TANK Transit Network Study

FINAL

December 2013

NELSON
NYGAARD

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1 EXECUTIVE SUMMARY

The Transit Authority of Northern Kentucky (TANK) serves 35 cities in Boone, Campbell, and Kenton counties. Historically, TANK has been a radial system focused on connecting Northern Kentucky commuters with downtown Cincinnati. However, the regional travel demand model and TANK's own ridership data suggests an increasingly diverse travel environment with more retail, medical, educational, and employment destinations in Northern Kentucky, along with a growing population base.

The following report summarizes the existing conditions of TANK's services and service area in Chapter 2 through Chapter 7, including an overview of the TANK system, current and past ridership and operating statistics, and analysis of the service area's population and demographic characteristics. Chapter 8 presents a series of short-term service and capital improvement recommendations developed as part of the TANK Transit Network Study Update. The goal of these recommendations is to make improvements to the system that are cost-neutral and help support ridership growth

Service recommendations were shaped by a combination of field work, data analyses, survey responses, and transit best practices. All routes in the current fixed-route system were reviewed with the exception of Route 31x -Rolling Hills Express, the Gateway Shuttle, and the NKU Shuttle. Route 31x began service in January 2013, and ridership and service performance data was not yet available at the time of the review. The Gateway and NKU shuttles were not reviewed because their service characteristics are largely set by the institutions they serve rather than by TANK policy.

The performance and characteristics of TANK's current services are presented in Chapter 2 and Chapter 6. A summary of results from an on-line survey designed to capture the needs and preferences of transit users and non-users in the region is presented in Chapter 7, and includes the following key findings:

- Because of the Southbank Shuttle, a larger percentage of area residents (86% of survey respondents) have used TANK's services than is typical of a transit system in a comparable environment.
- Issues identified in the survey that may attract new riders are more direct routes (52% of non-riders) and faster service (35% of non-riders).
- Existing riders had the least positive view of the "ease of transfers" (42% positive) than any other service characteristic.

In addition to addressing the issues highlighted in the on-line survey, the service recommendations incorporate several guiding principles that reflect transit best practices. These principles include the following:

- Service should be simple
- Service should operate at regular intervals

- Routes should operate along a direct path
- Routes should be symmetrical
- Routes should serve well defined markets

An initial set of short-term recommendations were developed and presented to the public in September 2013. Over 400 responses were collected from the public via an on-line survey, public meetings, listening sessions, phone calls, and emails. Many of the recommendations changed as a result of the public input, and the recommendations in this document reflect that feedback.

The short-term service recommendations are presented in groups to reflect the interconnected nature of a transit network. Changes to one part of the network tend to impact other parts of the network and the full benefits of a given change are often only realized when implemented concurrently with changes to other routes.

Routes 1, 18X, 19X, 28X and 42X serve the southwest portion of the TANK service area, including Florence Mall, Northern Kentucky Industrial Park, Dixie Highway, and Turkeyfoot Road. The issues facing these routes include the following:

- Route 1 has very high ridership and has several trips approaching or exceeding seating capacity. The route is also very long, which combined with heavy ridership results in long trip times and below average on-time performance. In addition, the route has alternating and circuitous routing on its outer end.
- Route 18x provides limited express service between Edgewood, Fort Mitchell, and Cincinnati. It provides an alternative to Route 1 service along Dixie Highway in Fort Mitchell. Overall ridership on Route 18x is low.
- Route 19x provides limited express service into Covington and Cincinnati, offering some riders an alternative to Route 1 service. An unofficial park-and-ride near Dixie Highway generates significant ridership for the route, but at least half of the stops served by Route 19x experience no ridership at all.
- Route 28x has above average ridership per trip, but ridership growth may be limited by very early and very infrequent service.
- A new transit center, the Florence Hub, was opened on November 2013 in the vicinity of Florence Mall, giving TANK the opportunity to develop new services and new connection opportunities in the southwest portion of the service area. Route 42x provides peak and limited midday service between Florence Mall and downtown Cincinnati.

The primary goal of the proposed service improvements to Routes 1 and 42x is to provide higher levels of frequency to the all-day transit markets and leverage the new Florence Hub to connect local and express routes, and provide better and faster reverse commute service to the industrial parks in the area. Alignments for Routes 18x and 19x are shortened to improve productivity, but still maintain coverage to most existing patrons.

In the vicinity of Cincinnati / Northern Kentucky International Airport (CVG), **Routes 1x, 2x, 39x and 40x** serve daily commuters and airport visitors. Among the issues requiring attention with this group of routes are:

- Route 1x has very little in common with Route 1, which may cause confusion for passengers. In addition, the route serves two park-and-rides in very close proximity to one another.
- Route 2x has the highest total ridership of all Express routes, but also has the lowest productivity among these routes due to its high frequency and long span of service.

Additionally, the circuitous appearance of the route on passenger schedules may be intimidating for prospective riders, especially infrequent travelers to the airport.

- Routes 39x and 40x provide Express service from downtown/CTC, followed by local circulation among several warehouse and light industrial sites east of CVG. The appeal of the service is limited by circuitous local routing that requires some passengers to endure long trips before reaching their destination.

The recommended approach for improving this group of routes is to produce separate passenger schedules aimed at commuters and airport visitors. An airport-focused schedule would not need to show information on outbound destinations served after the passenger terminals, resulting in a simpler and less intimidating schedule for airport visitors. Additionally, new route numbers and new alignments are recommended for service to industrial areas by the airport in order to provide more direct and logical service.

Routes 3, 12, 16, and 23 operate near the south bank of the Ohio River, on both sides of the Licking River. These routes link river-side neighborhoods in Bromley, Ludlow, Covington, Newport, and Bellevue to downtown Cincinnati. The primary issues seen in these routes are:

- The Riverfront communities generally have a high potential for transit use based on factors such as density and land-use.
- Together, these cities offer a large transit-friendly environment with many transit-accessible destinations. However, the current TANK network makes travel between cities on opposite sides of the Licking River inconvenient for transit users.
- In Newport, Routes 12, 23, and the Southbank Shuttle provide somewhat redundant service coverage.

The proposed service improvements for the riverfront area focus on introducing a more direct connection across the Licking River between Newport and Covington and consolidation of service in northern Newport.

The Licking River divides the TANK service area into two halves. **Routes 5, 7, 9, 25, and 33** provide local service in Kenton County, on the west side of the Licking River. These routes form a radial network anchored in downtown Cincinnati. Each route serves the Covington Transit Center (CTC) and at least on other park-and-ride or transit center on its outer end. The issues needing attention in this set of routes include:

- Service in the Covington-Latonia corridor is robust but uncoordinated, diluting the potential for high service frequency which could appeal to more riders. Instead, the routes are in many cases competing with one another for the same market.
- Route 25 operates under the same route name in both Kenton and Campbell County. This can cause confusion for passengers, especially in downtown Cincinnati where passengers may unintentionally board a bus heading in the wrong direction because of the common route number.

The primary themes of the service recommendations in the Covington-Latonia corridor are to coordinate service to create a high-frequency transit corridor on Madison Avenue, to re-brand Route 25 service Covington and Latonia to reduce confusion, and to extend all-day service to the new District in Taylor Mill development. Peak commuter service on Route 9 south of I-275 would be deleted.

Local service in Campbell County is provided by another group of radial routes. **Routes 11, 16, 20, and 25** are anchored in downtown Cincinnati and serve Newport and several other

destinations east of the Licking River, including Northern Kentucky University. Among the issues observed in this group of routes are:

- Overall, this group of routes provides service frequency and service coverage that appears to be out of balance with ridership demand.
- Service can be reduced or eliminated in some corridors with little anticipated impact on ridership.

All-day service frequency between downtown Cincinnati and NKU is improved, while some of the lower ridership areas have service levels reduced.

Other recommendations discussed in this report include truncating underperforming Express routes, including **Route 17x, 18x, and 19x**.

In addition, a series of short-range capital improvements that would support and complement the proposed service improvements are presented following the service change recommendations. These include:

- Enhanced and customized bus shelters
- Bus bulbs and bus bays
- Dedicated bus lanes
- Queue-jump treatments
- Freeway shoulder bus operations
- Two new focal points of service at NKU and at CVG airport

Chapter 9 presents long term recommendations. Long-term recommendations address some long-term needs that were not able to be addressed given short-term funding, including:

- Additional frequency in key corridors, such as Madison Avenue, Dixie Highway, and Alexandria Pike/Monmouth
- Additional span and frequency on weekends
- Additional park-and-ride capacity and service to downtown Cincinnati
- Better suburban connectivity between Campbell, Kenton, and Boone Counties
- Additional local and regional service to leverage the Florence, NKU, and CVG hubs

2 EXISTING TRANSIT SERVICES

TANK's fixed route transit service operates in Boone, Campbell, and Kenton counties, connecting residents to employment centers and destinations in Northern Kentucky as well as to downtown Cincinnati. The TANK bus system includes 27 local and express routes and serves 19 Park & Ride locations.

SYSTEM OVERVIEW

TANK bus service operates seven days a week. On weekdays, the fixed-route network consists of 27 bus routes, including 12 local routes, 12 express routes, and 3 shuttle routes (Figure 1). Saturday and Sunday service consists of 12 routes. Figure 2 shows a system map of the entire TANK network.

Complementary ADA paratransit service is provided by RAMP, TANK's Regional Area Mobility Program. RAMP is a door-to-door service for individuals who are unable to use TANK's fixed-route service due to a mental or physical disability. RAMP service is available within ¾ of a mile of any fixed-route that is in service.

Figure 1 Description and Service Type of TANK Bus Routes

Route	Service Type	Name	Service days
1	Local	Florence Mall	Weekday & weekend
1x	Express	Florence Express	Weekday only
2x	Express	Airport Express	Weekday & weekend
3	Local	Ludlow/Bromley	Weekday & weekend
5	Local	Holman/City Heights	Weekday & weekend
7	Local	Rosedale/Latonia	Weekday & weekend
9	Local	Taylor Mill/Independence	Weekday only
11	Local	Ft. Thomas/NKU	Weekday only
12	Local	Dayton	Weekday & weekend
16	Local	Grand Towers	Weekday & weekend
17x	Express	Villa Hills Express	Weekday only
18x	Express	Edgewood Express	Weekday only
19x	Express	Beechwood Express	Weekday only
20	Local	South Newport	Weekday only
22x	Express	Walton Express	Weekday only
23	Local	South Bellevue	Weekday only
25	Local	Eastern Avenue/Cincinnati/Alexandria	Weekday & weekend
25x	Express	Alexandria	Weekday only
28x	Express	Empire Drive Express	Weekday only
29x	Express	Hebron Express	Weekday only
30x	Express	Independence Express	Weekday only
31x	Express	Rolling Hills	Weekday & weekend
32x	Express	Burlington Express	Weekday only
33	Local	St Elizabeth South	Weekday & weekend
SBS	Shuttle	Southbank Shuttle	Weekday & weekend
GTWY	Shuttle	Gateway Shuttle	Monday – Thursday only
NKUS	Shuttle	NKU Shuttle	Weekday & weekend

Figure 2 TANK System Map

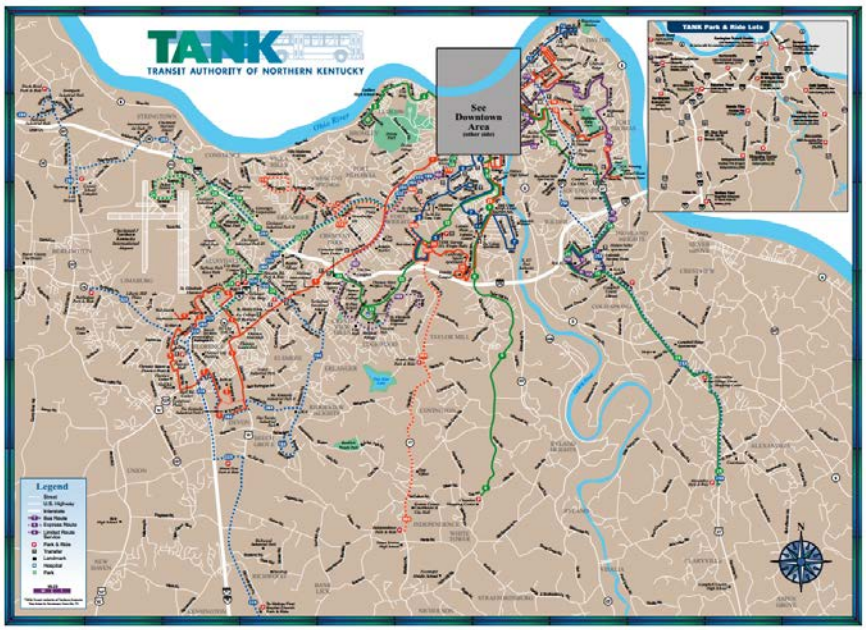


Figure 3 TANK Downtown Map

FREQUENCY AND SPAN

As shown in Figure 4, TANK operates weekday service as early as 4:00 AM and as late as 12:45 AM. Most express routes operate only on Weekdays, with the exception of Route 2x and 31x, though the latter operates only 2 runs Saturday and 1 on Sunday. Express route service is concentrated in the AM and PM peaks, with some routes providing service only in the peak travel direction (18x, 19x, 22x, 25x, 28x, 32x) while other operate bi-directional peak service. Route 2x is the only express route that offers all day service.

Local routes generally operate 7 days a week, although Routes 9, 20 and 23 are weekday only. Local service runs from the early morning into the evening on most routes, with service later than midnight provided on Routes 1 and Route 7. Typical frequencies are 30 minutes during peak times and 60 – 90 minutes in off-peak, though there is considerable variation between routes and times of day.

Figure 4 Span and Frequency by Time Period

Route	Service Type	Name	Span			Frequency (Minutes unless noted)				Weekend	
			Weekday	Saturday	Sunday	AM peak	Midday	PM Peak	Evening	Saturday	Sunday
1	Local	Florence Mall	4:27am - 12:45am	5:03am - 12:24am	5:40am - 12:40am	10 - 25	30	15 - 20	30 - 50	30 - 60	35 - 60
1x	Express	Florence Express	6:00am - 8:09am 10:47am - 6:13pm 9:10pm - 9:40pm	--	--	3 OB trips, 7 IB trips	3 OB trips, 2 IB trips	8 OB trips, 4 IB trips	1 IB trip	--	--
2x	Express	Airport Express	4:40am - 12:57am	4:30am - 11:45pm	4:53am - 11:45pm	30	30 - 60	60	30 - 90	75	75
3	Local	Ludlow/Bromley	5:23am - 7:13pm	7:45am - 10:12am, 3:00pm - 5:23pm	7:45am - 10:12am, 3:00pm - 5:23pm	30 - 40	60 - 70	30 - 35	--	5 OB trips 5 IB trips	5 OB trips 5 IB trips
5	Local	Holman/City Heights	4:38am - 10:25pm	7:01am - 8:07pm	8:31am - 8:12pm	30	60	30	40 - 45	90	90
7	Local	Rosedale/Latonia	4:37am - 12:44am	5:42am - 12:31am	6:13am - 11:07pm	25 - 45	50	15 - 20	50 - 60	50 - 60	60 - 65
9	Local	Taylor Mill/ Independence	6:00am - 6:45pm	--	--	30	--	30 - 50	--	--	--
11	Local	Ft. Thomas/NKU	4:51am - 7:04pm	--	--	30	60	30	--	--	--
12	Local	Dayton	4:35am - 12:18am	7:13am - 9:03pm	7:23am - 8:28pm	30	50	30	50 - 60	50	60 - 70
16	Local	Grand Towers	6:13am - 6:50pm	6:52am - 7:28pm	8:22am - 6:44pm	30	50 - 65	30	--	90	90
17x	Express	Villa Hills Express	6:25am - 7:35pm	--	--	15 - 42	2 OB trips 2 IB trips	20 - 60	--	--	--
18x	Express	Edgewood Express	6:36am - 8:07am 4:12pm - 5:46pm	--	--	3 IB trips	--	3 OB trips	--	--	--
19x	Express	Beechwood Express	6:12am - 8:13am 4:09pm - 5:54pm	--	--	3 IB trips	--	3 OB trips	--	--	--
20	Local	South Newport	6:04am - 8:18am 4:08pm - 5:53pm	--	--	3 OB trips 4 IB trips	--	3 OB trips 2 IB trips	--	--	--
22x	Express	Walton Express	6:10am – 7:55am 4:13pm – 6:03pm	--	--	4 IB trips	--	3 OB trips	--	--	--
23	Local	South Bellevue	6:21am - 8:23am 4:13pm - 6:18pm	--	--	2 OB trips 3 IB trips	--	3 OB trips 2 IB trips	--	--	--

Figure 4 Span and Frequency by Time Period (cont'd)

Route	Service Type	Name	Span			Frequency (Minutes unless noted)				Weekend	
			Weekday	Saturday	Sunday	AM peak	Midday	PM Peak	Evening	Saturday	Sunday
25	Local	Eastern Avenue/ Cincinnati/ Alexandria	4:09am - 11:38pm	5:31am - 10:24pm	5:31am - 9:24pm	25 - 40	60	30 - 40	60	50 - 60	50 - 60
25x	Express	Alexandria	5:52am - 8:06 3:55pm - 5:55pm	--	--	5 IB trips	--	5 OB trips	--	--	--
28x	Express	Empire Drive Express	4:54am - 6:50am 3:10pm- 6:50pm 9:33pm - 10:05pm	--	--	2 IB trips (from Florence)	--	2 IB trips (from Ft. Wright)	1 OB trip (CTC to Florence)	--	--
29x	Express	Hebron Express	5:05am - 8:19am 1:28pm - 7:04pm	--	--	4 OB trips 4 IB trips	1 OB trip 1 IB trip	4 OB trips 4 IB trips	--	--	--
30x	Express	Independence Express	6:06am - 8:20am 4:03pm - 6:29pm	--	--	1 OB trip 4 IB trips	--	4 OB trips	--	--	--
31x	Express	Rolling Hills	7:24am - 7:50am 5:05pm - 5:13pm	7:20am - 7:50am 5:05am - 5:13pm	7:20am - 7:50am	1 OB trip 1 IB trip	--	--	--	1 OB trip 1 IB trip	1 OB trip
32x	Express	Burlington Express	6:10am - 8:13am 4:14pm - 6:14pm	--	--	4 IB trips	--	4 OB trips	--	--	--
33	Local	St Elizabeth South	6:10am - 10:30pm	8:05am - 8:35pm	8:05am - 8:35pm	60	60	50 - 55	65 - 100	100 - 110	100 - 110
SBS	Shuttle	Southbank Shuttle	5:55am - 7:24pm Mon-Thurs 5:55am - 10:25pm Fri.	9:55am - 10:25pm	9:55am - 7:25pm	15	15	15	15	15	15
GTWY	Shuttle	Gateway Shuttle	8:00am - 9:00pm Mon - Thurs			75	75	75	75		
NKUS	Shuttle	NKU Shuttle	7:30am - 10:00pm Mon-Thurs 7:30am - 7pm Fri.	10:30am - 2:00pm 4:30pm - 7:00pm	10:30am - 2:00pm						

HISTORICAL TRENDS

Annual ridership trends by route for the years 2011 and 2012 are shown in Figure 5 and Figure 6. Overall ridership is comparable from 2011 to 2012, with increased ridership in 2012 on routes 2x, 29x, 25x 32x and the Southbank Shuttle. Other routes had either the same or slightly lower ridership in 2012. Service on route 31x began in January 2013, so ridership and operating statistics are not included in this report.

TANK ridership fluctuations throughout the year appear to be closely tied to the academic calendar. Ridership spikes in August and begins to decline around the winter holidays. Summer ridership is relatively steady, suggesting that students may be using TANK service for non-school trips as well.

Figure 5 Ridership 2011 – 2012 by Route: Local Routes

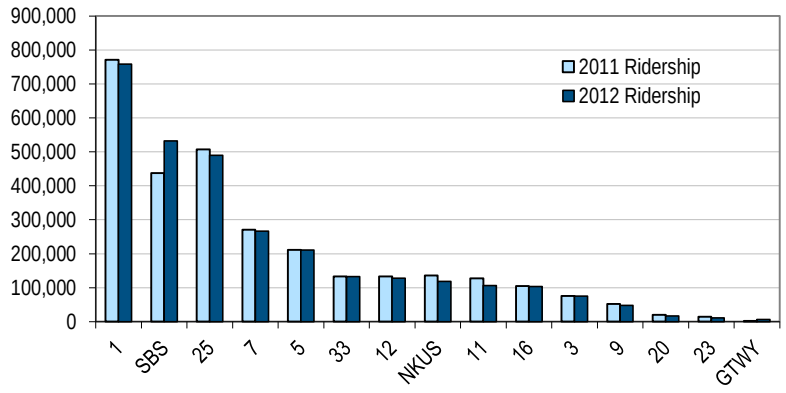


Figure 6 Ridership 2011 – 2012 by Route: Express Routes

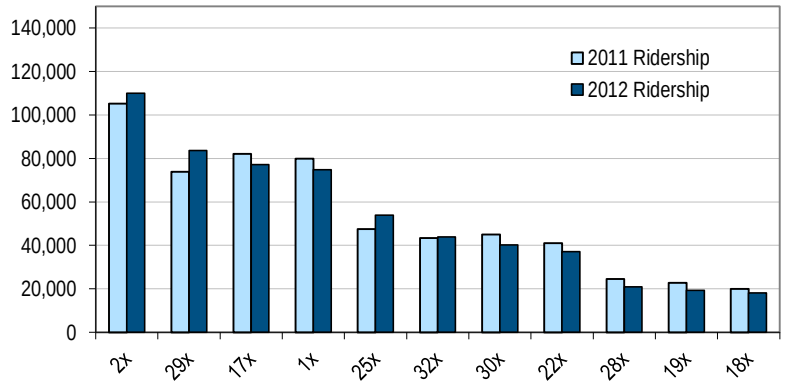
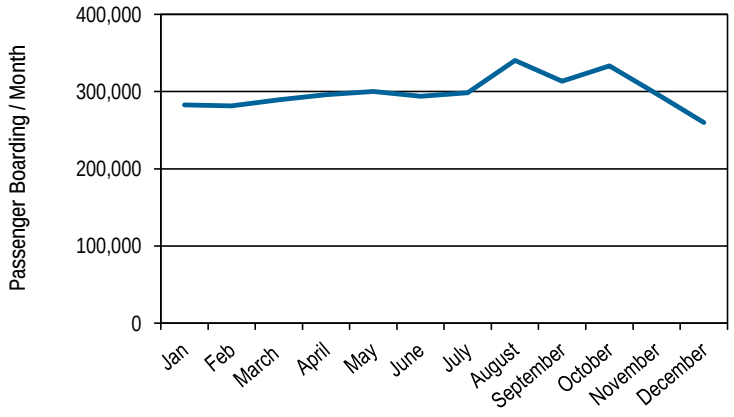


Figure 7 2012 Total System Ridership by Month



PRODUCTIVITY MEASURES

Annual service hours, service miles, boardings, trips, boardings per service hour, boardings per service mile, and boardings per trip for each weekday route are shown in Figure 8, based on TANK 2012 ridership and operating data. Annual trips were calculated using the number of scheduled trips on each type of service day (weekday, Saturday, Sunday/Holiday) multiplied by the number of service days in the year. In 2012 TANK operated 255 days on weekday schedules, 52 days on Saturday schedules, and 59 days on Sunday/Holiday schedules.

In 2012 there were 3,586,691 boardings systemwide, or 20.6 boardings per service hour. As shown in Figure 9, the NKU and Southbank Shuttle are the most productive local routes, along with Routes 1 and 7. Routes 32x, 22x, and 25x are the most productive express routes. The least productive local routes are routes 11, 23, and the Gateway Shuttle. The least productive express route is Route 2x, although boardings per service hour are still higher than the lowest performing local routes.

On time performance data, shown in Figure 12, was collected during the January 2013 ride check. On time is defined as arrival at scheduled time points between zero and five minutes after the scheduled time. Early is defined as arrival at schedule time points before the scheduled time, and late is defined as arrival at time points more than five minutes past the scheduled time. For the routes that are interlined, on time performance for individual routes was calculated using arrival times for all segments up to and including the Federal Reserve/4th & Vine in the inbound direction, and using departure times from the Federal Reserve/4th & Vine as the beginning of trips in the outbound direction.

Most routes are comparable in on time performance, with local routes averaging nearly 80% on time and express routes 72% on time. Routes 16 and 12 have the best on time percentage of local routes, and Routes 32x and 25x have the best on time percentage for express routes. The lowest on time percentages of all routes are Routes 17x, 30x, and 19x.

Figure 8 2012 Operating Statistics – All Routes

	Route	Annual Boardings	Annual Service Hours	Annual Service Miles	Annual Trips	Boardings/Service Hour	Boardings/Service Mile	Boardings/Trip
Local Routes	1	757,773	30,153.7	519,185.4	27,764	25.1	1.5	27.3
	3	75,059	4,058.0	60,692.8	10,800	18.5	1.2	6.9
	5	210,690	10,135.0	133,422.0	13,865	20.8	1.6	15.2
	7	266,850	10,570.4	143,256.5	18,966	25.2	1.9	14.1
	9	47,583	3,191.8	67,572.5	4,845	14.9	0.7	9.8
	11	106,408	8,636.0	139,085.3	10,200	12.3	0.8	10.4
	12	128,220	7,376.9	88,542.3	16,857	17.4	1.4	7.6
	16	107,355	5,507.0	78,948.3	10,125	19.5	1.4	10.6
	20	16,956	1,258.0	16,793.4	3,060	13.5	1.0	5.5
	23	11,160	1,177.3	14,520.5	2,550	9.5	0.8	4.4
	25	489,864	26,299.8	425,823.8	17,124	18.6	1.2	28.6
	33	133,112	7,711.9	126,339.7	8,682	17.3	1.1	15.3
	SBS	531,956	19,218.7	208,779.6	18,870	27.7	2.5	28.2
	GTWY	6,460	3,187.5	88,127.6	10,030	2.0	0.1	0.6
	NKUS	118,438	4,260.6	48,743.4	N/A	27.8	2.4	N/A
Express Routes	1x	74,587	3,883.9	92,149.8	7,140	19.2	0.8	10.4
	2x	109,924	10,760.3	299,637.1	16,897	10.2	0.4	6.5
	17x	77,169	3,106.8	61,394.1	6,885	24.8	1.3	11.2
	18x	18,095	828.8	16,782.1	1,530	21.8	1.1	11.8
	19x	19,292	1,122.0	24,302.5	1,530	17.2	0.8	12.6
	22x	37,105	1,330.3	40,130.0	1,785	27.9	0.9	20.8
	25x	53,904	2,010.3	42,561.6	2,805	26.8	1.3	19.2
	28x	20,976	1,003.0	26,215.8	1,275	20.9	0.8	16.5
	29x	83,643	4,186.3	110,966.2	4,590	20.0	0.8	18.2
	30x	40,218	1,734.0	37,497.6	2,295	23.2	1.1	17.5
	32x	43,894	1,109.3	30,559.8	2,040	39.6	1.4	21.5
Systemwide		3,586,691	173,817	2,942,030	1,294,351	20.6	1.2	16.1

Figure 9 Boardings per Service Hour by Route

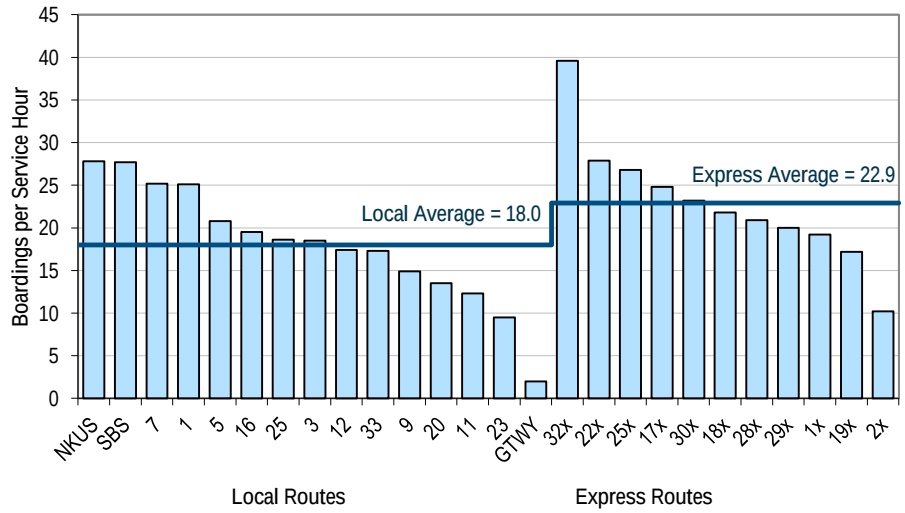


Figure 10 Boardings per Service Mile

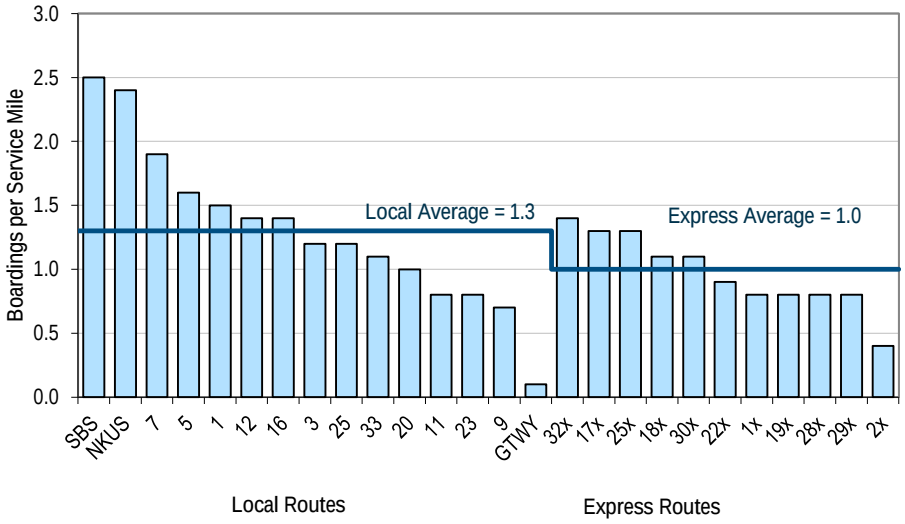
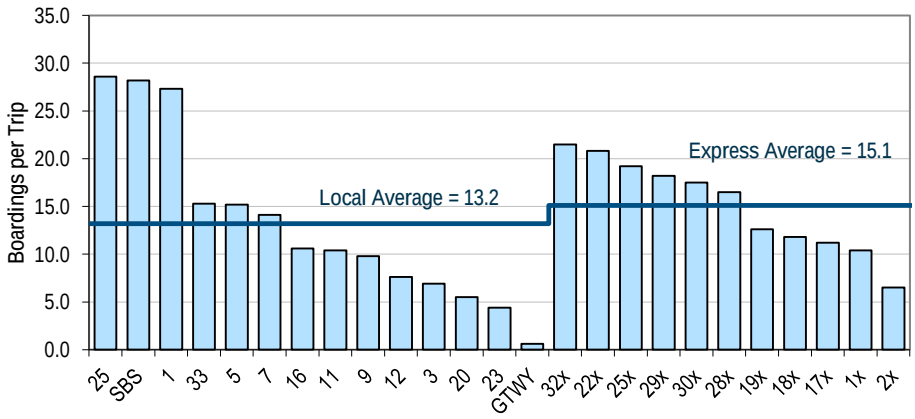
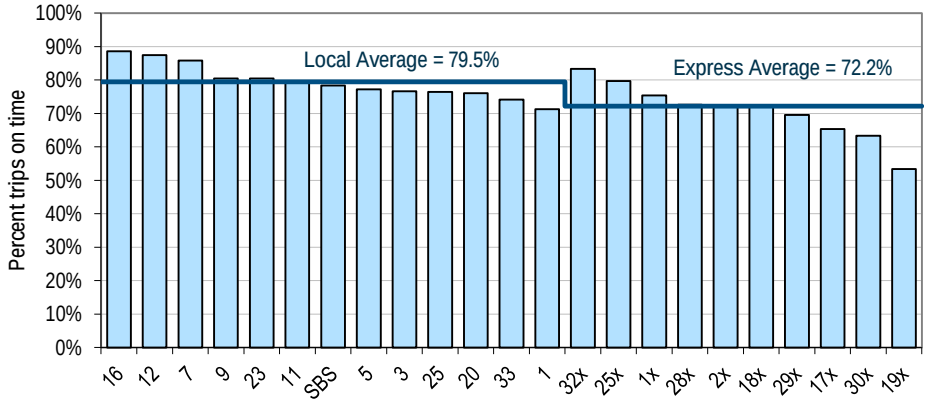


Figure 11 Boardings per Trip*



*Average boardings per trip not available for NKU Shuttle

Figure 12 On-Time Percentage by Route*



*On-time Performance data not available for Gateway Shuttle, NKU Shuttle, or 22x

Figure 13 On-Time Performance by Route

	Route	On time	Early	Late
Local Routes	1	71.3%	11.5%	17.2%
	3	76.6%	7.1%	16.2%
	5	77.2%	19.0%	3.8%
	7	85.9%	5.4%	8.8%
	9	80.5%	5.1%	14.4%
	11	79.6%	13.3%	7.1%
	12	87.5%	4.0%	8.5%
	16	88.6%	6.0%	5.4%
	20	76.0%	9.4%	14.6%
	23	80.4%	2.2%	17.4%
	25	76.4%	11.4%	12.1%
	33	74.1%	17.9%	8.0%
	SBS	78.3%	19.0%	2.7%
	GTWY	N/A	N/A	N/A
	NKUS	N/A	N/A	N/A
Express Routes	1x	75.4%	16.9%	7.7%
	2x	72.4%	17.6%	10.0%
	17x	73.0%	10.2%	16.8%
	18x	72.2%	0.0%	27.8%
	19x	53.3%	43.3%	3.3%
	22x	N/A	N/A	N/A
	25x	79.7%	16.7%	3.7%
	28x	72.6%	20.2%	7.1%
	29x	69.5%	15.5%	15.0%
	30x	63.3%	11.4%	25.3%
	32x	83.3%	16.7%	0.0%
Average		76.0%	13.1%	10.9%

3 DOCUMENT REVIEW

This section provides a review of previous documents that are relevant to this study. The review includes internal TANK documents as well as external planning studies conducted by Boone, Campbell, and Kenton Counties, as well as the Ohio Kentucky Indian Regional Council of Governments (OKI), and others. The reviewed documents include:

- TANK documents:
  - TANK 2006 Transit Network Study
- External documents:
  - Boone County Transportation Study
  - Campbell County Transportation Plan
  - Kenton County Transportation Plan
  - Regional Rail Plan
  - 2030 OKI Regional Transportation Plan Update
  - Regional BRT Analysis (OKI)

TANK DOCUMENTS

Tank 2006 Transit Network Study

The *Transit Authority of Northern Kentucky (TANK) Transit Network Study*, completed in 2006, is a comprehensive plan that analyzes and assesses the existing trends and operations of the transit system. Alongside this existing conditions review, this study was intended to help identify challenges and potential opportunities to meet the on-going mobility demands of its users throughout the Northern Kentucky region. This planning process identified a long-term vision that seeks to "Link Northern Kentucky Together".

An extensive public and stakeholder outreach process was implemented to foster input and involvement from residents in the Boone, Kenton, and Campbell Counties. In addition, an Advisory Committee composed of various regional stakeholders and organizations assisted TANK in development a unified long-term vision moving forward. This extensive planning process helped to create both short and long-term implementation strategies that could be applied incrementally overtime with adequate and available funding. Key elements of this long-term plan include:

- Constructing major transit ways along main corridors
- Consolidating and improving bus stop amenities and locations
- Improving bus technology for existing and potential users
- Designing transit hubs/ stations throughout the region
- Creating BRT facilities throughout various corridors

- Promoting Transit-Oriented Development
- Improved travel time and reliability

Since its publication, this study has served as practical planning resource for the Northern Kentucky and Greater Cincinnati region in identifying long-range decision-making plans. Recommendations and strategies have been adopted and incorporated by the Boone County Transportation Plan, the Dixie Fix, and Vision 2015.

EXTERNAL DOCUMENTS

Boone County Transportation Plan 2030

In response to the rapid growth and development that has been occurring in Boone County and the impact that this growth has had on the County's transportation system, the Ohio-Kentucky-Indiana Regional Council of Governments, working alongside Boone County implemented a county wide study to assess opportunities to proactively plan and develop a transportation plan that holistically addresses the existing and future needs of this growing county. The overarching goals of this study were to develop a transportation plan that is compatible with existing and future land uses, identify enhancements to the existing transportation system, and provide policy recommendations that enable the County to respond to development pressures.

At the onset of the study, a varied stakeholder group was convened to gather input for this extensive process, including representatives from the Kentucky Transportation Cabinet, TANK, the Cincinnati/Northern Kentucky International Airport, the cities of Florence, Union, and Walton, and their residents. The transportation plan was developed to include elements and recommendations such as:

- Operational Improvement Plan (short term/ low cost solutions for traffic/ safety)
- Long-Range Transportation Improvements (local road and regional highway corridors)
- Connectors (improve interconnectivity among neighborhoods and developments)
- Transit Recommendations (strategies identified in TANK's 2006 strategic plan)
- Bicycle and Pedestrian Facilities (improvement and expansion of existing facilities)

The plan also provided an assessment and comparison of existing and anticipated financial resources to the anticipated needs of the Boone County through the year 2030. This provides a foundation for both County officials and local and regional stakeholders to prioritize transportation projects and ways to seek additional funding sources as necessary.

Campbell County Transportation Plan

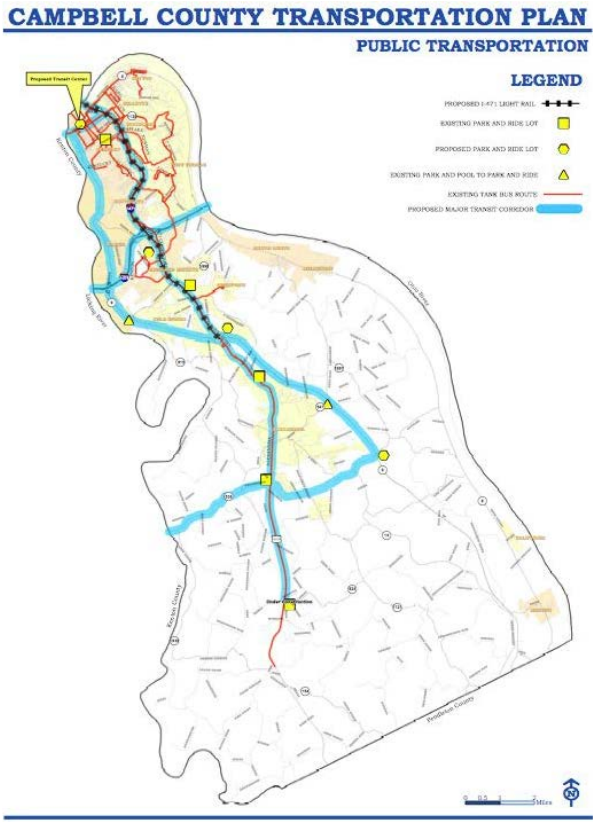
In 2003, the Ohio-Kentucky-Indiana Regional Council of Governments (OKI) working alongside the Campbell County Court Fiscal County, Wilbur Smith Associates, and other regional partners, undertook a study to address the transportation needs specific to communities within Campbell County. This plan provides both a local and regional perspective on evaluating and prioritizing transportation needs, projects, and funding that not only have an immediate effect on communities within this county, but also have a larger impact on the regional transportation as a whole. The development of this report was guided by three main objectives:

- Identifying county-wide needs on the state and federal highway system
- Identifying deficiencies on the county owned roadway network

- Identifying transit, bike, and pedestrian needs

After an extensive review of the county's existing transportation infrastructure and networks, a ranking system helped to assess and prioritize the transportation needs of the county, placing priorities on various county road improvements, public transportation enhancement and expansion recommendations as outlined in TANK's strategic plan, as shown on Figure 14 below, and partnering with communities to enhance local and regional pedestrian and bicycle networks. The report also provides a comprehensive financial outlook to evaluate existing and potential funding sources that could help achieve short- and long-term transportation improvements. This report is intended to serve as a resource and living document that evolves with the County's needs and achievements.

Figure 14 Campbell County Transportation Plan: Public Transportation



Kenton County Transportation Plan

The Kenton County Transportation Plan was initiated in 2003, by both the County and OKI as an initiative to improve multi-modal transportation opportunities, link transportation improvements with the county's future land use plans, and provide an implementation plan for these

recommendations to be executed in a financially feasible manner. This plan is unique in that it emphasizes a multi-modal approach to transportation endeavors for the county in order to encourage economic growth and quality of life for its residents well into the year 2030.

More specifically this plan delves into opportunities for improving linkages between land use and transportation through the concept of a "Transportation Service Area" as outlined in the County's Comprehensive Plan. This essentially has provided a framework for developing transportation recommendations that account for different land use patterns for meeting different transportation needs of the County's diverse urban and suburban environment. This study also delivers recommendations for a multi-pronged transit initiative, which seeks to initiate a cost-effective Bus Rapid Transit System in Northern Kentucky, implement light rail and streetcar systems linking Covington to downtown Cincinnati, and improving existing local and regional bus services, which are consistent with other regional studies. Other recommendations include improvements to pedestrian and bicycle infrastructure that encourage multi-modal options, and maintaining and improving county roadways.

Regional Rail Plan (2002)

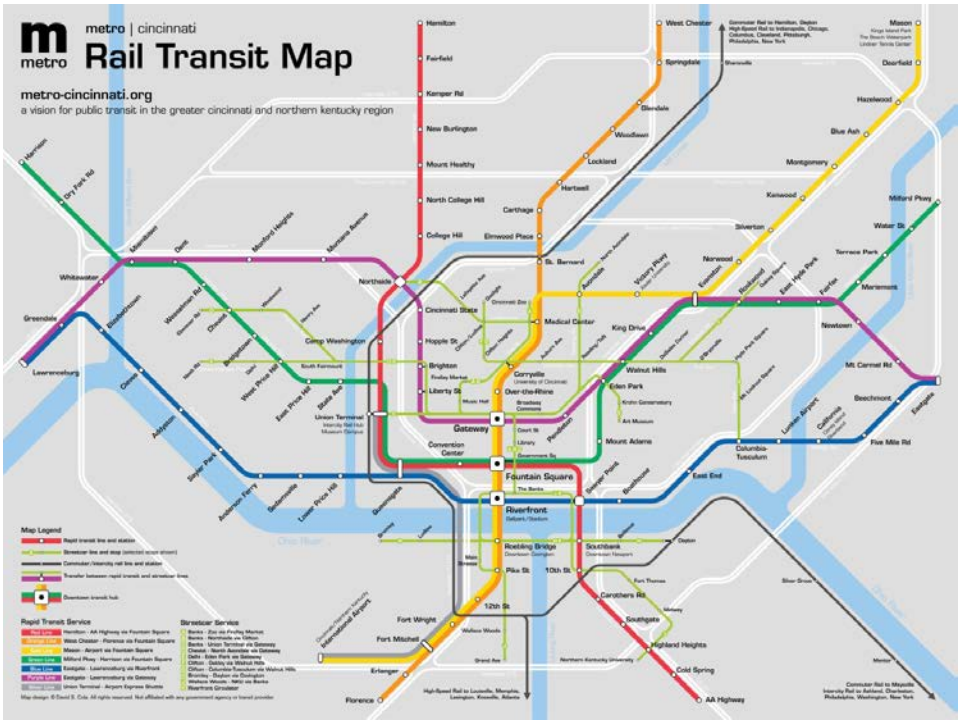
In 2002, SORTA, OKI, the Transit Authority of Northern Kentucky (TANK), and Hamilton County collaborated on a plan for the development of a regional passenger rail transit system in Hamilton County and the greater Cincinnati/Northern Kentucky area. This plan followed the OKI 2030 Regional Transportation Plan and the 2001 SORTA *MetroMoves* plan. In the OKI 2030 plan, the I-71 Corridor was identified as the first line in a comprehensive light rail network.

It also called for studies of the Central Area, Western, I-75, and Southeastern corridors. These corridors are examined in more detail in the Regional Rail Plan. This includes light rail in the I-71, Eastern, Southeastern, I-75, and Western corridors; streetcar lines in the Central Area and Uptown/Downtown line; and Commuter Rail in the River Road, I-75, and Eastern corridors. The Regional Rail Plan also includes a study on the potential reuse of the abandoned subway tunnels under Central Parkway. All of the lines included in the vision of this plan are shown in **Error! Reference source not found.** below. As a result of this plan, several studies were initiated, including:

- Preliminary Engineering plans and a Draft Environmental Impact Statement for the initial segment of the I-71 Corridor and the Eastern Corridor based on light rail and commuter rail transit technologies.
- Major Investment Studies for the I-75 and Eastern corridors based on light rail and commuter rail technologies.
- Conceptual transportation planning study for the central business districts of Cincinnati, Covington, and Newport, called the Central Area Loop Study, completed by OKI in 2001.
- Evaluation of potential rail transit line in western Hamilton County, under the Western Corridor Project
- Light rail feasibility study in the Southeastern Corridor (Campbell County)

The plan also includes preliminary cost estimates for the system, ridership forecasts for each corridor, and benefit cost calculation.

Figure 15 Metro Rail Plan Transit Map



2030 OKI Regional Transportation Plan Update (2001, 2008 update)

In 2008 the Ohio Kentucky Indiana Regional Council of Governments (OKI) undertook a planning process to update the region's 2030 Regional Transportation Plan from 2001 and to create a new vision for transportation in the counties of Butler, Clermont, Hamilton, and Warren Counties, Ohio; Boone, Campbell, Kenton Counties, Kentucky; and Dearborn County, Indiana.

The goals of the Regional Transportation Plan are to:

- Improve travel safety
- Improve accessibility and mobility options for people and goods
- Protect and enhance the environment
- Enhance the integration and connectivity of the transportation system
- Promote efficient system management and operation
- Emphasize the preservation of the existing transportation system
- Support economic vitality
- Consider regional security
- Strengthen the connection between infrastructure and land use

Extensive public and stakeholder involvement activities were conducted during the initial stages of the planning process. These activities included:

- Presentations and public open houses
- Surveys
- Public hearing

The Regional Transportation Plan includes the Transportation Improvement Program (TIP) for the region. The projects listed in the TIP are committed projects, and the plan includes a summary of recommended projects as well. Chapter 9 of the Regional Transportation Plan discusses recommendations for bus and rail transit service expansion, bus replacement, and technological improvements.

The Regional Transportation Plan update supports the recommendations in the Regional Rail Plan, although does not recommend the full plan due to funding restrains. The plan recommends the Cincinnati Streetcar, Eastern Corridor Oasis Rail Alignment, rail transit right of way preservation and an Ohio Hub Passenger Rail/Midwest Regional Rail Cincinnati Terminal. All other rail transit lines in the Regional Rail Plan are included as part of the Rail Transit Vision Plan.

Regional BRT Analysis

In 2012, the City of Cincinnati's Department of Transportation and Engineering (DOTE) worked with Metro and TANK to conduct an analysis of potential Bus Rapid Transit application in the Cincinnati metropolitan area and the region. This analysis was meant to coincide with the update of the OKI 2040 Long Range Transportation Plan update. The analysis looked at national BRT examples and best practices in the field for their success and applicability to Cincinnati. BRT has been evaluated in several other corridor studies in the region, including the I-71 Corridor Major Investment Study and the Eastern Corridor Major Investment Study. Currently the left shoulders on the segment of I-71 between Kenwood and Kings Island are used for express bus travel.

The study explored the implementation of BRT in the three railroad rights-of-way purchased by Metro in the early 1990s. These lines are the Oasis line, Blue Ash line and the Wasson Line. The study recommended not pursuing BRT along the Oasis Line and the active portion of the Blue Ash Line ROW. The study determined that the abandoned segment of the Blue Ash Line, and the Wasson lines, could be adapted to BRT use at considerable expense.

4 LAND USE AND DEMOGRAPHIC CHARACTERISTICS

Transit demand is influenced by the type and number of people who live and work in any given area. In order to assess the potential for transit demand, the land use and demographic characteristics for the TANK service area were analyzed. The examined factors are typically indicators of transit usage propensity (i.e. show the likelihood that someone may ride transit). The following factors were analyzed, and each is discussed in more detail below.

- Population density
- Child population density
- College-age population density
- Senior-age population density
- Employment density
- Poverty levels
- Vehicle availability
- Northern Kentucky University Student and Faculty Home Zip Codes

POPULATION AND EMPLOYMENT DENSITY

In most metropolitan areas, population and employment density are the factors which tend to have the greatest influence on transit demand. The density of residential, retail and commercial development determines the number of people and/or activities that are in close proximity to transit services. Furthermore, as the density of development increases, so do the incentives that people may have for using transit. As density increases, factors such as traffic congestion, parking fees, and parking congestion tend to encourage increased transit usage. Even more than income or age, density determines the potential market for transit. Other factors, such as the proximity of a large university or employment center, work in combination with underlying density to increase transit's market potential. Figure 16 below summarizes the breadth of transit service types that can be tailored to local conditions.

Figure 16 Corridor Service Types and Supportive Densities

Class	Corridor Service Type	Key Service Features	Density Threshold (persons + jobs per acre)
A+	High Capacity Transit	Local bus and LRT/BRT operation at high service level. 5 minutes peak, 10 minutes off-peak combined frequency minimum.	60 or more
A	Rapid Transit	Local bus and limited-stop operations at high service level. 10 minutes peak, 15 minutes off-peak combined frequency minimum.	40 to 60
B	Arterial Transit	Local bus operations at enhanced service level. 15 minutes peak, 30 minutes off-peak minimums.	20 to 40
C	Local Transit	Local bus and shuttle operations at baseline levels. 30 minutes peak, 60 minutes off-peak minimums.	10 to 20
D	Shuttle Transit	Employee shuttles and commuter bus services. Circulators and flex-route operations.	5 to 10
E	Demand Response	Ridesharing (carpool, vanpool, bus pool or van share). Demand response services.	5 or less

Level of service standards and density thresholds have been developed by Nelson\Nygaard based on a combination of empirical data (our own work in other places and transit systems e.g. Pittsburgh, Kansas City, Honolulu, Los Angeles) and industry research.[1]

Relatively high population and employment densities are required to support frequent transit service. Research has shown that transit demand tends to increase most dramatically between about 7 and 15 dwelling units per acre. Below 7 dwelling units per acre, it is usually difficult to operate productive transit services.[2] Density also leads to increased bicycling and walking, as the destinations that people need to travel tend to be closer to one another.

While the majority of Boone, Kenton, and Campbell counties have densities below five persons per acre, TANK serves almost all of the areas with higher population densities, shown in Figure 19. The densest pockets of TANK's service area, with 20 or more persons per acre, are concentrated mostly near downtown Cincinnati in communities such as Newport, Covington, Ludlow, Bellevue, and Kenton Vale. Moderate density exists in the Dixie Highway corridor with scattered pockets of higher density. There is also high density in the area surrounding Northern Kentucky University in Highland Heights.

Figure 20 shows the concentration of children ages 10 to 14. Census blocks that exceed two children per acre are mostly located in Newport, Bellevue, Dayton, Covington, and Ludlow. There are small pockets of high concentrations throughout the service area, most of which are near transit. The density of college age persons (18-24) is shown in Figure 21. Clusters of this age group

[1] Most notably: Boris S. Pushkarev and Jeffrey M. Zupan. Public Transportation and Land Use Policy. Indiana University Press, Bloomington, IN, USA, 1977.

[2] Boris S. Pushkarev and Jeffrey M. Zupan. Public Transportation and Land Use Policy. Indiana University Press, Bloomington, IN, USA, 1977. At an average size of 2.5 persons per household or dwelling unit, 7 to 15 dwelling units per acre would be equivalent to 17.5 to 37.5 persons per acre.

are more clearly defined than those of younger children. The high and moderate concentrations follow the same pattern as the total population density. There is a large concentration of college age persons in Highland Heights near Northern Kentucky University, as well as in Fort Thomas, and along the Dixie Highway corridor. Some high concentrations of college age persons in Florence and Park Hills are not directly served by transit.

Concentration of senior aged persons (65 and older) is shown in Figure 22. Most census blocks with more than two seniors per acre are served by transit with the exception of areas west of Florence. Villa Hills, Kenton Vale and areas South of Northern Kentucky University have moderate concentrations of seniors and the Dixie highway corridor has low, moderate, and high concentrations intermixed. Senior population projections for each county are shown in Figure 17 and Figure 18. Over the next 30 years, the rate of growth for senior populations does not exceed the growth rate of the population in any of the counties. Boone County has the highest overall growth rate with a 64% increase by 2040. Boone County is a less dense part of TANK's service area. It will be important to determine effective ways of serving this community as it grows.

Figure 17 Total Population and Population of Seniors by County (2010 – 2040)

County	Boone		Campbell		Kenton	
Year	Total	65 and Older	Total	65 and Older	Total	65 and Older
2010	118,811	11,313	90,336	11,557	159,720	17,853
2015	135,584	15,666	91,199	12,913	164,307	20,959
2020	153,933	21,227	91,642	14,871	168,458	24,558
2025	172,101	27,841	91,475	17,056	171,990	28,558
2030	190,270	34,683	90,731	18,594	174,699	31,302
2035	207,901	40,641	89,524	18,753	176,571	32,296
2040	224,687	46,189	88,012	18,057	177,963	32,449
% Change (2010-2040)	+53%	+24%	+103%	+64%	+90%	+55%

Figure 18 Population of Seniors by County (2010 - 2040)

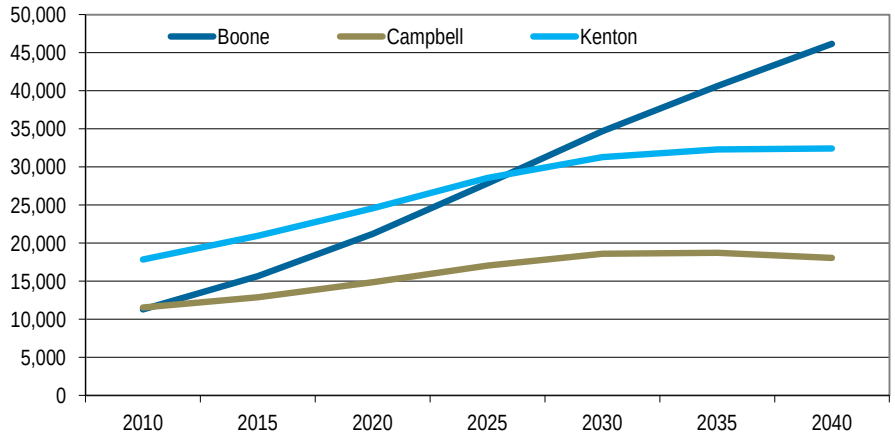


Figure 23 shows the concentration of employment by TAZ in 2005. Areas with more than 20 jobs per acre are located in downtown Cincinnati, directly across the river in Covington. There are moderate concentrations of employment in Newport, Erlanger, Edgewood, and Florence. All areas with more than five jobs per acre are currently served by transit.

Figure 19 2010 Population Density by Census Block

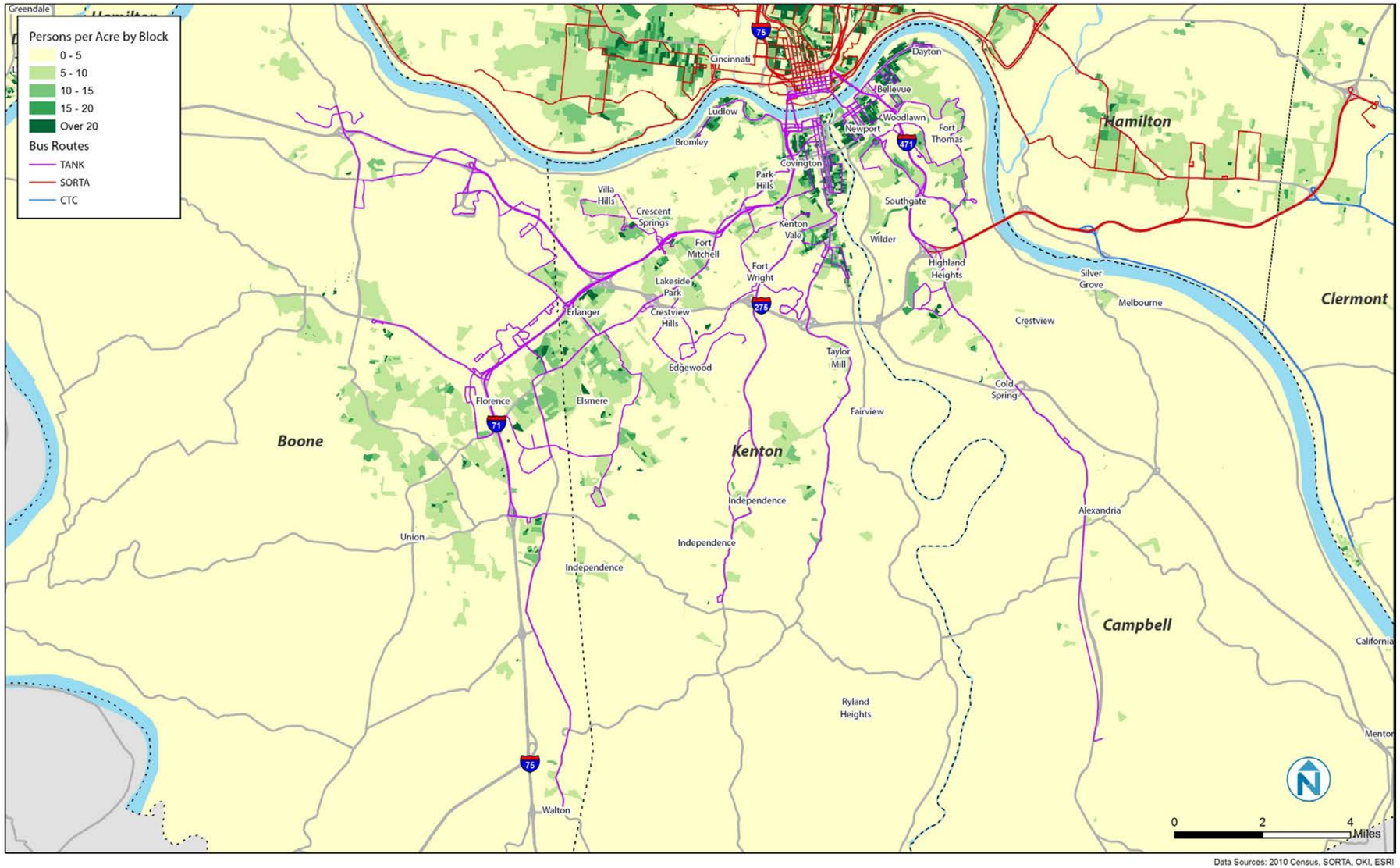


Figure 20 Children (10-14 Years Old) Population Density by Census Block

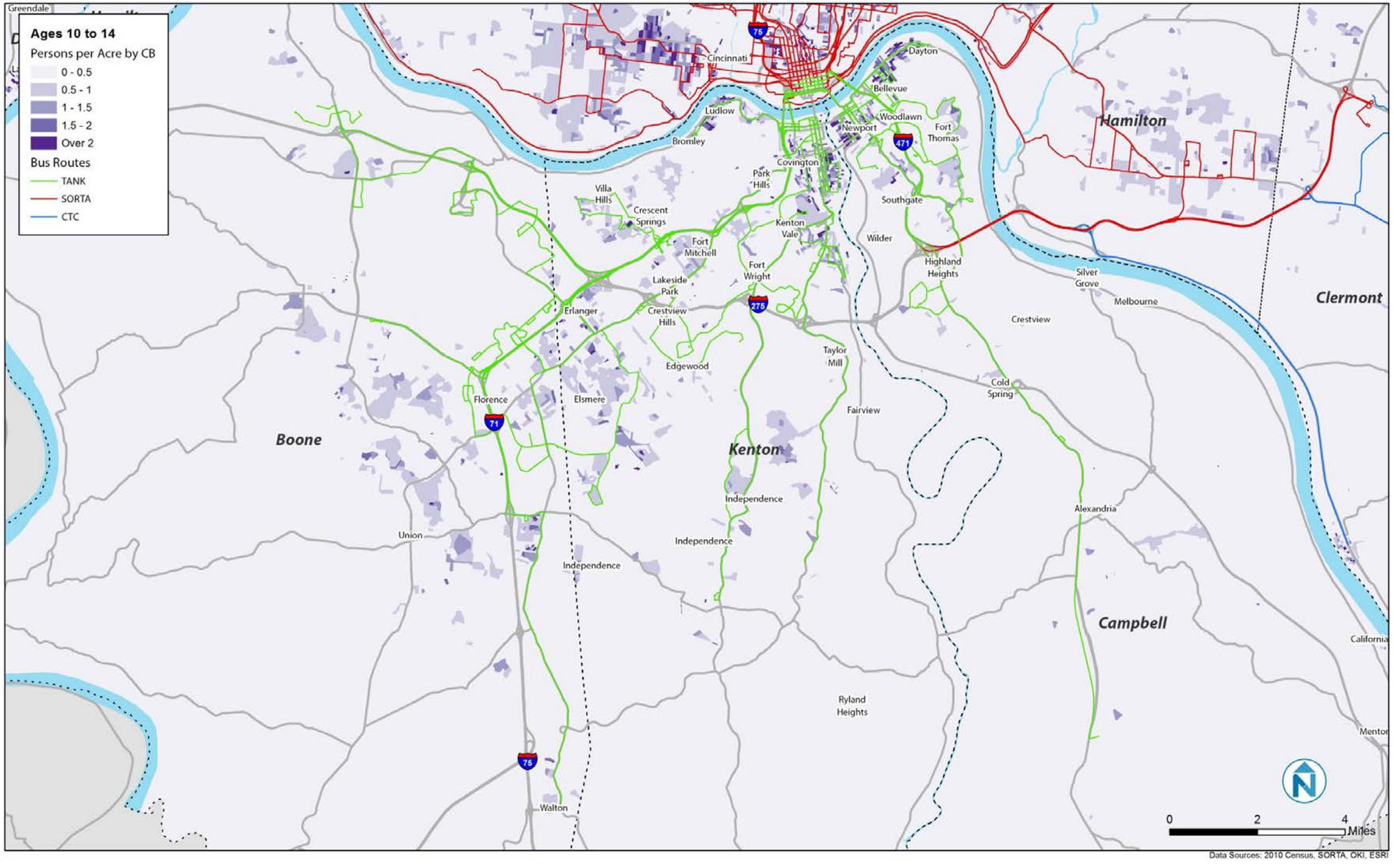


Figure 21 College Age (18 to 24 Years Old) Population Density by Census Block

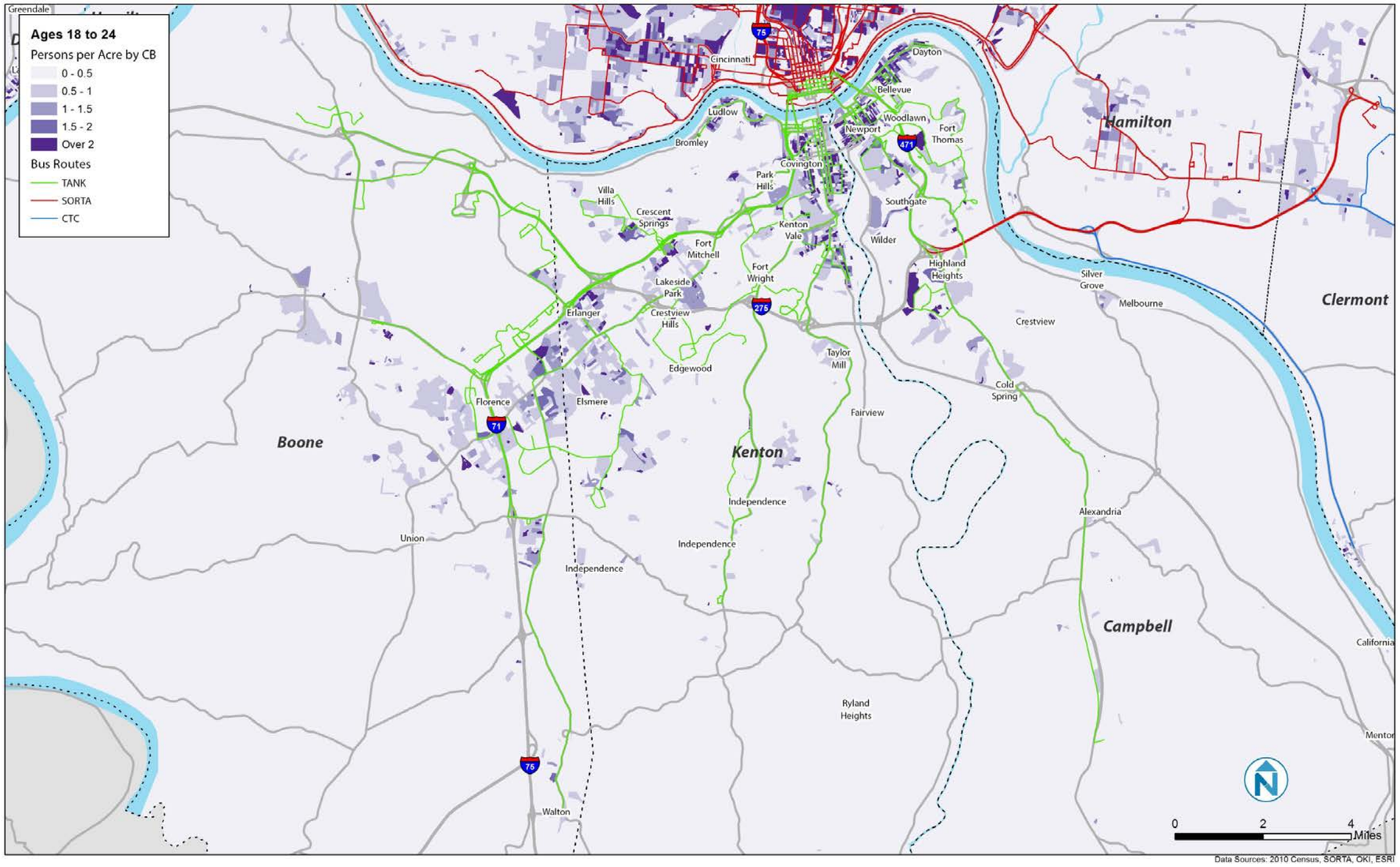


Figure 22 Seniors (65 and Older) Population Density by Census Block

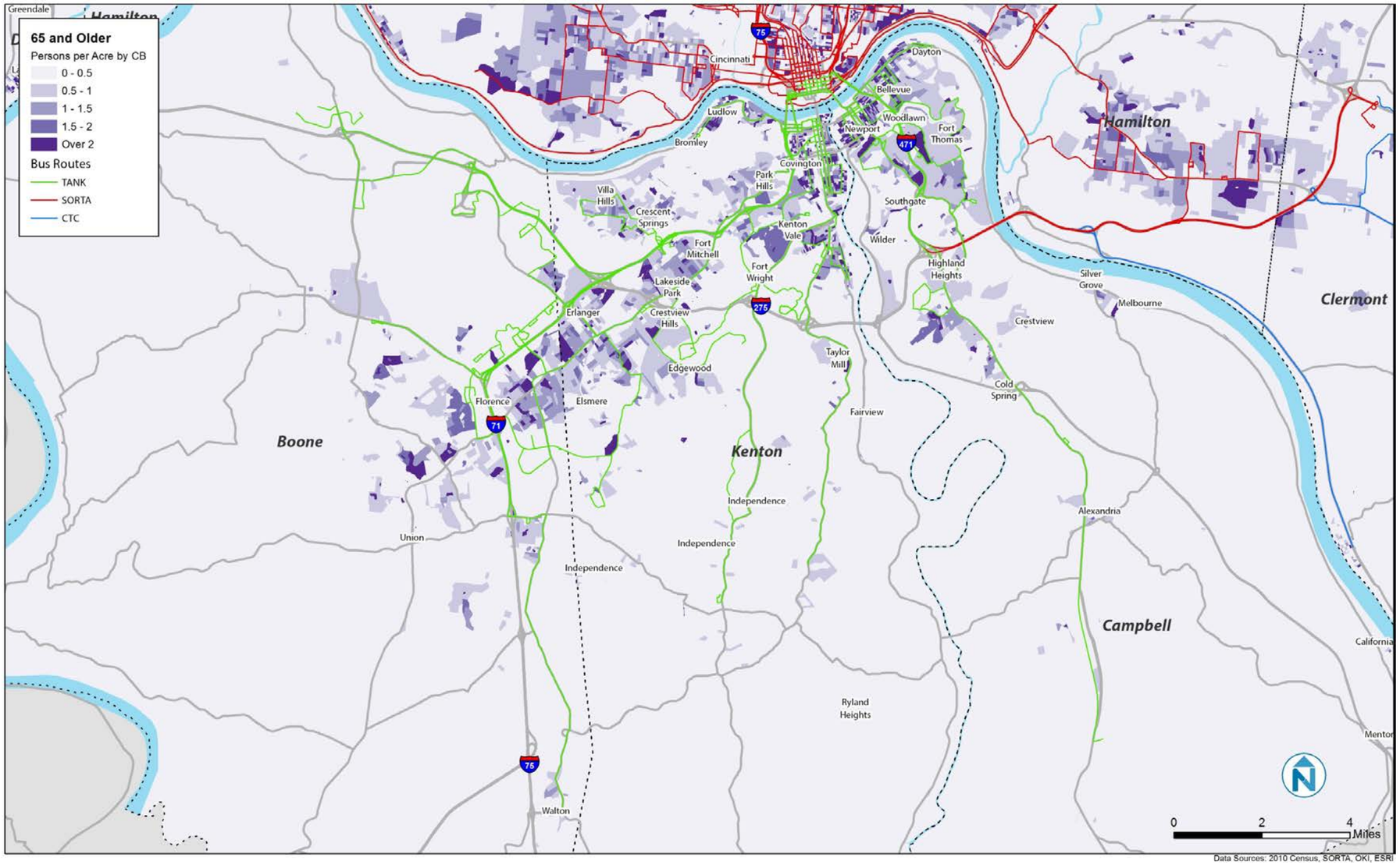
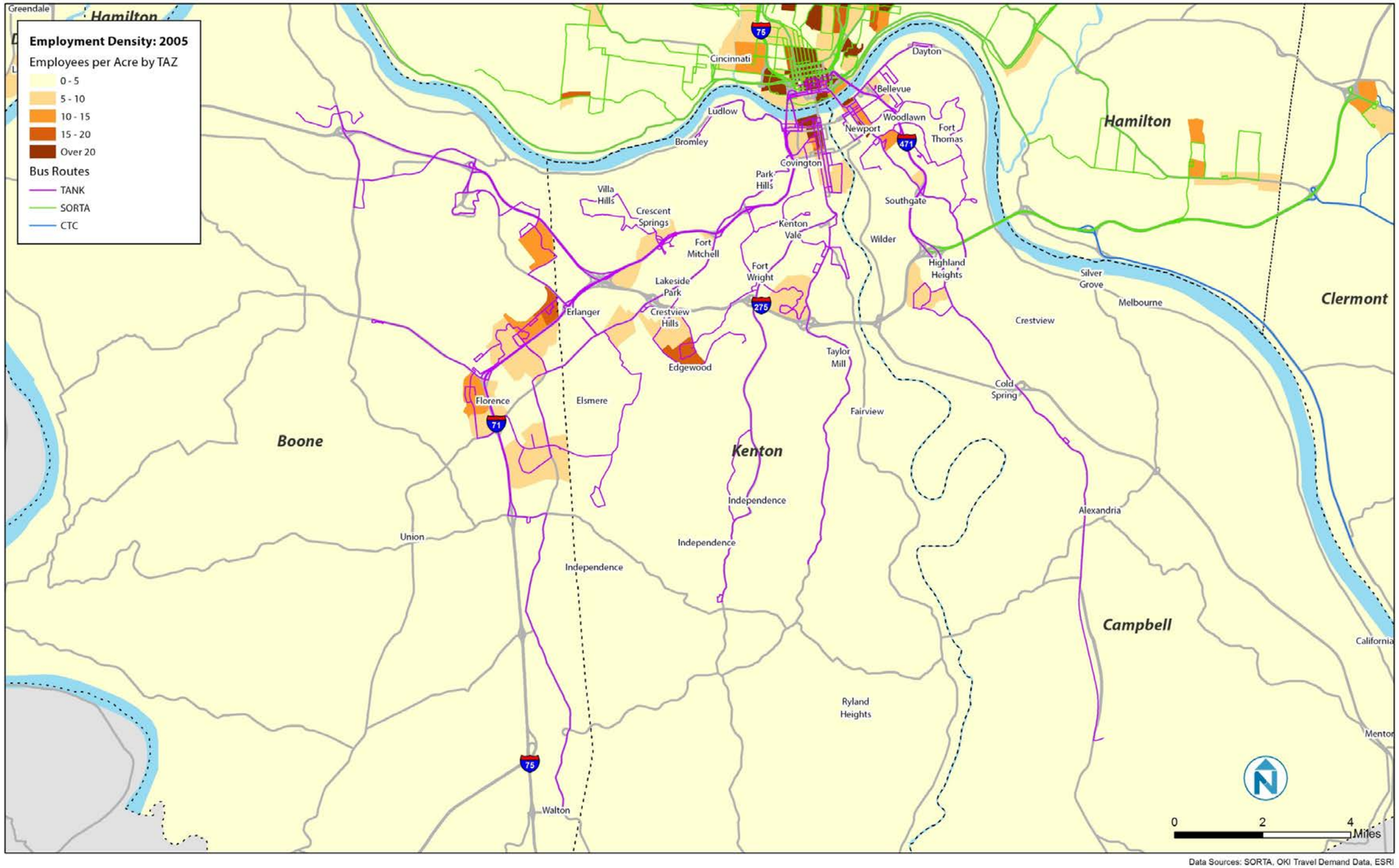


Figure 23 2005 Employment Density by TAZ



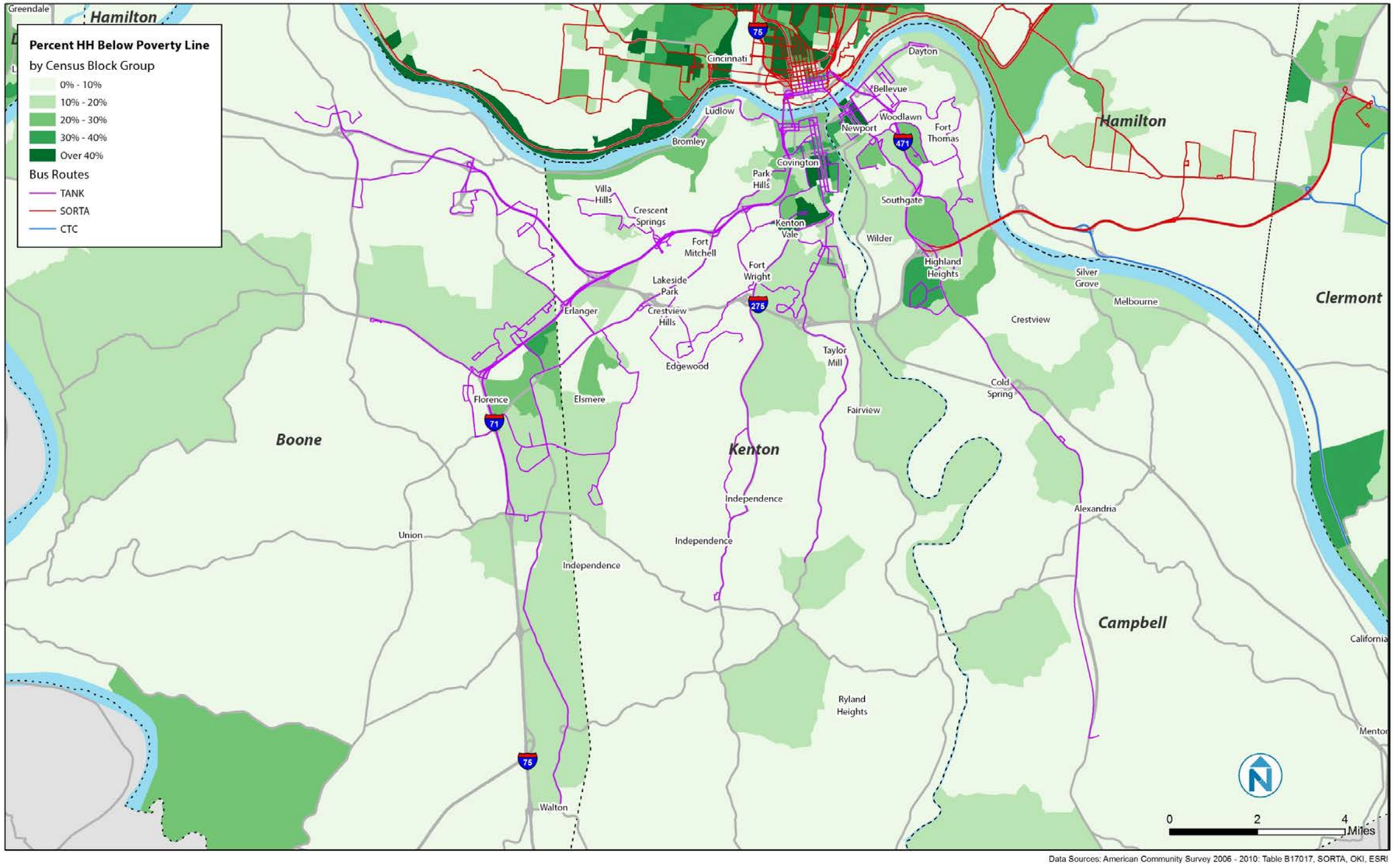
Data Sources: SORTA, OKI Travel Demand Data, ESRI

DEMOGRAPHIC CHARACTERISTICS

Figure 24 shows the percentage of households below the federal poverty line by census block group based on American Community Survey five year estimates (2006-2010). High percentage of poverty (above 40%) is relatively rare in TANK's service area when compared to Cincinnati. The only areas where this is the case are in Covington, Kenton Vale, and Newport. There are moderate levels of poverty near Northern Kentucky University and near Florence. Figure 25 shows the percentage of households without access to a vehicle, which most follows the same pattern as high percentage of households below the poverty line with the exception of Kenton Vale the area around Northern Kentucky University which shows a higher percentage of persons with access to a vehicle.

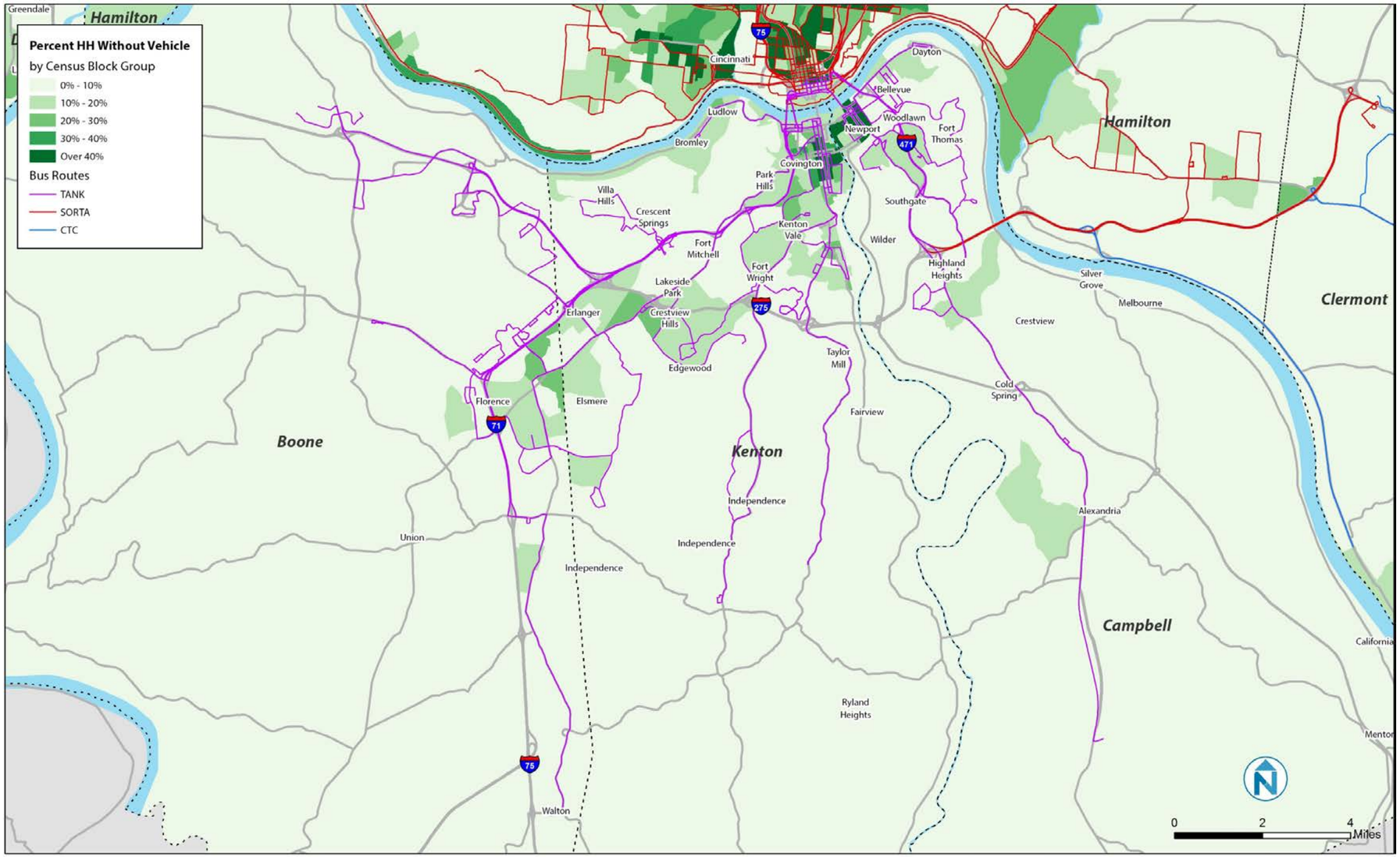
Figure 26 and Figure 27 show the concentration of Northern Kentucky University (NKU) students and faculty by zip code, respectively. High concentrations of both students and faculty are split into two distinct blocks, one immediately surrounding the university and another to the west in Kenton and Boone counties, separated by the areas of lower concentrations west of the Licking River. Access to NKU campus from the more western concentration of students and faculty is restricted by the fact that there is only one bridge crossing the Licking River (via highway 275) south of Covington. Currently, TANK routes do not make any east-west connections using that alignment, causing NKU affiliates who live away from campus to travel into Covington and transferring in order to reach campus. Driving distance using I-275 bridge is much shorter, making transit travel times uncompetitive.

Figure 24 Percentage of Households Below Poverty Level by Census Block Group



Data Sources: American Community Survey 2006 - 2010: Table B17017, SORTA, OKI, ESRI

Figure 25 Percentage of Households Without Access to a Vehicle by Census Block Group



Data Sources: American Community Survey 2006 - 2010: Table B25044, SORTA, OKI, ESRI

Figure 26 Northern Kentucky University Students by Zip Code (2012 – 2013 Academic Year)

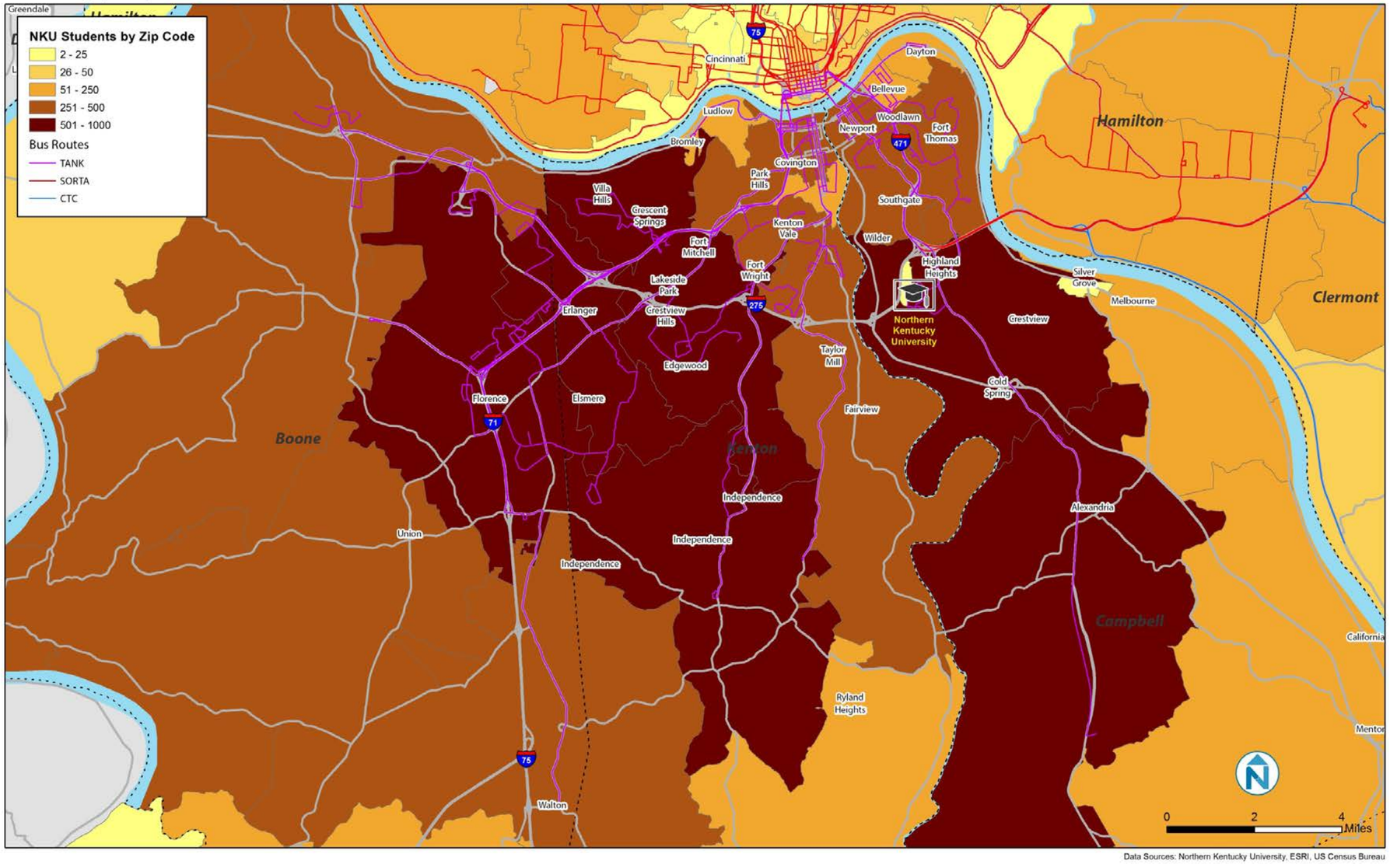
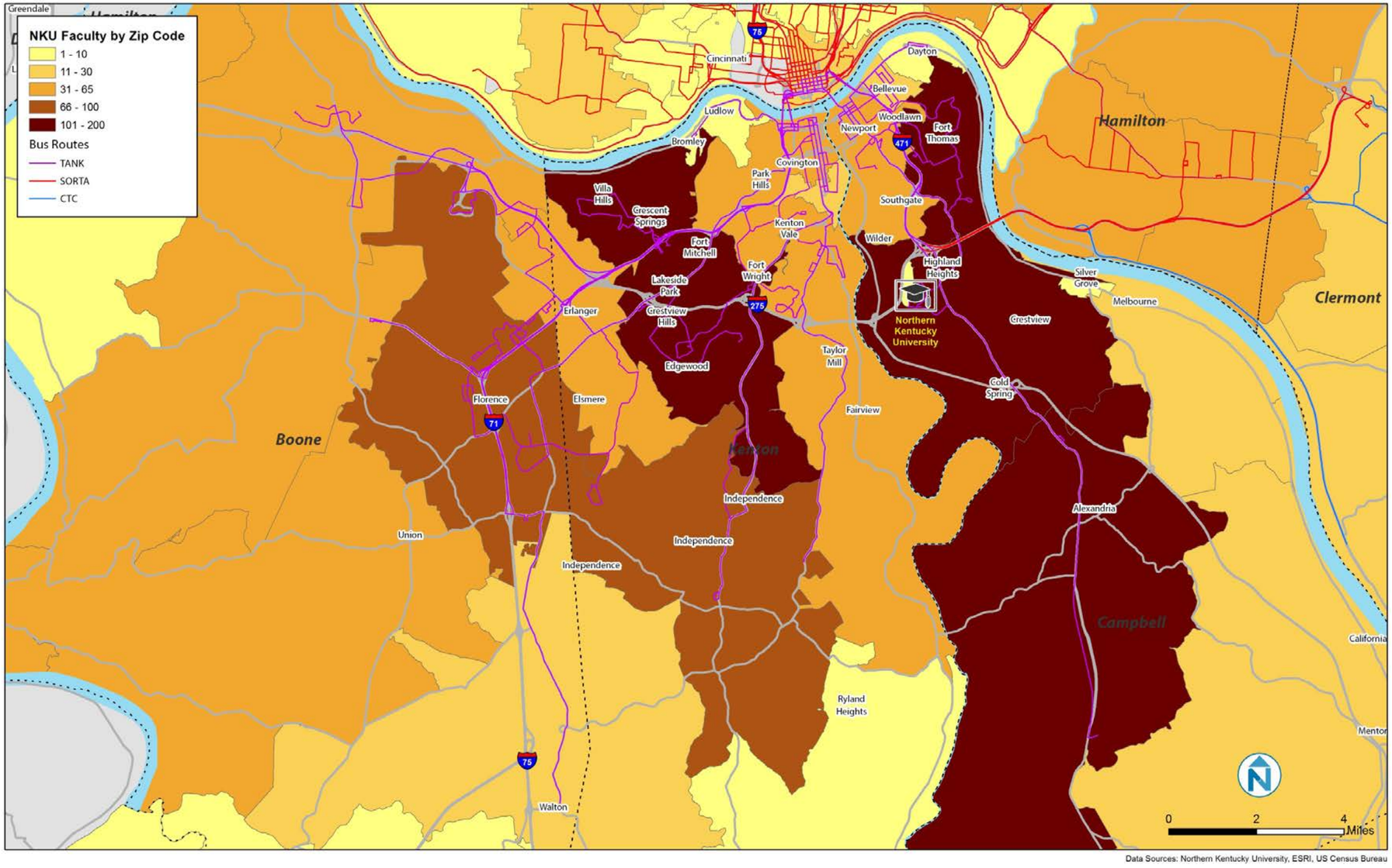


Figure 27 Northern Kentucky University Faculty by Zip Code (2012 – 2013 Academic Year)



5 TRAVEL DEMAND ANALYSIS

An analysis of origin-destination travel demand was produced to identify major travel patterns and development in the Northern Kentucky area. The analysis used trip tables from the OKI travel demand model for years 2005 and 2040 that include the following trip types: home-based work, home-based university, home-based other, and non home-based. In this section, the matrix is illustrated to describe travel demand within the TANK service area. Maps are used to illustrate major point-to-point travel patterns for the following categories:

- Home-based other + non home-based
- Home-based work + home-based university
- All trip types

A set of districts were defined by aggregating traffic analysis zones (TAZs). Doing so simplifies the analysis, as it is not possible to analyze every individual point of travel. In viewing the travel demand maps, it is important to consider a few facts:

- Data are from the OKI travel demand model, which is calibrated using actual travel counts but does not account for all nuances of real-life travel.
- Travel origin-destination pairs show travel in both directions for the entire day.
- Trips are not segregated by time of travel (i.e., peak vs. off-peak). In general, home-based work travel is heaviest in the traditional morning and evening peak periods. All other trips are spread more evenly throughout the day.
- Trips internal to districts are not illustrated.
- This point-to-point analysis does not illustrate how trips are assigned to available streets or transit routes. In viewing the data, it is helpful to think about how various point-to-point travel markets aggregate in actual travel corridors.

All Trips

- Figures 28 (year 2005) and 29 (year 2040) shows connections for all trip types with at least 4,000 daily trips.
- Most travel is short-distance and between contiguous zones (about 2 to 4 miles), but longer connections exist as well. Major long-distance travel connections are typically no longer than 7 miles.
- The Ohio River acts as a major barrier to travel. The only major travel patterns across the river are between the Cincinnati CBD and the Covington/Newport area.
- The most significant travel patterns are concentrated in the two portions of the service area with the highest population and employment densities:
  - There is significant travel in the Covington/Newport/Fort Thomas/Southgate districts, with both east-west travel within the area and north-south travel to and

from the Cincinnati CBD. These districts have dense residential areas and are generally well served by transit.

  - The Florence/Elsmere district acts as a subcenter and attracts many trips from all surrounding areas. This district has areas of relatively high population density as well as high employment density in the Florence Mall area. Much of the travel follows the I-71/75 and Dixie Highway corridors. There are several TANK routes serving this area, but the only local service is on Route 1. A disconnected street grid and suburban development patterns make this area difficult to serve with transit despite having areas of relatively high population and employment density.

- Significant growth is forecast to occur between 2005 and 2040, particularly in the southwest portion of the study area. East of Airport, Oakbrook/West Florence, Union, South Florence, Burlington, Hebron, and Francisville districts are all projected to see major growth in the number of trips, while Florence/Elsmere will remain a major subcenter. The north and east portions of the study area are projected to see less growth.

Home-Based Other + Non Home-Based (HBO/NHB)

- Figures 30 (year 2005) and 31 (year 2040) show HBO/NHB connections with at least 3,000 daily trips.
- The map is similar to the all trips map due to the fact that most trips are HBO/NHB trips. It shows the same general travel patterns as the all trips map.
- In general, trips are shorter than work and university trips.
- Comparing the 2005 and 2040 maps shows large growth in trips in the western portion of the service area.

Home-Based Work + Home-Based University (HBW/HBU)

- Figures 32 (year 2005) and 33 (year 2040) show HBW/HBU connections with at least 750 daily trips.
- The Florence/Elsmere district stands out as an employment center, with the Florence Mall area containing many jobs. The East of Airport (warehouse and retail land uses) and South Florence (warehouse and industrial uses) also appear to be attracting many commuters. Many of these connections are not currently served by local transit.
- The Cincinnati CBD attracts many trips from a number of districts throughout the TANK service area, including long distance connections. These connections are generally served by existing express bus service.
- Many districts do not have a strong relationship with the Cincinnati /Covington/Newport downtown districts. All districts likely send trips downtown, but many do not meet the 750 trip threshold used in this map.
- The 2040 map shows increased home-based work/university travel, much of which is in the western portion of the study area. The Florence/Elsmere, East of Airport, and South Florence districts are projected to grow and will remain major employment areas. Growth in population in the western portion of the study area will lead more travel between residential areas and employment areas.

Conclusions

Travel demand in the TANK service area for both work and non-work trips is focused around two areas:

- Downtown Covington, Newport, and the Cincinnati CBD
- Areas south and east of the airport, particularly the Florence/Elsmere district

There is some interaction between these areas, but they are two different kinds of markets. The TANK service network is generally set up as a radial network with local and express routes focused on downtown Covington, Newport, and Cincinnati. These "inner" areas have dense residential and employment areas and are generally well served by transit

While the Florence/Elsmere area is served by numerous express routes connecting it to the downtown areas, its only local bus service is Route 1, limiting accessibility for both work and non-work trips. There may be a market for increased transit service to employment sites and other destinations in the Florence/Elsmere and East of Airport districts, such as shopping centers. Transit will likely be most successful if it can serve short to medium distance trips in both peak and off-peak time periods. However, given the dispersed suburban nature of development in the area, it can be difficult to serve with transit, and issues such as first/last mile accessibility must be considered. This geographic area will continue to grow in importance, as illustrated by the year 2040 maps.

Figure 28 Major Travel Patterns – All Trip Types - 2005

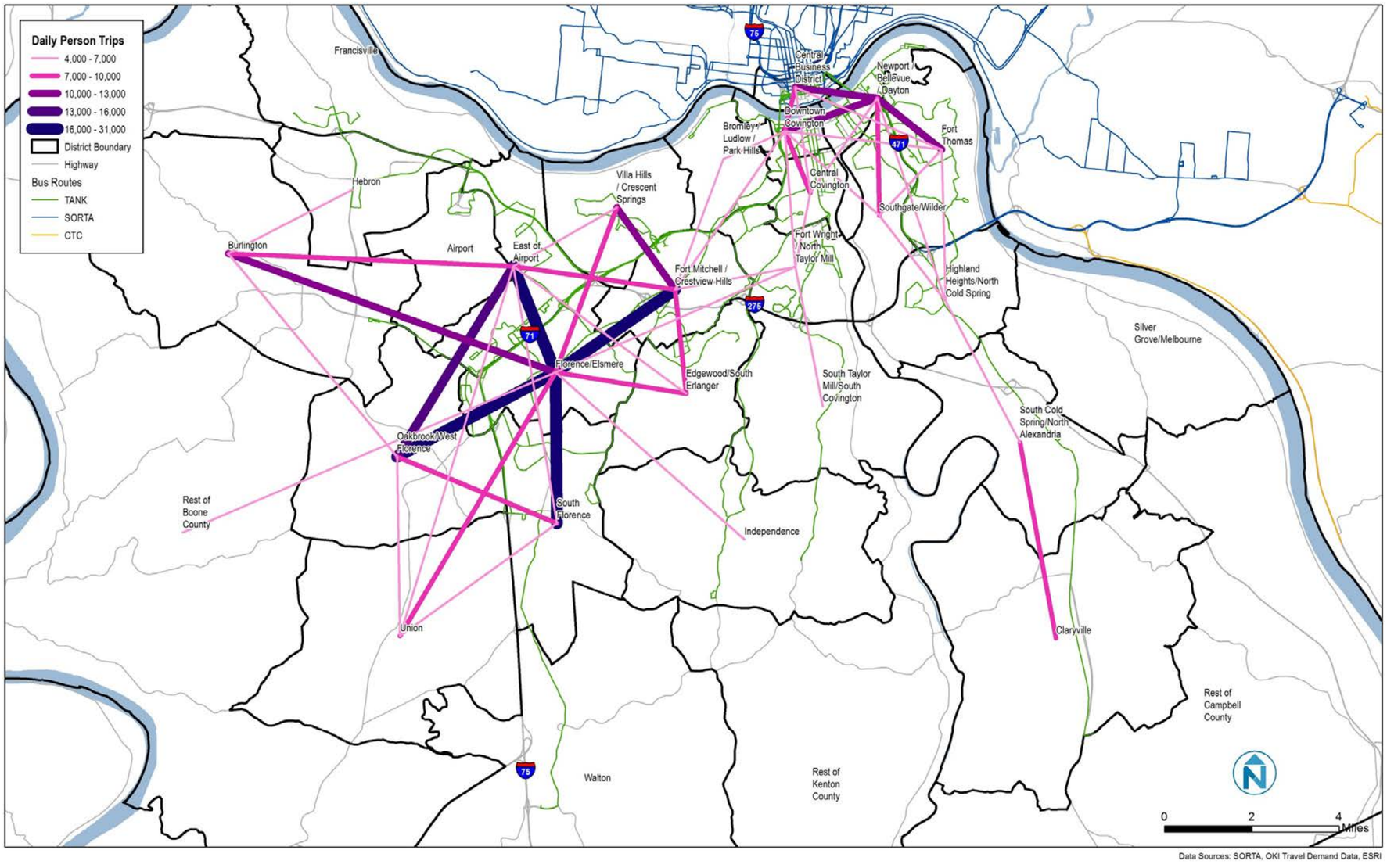
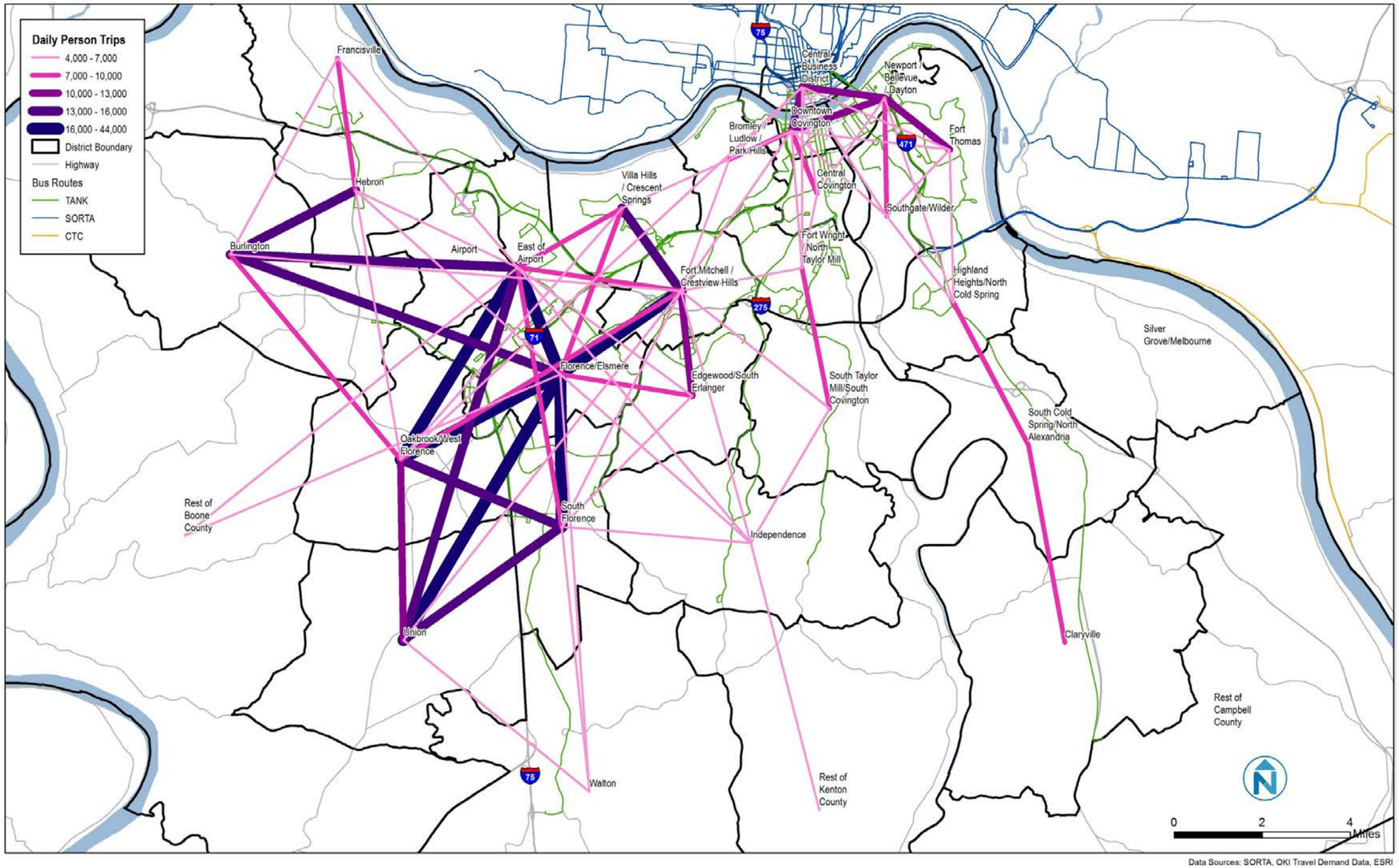


Figure 29 Major Travel Patterns – All Trip Types - 2040



Data Sources: SORTA, OKI Travel Demand Data, ESRI

Figure 30 Major Travel Patterns – Home-Based Other & Non Home-Based Trips - 2005

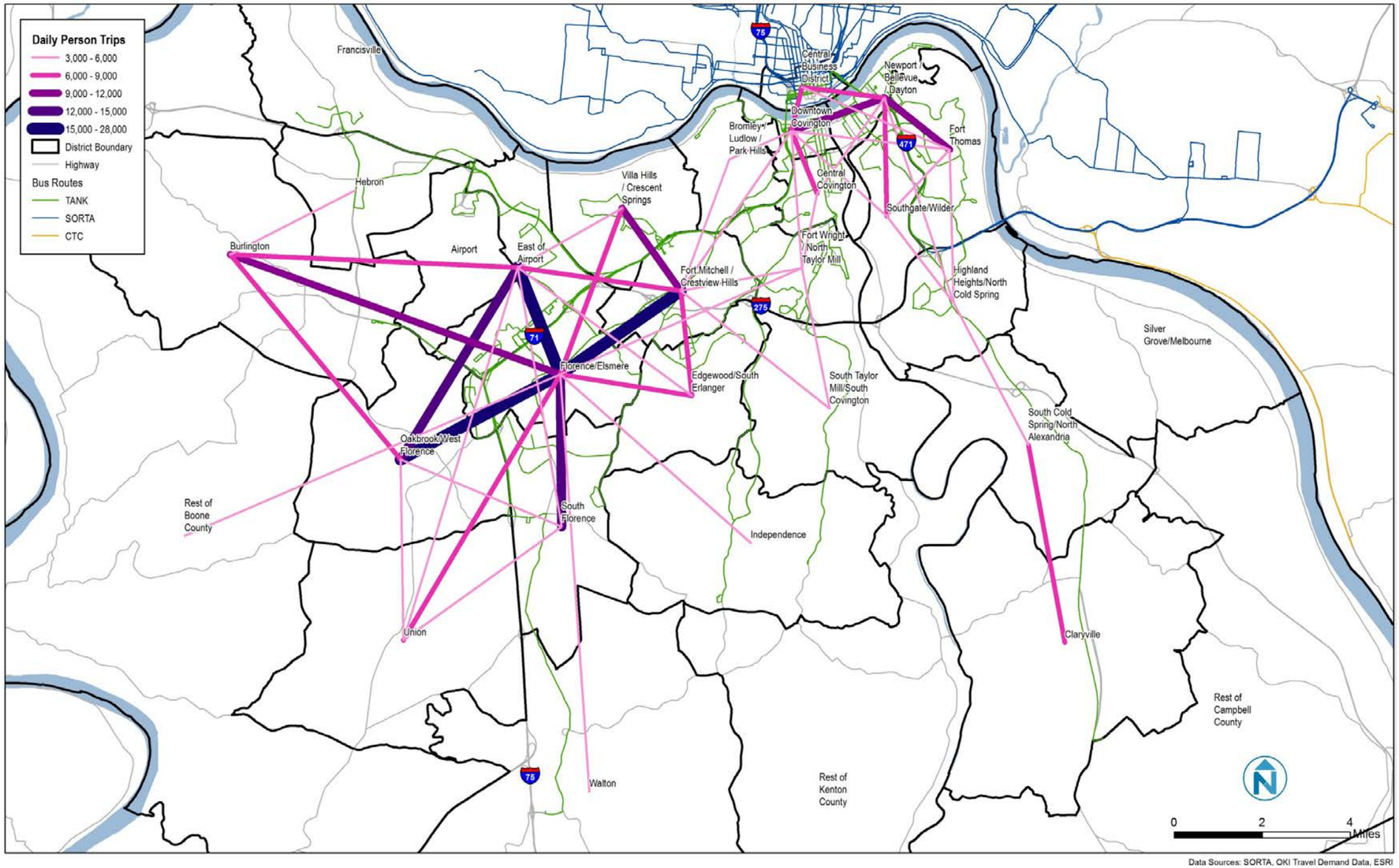


Figure 31 Major Travel Patterns – Home-Based Other & Non Home-Based Trips - 2040

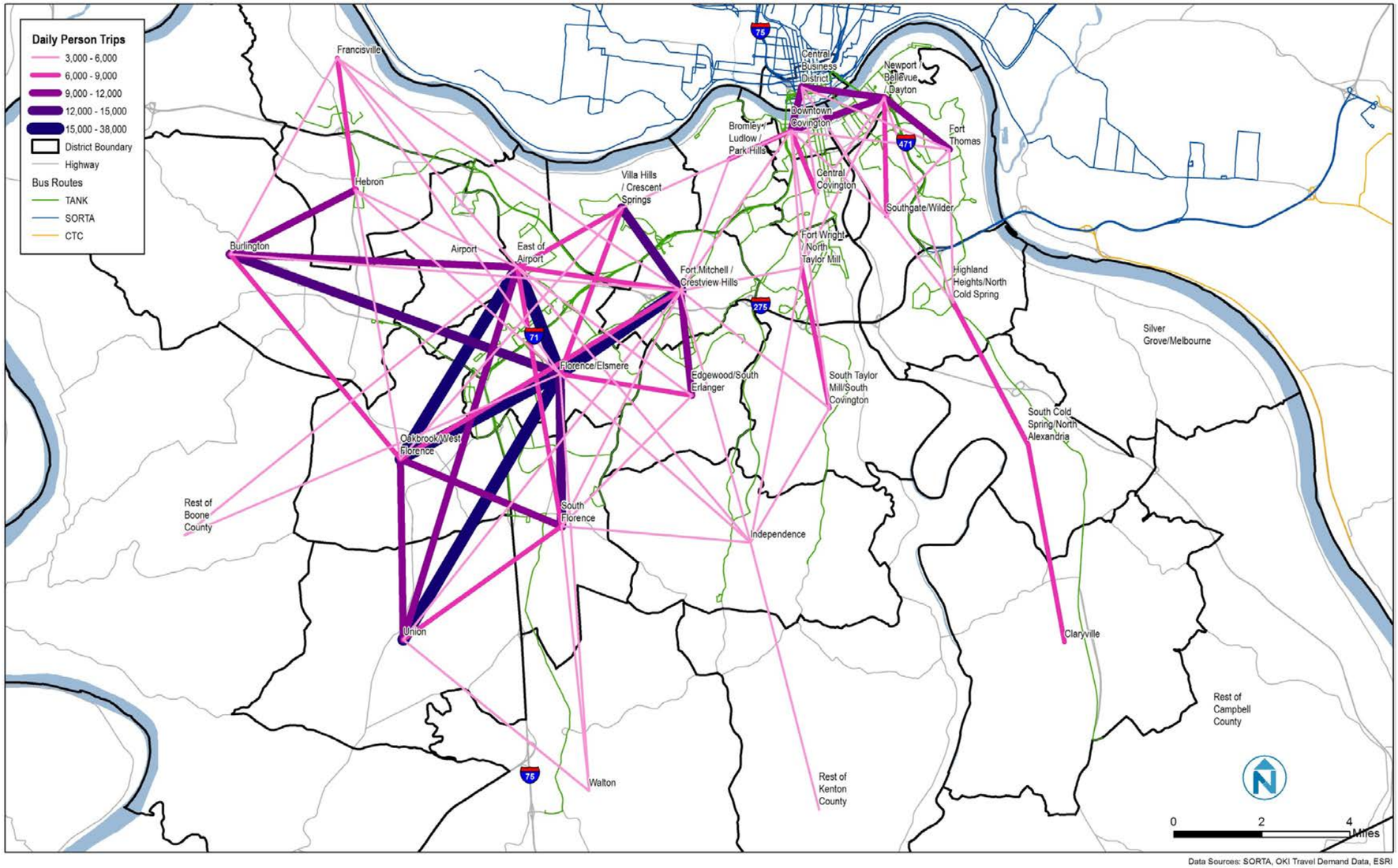


Figure 32 Major Travel Patterns – Home-Based Work/University Trips - 2005

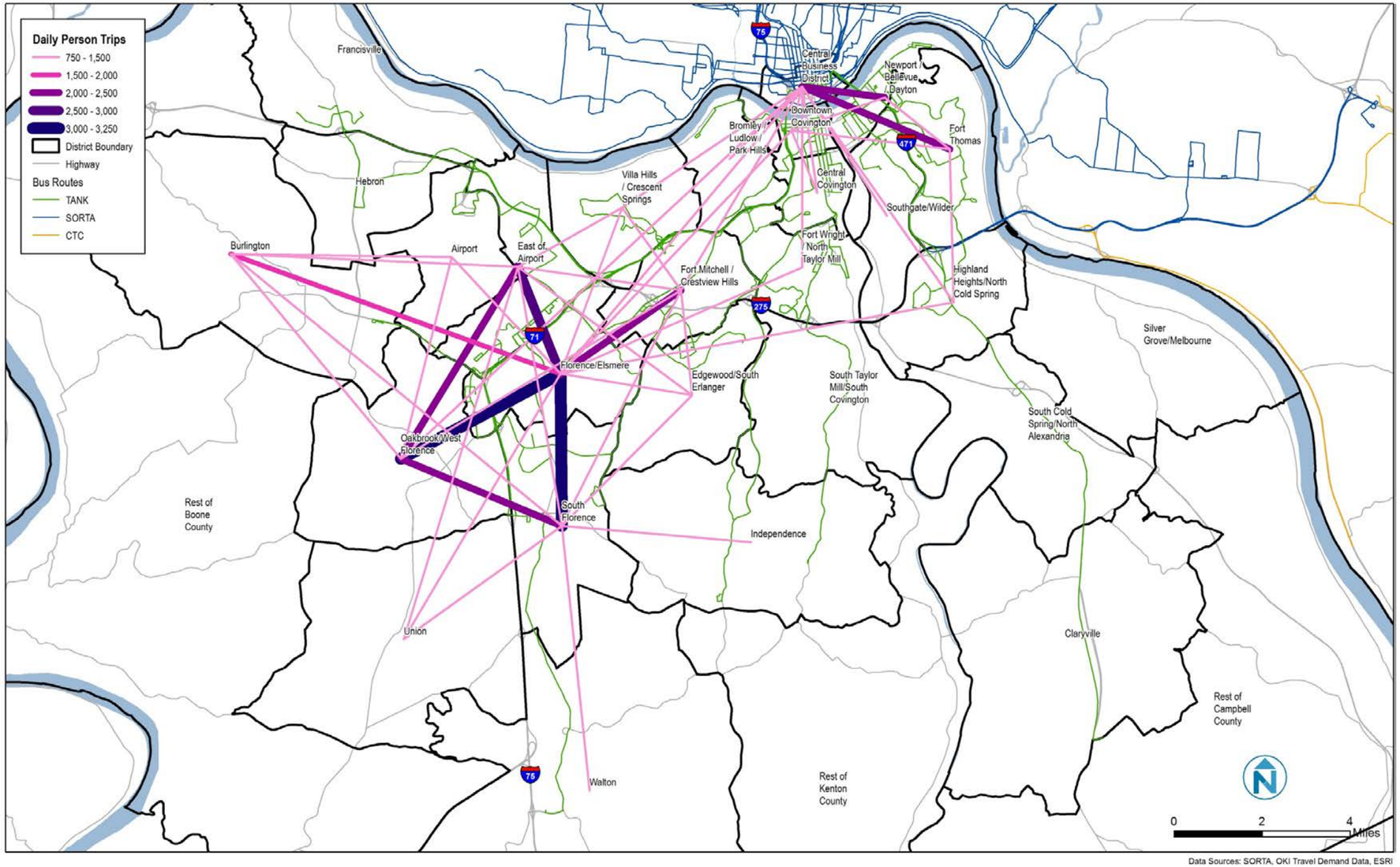
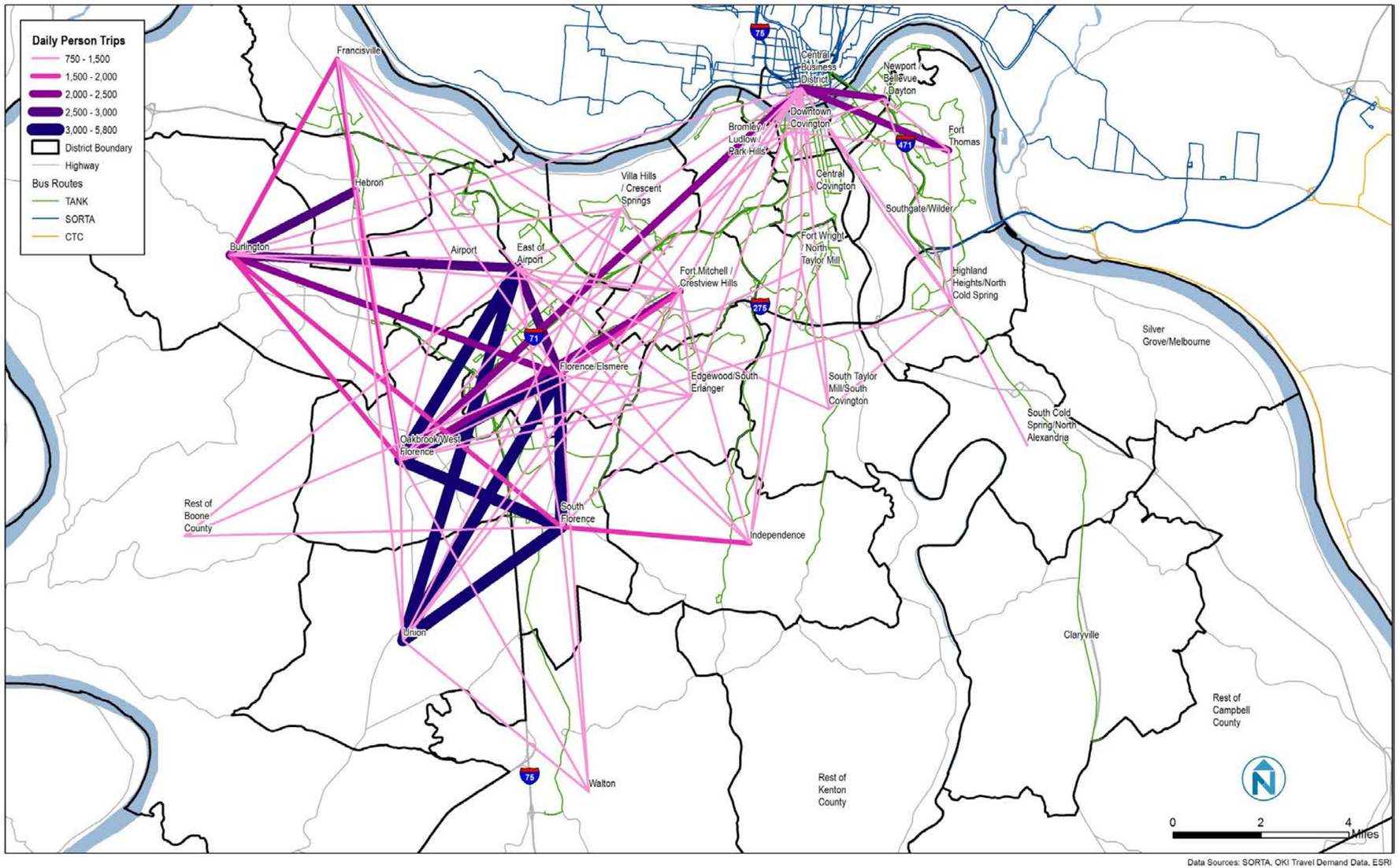


Figure 33 Major Travel Patterns - Home-Based Work/University Trips - 2040



6 ROUTE PROFILES

The following section provides individual profiles for each of the fixed-route services operated by TANK. Each route is evaluated based on alignment, operating characteristics, and markets served; as well as ridership, productivity and on-time performance.

Data for the route profiles comes from three primary sources:

- Annual system-wide ridership and service characteristics (hours, miles, and trips) were provided by TANK staff (Figure 8).
- Stop-level ridership data was collected in the field by project staff. An on-board ride-check was conducted in 2013 and included all routes with the exception of Route 22x, Gateway Shuttle, and NKU Shuttle. Data referenced for these three routes reflects TANK's 2012 farebox data.
- Service frequency and span of service information was collected from published passenger information.

Complete ridership maps based on the on board count data can be found at the end of each route summary. Complete route profiles based on the on board count data can be found in Appendix A.

TANK makes extensive use of interlining, or cycling a single vehicle through multiple routes throughout the service day. In some cases, route segments are shared by two routes. For example, Route 3 and Route 16 both serve downtown Cincinnati and Covington Transit Center. Service times for these two destinations are common to both routes, and appear on both routes' passenger schedules. For the purpose of this analysis, ridership and service hours on the common segment were assigned to the route beginning outbound service. Route 3 was considered to begin at the Federal Reserve on trips heading to Ludlow/Bromley. Route 16 was considered to begin at Covington Transit Center on trips heading to Carmel Manor. This method was used to allocate ridership and service hours for Routes 5 and 11; 7 and 12; and 9 and 23 as well.

Route 1: Florence Mall

Route 1 is a local route operating 7 days a week between Florence Mall and downtown Cincinnati.

From Florence Mall trips alternate between a clockwise and counter-clockwise routing to Dixie Highway. Clockwise trips operate primarily along Mall Road, US 42, Industrial Road, and Empire Drive, with select trips also serving BAWAC on Kentucky Drive. Counter-clockwise trips operate mostly on Mall Road, Woodspoint Drive, Spiral Drive, Hansel Avenue, and Turfway Road. From Dixie Highway, Route 1 continues on to downtown Cincinnati via the Covington Transit Center. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		4:27am-12:45am	5:03 am-12:24am	5:40am-12:40am
Boardings		2,442	N/A	N/A
Service Hours		96.7	N/A	N/A
Boardings Per Service Hour		25.3	N/A	N/A
Schedule Adherence	On Time	71%	N/A	N/A
	Early	11%	N/A	N/A
	Late	17%	N/A	N/A
Frequency (minutes)	AM Peak	10 - 25	30	45
	Midday	30	30	45
	PM Peak	15 - 20	30	45
	Evening	30 - 50	60	60

Major destinations served by Route 1 include Florence Mall, Wal-Mart, Saint Elizabeth Florence Hospital, BAWAC, Crestview Hills Town Center, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 1 and the following other routes:

- Route 32x at Mall Road and Burlington Peak
- Route 28x at Industrial Boulevard and Empire Drive
- Route 19x at Dixie Highway and Hallam Avenue
- Route 33 at Crestview Hills Town Center
- Route 18 at Dixie Highway and Turkey Foot Road
- Route 5 at Pike Street and Holeman Avenue
- Route 1 at 8th Street and Madison Avenue
- Multiple TANK Routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 1 varies throughout the service day. During the morning peak, the highest frequency is every 10 minutes. In the afternoon peak, buses run as often as every 15 minutes. Off-peak and weekend frequencies range from 30 to 60 minutes.

Ridership and Productivity

In 2012, Route 1 carried 757,773 annual passengers – more than any other TANK route – and had a service productivity of 25.1 passengers per service hour (Figure 8). This productivity is considerably higher than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, Route 1 provides 96.7 hours of revenue service and carries 2,442 total passengers.

Ridership activity on Route 1 is fairly well-distributed over the entire route. Boarding and alighting counts are highest in downtown Cincinnati and Covington Transit Center, but there are several stops with more than 50 boardings or alightings per day:

- Pike and Star Bank
- Pike and Holman
- Dixie Highway and United Dairy
- Spiral and Wal-Mart
- Florence Mall and Sears
- Kentucky Drive and Industrial
- Empire Drive and Duro
- Dixie Highway and Parkland Apartments
- Dixie Highway and Stevenson
- 8th and Madison
- Madison and 4th

Route 1 experiences its heaviest ridership on the 3:30 PM inbound trip (52 boardings) and 2:30 PM outbound trip (60 boardings). Several trips have maximum loads of more than 30 passengers, and one trip (2:55 PM outbound) has maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 75% of inbound passenger trips on Route 1 begin and end in Kentucky. 25% of inbound riders who board the route prior to Covington Transit Center continue on Route 1 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 1 has a 71% on-time performance rate, compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 12:28 PM inbound (13 minutes late)
- 8:46 PM inbound (9 minutes late)
- 6:00 AM outbound (7 minutes early)
- 8:40 AM outbound (6 minutes early)
- 11:00 AM outbound (6 minutes late)
- 2:30 PM outbound (9 minutes late)
- 3:35 PM outbound (8 minutes late)
- 3:55 PM outbound (10 minutes early)
- 4:25 PM outbound (10 minutes late)

Route 1x: Florence Express

Route 1x is a peak-period and mid-day express route that connects Florence with downtown Cincinnati on weekdays only. Select trips also serve Crescent Springs. Route 1x has several different variants. Morning trips to Florence begin in downtown Cincinnati and serve the Covington Transit Center (CTC) before continuing express to Florence on I-75/71. These trips terminate at the Turfway Park Park & Ride. Mid-day trips to Florence serve CTC before downtown Cincinnati, and terminate at the Houston Road Park & Ride. Select mid-day trips also serve the Buttermilk Park & Ride in Crescent Springs. Outbound trips in the afternoon and evening do not serve CTC at all. These trips terminate at the Houston Road Park & Ride.

At a Glance		Weekday	Saturday	Sunday
Span		6:00am-9:40pm	No service	No service
Boardings		366		
Service Hours		15.6		
Boardings Per Service Hour		23.5		
Schedule Adherence	On Time	75%		
	Early	17%		
	Late	8%		
Frequency (minutes)	AM Peak	3 OB, 7 IB trips		
	Midday	3 OB, 2 IB trips		
	PM Peak	8 OB, 4 IB trips		
	Evening	1 IB trip		

Morning trips to Cincinnati serve both the Turfway Park Park & Ride and the Houston Road Park & Ride, but not CTC on the way to downtown Cincinnati. Most mid-day and evening trips from Florence serve the Houston Road Park & Ride and the CTC, but not the Turfway Park Park & Ride. The last inbound trip of the day serves both park & rides in Florence, as well as the CTC.

Major destinations served by Route 1x include Citibank, Saint Elizabeth Florence Hospital, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 1x and the following other routes:

- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 1x varies by direction throughout the service day. During the morning peak, three trips operate outbound and seven trips operate inbound. This is reversed in the afternoon peak with eight outbound trips and four inbound trips. Mid-day service is limited to three outbound and one inbound trip. A single inbound trip operates in the evening.

Ridership and Productivity

In 2012, Route 1x carried 74,587 annual passengers, or 19.2 passengers per service hour (Figure 8). This productivity is below the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 15.6 hours of revenue service and carries 366 total passengers.

For express routes, it is also useful to measure productivity in terms of passengers per trip, as these routes tend to operate closed-door for a significant portion of each trip and offer limited boarding and alighting opportunities for passengers. In 2012, Route 1x carried 10.4 passengers per trip, compared to an average of 15.1 passengers per trip for all TANK express routes. During the survey period, several Route 1x trips carried five passengers or fewer:

- 11:45 AM inbound (3 passengers)
- 1:00 PM inbound (1 passengers)
- 4:00 PM inbound (1 passengers)
- 4:25 PM inbound (1 passengers)
- 5:05 PM inbound (0 passengers)
- 6:05 AM outbound (5 passengers)
- 7:05 AM outbound (2 passengers)

Route 1x experiences its heaviest ridership on the 6:00 AM inbound trip (30 boardings) and 5:08 PM outbound trip (28 boardings). Ridership tends to be extremely low in the mid-day, and somewhat sporadic in the reverse-commute direction during peak periods. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus. On some trips, maximum loads exceed the number of boardings for the trip. This can occur when passengers board a bus on one trip, but do not alight until some point on the next trip. Thus, a trip can have passengers on-board even before the first boarding of that trip.

Approximately 70% of inbound passenger trips on Route 1x begin and end in Kentucky. 30% of inbound riders who board the route prior to Covington Transit Center continue on Route 1x to downtown Cincinnati.

On-Time Performance

On weekdays, Route 1x has a 75% on-time performance rate, compared to an average of 72.2% for all express TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 6:00 AM inbound (10 minutes early)
- 7:25 AM inbound (9 minutes late)
- 7:40 AM inbound (6 minutes late)
- 3:45 PM outbound (6 minutes late)
- 5:38 PM outbound (8 minutes late)

Route 2x: Airport Express

Route 2x is an express route that connects Erlanger and Cincinnati / Northern Kentucky International Airport (CVG) with downtown Cincinnati seven days a week. Stops in Erlanger, beyond CVG are served during peak periods only.

At a Glance		Weekday	Saturday	Sunday
Span		4:40am-12:57am	4:30am–11:45pm	4:53am-11:45pm
Boardings		367	N/A	N/A
Service Hours		34.8	N/A	N/A
Boardings Per Service Hour		10.5	N/A	N/A
Schedule Adherence	On Time	72.4%	N/A	N/A
	Early	17.6%	N/A	N/A
	Late	10%	N/A	N/A
Frequency (minutes)	AM Peak	30	75	75
	Midday	30 – 60	75	90
	PM Peak	60	75	75
	Evening	30-90	75	75

Route 2x has several different variants. At peak times, inbound trips to Cincinnati begin at Homes Street and Commonwealth Avenue and continue along Commonwealth / Donaldson Highway toward CVG. Buses circulate through the airport and surrounding areas, including the warehouse / industrial zone between the airport and I-275, and airport exchange boulevard north of I-275. During off-peak times, Route 2x serves locations on airport property, but not adjacent areas east of the airport. From CVG, buses operate non-stop along I-275 to Covington Transit Center and downtown Cincinnati. Trips in the outbound direction have a similar alignment to the inbound trips. Stops on airport property are served in the clockwise direction both inbound and outbound. Certain stops, including DHL and Convergys are only served a handful of times per day as designated on the passenger schedule.

Major destinations served by Route 2x include Cincinnati / Northern Kentucky International Airport Citibank, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 2x and the following other routes:

- Route 19x at Homes Street and Commonwealth Avenue
- Route 1X Donaldson Highway and Houston Road
- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 2x varies throughout the service day. Buses operate every 30 minutes in the morning peak and hourly in the afternoon. Mid-day and evening frequencies range from 30 to 90 minutes, and service is available every 75 minutes on weekends.

Ridership and Productivity

In 2012, Route 2x carried 109,924 annual passengers - the most among TANK express routes - and had a service productivity of 10.2 passengers per service hour (Figure 8). This productivity is well below the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 34.8 hours of service and carries 367 total passengers.

With service to CVG and downtown Cincinnati, Route 2x should attract all-day in and outbound ridership. The route exhibits three pronounced peak periods in each direction, but many trips between the peaks attract very few riders. In 2012, Route 2X carried 6.5 passengers per trip,

compared to an average of 15.1 passengers per trip for all TANK routes. During the survey period, a significant number of Route 2x trips carried five passengers or fewer:

- 4:04 AM inbound (0 passengers)
- 5:52 AM inbound (5 passengers)
- 7:20 AM inbound (2 passengers)
- 8:07 AM inbound (2 passengers)
- 8:52 AM inbound (0 passengers)
- 9:37 AM inbound (2 passengers)
- 10:22 AM inbound (1 passengers)
- 11:07 AM inbound (4 passengers)
- 12:07 PM inbound (1 passengers)
- 12:52 PM inbound (3 passengers)
- 6:07 PM inbound (3 passengers)
- 6:52 PM inbound (4 passengers)
- 7:28 PM inbound (5 passengers)
- 8:38 AM outbound (1 passengers)
- 9:23 AM outbound (2 passengers)
- 10:08 AM outbound (2 passengers)
- 11:38 AM outbound (3 passengers)
- 5:08 PM outbound (2 passengers)
- 6:08 PM outbound (1 passengers)
- 6:38 PM outbound (1 passengers)
- 7:23PM outbound (2 passengers)
- 7:58 PM outbound (4 passengers)
- 11:53 PM outbound (1 passengers)

Route 2x experiences its heaviest ridership on the 2:20 PM inbound trip (18 boardings) and 1:23 PM outbound trip (21 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus. On some trips, maximum loads exceed the number of boardings for the trip. This can occur when passengers board a bus on one trip, but do not alight until some point on the next trip. Thus, a trip can have passengers on-board even before the first boarding of that trip.

Ridership activity on Route 2x is heaviest in downtown Cincinnati and in the vicinity of Cincinnati / Northern Kentucky International Airport. Outside of these areas, stop-level ridership is generally lower than 10 boardings per day.

Approximately 39% of inbound passenger trips on the peak-period variant of Route 2x begin and end in Kentucky. 23% of inbound trips begin and end in Kentucky in the off-peak. 61% of peak period riders and 77% of off-peak riders board Route 2x prior to Covington Transit Center and continue to downtown Cincinnati.

On-Time Performance

On weekdays, Route 2x has a 72.4% on-time performance rate, compared to an average of 72.2% for all express TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 6:50 AM inbound (6 minutes late)
- 7:20 AM inbound (14 minutes late)
- 5:43 AM outbound (8 minutes late)
- 6:08 AM outbound (7 minutes late)
- 6:38 AM outbound (10 minutes late)

Route 3: Ludlow / Bromley

Route 3 is a local route operating 7 days a week between Shelby and Steve Tanner Street in Bromley and downtown Cincinnati.

Inbound trips to Cincinnati travel primarily along Shelby/Oak Street, Elm Street, Highway Avenue, West 3rd Street, and Rivercenter Boulevard to Covington Transit Center (CTC). At CTC, Route 3 interlines with Route 16 to provide a one-seat connection to downtown Cincinnati, Newport, and Fort Thomas. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 3 include Ludlow High School, Northern Kentucky Convention Center, and downtown Cincinnati.

At a Glance		Weekday	Saturday	Sunday
Span		5:23am-7:13pm	7:45am-5:23pm	7:45am-5:23pm
Boardings		259	N/A	N/A
Service Hours		13.7	N/A	N/A
Boardings Per Service Hour		18.9	N/A	N/A
Schedule Adherence	On Time	77%	N/A	N/A
	Early	7%	N/A	N/A
	Late	16%	N/A	N/A
Frequency (minutes)	AM Peak	30 - 40	2 OB, 3 IB trips	2 OB, 3 IB trips
	Midday	60 - 70	No service	No service
	PM Peak	30 - 35	3 OB, 3 IB trips	3 OB, 3 IB trips
	Evening	1 OB, 1 IB trip	No service	No service

Transfers are available between Route 3 and the following other routes:

- Multiple TANK Routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 3 varies throughout the service day. During the peak periods, the highest frequency is every 30 minutes. In the mid-day, frequencies range from 60 to 70 minutes. No evening service is available on Route 3. Weekend service consists of five inbound and five outbound trips per day.

Ridership and Productivity

In 2012, Route 3 carried 75,059 annual passengers, or 18.5 passengers per service hour (Figure 8). This productivity is just above the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 13.7 hours of service and carries 259 total passengers.

Ridership activity on Route 3 is heavily concentrated at Covington Transit Center and downtown Cincinnati. No other stops generate more than 50 boardings or alightings per day.

Route 3 experiences its heaviest ridership on the 3:43 PM inbound trip (32 boardings) and 4:16 PM outbound trip (28 boardings)[3]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 58% of inbound passenger trips on Route 3 begin and end in Kentucky. 42% of inbound riders who board the route prior to Covington Transit Center continue on Route 3 to downtown Cincinnati.

[3] Trip-level ridership data for Route 3 includes boardings and alightings from Route 16, which is interlined with Route 3.

On-Time Performance

On weekdays, Route 3 has a 77% on-time performance rate[4], compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 7:48 AM inbound (8 minutes late)
- 12:43 PM inbound (6 minutes late)
- 6:41 AM outbound (7 minutes late)
- 7:11 AM outbound (6 minutes early)
- 8:21 AM outbound (7 minutes late)
- 10:41 PM outbound (7 minutes late)
- 11:41 PM outbound (7 minutes late)
- 3:41 PM outbound (10 minutes late)
- 4:46 PM outbound (16 minutes late)
- 5:21 PM outbound (8 minutes late)

[4] On-time performance by trip includes trips that begin as either Route 3 or Route 16.

Route 5: Holman

Route 5 is a weekday-only local route operating between the Fort Wright Hub at Madison Pike and Highland Pike, and downtown Cincinnati.

At a Glance		Weekday	Saturday	Sunday
Span		4:38am-10:25pm	7:01am-8:07pm	8:31am-8:12pm
Boardings		652	N/A	N/A
Service Hours		33.7	N/A	N/A
Boardings Per Service Hour		19.3	N/A	N/A
Schedule Adherence	On Time	77%	N/A	N/A
	Early	19%	N/A	N/A
	Late	4%	N/A	N/A
Frequency (minutes)	AM Peak	30	90	90
	Midday	60	90	90
	PM Peak	30	90	90
	Evening	45	90	90

From the Fort Wright Hub, buses travel along Madison Pike and Orphanage Road to Wal-Mart on Valley Plaza Parkway. The route then continues along Highland Pike to Hanser Drive, Monte Lane, and Benton Road, serving the City Heights Apartments. From City Heights, the route returns to Highland Pike and continues to Covington Transit Center via Holman Avenue and Madison Avenue. Select trips also serve Saint Elizabeth Hospital in Covington. At CTC, Route 5 interlines with Route 11 to provide a one-seat connection to downtown Cincinnati, Newport, Fort Thomas, and Northern Kentucky University in Highland Heights. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 5 include Wal-Mart, Saint Elizabeth Hospital, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 3 and the following other routes:

- Routes 25, 28X, 30X, and 33 at Fort Wright Hub
- Route 1 at Holman Avenue and Pike Street; and 8th Street at Madison Avenue
- Routes 9, 25, and 33 at 8th and Scott Street
- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 5 varies throughout the service day. During the peak periods Route 5 operates every 30 minutes. In the mid-day, buses run hourly. Frequency ranges from 40 to 45 minutes in the evenings and from 70 to 90 minutes on weekends.

Ridership and Productivity

In 2012, Route 5 carried 210,690 annual passengers, or 20.8 passengers per service hour (Figure 8). This productivity is higher than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 33.7 hours of service and carries 652 total passengers.

Between City Heights and downtown Cincinnati, Route 5 carries more than 20 passengers per service hour. While the ridership at the Wal-Mart is high, productivity on the segment between City Heights and the Fort Wright hub is only 9.6 passengers per service hour. Ridership at the Fort Wright hub is low, with only three boardings and six alightings throughout the day. This suggests that transfers to Route 5 at this location are low.

Route 5 experiences its heaviest ridership on the 7:03 AM inbound trip (51 boardings) and 2:01 PM outbound trip (52 boardings)[5]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 61% of inbound passenger trips on Route 5 begin and end in Kentucky. 39% of inbound riders who board the route prior to Covington Transit Center continue on Route 5 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 5 has a 77% on-time performance rate[6], compared to an average of 79.5% for all local TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 4:38 AM inbound (8 minutes early)
- 2:57 PM inbound (7 minutes late)
- 9:01 AM outbound (6 minutes early
- 11:01 AM outbound (8 minutes early)
- 2:01 PM outbound (7 minutes late)
- 2:51 PM outbound (7 minutes late)
- 1:34 PM outbound (7 minutes late)

[5] Trip-level ridership data for Route 5 includes boardings and alightings from Route 11, which is interlined with Route 5.
[6] On-time performance by trip includes trips that begin as either Route 5 or Route 11.

Route 7: Rosedale / Latonia

At a Glance		Weekday	Saturday	Sunday
Span		4:37am-12:44am	5:42am-12:31am	6:13am-11:07pm
Boardings		772	N/A	N/A
Service Hours		28.8	N/A	N/A
Boardings Per Service Hour		26.8	N/A	N/A
Schedule Adherence	On Time	86%	N/A	N/A
	Early	5%	N/A	N/A
	Late	9%	N/A	N/A
Frequency (minutes)	AM Peak	25 - 45	50	60
	Midday	50	50	60
	PM Peak	15 - 30	50	60 - 65
	Evening	50 - 60	60	60 - 65

Route 7 is a local route operating 7 days a week between 45th Street and Huntington Avenue in Latonia and downtown Cincinnati.

In Latonia, the route begins with a clockwise loop covering Decoursey Avenue, 45th Street, Huntington Avenue, and Southern Avenue. From Southern Avenue, Route 7 circulates through Latonia Plaza, except on early morning and late evening trips, when the plaza is bypassed. After Latonia Plaza, buses continue to Covington Transit Center (CTC) via Caroline Avenue, 34th Street, Southern Avenue, Latonia Avenue, and Madison Avenue. At CTC, Route 7 interlines with Route 12 to provide a one-seat connection to downtown Cincinnati, Newport, Bellevue, and Dayton. Other than the two one-way loops in Latonia, inbound and outbound trips on Route 7 operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 7 include Rosedale Manor, Holy Cross High School, Latonia Plaza, Holmes High School, Kroger, Covington Cathedral, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 7 and the following other routes:

- Routes 9 and 25 at Winston Avenue and 38th Street; and Madison Avenue and 26th Street
- Route 33 at Latonia Avenue and Madison Avenue
- Route 1 and 5 at Madison Avenue, and Pike Street
- Multiple TANK Routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 7 varies throughout the service day. During the morning peak, the highest frequency is every 25 minutes. In the afternoon peak, buses run as often as every 15 minutes. Off-peak and weekend frequencies range from 50 to 60 minutes.

Ridership and Productivity

In 2012, Route 7 carried 266,850 annual passengers, or 25.2 passengers per service hour (Figure 8). This productivity is substantially higher than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 28.8 hours of service and carries 772 total passengers.

Route 7 has above average productivity (over 20 passengers per service hour) on all segments between downtown Cincinnati and Latonia Plaza. The Decoursey loop south of Latonia Plaza is much less productive, with only 3.4 passengers per service hour, which is productivity on par with demand response service.

Ridership activity on Route 7 is highest at Lavonia Plaza, along Madison Avenue in Covington, at Covington Transit Center, and in downtown Cincinnati. Stops with more than 50 boardings or alightings per day include:

- Latonia Plaza
- Covington Transit Center
- East 5th and Main Street
- Federal Reserve
- Madison Avenue at 7th

No other stops generate more than 50 boardings or alightings per day.

Route 7 experiences its heaviest ridership on the 2:46 PM inbound trip (48 boardings) and 2:43 PM outbound trip (38 boardings)[7]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

During morning peak periods, Route 7 has a scheduled layover at Decoursey and 38th Street after Latonia Plaza. In the afternoons, the layover is scheduled for Southern Avenue and Church Street. These layover points are well placed, as the vast majority of Route 7 boardings and alightings take place between downtown Cincinnati and Latonia Plaza. However, passengers with origins or destinations along the loop serving Rosedale Manor are faced with scheduled delays of more than 10 minutes during many peak period trips.

Approximately 71% of inbound passenger trips on Route 7 begin and end in Kentucky. 29% of inbound riders who board the route prior to Covington Transit Center continue on Route 7 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 7 has a 86% on-time performance rate[8], compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 6:08 AM inbound (10 minutes early)
- 7:29 AM inbound (7 minutes late)
- 7:59 AM inbound (6 minutes early
- 5:46 PM inbound (12 minutes early)
- 4:43 PM outbound (9 minutes late)
- 8:13 PM outbound (8 minutes late)

[7] Trip-level ridership data for Route 7 includes boardings and alightings from Route 12, which is interlined with Route 7.
[8] On-time performance by trip includes trips that begin as either Route 7 or Route 12.

Route 9: Taylor Mill / Independence

Route 9 is a peak-period local route that operates on weekdays only between the Cherokee Park & Ride in Independence and downtown Cincinnati.

From Cherokee Park & Ride, Route 9 operates along Taylor Mill Road / Winston Avenue / Decoursey Avenue to 30th Street / James Avenue / Madison Avenue. The route then continues on 20th Street and Greenup Street to the Covington Transit Center (CTC). At CTC, Route 9 interlines with Route 23 to provide a one-seat connection to downtown Cincinnati, Newport, and Bellevue. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		6:00am-6:45pm	No service	No service
Boardings		108		
Service Hours		8.2		
Boardings Per Service Hour		13.2		
Schedule Adherence	On Time	80.5%		
	Early	5.1%		
	Late	14.4%		
Frequency (minutes)	AM Peak	30		
	Midday	No service		
	PM Peak	30 – 50		
	Evening	No service		

Major destinations served by Route 9 include Cherokee Shopping Center, Remke, Latonia Center, Holmes High School, Kroger, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 9 and the following other routes:

- Routes 25 at Winston Avenue and 43rd Street; and Madison Avenue and 20th Street
- Route 7 at Winston Avenue and 38th Street
- Routes 7 and 33 and James and 26th Street
- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 9 varies throughout the service day. Buses operate every 30 minutes during the morning peak, and every 30 to 50 minutes during the afternoon peak. No service is available in the mid-day, evening, or weekends.

Ridership and Productivity

In 2012, Route 9 carried 47,583 annual passengers, or 14.9 passengers per service hour (Figure 8). This productivity is somewhat lower than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 8.2 hours of service and carries 108 total passengers.

Ridership activity on Route 9 is highest at Cherokee Transit Center, Covington Transit Center, and in downtown Cincinnati. However, no stops generate more than 50 boardings or alightings per day.

The majority of stops between Cherokee Transit Center and Latonia Plaza had no boardings or alightings. Productivity is less than 10 passengers per service hour in that segment. Productivity improves to over 13 passengers per service hour between Latonia Plaza and downtown Cincinnati. However, Route 9 serves a similar market to Route 7, overlapping on Madison Avenue from 20th to 26th Street, and operating just blocks apart from 20th Street to Covington Transit Center. Both

routes serve Latonia Plaza at nearly the same time in. The routes are also essentially competing with one another for riders. Route 9 has very little unique market.

Route 9 has a relatively low ridership per trip of 9.8, compared to an average of 13.2 for all local TANK routes. The route's long stretches of little to no ridership also results in the second-lowest ridership per mile of all local TANK routes.

Route 9 experiences its heaviest ridership on the 6:30 AM inbound trip (17 boardings) and 7:43 PM outbound trip (17 boardings)[9]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 48% of inbound passenger trips on Route 9 begin and end in Kentucky. 52% of inbound riders who board the route prior to Covington Transit Center continue on Route 9 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 9 has an 80.5% on-time performance rate[10], compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early of late included the following:

- 4:35 PM inbound (6 minutes late)
- 7:15 AM outbound (7 minutes late)
- 7:44 AM outbound (10 minutes late)
- 3:05 PM outbound (7 minutes late)
- 4:05 PM outbound (9 minutes late)
- 4:50 PM outbound (7 minutes late)
- 5:06 PM outbound (15 minutes late)

[9] Trip-level ridership data for Route 9 includes boardings and alightings from Route 23, which is interlined with Route 9.
[10] On-time performance by trip includes trips that begin as either Route 9 or Route 23.

Route 11: Holman

At a Glance		Weekday	Saturday	Sunday
Span		4:51am-7:04pm	No service	No service
Boardings		453		
Service Hours		34.2		
Boardings Per Service Hour		13.2		
Schedule Adherence	On Time	79.6%		
	Early	13.3%		
	Late	7.1%		
Frequency (minutes)	AM Peak	30		
	Midday	60		
	PM Peak	30		
	Evening	No service		

Route 11 is a weekday-only local route operating between Northern Kentucky University (NKU) in Highland Heights and downtown Cincinnati.
From NKU, Route 11 operates primarily along M.L. Collins Boulevard, Alexandria Pike, Fort Thomas Avenue, Clover Ridge Avenue, Memorial Parkway/E. 10th Street and Washington Avenue to downtown Newport and on to downtown Cincinnati via the Taylor Southgate Bridge. In downtown Cincinnati, Route 11 interlines with Route 5 to provide a one-seat connection to Covington Transit Center, City Heights, and Fort Wright. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 11 include NKU, Kroger, VA Medical Center, Highlands High School, Newport High School, Newport on the Levee, and downtown Cincinnati.

Transfers are available between Route 11 and the following other routes:

- Routes 25 and NKU Shuttle at Northern Kentucky University
- Route 25X and 26X at Alexandria Pike and Nunn Drive
- Route 25 at Alexandria Pike and Holly Woods Drive
- Route 16 at Alexandria Pike and River Rd; and Alexandria Pike and Highland Avenue
- Route 23 at Washington and 6th Street
- Route 12 at Washington and 4th Street
- Routes 16, 20, and 25 at 3rd and York Street
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 11 varies throughout the service day. During the peak periods Route 11 operates every 30 minutes. In the mid-day, buses run hourly. No service is available in the evenings or on weekends.

Ridership and Productivity

In 2012, Route 11 carried 106,408 annual passengers, or 12.3 passengers per service hour (Figure 8). This productivity is substantially lower than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 34.2 hours of service and carries 453 total passengers.

Route 11's productivity is below average. The only segment with above average productivity is between downtown Cincinnati and 10th/Washington. Most other areas have less than 10 passengers per hour.

Ridership activity on Route 11 is highest in the vicinity of Northern Kentucky University; at Fort Thomas and Memorial Parkway; in downtown Newport; and in downtown Cincinnati. No stops

outside of downtown Cincinnati generate more than 50 boardings or alightings per day. Ridership is particularly low between Washington and 10th Street and Fort Thomas and Rossford Avenue, as well as between I-276 and US 27 along Alexandria Pike. Portions of Route 11 duplicate Routes 25 and 16.

Route 11 experiences its heaviest ridership on the 7:03 AM inbound trip (51 boardings) and 2:01 PM outbound trip (52 boardings)[11]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 28% of inbound passenger trips on Route 11 begin and end in Kentucky. 72% of inbound riders who board the route south of the Ohio River continue on Route 11 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 11 has an 79.6% on-time performance rate[12], compared to an average of 79.5% for all local TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early of late included the following:

- 4:38 AM inbound (8 minutes early)
- 2:57 PM inbound (7 minutes late)
- 9:01 AM outbound (6 minutes early
- 11:01 AM outbound (8 minutes early)
- 2:01 PM outbound (7 minutes late)
- 2:51 PM outbound (7 minutes late)
- 1:34 PM outbound (7 minutes late)

[11] Trip-level ridership data for Route 11 includes boardings and alightings from Route 5, which is interlined with Route 11.

[12] On-time performance by trip includes trips that begin as either Route 11 or Route 5.

Route 12: Dayton

Route 12 is a local route operating 7 days a week between Clark and 4th Street in Dayton and downtown Cincinnati.

Between Dayton and Newport, Route 12 operates primarily along 6th Avenue, Fairfield Avenue, and Dave Cowens Drive. From Newport, the route crosses the Taylor Southgate Bridge into to downtown Cincinnati and then onto Covington Transit Center via the CW Bailey bridge. In downtown Cincinnati, Route 12 interlines with Route 7 to provide a one-seat connection to Covington Transit Center and Latonia. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		4:35am-12:18am	7:13am-9:)3pm	7:23am-8:28pm
Boardings		595	N/A	N/A
Service Hours		34.6	N/A	N/A
Boardings Per Service Hour		17.2	N/A	N/A
Schedule Adherence	On Time	87.5%	N/A	N/A
	Early	4%	N/A	N/A
	Late	8.5%	N/A	N/A
Frequency (minutes)	AM Peak	30	50	60
	Midday	50	50	60
	PM Peak	50	50	60
	Evening	50- 60	50	70

Major destinations served by Route 12 include Newport on the Levee and downtown Cincinnati.

Transfers are available between Route 12 and the following other routes:

- Routes 9 Fairfield and Taylor Avenue
- Route 11 at Washington and 5th Street
- Route 20 at 5th and York Street
- Routes 16, 23, and 25 at York and 3rd Street
- Multiple TANK and SORTA routes in downtown Cincinnati
- Multiple TANK Routes at Covington Transit Center

The frequency of Route 12 varies throughout the service day. Service is available every 30 minutes during the morning peak period, and every 50 minutes in the mid-day and afternoon peak. Evening and weekend frequencies range from 50 to 70 minutes.

Ridership and Productivity

In 2012, Route 12 carried 128,220 annual passengers, or 17.4 passengers per service hour (Figure 8). This productivity is somewhat lower than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 34.6 hours of service and carries 595 total passengers.

Ridership activity on Route 12 is fairly well-distributed over the entire route. Boarding and alighting counts are highest at Clay and 6th Street in Dayton; downtown Newport; downtown Cincinnati; and Covington Transit Center. No stops outside of Covington Transit Center and downtown Cincinnati generate more than 50 boardings or alightings per day.

Route 12 experiences its heaviest ridership on the 2:46 PM inbound trip (48 boardings) and 2:43 PM outbound trip (38 boardings)[13]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 22% of inbound passenger trips on Route 12 begin and end in Kentucky. 78% of inbound riders who board the route south of the Ohio River continue on Route 12 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 12 has an 87.5% on-time performance rate[14], compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early of late included the following:

- 6:08 AM inbound (10 minutes early)
- 7:29 AM inbound (7 minutes late)
- 7:59 AM inbound (6 minutes early)
- 5:46 PM inbound (12 minutes early)
- 4:43 PM outbound (9 minutes late)
- 8:13 PM outbound (8 minutes late)

[13] Trip-level ridership data for Route 12 includes boardings and alightings from Route 7, which is interlined with Route 12.

[14] On-time performance by trip includes trips that begin as either Route 12 or Route 7.

Route 16: Carmel Manor

Route 16 is a local route operating Weekdays and Saturdays between Carmel Manor in Fort Thomas and downtown Cincinnati.

At a Glance		Weekday	Saturday	Sunday
Span		6:13am-6:50pm	6:52am-7:28pm	8:22am-6:44pm
Boardings		370	N/A	N/A
Service Hours		18.5	N/A	N/A
Boardings Per Service hour		20.0	N/A	N/A
Schedule Adherence*	On Time	88.6%	N/A	N/A
	Early	6%	N/A	N/A
	Late	5.4%	N/A	N/A
Frequency (minutes)	AM Peak	30	90	90
	Midday	50 - 65	90	90
	PM Peak	30	90	90
	Evening	No service	No service	No service

From Carmel Manner, the route operates along Boone Road, Fort Thomas Avenue, Highland Avenue, and Grand Avenue to Saint Elizabeth Hospital (designated trips do not enter the hospital). From Grand Avenue, buses continue to downtown Cincinnati via Carothers Road, Monmouth Street and Taylor Southgate Bridge, or via I-471 on one afternoon express run. In downtown Cincinnati, Route 16 interlines with Route 3 to provide a one-seat connection to Covington, Ludlow and Bromley. Inbound and outbound trips operate along the same alignment, except where there are one-way streets. All Route 16 trips are local in the outbound direction.

Major destinations served by Route 16 include Saint Elizabeth Hospital, Newport Shopping Center, Newport on the Levee, downtown Cincinnati, and Northern Kentucky Convention Center.

Transfers are available between Route 16 and the following other routes:

- Route 11 at Fort Thomas Avenue and Midway Court; Fort Thomas and Highland Avenue; and Monmouth Street and 5th Street
- Route 25 at Newport Shopping Center
- Route 20 at Monmouth and 16th Street; and York and 5th Street
- Route 23 at Monmouth and 6th Street
- Route 12 at Monmouth and 5th Street
- Multiple TANK and SORTA routes in downtown Cincinnati
- Multiple TANK routes at Covington Transit Center

The frequency of Route 3 varies throughout the service day. During the peak periods, the highest frequency is every 30 minutes. In the mid-day, frequencies range from 60 to 70 minutes. No evening service is available on Route 3. Weekend service consists of five inbound and five outbound trips per day.

Ridership and Productivity

In 2012, Route 16 carried 107,355 annual passengers, or 19.5 passengers per service hour (Figure 8). This productivity is higher than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 18.5 hours of service and carries 370 total passengers.

Ridership activity on Route 16 is highest at Newport Shopping Center, downtown Cincinnati, and Covington Transit Center. Stops with more than 50 boardings or alightings per day include:

- Newport Shopping Center
- Federal Reserve
- Covington Transit Center
- East 5th and Main Street

Productivity is excellent, close to or over 30 passengers per hour for segments north of St. Elizabeth Hospital. Productivity is poor south of St. Elizabeth Hospital, less than 10 passengers per service hour. Route 16 overlaps with Route 11 along Fort Thomas Avenue between Highland Avenue and the VA Medical Center, but both routes have very low ridership in the segment.

Route 16 experiences its heaviest ridership on the 3:43 PM inbound trip (32 boardings) and 4:16 PM outbound trip (28 boardings)[15]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus. On some trips, maximum loads exceed the number of boardings for the trip. This can occur when passengers board a bus on one trip, but do not alight until some point on the next trip. Thus, a trip can have passengers on-board even before the first boarding of that trip.

Approximately 17% of inbound passenger trips on Route 16 begin and end in Kentucky. 83% of inbound riders who board the route south of the Ohio River continue on Route 16 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 16 has a 88.6% on-time performance rate[16], compared to an average of 79.5% for all local TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early of late included the following:

- 7:48 AM inbound (8 minutes late)
- 12:43 PM inbound (6 minutes late)
- 6:41 AM outbound (7 minutes late)
- 7:11 AM outbound (6 minutes early)
- 8:21 AM outbound (7 minutes late)
- 10:41 PM outbound (7 minutes late)
- 11:41 PM outbound (7 minutes late)
- 3:41 PM outbound (10 minutes late)
- 4:46 PM outbound (16 minutes late)
- 5:21 PM outbound (8 minutes late)

[15] Trip-level ridership data for Route 16 includes boardings and alightings from Route 3, which is interlined with Route 16.

[16] On-time performance by trip includes trips that begin as either Route 16 or Route 3.

Route 17x: Villa Hills Express

Route 17x is a peak-period and mid-day express route that connects Villa Hills and Crescent Springs with downtown Cincinnati on weekdays only.

At a Glance		Weekday	Saturday	Sunday
Span		6:25am-7:35pm	No service	No service
Boardings		253		
Service Hours		11.9		
Boardings Per Service Hour		21.3		
Schedule Adherence	On Time	65.3%		
	Early	27.6%		
	Late	7.1%		
Frequency (minutes)	AM Peak	15 - 45		
	Midday	2 OB, 2 IB trips		
	PM Peak	20 - 60		
	Evening	No service		

Route 17x has several different variants. Most inbound trips begin at Royal Drive and Buttermilk Pike in Crescent Springs, while select trips begin at Amsterdam Road and Valley Trails Drive in Villa Hills or Buttermilk Park & Ride in Crescent Springs. All Route 17x inbound trips serve the Buttermilk Park & Ride regardless of where they begin. From the Park & Ride, the route operates non-stop to Covington Transit Center (CTC) and downtown Cincinnati. Some trips serve CTC before downtown Cincinnati, while others serve downtown first.

Outbound trips are similarly varied, with some terminating at Royal Drive in Crescent Springs and others terminating at Amsterdam and Valley Trails Drive in Villa Hills. All outbound trips serve the Buttermilk Park & Ride.

Major destinations served by Route 17x include Buttermilk Towne Center, Northern Kentucky Convention Center, and downtown Cincinnati.

Transfers are available between Route 17x and the following other routes:

- Route 1x at the Buttermilk Park & Ride
- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 17x varies throughout the service day. During the morning peak, the highest frequency is every 15 minutes. In the afternoon peak, buses run as often as every 20 minutes. Mid-day, Route 17x operates two outbound trips and one inb0und trip. No service is available on weekends.

Ridership and Productivity

In 2012, Route 17x carried 77,169 annual passengers – the third highest among TANK express routes - and had a service productivity of 24.8 passengers per service hour (Figure 8). This productivity is slightly higher than the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 11.9 hours of service and carries 253 total passengers.

Route 17x carried 11.2 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. According to the ridership count, several Route 17x trips carried five passengers or fewer:

- 8:07 AM inbound (3 passengers)
- 4:05 PM inbound (2 passengers)

- 4:50 PM inbound (1 passengers)
- 4:58 PM inbound (0 passengers)
- 5:24 PM inbound (2 passengers)
- 6:05 PM inbound (1 passengers)
- 6:56 PM inbound (0 passengers)
- 6:40 AM outbound (2 passengers)
- 7:22 AM outbound (2 passengers)
- 8:35 AM outbound (4 passengers)
- 7:15 PM outbound (3 passengers)

Ridership activity on Route 17x is heaviest in downtown Cincinnati and at the Buttermilk Park-and-Ride. Outside of these areas, stop-level ridership is generally lower than five boardings per day. Very little ridership activity occurs on the route segments beyond Buttermilk Park & Ride (Amsterdam Road, Valley Trails Drive, Buttermilk Pike, etc). The majority of stops in these segments had no boarding or alighting activity.

Route 17x experiences its heaviest ridership on the 7:08 and 7:25 AM inbound trip (23 boardings) and 6:33 AM inbound trip (22 boardings). Outbound ridership is heaviest on the 5:10 PM trip (25 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus. Ridership in the reverse commute direction is extremely low. Inbound afternoon trips averaged only two boardings per trip, while morning outbound trips averaged three boardings per trip.

Approximately 6% of inbound passenger trips on Route 17x begin and end in Kentucky. 94% of inbound riders who board the route prior to Covington Transit Center continue on Route 17x to downtown Cincinnati. In the AM peak, five inbound trips serve downtown Cincinnati and the Covington Transit Center. There are only five alightings at CTC for these trips combined. Similarly, there are only four alightings at the CTC on the remaining trips that stop at the CTC before traveling to downtown Cincinnati. In the outbound direction, there are fewer than five boardings at the CTC for all trips that serve it.

On-Time Performance

On weekdays, Route 17x has a 65.3% on-time performance rate, compared to an average of 72.2% for all express TANK routes. In general, early arrivals are more common than late ones, but late buses account for most of the trips that are far off-schedule (more than five minutes off-schedule). During the survey period, trips that were more than 5 minutes early or late included the following:

- 7:08 AM inbound (9 minutes late)
- 7:25 AM inbound (11 minutes late)
- 7:40 AM inbound (6 minutes late)
- 8:07 AM inbound (9 minutes late)
- 6:05 PM inbound (7 minutes early)
- 7:22 AM outbound (10 minutes early)
- 5:10 PM outbound (15 minutes late)
- 5:45 PM outbound (10 minutes late)

Route 18x: Edgewood Express

Route 18x is a peak-period express route that connects Edgewood with downtown Cincinnati. Buses operate inbound (to Cincinnati)-only in the morning, and outbound-only in the afternoon. Route 18x provides an express alternative to Route 1 for passengers with origins or destinations along Dixie Highway in Fort Mitchell.

Inbound trips begin at Dudley Pike and Winding Trails Drive, and serve local stops along Dudley Pike, Turkey Foot Road, and Dixie Highway, before operating non-stop via I-75/71 to downtown Cincinnati. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		6:36am-5:46pm	No service	No service
Boardings		73		
Service Hours		3.3		
Boardings Per Service Hour		22.5		
Schedule Adherence	On Time	72.2%		
	Early	0%		
	Late	27.8%		
Frequency (minutes)	AM Peak	3 IB trips		
	Midday	No service		
	PM Peak	3 OB trips		
	Evening	No service		

Major destinations served by Route 18x include Saint Elizabeth Medical Center, Thomas More College, Crestview Hills Town Center, Kroger, and downtown Cincinnati.

Transfers are available between Route 18x and the following other routes:

- Route 1 at Turkey Foot Road and Dixie Highway
- Multiple TANK and SORTA routes in downtown Cincinnati

Route 18x operates three inbound morning trips and three outbound evening trips with service every thirty minutes.

Ridership and Productivity

In 2012, Route 18x carried 18,095 annual passengers – the lowest of 11 TANK express routes - and had a service productivity of 21.8 passengers per service hour (Figure 8). This productivity is slightly lower than the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 3.3 hours of service and carries 73 total passengers.

Route 18x carried 12.1 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. The lowest passenger load was six passengers on the 7:36 AM inbound trip. The highest load was 18 passengers on the 4:42 PM outbound trip.

Ridership activity on Route 18x is heaviest in downtown Cincinnati and at the St. Elizabeth Hospital South (Dudley at Medical Village Dr.) Outside of these areas, stop-level ridership is generally lower than 10 boardings per day. Unlike most TANK express routes, Route 18x does not serve any park & rides or transit centers. Instead, over half of the overall ridership on the 18x is from the portion of the route serving Dixie Highway.

Route 18x experiences its heaviest ridership on the 7:06 AM inbound trip (13 boardings) and 4:42 outbound trip (18 boardings).

On-Time Performance

On weekdays, Route 2x has a 72.2% on-time performance rate, which aligns with the average of 72.2% for all express TANK routes. The remaining 27.8% of trips are late arrivals, and only a couple trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 7:36AM inbound (10 minutes late)
- 4:12PM outbound (8 minutes late)

Route 19x: Beechgrove Express

Route 19x is a peak-period express route that connects Beechgrove and Bristow in Independence to downtown Cincinnati. Buses operate inbound (to Cincinnati)-only in the morning, and outbound-only in the afternoon.

At a Glance		Weekday	Saturday	Sunday
Span		6:12am-5:54pm	No service	No service
Boardings		82		
Service Hours		4.4		
Boardings Per Service Hour		18.6		
Schedule Adherence	On Time	53.3%		
	Early	43.3%		
	Late	3.3%		
Frequency (minutes)	AM Peak	3 IB trips		
	Midday	No service		
	PM Peak	3 OB trips		
	Evening	No service		

From Beechgrove and Bristow, Route 19x operates along Turkey Foot Road, Stevenson Road, Hallam Avenue, and Commonwealth Avenue to I-75/71. Buses operate non-stop along the interstate to downtown Cincinnati. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 19x include Lloyd High School, and downtown Cincinnati. Transfers are available between Route 19x and the following other routes:

- Route 1 at Hallam Avenue and Dixie Highway
- Multiple TANK and SORTA routes in downtown Cincinnati

Route 19x operates three inbound trips and three outbound trips, with service every 30 minutes during the afternoon peak and slightly larger headways during the morning peak period.

Ridership and Productivity

In 2012, Route 19x carried 19,292 annual passengers - the second lowest of any TANK express route - and had a service productivity of 17.2 passengers per service hour (Figure 8). This productivity is below the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 4.4 hours of service and carries 82 total passengers.

Route 19x carried 13.7 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. Passenger loads ranged from 13 to 15 passengers per trip. Ridership activity on the route is heaviest in downtown Cincinnati and at Dixie Highway and Hallam Avenue in Erlanger; more than half of the route's ridership has an origin or destination in this segment. Ridership beyond this stop, along Turkey Foot Road, is quite low, with several stops having no boarding or alighting activity during the survey period.

On-Time Performance

On weekdays, Route 19x has a 53.3% on-time performance rate, which is well below the average of 72.2% for all express TANK routes. Early arrivals are more common than late ones and only a few inbound trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 6:12 AM inbound (12 minutes early)
- 6:47 AM inbound (6 minutes early)
- 7:30 AM inbound (6 minutes late)

Route 20: South Newport

Route 20 is a peak-period local route that operates between Covington Transit Center (CTC) and the Barkley Ridge Apartments in south Newport via downtown Cincinnati.

From CTC, Route 20 crosses the Clay Wade Bailey Bridge into downtown Cincinnati, making stops between Vine Street and Broadway before crossing Taylor Southgate Bridge into Newport. From Central and 5th Street in Newport, the route continues along Isabella Street to 11th Street, and then on 11th Street to Monmouth Street, past the Newport Shopping Center. From Main Street the route continues on to Grandview Avenue, Kentucky Drive, and Bluegrass Avenue, before terminating at the Barkley Ridge Apartments. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		6:04am-5:53pm	No service	No service
Boardings		58		
Service Hours		5.1		
Boardings Per Service Hour		11.3		
Schedule Adherence	On Time	76.0%		
	Early	9.4%		
	Late	14.6%		
Frequency (minutes)	AM Peak	3 OB, 4 IB trips		
	Midday	No service		
	PM Peak	3 OB. 2 IB trip		
	Evening	No service		

Major destinations served by Route 20 include the Northern Kentucky Convention Center, downtown Cincinnati, Newport on the Levee, and Newport Shopping Center.

Transfers are available between Route 20 and the following other routes:

- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati
- Route 11 at York and 3rd Street
- Routes 12, 16, 25, and 23 at 5th and York Street
- Routes 16 and 25 at 16th an Monmouth Street

Route 20 operates three outbound trips and four inbound trips in the morning peak. During the afternoon peak, Route 20 operates 3 outbound trips and two inbound trips. During these peak periods, buses run as often as 25 minutes.

Ridership and Productivity

In 2012, Route 20 carried 16,956 annual passengers, which is among the lowest of any TANK route. Route 20 had a service productivity of 13.5 passengers per service hour in 2012 (Figure 8). This productivity is considerably lower than the 18-passengers-per-service hour average for local TANK routes. In addition, Route 20 carries an average of just 4.8 passengers per trip, which is far below the 13.2 passenger per trip average for local TANK routes. On a typical weekday, Route 20 provides 5.1 hours of revenue service and carries 58 total passengers.

Ridership activity on Route 20 is highest at the Covington Transit Center (CTC) and downtown Cincinnati. However, total boarding and alighting counts at the CTC and downtown Cincinnati are very low, especially for outbound trips. There is virtually no ridership south of 11th Street.

Ridership patterns suggest that Newport residents are choosing the more frequent, all day Route 25 service over Route 20, even if Route 20 is closer to their origin or destination.

Route 20 experiences low ridership on all trips, with highest ridership on the 7:15 AM inbound trip (10 boardings) and 4:08PM outbound trip (11 boardings). During the survey period, the 7:13AM outbound trip had zero boardings, and the two inbound afternoon trips each had under five boardings. No trips carried more than 10 passengers during the survey period.

Approximately 17% of inbound passenger trips on Route 20 begin and end in Kentucky. 83% of inbound riders who board the route south of the Ohio River continue on Route 20 to downtown Cincinnati.

On-Time Performance

Route 20 has a 76% on-time performance rate, compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, only one trip was more than 5 minutes early or late: The 4:47PM inbound trip was 11 minutes late.

Route 23: South Bellevue

Route 23 is a peak-period local route that operates on weekdays only between Belleview and downtown Cincinnati.

At a Glance		Weekday	Saturday	Sunday
Span		6:21am-6:18pmpm	No service	No service
Boardings		113		
Service Hours		8.9		
Boardings Per Service Hour		12.7		
Schedule Adherence	On Time	80.4%		
	Early	2.2%		
	Late	17.4%		
Frequency (minutes)	AM Peak	2 OB, 3 IB trips		
	Midday	No service		
	PM Peak	3 OB, 2 IB trips		
	Evening	No service		

Route 23 has several different variants. Morning trips to Cincinnati begin at the Medical Arts Building in Belleview, except for the first trip which begins at Taylor and Fairfield Avenue. These inbound trips include a one-way loop along Fairfield, Ward, Grand, and Washington Avenue; followed by a second loop along Taylor, Glazier, and Berry Avenue. In the afternoons, inbound trips begin at Taylor and Fairfield Avenue only, and service the Medical Arts building following the completion of the two one-way loops. From Bellevue, Route 23 continues on to Covington Transit Center, via Newport and downtown Cincinnati. In downtown Cincinnati, Route 23 interlines with Route 9 to provide a one-seat connection to Covington, Taylor Mill and Independence.

Major destinations served by Route 23 include Kroger, Newport on the Levee, downtown Cincinnati, and Northern Kentucky Convention Center.

Transfers are available between Route 23 and the following other routes:

- Route 12 Taylor and Fairfield Avenue; and Monmouth and 5th Street
- Route 11 at Washington Avenue and 4th Street
- Routes 16, 20, and 25 at 3rd and York Street
- Multiple TANK and SORTA routes in downtown Cincinnati
- Multiple TANK routes at Covington Transit Center

The frequency of Route 23 varies by direction throughout the service day. During the morning peak, two trips operate outbound and three trips operate inbound. This is reversed in the afternoon peak with three outbound trips and two inbound trips. No mid-day, evening, or weekend service is available.

Ridership and Productivity

In 2012, Route 23 carried 11,160 annual passengers, or 9.5 passengers per service hour (Figure X). This productivity is significantly lower than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the route provides 8.9 hours of service and carries 113 total passengers.

Ridership activity on Route 23 is highly concentrated in downtown Cincinnati and Covington Transit Center. Most other stops along the route generate fewer than 5 boardings or alightings per day. Ridership is particularly low east of Riviera Avenue, with the majority of stops having no boarding or alighting activity during the survey period. This route segment is rather circuitous

and may be confusing for passengers. In addition, no ridership activity was recorded at the Medical Art Building.

Route 23 experiences its heaviest ridership on the 6:30 AM inbound trip (17 boardings) and 7:43 PM outbound trip (17 boardings)[17]. No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 30% of inbound passenger trips on Route 23 begin and end in Kentucky. 70% of inbound riders who board the route south of the Ohio River continue on Route 23 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 9 has an 80.5% on-time performance rate[18], compared to an average of 79.5% for all local TANK routes. Late arrivals are more common than early ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early of late included the following:

- 4:35 PM inbound (6 minutes late)
- 7:15 AM outbound (7 minutes late)
- 7:44 AM outbound (10 minutes late)
- 3:05 PM outbound (7 minutes late)
- 4:05 PM outbound (9 minutes late)
- 4:50 PM outbound (7 minutes late)
- 5:06 PM outbound (15 minutes late)

[17] Trip-level ridership data for Route 23 includes boardings and alightings from Route 9, which is interlined with Route 23.

[18] On-time performance by trip includes trips that begin as either Route 23 or Route 9.

Route 25: Eastern Avenue / Cincinnati / Alexandria

Route 25 is a local route operating 7 days a week between Fort Wright and Alexandria via downtown Cincinnati.

At a Glance		Weekday	Saturday	Sunday
Span		4:09am-11:38pm	5:31am-10:24pm	5:31am-10:24pm
Boardings		1,520	N/A	N/A
Service Hours		79.7	N/A	N/A
Boardings Per Service Hour		19.1	N/A	N/A
Schedule Adherence	On Time	76%	N/A	N/A
	Early	11%	N/A	N/A
	Late	12%	N/A	N/A
Frequency (minutes)	AM Peak	25 - 40	50	50
	Midday	60	50 - 60	50 - 60
	PM Peak	30 - 40	50	50
	Evening	60	60	60

Most trips from Fort Wright begin at the Fort Wright Hub and operate primarily along Fidelity Drive, Taylor Mill Road, Decoursey Avenue, Madison Pike, Eastern Avenue, and Greenup Street through Fort Wright, Latonia, and Covington to Covington Transit Center and downtown Cincinnati. Late evening trips begin at Latonia Centre rather than Fort Wright Hub.

From downtown Cincinnati, buses continue to Newport, Fort Thomas, Highland Heights, Cold Spring, and Alexandria, primarily along York Street and Alexandria Pike. Most trips terminate at Village Green in Alexandria, with select trips terminating at Alexandria Park & Ride instead. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 23 include Wal-Mart, Fidelity, Latonia Centre, Holmes High School, Covington Cathedral, Northern Kentucky Convention Center, downtown Cincinnati, Newport on the Levee, Newport Shopping Center, and Northern Kentucky University.

Route 25 overlaps with Route 11 along Alexandria Pike between Fort Thomas Avenue and Nunn Drive. Transfers are available between Route 25 and the following other routes:

- Routes 5, 25, 28x, 30x, and 33 at Fort Wright Hub
- Route 33 at Madison Avenue and 20th Street
- Multiple TANK routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 25 varies throughout the service day. During the weekday morning peak, the highest frequency is every 25 minutes. In the weekday afternoon peak, buses run as often as every 30 minutes. Off-peak and weekend frequencies range from 50 to 60 minutes.

Ridership and Productivity

In 2012, Route 25 carried 489,864 annual passengers – the second highest of any TANK route – and had a service productivity of 18.6 passengers per service hour (Figure 8). This productivity is slightly higher than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, Route 25 provides 79.7 hours of revenue service and carries 1,520 total passengers.

Productivity on the Fort Wright branch is generally above 20 boardings per service hour between Latonia Plaza and downtown Cincinnati. The productivity between Latonia Plaza and Fort Wright is much lower, less than 8 boardings per service hour. A similar pattern exists on the

Alexandria branch, where productivity nosedives to only 1.6 boardings per service hour on the segment between Village Green Park & Ride and the Alexandria Park & Ride.

Boarding and alighting counts are highest in downtown Cincinnati and Covington Transit Center, but there are several stops with more than 50 boardings or alightings per day:

- Village Green Park & Ride
- Johns Hill Rd. & University Dr.
- NKU Kenton Dr. & Campbell Dr.
- Newport Shopping Center
- Monmouth & E 7th St.
- Monmouth & 16th St.
- 3rd & York (Newport on the Levee)
- 4th & Main/Vine (downtown Cincinnati)
- Covington Transit Center
- Garrard St & E. 15th St.
- Madison Ave. & Catalpa St.
- Latonia Centre
- Ft. Wright

Route 25 experiences its heaviest ridership on the 2:25 PM inbound trip (82 boardings) and 2:27PM outbound trip (50 boardings). The 2:25PM inbound trip had a maximum load of 34 passengers, which is close to the typical seating capacity of a 40-ft transit bus (40 passengers). Most other trips had maximum loads in the teens and twenties.

On Route 25 trips that begin in Alexandria, approximately 38% of inbound passengers begin and end their trip in Kentucky. 62% of inbound riders who board the route south of the Ohio River continue on Route 25 to downtown Cincinnati. On trips that begin in Fort Wright, approximately 49% of inbound passengers begin and end their trip in Kentucky. 51% of inbound riders who board the route prior to Covington Transit Center continue on Route 25 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 25 has a 76% on-time performance rate, compared to an average of 79.5% for all local TANK routes. When buses are not on-time, they are almost as likely to arrive early (11%) as to arrive late (12%). Few trips are more than five minutes off-schedule. During the survey period, trips that were more than 5 minutes early or late included the following:

- 2:25PM inbound trip (13 minutes late)
- 5:28PM inbound trip (6 minutes late)
- 9:00PM inbound trip (8 minutes late)
- 8:12AM outbound trip (6 minutes late)
- 1:27PM outbound trip (7 minutes late)
- 2:27PM outbound trip (9 minutes late)
- 3:27PM outbound trip (7 minutes late)
- 3:57PM outbound trip (7 minutes late)
- 4:22PM outbound trip (11 minutes late)
- 10:25PM outbound trip (10 minutes early)

Route 25x: Alexandria

Route 25x is a peak-period express route that connects Alexandria with downtown Cincinnati. Buses operate inbound (to Cincinnati)-only in the morning, and outbound-only in the afternoon. The route offers an express alternative to Route 25 in peak periods.

Inbound trips begin at Alexandria Park & Ride and serve local stops along Alexandria Pike / US 27, before operating non-stop via I-471 to downtown Cincinnati. In addition to the Alexandria Park & Ride, Route 25x also serves a Park & Ride at Village Green Shopping Center in Alexandria. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		5:52am-5:55pm	No service	No service
Boardings		213		
Service Hours		7.9		
Boardings Per Service Hour		27.0		
Schedule Adherence	On Time	80%		
	Early	17%		
	Late	4%		
Frequency (minutes)	AM Peak	5 IB trips		
	Midday	No service		
	PM Peak	5 OB trips		
	Evening	No service		

Transfers are available between Route 25x and the following other routes:

- Route 25 at US 27 and Nunn Drive; US 27 and East Alexandria Pike; Village Green Park & Ride
- Route 11 at US 27 and Nunn Drive
- Multiple TANK and SORTA routes in downtown Cincinnati

Route 25x operates five inbound trips in the morning peak and five outbound trips in the afternoon peak. The frequency of this service varies through each peak period. During the morning peak, the highest frequency is every 10 minutes. In the afternoon peak, buses run as often as every 15 minutes.

Ridership and Productivity

In 2012, Route 25x carried 53,904 annual passengers. The average annual ridership across all express routes is 52,619 annual passengers. Route 25x had a service productivity of 26.8 passengers per service hour (Figure 8). This productivity is the third highest of all TANK express buses and higher than the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 7.9 hours of service and carries 213 total passengers.

Route 25x carried 19.2 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. During the rider count, the lowest passenger load was twelve passengers on the 6:10 AM inbound trip. The highest load was 35 passengers on the 4:40 PM outbound trip.

Ridership activity on Route 25x is concentrated in downtown Cincinnati and at the Village Green Shopping Center and Park-and-Ride. Outside of these areas, stop-level ridership is generally lower than 10 boardings per day.

Route 25x experiences relatively steady inbound ridership (between 15-20 boardings/trip). Route 25x sees its heaviest ridership on the 4:40PM outbound trip (35 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

On-Time Performance

On weekdays, Route 2x has an 80% on-time performance rate, compared to an average of 72.2% for all express TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 5:52AM inbound (10 minutes early)
- 6:24AM inbound trip (6 minutes early)
- 7:24AM inbound trip (35 minutes late)

Route 28x: Empire Drive Express

Route 28x is a peak-period express route that primarily serves reverse commuters traveling between downtown Cincinnati and Florence, but also provides morning-only inbound service from Fort Wright Hub to downtown Cincinnati. Buses operate outbound (to Florence)-only in the morning, and inbound-only in the afternoon.

Morning inbound trips begin at Fort Wright Hub, and operate primarily along Madison Avenue and Scott Street to Covington Transit Center and on to downtown Cincinnati. From Cincinnati, the Route operates non-stop along I-75/71 to US 42 in Florence and then provides local service along Industrial Road and Empire Drive.

Inbound trips from Florence serve the Covington Transit Center before downtown Cincinnati. Otherwise, inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		4:54am-10:05pm	No service	No service
Boardings		75		
Service Hours		3.8		
Boardings Per Service Hour		19.7		
Schedule Adherence	On Time	73%		
	Early	20%		
	Late	7%		
Frequency (minutes)	AM Peak	2 IB (from Ft. Wright) trips		
	Midday	No Service		
	PM Peak	2 IB (from Florence) trips		
	Evening	1 OB (from CTC to Florence)		

Major destinations served by Route 28x include Northern Kentucky Industrial Park, Holmes High School, Kroger, Northern Kentucky Convention Center and downtown Cincinnati. Route 28x offers an express alternative to Route 1 for passengers traveling from downtown Cincinnati to jobs in the industrial parks at the outer ends of both routes.

Transfers are available between Route 28x and the following other routes:

- Route 1 at Industrial Road and Empire Drive
- Routes 5, 8,30x, and 33 at Fort Wright Hub
- Multiple Tank routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

Route 28X operates two outbound trips in the morning peak period at 4:54 AM and 5:48 AM and two inbound trips in the afternoon peak period at 3:10PM and 3:40PM. Route 28x also operates one outbound trip at 9:40 PM between the Covington Transit Center and Industrial Road at Turkeyfoot Road.

Ridership and Productivity

In 2012, Route 28x carried 20,976 annual passengers and had a service productivity of 20.9 passengers per service hour (Figure 8). While the total annual ridership is significantly below the TANK express route average (52,619 annual passengers), the productivity of Route 28x is only slightly below the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 3.8 hours of service and carries 75 total passengers.

Route 28x carried 16.5 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. During the ridership count, the lowest passenger load was eight passengers on the 3:40 PM inbound trip. Only five boardings were recorded on the Fort Wright branch of the route.

Ridership activity on Route 28x is heaviest in downtown Cincinnati, at the Covington Transit Center, and at Industrial Road & Empire Drive. All other stops experienced ridership below five boardings per day.

Route 28x experiences its heaviest ridership on the 3:10 PM inbound trip (15 boardings) and 4:54AM outbound trip (24 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 48% of inbound passenger trips on Route 28x begin and end in Kentucky. 52% of inbound riders who board the route prior to Covington Transit Center continue on Route 28x to downtown Cincinnati.

On-Time Performance

On weekdays, Route 2x has a 73% on-time performance rate, compared to an average of 72.2% for all express TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 3:40PM inbound (7 minutes early)
- 5:48 AM outbound (8 minutes late)

Route 29x: Hebron Express

Route 29x is a peak-period and mid-day express route that connects Hebron with downtown Cincinnati.

At a Glance		Weekday	Saturday	Sunday
Span		5:05am-7:04pm	No service	No service
Boardings		160		
Service Hours		6.8		
Boardings Per Service Hour		23.5		
Schedule Adherence	On Time	69.5%		
	Early	15.5%		
	Late	15.0%		
Frequency (minutes)	AM Peak	4 OB, 4 IB trips		
	Midday	1 OB, 1 IB trip		
	PM Peak	4 OB, 4 IB trips		
	Evening	No service		

Route 29x has several different variants. In the morning, inbound trips begin either at North Bend Park & Ride or at Parkwest Industrial Park. Trips serving the industrial park also serve North Bend Park & Ride. All inbound morning trips then make local stops along Northbend Road, Conner Road, Limaburg Road (including Limaburg Park & Ride), Petersburg Road, and Aviation Boulevard. Buses then operate non-stop along I-275 and I-75/71 to downtown Cincinnati and Covington Transit Center (CTC), except the first trip of the morning, which does not serve CTC. Outbound morning trips operate along a similar alignment, with two trips terminating at the North Bend Park & Ride, and one trip terminating at the Parkwest Industrial Park. One of the morning trips serving North Bend Park & Ride bypasses all local stops along Aviation Boulevard and south of I-275, and instead operates non-stop from CTC to Southpark Industrial Park.

Afternoon inbound trips begin at North Bend Park & Ride, serve the industrial parks north of I-275, and follow the same to I-275 as the morning trips. From I-275, afternoon inbound trips operate non-stop to CTC and then downtown Cincinnati. Afternoon outbound trips begin at CTC, serve downtown Cincinnati, and then operate non-stop along I-75/71 and I-275 to Terminal Drive in Hebron. Buses then make local stops along Aviation Boulevard, Petersburg Road, and Limaburg Road, including the Limaburg Park & Ride. From the Park & Ride, buses either continue directly to the North Bend Park & Ride without circulating through the industrial parks north of I-275, or serve the industrial parks and then proceed to North Bend Park & Ride.

Major destinations served by Route 29x include Galerie Chocolate Factory, downtown Cincinnati, and Northern Kentucky Convention Center.

Transfers are available between Route 30x and the following other routes:

- Multiple TANK and SORTA routes in downtown Cincinnati
- Multiple TANK routes at Covington Transit Center

Route 29x provides four outbound trips and four inbound trips in the morning and afternoon peak periods. Route 29x also operates one mid-day outbound trip. Buses operate every 30 minutes in the morning peak and as often as every 24 minutes in the afternoon peak.

Ridership and Productivity

In 2012, Route 29x carried 83,643 annual passengers and had a service productivity of 20.0 passengers per service hour (Figure 8). This productivity is below the 22.9-passengers-per-

service hour average for TANK express routes. On a typical weekday, the route provides 6.8 hours of service and carries 160 total passengers.

Route 29x carried 18.2 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. During the survey period, the lowest passenger load was three passengers on the 4:54 PM inbound trip. Directional ridership on the route is fairly evenly split between the forward and reverse commute.

Ridership activity on Route 29x is heaviest in downtown Cincinnati and in the vicinity of the North Bend Park-and-Ride and Limaburg Park-and-Ride. Outside of these areas, stop-level ridership is generally lower than 10 boardings per day.

Route 29x experiences its heaviest ridership on the 4:30PM inbound trip (30 boardings) and 4:42PM outbound trip (35 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

Approximately 27% of inbound passenger trips on Route 29x begin and end in Kentucky. 73% of inbound riders who board the route prior to Covington Transit Center continue on Route 27x to downtown Cincinnati.

On-Time Performance

On weekdays, Route 29x has a 69.5% on-time performance rate, compared to an average of 72.2% for all express TANK routes. Early arrivals are almost as common as late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 3:23PM inbound (12 minutes late)
- 4:30PM inbound (10 minutes late)
- 6:04PM inbound (6 minutes early)
- 7:02AM outbound (17 minutes late)
- 5:12PM outbound (7 minutes late)

Route 30x: Independence Express

At a Glance		Weekday	Saturday	Sunday
Span		6:06am-6:29pm	No service	No service
Boardings		160		
Service Hours		6.8		
Boardings Per Service Hour		23.5		
Schedule Adherence	On Time	63%		
	Early	11%		
	Late	25%		
Frequency (minutes)	AM Peak	1 OB, 4 IB trips		
	Midday	No service		
	PM Peak	4 OB trips		
	Evening	No service		

Route 30x is a peak-period express route that connects Independence with downtown Cincinnati. The route primarily operate inbound (to Cincinnati) in the morning, and outbound in the afternoon. A single outbound express trip is available from downtown Cincinnati to Kroger Park & Ride in Independence in the morning.

Route 30x has several different variants. Most inbound trips begin at the Kroger Park & Ride at Centennial Boulevard and Declaration Drive in Independence. These trips serve local stops along Madison Pike and Highland Pike, including the Hands Pike Park & Ride and the Fort Wright Hub, before operating non-stop along I-75/71 to downtown Cincinnati. One inbound trip begins at Hands Pike Park & Ride instead of Kroger. From downtown Cincinnati, all inbound trips continue on to Covington Transit Center. Other than the outbound trip in the morning, inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 30x include Kroger, Wal-Mart, downtown Cincinnati, and Northern Kentucky Convention Center.

Transfers are available between Route 30x and the following other routes:

- Routes 8, 25, 28x, 30x, and 33 at the Fort Wright Hub
- Multiple TANK and SORTA routes in downtown Cincinnati
- Multiple TANK routes at Covington Transit Center

Route 30x operates four inbound trips and one outbound trip in the morning peak and four outbound trips during the afternoon peak. The frequency of Route 30x varies during the peak periods. During the morning peak, the highest frequency is every eight minutes. In the afternoon peak, buses run as often as every 30 minutes.

Ridership and Productivity

In 2012, Route 30x carried 40,218 annual passengers and had a service productivity of 23.2 passengers per service hour (Figure 8). This productivity is slightly above the 22.9-passengers-per-service hour average for TANK express routes. Meanwhile, the annual ridership figure is significantly below the TANK express route average of 52,619 annual passengers. On a typical weekday, the route provides 6.8 hours of service and carries 160 total passengers.

Route 30x carried 17.5 passengers per trip in 2012, compared to an average of 15.1 passengers per trip for all TANK express routes. During the survey period, the lowest passenger load was seven passengers on the 5:47 PM outbound trip. Twelve passengers utilized the early morning reverse-commute trip from downtown Cincinnati to Kroger Park & Ride in Independence.

Ridership activity on Route 30x is heaviest in downtown Cincinnati and at the Kroger, Hands Pike, and Ft. Wright Park-and-Rides. Outside of these areas, stop-level ridership is generally lower than 5 boardings per day.

Route 30x experiences its heaviest ridership on the 6:36AM inbound trip (22 boardings) and 4:33PM outbound trip (27 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

On-Time Performance

On weekdays, Route 30x has a 63% on-time performance rate, compared to an average of 72.2% for all express TANK routes. Late arrivals are more common than late early and many trips are more than five minutes off-schedule. During the survey period, trips that were more than 5 minutes early or late included the following:

- 7:18AM inbound (10 minutes late)
- 4:03PM outbound (14 minutes late)
- 4:33PM outbound (15 minutes late)
- 5:03PM outbound (13 minutes late)
- 5:47PM outbound (11 minutes late)

Route 31x: Rolling Hills Express

Route 31x is a peak-period express route that provides seven-day-a-week outbound service from downtown Cincinnati to Fort Wright and Edgewood during the morning peak period, and afternoon-only inbound service from Edgewood to the Fort Write Hub. For inbound service into Cincinnati, passengers must transfer to Route 25 of 33 at the Fort Write Hub.

Route 31x began service in January 2013. Ridership and service performance data was not yet available at the time of this study.

At a Glance		Weekday	Saturday	Sunday
Span		7:24am-5:13pm	7:20am-5:13pm	7:20am-7:50am
Boardings		Not surveyed	Not surveyed	Not surveyed
Service Hours		Not surveyed	Not surveyed	Not surveyed
Boardings Per Service Hour		Not surveyed	Not surveyed	Not surveyed
Schedule Adherence	On Time	Not surveyed	Not surveyed	Not surveyed
	Early	Not surveyed	Not surveyed	Not surveyed
	Late	Not surveyed	Not surveyed	Not surveyed
Frequency (minutes)	AM Peak	1 OB, 1 IB trip	1 OB, 1 IB trip	1 OB trip
	Midday	No service	No service	No service
	PM Peak	No service	No service	No service
	Evening	No service	No service	No service

Route 32x: Burlington Express

Route 32x is a peak-period express route that connects Burlington with downtown Cincinnati. Buses operate inbound (to Cincinnati)-only in the morning, and outbound-only in the afternoon.

Inbound trips begin at Burlington Park & Ride, and serve several stops along Burlington Pike, before operating non-stop via I-75/71 to downtown Cincinnati. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by Route 32x include Kroger, K-Mart, Florence Mall, and downtown Cincinnati.

Transfers are available between Route 32x and the following other routes:

At a Glance		Weekday	Saturday	Sunday
Span		6:10am-6:14pm	No service	No service
Boardings		199		
Service Hours		4.3		
Boardings Per Service Hour		45.9		
Schedule Adherence	On Time	83%		
	Early	17%		
	Late	0%		
Frequency (minutes)	Peak	4 IB trips		
	Midday	No service		
	PM Peak	4 OB trips		
	Evening	No service		

- Route 1 at Burlington Pike and Houston Road
- Multiple TANK and SORTA routes in downtown Cincinnati

Route 32x operates four inbound trips in the morning peak and four outbound trips during the afternoon peak. During the morning and afternoon peak periods, buses operate every 27-31 minutes.

Ridership and Productivity

In 2012, Route 32x carried 43,894 annual passengers and had a service productivity of 39.6 passengers per service hour (Figure 8). This productivity is higher than any other route in the TANK network, well above the 22.9-passengers-per-service hour average for TANK express routes. On a typical weekday, the route provides 4.3 hours of service and carries 199 total passengers.

In 2012, Route 32x carried 21.5 passengers per trip – the highest productivity among TANK express routes. During the survey period, all Route 32x trips carried 23 passengers or more.

Ridership activity on Route 32x is heaviest in downtown Cincinnati and the Burlington Park-and-Ride. The other seven stops along the route have less than three riders.

Route 32x experiences its heaviest ridership on the 6:37AM inbound trip (26 boardings) and4:44PM outbound trip (30 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

On-Time Performance

On weekdays, Route 32x has an 83% on-time performance rate, compared to an average of 72.2% for all express TANK routes. The remaining 17% of trips arrived early. During the survey period, trips that were more than five minutes early included the following:

- 6:10 AM inbound (11 minutes early)
- 6:37AM inbound (12 minutes early)

Route 33: Saint Elizabeth Edgewood

Route 33 is a local route operating 7 days a week between Crestview Hills Town Center and downtown Cincinnati.

From Crestview Hills Town Center, Route 33 travels along Town Center Boulevard and Thomas More Parkway to Saint Elizabeth Medical Center – Edgewood Campus. From Saint Elizabeth, the route continues along Horsebranch Road, Orphanage Road, Valley Plaza Parkway, and Madison Pike to the Fort Wright Hub, and on to downtown Cincinnati via Madison Pike, Greenup Street and the Covington Transit Center. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

At a Glance		Weekday	Saturday	Sunday
Span		6:10am-10:30pm	8:05am-8:35pm	8:05am-8:35pm
Boardings		415	N/A	N/A
Service Hours		25.5	N/A	N/A
Boardings Per Service Hour		16.3	N/A	N/A
Schedule Adherence	On Time	74%	N/A	N/A
	Early	18%	N/A	N/A
	Late	8%	N/A	N/A
Frequency (minutes)	AM Peak	60	100	100
	Midday	60	110	110
	PM Peak	50 - 55	110	110
	Evening	65 - 100	110	110

Major destinations served by Route 33 include Crestview Hills Town Center, Thomas More College, Saint Elizabeth Medical Center – Edgewood Campus, Wal-Mart, Kroger, the Northern Kentucky Convention Center, and downtown Cincinnati.

From Latonia Avenue to downtown Cincinnati, Route 33 serves a similar market to Route 7 and Route9; overlapping with Route 7 along Madison Avenue from Latonia Avenue to 20th Street and with Route 9 from 26th Street to CTC.

Transfers are available between Route 33 and the following other routes:

- Routes 1 at Dixie Highway and Town Center Boulevard
- Routes 5, 25, 28x, 30x, and 33 at the Fort Wright Hub
- Routes 7, 8, and 9 at Madison Pike and 26th Street
- Multiple TANK Routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The frequency of Route 33 varies throughout the service day. Buses operate hourly during the morning peak and mid-day periods. Service is available every 50 to 55 minutes in the afternoon peak, and every 65 to 100 minutes in the evening. Weekend frequencies range from 100 to 110 minutes.

Ridership and Productivity

In 2012, Route 33 carried 133,112 annual passengers, or 17.3 passengers per service hour (Figure 8). This productivity is lower than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, Route 33 provides 25.5 hours of revenue service and carries 415 total passengers.

Route 33 averages over 30 passengers per service hour in the segment between the CTC and 20th Street. This is the segment that parallels both Routes 9 and 7. Productivity drops off rapidly the further south the route travels. South of the Wal-Mart, Route 33 carries less than 10 passengers per service hour.

Route 33 experiences its heaviest ridership on the 12:07 PM inbound trip (26 boardings) and 7:05 PM outbound trip (37 boardings). The 7:05 PM outbound trip also has a maximum load of 33 passengers, which is approaching the typical seating capacity (40 passengers) of a 40-ft transit bus.

Approximately 76% of inbound passenger trips on Route 33 begin and end in Kentucky. 24% of inbound riders who board the route prior to Covington Transit Center continue on Route 33 to downtown Cincinnati.

On-Time Performance

On weekdays, Route 33 has a 74.1% on-time performance rate, compared to an average of 79.5% for all local TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early of late included the following:

- 6:14 AM inbound (8 minutes late)
- 4:37 PM inbound (8 minutes late)
- 6:10 AM outbound (15 minutes late)
- 8:05 AM outbound (10 minutes early)

Southbank Shuttle

The Southbank Shuttle is a local circulator connecting the urban areas of Covington and Newport with downtown Cincinnati. The shuttle is designed primarily to connect tourist areas, hotels, and convention centers in Covington, Cincinnati, and Newport.

At a Glance		Weekday	Saturday	Sunday
Span		5:55am-10:25pm	9:55am-10:25pm	9:55am-10:25pm
Boardings		857	N/A	N/A
Service hours		50.4	N/A	N/A
Boardings Per Service hour		17.0	N/A	N/A
Schedule Adherence	On Time	78%	N/A	N/A
	Early	19%	N/A	N/A
	Late	3%	N/A	N/A
Frequency (minutes)	Peak	15	15	15
	Midday	15	15	15
	Evening*	15	15	No service

*Friday & Saturday only

From Philadelphia and 5th Street in Covington, the route operates clockwise along 5th, Main, and 4th Street, then continues along Philadelphia to 3rd Street, Johnson Street, and Rivercenter Street. From Rivercenter, the route operates along Scott Street, Park Street, and Greenup Street before crossing into downtown Cincinnati via John Roebling Bridge.

The Southbank Shuttle serves downtown Cincinnati in a clockwise loop including Vine, 5th, and Walnut Street. Buses then continue to Taylor Southgate Bridge and cross into Newport. In Newport the route operates primarily along 3rd Street, Riverboat Row and Riviera Drive. Inbound and outbound trips operate along the same alignment, except where there are one-way streets.

Major destinations served by the Southbank Shuttle include MainStrasse Village, Northern Kentucky Convention Center, downtown Cincinnati, Newport Aquarium, Newport on the Levee, and Bellevue Medical Arts Building.

Transfers are available between Route 33 and the following other routes:

- Multiple TANK Routes at Covington Transit Center
- Multiple TANK and SORTA routes in downtown Cincinnati

The Southbank Shuttle operates every 15 minutes throughout the service day.

Ridership and Productivity

In 2012, The Southbank Shuttle carried 531,956 annual passengers – the second-highest ridership among all TANK routes – and had a service productivity of 27.7 passengers per service hour (Figure 8). This productivity is slightly lower than the 18-passengers-per-service hour average for local TANK routes. On a typical weekday, the Southbank Shuttle provides 50.4 hours of service and carries 857 total passengers.

Ridership activity on the Southbank Shuttle is heaviest at Fountain Square in downtown Cincinnati, but there are several stops with more than 50 boardings or alightings per day:

- 5th and Philadelphia
- Park Place and Court
- Newport on the Levee

- 3rd and Monmouth
- 3rd and Bakewell

The Southbank Shuttle experiences its heaviest ridership on the 5:00 PM eastbound trip (26 boardings) and 3:10 and 4:55 PM westbound trips (17 boardings). No trips exceed a maximum load of 40 passengers, which is the typical seating capacity of a 40-ft transit bus.

On-Time Performance

On weekdays, the Southbank Shuttle has a 78% on-time performance rate, compared to an average of 79.5% for all local TANK routes. Early arrivals are more common than late ones and only a few trips are more than five minutes off-schedules. During the survey period, trips that were more than 5 minutes early or late included the following:

- 12:20 PM eastbound (13 minutes late)
- 4:45 PM eastbound (7 minutes late)
- 5:55 AM westbound (6 minutes early)

Other Shuttles

TANK operates two shuttles in addition to the Southbank Shuttle - the Gateway Shuttle and the NKU Shuttle - which were not surveyed during the January 2013 ridecheck. These routes do not have full profiles or summaries as they are operated by TANK under agreements with the academic institutions that they serve.

Gateway Shuttle

The Gateway Shuttle is operated in partnership with Gateway Community and Technical College and provides service from downtown Covington at the College's Urban Center to the three campus locations in Edgewood, Covington/Park Hills, and Boone County. Service is provided during the school year Monday-Thursday and operates from 8:00 AM to 9:25 PM. The shuttle takes 50 minutes to travel from the Urban Center to the Boone Campus, and 25 minutes to return to the Urban Center from the Boone Campus. The shuttle runs a total of 10 trips a day.

The Gateway Shuttle is one of the least productive routes that TANK operates. Based on 2012 ridership, the shuttle has only 2 riders per service hour, 0.1 rider per service mile and 0.6 riders per trip. The shuttle also has a very high cost per passenger trip because of the low ridership and long route. However because of financial support for the operating costs provided by Gateway Community and Technical College, the financial burden for TANK is minimal.

NKU Shuttle

The NKU Shuttle is operated in partnership with Northern Kentucky University. The shuttle provides service from Callahan Hall through campus to the BEP Center, serving Dogwood Drive, Johns Hill Road, and University Drive on weekdays. On weekends the shuttle continues to serve Kenton Drive, Regents Hall, Nunn Hall, and Norse Hall. The NKU Shuttle provides service during fall and spring semesters when school is in session. Service varies by day; Monday-Thursday service operates from 7:30 AM to 10:00 PM, Friday service operates from 7:30 AM to 7 PM, Saturday service operates from 10:30 AM to 2:00 PM and from 4:30 PM to 7:00 PM, and on Sunday service operates from 10:30 AM to 2:00 PM.

The NKU Shuttle is a relatively high performing route, with an average of 27.8 boardings per service hour, which is the highest of any local route that TANK operates. The shuttle also has 2.4 riders per service mile, which is the second highest of local routes.

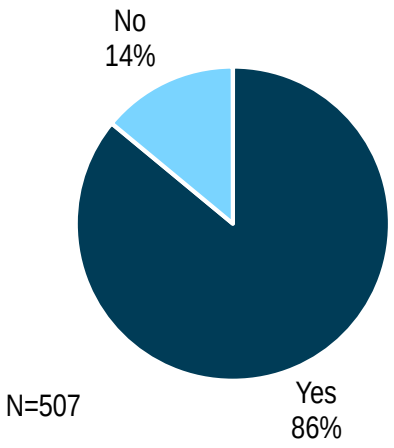
7 COMMUNITY SURVEY

The general public was encouraged to take a web-based online survey to help TANK understand mobility needs throughout the region. The survey was advertised on the TANK website and project stakeholders encouraged their clients and customers to participate as well. Over 500 community members took part and the following sections highlight their inputs.

Community Survey Findings

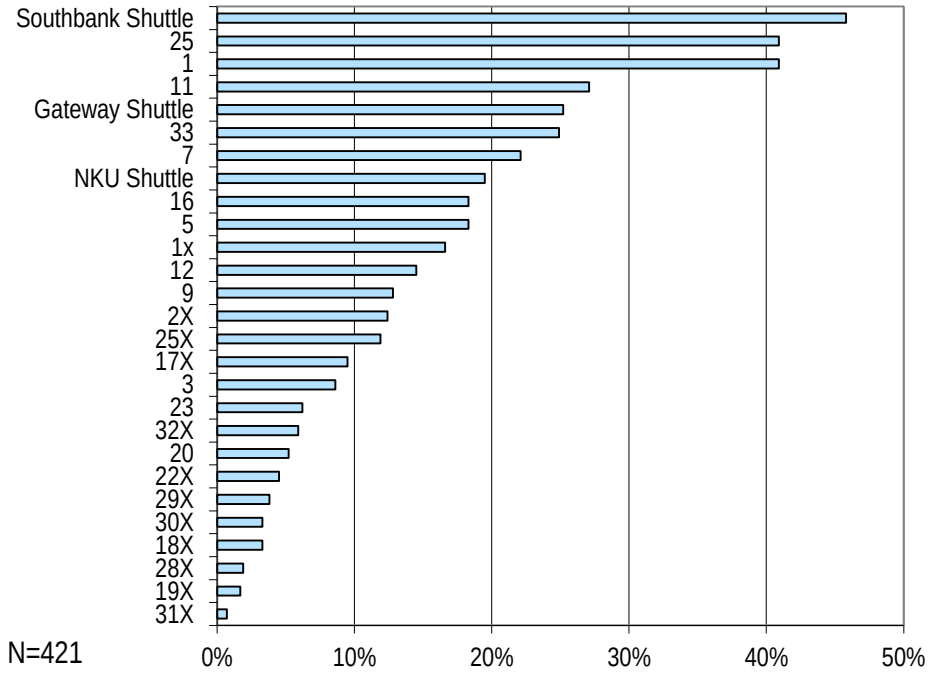
Most respondents are familiar with TANK services. Eighty six percent (86%) have used these transit services before, while 14% have never used TANK (Figure 34).

Figure 34 Prior Use of TANK Transit



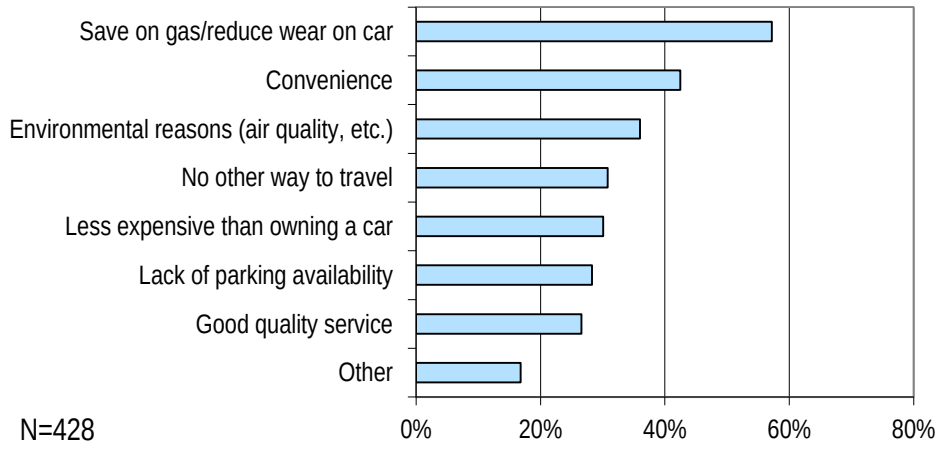
Of those respondents who have used TANK transit, over 40% have used the Southbank Shuttle, Route 25, and Route 1 (Figure 35).

Figure 35 Transit Service Used



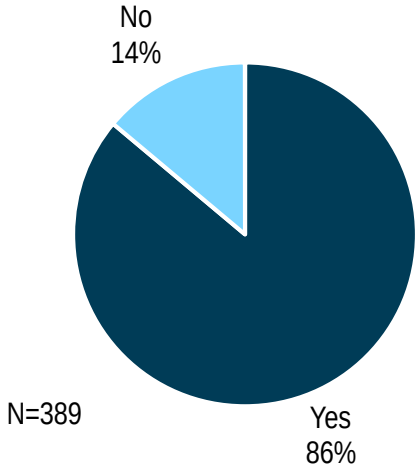
Fifty seven percent (57%) of respondents indicate they use transit to save gas and/or reduce wear on their car. Survey respondents also listed convenience (43%) as a reason for riding transit (Figure 36).

Figure 36 Reasons for Riding Transit



Respondents were asked whether or not TANK gets them to where they need to go, to which 86% responded yes (Figure 37).

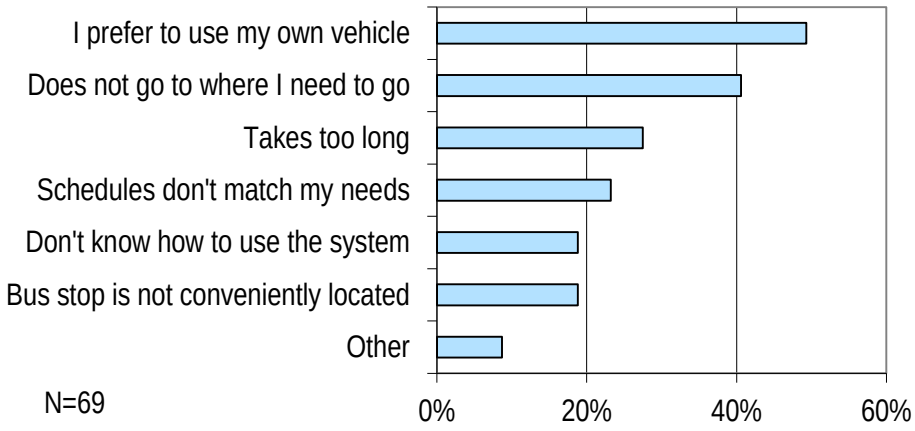
Figure 37 Effectiveness of TANK Service



Of those respondents who state they have not ever used TANK transit, nearly half (49%) prefer to drive their own vehicle (Figure 38). Forty one percent (41%) of respondents say service does not

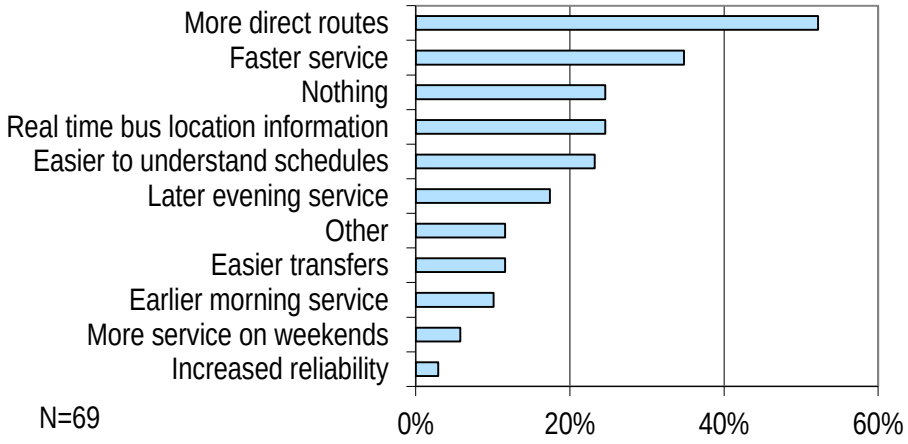
go where they need to go. Other reasons for not riding transit include additional travel time (28%) and ineffective schedules (23%).

Figure 38 Reasons for Not Riding Transit



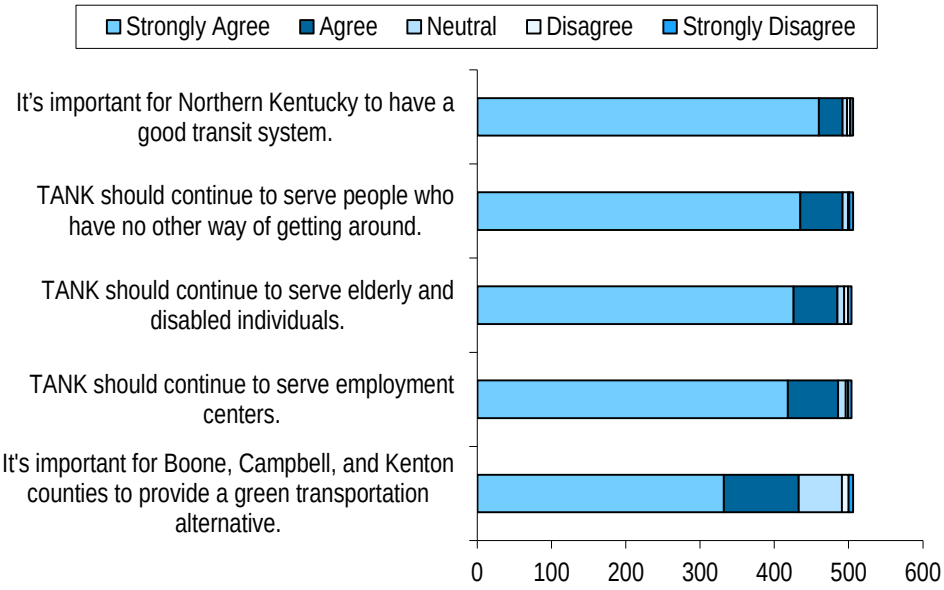
Of those respondents who state they have not ever used TANK transit, 52% indicate more direct routes would encourage them to reconsider using transit (Figure 39). Thirty five (35%) of respondents would be encouraged by faster service. Twenty five (25%) of respondents have no interest in using transit.

Figure 39 Factors that would encourage transit usage



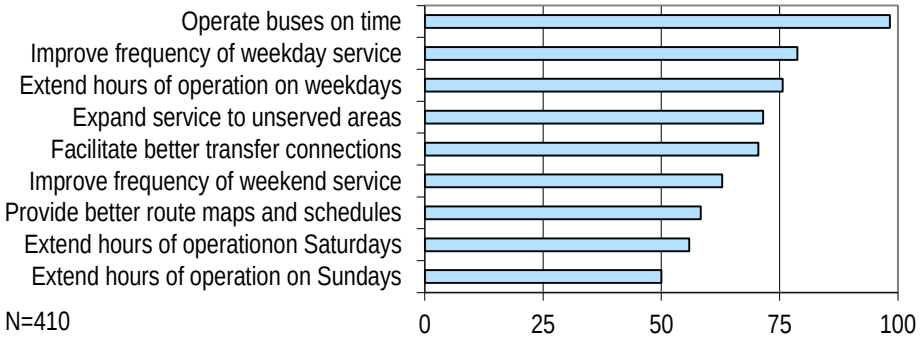
Almost all respondents (97%) agree or strongly agree that it is important for Northern Kentucky to have a good transit system. Between 86%-89% of respondents agree or strongly agree that TANK should continue to serve transit dependent, elderly, and disabled individuals (**Error! Reference source not found.**). Respondents did not feel like providing "green alternatives" had as high a priority.

Figure 40 Views on transit service priorities



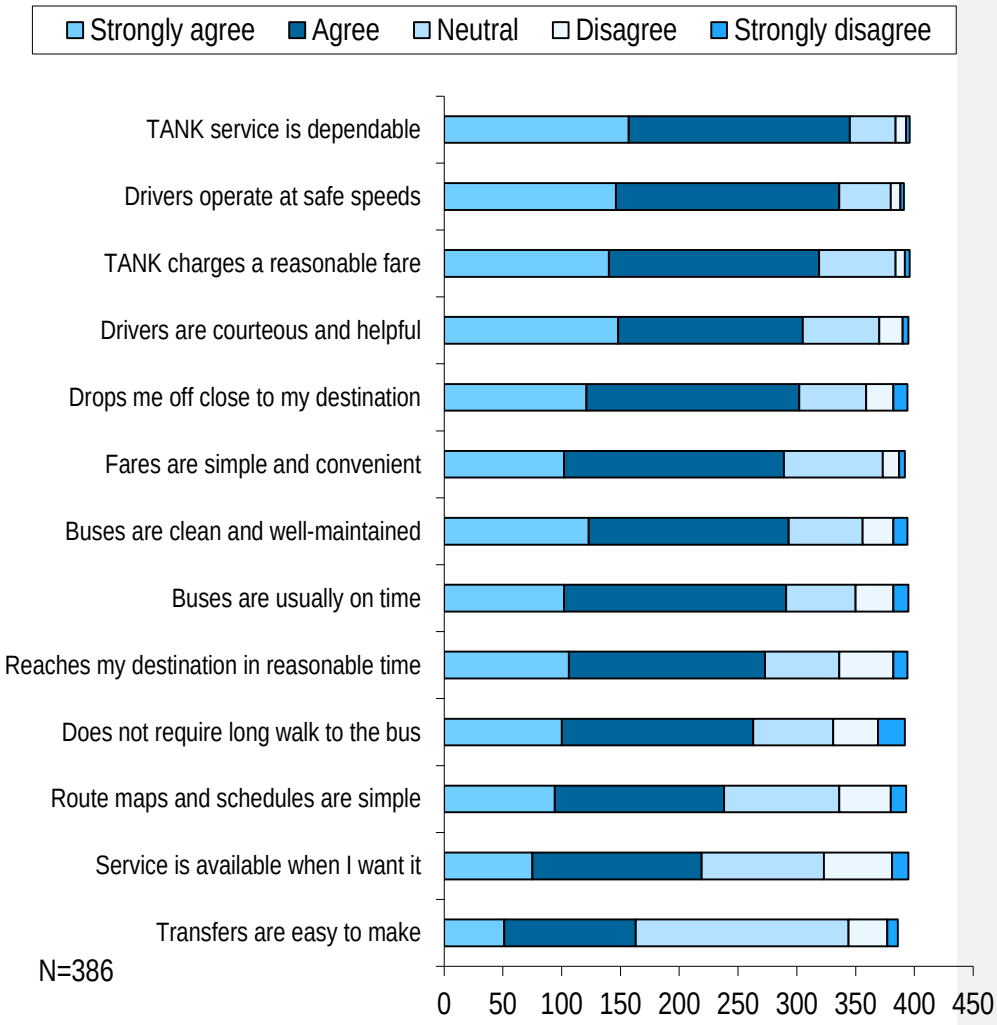
Respondents were asked to consider nine potential service improvements and rank them in order of importance. Potential service improvements were then assigned weighted scores based on the responses. The service improvement most important to respondents is operating bus on time (**Error! Reference source not found.**). On-time performance is typically not the "Number 1" service improvement priority in similar surveys at other transit systems. Improving the frequency and extending hours of weekday service are also preferred.

Figure 41 Preferred service improvements



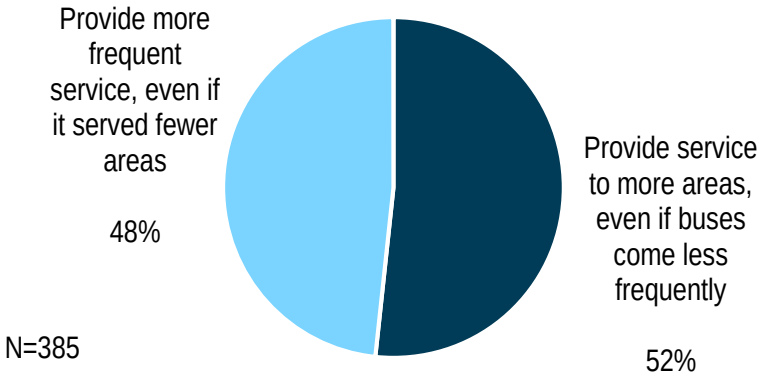
Respondents were asked to what degree they agreed on specific characteristics of existing TANK service (**Error! Reference source not found.**). These responses provide an overall rating of existing TANK service. Eighty seven percent (87%) of respondents agree or strongly agree that TANK service is dependable. Between 80%-86% of respondents agree or strongly agree the drivers operate at safe speeds and TANK charges a reasonable fare. Conversely, only 42% of respondents agree that transfers are easy to make. Service availability was also rated low.

Figure 42 Rating of existing TANK transit service



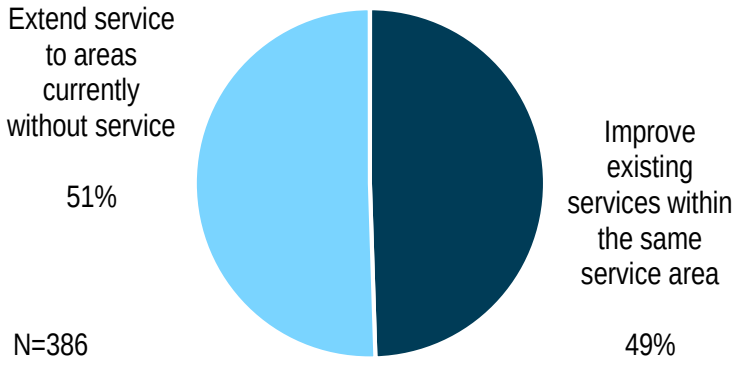
A series of tradeoff questions were asked to determine relative priorities. Respondents were evenly split on their preference of improving bus frequency or expanding service (Figure 43).

Figure 43 Preference of improving frequency or expanding service



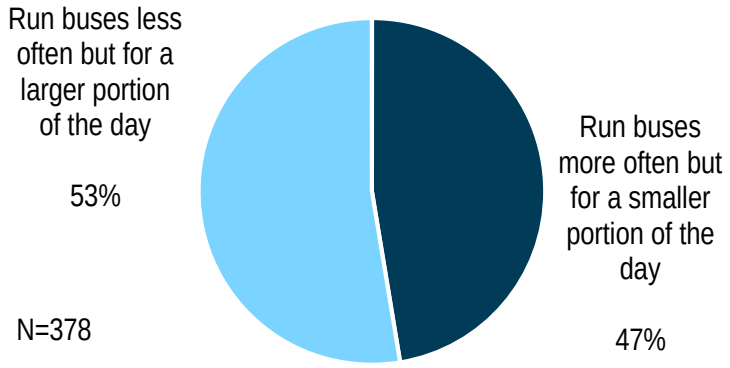
Similarly, respondents were evenly split on their preference of expanding service or improving existing routes (Figure 44).

Figure 44 Preference of expanding service or improving existing routes



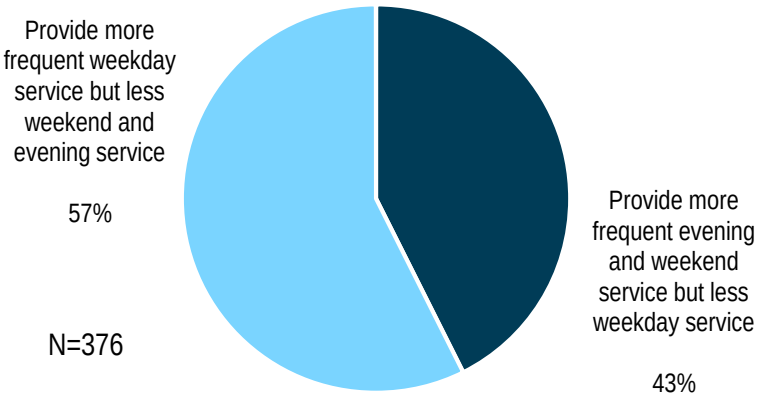
Respondents had a slight preference to run buses less often to expand span of service, but the difference is very small (**Error! Reference source not found.**).

Figure 45 Preference of increasing hours of operation or improving frequency



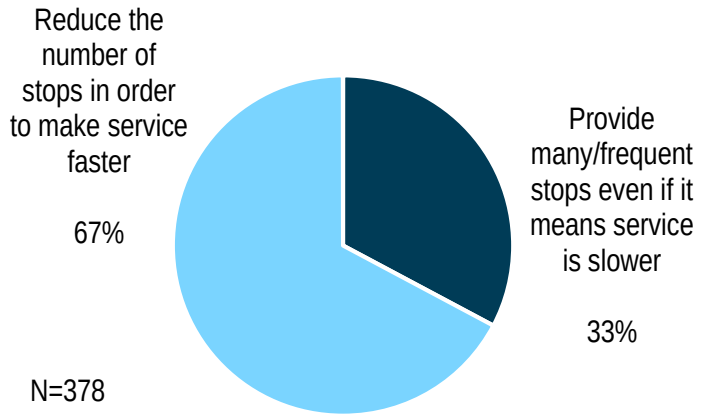
Respondents preferred adding additional weekday service (57%) over expanding weekend service (**Error! Reference source not found.**).

Figure 46 Preference of increasing weekday or evening and weekend service



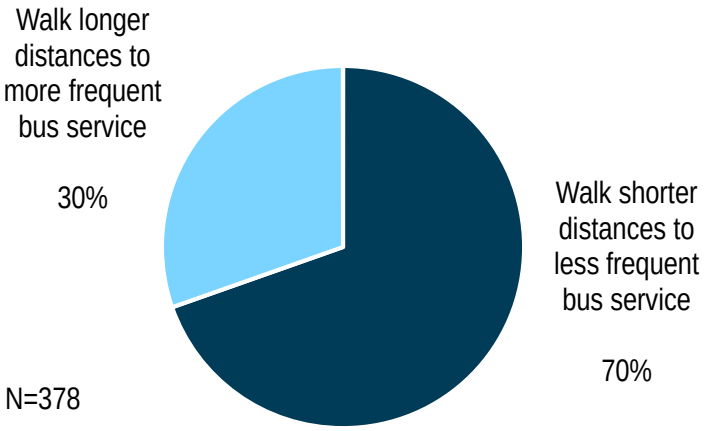
Respondents were in clear favor of reducing the number of bus stops (67%) in order to make the bus service faster (Figure 47). This suggests that passengers perceive there are too many bus stops.

Figure 47 Preference of reducing or maintaining the number of stops



Seventy percent (70%) of respondents prefer to walk a shorter distance even if service is less frequent (Figure 48). This may be a reflection of the pedestrian environment in the TANK service area, including an incomplete sidewalk network, wide arterials with fast flowing traffic, and steep grades in some places.

Figure 48 Preference of improving frequency or preserving bus stops

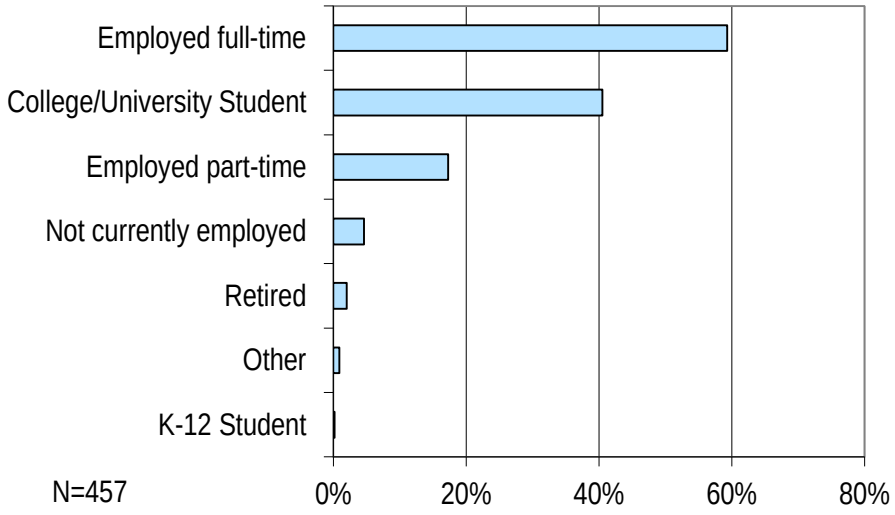


Community Survey Respondent Demographics

A high percentage (77%) of survey respondents are employed at least part-time (**Error! Reference source not found.**). Forty one percent (41%) of survey respondents are College and University students.

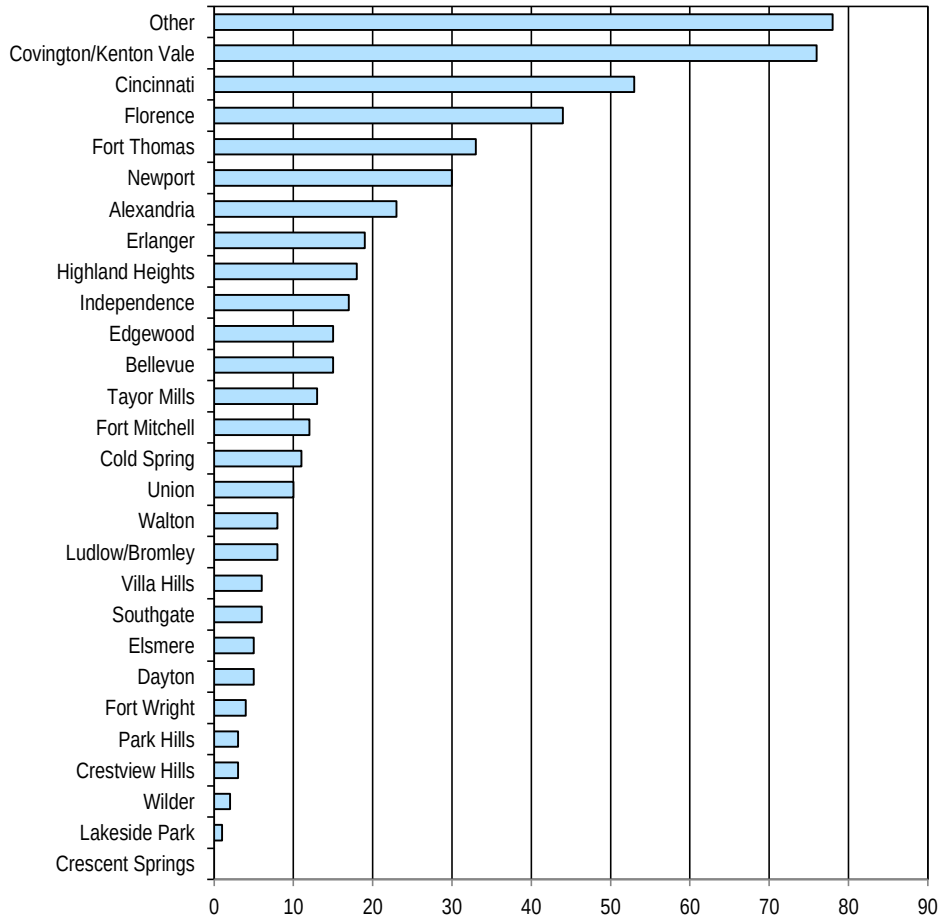
In a separate open-ended question regarding destinations not currently served by TANK, 15 respondents expressed a need to serve Northern Kentucky University or Gateway Community & Technical College campuses.

Figure 49 Survey Respondent Classification



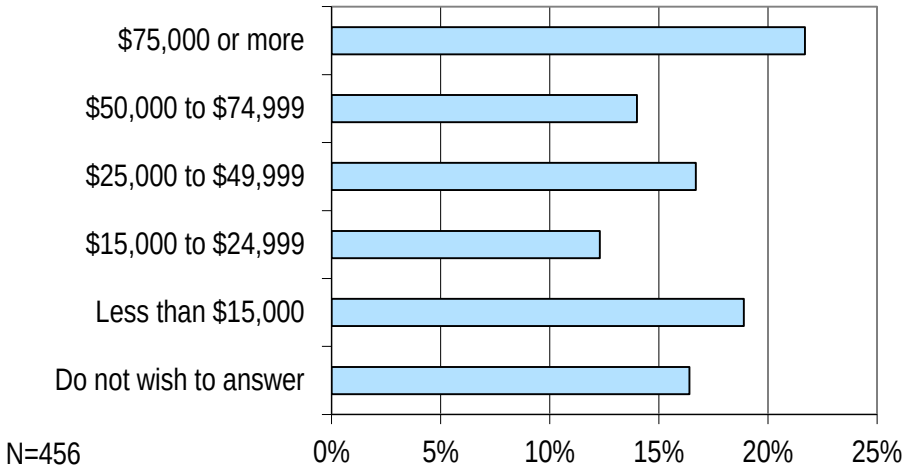
Survey respondents reside in a various cities across the Northern Kentucky region (**Error! Reference source not found.**). Covington/Kenton Vale an Cincinnati were the two most commonly mentioned residential areas.

Figure 50 Survey Respondent Residence



Over half (57%) of survey respondents providing a valid response have an annual household income of $50,000 or less (Figure 51).

Figure 51 Survey Respondent Household Income



8 SHORT TERM RECOMMENDATIONS

This chapter summarizes the short-term service and capital improvement recommendations developed as part of the TANK Transit Network Study Update. The goal of these recommendations is to make improvements to the system that are cost-neutral and help support ridership growth. This chapter includes guiding service design principals, route recommendations, and capital improvements.

GUIDING PRINCIPALS FOR SERVICE RECOMMENDATIONS

Route recommendations within this chapter are based on several key transit planning principles. These principles, described below, serve as the foundation for all service improvement recommendations and have been found to help increase transit ridership in our past experience.

- **Service Should be Simple:** First and foremost, for people to use transit, service should be designed so that it is easy to use and intuitive to understand. This applies not only to the routing and scheduling of service, but also to the information presented to customers at the stop and on passenger information materials.
- **Service Should Operate at Regular Intervals:** In general, people can easily remember repeating patterns, but have difficulty remembering irregular sequences. For this reason, routes should operate at regular frequencies to the extent possible.
- **Routes Should Operate Along a Direct Path:** The fewer directional changes a route makes, the easier it is to understand. Conversely, circuitous alignments are disorienting and difficult to remember. Routes should not deviate from the most direct alignment unless there is a compelling reason, such as to provide service to a major ridership generator. In such cases, the benefits of a deviation must be weighed against the inconvenience caused to passengers already on board.
- **Routes Should be Symmetrical:** Routes should operate along the same alignment in both directions to make it easy for riders to know how to get back to where they came from. In cases where such operation is not possible due to one-way streets or turn restrictions, routes should be designed so that the opposite directions parallel each other as closely as possible.
- **Routes Should Serve Well Defined Markets:** To make service easy to understand and to eliminate service duplication, routes should be developed to serve clearly defined markets. Ideally, corridors should be served by only one route unless the routes are complementary (such as providing greater over-all service frequency where it is warranted), or serve different functions in the transit network (such as local vs. express trips).

ROUTE RECOMMENDATIONS

Based on the above service design principles and the findings described in the Chapter 2 through Chapter 7, we have developed the following series of fiscally constrained service improvement

recommendations. The first draft of recommendations were presented to the public in September 2013. Through listening sessions, phone calls, emails, public meetings, and an on-line survey, hundreds of responses to the initial recommendations were received. Changes were made to the recommendations accordingly, and the revised recommendations are presented in this section.

The recommendations are presented in groups. This is reflective of the fact that transit systems are usually networks with inter-related components. Changes to one part of the network tend to impact other parts of the network. Furthermore, some changes are complementary, and their full benefit is only realized as a group.

The route recommendations described in this section assume that no new funding resources will be available. The package of recommendations is resource-neutral based on today's transit network. Improvement of service in terms of service frequency or service modification is completed though the restructure of existing services through realignments or elimination of service.

Overall, the themes of the improvements were multiple:

- **Provide more frequency in the corridors where market demand exists.** Corridors with frequency upgrades include Madison Avenue, Houston Road, Alexandria Pike, and York/Monmouth Streets in Newport.
- **Tailor service levels to the market.** Service to the Florence Industrial Park is upgraded, with faster travel times.
- **Reduce service to areas with less market demand.** Given no net increases in funding are assumed in the short-term, service to low-demand areas is reduced or consolidated into other routes.
- **Better connect the intra-Kentucky market.** A direct route connecting Newport and Covington would be created. In a non-funded short-term recommendation, a new route connecting NKU, Fort Wright, and Florence is also added.

A full description of all recommendations follows.

Florence / Edgewood Routes: 1, 18x, 19x, 42x and 28x

The routes in this group generally serve the southwest portion of the TANK service area, including Florence Mall, Northern Kentucky Industrial Park, Dixie Highway, and Turkeyfoot Road. Routes 18x, 19x, 28x, and 42x provide express service along I-75/71 and local service on their outer ends. These routes have very limited schedules, and run in opposite directions during peak periods. Route 1, on the other hand, provides frequent and bi-directional local service along the Dixie Highway Corridor, seven days a week.

Issues to Address

Route 1 has the highest ridership of all TANK routes, and serves a corridor with many ridership generators and two very strong anchors (downtown Cincinnati and Florence Mall). However, the route is very long (more than an hour end-to-end) and experiences heavy boarding and alighting activity. As a result, Route 1 has several trips approaching or exceeding seating capacity and a below average on-time performance rate. In addition, the route has alternating and circuitous routing on its outer end.

Route 18x serves Edgewood on Dudley Pike, and continues on Turkeyfoot Road and Dixie Highway prior to expressing into downtown Cincinnati. The majority of ridership activity is on

Dixie Highway, where Route 1 also has service. According to the ridership count, the highest load on Route 18x was 18 passengers, with several trips having less than 10 passengers.

Route 19x intersects with Route 1 at Hallam Avenue and Dixie Highway. As with Route 18x, passengers on Dixie Highway prefer to take Route 19x over Route 1 due to travel time savings. There is an unofficial park-and-ride about a block away from Dixie Highway which generates significant ridership on Route 19x. Beyond Dixie Highway, Route 19x generates very little ridership. 40 minutes of running time per round-trip is spent serving stops along Hallam Avenue and Turkeyfoot Road between Dixie Highway and Beechgrove Drive. However, at least half of the stops in this segment generate no boardings or alightings at all.

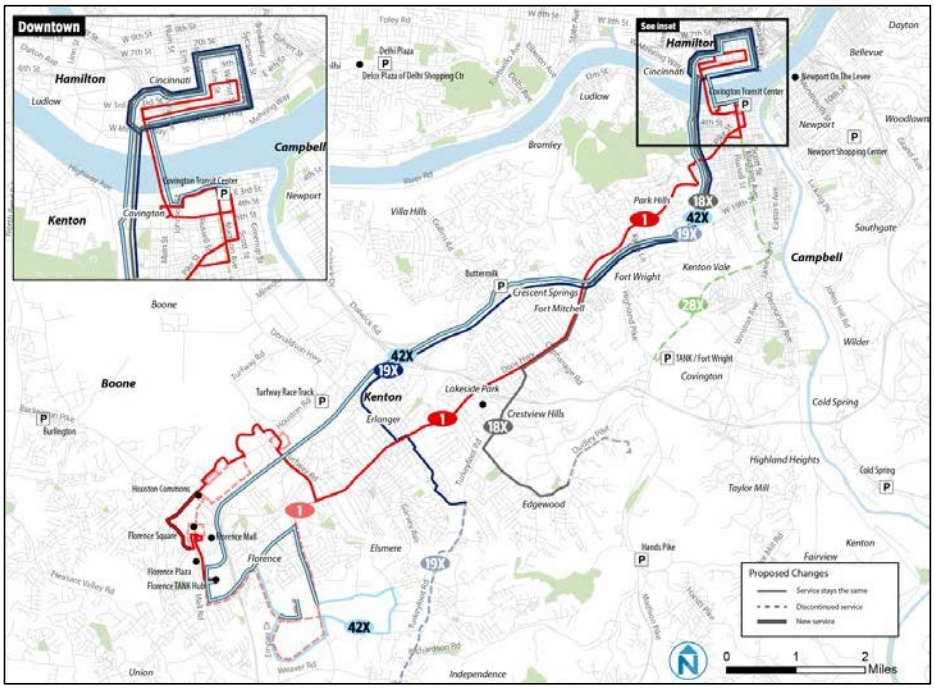
Route 28x has above average ridership per trip, but ridership growth may be limited by very early and very infrequent service. Route 28x is currently designed for very targeted markets, not to be an all-day route.

Finally, a new transit center was opened November 2013 in the vicinity of Florence Mall. This transit center will give TANK the opportunity to develop new services and new connection opportunities in the southwest portion of the service area, particularly with a park-and-ride market. TANK recently implemented Route 42x, adding four peak directional trips from the park-and-ride to downtown Cincinnati, as well as three midday round trips that also stop at the Buttermilk Park-and-Ride.

Proposed Service Improvements

Figure 52 below shows the proposed service improvement concepts for the Florence routes. The primary goal of the proposed service improvements is to provide higher levels of frequency to the all-day transit markets along Houston Road, leverage the new Florence Mall Transit Center Park-and-Ride service to provide better and faster reverse commute service to the industrial park south of Florence Mall, and to use the new Transit Center to connect the express and local trip markets.

Figure 52 Proposed Florence Area Service Improvements



Route 28x and Route 42x Recommendations

Route 28x today is primarily an express reverse commute route between downtown Covington, Cincinnati, and the Florence industrial park. It provides a significantly faster trip from downtown Cincinnati and Covington to the Florence job centers when compared to Route 1.

Route 42x and Route 28x should be consolidated into one new Route 42x. The new Route 42x would keep all existing peak directional trips to/from downtown Cincinnati and also provide more trips to the Industrial Park. In addition, to serve more employers, the route should be modified to serve Foundation Drive, Garvey Avenue, and New Buffington Road.

Route 42x would provide faster and more direct service to the Florence industrial park for the majority of employees and it would replace Route 1 service in the industrial park. Route 42x would become the only route serving the Empire Drive industrial area, and would shorten travel times between Cincinnati, Covington and the job sites by up to 30 minutes. Connections to Route 1 could be made at the Florence Mall Transit Center, allowing passengers to transfer between the regional express bus and the local Route 1 depending on their travel needs.

Route 42x would operate between the Florence Hub and downtown every 30 minutes in the morning and every 30 minutes in the afternoon between downtown and Florence Hub. During morning and afternoon peaks, Route 42x should serve the industrial park hourly, replacing Route 1 service. During midday, Route 42x would operate between 60 and 90 minutes. Several late night evening trips would also be provided for the third shift.

Route 42x would operate six round trips per day on Saturdays and Sundays, and one evening departure back into Cincinnati and Covington would be provided.

Route 1 Recommendations

In conjunction with the changes to Routes 28x and 42x, Route 1's alignment would be adjusted to better serve regional all-day destinations such as the medical, retail, and commercial areas along Houston Road. The existing reversing loops serving Houston Road and Empire Drive would be restructured to provide consistent, bi-directional service between the new Florence Mall Transit Center, Houston Road, and Turfway Road. Frequency on this segment would double, as a result.

In addition to modifying the terminal loop, Route 1 service in the Houston Road corridor would be streamlined and refocused on the largest retailers. Direct service to Meijer would be dropped, but the store could still be accessed from a bus stop at the intersection of Houston Road and Spiral Boulevard.

Service frequency and span of service would be similar to today's service levels along Dixie Highway.

Route 18x and 19x Recommendations

Route 18x and 19x are among the least productive commuter routes operated by TANK. Route 19x's primary ridership market is from the Methodist Church Park-and-ride by Dixie Highway and Route 18x does not have a park-and-ride on the route.

Route 18x should be truncated to end at Freedom Park in Edgewood. A new park-and-ride at this location should attract additional riders. Three morning inbound trips and three outbound trips would continue to be operated.

As with Route 18x, Route 19x should also be truncated so that the less productive areas of the route are no longer served. Route 19x should start at the intersection of Turkey Foot and Stevenson Road and continue to downtown Cincinnati on its existing alignment. Beech Grove would no longer be served by Route 19x. Three morning inbound trips and three outbound trips would continue to be operated.

Airport Area and Hebron: 1x, 2x, 17x, and 29x/39x/40x

This group of routes includes Route 2x, which provides all-day express service from Covington Transit Center (CTC) and downtown Cincinnati to the passenger terminals of Cincinnati / Northern Kentucky International Airport (CVG) and peak-period service to various warehouse and distribution centers east of the airport, including DHL. During peak-periods, the route also serves a Convergys facility along Pacific Avenue and provides a connection to the Dixie Highway Corridor.

East of CVG, Route 1x, a bi-directional express service that serves reverse commuters to the Citi campus on Houston Road, and traditional commuters from the Turfway Park and Houston Road park & rides to Covington Transit Center and downtown Cincinnati.

To the west of CVG, Route 29x serves several industrial parks, north and south of I-275, as well as one park & ride on either side of the interstate.

Issues to Address

Route 2x has the highest total ridership of all TANK Express routes, but Route 2x also has the lowest boardings per trip, boardings per mile, and boardings per hour among Express routes. These metrics are low, in part, because of the route's relatively high frequency and long span of service (particularly for an Express route), but also because ridership is highly concentrated at just a few stops. Most stops beyond the airport yield very few boardings, making the time spent serving these stops relatively unproductive. Additionally, when shown on passenger schedules, the circuitous nature of Route 2x may serve to intimidate prospective riders, particularly airline passengers who may be unfamiliar with the area or infrequent transit users.

Route 1x has very little in common with Route 1, and will likely have even less in common in the future. Currently, Route 1x services two park & ride lots on along the Houston Road corridor. The Houston Road Park & Ride is considered the primary lot, but has limited capacity. The Turfway Park facility is a shared-use lot and helps relieve over-crowding at the Houston Road facility. It is anticipated that once the new Florence Transit Center opens, the Turfway Park facility will cease to operate as a TANK park & ride.

Route 29x service to the east of the airport requires some passengers to endure long and circuitous trips before reaching their final destination. Travel time from the first time point after the bus exits I-275 for local service, to the last time point before it reenters the highway for the return trip to Cincinnati is 30 to 40 minutes. This likely limits the appeal of the service for some prospective riders.

Proposed Service Improvements

Figure 53 and Figure 54 below show the proposed service improvement concepts for this group of routes. The primary theme of the improvements is to create more consistency and ease of understanding for the CVG market by de-coupling some destinations and customizing passenger information for airport visitors.

Route 2x Recommendations

Route 2x should continue to serve the CVG terminal area all day and DHL during peak-periods. The schedule between downtown Cincinnati and CVG would be identical to the existing schedule. The industrial park segments of Route 2x should be renamed something other than Route 2x, such as the CVG Industrial Park Shuttle. The rational is that passengers to the airport want to see a clean, easy to understand schedule. A separate schedule for the airport, not showing the extension, should be created.

Recommendations for the service to the Industrial Park are described below.

Route 1x (Renamed 4x) Recommendations

During peak times, CVG industrial areas would instead be served by a Route 4x, a modified and renamed version of the current Route 1x which would serve both Convergys and the Citi campus, along with the existing park-and-rides. Route 4x would serve these destinations instead of directly "deadheading" back to the Houston Road Park-and-Ride.

In the peak direction between downtown Cincinnati and the Houston and Turfway Park-and-Rides, Route 4x would operate the same schedule as the existing Route 1x - commuters would not have any different service.

Route 4x would have several midday trips that connect Florence Hub with the Turfway, Houston, and Buttermilk park-and-rides.

CVG Industrial Park Flex Route Recommendations

The extension of Route 2x into the Industrial Park should be marketed as a separate route. In addition, it can be operated as a "Flex" route to provide on-demand transit service in areas that do not have the characteristics to support traditional fixed-route transit service. It is envisioned that the Flex service would have at two or three scheduled time-points such Homes and Commonwealth, near Dixie Highway, and along Terminal Drive on the approach to CVG, but the path between these points would not be defined. Instead, the route would be responsive to passenger requests called in to a dispatcher, or requested on-board. With some scheduled time points, the Flex service could provide "last-mile connections" for Route 1 and 4x passengers as well.

Route 29x Recommendations

TANK staff has recommended splitting Route 29x into two separate Routes (Route 39X and Route 40X) with each serving a distinct market east of CVG. Route 39X would focus on serving the industrial parks near the Limaburg Park & Ride, including Amazon, while Route 40x would focus primarily on the industrial parks closest to the Northbend Park & Ride (Figure 54). These change would result in faster, more direct service for most passengers, and may increase the appeal of the service for new riders.

Route 17x Recommendations

Route 17x carries good loads on most trips between Cincinnati and the Buttermilk Park-and-Ride. Ridership in Villa Hills is very low, with only 5 boardings throughout the day.

Route 17x should be truncated. The Villa Hills loop should be deleted. This will save approximately one revenue hour a day.

Route 17x midday trips should be extended to the Florence Mall Transit Center and consolidated with Route 4x.

Figure 53 Proposed Airport Area Service Improvements

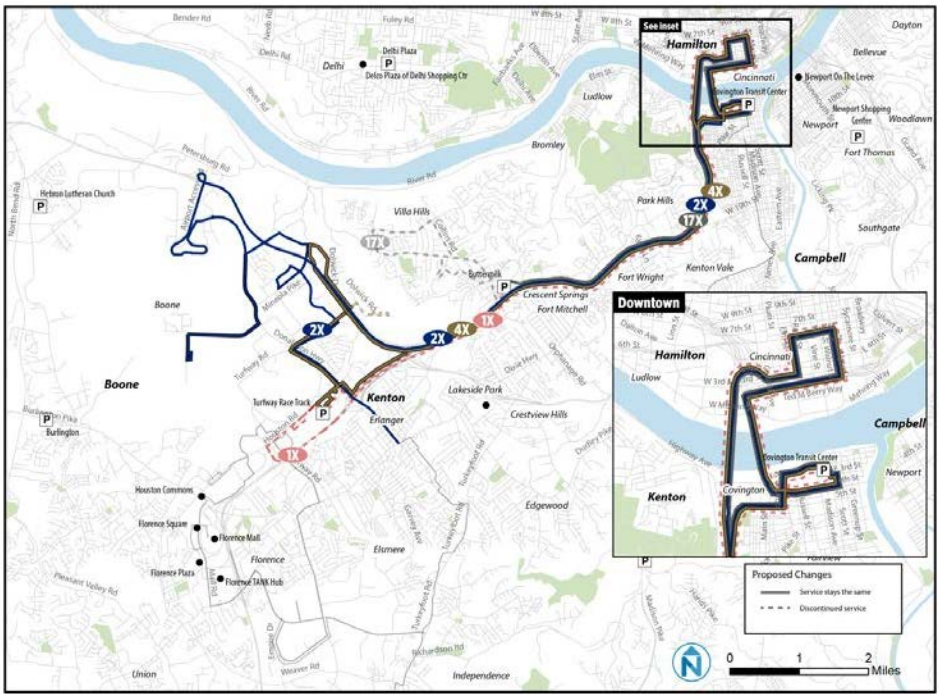
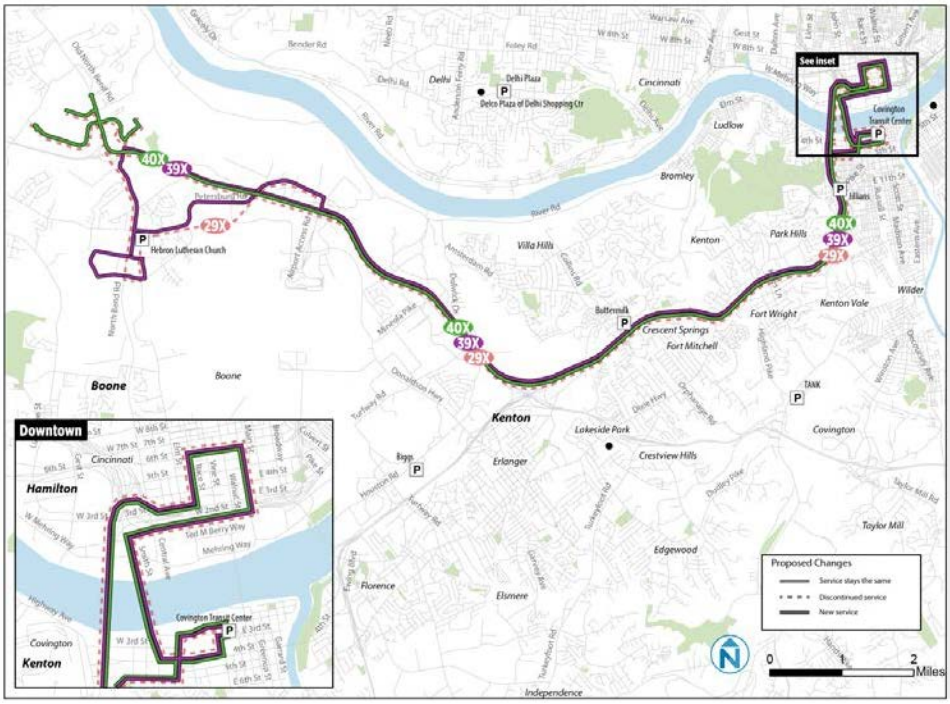


Figure 54 Proposed Hebron Area Service Improvements



Riverfront Routes: 3, 12, 16 and 23

These recommendations focus on routes operating along the riverfront of the Ohio River, on both sides of the Licking River. Route 3 provides all-day local service to river-side neighborhoods in Bromley, Ludlow, and Covington and links these neighborhoods to downtown Cincinnati. Route 12 provides similar service in Newport, Bellevue, and Dayton, east of the Licking River.

Route 23 also operates south of the Ohio River and east of the Licking River, but has a limited peak-period weekday schedule only. In addition to these three routes, the south bank is also served by the Southbank Shuttle, a local circulator connecting the urban areas of Covington and Newport with downtown Cincinnati. The shuttle is designed primarily to connect tourist areas, hotels, and convention centers in Covington, Cincinnati, and Newport.

Route 16, which extends as far south as Carmel Manor in Fort Thomas, is included in this group because its ridership is heavily concentrated in Newport, and it is currently interlined with Route 3, meaning that passengers from Ludlow and Covington have a one-seat connection to destinations such as Newport on the Levee and St. Elizabeth Hospital in Fort Thomas.

Issues to Address

The communities just across the Ohio River from downtown Cincinnati generally have high potential for transit ridership. These communities are dense and walkable, and have a mix of residential, retail, and commercial land-uses in close proximity. While connections from the

riverfront cities to Cincinnati are good, there are no routes that allow resident to travel between cities on opposite sides of the Licking River, without first traveling to Cincinnati. There are several destinations on either side of the Licking River that passengers would benefit from being able to access more directly. For example, The Covington Transit Center cannot be accessed directly from Newport, while the Newport on the Levee shopping center cannot be reached by Covington residents without first going through Cincinnati. In addition, Routes 12, 23, and the Southbank Shuttle serve similar markets in northern Newport, resulting in an excess of service relative to ridership and demand.

Proposed Service Improvements

The proposed service improvements for the riverfront area are shown in Figure 55. The primary theme of the improvements is to provide a direct connection between Covington and Newport, i.e. a crosstown between two of TANK's highest ridership areas, and to reduce duplication of service both between Kentucky and Ohio, and within northern Newport.

Southbank Shuttle Recommendations

The Southbank Shuttle alone provides connections from both Newport and Covington to downtown Cincinnati every 15 minutes. No recommendations are made for the Southbank Shuttle.

Route 3 Recommendations

Route 3 would continue to serve Bromley, Ludlow, the CTC, and downtown Cincinnati. The number of trips and scheduled operating times would be comparable to today.

On Saturday only, Route 3 would be interlined with Route 16 at the CTC. Saturday Route 3 service would operate every 120 minutes.

Route 16 Recommendations

Route 16's alignment between Newport and the CTC should use the Fourth Street Bridge over the Licking River. Bypassing downtown Cincinnati would create a faster and more direct connection between Newport and Covington, as shown in Figure 55 below. This would allow for faster and more convenient travel between Covington and Newport, and could increase transit use between the riverfront communities. It would also provide better all-day service to the redeveloping riverfront area in Covington.

Existing Route 16 passengers at the Newport Shopping Center Park-and-Ride and along York/Monmouth would continue to have direct service to downtown Cincinnati via Route 25. Additional recommendations for Route 16, describing the truncation of the route at St. Elizabeth Hospital, are found in the "Newport Routes" section.

Route 12 Recommendations

Route 12 is a good route serving Dayton. Several routing and scheduling changes are recommended for Route 12 to improve its ridership potential. First, Route 12's alignment should be shifted to serve E 6th Street between Riviera Drive and York/Monmouth Streets. This will serve the Kroger on Donnermeyer Drive, as well as provide all-day service to a more densely populated area of Newport.

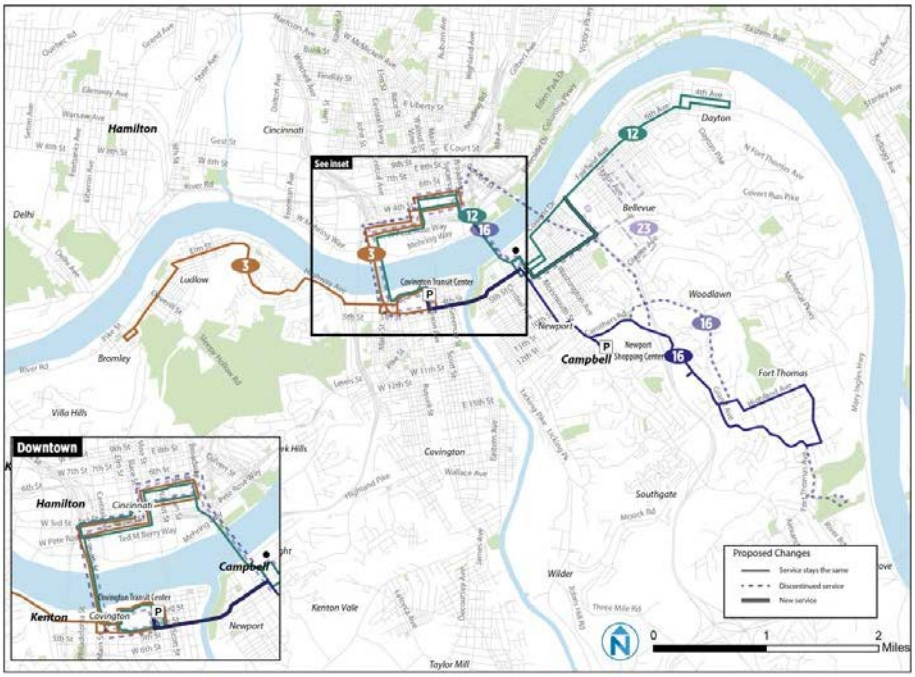
In addition, Route 12 should be scheduled to operate every 30 minutes during peak times and hourly during off-peak times. Route 12's schedule should be coordinated with Route 25's schedule in Newport so that a downtown Newport, downtown Cincinnati, Covington Transit

Center corridor may be operated every 15 minutes during peak times and every 30 minutes during off-peak times. This coordinated high-frequency service will connect some of TANK's highest ridership areas with service high frequency service.

Route 23 Recommendations

Route 23 is a peak only, low ridership route. Its largest markets are on E 6th Street and by the Kroger on Donnermeyer Drive. The modified Route 12 would serve these two areas. As a result Route 23 should be eliminated as all remaining portions of the route have insufficient ridership to warrant fixed-route bus service.

Figure 55 Proposed Riverfront Service Improvements



Covington / Latonia Routes: 5, 7, 9, 25, and 33

This group of routes provides radial service from downtown Cincinnati and Covington Transit Center, through Covington and Latonia, with a variety of final destinations in Edgewood, Fort Wright, and Independence. Besides the CTC, each route serves at least one other park-and-ride or transit center on its outer end. With the exception of Route 9, which operates on weekdays only, all of the routes in this group provide daily service.

Issues to Address

The Covington-Latonia corridor is served by four routes (7, 9, 25, and 33) on just as many different alignments. While there is certainly a benefit in maximizing transit coverage over a wide geographic area, spreading service out over several parallel streets can deny passengers the benefit of higher service frequencies. A transit user who is familiar with a route that runs by their home or work place may be less familiar with a route that serves a similar travel pattern but runs a block or two away. In a pedestrian-friendly environment that has high ridership potential, consolidating service along a single alignment can create high service frequency between key destinations. Passengers traveling between these destinations can have the confidence of going out to catch a bus without needing to refer to a passenger schedule.

The way they are currently designed, Route 9 serves a similar market to Route 7, operating just blocks apart from 20th Street to Covington Transit Center. Both routes serve Latonia Plaza at nearly the same time in. The routes are essentially competing with one another for riders, and Route 9 has very little unique market north of Latonia Plaza. South of the Plaza, Route 9 generates virtually no ridership until the Park-and-Ride at Cox Road and Taylor Mill Road. This segment of Route 9 represents approximately half of the total length of the route and 20 minutes of travel time per direction.

Route 7 is generally a stronger route in the Latonia-Covington corridor, as its all day-service likely affords it greater familiarity compared to Route 9. During morning peak periods, Route 7 has a scheduled layover at Decoursey and 38th Street after Latonia Plaza. In the afternoons, the layover is scheduled for Southern Avenue and Church Street. These layover points are well placed, as the vast majority of Route 7 boardings and alightings take place between downtown Cincinnati and Latonia Plaza. However, passengers with origins or destinations along the loop serving Rosedale Manor are faced with scheduled delays of more than 10 minutes during many peak period trips.

The Covington-Latonia corridor is also served by the western branch of Route 25. The two branches of Route 25 serve completely different markets and have little reason to be grouped together. Since downtown Cincinnati is the midpoint of the route, passengers may unintentionally board a bus heading in the wrong direction because of the common route number, despite the otherwise different destination signs.

Proposed Service Improvements

The primary themes of the service recommendations in the Covington-Latonia corridor are to coordinate service to create a high-frequency transit corridor along Madison Avenue, to re-brand Route 25 service in the corridor to reduce confusion , and to extend service to the new District in Taylor Mill development. Figure 56 shows the proposed route alignments.

Route 5 Recommendations

No recommendations are made for Route 5.

Route 7 Recommendations

To improve ridership in the Covington-Latonia corridor, a high frequency transit corridor can be established along Madison Avenue by converging the alignments of Route 33 and 7 from Latonia Avenue to downtown Cincinnati and coordinating their schedules to provide 15-minute peak-frequency in the corridor and 30-minute off-peak service.

For a high frequency transit corridor to work well, buses must be reliably on time, to ensure that "bus bunching" does not occur. Bus bunching is a situation where buses that should be evenly staggered arrive one right after the other, leaving a leaving a large time gap before the next bus. To reduce the likelihood of such a scenario in the Covington-Latonia corridor, Routes 7 should be shortened and streamlined. Route 7 is streamlined on its approach to Latonia Plaza, and features a smaller loop through the neighborhood east of the Plaza. Streets to be used include Latonia Avenue, E 43rd Street, Decoursey Avenue, E 44th Street, Huntington Avenue, E 40th Street, and Winston Avenue.

Route 7 should operate every 30-minutes during peaks and every 60-minutes during off-peak times. Route 7 would be interlined with Route 12 in downtown Cincinnati.

Route 33 Recommendations

In conjunction with the Route 7 changes, Route 33 should also operate on Madison Avenue. The route would be interlined with Route 25 (to NKU) in downtown Cincinnati. Route 33 should be truncated at the Fort Wright Hub to ensure the trunk corridor has reliable service and that the scheduled running times of Route 7 and Route 33 mesh together. A new Route 10 (see below) will serve Route 33's alignment between the Fort Wright Hub and Crestview Hills Town Center.

Route 33's proposed frequencies are 30-minutes during weekday peaks and midday times, and ever 60-minutes during evenings. If properly coordinated, Route 33 and Route 7 could provide 15-minute peak-frequency on Madison Avenue between Latonia Avenue, the Covington Transit Center, and downtown Cincinnati. Midday and evening service on the corridor would be a minimum of 30-minutes.

The coordination of Route 7 and Route 33's schedules allow for a frequency improvement to the highest ridership areas in Covington.

Route 9 Recommendations

The existing Route 9 is an ineffective route without a large unique market. The construction of the District of Taylor Mill development will change the nature of the area south of Latonia Plaza from a marginal peak only traffic generator to an all day destination. Route 9 service should be adjusted to serve that market, and should operate all day, not just during peak times.

Route 9 should terminate at the District of Taylor Mill and not continue further south. Any riders using the Cox Road Park-and-Ride can instead drive to the Independence Park-and-Ride which is served by Route 30x.

In addition, Route 9 should be modified in Covington to not compete with Routes 7 and 33 on Madison Avenue. Instead, the route should operate approximately on the alignment of the existing Route 25 in Covington, using Greenup/Scott, 15th Street, and Eastern to access James Avenue. Route 9 would continue to serve downtown Cincinnati.

All Route 9 trips would continue as Route 10 from the District of Taylor Mill to the Fort Wright Hub and Crestview Hills Town Center. If the redeveloped District of Taylor Mill does not allow for an effective bus turnaround, Route 9 should serve the Fidelity campus directly.

A one-seat ride from downtown Cincinnati and the Covington Transit Center would be maintained to Fidelity, Gateway Community & Technical College Edgewood, and St. Elizabeth Edgewood Hospital with a trip on Route 9, and continuing service on Route 10.

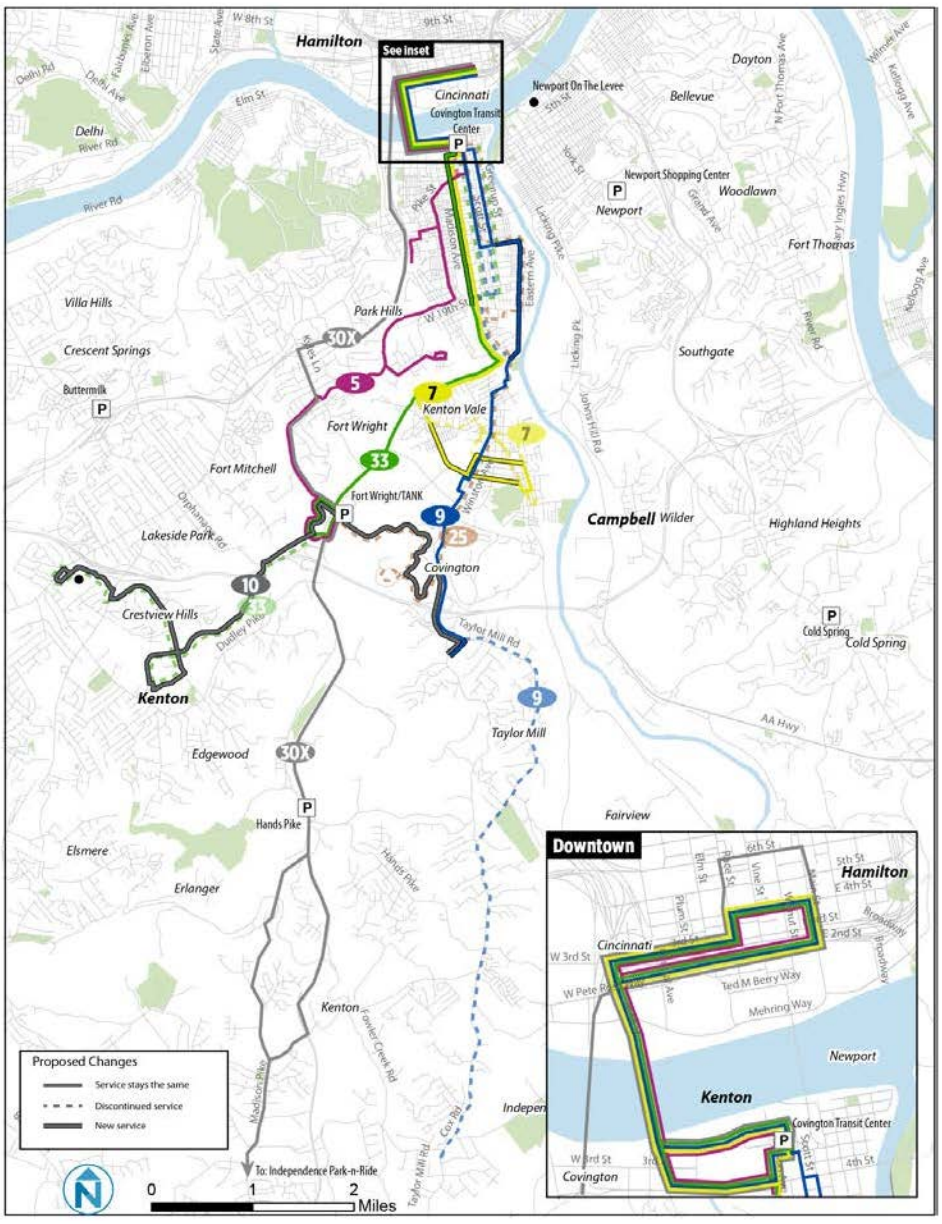
Route 9 would operate hourly throughout the day.

Route 10 (New Route) Recommendations

A new Route 10 would provide crosstown service between the District of Taylor Mill and the Crestview Hills Town Center. Route 10 would be interlined with Route 9 at the District of Taylor Mill. All Route 10 trips to the District at Taylor Mill would continue to the Covington Transit Center and downtown Cincinnati without the need to transfer.

Route 10's alignment would serve portions of the existing Routes 25 and 33 and would replace that service. It would serve the Fidelity complex, Fort Wright Hub, Wal-Mart, and the St. Elizabeth Hospital / Gateway campus. Route 10 would operate hourly.

Figure 56 Proposed Covington / Latonia Service Improvements



Newport Routes: 11, 16, 20, and 25

This group of routes provides radial service from downtown Cincinnati, through Newport, to a variety of destinations in Campbell County. Routes 11 and 25 serve the campus of Northern Kentucky University. The service characteristics of these routes range from peak-period only for Route 20, to weekday service on Route 11 to daily service on Routes 16 and 25.

Issues to Address

Overall, this group of routes provides service frequency and service coverage that appears to be out of balance with ridership demand. For example, Routes 11 and 16 overlap along South Fort Thomas Avenue, between Highland Road and River Road, providing high service frequency where demand is relatively low. Alternatively, between the Newport Shopping Center and downtown Cincinnati, ridership demand is high, yet the schedules of the overlapping routes are not coordinated to maximize frequency. Moreover, the Cincinnati – Newport – NKU market could support higher levels of service.

Some routes fail to attract sufficient ridership simply by virtue of the demographics and land-use of their service area. Route 20 in Newport has among the lowest ridership of any TANK route, despite a route design that serves several unique markets.

Proposed Service Improvements

Rationalizing service in Newport and Campbell County is the primary theme of these recommendations. Finding the unique market for Routes 11, 16, and 25 is the goal.

Route 16 Recommendations

Both Route 16 and Route 11 serve Fort Thomas Avenue and the ridership market is insufficient to support two different fixed routes. To reduce duplication, Route 16 should be shortened. Rather than serving the VA hospital, Route 16 would operate a one-way loop from St. Elizabeth St. Thomas campus via Highland, Fort Thomas Avenue, and Grand Avenue. (Figure 57). Route 11 will continue to serve riders on Fort Thomas Avenue and the VA hospital.

As described in the Riverfront recommendations, Route 16 would be reconfigured to connect Newport and the Covington Transit Center without traversing through downtown Cincinnati.

Route 16 is proposed to operate with 30-minute frequency in the peak and hourly during off-peak times.

Route 16 would operate on Saturdays. On Saturdays only, Route 16 and Route 3 would be interlined at the CTC and both would operate every 120 minutes.

Route 25 Recommendations

Route 25 should be rebranded to operate between the Covington Transit Center, downtown Cincinnati, NKU and Village Green only. An all-day version of Route 9 would continue to serve Eastern Avenue and Latonia.

Route 25 should be interlined with Route 33 in downtown Cincinnati. This interlining is necessary to achieve the cycle times needed for 15-minute coordinated service with Route 7 along Madison Avenue in Covington, through downtown Cincinnati, and Newport.

Service to the Alexandria Park-and-Ride should be discontinued due to low ridership and the need to have a consistent cycle time for all trips on Route 25/33 in order to coordinate schedules with Route 7.

Route 25 should operate at 30 minute frequency for most of the day. During evenings, Route 25's frequency would be hourly in the off-peak.

Route 11 Recommendations

Routes 11 and 25 overlap along Alexandria Pike between NKU and South Fort Thomas Avenue, resulting in higher service frequency than is warranted by ridership in this corridor. However, the two routes connect distinct markets to NKU, with Alexandria Pike providing the most direct routing in each case. Thus no changes are recommended for Route 11 at this time.

Route 20 Recommendations

Due to low ridership, Route 20 should be deleted. Most of Route 20's existing ridership is within a short walk of more frequent service on Route 25 or Route 16. The high density housing adjacent to the corner of 6th Street and Isabella Street would be served by the reconfigured Route 12.

Route 35X (New Route) Recommendations

Market outreach, the existing travel patterns on routes to NKU, and an assessment of travel demand for all students/staff at NKU indicate that a bus route between NKU and areas immediately east of the Licking River have the potential to support fixed-route bus service. At this time, TANK does not have the resources to support this service, but it is a market worth considering in the short-term.

To facilitate a one-seat connection between NKU, Fort Wright Hub, and the residential and commercial areas in Florence, and new limited-stop route, Route 35x is proposed (Figure 58). This route would operate along I-275 between NKU and Fort Wright Hub, and again from Fort Wright Hub to Dixie Highway, terminating at Florence Mall.

Connections to other routes may be made both at the Fort Wright Hub, as well as at the new Florence Mall Transit Center.

Route 35x would operate hourly on weekdays and require approximately 6,400 annual hours to run.

Figure 57 Proposed Newport / NKU Service Improvements

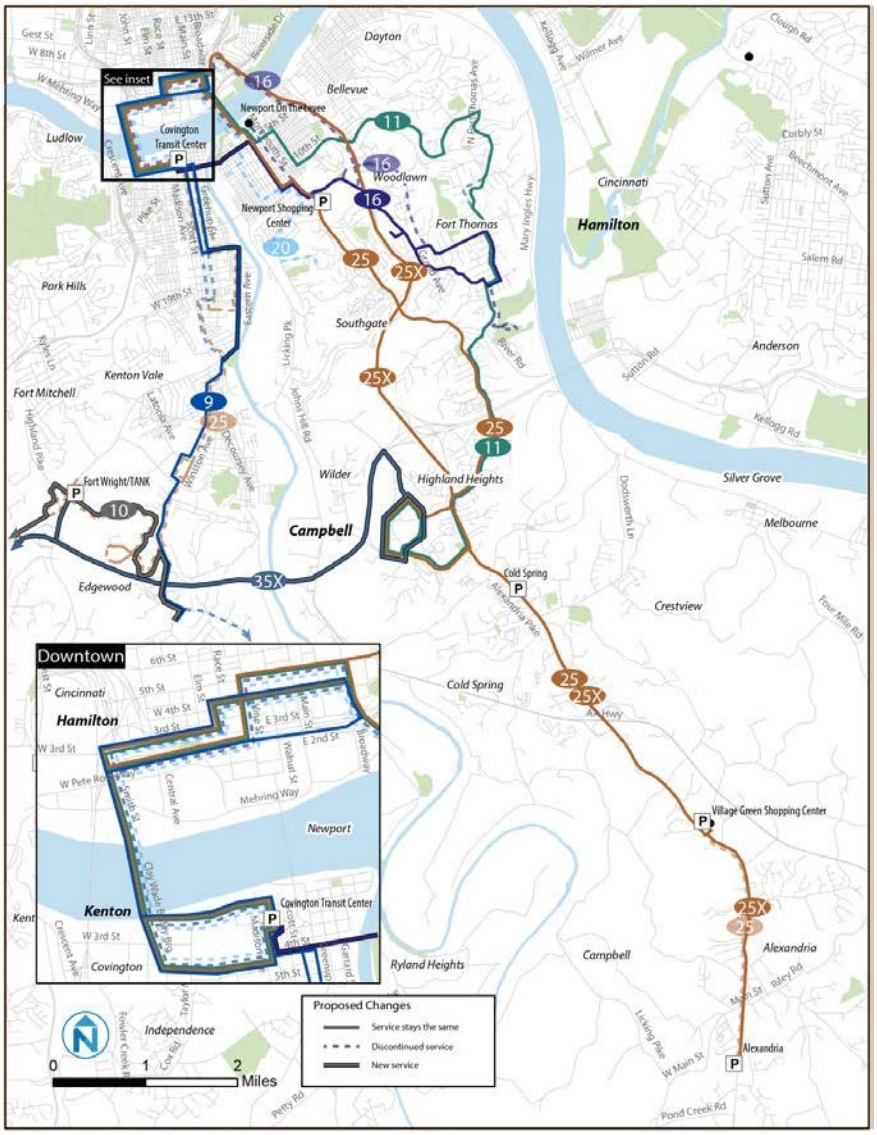
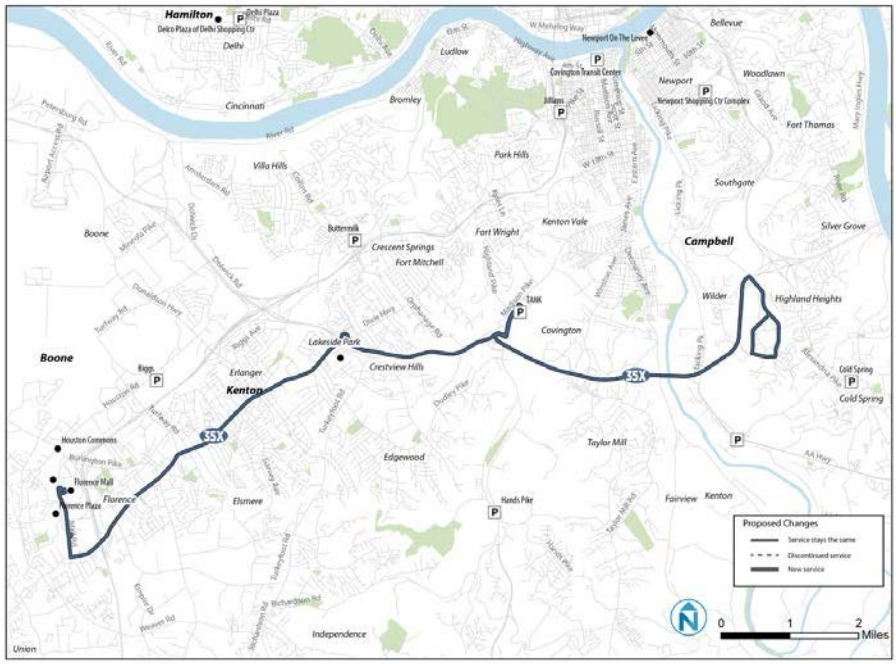


Figure 58 Proposed New Cross-Town Service



Other Express Routes: 22x, 25x, 30x, and 32x

The purpose of almost all of the express routes is to bring commuters into Cincinnati in the morning and back out of Cincinnati in the afternoon. There are no recommendations in the short term for these routes.

Route 22x Recommendations

No recommendations are made for Route 22x.

Route 25x Recommendations

No recommendations are made for Route 25x.

Route 30x Recommendations

No recommendations are made for Route 30x.

Route 32x Recommendations

No recommendations are made for Route 32x.

Frequency and Span

Figure 59 shows the proposed weekday span and frequency of all recommended routes. Figure 60 shows the proposed weekend span and frequency of all recommended routes. Routes with changes are bolded. The total revenue hours for the recommended routes are comparable to existing service levels.

Figure 59 Estimated Weekday Span and Frequency

Route	Name	Span	Frequency (Minutes unless noted)			
		Weekday	AM peak	Midday	PM Peak	Evening
1	Florence Mall	4:27am - 12:00am	10 - 25	30	15 - 20	30 – 50
4x	Florence Express	6:00am - 8:09am 10:47am - 6:13pm 9:10pm - 9:40pm	3 OB trips, 7 IB trips	3 OB trips, 2 IB trips	8 OB trips, 4 IB trips	1 IB trip
2x	Airport Express	4:40am - 12:57am	30	30 - 60	60	30 – 90
3	Cincinnati/ Ludlow/ Bromley	5:20am – 7:10pm	30	60	30	60
5	Holman/City Heights	4:38am - 10:25pm	30	60	30	40 – 45
7	Rosedale/Latonia	4:30am - 12:15am	30	60	30	60
9	Taylor Mill	6:00am - 11:30pm	60	60	60	60
10	Taylor Mill / Crestview	6:00am - 11:30pm	60	60	60	60
11	Ft. Thomas/NKU	4:51am - 7:04pm	30	60	30	--
12	Dayton	5:00am - 12:00am	30	60	30	60
16	Ft. Thomas/St. Elizabeth/CTC	6:15am – 6:40pm	30	60	30	60
17x	Villa Hills Express	6:25am - 7:35pm	15 - 42	2 OB trips 2 IB trips	20 - 60	--
18x	Edgewood Express	6:36am - 8:07am 4:12pm – 5:44pm	3 trips		3 trips	
19x	Erlanger Express	6:31am - 8:13am 4:09pm – 5:41pm	3 trips		3 trips	
20	South Newport	Route Deleted				
22x	Walton Express	6:10am – 7:55am 4:13pm – 6:03pm	4 IB trips	--	3 OB trips	--
23	South Bellevue	Route Deleted				
25	Cincinnati/ NKU/Village Green	4:30am - 11:00pm	30	30	30	60

Figure 59 (cont.) Estimated Span and Frequency

Route	Name	Span	Frequency (Minutes unless noted)			
		Weekday	AM peak	Midday	PM Peak	Evening
25x	Alexandria	5:52am - 8:06 3:55pm - 5:55pm	5 IB trips	--	5 OB trips	--
29x	Hebron Express	Route Replaced with 39x and 40X				
28x	Empire Drive	Consolidate with Route 42x				
30x	Independence Express	6:06am - 8:20am 4:03pm - 6:29pm	1 OB trip 4 IB trips	--	4 OB trips	--
31x	Rolling Hills	7:24am - 7:50am 5:05pm - 5:13pm	1 OB trip 1 IB trip	--	--	--
32x	Burlington Express	6:10am - 8:13am 4:14pm - 6:14pm	4 IB trips	--	4 OB trips	--
33	Fort Wright Hub	4:00am - 11:00pm	30	30	30	60
35x	Florence Hub / NKU	6:00am – 8:55pm	60	60	60	60
39X	Limaburg P&R	5:13am - 8:04am 1:38pm - 6:45pm	4 OB trips 4 IB trips	1 OB trip 1 IB trip	4 OB trips 4 IB trips	1 OB trip 1 IB trip
40X	Northbend P&R	5:08am - 8:00am 1:43pm - 7:05pm	4 OB trips 4 IB trips	1 OB trip 1 IB trip	4 OB trips 4 IB trips	1 OB trip 1 IB trip
42x	Florence Hub / Empire Drive Express	5:00am – 12:45am	4 OB trips 6 IB trips	5 OB trips 4 IB trips	5 OB trips 4 IB trips	2 OB trips 3 IB trips
SBS	Southbank Shuttle	5:55am - 7:24pm Mon-Thurs 5:55am - 10:25pm Fri.	15	15	15	15
GTWY	Gateway Shuttle	8:00am - 9:00pm Mon - Thurs	75	75	75	75
NKUS	NKU Shuttle	7:30am - 10:00pm Mon-Thurs 7:30am - 7pm Fri.				

Figure 60 Recommended Weekend Span and Frequency

Route	Name	Saturday Span	Saturday Frequency	Sunday Span	Sunday Frequency
1	Florence Mall	5:03am - 12:00am	30-60	5:40am - 12:00am	35-60
2x	Airport Express	4:30am - 11:45pm	75	4:53am - 11:45pm	75
3	Cincinnati / Ludlow/ Bromley	7:45am – 5:40pm	120	7:45am – 5:40pm	120
5	Holman/City Heights	7:00am - 8:30pm	60	9:00am - 8:30pm	120
7	Rosedale/Latonia	6:00am - 12:30am	60	8:00am - 10:30pm	60
9	Taylor Mill	6:00am – 10:30pm	80	7:20am – 10:30pm	80
10	Taylor Mill / Crestview	7:50am - 8:40pm	60	9:00am - 8:40pm	60
12	Dayton	6:30am - 10:00pm	60	8:30am - 8:40pm	60
16	CTC / Ft. Thomas / St Elizabeth	6:50am – 6:40pm	120	6:50am – 6:40pm	120
25	Cincinnati/ NKU/Village Green	6:00am - 10:00pm	60	7:00am - 10:00pm	60
33	Fort Wright Hub	5:30am - 12:30am	60	6:30am - 11:00pm	60
SBS	Southbank Shuttle	9:55am - 10:25pm	15	9:55am - 7:25pm	15
31x	Rolling Hills	7:20am - 7:50am 5:05am - 5:13pm	1 OB trip 1 IB trip	7:20am - 7:50am	1 OB Trip
42x	Florence Hub / Empire Drive Express	5:30am - 12:45am	6 OB trips 7 IB trips	5:30am - 12:45am	6 OB trips 7 IB trips

SERVICE IMPLEMENTATION

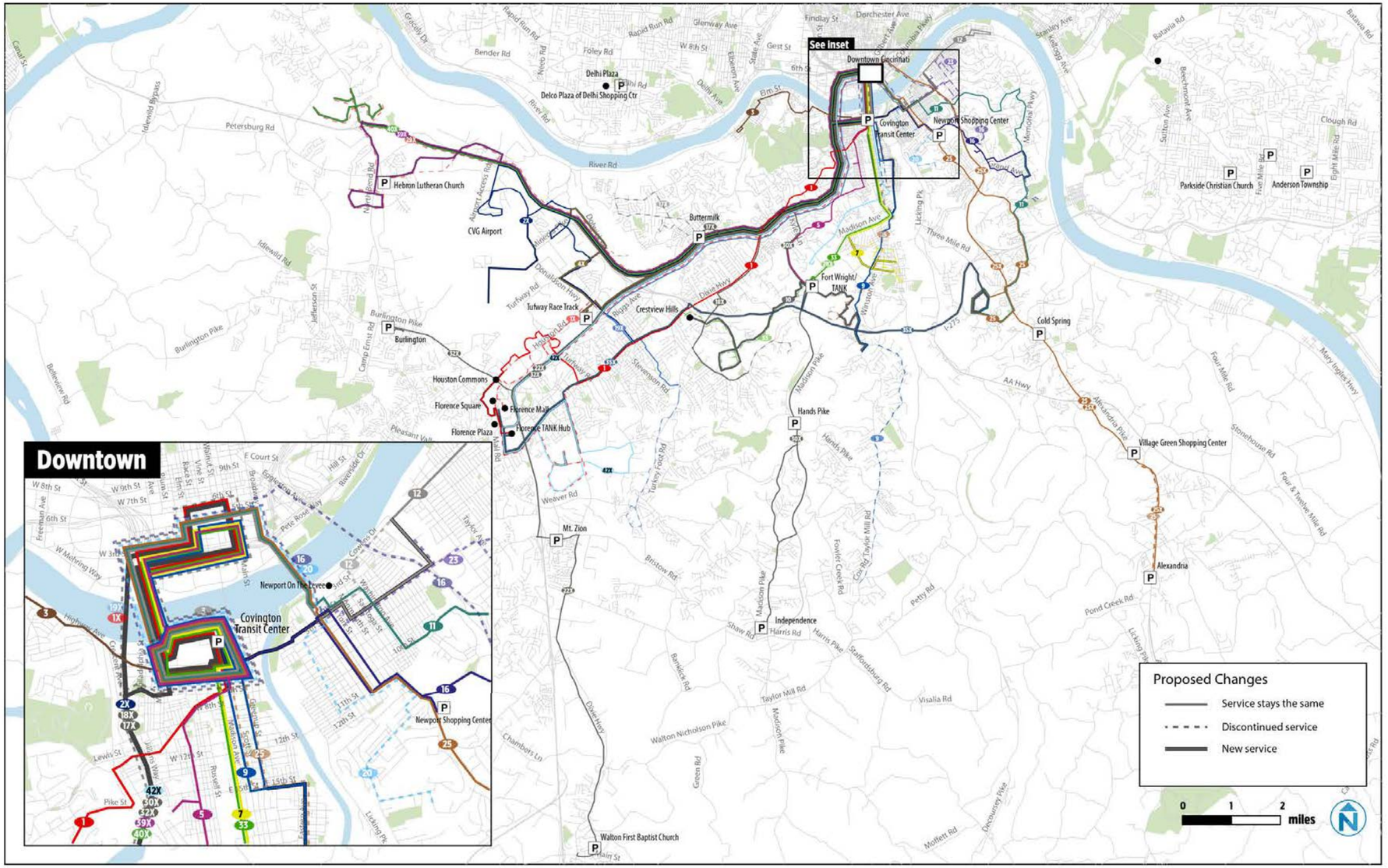
As mentioned previously, TANK service is a network with many interconnected elements. Some of the service changes described above can be implemented independently, while others can only be implemented as a group to avoid significant service disruption for passengers. The reference table in Figure 61 shows the prerequisite or concurrent service changes necessary to implement each proposes service change. Routes with changes are bolded. Figure 62 shows a system map of the proposed recommendations.

Figure 61 Service Implementation Summary

Comment [EM1]: The table is not fully up-to-date. See Implementation_phases spreadsheet for more accurate table.

Service Change Focus Route	Name	Prerequisite or Concurrent Service Changes	Other Prerequisites	Other Notes
1	Florence Mall	28x, 42x	Florence Hub	
1x	Florence Express	4x		Renamed 4x
2x	Airport Express	4x		
2x Ext.	CVG Shuttle	4x		
3/16	St. Elizabeth Ft. Thomas/CTC/ Ludlow/ Bromley	None		
4x	Florence Express	1x, 2x	Florence Hub	
5	Holman/City Heights	None		No Changes
7	Rosedale/Latonia	12, 33		
9	Taylor Mill	25	The District of Taylor Mill	
10	Taylor Mill / Crestview	25,33	The District of Taylor Mill	
11	Ft. Thomas/NKU	None		No Changes
12	Dayton	7, 23		
17x	Villa Hills Express	4x	Florence Hub	
18x	Edgewood Express	None		
19x	Beechwood Express	None		
20	South Newport	12		Route Deleted
22x	Walton Express	None		No Changes
23	South Bellevue	7		Route Deleted
25	Cincinnati/ NKU/Village Green	9, 33		
25x	Alexandria	None		No Changes
28x	Empire Drive Express	1, 42x	Florence Hub	
29x	Hebron Express	39x, 40x		
30x	Independence Express	None		No Changes
31x	Rolling Hills	None		No Changes
32x	Burlington Express	None		No Changes
33	Fort Wright Hub	7, 10, 25		
39x	Limaburg P&R	29x		
40x	Northbend P&R	29x		
42x	Florence Hub / Empire Drive	1, 28x	Florence Hub	
SBS	Southbank Shuttle	None		No Changes
GTWY	Gateway Shuttle	None		No Changes
NKUS	NKU Shuttle	None		No Changes

Figure 62 System Map of Proposed Short-Term Changes



SHORT-RANGE CAPITAL IMPROVEMENTS

The short-range capital improvements discussed below are intended to complement the proposed short-range service improvements and to enhance the overall passenger experience.

Focus Corridors

A key component of the short-term service improvement recommendations is the creation of two high-frequency transit corridors in Covington (all day) and Newport (peak periods). In each corridor, high service frequency is achieved through the convergence of two 30-minute peak-period routes into a single corridor. By coordinating the schedules of each pair of routes, an effective service frequency of every 15 minutes can be offered in the corridor.

In Covington, Routes 7 and 33 would converge from Madison Avenue at Latonia Avenue to Covington Transit Center (converging with more routes to serve downtown Cincinnati). In Newport, Routes 16 and 25 would converge at Newport Shopping center, running inbound along Alexandria Pike and Monmouth Street and outbound along York Street and Alexandria Pike.

The resulting high-frequency corridors present an opportunity for TANK, in collaboration with the respective municipalities, to focus infrastructure investment with the aim of creating a highly transit supportive environment.

In addition to the two proposed high-frequency transit corridors in Covington and Newport, Dixie Highway should be considered an important focus corridor for transit-supportive investment as well. The corridor is served by Route 1, which has the highest ridership and highest peak service frequency of all TANK routes. It is also a potential future BRT corridor.

The combination of high service frequency and special corridor treatments is often referred to as "Enhanced Bus" or "Bus Rapid Transit (BRT)" service. Enhanced Bus service typically operates in mixed traffic and uses more conventional transit vehicles than those used for BRT service. In some cases, Enhanced Bus service is an intermediate step between local bus and BRT or streetcar implementation. Through a route-convergence approach, TANK can implement Enhanced Bus service with existing fleet resources and without the need for specialized vehicles.

Corridor Treatments

Enhanced Bus service is often characterized by specialized branding and operational treatments applied to vehicles, service corridors, or both. Many of the treatments have a dual purpose of marketing the enhanced service and improving service characteristics such as travel time and reliability.

In the short-term, TANK would benefit most by focusing on corridor treatments rather than vehicle treatments. Specially designed or branded vehicles can complicate maintenance and route assignments for a transit system. Specialized parts may not be compatible with the rest of the fleet, and vehicles that are branded for a specific service cannot be assigned to other service types without diluting or confusing marketing efforts.

Corridor treatments can be very effective in signaling the presence of Enhanced Bus service. Treatment options can include the following:

Consolidated Stops and Enhanced Shelters – Passengers are often willing to walk a little bit farther to reach a bus stop with passenger amenities, particularly in pedestrian-friendly environments like northern Newport and eastern Covington. Bus stops within the high-capacity transit corridors could be consolidated and spaced every three or four blocks, rather than every one or two blocks as they are now. With fewer total stops, a higher percentage of stops in each corridor could have passenger amenities. In addition, fewer stops would reduce travel times, making transit more competitive with other modes in the corridor.

To help reinforce the important role of transit in the focus corridors, TANK could consider installing "enhanced shelters" which are designed to create a station-like environment with features including lighting, larger stylized canopies and seating, area maps, and even real-time bus arrival information.

KCATA MAX Shelter - Kansas City, MO

Bus Bulbs – Where on-street parking is permitted at all times, bus bulbs ensure that cars do not block bus stops by extending the sidewalk out toward the travel lane. By expanding the bus stop area, bus bulbs also provide a dedicated waiting area for transit users, allowing the adjacent sidewalk to remain clear for pedestrians.

Operationally, bus bulbs can improve travel time and on-time performance by allowing buses to remain in the travel lane while loading and unloading passengers. During peak periods, buses that pull out of the travel lane to access a bus stop can sometimes have difficulty pulling back into traffic, causing delays for passengers.

Bus Bulb - Seattle, WA

Bus bulbs can cause moderate traffic delays for other vehicles, and are often considered a traffic calming tool. Thus, bus bulbs are most appropriate in urban environments, like northern Newport and eastern Covington, where travel speeds are relatively slow and there are many parallel streets that offer alternative routings for automobiles. Bus bulbs are never appropriate at lay-over or recovery points.

Bus Bays – In higher speed and higher traffic volume environments like Alexandria Pike south of NKU, bus bays are a more appropriate bus stop treatment than bus bulbs. As opposed to bus bulbs which extend the passenger waiting area out toward the travel lane, bus bays push passengers back, away from fast-moving traffic.

Bus Bay - Tucson, AZ

In addition to improving the safety conditions of waiting passengers, bus bays allow traffic flow to continue uninterrupted during passenger loading and unloading. Bus bays do, however, create the potential for transit service delays if buses are unable to quickly re-enter traffic (during periods of congestion), and the potential for conflicts with other vehicles when slow moving buses enters faster moving traffic (during periods of free flowing traffic). These issues can be minimized by creating longer bus bays that include some room for acceleration before re-entry into general traffic. Bus bays are also ideal for lay-over or recovery points.

Exclusive or Restricted Lanes – Bus lanes can range from being fully exclusive to being restricted to certain vehicle movements or certain times of day. For example, a lane can be designated for buses and turning vehicles only, requiring through traffic to use other lanes. Or, a lane can be designated as bus-only during peak periods, and open to all other traffic or even parking during other times.

Operationally, exclusive or restricted lanes offer a form of service prioritization to buses by creating a dedicated or semi-dedicated right-of-way. When the lanes are painted or otherwise marked they also serve to inform transit users and prospective users of the presence and path of Enhanced Bus service.

Ultimately, the level of lane exclusivity must be determined on a case by case basis, taking into account factors such as traffic volume, roadway capacity, and alternative routings for delivery vehicles and automobiles.

Bus-Only Lane - New York, NY

Queue Jumps and Signal Priority – In congested corridors where capacity constraints do not allow for a full lane to be dedicated to transit service, queue jumps can provide an intersection-focused alternative. Queue jumps allow buses to avoid congestion-related delays by bypassing queued vehicles. This treatment is most appropriate at intersections where long cycle times on cross-streets have the potential to create long queues on the primary transit corridor.

Queue jumps can be combined with other functions, such as a near-side bus stop or a right-turn-only lane. In the case of a near-side stop / queue jump combination, buses may be permitted to proceed through the intersection during the "Leading Pedestrian Interval," or the period in which pedestrians may walk, but before other traffic gets a green phase. This combination of pull-out lane and prioritization would allow buses to bypass other traffic queued at an intersection and give buses a head start over other vehicles in proceeding through the intersection.

In the case of a far-side stop, buses could be allowed to proceed straight through an intersection from a lane that is designated as right-turn-only for other vehicles. A right turn arrow phase could clear the turn lane of vehicles in front of the bus, and allow it to proceed through the intersection ahead of vehicles in the other travel lanes.

Queue Jump - Portland, OR

Freeway Corridors

TANK's express routes operate primarily along freeway corridors and are susceptible to delays caused by peak-period traffic congestion. The I-75 corridor between the Buttermilk interchange and Cincinnati is particularly congested. In some regions, buses are permitted to operate along freeway shoulder lanes in order to bypass traffic congestion and incentivize the use of transit.

The primary requirement for buses to operate in the shoulder is for main-lane traffic speeds to fall below a certain speed (often 35 mph). Secondly, the differential speed between shoulder-running buses and main-lane traffic must not exceed 15 mph. Thus, buses operating adjacent to stop-and-go traffic are limited to top speeds of just over 15 mph. But even at such relatively low speeds, the time savings for bus passengers can be significant compared to main-lane travel speeds. When main-lane speeds exceed 35 mph, it is generally considered unsafe and unnecessary for buses to operate in the shoulder, and regular main-lane operation resumes.

Bus Operations on Freeway Shoulder - Minneapolis, MN

Ideally, shoulders should be at least 12-ft. wide to facilitate bus operations on freeways. In addition, regions where bus operations on freeways are permitted often have programs in place to quickly remove stalled vehicles from shoulder lanes.

In some place, including in Cincinnati, buses operate in the left shoulder, while in other place, like in Minneapolis, buses operate in the right shoulder. Both approaches have risks and benefits. Operating in left shoulder tends to allow for faster travel speeds, but also requires buses to cross several lanes of traffic to get to and from the left lane (except where there is a left side exit lane). Buses operating in the right shoulder must be aware of other vehicles entering or exiting the freeway as they cross over and thus often operate at somewhat slower speeds.

During the peak hour, TANK operates 20 buses per hour in the peak direction on the Brent Spence bridge. Given that the average commuter route averages between 20 and 25 passengers, and the potential for future growth, provisions for shoulder running or an HOV lane on the bridge should be considered.

Covington Transit Center

The integration of Covington Transit Center into a parking structure is an innovative and cost-effective approach to siting a large transit center in a dense urban environment. For passengers, the station offers protection from the elements and access to nearly every TANK route. However, in its current design, the station lacks a "human scale" and feels very much like a parking garage.

TANK is currently examining strategies to improve the customer experience at the Covington Transit Center. Strategies that could be looked at include real time information, improved signage and wayfinding outside the transit center, and the use of different lighting and materials to improve the overall customer experience.

Transit Tunnel - Seattle, WA

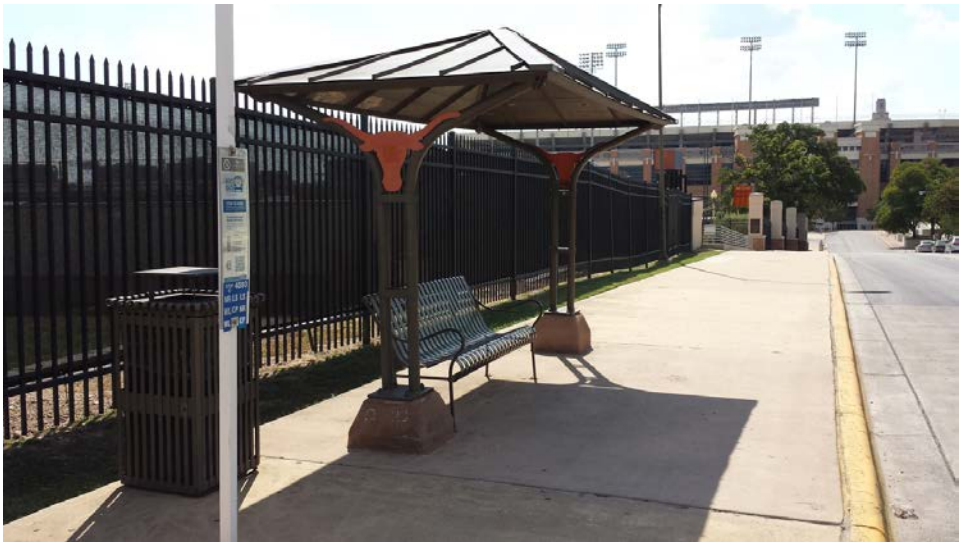
Northern Kentucky University Enhanced Bus Stop

NKU is a focal point of TANK service, with several existing routes serving the campus. NKU, with its pass agreement, is a major ridership market, and is projected to continue to grow as enrollment grows. The ridership count showed there were 138 boardings on Kenton Drive on Routes 11 and 25.

The short-term recommendations suggest adding another route to the NKU campus to accommodate travel between NKU, Fort Wright, and Florence. This will further increase the number of transit patrons on NKU's campus.

Market research has consistently shown that high quality transit amenities will attract more people to use transit services. The growth in transit ridership on NKU's campus would be boosted by the creation of a high quality enhanced bus stop. Amenities for this could include unique

shelters, lighting, rider information, and artwork that showcased TANK services. This enhanced bus stop would be the focal point of service on NKU's campus. Space for at least three bus bays should be included to account for existing services and up to two additional routes.



Customized Bus Shelter - University of Texas at Austin

New Edgewood Park-and-Ride

Edgewood is at the geographic center of the western part of the TANK service area and includes both a mix of residential neighborhoods and key regional destinations like Gateway Community College, Thomas Moore College, and St. Elizabeth Medical Center. While there are major destinations, the residential density is dispersed, and could be focused more effectively in a park-and-ride. The express service from Edgewood needs additional density to maintain long-term viability. To facilitate the development of a larger network in the area, a new **Edgewood Transit Park-and-Ride** should be considered for the area. A potential location for this is in the vicinity of Freedom Park on Dudley Pike. Eventually, this hub can serve as an anchor for local and regional fixed-route service, and in the long-term, neighborhood circulators, and site-specific shuttles.

System-Wide Passenger Amenities

Outside of the transit focus corridors, the over-all transit experience can be improved with the continued deployment of passenger amenities such as benches and shelters. These amenities not only improve the passenger experience for existing riders, but also create a more inviting image for prospective transit users.

Many transit users would prefer that all stops have passenger amenities, but realistically, only 15-20% of stops in a system the size of TANK will have the ridership levels to justify the investment.

9 LONG RANGE RECOMMENDATIONS

The short-range service recommendations described in the previous chapters are meant to align TANK's existing service with demand, and create a more productive transit network within the confines of the existing budget. The long-range service recommendations, described below, focus on opportunities to grow TANK ridership through strategic investments in service, facilities, and branding. These are priorities that, in general, will require additional funding sources.

MULTI-HUB SYSTEM

TANK has traditionally provided radial bus service to and from downtown Cincinnati. However, as the communities of Northern Kentucky continue to grow in population and mature economically, the demand for travel between these communities will continue to grow, particularly to regional destinations such as the Florence Mall area. To facilitate a greater variety of travel patterns in the future, TANK must provide passengers with more cross-town and inter-county service coupled with more "pivot-points" where passengers can efficiently transfer from radial to cross-town routes.

The short-range service recommendations begin to address this issue with recommended direct service between Covington and Newport. Additionally, the concept of a regional route connecting NKU, Fort Wright Hub, the Dixie Highway corridor, and Florence Mall is introduced in the short-range recommendations, with the caveat that it is not a cost-neutral recommendation.

Improved cross-town and inter-county service is a primary theme of the long-range recommendations. Supporting capital infrastructure is necessary to implement many of these recommendations, as they require connections between bus routes and in some cases parking capacity. Two new major focal points of service at NKU and at CVG Airport are recommended, as are other focal points.

Service to the Proposed NKU Hub

As a large public university, NKU serves as a major regional destination and a significant employment hub. NKU has been growing, and there is increasing awareness of the important of the non-driving population to access NKU.

The university's location near the intersection of I-275, I -471, and Alexandria Pike makes it an ideal location for a regional transit hub. Several TANK routes currently serve NKU, including an all-day service on Routes 25 and 11. TANK and the university have plans to develop a transit center or focal point of service on the southern edge of campus. These plans may be completed in the next five years.

With the new transit center, NKU could serve as an outer hub for the TANK service area, facilitating traditional radial service into Newport and Cincinnati, and new cross-town service along the I-275 corridor. To the west, service could operate along I-275 between NKU and Fort Wright Hub, and again from Fort Wright Hub to Dixie Highway, terminating at Florence Mall.

This concept was introduced and referred to as **Route 35x** in the Short-Range Service Recommendations. Existing and projected regional travel patterns suggest that a direct connection between NKU and Kenton and Boone Counties has strong ridership potential and should thus be considered a high long-range priority.

A transit center at NKU could also facilitate future service between Campbell County and Cincinnati / Northern Kentucky International Airport (**Route 37x**). During peak periods, separate express routes would operate between NKU and Florence Mall, and NKU and CVG every 30 minutes (Figure 63). In the mid-day and evening, a combined route could serve NKU, Florence Mall, and CVG as a 90-minute loop. Initially, these routes would operate on weekdays only.

To the east, new limited-stop or express service could connect NKU to Anderson Station Park & Ride in Hamilton County, Ohio (**Route 44x**) and Union Township Park & Ride in Claremont County, Ohio (**Route 43x**). Commuters traveling between Hamilton or Clermont County in Ohio, and Campbell, Kenton or Boone County in Kentucky could bypass downtown Cincinnati and travel more directly to destinations along the I-275 corridor (Figure 63).

Route 42x and 43x are similar to two routes operated by SORTA: Metro Route 75x connects Anderson Township to downtown Cincinnati, and Route 82x operates between Union Township and downtown Cincinnati. Both Metro routes travel along I-275 through Northern Kentucky, but neither makes a stops until downtown Cincinnati. Additionally, the Metro routes are peak-period only. To help share the cost of Route 42x and 43x, TANK could partner with SORTA for combined mid-day trips serving Union Township, Anderson Township, NKU and downtown Cincinnati.

During peak periods, separate express routes would operate between NKU and Anderson Township, and NKU and Union Township every 30 minutes (Figure 64). To maintain an hourly cycle-time, it is recommended to interline the two routes, so that buses alternate between the shorter Anderson Township trips and the longer Union Township trips. For example, a bus departing Anderson Township for NKU, could then serve Union Township on the outbound trip, thus combining a long and short trip segment. Mid-day service would consist of four round trips serving both Union and Anderson Township, along with NKU. The same combined routing would be used for a single evening trip in each direction. Initially, these routes would operate on weekdays only.

In the longer term, TANK should also examine the possibility of bus service directly connecting the region's major educational facilities. In particular, direct, fast service from NKU to Uptown Cincinnati/UC should be discussed to see if a partnership to operate such a service may be developed.

The NKU Hub should also facilitate enhanced local service. A new circulator serving Moock Road is described in the Neighborhood Circulator section below, and frequency improvements to Route 25 are described in the Enhanced Bus section.

Figure 63 Proposed Cross-Town Service anchored at NKU

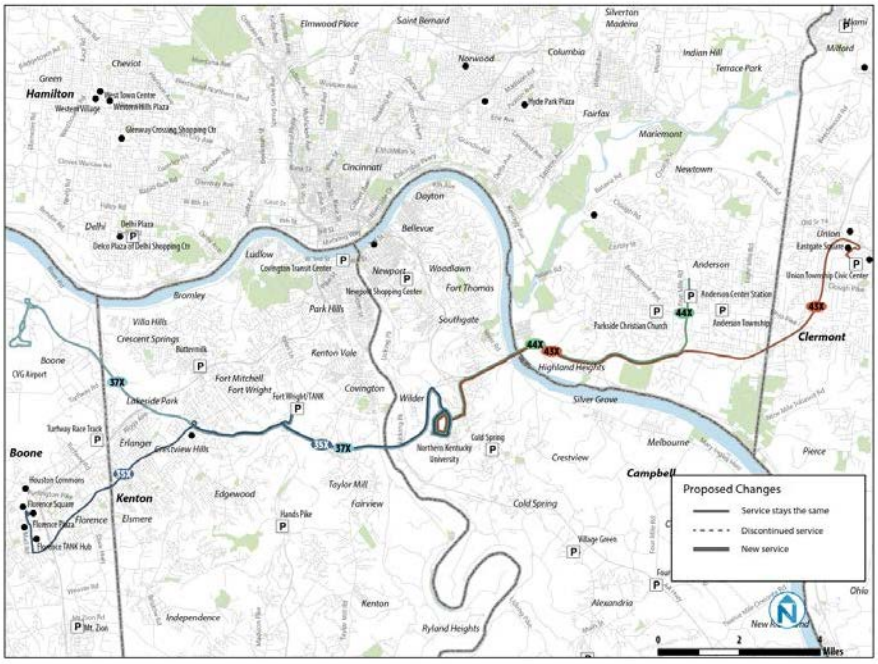


Figure 64 Estimated Service Characteristics of expanded NKU-based Express Routes

Route	Name	Span	Proposed Frequency (Minutes unless noted)				Daily Revenue Hours
		Weekday	AM peak	Midday	PM Peak	Evening	
35x	NKU - Florence Mall	6:00am – 8:00pm	30	90 (combined with 37x)	30	90 (combined with 37x)	20
37x	NKU - CVG	6:00am – 8:00pm	30		30		12
43x	NKU – Union Township, OH	6:00am – 7:00pm	30 (interlined with 44x)		30 (interlined with 44x)		Included in 44x
44x	NKU – Anderson Township, OH	6:00am – 7:00pm	30 (interlined with 43x)	4 trips (combined with 43x)	30 (interlined with 43x)	1 trip (combined with 43x)	17

Service to the Proposed CVG Hub

Despite changes in the airline industry that have resulted in a significant reduction in daily passenger flights at CVG, the airport remains a major employer in the region. Cargo traffic is playing an increasingly important role at CVG, and is a major driver of job growth in the vicinity of the airport. Unlike the centralized nature of passenger operations at CVG, cargo operations are dispersed around the perimeter of the airport, making them more difficult to serve with transit.

In the long-range, a **transit hub at or very near CVG** could provide an anchor for a variety of local routes and site-specific shuttles serving the cargo and industrial facilities around CVG.

Site-specific shuttles are designed to provide "last-mile" connections from regional transit hubs to near-by employers, institutions, or retail destinations that are beyond walking distance from the regional hub (see Service Types and Branding section below for further discussion). In the case of CVG, that may include DHL, Amazon, Toyota, or General Electric. Costs for site-specific shuttles are often shared between the transit agency and the "site" being served, and schedules are coordinated to match major shift changes.

A transit hub near CVG could allow for a streamlining of **Route 2x** to include stops at the transit hub and passenger terminals only. Connections to other destinations could then be made at the hub.

Another approach to serving the industrial parks near CVG is with "flex" service, which combines elements of fixed-routes and demand response service. For example, a Flex Route could have two or three scheduled time-points in the vicinity of the airport, such as Dixie Highway, a new transit hub, and at the terminals, but the path between these points would not be defined. Instead, the route would be responsive to passenger requests called in to a dispatcher, or requested on-board. Flex service could be implemented in place of or in addition to site-specific shuttle service.

Park & Rides as Minor Hubs

Most communities in Northern Kentucky host at least one TANK park & ride facility. The majority of these park & rides are access points to radial routes serving Covington and downtown Cincinnati, but are not true hubs that allow passengers to choose from multiple routes offering numerous directions of travel.

Existing park & ride facilities have the potential to evolve into more significant transit hubs in the long-range, particularly where there are relatively high concentrations of population or employment within close proximity. For example, several residential neighborhoods lie between Madison Pike and Taylor Mill Road, south of I-275. This area is served by three park & rides (Hands Pike, Independence, and Cherokee Shopping Center), but no local routes that could provide feeder service from the neighborhoods to the park & rides. A **neighborhood circulator** (see Service Types and Branding section below for further discussion) could be an effective approach to proving feeder service from the neighborhoods to the park & rides, while also facilitating cross-corridor connections between Madison Pike and Taylor Mill Road. Currently, passengers wishing to travel from the **Independence Park & Ride to the Cherokee Shopping Center Park & Ride**, both in Independence, must travel more than eight miles north to the Fort Wright Hub and make two transfers before returning south to the Cherokee Shopping Center two hours later. This trip time could be cut by more than half with a neighborhood circulator serving both facilities.

The availability of feeder service from residential neighborhoods to park & rides can help relieve parking congestion by providing an alternative to driving as the first leg of a commuter trip. In

some cases this can postpone the need for capacity expansion at park & rides, but never the less capacity must be monitored closely over the long-range and expanded when necessary. When capacity is expanded it is likely necessary to consider service expansion as well, to accommodate ridership growth. If a park & ride lot is near capacity, some passengers may be hesitant to use it because of the perception that parking is difficult to find. If the lot is expanded, these hesitant riders may become more regular riders as long as bus seating capacity is sufficient.

Upgraded Amenities at Newport Park & Ride

Newport Shopping Center serves as an important TANK hub offering parking and relatively frequent transit service to downtown Cincinnati and NKU. In the future the facility may also anchor an enhanced bus corridor through Newport. Despite the importance of this facility to TANK's transit network, it remains relatively low-profile and somewhat hidden to those who are not aware of its existence. To improve awareness of the site, TANK should consider the following treatments:

- Prominent "Park & Ride" directional signage at access points along Monmouth Street and Carothers Road
- Sidewalks on Monmouth leading to the access points of the facility and a pedestrian path from Monmouth to the pick-up area on the interior of the shopping center to give pedestrians a safe alternative to mixing with vehicular traffic
- Passenger amenities including lighted shelters with benches and trash receptacles at pick up area
- Bus pull-outs along both sides of Monmouth Street with a crosswalk and pedestrian crossing lights to allow Route 25 buses to save time and avoid entering the shopping center

SERVICE TYPES AND BRANDING

TANK currently operates three primary service types (local, express, and shuttles), and has two uniquely branded services that differ from the main TANK brand (Southbank Shuttle, and NKU Shuttle). A diversity of service types can help ensure that the most appropriate level of service is applied in various operating environments. For example, residential neighborhoods may neither have the ridership demand nor roadway infrastructure to support tradition fixed-route service with 40-ft buses. However, smaller vehicles with a flexible route and schedule may garner more neighborhood support.

The challenge for a transit agency is finding the right balance between fleet uniformity and specialization. Specially designed or branded vehicles can complicate maintenance and route assignments for a transit system. Specialized parts may not be compatible with the rest of the fleet, and vehicles that are branded for a specific service cannot be assigned to other service types without diluting or confusing marketing efforts.

Thus, the creation of a sub-fleet is most appropriate when it can be done at a reasonable scale. Investing in one or two small transit vehicles for a single neighborhood circulator would be difficult to justify, given the incompatibility of such vehicles with the rest of the TANK fleet, but investing in a dozen or more such vehicles (including spares) to launch a new service type in several neighborhoods would be reasonable.

Special branding can be applied to a corridor in addition to or in place of vehicle branding. Corridor branding may include designated bus lanes, enhanced passenger amenities, and technologies to improve the passenger experience. These elements help signal to current and prospective passengers that a higher level of transit service is available in the corridor.

NEIGHBORHOOD CIRCULATORS

Neighborhood circulators can be fixed-route, demand-response, or a combination of the two ("flex" service), and can be provided using smaller transit vehicles that are more conducive to operating along residential streets or any environment with limited transit demand. When anchored at more than one transit hub, neighborhood circulators can play a role in providing cross-town or cross-corridor connections that are often missing with a primarily radial network.

In some cases, neighborhood circulators can be a first step in introducing more traditional transit service to an area without any existing service. Conversely, neighborhood circulators can replace poorly performing fixed-route service to preserve a minimum level of transit coverage.

In the long-range, neighborhood circulators may be considered for the following areas (Figure 66):

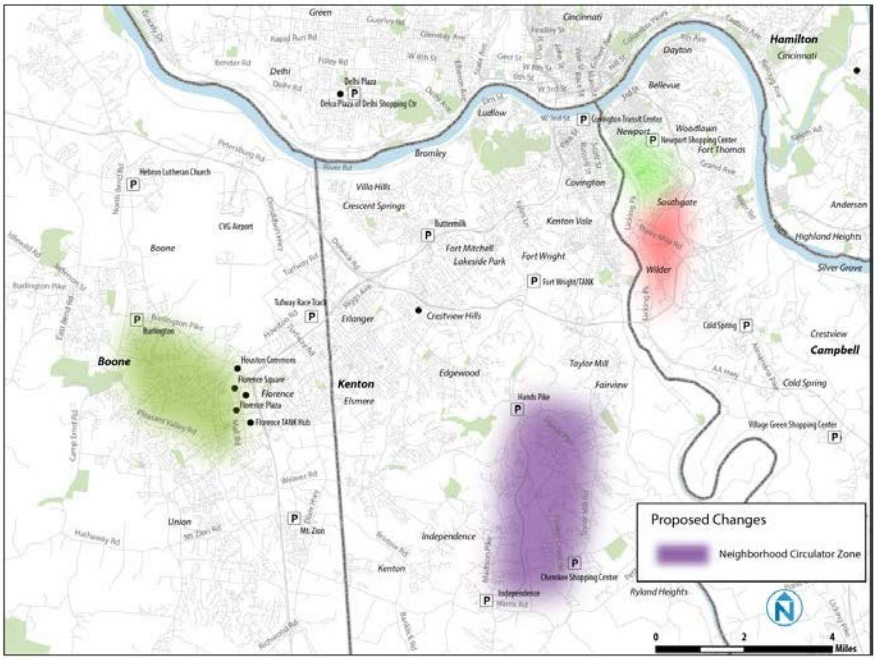
- Neighborhoods between Madison Pike and Taylor Mill Road (anchored at Independence Park & Ride, Cherokee Shopping Center, and/or Hands Pike Park & Ride)
- Moock Road (anchored at NKU)
- Neighborhoods west of Florence Mall (anchored at Florence Mall Transit Center and Burlington Park & Ride)
- Neighborhoods currently served by Route 20 (anchored at Newport Shopping Center)

It is recommended to launch each neighborhood circulator with a single vehicle operating 12 hours of demand-response service on weekdays only (Figure 65). Over time, service can be expanded to include more hours, more vehicles, and a more fixed route, as appropriate based on ridership trends.

Figure 65 Estimated Service Characteristics of Neighborhood Circulators

Route	Name	Span	Proposed Frequency (Minutes unless noted)				Daily Revenue Hours
		Weekday	AM peak	Midday	PM Peak	Evening	
NC1	Covington / Independence	6:00am – 6:00pm	On-Demand	On-Demand	On-Demand		12
NC2	Moock Road	6:00am – 6:00pm	On-Demand	On-Demand	On-Demand		12
NC3	Florence	6:00am – 6:00pm	On-Demand	On-Demand	On-Demand		12
NC4	Newport	6:00am – 6:00pm	On-Demand	On-Demand	On-Demand		12

Figure 66 Proposed Neighborhood Circulator Zones



As the name suggests, neighborhood circulators provide local-area circulation, linking residential areas with near-by neighborhood retail centers. They also serve as feeders to connect residents to other, more regional services at transit hubs. Site-specific shuttles (described in the New CVG Hub section) are similar to neighborhood circulators, but are designed primarily to provide "last mile" connections from transit hubs to major employment centers. In the long-range, site specific shuttles would be most appropriate for the following areas:

- Industrial parks near CVG (anchored at future CVG transit hub)
- Fidelity Campus (anchored at Fort Wright Hub)

Site-specific shuttle schedules are closely tied to the shift times of the sites being served. Initially a single vehicle would provide weekday peak-period-only service for each shuttle (Figure 67). Over time, service may be expanded, based on ridership trends.

Figure 67 Estimated Service Characteristics of Neighborhood Circulators

Route	Name	Span	Proposed Frequency (Minutes unless noted)				Daily Revenue Hours
		Weekday	AM peak	Midday	PM Peak	Evening	
SSS1	CVG Industrial	8 hours, tied to shifts	15-20 minutes		15-20 minutes		8
SSS2	Fidelity	6 hours, tied to shifts	15-20 minutes		15-20 minutes		6

SERVICE LEVELS ON ENHANCED BUS CORRIDORS

Enhanced Bus service is designed to provide faster, more frequent service than regular local bus routes and incorporates many of the features associated with Bus Rapid Transit (BRT). However, unlike BRT, Enhanced Bus service typically operates in mixed traffic and uses more conventional transit vehicles than those used for BRT service. In some cases, Enhanced Bus service is an intermediate step between local bus and BRT or streetcar implementation.

In the long-range, enhanced bus service frequenices may be considered along the entire Dixie Highway Corridor; in Covington along Madison Avenue from Latonia Plaza to CTC; and in Newport along York / Monmouth and Alexandria Pike as far as Newport Shopping Center.

As described in the Short-Range Service Recommendations, these corridors can generally already support 15-minute peak period frequency. In the long-range, 15-minute service for most or all of the day would help establish these corridors as Enhanced Bus Transit Corridors, and present an opportunity for TANK, in collaboration with the respective municipalities, to focus infrastructure investment with the aim of creating a highly transit supportive environment. Examples of Enhance Bus corridor treatments are provided in the Capital Improvements section of the Short-Range Service Recommendations memo.

Operationally, 15-minute service frequency in a corridor can be achieved with a single route, or by staggering the schedules of two routes operating in the same corridor. Along the Dixie Highway corridor, it is recommended that Route 1 will operate every 15 minutes for much of the service day Figure 68). In Covington, Route 7 and 33 could each operate every 30 minutes along Madison Avenue to create 15-minute service in the corridor. A third enhanced bus corridor could be created between CTC/downtown Cincinnati and NKU by operating Route 25 with 15 minute frequency along its entire route. If Route 25 were to operate every 15 minutes, then the interline pattern in downtown with Routes 33 and 7 would likely need to be adjusted.

Figure 68 Estimated Service Characteristics of Routes Serving Enhanced Bus Corridors (Weekdays)

Route	Corridor	Proposed Frequency (Minutes unless noted)					
		AM peak	Midday	PM Peak	Evening	Sat.	Sun.
1	Dixie Highway	15	15	15	15-30	15-30	15-30
7 / 33 combined	Madison Avenue	15	15	15	15-30	15-30	15-30
25	Monmouth/ Alexandria Pike	15	15	15	15-30	15-30	15-30

FREQUENCY AND SPAN ENHANCEMENTS

In addition to introducing new service types, TANK can improve the passenger experience and attract new riders by improving service so that it is more attractive to choice riders. In particular, service frequency and span of service improvements can have a multiplier effect on ridership.

Commuter Route Enhancements

For example, commuters who are interested in using express service may be hesitant to consider a route that lacks mid-day or evening service because they are concerned that they may not be able to return to their cars until the afternoon peak period even in case of personal emergency. Thus the addition of some mid-day trips tends to increase ridership during the peak periods by creating a sense of flexibility for choice riders. Thus, TANK should consider a service standard of at least two mid-day trips for all weekday express routes serving larger park-and-rides. It should be noted that off-peak park-and-ride service can be different than peak routes; i.e., one route can serve multiple park-and-rides to provide this access instead of having individual point to point routes.

The following express routes have either no mid-day service or just one mid-day trip: 18x, 22x, 25x, 30x, 31x, 32x, 39x, 40x. Route 25x passengers do have the option of using Route 25 during the mid-day to return to Alexandria Park & Ride, thus mid-day service on Route 25x is not critical. Route 31x serves reverse commuters only, and is essentially a site-specific shuttle for Club Chef. Schedule changes for the route should be made in consultation with Club Chef. It is recommended that the remaining express routes each add two mid-day round-trips (Figure 69).

In addition, current ridership on Route 32x Burlington suggests that additional capacity will be necessary during peak times if there is any additional ridership growth. An additional morning and afternoon trips should be added.

Figure 69 Estimated Service Characteristics of Express Routes with Service Additions

Route	Name	Span	Proposed Frequency (Minutes unless noted)				New Revenue Hours
		Weekday	AM peak	Midday	PM Peak	Evening	
18x	Edgewood Express	6:16am - 7:55am 4:10pm – 5:55pm	3 trips	2 round-trips	3 trips		2.6
22x	Walton Express	6:10am – 7:55am 4:13pm – 6:03pm	5 IB trips	2 round-trips	4 OB trips	--	6.2
30x	Independence Express	6:06am - 8:20am 4:03pm - 6:29pm	1 OB trip 4 IB trips	2 round-trips	4 OB trips	--	4
32x	Burlington Express	6:10am - 8:13am 4:14pm - 6:14pm	4 IB trips	2 round-trips	4 OB trips	--	4
39X	Limaburg P&R	5:13am - 8:04am 1:38pm - 6:45pm	4 OB trips 4 IB trips	2 round-trips	4 OB trips 4 IB trips	1 OB trip 1 IB trip	4
40X	Northbend P&R	5:08am - 8:00am 1:43pm - 7:05pm	4 OB trips 4 IB trips	2 round-trips	4 OB trips 4 IB trips	1 OB trip 1 IB trip	2.6

Local Route Enhancements

More frequent local service can also encourage existing riders to use the service more often and attract new riders who have other transportation options. Experience nationwide has shown that frequent service and better amenities will draw additional passengers to use the service. The Enhanced Bus corridors, with both amenity and service level increases, are designed to attract that market.

There are multiple corridors where TANK operates where hourly peak-hour service is offered. Thirty-minute peak service has been shown to attract almost twice as many riders as hourly service. It is the minimum level of service necessary to attract choice riders. All weekday peak service should be upgraded to a minimum of 30-minute service on weekdays. Routes 9 and 10 should operate every 30-minutes during peak times.

On weekends, TANK currently operates several routes with greater than 60 minute frequencies. Greater than 60-minute frequencies introduces excessive waiting times and will attract only the most transit dependent of patrons. TANK should upgrade weekend frequency on all routes to have at least 60-minute frequencies on weekends. Routes with less than hourly service on weekends are: 3, 5, 9, 10, and 16. The frequency of all five routes upgraded to hourly service.

Revenue Hour Impact of Long-Range Recommendations

Using the revenue hours from the short-range recommendations as a baseline, the tables below shows the impact of the long-range recommendations discussed above. Only those routes with recommended changes are shown. The total revenue hour figure is the net change from the baseline, and not the total revenue hours required to operate the entire TANK network in the long-range.

Figure 70 Estimated Revenue Hour Impacts of Long-Range Recommendations

Route	Improvement	Additional Annual Revenue Hours Required
1	Upgrade frequency to 15-minute service on seven days a week.	24,700
5	Upgrade weekend service to hourly service or better.	1,900
7/12	Upgrade frequency to 30-minute service seven days a week.	8,300
9 / 10	Upgrade weekday peak frequency to 30-minutes. Upgrade weekend frequency to hourly service or better	4,700
3 / 16	Upgrade frequency on weekends to hourly or better service	1,100
33	Upgrade frequency to 30-minute service seven days a week.	4,200
25	Upgrade frequency to 15-minute service seven days a week	27,700
18x	Add two mid-day trips to expand commuter market	700
22x	Add two mid-day & peak trips to expand commuter market	800
30x	Add two mid-day trips to expand commuter market	1,100
32x	Add two mid-day trips to expand commuter market	1,100
35x	Implement new cross-town route connecting NKU and Florence Hub	5,100
37x	Implement new cross-town route connecting NKU and CVG Airport	3,100
39X	Add two mid-day trips to expand commuter market	1,300
40X	Add two mid-day trips to expand commuter market	700
43x	Implement new cross-town route connecting NKU and Union Township, OH	4,300
44x	Implement new cross-town route connecting NKU and Anderson Township	(included in 43x)
NC1	New neighborhood circulator connecting suburban Covington / Independence	3,100
NC2	New neighborhood circulator connecting Moock Road with NKU	3,100
NC3	New neighborhood circulator connecting neighborhood to Florence Hub	3,100
NC4	New neighborhood circulator connecting Newport neighborhoods	3,100
SSS1	CVG Employment Shuttle	2,100
SSS2	Fidelity Employment Shuttle	1,600
Total		106,900