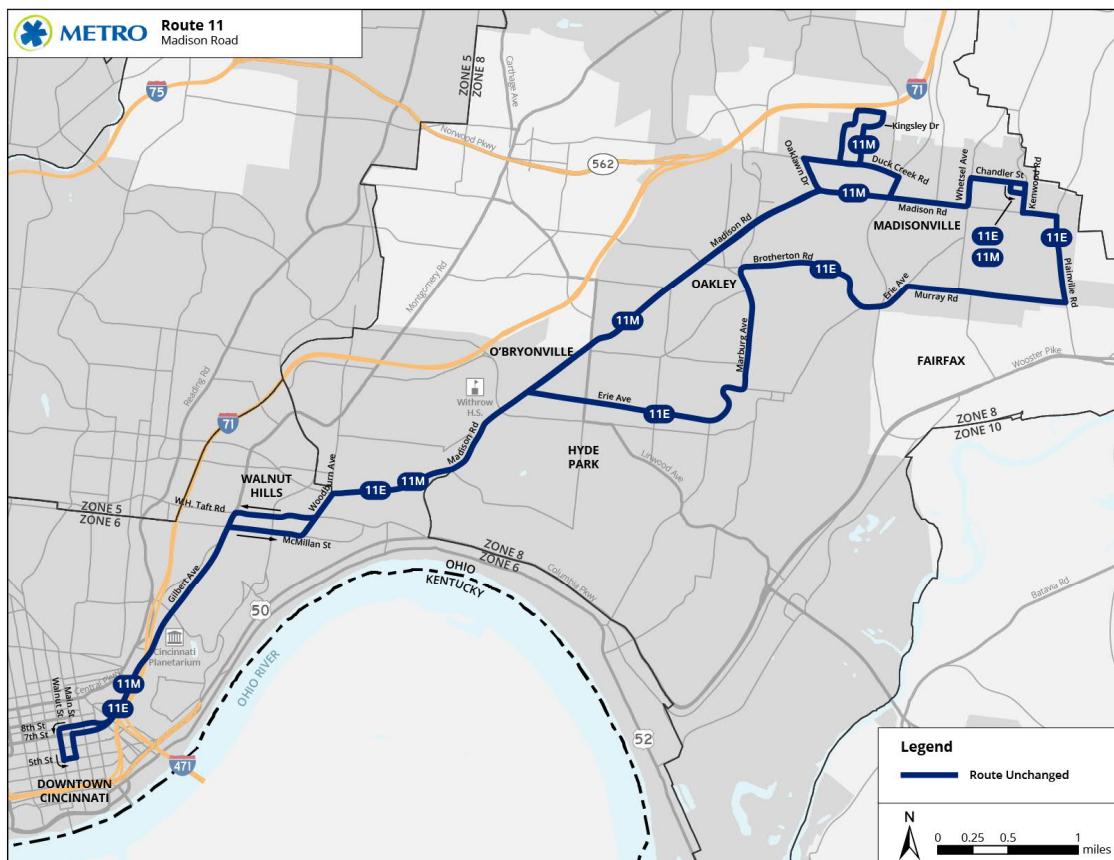
2.2.4.3 Route 11

The Year 2023 improvements to Route 11 are reductions of headway during weekdays, all time periods. During peak periods the headway will be reduced from 10 minutes to 8 minutes. During midday periods headways will be reduced from 25 minutes to 20 minutes. During evenings headways will be reduced from 40 minutes to 30 minutes. Service will continue to operate 24 hours a day, seven days a week. Service will continue to operate with standard 40 foot buses. Table 2-45 presents the service parameters for Route 11 in Year 2023. A map of Route 11 is presented on Figure 2-47.

Table 2-45: Route 11 - Year 2023 Service Parameters

	Year 2020	Year 2023
Weekday Span	24-Hour	24-Hour
Peak Headway	10 Minutes	8 minutes
Midday Headway	25 Minutes	20 minutes
Evening Headway	40 Minutes	30 minutes
Saturday Span	24-Hour	24-Hour
Saturday Headway	15 Minutes	15 Minutes
Sunday Span	24-Hour	24-Hour
Sunday Headway	30 Minutes	30 Minutes

Figure 2-47: Route 11 in Year 2023



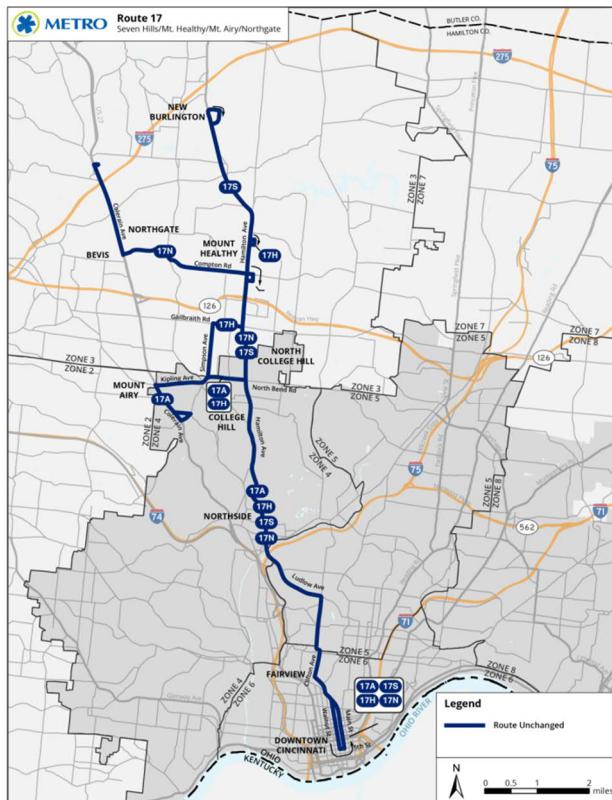
2.2.4.4 Route 17

The Year 2023 improvements to Route 17 are improvements to headway during weekday peak and midday periods. During peak periods the headway will be reduced from 10 minutes to 8 minutes. During midday period headways will be reduced from 15 minutes to 10 minutes. Service will continue to operate 24 hours a day, seven days a week. Service will continue to operate with standard 40 foot buses. Table 2-46 presents the service parameters for Route 17 in Year 2023. A map of Route 17 is presented on Figure 2-48. While Route 17 comes close to the Butler County border, there are no Butler County services that operate near the same areas served by Route 17 so in the short-term this route would not connect to Butler County services.

Table 2-46: Route 17 - Year 2023 Service Parameters

	Year 2020	Year 2023
Weekday Span	24-Hour	24-Hour
Peak Headway	10 Minutes	8 Minutes
Midday Headway	15 Minutes	10 Minutes
Evening Headway	30 Minutes	30 Minutes
Saturday Span	24-Hour	24-Hour
Saturday Headway	15 Minutes	15 Minutes
Sunday Span	24-Hour	24-Hour
Sunday Headway	15 Minutes	15 Minutes

Figure 2-48: Route 17 in Year 2023



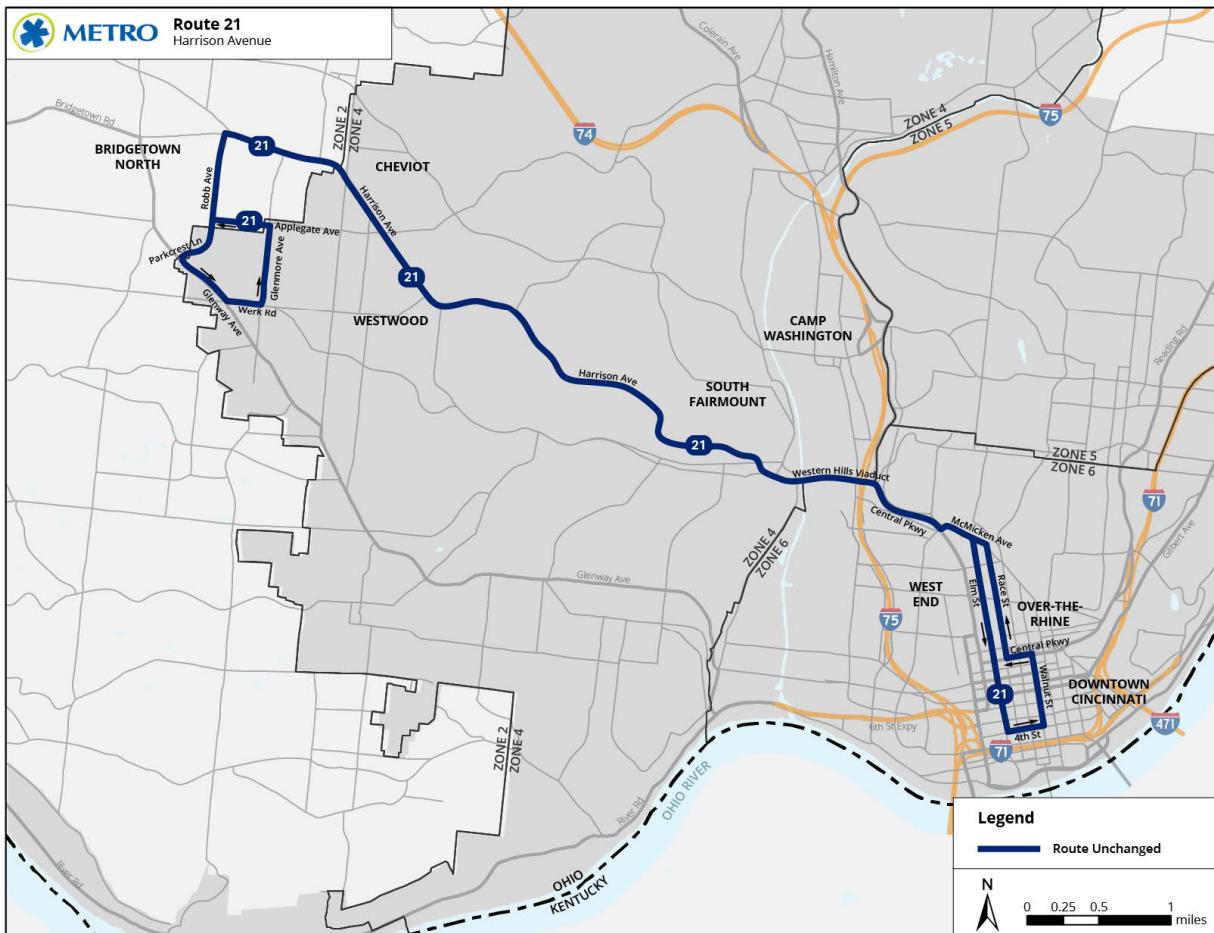
2.2.4.5 Route 21

Route 21 will be improved on all days in Year 2023. Service will operate earlier in the morning and continue later into the evening on weekdays and Saturdays. The headway will be improved on all days and time periods. Service will continue to operate with a standard 40 foot transit bus. Year 2023 service parameters on Route 21 are presented on Table 2-47 and a route map is presented on Figure 2-49.

Table 2-47: Route 21 - Year 2023 Service Parameters

	Current	Year 2023
Weekday Span	4:28AM to 12:55AM	4:00AM to 1:00AM
Peak Headway	15 Minutes	12 Minutes
Midday Headway	30 Minutes	15 Minutes
Evening Headway	50 Minutes	30 Minutes
Saturday Span	5:03AM to 12:55AM	5:00AM to 1:00AM
Saturday Headway	33 Minutes	30 Minutes
Sunday Span	5:19AM to 12:22AM	5:20AM to 12:00AM
Sunday Headway	44 Minutes	30 Minutes

Figure 2-49: Route 21 in Year 2023



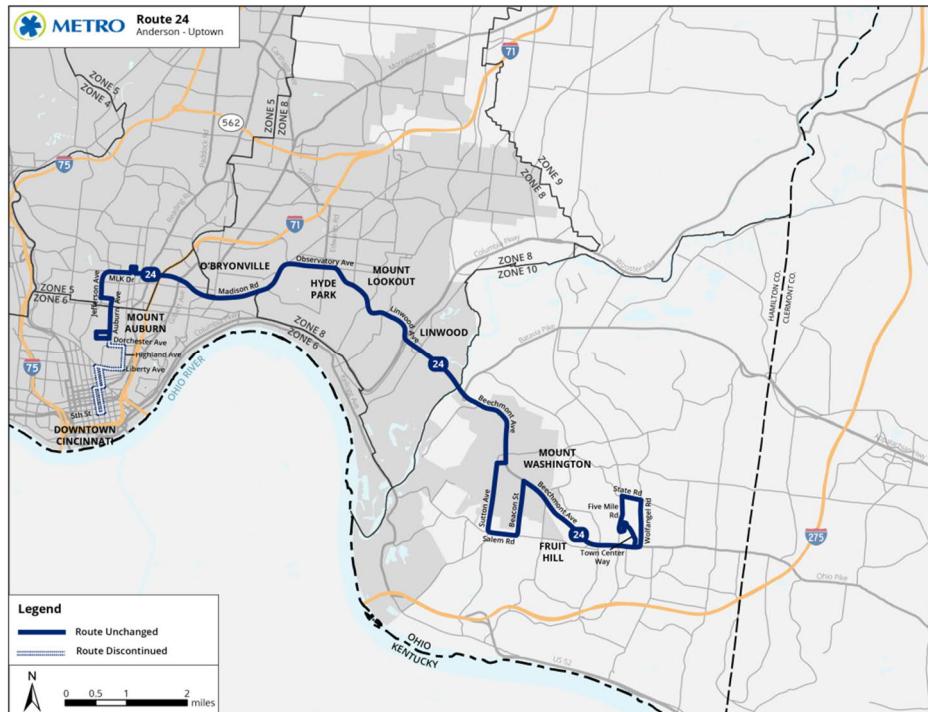
2.2.4.6 Route 24

Route 24 service will be truncated to operate only between Anderson Township and Uptown. In Uptown transfers are available to numerous routes, including future BRT services, to access Downtown. Truncating service to Uptown will allow for improvements to the headway on Saturday and Sunday, with headways decreasing from 45 minutes on Saturday and 65 minutes on Sunday to 30 minutes each day. Service on this route can operate with a shorter 30 foot transit bus. This route serves the Anderson Township park and ride which today is only served by SORTA buses, but longer term TANK and Clermont County could extend their services to this location to strengthen connectivity in the eastern parts of the metropolitan area. Service parameters for Route 24 are presented on Table 2-48 and a route map is presented on Figure 2-50.

Table 2-48: Route 24 - Year 2023 Service Parameters

	Current	Year 2023
Weekday Span	4:13AM to 12:03AM	4:13AM to 12:03AM
Peak Headway	25 Minutes	25 Minutes
Midday Headway	45 Minutes	45 Minutes
Evening Headway	105 Minutes	105 Minutes
Saturday Span	4:50AM to 11:20PM	4:50AM to 11:20PM
Saturday Headway	45 Minutes	30 Minutes
Sunday Span	5:12AM to 9:23PM	5:12AM to 9:23PM
Sunday Headway	65 Minutes	30 Minutes

Figure 2-50: Route 24 in Year 2023



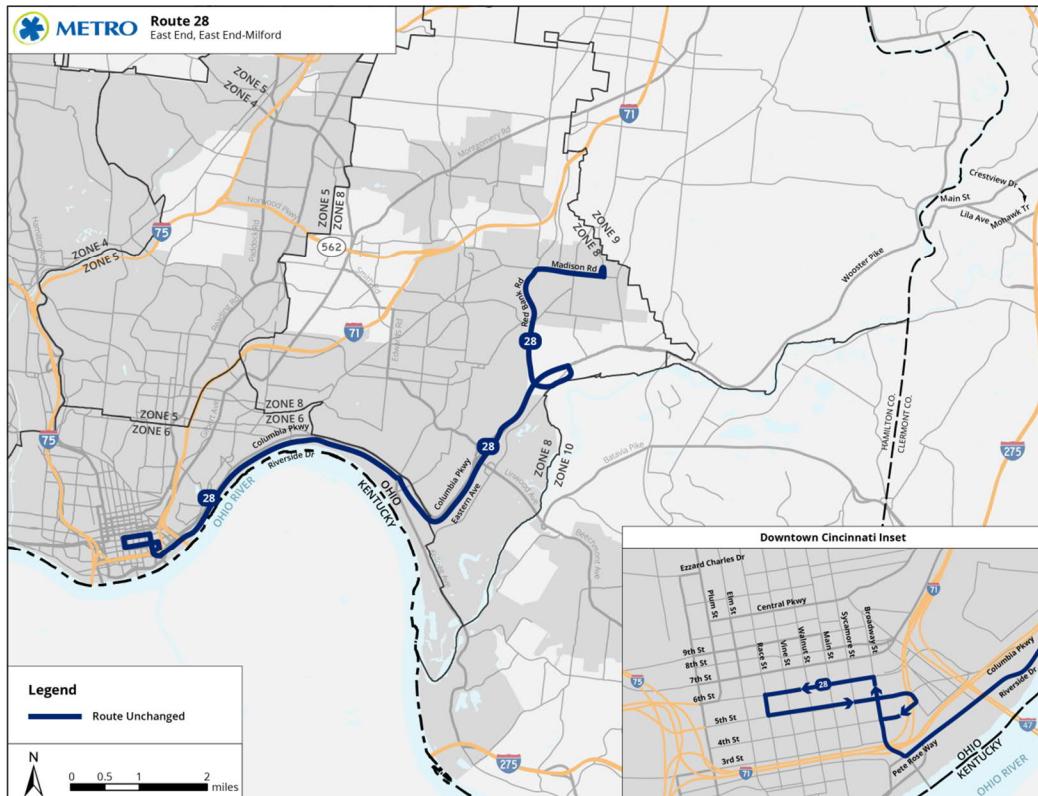
2.2.4.7 Route 28

Route 28 was recently modified to end in Madisonville. In Year 2023 the headway will improve. Weekday peak period headway will improve from 30 minutes to 20 minutes. Midday headway will improve from every two hours to every hour. Evening headway will improve from every 52 minutes to every 45 minutes. Weekend headway will improve from every 80 minutes to every 60 minutes. Route 28 would operate with a shorter 30 foot transit bus. Table 2-49 presents the Route 28 service parameters, with a route map presented on Figure 2-51.

Table 2-49: Route 28 - Year 2023 Service Parameters

	Current	Year 2023
Weekday Span	5:36AM to 10:07PM	5:30AM to 10:00PM
Peak Headway	30 Minutes	20 Minutes
Midday Headway	120 Minutes	60 Minutes
Evening Headway	52 Minutes	45 Minutes
Saturday Span	6:15AM to 9:00PM	6:15AM to 9:00PM
Saturday Headway	80 Minutes	60 Minutes
Sunday Span	6:15AM to 9:00PM	6:15AM to 9:00PM
Sunday Headway	80 Minutes	60 Minutes

Figure 2-51: Route 28 in Year 2023



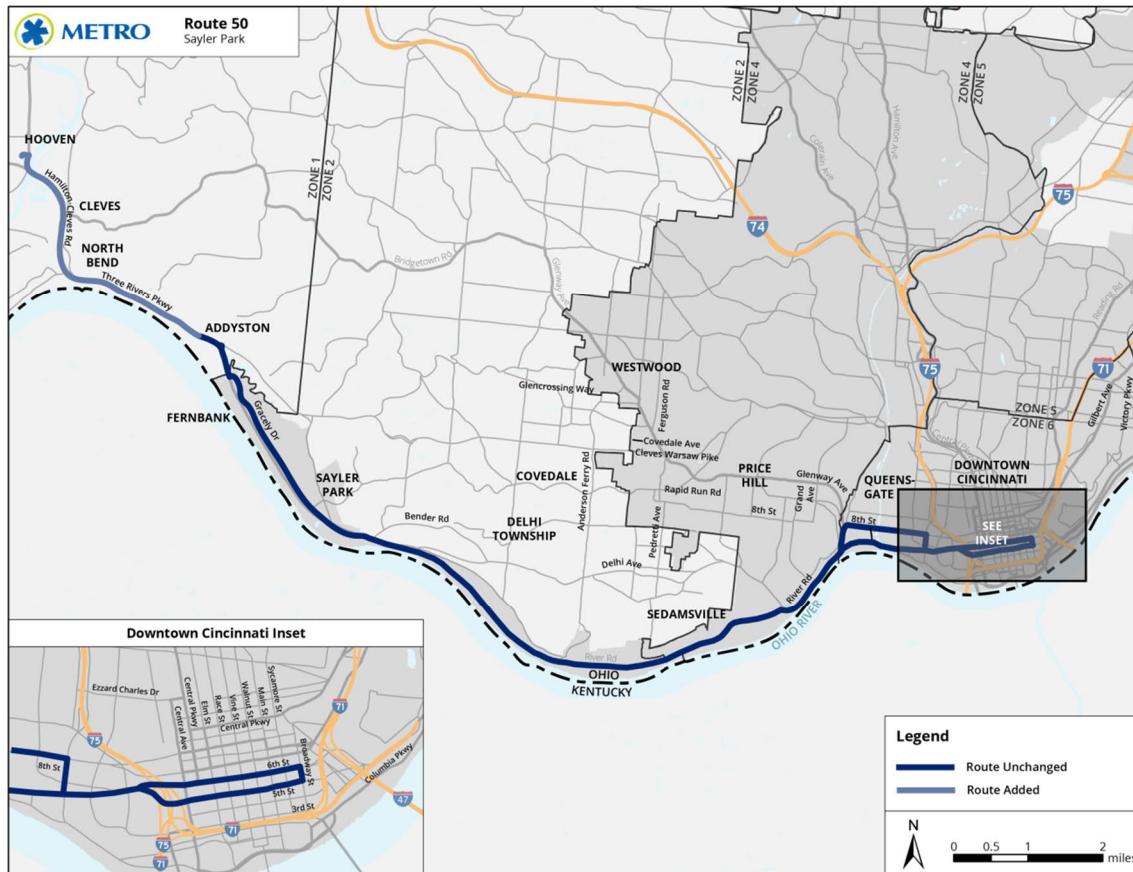
2.2.4.8 Route 50

The changes to Route 50 include an extension further west to Hooven and the introduction of midday service. Midday service would operate every two hours. The extension to Hooven will provide service to far western parts of Hamilton County, including service to Kroger. Service on Route 50 will operate with a shorter 30 foot transit bus. Service parameters for Route 50 are presented on Table 2-50 with a route map presented on Figure 2-52.

Table 2-50: Route 50 - Year 2023 Service Parameters

	Current	Year 2023
Weekday Span	5:42AM to 6:46PM	5:42AM to 6:46PM
Peak Headway	40 Minutes	40 Minutes
Midday Headway	No service	120 Minutes

Figure 2-52: Route 50 in Year 4



2.2.4.9 Route 64

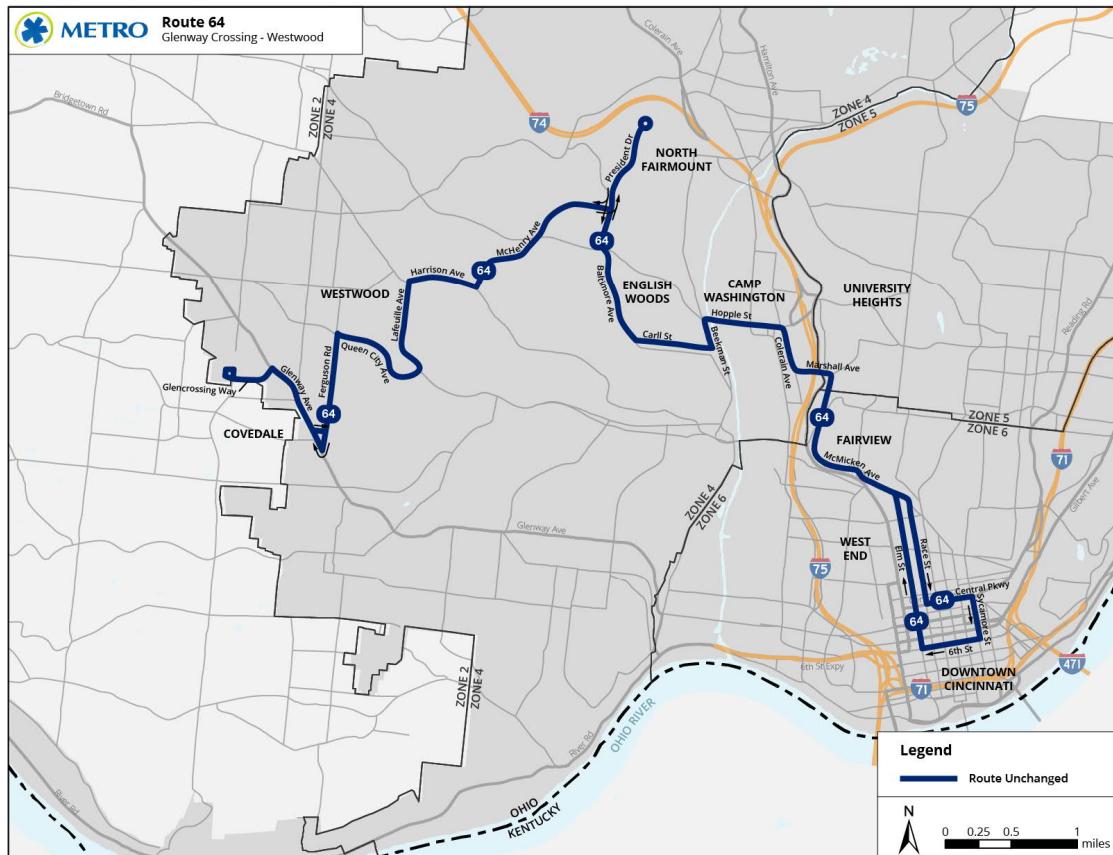
In Year 2023 headway improvements will be implemented on Route 64, reducing the headway. Headway improvements will be introduced during all time periods on all days. Weekday peak period headways will improve from every 20 minutes to every 15 minutes. Midday headways will improve

from every 35 minutes to every 20 minutes. Evening and weekend headways will improve to every 30 minutes. Service will continue to operate with a standard 40 foot transit bus. Service parameters for Route 64 are presented on Table 2-51 and a route map is presented on Figure 2-53.

Table 2-51: Route 64 - Year 2023 Service Parameters

	Current	Year 2023
Weekday Span	3:56AM to 12:25AM	4:00AM to 12:30AM
Peak Headway	20 Minutes	15 Minutes
Midday Headway	35 Minutes	20 Minutes
Evening Headway	40 Minutes	30 Minutes
Saturday Span	4:22AM to 12:20AM	4:30AM to 12:15AM
Saturday Headway	40 Minutes	30 Minutes
Sunday Span	5:46AM to 11:40PM	5:45AM to 11:45PM
Sunday Headway	50 Minutes	30 Minutes

Figure 2-53: Route 64 in Year 2023



2.2.4.10 Route 78

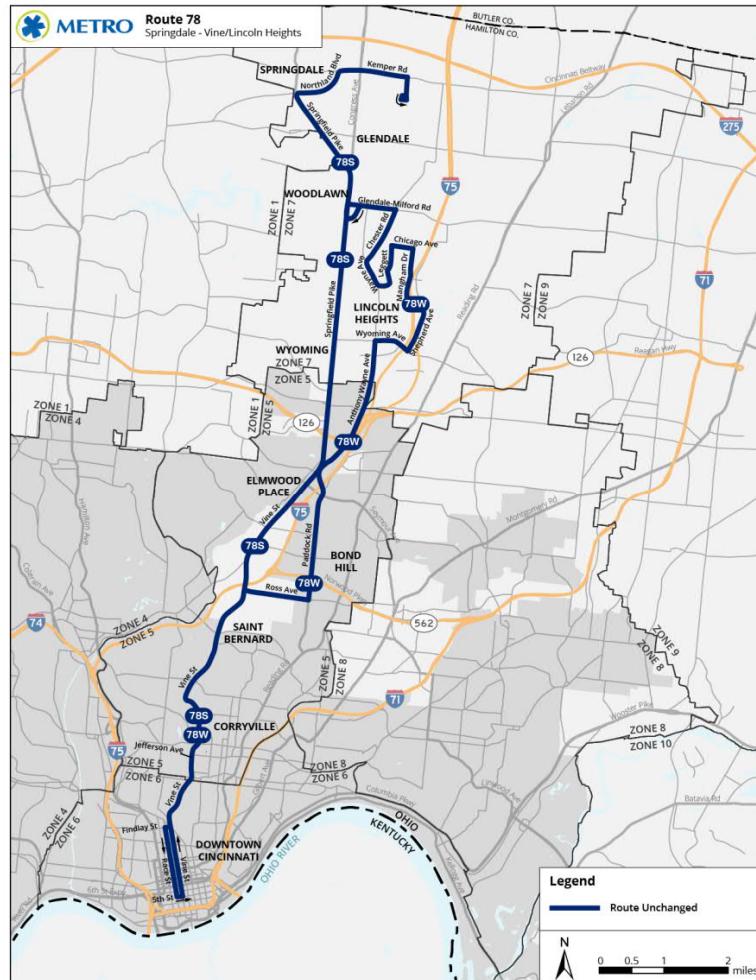
The improvements to Route 78 in Year 2023 will result in more frequent service on weekdays. The headway during peak period will improve to every 10 minutes. During middays the headway will

improve to every 20 minutes. During evenings the headway will improve to every 30 minutes. Route 78 will continue to operate with standard 40 foot buses. Table 2-52 presents the service parameters for Route 78 in Year 2023. A map of Route 78 is presented on Figure 2-54. These service improvements would allow for better connections between Route 20 and Butler County Routes R4 and R6.

Table 2-52: Route 78 - Year 2023 Service Parameters

	Year 2020	Year 2023
Weekday Span	24-Hour	24-Hour
Peak Headway	15 Minutes	10 Minutes
Midday Headway	30 Minutes	20 Minutes
Evening Headway	45 Minutes	30 Minutes
Saturday Span	24-Hour	24-Hour
Saturday Headway	30 Minutes	30 Minutes
Sunday Span	24-Hour	24-Hour
Sunday Headway	30 Minutes	30 Minutes

Figure 2-54: Route 78 in Year 2023



2.2.5 Beyond Year 2023

All service improvements are projected to be implemented by 2023, the fourth year of the plan. While the new services may be in place, that does not mean that system planning is complete, there are a number of ongoing activities that will need to occur. This includes continued planning for Bus Rapid Transit services and a more regional system. As BRT services are implemented, local services that feed operate along BRT corridors may be adjusted to better support BRT and intersecting services may need to be modified to serve BRT stations.

The most essential function will be to monitor the system that is in place and adjust service as necessary based on actual revenues available and ridership. This includes possible adjustments to the routes that were not modified as part of the service plan; local routes 1, 27, 49, 72, and 85 along with county funded express routes 42X, 71X, and 82X. Future bus planning would not only include the services operated by SORTA but also how can services be operated more seamlessly throughout the region.

2.3 Bus Rapid Transit

The financial plan associated with this sales tax includes funding for the construction and operation of two Bus Rapid Transit (BRT) services. BRT will provide rapid transit to the Cincinnati area, using buses that will utilize dedicated running ways for significant portions of the route. BRT will utilize a combination of local and federal funding sources for construction, and the financial plan assumes funding for the local match. The two BRT corridors will be along Reading Road (which should be renamed the North Line) and Glenway Avenue (which should be renamed West Line).

Long term BRT should be considered regionally. This could include through running of the planned BRT services into neighboring counties or new interjurisdictional BRT services. Even if BRT services should only serve one county or one transit operator's service area, planning for BRT should be considered regionally to ensure it is improving regional mobility.

Bus Rapid Transit was analyzed along six corridors, with two corridors ultimately recommended for Bus Rapid Transit. The analysis considered the FTA Small Starts application process, which is described in the next section, and includes current service characteristics including current transit service, demographics of the potential corridor, and land use characteristics. A map of all the corridors considered is presented on Figure 2-55. The analysis is presented on Table 2-53. Ultimately the analysis showed that the Reading Road and Glenway Avenue corridors would score the highest based on the FTA Small Starts criteria.

Figure 2-55: Potential Bus Rapid Transit Corridors

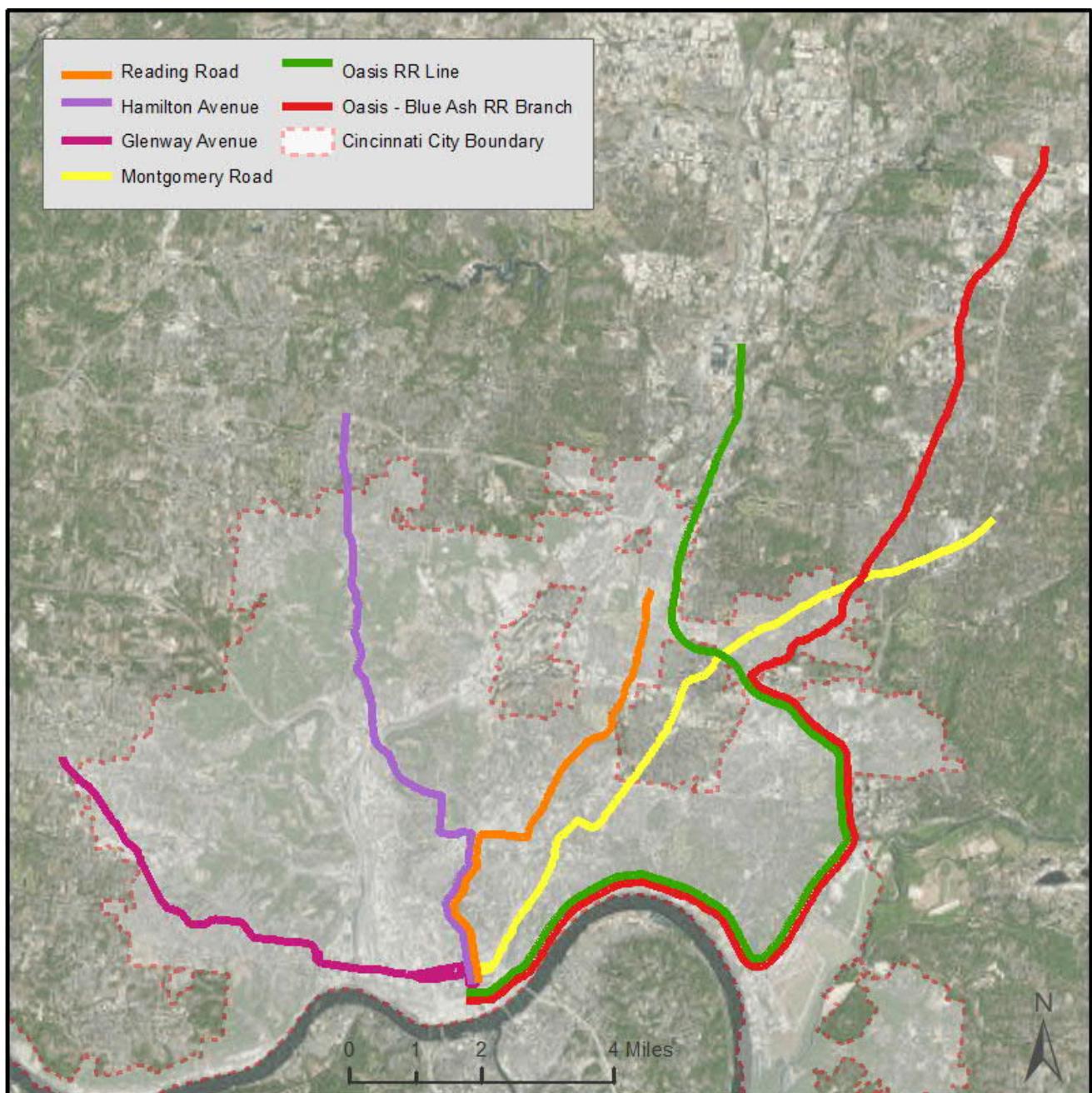


Table 2-53: Bus Rapid Transit Comparison

	Reading Road	Glenway Avenue	Hamilton Avenue	Montgomery Road	Oasis Line	Oasis Line – Blue Ash
Corridor Characteristics						
Corridor Length (miles)	9 miles	8 miles	9 miles	11 miles	17 miles	21 miles
Average Weekday Bus Ridership (all routes)	5,300	3,400	5,300	4,800	1,300	1,900
Average Peak Bus Headway ¹	8 Minutes	12 Minutes	10 Minutes	7.5 Minutes	None	None
Average Midday Bus Headway ²	10 Minutes	15 Minutes	15 Minutes	12 Minutes	None	None
Current Average Travel Speed	13.3 MPH	11.7 MPH	15.2 MPH	11.9 MPH	27.0 MPH	27.0 MPH
Percent of Corridor with Right-of-Way Greater than 48 Ft.	38.8%	43.0%	29.3%	82.6%	85.0%	85.0%
Projected Capital Costs for BRT in Millions ³	\$108M	\$96M	\$108M	\$132M	\$250M	\$160M
Demographics						
Population Density (people per square mile)	6,000	5,200	5,700	5,300	3,000	2,800
Total Jobs	268,000	146,000	248,000	240,000	172,000	240,000
Transit Dependent Population	29%	24%	23%	20%	14%	11%
Land Use Characteristics						
Affordable Housing Percentage	24%	13%	13%	10%	11%	5%
Generators	12	9	12	13	7	8
New Development list provided by SORTA	1	0	1	0	0	1
Economic Development Potential ⁴	Medium	Medium	Medium	Lower	Higher	Higher

Sources: 2016 Longitudinal Employer-Household Dynamics Survey and American Community Survey from the US Census Bureau, and SORTA

¹ Peak period is from 6:00AM to 9:00AM and 3:00PM to 6:00PM

² Midday period is from 9:00AM to 3:00PM

³ Capital cost is based on \$12 Million per Mile which includes stations, right-of-way improvements, and buses

⁴ Based on vacant land, land values, and land use types

2.3.1 FTA Capital Investment Grant Program

This section provides an overview of the Federal Transit Administration (FTA) Capital Investment Grant (CIG) Program and its potential applicability within the Southwest Ohio region. The CIG program is the primary federal program used to fund major transit capital investments. The CIG program is a discretionary and competitive federal grant program. The CIG program was appropriated approximately \$2.3 billion annually as part of the Fixing America's Surface Transportation Act (FAST Act). The CIG program includes four types of projects:

- Core Capacity
 - Substantial corridor-based capital investments in existing fixed guideway systems
 - Increase capacity by not less than 10%
 - In corridors that are at capacity today or will be in 5 years
 - Projects may NOT include elements designed to maintain a state of good repair
 - Historically funds 30-50% of capital cost
- Small Starts
 - New fixed guideway projects or extensions of existing fixed guideway systems
 - Total estimated capital cost less than \$300 million and
 - Seeking less than \$100 million from the Section 5309 CIG Program
 - Historically funds 50-70% of capital cost, maximum of 80%
- New Starts
 - New fixed guideway projects or extensions of existing fixed guideway systems
 - Total estimated capital cost \$300 million or more, or
 - Seeking \$100 million or more from the Section 5309 CIG Program
 - Historically funds 50% of capital cost
- Program of Interrelated Projects
 - Any combination of two or more New Starts, Small Starts, or Core Capacity projects
 - Projects in the program must have logical connectivity to one another and all must begin construction within a reasonable timeframe

While a Program of Interrelated Projects was authorized as part of the Moving Ahead for Progress in the 21st Century Act (MAP-21) and reauthorized as part of the FAST Act. The FTA has yet to advance projects through the CIG program using the Program of Interrelated projects.

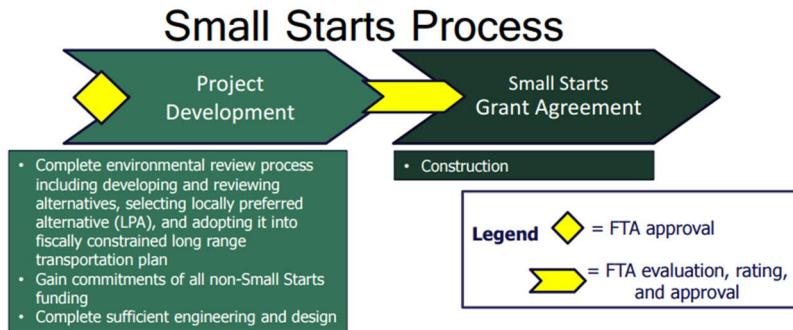
2.3.2 Applicability of CIG Program in the Southwest Ohio Region

In 2012 Southwest Ohio Regional Transit Authority (SORTA) conducted a feasibility study exploring the corridors for potential transit enhancement within the Southwest Ohio region. The study recommends improving high capacity transit service in four heavily utilized corridors (Reading Road, Glenway Avenue, Hamilton Avenue, and Montgomery Road). SORTA is exploring improving transit service in these corridors through the use of Bus Rapid Transit (BRT). Given the approximate length of each of these corridors and BRT as the preferred mode one or more projects in the Southwest Ohio region would most likely advance through the FTA's CIG program as a series of Small Starts Projects.

2.3.3 Small Starts Process and Evaluation

Projects advancing through the CIG program as Small Starts projects are less than \$300 million in total capital cost and seeking less than \$100 million from the FTA's CIG program. Historically, the CIG program has provided between 50-70% of a Small Starts project capital funding. As shown in Figure 2-56, the Small Starts process is comprised of two phases Project Development (PD) and Small Starts Grant Agreement.

Figure 2-56: Small Starts Process



2.3.3.1 Project Development

SORTA would formally request to enter Small Starts PD for each of the proposed projects. To request entry SORTA would provide FTA with a letter containing the following information.

- The name of the study sponsor, any partners involved in the study, and the roles and responsibilities of study sponsor and project partners
- Identification of a project manager and other key staff that will perform the PD work
- A brief description and clear map of the corridor being studied, including its length and key activity centers
- The brief description of the transportation problem in the corridor or a statement of purpose and need
- Electronic copies of or weblinks to prior studies done in the corridor, if any
- Identification of a proposed project if one is known and alternatives to that project if any are being considered
- A brief description of current levels of transit service in the corridor today
- Identification of a cost estimate for the project, if available
- The anticipated cost to complete PD, not including the cost of any work done prior to officially entering the PD phase
- Identification of the non-CIG funding available and committed to conduct the PD work
- Documentation demonstrating commitment of funds for the PD work (e.g. Board resolutions, adopted budgets, approved Capital Improvement Programs, approved Transportation Improvement Programs, letters of commitment)
- An anticipated draft timeline for completing the following activities:
 - compliance with NEPA and related environmental laws
 - selection of a locally preferred alternative (LPA)

- adoption of the LPA in the fiscally constrained long range transportation plan
- completion of the activities required to obtain a project rating under the evaluation criteria
- anticipated receipt of a construction grant agreement from FTA
- anticipated start of revenue service

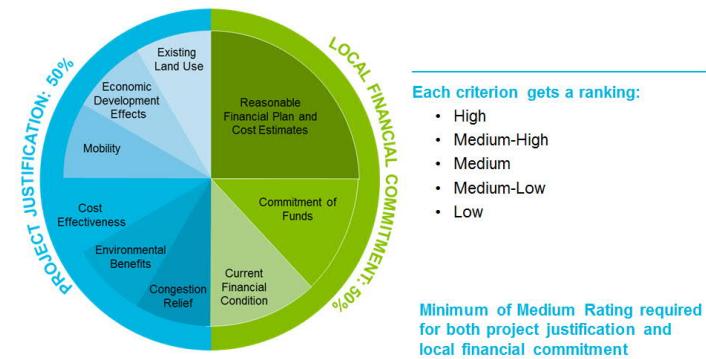
Requests to enter PD must demonstrate to FTA that funding is available and committed to perform the PD work. Project sponsors must have money available to begin the PD work immediately upon entry into the program. Funding available one or more years in future does not qualify as available and committed for entry into PD. The FTA has 45 days to process and review the request to enter PD, determining if the sufficient information has been provided.

While in Small Starts PD Project Sponsors need to complete the following activities:

- The project sponsor must select a LPA
- The project sponsor must get the LPA adopted into the fiscally constrained metropolitan transportation plan
- The environmental review process required under 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
- The project sponsor must develop sufficient information for FTA to develop a project rating

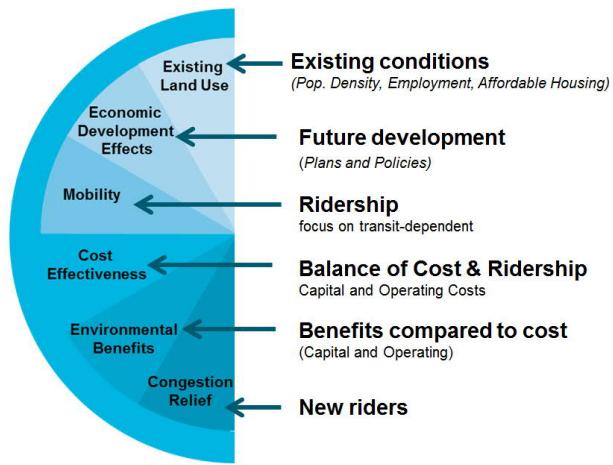
FTA rates projects based on two primary criteria, Project Justification and Local Financial Commitment. In order to be recommended for funding projects must receive at least a Medium rating for both Project Justification and Local Financial Commitment, see Figure 2-57.

Figure 2-57: Small Starts Evaluation Criteria



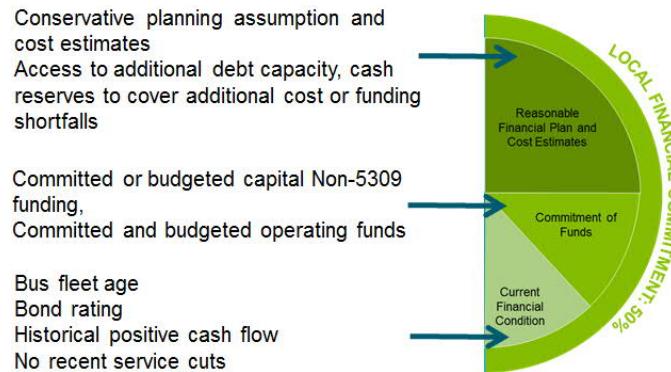
The Project Justification rating is based on six equally rated criteria, see Figure 2-58.

Figure 2-58: Small Starts Project Justification Criteria



The Local Financial Commitment rating is based on three criteria. Reasonable Financial Plan and Cost Estimates (50%), Commitment of Funds (25%), and Current Financial Condition (25%), Figure 2-59.

Figure 2-59: Small starts Local Financial Commitment Criteria



Funds spent towards advancing the project while in PD are covered by pre-award authority and may be eligible for future reimbursement from the CIG program should a construction grant be awarded in the future. The FTA believes project sponsors should demonstrate sufficient progress to remain in the program. Thus, FTA requires that project sponsors obtain commitments of at least 50 percent of all non-CIG funds within three years of a Small Starts project's advancement into PD and continue to make sufficient progress on advancing the level of design of the project during that time. Otherwise, projects will be withdrawn from PD. Projects can reapply to enter PD when the project has obtained 50% of non-CIG funds and advanced design to a sufficient level. Work performed after a project has withdrawn from PD but before it re-enters will not be eligible for pre-award authority or be eligible for reimbursement in the future.

To complete the PD 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 Small Starts Grant Agreement.

2.3.3.2 Small Starts Grant Agreement

SORTA would apply to be evaluated and rated for by FTA to be included in the federal budget. The federal application process will take 18-24 months for a grant agreement. FTA funding requests are typically due in late August or early September. The FTA then reviews all funding applications received from around the country and evaluates, rates, and makes funding recommendations in February/March of the following year. Congress then includes those funding recommendations in its budget decisions for the following fiscal year. The federal fiscal year begins on Oct. 1. If the project is included for funding in the federal budget, SORTA and the FTA will initiate negotiations of the Small Starts Grant Agreement. Negotiations of a grant agreement typically takes 5-6 months. Upon signing of a grant agreement SORTA can begin constructing the BRT project(s). An aggressive timeline would have service starting in 2026 with a May 2019 passage of a sales tax initiative.

2.4 Access Service

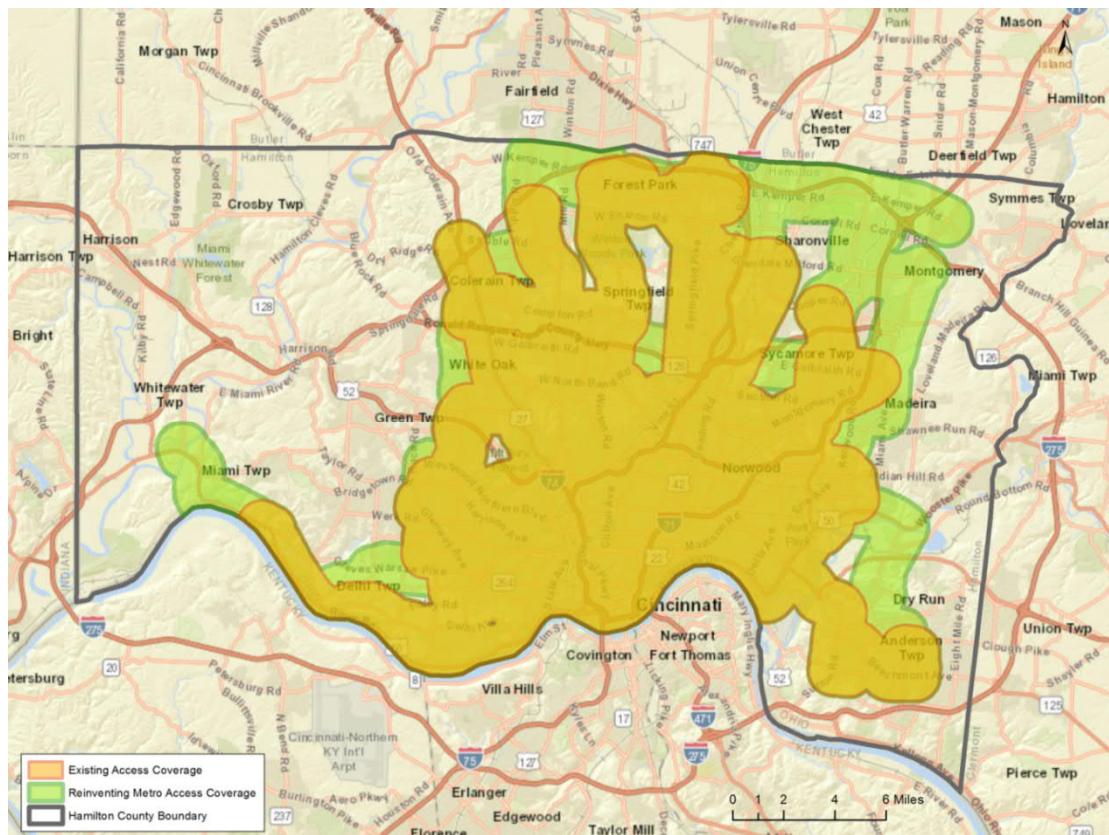
As fixed route service coverage grows, the Access service area will also need to grow. The American's with Disabilities Act (ADA) requires that service be provided within $\frac{3}{4}$ mile of a fixed route when the route is operating. Users of the service and advocates have requested expansion of the service area beyond the current limits to encompass all of Hamilton County, including areas that are beyond the reach of the local bus network. An analysis that compares the current SORTA ADA coverage with the proposed Reinventing Metro and countywide service is presented on Table 2-54. This table shows that most potential ADA passengers would be served by the Reinventing Metro ADA network and the cost to operate a countywide network would be prohibitively expensive. A comparison of service coverage is presented on Figure 2-60. This analysis assumes no changes in the Access Service delivery model.

Table 2-54: Analysis of Access Service

	Current	Reinventing Metro	Countywide
Hamilton County Coverage	41.9%	53.8%	100%
Hamilton County Population Served	70.6%	80.5%	100%
Percent of Disabled Population	75.9%	84.1%	100%
Percent of Elderly Population	66.0%	77.8%	100%
Projected Annual Ridership	227,000	240,000	395,000 – 680,000
2022 Project Cost	\$7.3 Million	\$7.5 Million	\$13.5 Million - \$23.2 Million
Vehicles Required	56	59	108-180
Passengers per Hour	2.49	2.48	1.99

Reinventing Metro

Figure 2-60: Access Service Coverage



3 Conceptual Regional Transit Network

The overall plan and ballot initiative will not only be a blueprint for improvements to SORTA's Metro services, but will also serve as a framework for improvements for users of transit throughout the Tri-State Cincinnati Metropolitan area. This will be achieved by determining how agencies can do more to cooperate to improve the experience for interjurisdictional operations as political subdivisions do not impact passenger travel.

Many of the reports regarding access to jobs look at the entire Cincinnati metro area as a whole and not just Hamilton County. This means that accesses to jobs in areas outside of the primary SORTA service area are considered. While SORTA does provide service into neighboring counties in Ohio, and neighboring transit services operate into Hamilton County, that does not mean that all areas are connected. There are a number of barriers to service including fare policy, schedule coordination, route interface, and directionality of service. It is important to note that passengers are less concerned about what agency operates the buses but rather the quality of interjurisdictional connections when a trip crosses county lines.

While there is some coordination regarding passes between SORTA and some neighboring transit providers, a regional fare media, and ideally a consistent fare policy would make it easier for transit users to travel regionally. Two factors mentioned, schedule coordination and route interface, refer to how transfer between services, both looking to coordinate arrival times at a common location for all transit services. Directionality of service is important because even if routes are properly timed to meet at a common point, most likely in Downtown Cincinnati, if one of the routes is a peak direction express route, it does not allow that route to be useful to connect to a job at the other end of the route.

One way regionalism can be started is through paratransit service. All transit providers today operate a dial-a-ride program for passengers who qualify for service under the Americans with Disabilities Act (ADA). Right now there is no coordination for ADA passengers who are traveling between counties, passengers need to make separate reservations on each system and transfer between ADA vehicles. Regional coordination would allow for a single reservation, and possibly allow for cross-jurisdictional service to allow for a single vehicle trip.

As BRT is developed within the region, regional connections should be considered. While SORTA is planning two BRT lines that would converge in Downtown Cincinnati, in the future these lines could be extended into neighboring counties or into Northern Kentucky. Logical extensions would include Mason in Warren County, the Covington Transit Center, or the Cincinnati-Northern Kentucky International Airport. A short-term solution will be to ensure that any BRT service take into account regional connections as part of planning, which would include ensuring stations are sited and have facilities for connections between BRT buses, SORTA local buses, and regional providers. Also, neighboring operators should consider extending services so they are able to connect to BRT services. Longer term, regional cooperation and coordination will be required to plan interjurisdictional BRT services.

This chapter presents a conceptual regional transit network. The network is conceptual as new routes and services are presented, however, the operator of the service and funding for the service at this

point has not been identified. These conceptual routes would improve mobility in the region and should be considered as part of each transit providers planning process and the OKI Long Range Plan. Routes were developed by looking at regional demographics, travel patterns, job hub analyses, and by conversing with staff from each of the regional operators.

3.1 Flexible Transit

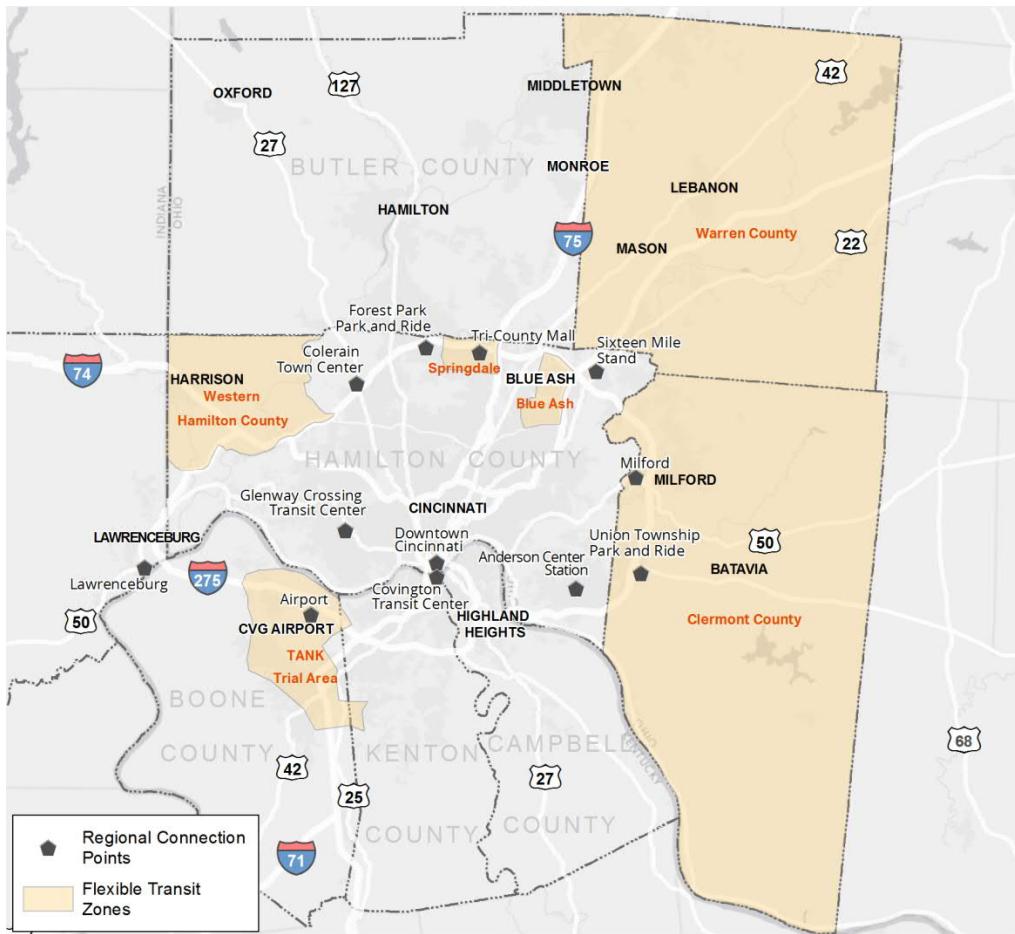
One of the first discussions of regional transit is with flexible transit services. As described in the Hamilton County network, flexible transit networks range from general public dial-a-ride to route deviation services or even microtransit. General public dial-a-ride is a system where passengers call a number to request a trip from anywhere within the dial-a-ride zone to any other location within a dial-a-ride zone. Today Clermont, Warren, and Dearborn Counties have countywide dial-a-ride service. Route deviation services operate on fixed route, like regular transit bus routes, but passengers can request a deviation up to $\frac{3}{4}$ mile to get closer to the origin or destination. The deviation usually is an additional fare unless the passenger qualifies for Access Service. It is important to note that route deviation services have to serve all stops along the fixed route, limiting where and how deviations occur. Point deviation services are scheduled services here the only limitation is that buses need to be at specific locations at specific times, otherwise the bus can deviate on request. Finally, Microtransit has no route or schedule but fixed stop locations and passengers request a trip and trip time and the customer app tells the passenger when to be at the designated pick up area.

There are a number of benefits to flexible transit services. First these services can reduce demand on the Access paratransit system as flexible services can be used by ADA passengers traveling within the flexible service zone. The second benefit is that it can serve areas where fixed bus service is not appropriate due to land use or due fixed route productivity. In this instance flexible transit services can be used as a first/last mile connection to the fixed route transit network.

Besides the general public dial-a-rid dial-a-ride operated in Clermont and Warren Counties there are other applications of the flexible transit network in the region. First, the Reinventing Metro plan introduces flexible transit in the Springdale and Blue Ash areas. TANK is considering a flexible transit pilot program to see if flexible transit can be effective at serving portions of Northern Kentucky. Finally, as an enhancement to regional transit, a flexible transit zone, which is currently unfunded, in Western Hamilton County should be considered.

The flexible transit network in the region is presented on Figure 3-1.

Figure 3-1: Conceptual Flexible Transit Network



3.2 Transit Authority of Northern Kentucky (TANK)

The Transit Authority of Northern Kentucky (TANK) operates local and express bus service between the Northern Kentucky counties (Boone, Campbell, and Kenton Counties) and Cincinnati. Many of the routes also provide service to the Covington Transit Center in Covington, Kentucky. All but one route operates into Downtown Cincinnati. In Downtown Cincinnati most routes have an on-street circulation pattern that takes approximately 20 minutes. This distribution loop allows for TANK passengers to be dropped off and picked up close to their place of employment and allows for TANK and SORTA passengers to transfer between services. Downtown is a good place for routes to meet because most SORTA and TANK routes come into Downtown.

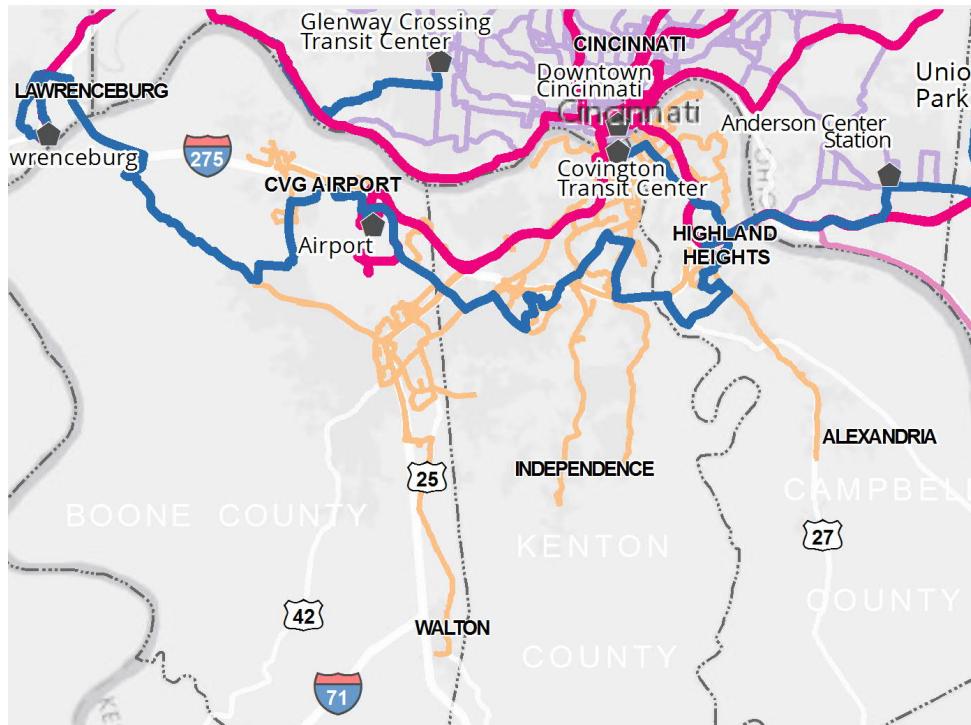
As the second largest transit provider in the region, TANK also provides connections to employers in Northern Kentucky. The airport is emerging as a major transit node and the conceptual regional transit network proposes improved connections to Downtown Cincinnati, Anderson in eastern Hamilton County, and Dearborn County. This will require new TANK routes and improvements to Route 2X will be needed to support job growth at the airport. TANK reverse commute services can be suited to strengthen emerging job hubs in Northern Kentucky, thereby increasing access to regional jobs. These

reverse commute services will need to have schedules coordinated with SORTA routes in Downtown Cincinnati.

TANK also is interested in connecting with passengers in eastern Hamilton County. The Anderson Center Station is a good location as a few of the proposals will enhance service to this transit hub allowing TANK passengers to access portions of eastern Hamilton County without traveling into Downtown Cincinnati. An extension and modification of TANK routes to connect Anderson Center Station to the Airport and to the Covington Transit Center should be considered.

The conceptual Northern Kentucky network is presented on Figure 3-2. Blue lines represent new or modified local services while the enhanced Route 2X service is shown in red. The underlying orange lines is the existing TANK network and the purple lines is the existing SORTA Metro bus network.

Figure 3-2: Conceptual Northern Kentucky Transit Network



3.3 Butler County

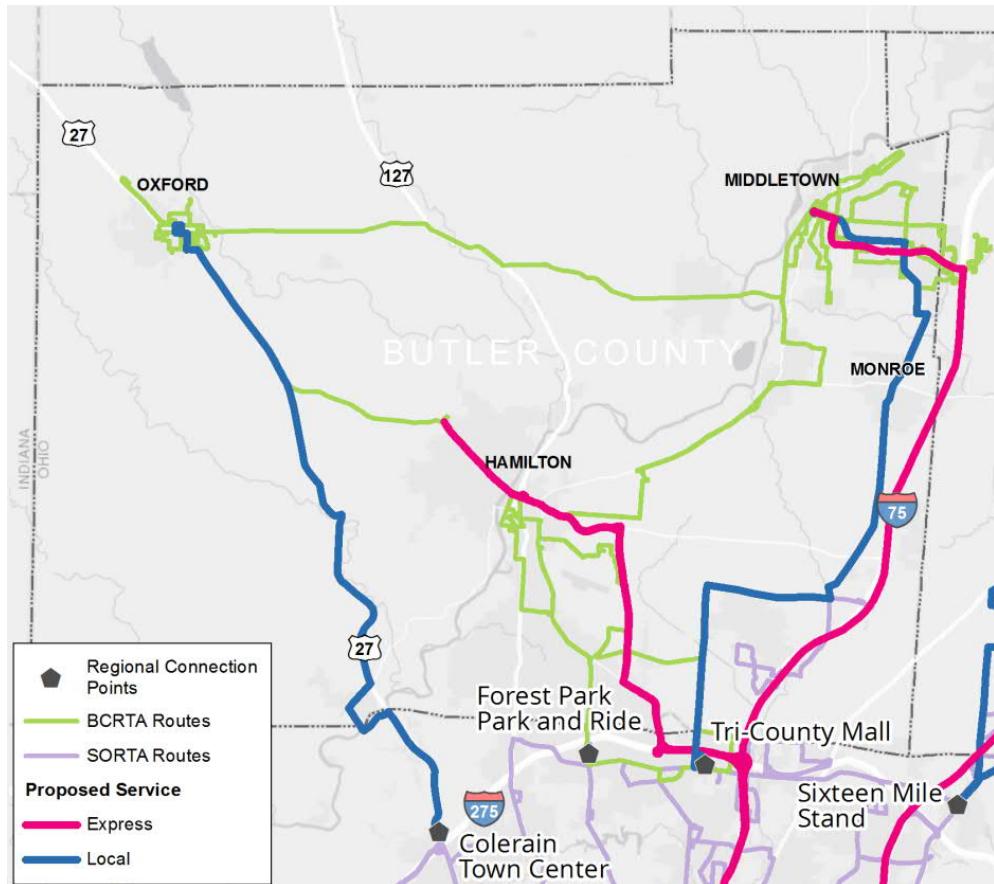
Butler County Regional Transit Authority (BCRTA) operates transit service throughout Butler County. BCRTA operates regional routes throughout the county with two routes that operate into Hamilton County the R4 and the R6; both of these routes serve Tri County Mall. BCRTA also funds SORTA Routes 42 and 42X which provide express service between Butler County and Downtown Cincinnati.

Tri-County Mall is a good location for BCRTA routes to coordinate with SORTA routes. At this location both of the BCRTA R4 and R6 terminate and they depart at the same times. SORTA Route 78, which is a major corridor route with frequent service, which is planned to have to have 24-hour a day service, also serve this location. Besides the 78, Route 20 and Route 23X serves this location making this a good

transfer point. The other location that is an opportunity is the Forest Park Park and Ride which is served by SORTA Routes 14X, 20, 23X, and BCRTA Route R4.

The conceptual Butler County network includes a number of local and express routes shown on Figure 3-3. The Tri-County Mall transfer point will be further enhanced by adding a local service to Middletown. Another local route would be developed to connect Oxford and Colerain Town Center. Bi-directional express routes would connect to job locations in both Hamilton and Butler Counties by operating between Middletown and Downtown Cincinnati and Hamilton and Downtown Cincinnati.

Figure 3-3: Conceptual Butler County Network

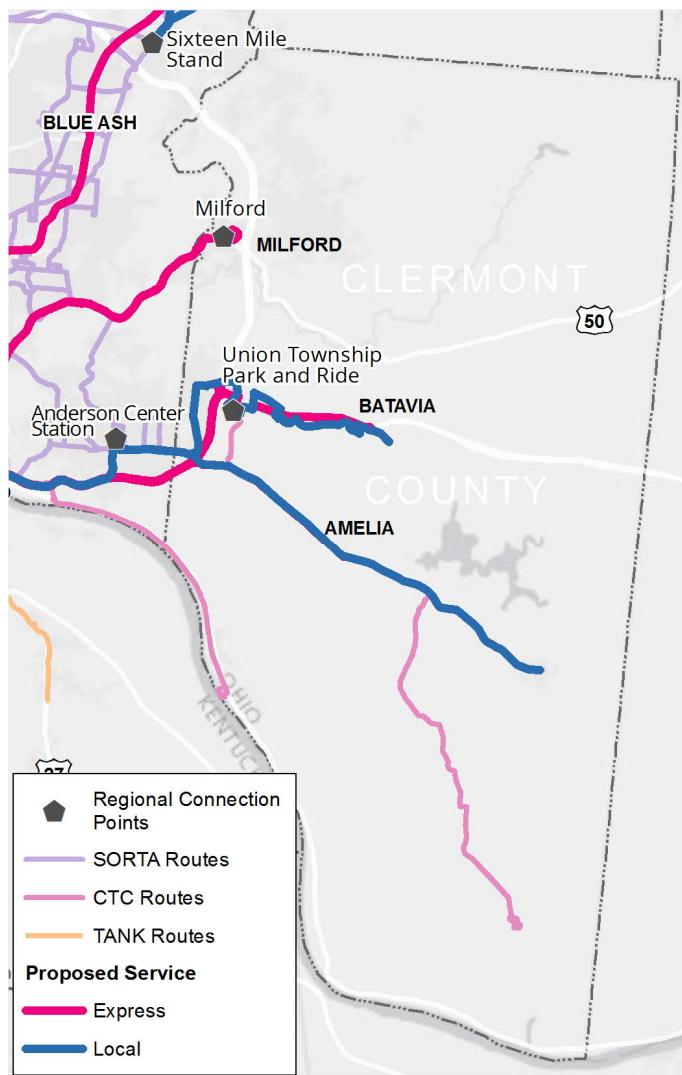


3.4 Clermont County

Clermont County operates two express routes to and from Downtown Cincinnati, as well as a county Dial-A-Ride system branded as the Clermont Transportation Connection (CTC). SORTA operates express Route 29X and 82X that serves portions of Clermont County. The terminal points of the SORTA routes do provide opportunities to connect with the Clermont County Dial-A-Ride. Long-term, to facilitate connections, all day service, with reverse commute trips, on the SORTA routes or the CTC express routes could be implemented to better connect Clermont County to Cincinnati. Another potential connection would allow Clermont County Dial-A-Ride services to operate to Anderson Town Center for connection to SORTA services.

The conceptual transit network for Clermont County is presented on Figure 3-4. This network would extend the current Route 82X to Batavia. Two new local services would be implemented connecting to Anderson Center Station, one route would serve Batavia and the other would serve Amelia. The current county dial-a-ride network would be maintained.

Figure 3-4: Conceptual Clermont County Network

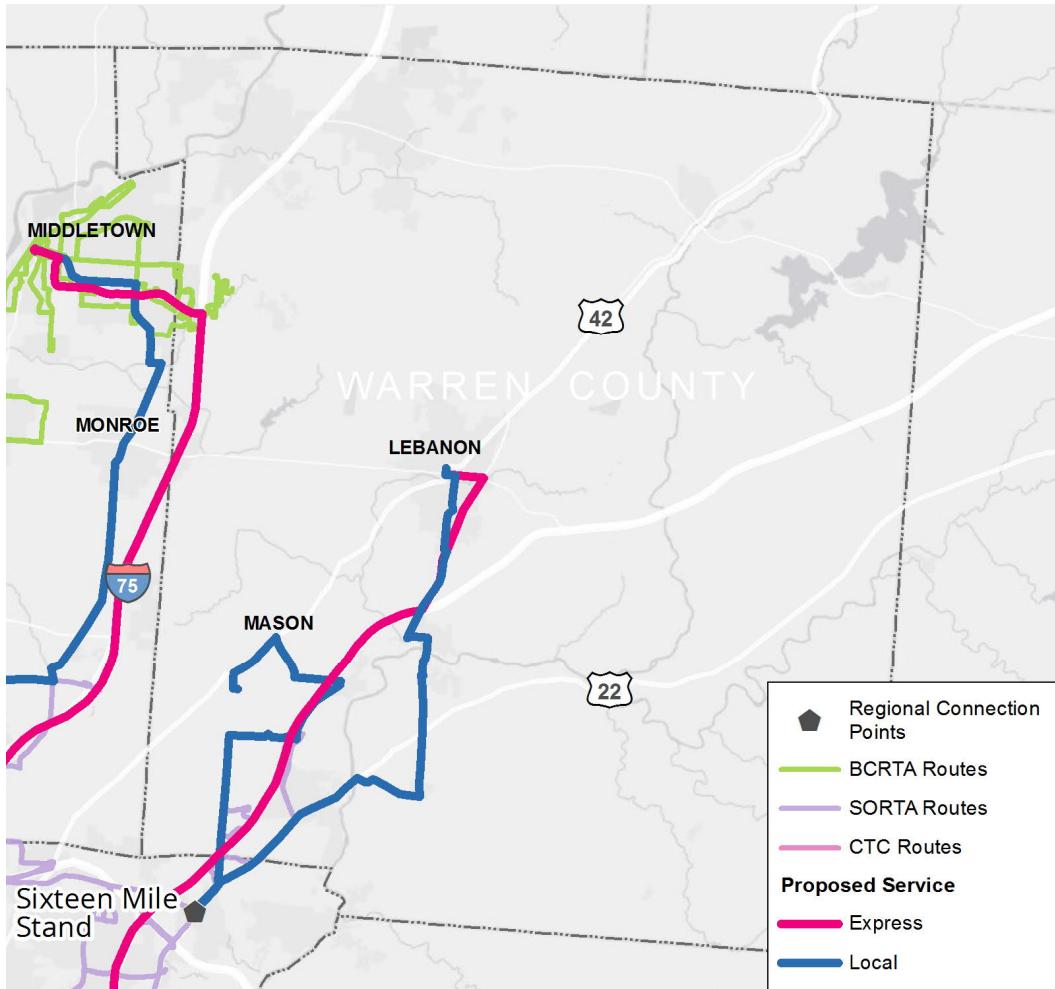


3.5 Warren County

Transit in Warrant County is provided by a countywide Dial-A-Ride. SORTA does operate express Route 71X and Job Connector 71 service between Downtown Cincinnati and southern Warren County. During the summer season SORTA also operates Route 72 service between Downtown Cincinnati and Kings Island Amusement Park. Dial-A-Ride services can provide a connection to the express route 71X in Warren County. For an all-day connection, Warren County Dial-A-Ride services can connect with the SORTA extended Route 4 that is proposed to terminate at Sixteen Mile Stand, close to the Warren County border. Sixteen Mile Stand would be a good terminal for Warren County fixed route services to facilitate connections to SORTA's Route 4 service. Two local Warren County routes are proposed as part

of the conceptual regional transit network, one connecting to Mason and the second connecting to Lebanon. A new express route connecting Lebanon and Downtown Cincinnati is also proposed. These routes are presented on Figure 3-5.

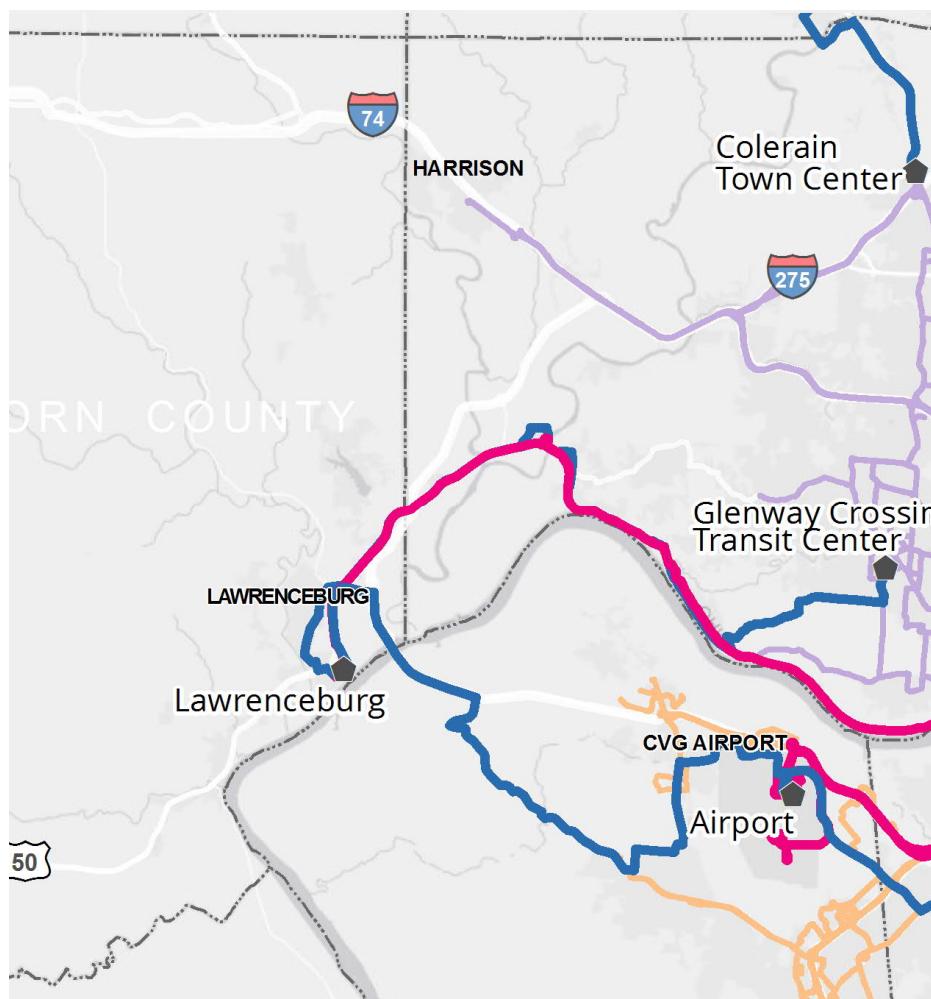
Figure 3-5: Conceptual Warren County Network



3.6 Dearborn County, Indiana

Dearborn County is served by a multi-county general public dial-a-ride. The conceptual regional transit network proposes that two SORTA routes be extended into Dearborn County, and a new TANK route be developed that would connect Dearborn County to the airport. The SORTA routes that would be extended to Dearborn County would be the current Route 50 which would connect Dearborn County to Downtown Cincinnati and the proposed Route 35 which would connect to the Glenway Transit Center. Fixed route transit services would be operate to and from Lawrenceburg where dial-a-ride service, and any potential future fixed route service, would connect to the rest of the county. The conceptual Dearborn County routes are shown on Figure 3-6.

Figure 3-6: Conceptual Dearborn County Network



3.7 Paratransit Coordination

Coordination of paratransit services amongst regional operators is one of the most important issues when discussing regional transit needs. Paratransit services, by design, have very inexact schedules since passengers have to call for a reservation. Also, on a per passenger trip basis, paratransit services are some of the most expensive transit services. Finally, the nature of paratransit trips may result in more of a need to cross jurisdictional borders as there are fewer medical facilities, major generators for paratransit trips, in the neighboring counties. Paratransit coordination is needed to address some of these issues.

When discussing paratransit coordination the first question is what can be coordinated and what that should look like. Coordination and cooperation can range to coordination of various functions to full out coordination in the overall service delivery of paratransit service, which is essentially a merger of all the paratransit functions in the region. Based on the interstate nature of the region and different policies

each transit agency has that it does not make sense at this time to consider a merger of paratransit functions, rather it would make sense to coordinate in certain functional areas.

As paratransit coordination moves forward, there will need to be policy decisions that will be needed amongst the various governing boards of the transit providers in the region which include cross-honoring of paratransit service eligibility for users, a common fare payment system which is already in developed and overall operations. The operations question is whether paratransit services would be able to directly serve generators in neighboring jurisdictions or would transfers need to be facilitated. If transfers are needed, where and how these transfers would occur will need to be agreed upon.

The opportunities for coordination for paratransit services are primarily in the back office functions of reservations and scheduling. Regional operators would come together and have one organization handle the scheduling and reservation process, which could include general public flexible services as well. The one organization would be able to schedule passenger trips and create operator manifests regardless of the rules and regulations of each organization. This would eliminate duplicative functions that each agency has.

4 Fare Policy and Revenue Allocation

In metropolitan areas with multiple transit operators, operators often coordinate fare policies and fare collection to promote use of transit regionally. This chapter summarizes findings of regional coordination of fare policies and fare collection in the San Francisco bay area and the Dallas metro area. The peer research of those two regions focused on the following areas:

- Interagency fare pass
- Interagency transfer discount
- Fare payment and collection
- Fare revenue allocation

4.1 Interagency Fare Pass

In the San Francisco bay area, no region-wide fare pass is available. Transit operators have bilateral arrangements that offer interagency monthly passes. These passes can be used to ride transit services operated by two participating agencies. Some transit agencies will honor fare passes issued by other transit agencies, effectively making them interagency passes. Here are some examples of interagency fare passes in the bay area:

- Monthly "A" Pass, which covers unlimited rides on San Francisco Municipal Transportation Agency (Muni) and Bay Area Rapid Transit District (BART) within the City of San Francisco
- SuperPass, which covers two or more of the four transit systems that operate services in Sonoma County; price varies depending on which systems a rider chooses to cover
- Altamont Corridor Express (ACE) pass can be used to ride most Santa Clara Valley Transportation Authority (VTA) services with no charge
- AC Transit's 31-Day Local Pass can be used for VTA local routes with no charge (but charges \$2.25 of the \$4.50 regular fare for VTA express routes)

In the Dallas metro area, region-wide passes (daily, monthly, and annual) are available for riders. The regional passes can be used to ride on buses and trains operated by all major transit agencies in the region, including Dallas Area Rapid Transit (DART), Trinity Metro (Fort Worth), Trinity Railway Express, and Denton County Transit.

4.2 Transfer Discount

In the San Francisco bay area, transfer discounts are also negotiated bilaterally between transit agencies. Some transfers are free, some with partial discounts, while others charge full fares. Here are some examples of interagency transfer discounts in the bay area:

- One 50-cent discount on the AC Transit local fare within 1-1/2 hours of exiting BART, but no discount when transferring from AC Transit local routes to BART, if rider pays by Clipper Card, the regional electronic transit fare payment card; if rider pays by cash, one 25-cent discount for transfer between BART and AC Transit local routes
- One 50-cent discount when transferring between Golden Gate Transit or Ferry and Muni within 2 hours if rider pays by Clipper Card; no transfer discount if rider pays by cash

- One \$1.50 discount when transferring between Sonoma-Marin Area Rail Transit (SMART) and Golden Gate Transit, Marin Transit, Petaluma transit, Santa Rosa CityBus or Sonoma County Transit
- Free transfer from ACE to most VTA services

In the Dallas metro area, transfer discount is not available for single ride fare. However, daily, monthly, and annual passes for regional transit are available as mentioned previously, which effectively allow free transfers among systems.

4.3 Fare Payment and Collection

In the San Francisco bay area, an electronic payment option, Clipper Card, is accepted by most transit operators in the region. Metropolitan Transportation Commission (MTC), the metropolitan planning organization of the San Francisco bay area, contracts with a third party private firm to implement, operate, and maintain the Clipper fare payment system. The Clipper fare payment system is governed by an Executive Board comprised of nine members, including one from MTC, one from each of the six major transit operators, and two representing all other smaller operators. The Board designates, oversees, and advises a contracting agency, currently the MTC, which procures the Clipper program contractor and provides contract oversight.

The operating costs of the Clipper program are allocated among MTC and the participating transit operators. MTC pays for the fixed operating costs and selected variable costs. The participating transit operators split the remaining operating costs based on their respective revenue processed, number of fee generating transactions, and percentage of cards used on an operator's system.

Each participating transit operator receives its fare or parking revenue. Interest earning on the Clipper program's cash balance is allocated to operators based on percentage of cards used on an operator's system.

In Dallas metro area, a new regional mobile/electronic fare payment system, GoPass, is now available in two forms, as a mobile app and a physical payment card. Riders can use GoPass to pay on all major transit buses and trains in the region. DART developed the GoPass program and now manages it with a third party contractor providing technical support. DART encourages other transit operators in the region to adopt GoPass as their mobile/electronic fare payment. DART has entered into bilateral interlocal agreements with other major transit operators in the Dallas metro area. According to the interlocal agreements, DART is responsible for managing the GoPass program, including procuring and overseeing a third party contractor that develops software and provides technical support; each operator determines their fare policies; DART charges each operator a Program Management Fee and a Software Transaction Fee based on total value of fare products sold through GoPass.

4.4 Fare Revenue Allocation

In the San Francisco bay area, like the interagency fare pass programs in that region, fare revenue allocation arrangements are also bilateral. MTC requires all transit operators enter into fare revenue sharing agreements with other transit operators whose services they are connected to. Such fare

revenue sharing agreements govern fare revenue allocation between agencies. For example, monthly "A" Pass is offered by SFMTA for unlimited rides on Muni and BART within the City of San Francisco for \$94; SFMTA reimburses BART \$1.35 for each "A" Pass trip on BART.

In the Dallas metro area, as mentioned above, transfer discount is not available for single ride fares. However, transit agencies in the region offer a series of regional passes, daily, monthly, and annually, that give riders unlimited access to transit services in the region. Each agency keeps the revenue generated from regional passes sold in their respective service areas.

In both the San Francisco bay area and the Dallas metro area, each agency's fare policy, including existing inter-agency fare coordination agreements, is programmed into the system of the mobile/electronic fare payment media, Clipper and GoPass. Each agency keeps the fare revenue it receives through the mobile/electronic fare payment media in accordance with their fare policy and relevant fare coordination agreements.

5 Economic Benefits

SORTA's (Southwest Ohio Regional Transit Authority's) transit service connects people to economic opportunity in the Greater Cincinnati region that spans three states and fifteen counties.⁵ SORTA's operations directly impact the regional economy through the jobs and income that it creates across communities from construction and operating spending. In this way, transit systems are like any other employer that moves into an economy and hires workers. The jobs and income that result from the construction, and operation and maintenance (O&M) of transit systems provide the basis for consumer spending that yields additional jobs and earnings as the initial spending flows through the economy. The increase in spending, in turn, increases state sales tax revenues.

Transit operations offer more than immediate economic benefits such as jobs and income, however. Provision of transit service enhances regional economic competitiveness by bolstering the productivity of local firms in southwest Ohio, northern Kentucky and southeast Indiana. Transit access expands the labor pool available to local employers by connecting up the tri-state region, improving their employers' ability to grow when market conditions warrant and affording employers a wider range of choice in their hiring decisions. This allows the Cincinnati region to compete for larger scale investments and relocations as a single large economy rather than as the smaller fragmented communities of southwest Ohio, northern Kentucky and southeast Indiana. Access to transit service improves workforce reliability and reduces absenteeism and turnover, improving the day-to-day productivity of the City of Cincinnati and Cincinnati–Middletown Metropolitan area's (MSA's) employers. Collectively, productivity gains such as these support local economies' long-term economic health. (See Box 1)

Box 1. 2018 Public Transit Survey Results

Many residents in Hamilton County rely on Cincinnati Metro to get them to their jobs, medical appointments, and to the grocery store. The Human Services Chamber of Hamilton County recently conducted a survey of the clients and staff of the member agencies. Over 700 responses, 76 percent of the bus riders are from households with incomes below \$25,000 and 58 percent of them regularly use the bus to get to work or school. Additionally, 84 percent of these riders do not have access to a car, so the bus is likely their only option to get to work. Forty-two percent of respondents rely on the bus to get to the grocery store and 38 percent to get to medical appointments.

⁵ The formal name for the area defined by the United States Census Bureau is the Cincinnati–Middletown, OH–KY–IN Metropolitan Statistical Area (MSA). The MSA includes Dearborn and Union Counties in Indiana; Boone, Bracken, Campbell, Gallatin, Grant, Kenton, and Pendleton Counties in Kentucky; and Brown, Butler, Clermont, Hamilton, and Warren Counties in Ohio.

<https://www.whitehouse.gov/wp-content/uploads/2018/04/OMB-BULLETIN-NO.-18-03-Final.pdf?#>

Transit service can also improve the quality of life. Residents of communities where transit is available enjoy amenity gains such as improved mobility, job accessibility for those otherwise unable to afford personal vehicles, congestion relief, and environmental benefits. Of particular note, a resident need not be a transit user to enjoy the congestion and environmental amenities afforded by transit. Those who remain on the Cincinnati-Middletown MSA's roads benefit as well, due to the traffic reduction by auto travelers diverting and becoming transit riders.

In summary, the economic benefits resulting from the implementation of a new bus rapid transit (BRT) service and an expanded regional bus network in the City of Cincinnati and the Cincinnati-Middletown MSA range from one-time impacts from construction activities to the recurring impacts from system operations and the improved regional transportation network's performance. The balance of this section quantitatively assesses a number of economic outcomes attributable to the planned expansion of the regional transit network and implementation of a new BRT system. Impacts are estimated as the change between two scenarios: 1) a base case, or No-Build, which continues current operations of limited bus service in the City of Cincinnati and neighboring counties (the status quo); and 2) an improvement case, or Build, in which BRT and expanded bus services are available in the City of Cincinnati and neighboring counties. The improvement case is described in the service plan section of this report. (Also read Box 2)

The impacts to the regional economy are presented in Figure 5-1 and listed below in the order in which they would be realized.

- New construction jobs due to the new BRT and extended bus services and associated new facilities
- Incremental bus employment due to increased bus operations
- Improved access to jobs potentially impacting the labor market performance
- Delays avoided (time saved) through improved headways and better mobility options
- Property values positively affected by new corridor-area accessibility
- Greater tax base from higher property premiums and increased employment which translates in higher property, income, and sales tax revenues
- Enhanced quality of life by relieving congestion, reduced emissions and improving safety.

Box 2. System Improvements and New BRT Service

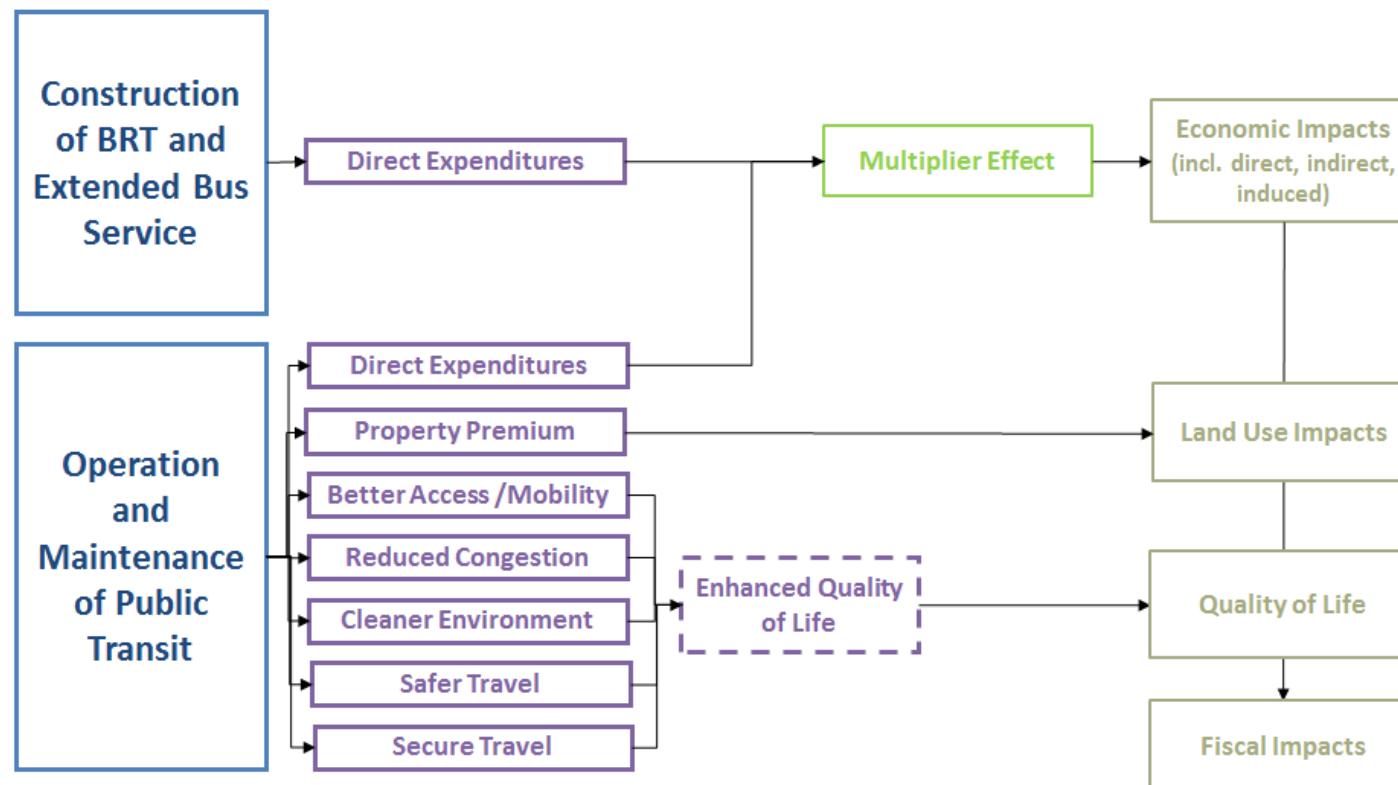
SORTA's proposal (the improvement case) consists of a multi-year transit system improvement plan in the City of Cincinnati and Hamilton County, in addition to regional transit network enhancements in Butler, Warren, and Clermont Counties in Ohio; in Northern Kentucky, and in Dearborn County in Indiana.

SORTA is also proposing two BRT systems departing from downtown Cincinnati, the Glenway (8-mile long) and Reading (9-mile long) BRT corridors.

The plan includes approximately 101 additional buses for local and express services.

Also, the plan comprises the construction of a new garage or the expansion of an existing garage.

Figure 5-1: Benefits from Transit Operation and Investment in Cincinnati–Middletown Metropolitan Statistical Area



5.1.1 Construction Impacts

Capital spending to expand SORTA's system and implement the new BRT routes would support the local economy through the hiring of construction personnel, renting or purchasing construction equipment, and procurement of construction materials for the duration of the construction period, impacting the local labor and manufacturing markets. During construction, specialized labor from throughout the region would be engaged, leading to an increase in employment for that market. In addition, construction-related goods would be purchased, most of which would come from the region. These activities would provide direct, indirect, and induced effects for the local economy

- Direct effect – Includes the effects on industries from which services and goods are directly provided and purchased to build the project, including purchases of equipment and raw materials.
- Indirect effect – Includes the effects on supporting industries that supply services and goods to the direct effect industries. This includes workers in industries that supply equipment parts, steel, concrete, wood, and other raw materials that are needed for building guideways and station facilities.
- Induced effect – Includes the effect of direct and indirect workers spending their income on consumer goods and services such as food, shelter, clothing, recreation, and personal services.

Using the Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II) Series 2015 multipliers, the following section describes the estimation of jobs and earnings that would result from construction of the improved transit system and the new BRT system. The multipliers are constructed to reflect the structure of the economies of the Cincinnati–Middletown MSA. RIMS II multipliers measure the total change (direct + indirect + induced effects) in output, employment, and earnings that results from an incremental change to a particular industry. The RIMS II multipliers used in this report represent the most updated version available at the time this analysis was prepared.

Capital costs were developed for the project and organized by cost categories in 2018 dollars. These costs do not include the vehicles purchased (paratransit and buses) since they will be manufactured in another U.S. city and not contribute to Cincinnati's regional economy. The construction and professional services costs served as the basis for estimating construction spending impacts. Table 5-1 and Table 5-2 show the total and annual breakdown of capital costs to improve the transit system and implement the new BRT routes. The source of the cost information is the service plan budget presented in Chapter 7. As those costs are in year of expenditure dollars, they were deflated to 2018 dollars using the Direct Capital Non-Defense Index information from the White House Office of Management and Budget's Gross Domestic Product and Deflators.^{6,7} Costs are presented in year of expenditure dollars and in 2018 dollars below.

⁶ Bureau of Economic Analysis (BEA) Regional Input-Output Modeling System (RIMS II) Series 2015 multipliers. <https://bea.gov/regional/rims/rimsii/home.aspx>

⁷ White House Office of Management and Budget. Historical Tables, Table 10.1 – Gross Domestic Product and Deflators Used in the Historical Tables 1940-2022. <https://www.whitehouse.gov/omb/historical-tables/> Estimates for 2023-2028 have been calculated assuming a 2 percent growth rate from the 2022 estimate.

Table 5-1: Total Net New Capital Costs for System Improvement and New BRT System (in year of expenditure and in 2018 dollars)

	Total Net Capital Cost
Year of expenditure	
O&M Facility Expansion (2020-2021)	\$45,000,000
BRT System (2023-2024)	\$162,000,000
Total	\$207,000,000
2018 Dollars*	
O&M Facility Expansion (2020-2021)	\$43,000,000
BRT System (2023-2024)	\$145,000,000
Total	\$188,000,000

Source: SORTA Implementation Support Study: Preferred Sales Tax Scenario Service Plan, September 2018.

* White House Office of Management and Budget's Gross Domestic Product Deflators.

Note: Costs exclude the purchase of new paratransit vans and buses.

In order to isolate the potential economic effects of the project to the study area, it is necessary to distinguish those resources that are new to the economy and that would not be invested in study area counties but for the Project, from those that would still be spent in the region with similar economic effects (e.g., funds that would be allocated to other transportation construction projects in the region). Only those impacts from new funding sources would create new employment in the study area. At this stage of planning, the funding sources have not been finalized; therefore, the study assumes 100 percent of funding comes from outside the region. Thus, the analysis applies the full project cost, which represents the maximum construction impact.

Capital investment for the project would create and support jobs and wages during the construction of the proposed facilities. Capital expenditures were separated into construction and professional services expenditures,⁸ and multipliers for the appropriate industry were applied to the respective costs.

⁸ The analysis assumes that 28 percent of the capital expenditure corresponds to professional services costs. The applied percentage corresponds to the average professional services costs in three BRT systems of similar size. Those systems are Boston MBTA - South Boston Piers - Busway; Cleveland - Euclid Ave BRT; and Pittsburgh - Airport Busway as found from the National Transit Database (NTD): <https://www.transit.dot.gov/capital-cost-database>

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Table 5-2: Net New Capital Costs for System Improvement and New BRT System by Year (in year of expenditure and in 2018 dollars)

	Base Year – 2018	Year 1 – 2019	Year 2 - 2020	Year 3 - 2021	Year 4 - 2022	Year 5 - 2023	Year 6 – 2024	Year 7 - 2025	Year 8 - 2026	Year 9 - 2027	Year 10 - 2028
Year of expenditure Dollars											
O&M Facility Expansion	\$0	\$0	\$22,500,000	\$22,500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bus Rapid Transit System	\$0	\$0	\$0	\$0	\$81,000,000	\$81,000,000	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$22,500,000	\$22,500,000	\$0	\$81,000,000	\$81,000,000	\$0	\$0	\$0	\$0
2018 Dollars*											
O&M Facility Expansion	\$0	\$0	\$21,627,922	\$21,202,608	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bus Rapid Transit System	\$0	\$0	\$0	\$0	\$73,365,666	\$71,927,241	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$21,627,922	\$21,202,608	\$0	\$73,365,666	\$71,927,241	\$0	\$0	\$0	\$0

Source: SORTA Implementation Support Study: Preferred Sales Tax Scenario Service Plan, September 2018.

* White House Office of Management and Budget's Gross Domestic Product Deflators.

Note: No changes to the current Capital Plan are programmed for 2018 and 2019.

Costs exclude the purchase of new paratransit vans and buses.

In the RIMS II employment multipliers, the final demand employment multiplier represents the total change in number of jobs that occur in all industries for each \$1 million of output (in 2015 dollars) delivered to final demand by the construction industry. For example, based on the multipliers in Table 5-3, every \$1 million spent on construction goods and services in the Cincinnati–Middletown MSA yields 14.7992 jobs. The employment effects are expressed in job-years, which are defined as one job for one person for one year. For example, three job-years are equal to three people doing a job for one year, or one person doing a job for three years.

The construction of the improved transit system and implementation of BRT (versus the No-Build Alternative) results in earnings impacts to the Cincinnati–Middletown MSA for both the construction and professional services industries. The final demand earnings multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the construction industry. For example, based on the multipliers in Table 5-3, every \$1 delivered to final demand by the construction industry in the Cincinnati–Middletown MSA yields \$0.6617 of earnings for households.

Table 5-3: Cincinnati–Middletown MSA Employment and Earnings Multipliers for Construction and Professional Services

Construction Multipliers	Employment per \$M (number of jobs)	Earnings per \$ (2015\$)
Construction	14.7992	\$0.6617
Professional services	16.3203	\$0.7673

Source: RIMSII -- Cincinnati, OH-KY-IN Metropolitan Statistical Area (Type II) -- Series: 2007 U.S. Benchmark I-O data and 2015 Regional Data.

Notes: Table 5-2 through 5-5, Final-demand Employment /3/ (number of jobs), Final-demand Earnings /2/ (dollars). Multipliers are from the construction industry; and the professional, scientific, and technical services industry.

The economic impacts in terms of jobs and earnings from the construction of the project are shown in

Table 5-4 5-4 and are separated into construction and professional services jobs and earnings. Jobs are shown in job-years. For the Cincinnati–Middletown MSA, construction (includes construction and professional services activities) of the service improvements would result in 624 total job-years and would result in \$29.6 million in earnings over the two year period 2020-2021; construction of the BRT service would result in 2,116 total job-years and would result in \$100 million in earnings over the two year period 2023-2024.

Table 5-4: Cincinnati–Middletown MSA Construction and Professional Services Impacts in Terms of Jobs and Earnings

Construction Multipliers	Jobs (Job-Years)	Earnings (2018\$ M)	Deflator
O&M Facility Expansion (2020-2021)			
Construction	440	\$20.5	Direct Capital – Non-Defense
Professional services	184	\$9.092	GDP (Chained) Price Index
Total	624	\$29.592	
Bus Rapid Transit System (2023-2024)			
Construction	1,492	\$69.541	Direct Capital – Non-Defense
Professional services	624	\$30.844	GDP (Chained) Price Index
Total	2,116	\$100.385	

Source: AECOM analysis.

5.1.2 Operating & Maintenance Impacts

Implementation of the improved transit system and the new BRT service would support jobs and earnings as a result of ongoing O&M expenditures. These impacts are recurring annual impacts that would continue through the life of the service. O&M of the transit service under the Build Alternative would expand payrolls in each year the service is operated. The O&M hiring associated with the Build Alternative represents the direct effects within the study area. The earnings of these newly hired transit employees would translate into a proportional increase in consumer demand as these workers purchase goods and services in the region. A further increase of new employment across a variety of industrial sectors and occupational categories is expected as employers hire to meet this increase in local consumer demand. This latter hiring represents the project's potential indirect and induced impact.

Table 5-5 and Table 5-6 present the ten-year total and annual O&M costs used to estimate the anticipated total employment impacts from the improved transit system and the new BRT service. Costs are in year of expenditure dollars and deflated to 2018 dollars using the Direct Capital Non-Defense Index information from the White House Office of Management and Budget's Gross Domestic Product and Deflators.^{9,10} The O&M impacts consider the incremental expenses in the Build Alternative compared to the No-Build Alternative to deliver the additional bus hours and miles.

⁹ <https://bea.gov/regional/rims/rimsii/home.aspx>

¹⁰ White House Office of Management and Budget. Historical Tables, Table 10.1 – Gross Domestic Product and Deflators Used in the Historical Tables 1940-2023. <https://www.whitehouse.gov/omb/historical-tables/> Estimates for 2023-2028 have been calculated assuming a 2 percent growth rate from the 2022 estimate.

Table 5-5: Net Total New O&M Costs for System Improvements and New BRT System (in year of expenditure and in 2018 dollars)

	Total 10-year Net O&M Cost
Year of expenditure	Dollars
O&M Facility Expansion (2020-2029)	\$338,745,614
Bus Rapid Transit System (2025-2034)	\$15,498,715
Total	\$354,244,329
	2018 Dollars*
O&M Facility Expansion (2020-2029)	\$293,452,818
Bus Rapid Transit System (2025-2034)	\$12,904,081
Total	\$306,356,899

Source: SORTA Implementation Support Study: Preferred Sales Tax Scenario Service Plan, September 2018.

* White House Office of Management and Budget's Gross Domestic Product Deflators.

Note: No changes to the current M&O Plan are programmed for 2018 and 2019.

This analysis assumes that funding for O&M would be provided through a mix of government funds and project-generated funds, such as fares and potentially advertising revenues. Although these funds could include local sources, this represents spending that would not take place but for the implementation of service. The expansion of transit service associated with the Build Alternative represents an expansion of economic activity in the Cincinnati–Middletown MSA and thus generates recurring net economic impacts.

As with construction impacts, O&M impacts are calculated for the Cincinnati–Middletown MSA. RIMS II Series 2015 multipliers were used, as they were the most recent available at the time of the analysis. The economic impacts calculated are total employment and total earnings, which are the sum of the direct, indirect, and induced effects.

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Table 5-6: 2018-2028 Net New O&M Costs for System Improvements and New BRT System by Year (in year of expenditure and in 2018 dollars)

	Base Year – 2018	Year 1 – 2019	Year 2 - 2020	Year 3 - 2021	Year 4 - 2022	Year 5 - 2023	Year 6 – 2024	Year 7 - 2025	Year 8 - 2026	Year 9 - 2027	Year 10 – 2028 and Forward
Year of expenditure Dollars											
System Improvement	\$0	\$0	\$4,191,333	\$15,550,049	\$29,340,465	\$38,283,421	\$39,278,381	\$40,329,251	\$41,440,030	\$42,615,016	\$43,858,834
Bus Rapid Transit	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$710,373	\$2,661,215	\$3,965,273	\$4,080,927
Total	\$0	\$0	\$4,191,333	\$15,550,049	\$29,340,465	\$38,283,421	\$39,278,381	\$41,039,624	\$44,101,245	\$46,580,289	\$47,939,761
2018 Dollars*											
System Improvement	\$0	\$0	\$4,028,719	\$14,653,932	\$27,107,528	\$34,676,415	\$34,880,086	\$35,111,117	\$35,370,816	\$35,660,563	\$35,981,821
Bus Rapid Transit	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$618,459	\$2,271,460	\$3,318,170	\$3,347,996
Total	\$0	\$0	\$4,028,719	\$14,653,932	\$27,107,528	\$34,676,415	\$34,880,086	\$35,729,576	\$37,642,275	\$38,978,733	\$39,329,817

Source: SORTA Implementation Support Study: Preferred Sales Tax Scenario Service Plan, September 2018.

* White House Office of Management and Budget's Gross Domestic Product Deflators.

Note: No changes to the current M&O Plan are programmed for 2018 and 2019. Operation and maintenance cost after year 10 was assumed constant.

Table 5-7 presents the multipliers used in the analysis for the O&M expenditures in Cincinnati–Middletown MSA. Multipliers for “Transit and ground passenger transportation” were applied to the O&M expenditures for the improved transit system and the new BRT service.

The interpretation of the RIMS II employment multipliers used in the analysis is as follows.

- The final demand employment multiplier represents the total change in number of jobs that occurs in all industries for each \$1 million of output (in 2015 dollars) delivered to final demand by the transit and ground passenger transportation industry. For example, based on the multipliers in Table 5-7, every \$1 million delivered to final demand by the transit and ground passenger transportation industry in Cincinnati–Middletown MSA yields 30.4742 jobs in all industries. The employment effects are expressed in job-years, which are defined as one full-time job for one person for one year.
- The final demand earnings multiplier represents the total dollar change in earnings of households employed by all industries for each additional dollar of output delivered to final demand by the transit and ground passenger transportation industry. Based on the multipliers shown in Table 5-7, every \$1 delivered to final demand by the transit and ground passenger transportation industry in Cincinnati–Middletown MSA yields \$0.7709 of earnings for households employed by all industries.

Table 5-7: Cincinnati–Middletown MSA Employment and Earnings Multipliers for Transit and Ground Passenger Transportation

O&M Multipliers	Employment per \$M (number of jobs)	Earnings per \$ (2015\$)
Transit and Ground Passenger Transportation	30.4742	0.7709

Source: RIMSII -- Cincinnati, OH-KY-IN Metropolitan Statistical Area (Type II) -- Series: 2007 U.S. Benchmark I-O data and 2015 Regional Data.

Notes: Final-demand Employment /Table 2-3/ (number of jobs), Final-demand Earnings /Table 2-2/ (dollars). Multipliers are from the transit and ground passenger transportation industry.

The economic impacts in terms of jobs and earning from the project O&M are shown in Table 5-8 for a ten-year analysis period. Jobs are shown in job-years. For the Cincinnati–Middletown MSA, O&M spending for the service expansion would result in 8,506 total job-years and \$226.2 million in earnings over a ten year period. Operation of the new BRT system would result in 859 total job-years and would result in \$22.9 million earnings over a ten-year period.

Table 5-8: Cincinnati–Middletown MSA Operating and Maintenance Impacts

O&M Multipliers	Total	Deflator
Service Expansion (2020-2029)		
Jobs (job-years)	8,506	GDP (chained) price index
Earnings (2018\$ M)	\$226.2	
Bus Rapid Transit System (2025-2034)		
Jobs (job-years)	859	GDP (chained) price index
Earnings (2018\$ M)	\$22.9	

Source: AECOM analysis

5.1.3 Income and Sales Tax Revenues from Construction and O&M Costs

The benefits resulting from transit's direct expenditures in the Cincinnati–Middletown MSA extend beyond the individuals who fill the jobs. The construction and O&M of the improved transit system and the new BRT service will result in employment for a number of workers both temporarily during construction, and permanently over the duration of service operations. State and local governments' coffers benefit as well. The earnings of these workers are taxable, with a portion going towards income tax and, assuming workers spend their paychecks as typical workers do, a portion going towards retail sales tax, supporting government revenues.

For each of the three states in the Cincinnati–Middletown MSA, dividing the total individual income tax by the total wages and salaries from the Bureau of Economic Analysis (BEA) results in three effective tax rates for fiscal year 2016. This approach captures deductions and exemptions and compares the tax revenue yield to the net change in personal income (earnings).

Table 5-9 presents the population-weighted average of the three states' effective rates, resulting in a regional income effective tax rate of 3.6 percent for fiscal year 2016 for the Cincinnati–Middletown MSA.¹¹ Multiplying earnings by the effective tax rate results in income taxes on earnings for construction and operations employment.

Table 5-9: Regional Income Tax Effective Rate for Fiscal Year 2016

	Ohio	Indiana	Kentucky
FY16 Personal Income Tax Revenue (\$ million)	\$8,169	\$5,218	\$4,282
FY16 BEA Wages and Salaries (\$ million)	\$267,733	\$140,397	\$86,408
Income Tax Effective Rate	3.05%	3.72%	4.96%
2016 State Population	11,622,554	6,634,007	4,436,113
2016 Population Share	51%	29%	20%
Regional Income Tax Effective Rate	3.6%		

Sources:

Income revenue for Ohio FY16 comes from the Annual Report Department of Taxation Fiscal Year 2016, Table 1, Page 46.

https://www.tax.ohio.gov/Portals/0/communications/publications/annual_reports/2016AnnualReport/2016AnnualReport.pdf

Income revenue for Indiana FY16 comes from Indiana Annual Report Department of Revenue 2016. Page 45.

<https://www.in.gov/dor/files/dor-annual-report-fy-2016.pdf>

Income revenue for Kentucky FY16 comes from 2015-2016 Kentucky Department of Revenue Annual Report. Page 2

https://revenue.ky.gov/News/Publications/Annual%20Reports/2015-2016%20Annual%20Report_web.pdf

Bureau of Economic Analysis, FY16, SQ7N Wages and Salaries by NAICS Industry Tables

<https://apps.bea.gov/itable/itable.cfm?ReqID=70&step=1>

Note: Rounded to the nearest thousand. Fiscal year 2016 started in July 1, 2015 and ended in June 30, 2016.

To estimate the portion of earnings that is sales tax-eligible, information on households' spending patterns from the Consumer Expenditure Survey (CES) for the Mid-West region (2016-2017)¹² was applied. The regional information served as a proxy for the metropolitan areas as the Consumer

¹¹ Analysis used most recent fiscal information available at the time of the study.

¹² BLS, Consumer unit characteristics and average annual expenditures and characteristics, consumer expenditure survey, region of residence, 2016-2017, table 1800. <https://www.bls.gov/cex/2017/region/region.pdf>

Expenditure Survey does not report statistics for Cincinnati alone.¹³ Using the consumer households' unit characteristics and average annual expenditures, an estimate was made of the retail taxable spending as shown in Table 5-10.

Table 5-10: Mid-West Region Average Taxable Annual Expenditures, 2016-2017

Category	Mid-West Region
Food away from home	\$3,130
Alcoholic beverages	\$518
Housekeeping supplies	\$705
Household furnishings and equipment	\$1,999
Apparel and services*	\$840
Vehicle purchases (net outlay)	\$3,617
Healthcare*	\$2,556
Entertainment	\$3,182
Personal care products and services	\$739
Reading	\$114
Tobacco products and smoking supplies	\$397
Miscellaneous	\$969
Retail Taxable Spending	\$18,766
Mid-West Region Average Annual Expenditure (income before taxes)	\$69,473
Taxable Spending (%)	27%

Source: BLS, Consumer unit characteristics and average annual expenditures and characteristics, consumer expenditure survey, region of residence, 2016-2017, table 1800. <https://www.bls.gov/cex/2017/region/region.pdf>
 Note: * Half of apparel services and healthcare expenditures are shown in the table.

Because some items like some apparel and prescription and non-prescription medications are not eligible for sales taxes, it was assumed that half of apparel and healthcare purchases are taxable. The total retail taxable spending was estimated to be \$18,766, or 27 percent of the average annual expenditure of \$69,473 in the Mid-West Region. Multiplying the portion of earnings that are sales-taxable by a population weighted average regional sales tax rate of 6.5 percent results in the sales taxes on earnings, as presented in Table 5-11

¹³ Cincinnati used to be in the consumer expenditure survey, but has been dropped.

Table 5-11.

Table 5-11: Regional Effective Sales Tax Rate for FY 2016

	Ohio	Indiana	Kentucky
Sales Tax Rate	6.5%	7%	6%
2016 State Population	11,622,554	6,634,007	4,436,113
2016 Population Share	51%	29%	20%
Regional Effective Sales Tax Rate		6.5%	

Note: Ohio state sales tax rate is 5.75 percent, and the Ohio county sales tax rates vary between 0.75 percent and 1.75 percent.

The analysis conservatively applies the low end of the range: 0.75 percent on top of the 5.75 percent sales tax for Ohio.

Sources: https://www.tax.ohio.gov/sales_and_use.aspx

https://www.tax.ohio.gov/Portals/0/tax_analysis/tax_data_series/sales_and_use/salestaxmap.pdf

<https://revenue.ky.gov/Business/Sales-Use-Tax/pages/default.aspx>

<https://www.in.gov/dor/3986.htm>

Additionally, goods and materials purchased for construction purposes in Ohio, Indiana, and Kentucky are tax-eligible purchases. As a result, the three states will get retail sales taxes from the construction purchases. In the absence of a detailed construction budget at this level of planning, the analysis assumes half of construction budget (excluding professional services and vehicles) would be spent on taxable materials. Applying the population weighted average regional sales tax rate of 6.5 percent results in the total sales tax impact for construction purchases over the construction period.

The total of income taxes and sales taxes on construction purchases, and construction earnings are shown in Table 5-12. With the bus service expansion, a total of \$2.61 million is estimated to be collected by the states and respective counties; the new BRT system will have a positive tax impact of approximately \$8.85 million for the state and counties.

The total of income taxes and sales taxes on operation and maintenance earnings are shown in Table 5-13. With the bus service expansion, a total of \$10.69 million is estimated to be collected by the states and respective counties in a ten-year period; the new BRT system will have a positive tax impact of approximately \$1.23 million for the state and counties in a ten-year period.

Table 5-12: Sales and Income Tax Effects on Construction Purchases and Construction Earnings, in 2018\$ Million

2018\$ Million	Income/Sales Tax	Sales Tax	Total	Notes
O&M Facility Expansion (2020-2021)				
Construction Purchases	NA	\$1.01	\$1.01	(1)
Construction Earning	\$1.07	\$0.52	\$1.59	(2)
Construction Tax Impacts	\$1.07	\$1.53	\$2.61	
Bus Rapid Transit System (2023-2024)				
Construction Purchases	NA	\$3.44	\$3.44	(1)
Construction Earnings	\$3.63	\$1.78	\$5.41	(2)
Construction Tax Impacts	\$3.63	\$5.22	\$8.85	

Notes:

(1) Assumes half (50 percent) of construction costs are for purchases of in-state goods and materials. The other half is excluded as materials purchased out-of-state and labor.

(2) Effective tax rate conservatively based on FY 2016 state income tax and sales tax revenues.

Table 5-13: Ten-year Total Sales and Income Tax Effects on O&M Earnings, in 2018\$ Million

2018\$ Million	Income/Sales Tax	Sales Tax	Total	Notes
O&M Facility Expansion (2020-2029)				
O&M Earnings	\$7.18	\$3.51	\$10.69	(3)
Bus Rapid Transit System (2025-2034)				
O&M Earnings	\$0.83	0.40	\$1.23	(3)

Notes:(3) Effective tax rate conservatively based on FY 2016 state income tax and sales tax revenues.

5.2 Time Saved (Delays Avoided) by Existing System Users

As part of SORTSA's planned enhancements to service, it will increase frequencies on multiple routes. As bus frequencies increase, the time that riders must wait to board or make a transfer decreases, saving time on every trip. These "delays avoided" or time saved have value. The estimate of time saved due to increased frequencies is based on information from the SORTA bus survey and the proposed peak and non-peak headways by route. The standard practice for such estimates is to calculate the change in headways and assume that one half of the change is saved by each rider on that route. This approach was modified slightly for the SORTA estimate as many riders use the SORTA mobile app that provides information on the bus arrival time. As a result, riders need less buffer time to board the bus for their trip. Given this, the time saved estimate accounts for ¼ or 25 percent of the change in headway. For transfers, the bus app does not reduce the time between alighting the first bus and boarding the second transfer bus so the full 50 percent of the change in headway was applied. The total time saved across the system is thus the time savings in minutes for boardings and transfers by route over the peak, midday, night, Saturday, and Sunday time periods multiplied by the number of riders on each route by time of day. The total minutes saved was divided by 60 to yield the total hours saved and monetized using standard U.S.DOT value of wait time assumptions.

Cincinnati transit riders may save \$15.7 million in value of time annually; or \$157 million in savings over 10 years as presented in Table 5-14.

Table 5-14: Annual Value of Time Savings, in 2018 Dollars

Day of the Week	Time of the Day	Savings
Weekday	Peak	\$6,552,200
Weekday	Midday	\$4,773,721
Weekday	Evening	\$1,718,208
Saturday		\$1,474,919
Sunday		\$1,209,798
Total Annual Benefit		\$15,728,846

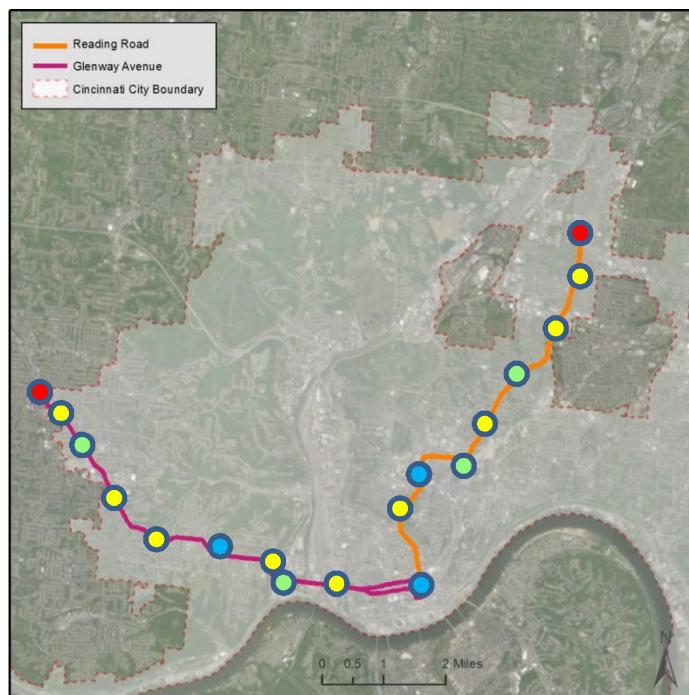
Notes: Trips 30 min or under do not have a transfer; Trips +30 min have one transfer. Values of time apply to all combinations of in-vehicle and other transit time on surface transportation modes. Walk access, waiting, and transfer time should be valued at \$28.40 per hour for personal travel when actions affect only those elements of travel time.

Source: USDOT Value of Wait Time. https://www.transportation.gov/sites/dot.gov/files/docs/mission/office-policy/transportation-policy/284031/benefit-cost-analysis-guidance-2018_0.pdf

5.3 Property Premium Impacts

The implementation of the Glenway and Reading BRT corridors would provide the property parcels within a typical walking distance (assume d to be $\frac{1}{2}$ -mile of the guideway stops) with greater access to the corridor as well as the broader metropolitan economy (see Figure 5-2). As a result, residents and commercial enterprises will be willing to pay a premium for the locations where access is improved relative to the No-Build. Empirical economic research on the economic impact of BRT access and the value of walkable community centers indicates that there are often positive impacts on property values associated with such investments. In addition, recent research has demonstrated a “walkability premium” for commercial real estate investments ranging between one and nine percent, depending on property type.¹⁴

Figure 5-2: Glenway and Reading BRT Corridors



For the two BRT corridors in the Build Alternative, the following assumptions were made:

- Service is assumed to be operating on a dedicated Right of Way (ROW)
- Service is assumed to have frequent stops within $\frac{1}{2}$ miles of each other, as is common for many BRT lines¹⁵
- The BRT will provide faster and more frequent service along the corridor than the existing service

¹⁴ Pivo, G. and Fischer, J. 2010. "The Walkability Premium in Commercial Real Estate investments," forthcoming in Real Estate Economics.

¹⁵ El Camino Real BRT Phasing Plan BRT Industry Review. p. 12. Prepared for: SamTrans http://www.samtrans.com/Assets/_Planning/BRT/BRT+Industry+Review.pdf

Given the findings in the empirical economic literature, for the Build Alternative, the analysis applies a modest four percent increase in property values within $\frac{1}{4}$ -mile of the Build ROW, and a two percent increase for the portion between $\frac{1}{4}$ - and $\frac{1}{2}$ -mile from the Build ROW. The analysis thus assumes that the property premium impact declines with distance from the BRT stop. These values are below that assumed for the Boston Silver Line BRT, which had a premium of 7.6 percent. Additionally, a January 2012 Washington DC Streetcar study expected property premiums along transit corridors to be in the range of 2-10 percent (depending on conditions in the corridor) and a survey of Washington DC area developers completed for the WMATA Surface Transit AA expected a 10 percent property premium within a $\frac{1}{4}$ -mile of BRT stations.

The increase in property values adjacent to the Build ROW results in an increase in the tax base for Hamilton County, which translates into an increase in the annual property tax revenues received by the County and its comprising jurisdictions, including townships and school districts.

To estimate the value of the property value uplift, the parcels within $\frac{1}{2}$ -mile of the station stops were identified and their assessed values were collected from assessor's online database from the Hamilton County. These are the latest available property values, and are thus assumed to be in 2018 dollars.¹⁶ An estimate of the potential increase in annual property tax revenues for Hamilton County associated with existing properties (does not include any new development or large scale redevelopment projects in the corridor) is also shown in Table 5-15.¹⁷ The property tax estimate is based on the latest tax payments to Hamilton County and its comprising jurisdictions on the parcels within the $\frac{1}{4}$ - and $\frac{1}{2}$ -mile radii of the BRT corridors. While the total property tax paid varies by the special district, township, and school district, the county millage rate is 19.16 per \$1,000.¹⁸ Tax revenue shown in Table 5-15 includes revenue for any special districts the property may be a part of.

Table 5-15: Property Premium and Additional Tax Revenue Generated by Implementation of Glenway and Reading BRT in Hamilton County (2018\$)

	Market Value	Property Premium	Additional Annual Tax Revenue Generated by Premium
Quarter Mile	\$6,754,130,000	\$270,170,000	\$4,550,000
Quarter Mile to Half Mile	\$3,532,180,000	\$70,640,000	\$1,000,000
Total	\$10,286,310,000	\$340,810,000	\$5,550,000

Source: AECOM Analysis

Note: Numbers rounded to the nearest \$10,000.

5.4 Quality of Life Benefits

Aside from the most visible economic benefits of improved transit operations such as employment gains and the increases in government tax collections that result from the increased economic activity, public transit can provide important qualitative benefits to economies. Described in greater detail below, these benefits include:

- Congestion relief
- Environmental benefits

¹⁶ City of Cincinnati. Hamilton County Parcel Polygons. <https://data.cincinnati-oh.gov/dataset/Hamilton-County-Parcel-Polygons/g24g-2pi5>

¹⁷ Property taxes are calculated from taxable value, which is 35 percent of market value.

¹⁸ Hamilton County Auditor. For Taxes Paid in 2018 Annual Cost for \$100,000 Market Value Home. https://www.hamiltoncountyauditor.org/pdf/re_100k2018_hightolow.pdf

- Safety benefits

Quality of life benefits such as those listed above are a critical element of successful economic development. In Cincinnati, the main industries are professional and business services, and education and health services, and leisure and hospitality, all which account for 42 percent of total nonfarm employments (see Table 5-16). Such industries rely on workers' human capital for their success. Because people are far more mobile than factories, the successful retention and attraction of skilled labor is essential to compete in the knowledge economy. Talented workers can find jobs in locations throughout the country; they will select those locations to work and live that offer the greatest quality of life, all other factors being held equal. Thus, the outlook for Cincinnati–Middletown MSA's economic future rests in part on the region's ability to preserve and enhance the quality of life available in the region.

Table 5-16: Main Industries in Cincinnati (August 2018)

Cincinnati Area Employment (numbers in thousands)	Aug.2018	Change from Aug. 2017 to Aug 2018.	
		Number	Percent
Total nonfarm	1,114.2	13.7	1.2
Mining, logging, and construction	52.5	3.6	7.4
Manufacturing	117.5	0.9	0.8
Trade, transportation, and utilities	223.2	7.3	3.4
Information	13.4	-0.4	-2.9
Financial activities	77.8	3.2	4.3
Professional and business services	167.7	-1.0	-0.6
Education and health services	164.0	0.5	0.3
Leisure and hospitality	131.0	1.6	1.2
Other services	43.7	0.6	1.4
Government	123.4	-2.6	-2.1

Source: U.S. BLS, Current Employment Statistics. https://www.bls.gov/regions/midwest/summary/blssummary_cincinnati.pdf

Of particular interest to the Cincinnati–Middletown MSA is that transportation amenities are important to professional, business, knowledge, and health care workers with a strong preference for accessibility. Working long hours, these workers put a premium on their leisure time and seek residential locations where attractions and activities are easy to get to. The availability of an improved transit system is a key factor in the attractiveness of cities such as Cincinnati.

5.4.1 Congestion Relief

Congestion-related delays total about 41 hours for Cincinnati–Middletown MSA auto commuters per year, ranking 45 compared with other 101 cities in the U.S.¹⁹

Of particular note in the context of congestion relief is that the shift from vehicle miles to transit passenger miles is not one-to-one. A number of researchers in recent years have found that three to

¹⁹ Texas Transportation Institute. 2015 Urban Mobility Study estimates for 2014.

<https://static.tti.tamu.edu/tti.tamu.edu/documents/mobility-scorecard-2015.pdf>

four vehicle miles are removed from the roads for every transit passenger mile on average.²⁰ The reduction reflects changes in land uses around transit stations that foster pedestrian mobility such as higher-density, mixed-use developments as well as increased reliance on transit due to lower auto expenditures.

5.4.2 Environmental Benefits

A cleaner environment is a potential benefit of increased use of public transportation. Pollutants aggravate chronic lung and heart disease and can harm children and people with asthma.

The magnitude of air pollution benefits that result from removing cars can vary significantly due to a number of factors. First, the level of emissions will vary with climate and season. Second, the potential gain from a switch to public transit depends on the mode that the traveler originally used. For example, the potential gain from removing three SUV drivers from the road and putting them on transit is much different than if the new transit rider previously carpooled, drove a hybrid vehicle, or walked.

In Figure 5-17, the potential reduction in energy use and associated pollution is shown for one hypothetical example. In this scenario, 500 people who commute alone by car are convinced to use an existing public transit service instead. The reduction of 500 commuting cars from the road results in the changes summarized in Table 5-17. As transit vehicles do not run with 100 percent occupancy and as the new riders are assumed to be distributed across several routes, the example assumes that the existing transit service can accommodate the 500 riders without requiring additional vehicles. It is important to note the balance between the number of cars removed from the road, vehicle miles travelled (VMT) and pollution estimates. The results could be scaled to fit any size transit system.

As the table shows, the switch to transit would help improve air quality and could increase the number of days a community would be in compliance with federal air quality regulations. Smog, acid rain, and carbon dioxide, a contributor to global warming would all be reduced. The improvement in air quality would also increase local quality of life, making the community more attractive to potential residents.

²⁰ Average of five empirical studies across a variety of locations. Studies are summarized in Holtzclaw, John, 2000, "Does a Mile in a Car Equal a Mile on a Train? Exploring Public Transit's Effectiveness in Reducing Driving," The Sierra Club.

Table 5-17: Savings from 500 Commuters Switching from Autos to Transit

Pollutant	Problem	Amount	VMT Change	Pollution or Fuel Consumption
Hydrocarbons (HC)	Urban Ozone (Smog) and Air Toxics	3.5 grams/mile	10,000	77 lbs of HC
Carbon Monoxide (CO)	Poisonous Gas	25 grams/mile	10,000	550 lbs of CO
Nitrogen Oxides (Nox)	Urban Ozone (Smog) and Air Toxics	1.5 grams/mile	10,000	33 lbs of Nox
Carbon Dioxide (CO2)	Global Warming	1.0 pound/mile	10,000	9,900 lbs of CO2
Gasoline	Imported Oil	0.05 gallon/mile	10,000	500 gallons gasoline

Notes: The emission factors used here come from standard EPA emission models and assume an "average" mix of properly maintained cars and trucks on the road operating on typical gasoline in normal summer weather. Emissions may be higher in very hot or very cold weather.

Fuel consumption is based on average in-use fuel economy of 20 miles per gallon.

Emission factors and pollution/fuel consumption totals may differ slightly from original sources due to rounding.

The reduction in Vehicle Miles Traveled (VMT) is calculated by multiplying the number of people who do not drive by the distance that would normally commute. The assumptions in this example are:

- Average commute is 20 miles round trip.
- 500 single drivers switch to an existing, operating public transit system. 500 cars X 20 miles = 10,000 miles per day.
- VMT Change is 500 commuters not driving X 20 miles per day = 10,000 miles per day.

Example here considers only gains derived from switch to transit for commuting. Other types of trips are not considered.

Source: US EPA, National Vehicle and Fuel Emissions Laboratory.

5.4.3 Safety Benefits

The provision of public transit service provides Cincinnati–Middletown MSA residents with a safer travel alternative than the auto since overall, is a relatively safe (low crash risk) transport mode. Litman (2014) found that transit travel has about one-tenth the traffic casualty (injury or death) rate as automobile travel, and residents of transit-oriented communities have about one fifth the per capita crash casualty rate as in automobile-oriented communities.²¹

Table 5-18 shows that transit modes uniformly outperform autos in terms of safety. The rates reflect the number of fatalities per passenger mile traveled. Thus, they account for differences in the amount of travel and vehicle occupancy rates experienced on different modes and make the comparison on a standard basis.²² Bus transit is a safer alternative than auto travel.

²¹Todd Litman. 2014. A New Transit Safety Narrative. http://www.nctr.usf.edu/wp-content/uploads/2014/12/JPT17.4_Litman.pdf

²²Ibid. Table 2. Page 115.

Table 5-18: Passenger Fatalities per Billion Passenger-Miles, 2000–2009

Travel Mode	Deaths per Billion Passenger-Miles
Car or light truck driver or passenger	7.28
Commuter rail and Amtrak	0.43
Urban mass transit rail (subway or light rail)	0.24
Bus (transit, intercity, school, charter)	0.11
Commercial aviation	0.07

Source: Litman (2014).

5.5 Summary

Economic vitality, business competitiveness, and community quality of life are all strengthened by the availability of transit. The large metropolitan areas of the tri-state region are its engines of growth—transit helps manage their expansion so that they retain their attraction for workers and business alike. Cincinnati is one of each state's larger cities where the transit system helps the region maintain its distinct quality of life.

The Cincinnati–Middletown MSA increasingly competes in a dynamic global market where changing technology and market forces determine the economic winners and losers. Maintaining and enhancing the comparative advantage of the MSA's economy is critical to success in this fluid environment. This is a challenge to be met on many fronts. Communities across the region are seeking ways to support individuals, foster business activity, and protect local quality of life. Provision of transit service can aid communities in addressing each of these goals.

Individuals benefit from the access to jobs, health care, and community services such as education that transit provides. This is especially true for those with low income, a disability, and for seniors. Transit service expands the City of Cincinnati and Cincinnati–Middletown MSA employers' access to labor, improves the reliability of that workforce and enhances business activity through job creation, commercial development, and an expanded tax base. Transit enhances local quality of life by relieving congestion at a time when the state's traffic is outpacing its construction of lane-miles. Transit service can help curb sprawl and improve air quality. It makes the amenities and attractions of a local community more accessible to residents. Transit is one of the safest means of transportation and it provides critical transportation redundancy in times of crisis.

The health and vibrancy of the Cincinnati–Middletown MSA economy rests on the strength of its local economies. Even as the fortunes of the MSA are increasingly intertwined with those of the state economy, the region's residents still raise families and go to work in local communities. The provision of transit service makes these communities better places for all tri-state residents. The service expansion and the introduction to a new BRT system will generate over 1,300 job years during the construction period (temporary jobs) and over 900 job years annually at full build out. Table 5-19 and Table 5-20 summarize the employment, earnings and fiscal impacts.

Table 5-19: Summary Table for Employment and Earnings Impacts

Capital Expenditure Impacts (schedule)	Average Annual Job Years over Construction Period	Total Job Years	Average Annual Earnings (2018\$)	Total Earnings (2018\$)	NPV Total Earnings @4.5% (2018\$)
Temporary Impacts – Construction					
O&M Facility Expansion (2020-2021)	312	624	\$14,796,000	\$29,592,000	\$26,515,000
BRT System (2023-2024)	1,058	2,116	\$50,192,500	\$100,385,000	\$78,820,000
Operations & Maintenance Impacts (schedule)	Average Annual Job Years over 10-year O&M Period	Total Job Years (over 10-year period)	Average Annual Earnings (2018\$)	10-Year Total Earnings (2018\$)	NPV 10-Year Total Earnings @4.5% (2018\$)
Recurring Impacts - O&M (10-year Analysis Period)					
Service Expansion (2020-2029)	851	8,506	\$22,622,000	\$226,222,000	\$164,882,000
BRT System (2025-2034)	86	859	\$2,285,000	\$22,853,000	\$13,537,000

Note: NPV means net-present value at 4.5 percent.

Dollar values rounded to nearest \$1,000.

Table 5-20: Summary Table for Fiscal Impacts

Income and Sales Taxes (schedule)	Average Annual Impact (2018\$)	Total Revenue Yield (2018\$)	NPV Total Revenue Yield @4.5% (2018\$)
<hr/>			
O&M Facility Expansion (2020-2021)	\$1,304,000	\$2,608,000	\$2,337,000
BRT System (2023-2024)	\$4,424,000	\$8,849,000	\$6,948,000
<hr/>			
Income and Sales Taxes (schedule)	Average Annual Impact (2018\$)	10-Year Total Revenue Yield (2018\$)	NPV 10-Year Total Revenue Yield @4.5% (2018\$)
<hr/>			
Service Expansion (2020-2029)	\$1,219,000	\$12,186,000	\$8,882,000
BRT System (2025-2034)	\$123,000	\$1,231,000	\$729,000
Property Premium (2024-2033)	\$5,549,000	\$55,491,000	\$35,234,000
Total Recurring Impacts (assuming average year)	\$6,891,000	\$68,908,000	

Note: NPV means net-present value at 4.5 percent.

Dollar values rounded to nearest \$1,000.

6 Capital Program

The capital program includes the core capital improvement program and support for service expansion. The capital program not only supports the Reinventing Metro plan for Hamilton County but also serves as a prerequisite for improvements that would be needed for the conceptual regional transit network. The capital program is divided into two elements, the core capital program and the expansion program. Each element is described below. Costs for the capital program are presented in the financial plan.

The core capital program includes SORTA infrastructure projects, replacement buses and facility upgrades. These are items that are included in the current SORTA capital program and are needed regardless of the reinventing metro plan. The key items that make up the core capital plan are presented on Table 6-1 which shows what projects will occur during each year.

Table 6-1: Core Capital Program Elements

	2020	2021	2022	2023	2024	2025	2026	2027	2028
Replacement fixed route buses	108	17	6	6	6	6	6	6	6
Replacement paratransit vehicles	11	11	11	4	3	4	11	10	11
Capital maintenance buses	X	X							
Security projects						Ongoing			
Computer equipment and software									
Support vehicles	X				X			X	X
Mechanical and miscellaneous equipment						Ongoing			
Facilities upgrades									
Queensgate roof								X	
Development of park and rides and transit centers				X	X		X	X	

The expansion capital program includes items that are needed to support the Reinventing Metro plan. This includes expansion buses for fixed route services and Access paratransit services, Bus Rapid Transit, and improvements to SORTA's bus garages to support a bus fleet that will expand by 111 buses including expansion regular route buses and BRT buses. The elements of the expansion capital program are presented on Table 6-2.

Table 6-2: Expansion Capital Program Elements

	2020	2021	2022	2023	2024	2025	2026	2027	2028
30 Foot bus		12	11	11					
40 foot bus		6	6	6					
Cutaway Bus		13	13	13			13	13	13
Access Van		3					3		
Bus Garage Improvements		X	X						
Bus Rapid Transit				X	X	X	X	X	X

7 Financial Plan

The financial plan for the 0.8 sales tax scenario was initially calculated based on a set percentage of service being implemented each year. The percentage was based on similar principles regarding the issues and concerns with implementation. This includes having sufficient time to procure buses, hire and train drivers, and adding administration staff. This also considered time to expand or build new transit facilities to support growth in service. The Economics Center at the University of Cincinnati provided sales tax estimates for all of the sales tax scenarios. The financial forecasts, presented on Table 7-1 use these forecasts along with projections of operating costs. The 10 year financial forecasts show that this plan is sustainable, even with Bus Rapid Transit. While not shown on this table, over the 20 year forecast period this plan is still sustainable, with only a \$2.2 million deficit over 20 years.

The financial plan is based on a policy goal of having a 20% farebox recovery. This means that fare changes are introduced every year starting in 2021 to achieve this farebox recovery ratio. Fare increases are applied to all services and a Simpson-Curtin regression is used to calculate the impact on ridership and revenue. This is reflected in the financial plan presented on Table 7-1.

The financial plan includes all elements in the capital program presented in Chapter 6. The core capital program is represented by three lines; replacement buses, replacement paratransit vans, and SORTA infrastructure which is all other elements. The elements for the Reinventing Metro plan have their own lines on the table.

Reinventing Metro

Table 7-1: 10 Year Financial Plan for the 0.8 Sales Tax Scenario

	Base Year - 2018	Year 1 – 2019	Year 2 - 2020	Year 3 - 2021	Year 4 - 2022	Year 5 - 2023	Year 6 - 2024	Year 7 - 2025	Year 8 - 2026	Year 9 - 2027	Year 10 - 2028	10 Year Cumulative
Operating Costs												
Fixed Route	\$69,869,551	\$71,268,318	\$77,109,049	\$90,204,219	\$105,824,266	\$116,696,610	\$119,727,793	\$123,639,705	\$128,974,625	\$133,858,404	\$137,763,516	\$1,105,066,504
Access	\$6,468,908	\$6,637,024	\$6,836,135	\$7,308,262	\$7,529,194	\$7,756,041	\$7,989,558	\$8,230,130	\$8,477,971	\$8,733,305	\$8,996,359	\$78,493,979
Administration	\$21,722,417	\$22,139,082	\$23,760,313	\$24,241,708	\$24,740,903	\$25,258,988	\$25,797,133	\$26,356,598	\$26,938,739	\$27,545,016	\$28,177,000	\$254,955,480
Total	\$98,060,876	\$100,044,424	\$107,705,497	\$121,754,189	\$138,094,363	\$149,711,639	\$153,514,483	\$158,226,432	\$164,391,336	\$170,136,725	\$174,936,874	\$1,438,515,963
Operating Revenue												
Fares	\$17,685,129	\$17,467,399	\$18,400,572	\$22,749,731	\$27,746,555	\$29,649,716	\$31,082,064	\$32,505,575	\$34,506,176	\$35,944,867	\$37,379,425	\$287,432,080
CPS Contract	\$7,629,401	\$7,781,989	\$7,937,629	\$8,096,381	\$8,258,309	\$8,423,475	\$8,591,945	\$8,763,784	\$8,939,059	\$9,117,840	\$9,300,197	\$85,210,609
Non-Transportation	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$1,683,000	\$16,830,000
County and Other Local	\$2,236,860	\$2,281,597	\$2,327,229	\$2,373,774	\$2,421,249	\$2,469,674	\$2,519,068	\$2,569,449	\$2,620,838	\$2,673,255	\$2,726,720	\$24,982,853
Fuel Tax Reimbursement	\$777,596	\$769,820	\$762,122	\$754,501	\$746,956	\$739,486	\$732,091	\$724,770	\$717,523	\$710,347	\$703,244	\$7,360,859
Federal Section 5307	\$11,616,085	\$11,732,246	\$12,309,797	\$14,008,231	\$15,869,015	\$17,012,845	\$17,182,973	\$17,581,108	\$17,985,487	\$18,165,342	\$18,346,995	\$160,194,038
Total	\$41,628,071	\$41,716,050	\$43,420,349	\$49,665,618	\$56,725,084	\$59,978,196	\$61,791,141	\$63,827,686	\$66,452,083	\$68,294,651	\$70,139,581	\$582,010,439
Capital Costs												
Capital Infrastructure	\$1,564,000	\$11,196,000	\$6,994,450	\$2,616,000	\$3,383,229	\$9,984,219	\$943,920	\$699,579	\$3,501,189	\$7,823,689	\$928,439	\$49,634,714
Replacement Buses	\$38,546,193	\$10,440,000	\$34,970,000	\$19,944,000	\$7,994,000	\$28,812,000	\$6,050,000	\$14,976,000	\$23,780,640	\$7,282,022	\$7,500,483	\$200,295,338
Replacement Paratransit Vans	\$1,698,710	\$1,081,493	\$1,012,671	\$1,147,356	\$1,181,777	\$442,629	\$341,931	\$469,585	\$1,330,100	\$1,245,458	\$1,411,104	\$11,362,815
Expansion Buses	\$0	\$0	\$0	\$8,500,315	\$8,394,672	\$8,610,012	\$0	\$0	\$1,571,937	\$1,619,095	\$0	\$28,696,031
Expansion Paratransit Vans	\$0	\$0	\$0	\$312,915	\$0	\$0	\$0	\$0	\$362,755	\$0	\$0	\$675,670
New Garage	\$0	\$0	\$4,500,000	\$4,500,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9,000,000
Bus Rapid Transit	\$0	\$0	\$0	\$0	\$0	\$2,527,027	\$2,527,027	\$2,527,027	\$2,527,027	\$2,527,027	\$2,527,027	\$15,162,162
Total	\$41,808,903	\$22,717,493	\$47,477,121	\$37,020,587	\$20,953,678	\$50,375,887	\$9,862,878	\$18,672,191	\$33,073,648	\$20,497,291	\$12,367,052	\$314,826,729
Capital Funding												
Total	\$16,755,100	\$14,310,005	\$10,565,356	\$13,172,777	\$12,790,629	\$13,046,931	\$13,573,585	\$14,827,220	\$15,147,500	\$15,730,207	\$139,919,311	\$279,838,623
Tax Revenue	\$56,432,810	\$53,065,068	\$120,760,000	\$121,320,000	\$121,860,000	\$122,360,000	\$122,830,000	\$123,280,000	\$123,710,000	\$124,110,000	\$124,490,000	\$1,157,785,068
Operating Subsidy	\$56,432,805	\$58,328,374	\$64,285,148	\$72,088,571	\$81,369,279	\$89,733,443	\$91,723,342	\$94,398,747	\$97,939,253	\$101,842,074	\$104,797,294	\$856,505,524
Capital Subsidy	\$25,053,802	\$8,407,488	\$36,911,765	\$23,847,810	\$8,163,049	\$37,328,956	(\$3,710,707)	\$3,844,971	\$17,926,148	\$4,767,084	(\$127,552,259)	\$34,988,107
2-Month Reserve Funding	\$0	\$16,674,071	\$1,276,845	\$2,341,449	\$2,723,362	\$1,936,213	\$633,807	\$785,325	\$1,027,484	\$957,565	\$800,025	\$29,156,146
Tax Remaining	(\$25,053,797)	(\$30,344,865)	\$18,286,242	\$23,042,170	\$29,604,310	(\$6,638,611)	\$34,183,558	\$24,250,958	\$6,817,115	\$16,543,278	\$146,444,941	\$237,135,292

8 Next Steps

This document is the plan for action for SORTA over the next four years assuming that a sales tax referendum is passed in May 2019. There are a number of courses of action for the next steps depending on what actions the SORTA Board of Trustees take and how the general public reacts. These actions are detailed in this chapter.

The ideal scenario is that the Board of Trustees authorizes a May 2019 referendum and it is passed by the voters. In this case implementation of the Reinventing Metro plan would follow the schedule that has been put forward in this document. This means that immediately after the approval of the referendum, planning for the implementation of Reinventing Metro will begin.

A second scenario is that the Board of Trustees approves the referendum but it is not approved by the Hamilton County electorate. If this were to happen there would be two courses of action. The first course of action would be to work with SORTA's stakeholders to identify if there is another funding source that can be used to maintain SORTA operations. The second course of action would be to begin planning for reductions in service to create a financially sustainable transit network in Hamilton County. Regardless, the planning process for Fiscal Year 2020 will consider service cuts under this scenario.

A third scenario is that the referendum for a sales tax is outright rejected by the Board of Trustees. Under this scenario SORTA will have to begin planning for reductions in service to create a financially sustainable transit network in Hamilton County. Regardless, the planning process for Fiscal Year 2020 will consider service cuts under this scenario.

A fourth scenario is that the Board of Trustees rejects the referendum for the sales tax based on the service plan. This may be that the board does not reach consensus regarding such services as BRT or certain expansions. The result of this decision is that the Board of Trustees may consider delaying the vote for the sales tax to another timeframe and ask for revisions to the service plan. Revisions to the service plan may be to replace Bus Rapid Transit with additional and enhanced Metro*Plus service. If this is the case, Metro*Plus can be studied along the corridors where BRT is planned, additional corridors throughout the region, and enhancements along the current Madison Road Line. In the Washington Metropolitan Area the Washington Metropolitan Area Transit Authority (WMATA) developed the Priority Corridor Network (PCN) where they conducted corridor studies for enhanced bus along major bus corridors in the region. Changing the date of the sales tax referendum will impact the Reinventing Metro plan and an update to the financial plan for Reinventing Metro will be needed.