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KENTUCKY TRANSPORTATION CABINET **US 27 CORRIDOR STUDY**

July 2026
Final Report



US 27 CORRIDOR STUDY

Items No. 7-453.00

Final Report

Prepared for



TRANSPORTATION
CABINET

Prepared by



June Marie Warren

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Executive Summary

CHAPTER





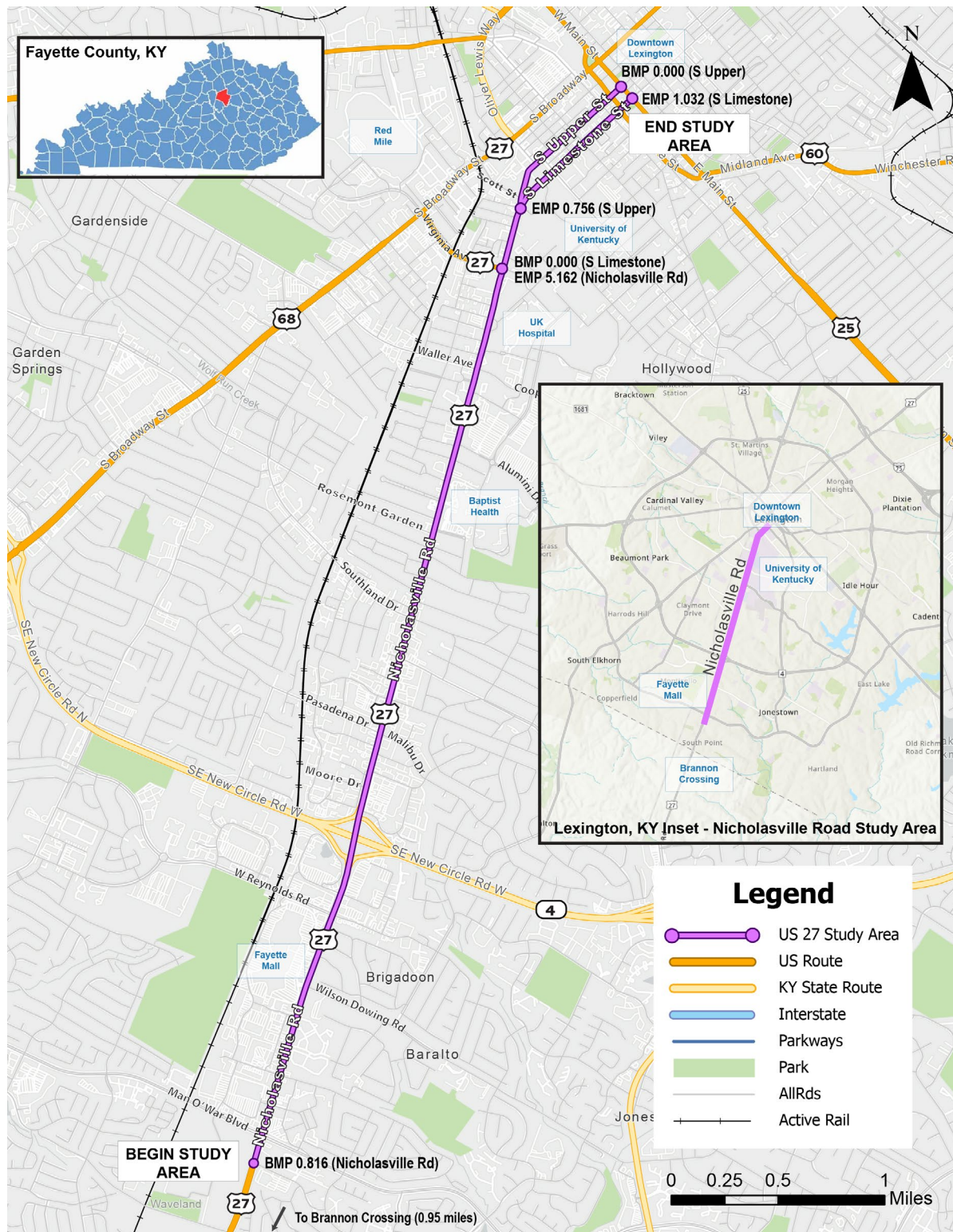
EXECUTIVE SUMMARY

In 2021, the Lexington-Fayette Urban County Government (LFUCG) completed the Imagine Nicholasville Road (INR) study, which was subsequently formally adopted by the Lexington Planning Commission. INR recommended transforming US 27 for approximately six miles from Main Street to Toronto Road (Figure ES1) into a Complete Street featuring transit-oriented development (TOD), bus rapid transit (BRT), improved bicycle and pedestrian safety and connectivity, and enhanced placemaking. The US 27 Corridor Study advances those recommendations by evaluating their feasibility, particularly the transportation elements, and developing conceptual designs and cost estimates to guide the next phases of implementation.

THE GOALS OF THE STUDY ARE TO:

- » Forecast future conditions by developing the following three scenarios for traffic/transit volumes and land use density:
 01. No changes to land use patterns and minor transit service improvements
 02. Partial land use build-out and moderate transit service improvements
 03. Full land use build-out and full implementation of BRT service
- » Identify corridor solutions that transform Nicholasville Road into a Complete Street
- » Evaluate the combined impacts to all modes of transportation across the three future scenarios
- » Incorporate public and stakeholder input to align with the vision set forth in the INR study
- » Develop phased project packages for a 5-year, 10-year, and long-term implementation

The corridor encompasses major trip generators such as the University of Kentucky and associated hospital and medical facilities, Baptist Health Hospital, The Fayette Mall, The Summitt, and serves as a connector between Jessamine County and Lexington, with numerous neighborhoods and the Brannon Crossing shopping center to the south.



SAFETY

A total of 5,679 crashes were reported between 2018 and 2022.

Of these, 25 were fatal or suspected serious injury (KA), 702 were apparent minor injury or suspected minor injury (BC), and 4,952 were property damage only (PDO). Vulnerable road users (VRUs), including bicyclists and pedestrians, resulted in 48 pedestrian crashes (one fatal, five suspected serious injuries) and nine bicyclist crashes (one suspected serious injury). The majority of crash types along Nicholasville Road are rear end (2,397, 42%), side-swipe same direction (1,289, 23%), and angle (932, 16%). The remaining 19% of crashes were dispersed amongst other crash types. Crashes are highest between 11:00 am and 7:00 pm with 5:00 pm being the peak.

The corridor has a mix of crash hot spots, specifically at major intersections like Man O' War Boulevard, Reynolds Road, the New Circle Interchange, and the area from Moore Drive to Southland Drive and Rosemont Garden to Virginia Ave. From a vehicular standpoint, areas with the reversible lanes, higher speeds, access point density, and wider intersections can differ from typical driver expectation and cause confusion, raising crash risks. The southern portion of the corridor has varying land uses and longer crosswalks, raising the risks of the three main metrics of the Safe System Approach: likelihood, exposure, and severity, for VRUs crossing US 27.

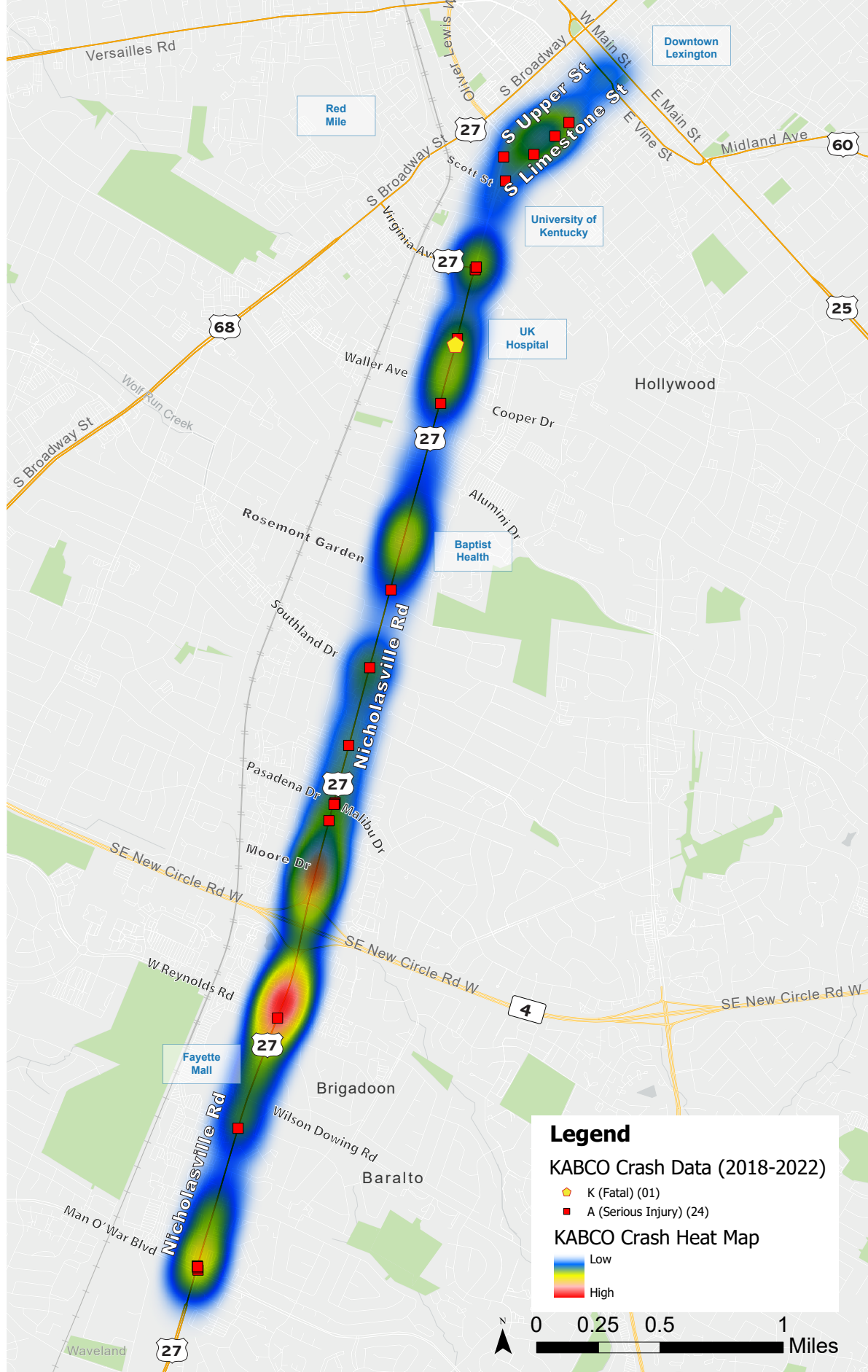


FIGURE ES2. CRASH DENSITY, 2018 – 2022

TRAFFIC

A traffic forecast was prepared for this study and included:

- › 2023 Annual Average Daily Traffic (AADT) And Design Hourly Volume (DHV) Volumes
- › 2023 Truck AADT And DHV Volumes
- › 2023 And 2050 Turning Movement Forecasts
- › 2050 Transit Ridership Forecasts

Future year traffic volumes were developed for three potential BRT and land use scenarios:

- › **Scenario 1:** 2050 Scenario of the Lexington Area Metropolitan Planning Organization (LAMPO) regional travel demand model (TDM) based on the most recent census projections. Existing transit with limited improvements.
- › **Scenario 2:** 2050 Scenario with medium growth and development adjustments made to the LAMPO model. Adds rapid transit service to Brannon Crossing with fewer stops and other transit service improvements such as transit signal priority and queue jumps but does not contain dedicated lanes for rapid service.
- › **Scenario 3:** 2050 Scenario with medium growth and development adjustments made to the LAMPO model. This scenario was originally scoped to show high growth and development as shown in the INR study; however, recent expansions to the Lexington Urban Service Boundary resulted in the project team agreeing that medium growth would more accurately reflect this scenario. Full Bus Rapid Transit (BRT) scenario, adding the transit improvements from Scenario 2, with the addition of dedicated lanes for service, such as a Bus Access Transit (BAT) lane in both directions between Southland Drive and Man O' War Boulevard, and a bi-directional center running bus-only lane between Scott Street and Alumni Drive.

POTENTIAL IMPROVEMENT CONCEPT EVALUATION

Traffic simulation models were utilized to evaluate potential improvement concepts for the three scenarios, and a high-level safety analysis was performed to determine the safety benefits. During the evaluation phase, the project management team agreed that Scenarios 1 and 2 did not meet the goals of making Nicholasville Road a Complete Street. These two scenarios do not make transit as much of a viable option for travel through the corridor as Scenario 3 does through the reduction of transit travel times. Scenarios 1 and 2 keep Nicholasville Road car-centric and do not promote mode shift to bicycle, pedestrian, or transit options, which does not make the roadway safer for all modes.



Image Source: Baptist Health

RECOMMENDATIONS

Figures ES3 through ES7 show the recommended improvement concepts along the corridor. Cost estimates were developed for the potential improvement concepts. Estimates include the Design, Right-of-Way, Utility, and Construction (DRUC) costs for roadway capital improvements, as well as capital costs for the transit infrastructure and vehicles. Additional costs not included in this study are the yearly operational costs for Lextran to operate the BRT line.

An implementation plan was developed, which created project packages that estimated when each segment for the roadway capital improvements would likely be funded. Projects were assigned to one of three time periods: 2026-2030, 2031-2035, or 2035 and beyond. These projects will likely be funded through a combination of the Kentucky Highway Plan and the City of Lexington's transportation funding.

Transit infrastructure improvements will likely be funded through the Federal Transit Administration (FTA) Capital Investment Grant (CIG) program. Based on current ridership forecasts from this study, if the project were to seek CIG funding as a Small Starts project under the current guidance¹, the maximum federal share² the project could reasonably seek and still anticipate receiving a medium rating for cost effectiveness is between \$60-\$100 million in federal funds. Additionally, project sponsors in the CIG program, utilizing federal funds for a project, must also provide non-federal local match contribution of 20% or more.

Figure ES8 shows the implementation plan and project packages. Because the total transit infrastructure costs are close to the maximum federal share for the CIG grant, the majority of the roadway capital improvements will need to be completed prior to entering into CIG Project Development. Roadway segments 6, 7, and 10, which are the center-running bi-directional bus-only lane section, could be included in the CIG Project Development phase because of the tie between those improvements and the start of the BRT service. Additionally, the roadway costs for that section could be used as the local match for the grant.

1 49 USC 5309 (g)(5)(B) – States that FTA must issue updated policy guidance “each time the Secretary makes significant changes to the process and criteria, but not less frequently than once every 2 years”

2 Federal share includes all federal funds used for project. So this would include FTA formula funds, FHWA funds, other discretionary grants, or any other federal funds used for the project. It is not limited to the CIG grant amount.

LEGEND

-  BRT BUSINESS ACCESS TRANSIT LANE
-  BRT LINE IN MIXED TRAFFIC
-  10-FOOT SHARED USE PATH
-  TRANSIT STOP

Transit Signal Priority (TSP) at all signalized intersections

- 11-foot lanes from New Circle Road to Man O War Boulevard
- Lengthening right turn lane or add BAT lane on blocks where necessary to maintain 3 full access travel lanes in each direction between New Circle Road and Man O'War Boulevard

US 27 - NEW CIRCLE TO MAN O' WAR - MAINLINE

Lane Width	Vehicle Type
11'	Buss
11'	Car
11'	Car
11'	Car
11'	Center Turn Lane
11'	Car
11'	Car
11'	Car
11'	Buss

0 0.09 0.18 0.28 0.38 Miles

xii

SOUTHLAND/MAN O' WAR SECTION - NEW CIRCLE RD TO SOUTHLAND DR

Scenario 3



FIGURE ES4. RECOMMENDATIONS FROM NEW CIRCLE ROAD TO SOUTHLAND DRIVE



FIGURE ES5. RECOMMENDATIONS FROM SOUTHLAND DRIVE TO ALUMNI DRIVE

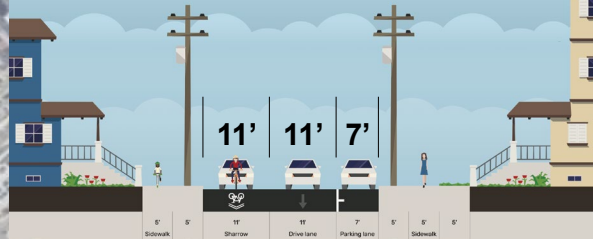


DOWNTOWN SECTION - SCOTT ST TO MAIN ST

Scenario 3



S. UPPER STREET - MAINLINE SB



UPPER ST
S LIMESTONE
MAIN ST
END OF STUDY AREA

HIGH ST

STUDY AREA

MAXWELL ST

PROTECTED PARKING BIKE LANE

AVE OF CHAMPIONS

TRANSIT STOP

Center Running Bi-Directional BRT Lane

SCOTT ST

LEGEND

- BRT LINE IN MIXED TRAFFIC
 - CENTER RUNNING
 - BI-DIRECTIONAL BRT LANE TRANSIT STOP
 - PARKING AND PROTECTED BIKE LANE
 - RESTRIPING
 - HISTORIC LIGHTING
 - SIDEWALK IMPROVEMENTS
 - URBAN INTERSECTION UPGRADES
 - RIGHT-IN/RIGHT-OUT
- Transit Signal Priority (TSP) at all signalized intersections

S. LIMESTONE - MAINLINE NB

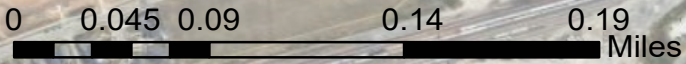
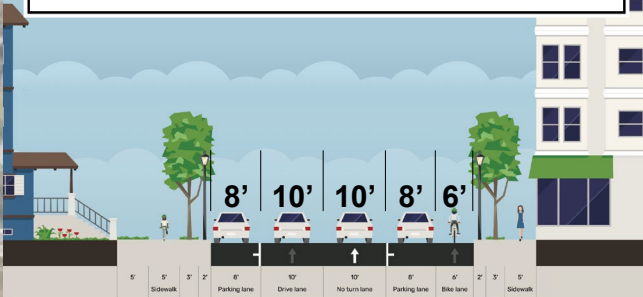
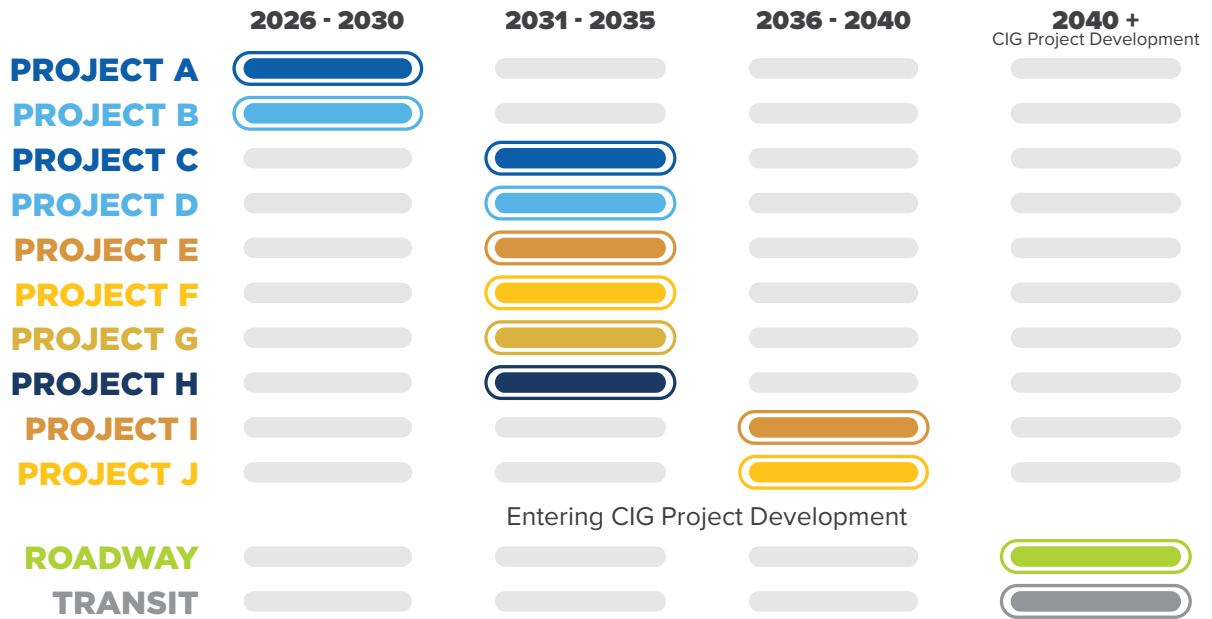
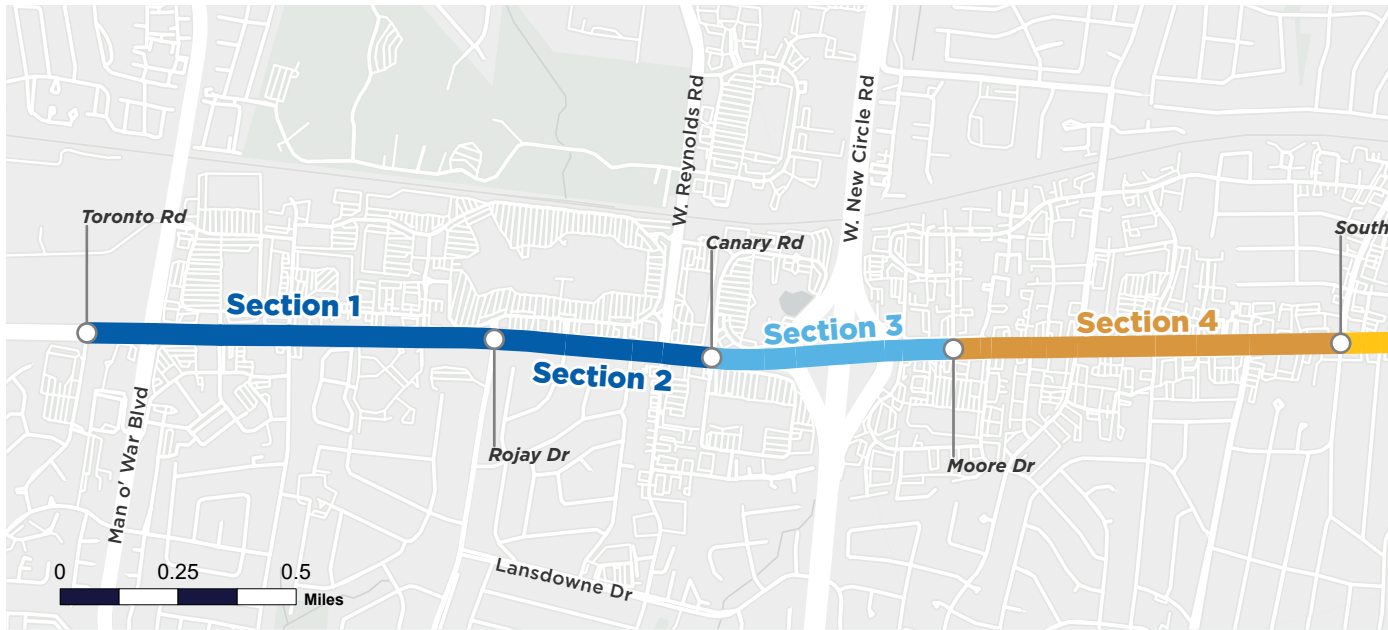


FIGURE ES7. RECOMMENDATIONS FROM SCOTT STREET TO MAIN STREET





PROJECT A

**Section 1-2
Design**
\$6.4 M

PROJECT B

**Section 3
Design**
\$3.0 M

PROJECT C

**Section 1-2
Right-of-Way**
\$2.2 M
Utilities
\$7.9 M
Construction
\$45.2 M

PROJECT D

**Section 3
Right-of-Way**
\$0.7 M
Utilities
\$3.3 M
Construction
\$21.8 M

PROJECT E

**Section 4
Design**
\$3.5 M

PROJECT F

**Section 5
Design**
\$3.0 M

PROJECT G

**Section 8 & 9
Design**
\$2.6 M
Right-of-Way
\$3.1 M
Utilities
\$5.3 M
Construction
\$17.0 M

PROJECT H

**Section 11
Design**
\$3.3 M
Right-of-Way
\$2.3 M
Utilities
\$3.7 M
Construction
\$26.7 M

PROJECT I

**Section 4
Right-of-Way**
\$2.0 M
Utilities
\$3.7 M
Construction
\$25.1 M

PROJECT J

**Section 5
Right-of-Way**
\$2.5 M
Utilities
\$5.2 M
Construction
\$22.3 M

CIG Project Development

Roadway

**Section 6 - 7 & 10
Design**
\$6.6 M
Right-of-Way
\$5.6 M
Utilities
\$10.8 M
Construction
\$46.7 M

Transit

Transit Stations
Side Stations
\$26.4 M (\$1.65 M/Station)
Center Stations
\$6.6 M (\$2.2 M/Station)

General Streetscape
\$25.2 M
Vehicle Procurement
\$46.0 M

ITS
\$2.75 M (\$125,000/Station)
TSP
\$2.9 M

FIGURE ES8. US 27 BRT PROPOSED IMPLEMENTATION PLAN

1

Introduction

CHAPTER





INTRODUCTION

The Kentucky Transportation Cabinet (KYTC), in partnership with the Lexington Area Metropolitan Planning Organization (LAMPO), the Lexington Fayette Urban County Government (LFUCG), and Lextran, initiated the US 27 Corridor Study to evaluate how varying levels of land use density and transit operations would affect mobility along US 27 (Nicholasville Road) in Lexington, Kentucky.

The study area begins at Toronto Road (mile point [MP] 0.816) and extends to Main Street in downtown Lexington (*Figure 1*). US 27 is state-owned from Toronto Road (MP 0.816) to Virginia Avenue (MP 5.162), where it is primarily known as Nicholasville Road. Between Waller Avenue/Cooper Drive and Virginia Avenue, it is referred to as South Limestone. North of Virginia Avenue, the corridor becomes city-owned and splits into two one-way streets at Scott Street: northbound South Limestone (MP 0.000–1.032) and southbound South Upper Street (MP 0.000–0.756).

In 2021, LFUCG completed the Imagine Nicholasville Road (INR) study, which was subsequently formally adopted by the Lexington Planning Commission. The INR study recommended transforming US 27 into a Complete Street featuring transit-oriented development (TOD), bus rapid transit (BRT), improved bicycle and pedestrian safety and connectivity, and enhanced placemaking. This study advances those recommendations by evaluating their feasibility, particularly the transportation elements, and developing conceptual designs and cost estimates to guide the next phases of implementation.

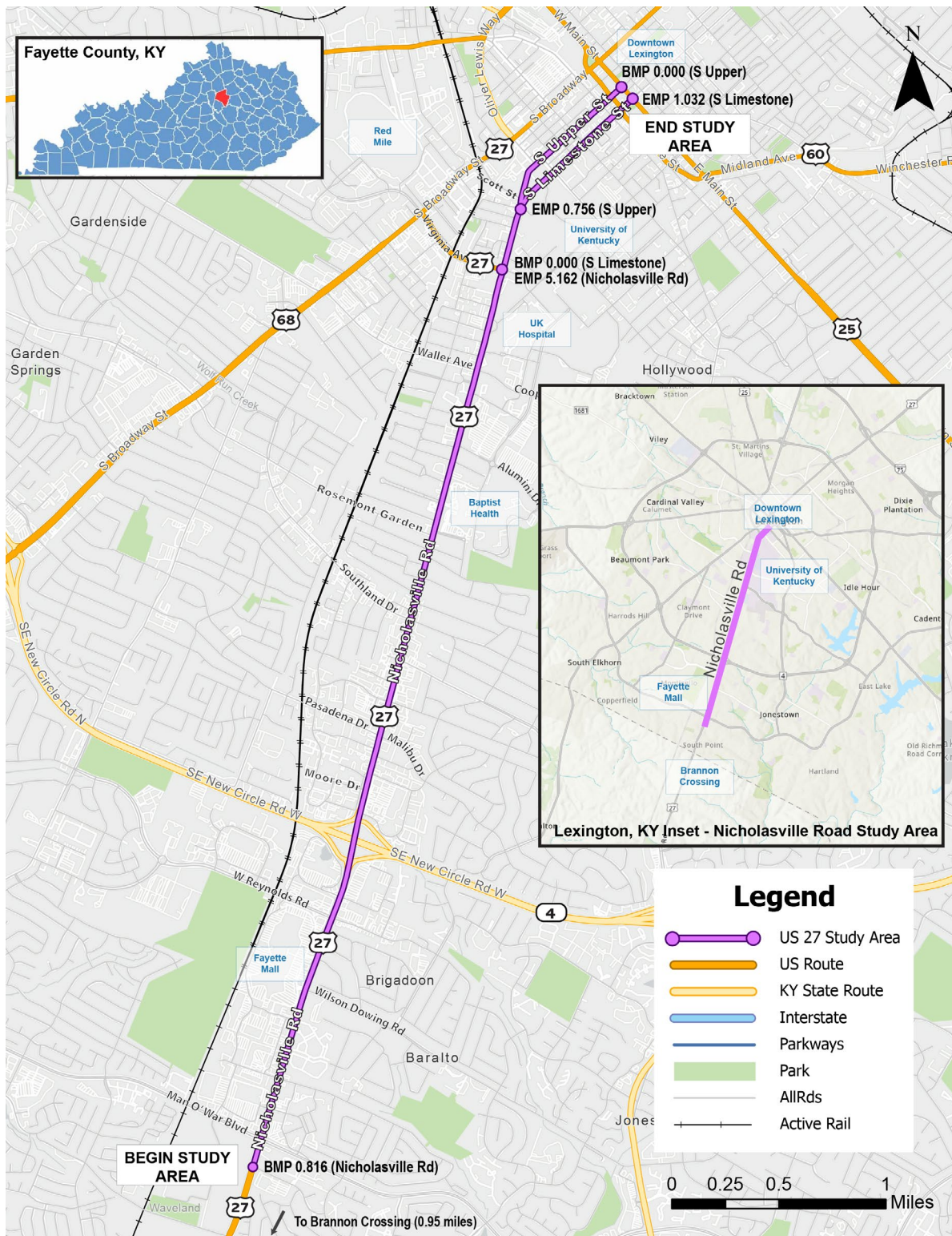


FIGURE 1. US 27 CORRIDOR STUDY AREA

RECENT, COMMITTED, AND PROPOSED PROJECTS/RELEVANT STUDIES

KYTC provided a list of committed and proposed projects in the study area vicinity. There are four projects included in Kentucky’s 2024-2030 Enacted Highway Plan (Highway Plan) (one project is split into two segments) and one project is in the KYTC Continuous Highway Analysis Framework (CHAF) database. Each is listed below with the year of phase programming. There is also one project in the study area vicinity that is included in the LAMPO Metropolitan Transportation Plan (MTP). Additionally, recent relevant studies and projects were referenced for this study.

HIGHWAY PLAN PROJECTS

7-430.00	Access Management on Nicholasville Road Between Nicholasville and Man-O-War Blvd (14CCR) (2024CCN) Right of Way, Utilities, Construction / 2026. » This project was split into two sections, with the second being the priority: » 7-430.10: Nicholasville - Man-O-War Blvd; Access Management on US-27 (Nicholasville Rd) From Nicholasville Bypass to Just South of Kohl’s Drive. » 7-430.20: Nicholasville - Man-O-War Blvd; Access Management on US-27 (Nicholasville Rd) from just South of Kohl’s Drive to Man-O-War Blvd.
7-80205.00	Access Management Improvement on US 27 (Nicholasville Rd) At KY 4 (New Circle) Interchange. (2022CCN) (2024CCR) Right of Way, Utilities, Construction / 2025, 2026, 2027.
7-80112.00	Construct a Right Turn Lane Headed Westbound on Virginia Ave from US 27 and Construct a Bus Turnout South of Virginia Ave (2020CCN). » The level of interest in completing this project as originally described is low, and the intersection concept has evolved from its initial design when the project was first proposed.

CHAFS

IP20250152	Reduce congestion and promote multi-mobility on US 27 (Nicholasville Road) from Man O’ War Blvd to Reynolds Road. » This was added as a result of the INR study.
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MTP

FJ-001A	US 27 from Catnip Hill Road (KY 3375) to Fayette/Jessamine County Line Access Management 2030-2034 (same as 7-430.00).
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RELEVANT STUDIES + PROJECTS
» Us 27 Access Management Study KYTC, 2012
» Lextran Comprehensive Operational Analysis Lextran, 2022
» Imagine Nicholasville Road Land Use And Transportation Study LFUCG, 2021
» Lexington Bottleneck Study LFUCG/ KYTC, 2021
» Campus To Commons Study LFUCG, 2024
» Elizabeth Street Widening Project University Of Kentucky, Ongoing

STUDY GOALS AND OBJECTIVES

The US 27 Corridor Study aims to improve access for all modes and create a more balanced transportation network along Nicholasville Road from Toronto Road to Main Street using a Complete Streets approach. The study addresses both existing conditions and projected redevelopment growth along the corridor.

THE GOALS OF THE STUDY ARE TO:

- » Forecast future conditions by developing the following three scenarios for traffic/transit volumes and land use density:
 01. No changes to land use patterns and minor transit service improvements
 02. Partial land use build-out and moderate transit service improvements
 03. Full land use build-out and full implementation of BRT service
- » Identify corridor solutions that transform Nicholasville Road into a Complete Street
- » Evaluate the combined impacts to all modes of transportation across the three future scenarios
- » Incorporate public and stakeholder input to align with the vision set forth in the INR study
- » Develop phased project packages for a 5-year, 10-year, and long-term implementation

STUDY PROCESS, MEETINGS, AND ENGAGEMENT

Project Team Meetings (PTM) were held at key milestones to share progress and gather feedback as shown in *Figure 2*. Meeting minutes for each PTM are included in “*Appendix A*”. All PTMs were conducted virtually via Microsoft Teams. Below is a brief overview of each PTM.

In addition to the PTMs, monthly project management meetings were held with the managing members of the project team and relevant subject matter experts to monitor progress and resolve issues or roadblocks to keep the study progressing.

In the summer of 2025, findings were presented to the Lexington City Council, LAMPO Transportation Policy Committee, and the Lextran Board of Directors.

The study process is shown in *Figure 3*.

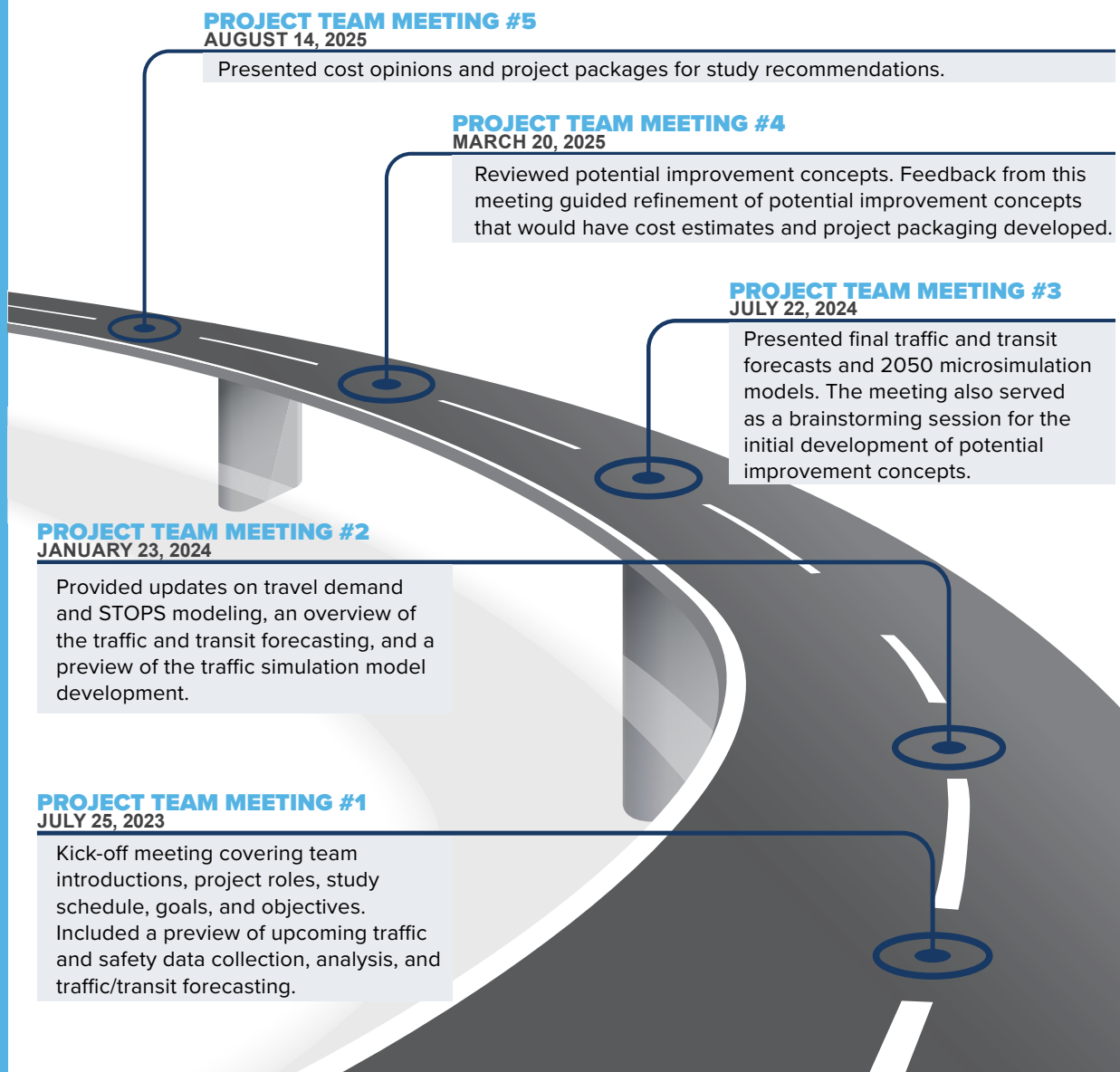


FIGURE 2. PTM MEETING OVERVIEW

STUDY PROCESS



FIGURE 3. STUDY PROCESS

2

Safety Analysis

CHAPTER





SAFETY ANALYSIS

The INR study prepared an existing conditions analysis that gave an overview of the roadway characteristics. This study performed an update to safety analysis from that study with a comprehensive analysis of crash data from 2018 to 2022, sourced from the Kentucky State Police database. The detailed safety analysis is included in *“Appendix B”*.

A total of 5,679 crashes were reported between 2018 and 2022. Of these, 25 were fatal or suspected serious injury (KA), 702 were apparent minor injury or suspected minor injury (BC), and 4,952 were property damage only (PDO). The spatial distribution of these incidents is depicted in *Figure 4* as a heat map to provide a visual representation of crash hotspots and areas of concern. These data show four areas with a higher density of crashes:

- Man o’ War Boulevard
- Reynolds Road to Moore Drive
- Rosemont Garden to Alumni Drive
- Cooper Drive / Waller Avenue to Virginia Avenue

The majority of crash types along Nicholasville Road are rear end (2,397, 42%), side-swipe same direction (1,289, 23%), and angle (932, 16%). The remaining 19% of crashes were dispersed amongst other crash types. Crashes are highest between 11:00 am and 7:00 pm with 5:00 pm being the peak.

Vulnerable road users (VRUs), including bicyclists and pedestrians, were involved in 48 pedestrian crashes (one fatal, five suspected serious injuries) and nine bicyclist crashes (one suspected serious injury). VRU crashes occurred most frequently on the one-way pairs of Limestone Street and Upper Street, near Virginia Avenue and the University of Kentucky (UK) campus/hospital, between Rosemont Garden and New Circle Road, and around Fayette Mall.

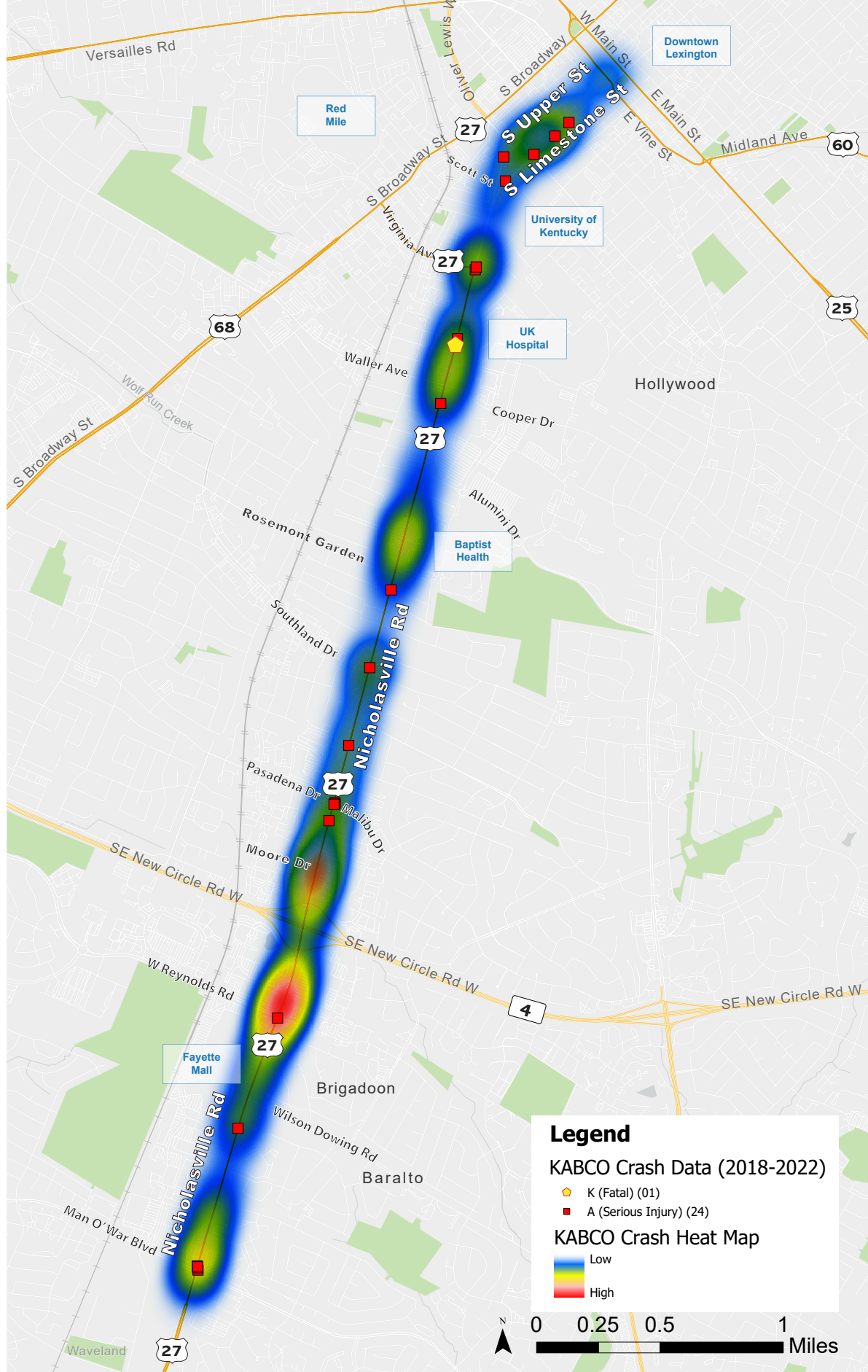


FIGURE 4. CRASH DENSITY, 2018 – 2022

KYTC and the Kentucky Transportation Center (KTC) have developed a more refined statistical methodology based on the Highway Safety Manual (HSM) to rank highway safety needs. Excess Expected Crashes (EEC) is based on a crash prediction model that estimates the number of crashes expected on a roadway segment of a given type and length. It represents the number of excess crashes a segment has experienced compared to other roadways of its type. EEC is positive when more crashes have occurred than were expected and negative when fewer crashes occurred than were expected.

Figure 5 shows positive and negative total EEC (including fatal, injury, and property damage only). The study area experiences more positive than negative EEC values at both intersections and along segments, indicating that there are more crashes than model predictions. The exceptions occur along several downtown segments and intersections, and the segment between Rosemont Garden and Southland Drive. Positive EEC values are in the UK area, and from Southland Drive to the southern end of the study area, with exceptions at the Prall Street, Alumni Drive, Pasadena Drive/Malabu Drive, New Circle Road interchange ramps, and Tiverton Way intersections. The positive EECs along the majority of the study area indicate that safety improvements have a high potential for crash reduction.

Crash heat maps and EECs help identify areas to focus based on historical data context and comparing to other similar facilities. The Safe System Approach is a proactive approach to evaluate existing facilities based on crash risk and can be evaluated for all users. The Safe System Approach utilizes three key metrics to estimate risk: likelihood, exposure, and severity. The study area has a mix of crash hot spots, specifically at major intersections like Man O' War Boulevard, Reynolds Road, the New Circle Interchange, and the area from Moore Drive to Southland Drive and Rosemont Garden to Virginia Avenue. From a vehicular standpoint, areas with reversible lanes, a high density of offset access points, higher speeds, and wider intersections can vary from typical driver expectation and cause confusion, raising crash risks that can be viewed from the Safe System Approach. The middle and southern portions of the corridor have varying land uses and longer crosswalks, showing increased risks for likelihood, exposure, and severity for VRUs crossing US 27. Towards the north near the University of Kentucky, the Safe System Approach countermeasures are in place, lowering speeds and enhancing driver expectation, potentially limiting the likelihood and severity of crashes.

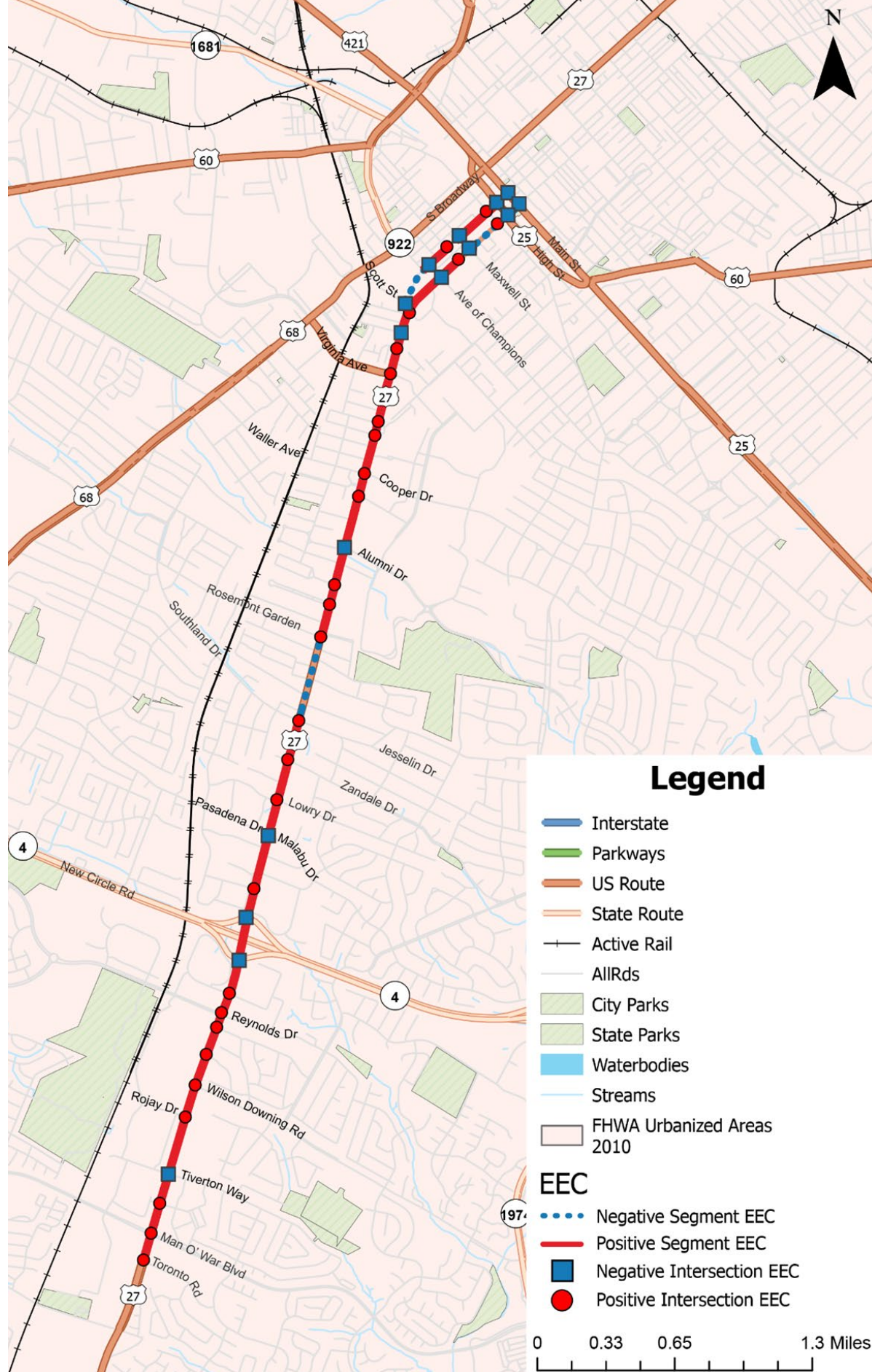


FIGURE 5. EXCESS EXPECTED CRASHES

3

Traffic and Transit Forecasting

CHAPTER



THE SUMMIT

at fritz farm

TRAFFIC AND TRANSIT FORECASTING

A traffic forecast was prepared for this study and is included in “Appendix C”.
The forecast included:

- 2023 Annual Average Daily Traffic (AADT) and Design Hourly Volume (DHV) volumes
- 2023 Truck AADT and DHV volumes
- 2023 and 2050 Turning Movement forecasts
- 2050 Transit ridership forecasts

BASE YEAR (2023) TRAFFIC VOLUMES

Base year (2023) traffic volumes were developed for this study. *Table 1* shows the most recent year AADT, DHV, and truck volumes from KYTC. *Figure 6*, *Figure 7*, and *Figure 8* show the 2023 intersection turning movement volumes.

YEAR	ROUTE	BEGINNING Description	END Description	AADT	AADTT	K FACTOR	DHV	TDHV
2023	US 27	KY 4 WB On Ramp		12100	650	0.107	1300	70
2023	US 27	KY 4 Westbound (WB) Off Ramp		12900	700	0.098	1275	70
2023	US 27	KY 4 EB On Ramp		13500	700	0.099	1325	70
2023	US 27	KY 4 Eastbound (EB) Off Ramp		13700	700	0.101	1375	70
2023	US 27	Man O' War Blvd	Jessamine (County Line)	44900	2400	0.083	3725	200
2013	US 27	East Reynolds Rd	Man O' War Blvd	36600	2700	0.066	2425	220
2022	US 27	KY 4 (New Circle Rd)	East Reynolds Rd	68500	4450	0.091	6225	370
2022	US 27	Jesselin Dr	KY 4 (New Circle Rd)	36100	1150	0.091	3275	100
2021	US 27	Cooper Dr	Jesselin Dr	32300	2000	0.08	2575	200
2023	US 27	Huguelet Dr	Cooper Dr	33000	2150	0.083	2750	180
2021	US 27	Admin Dr	Huguelet Dr	28800	1950	0.078	2250	180
2023	US 27	Colfax St	Bolivar St	14800	1700	0.089	1325	150
2021	US 27	US 25 (West Main St)	Bolivar St	7500	800	0.092	700	100
2023	US 27	Avenue of Champions	Admin Dr	16200	1850	0.088	1425	160
2023	US 27	US 25 (East Main St)	Avenue of Champions	11200	1300	0.098	1100	130

TABLE 1. BASE YEAR CORRIDOR VOLUMES



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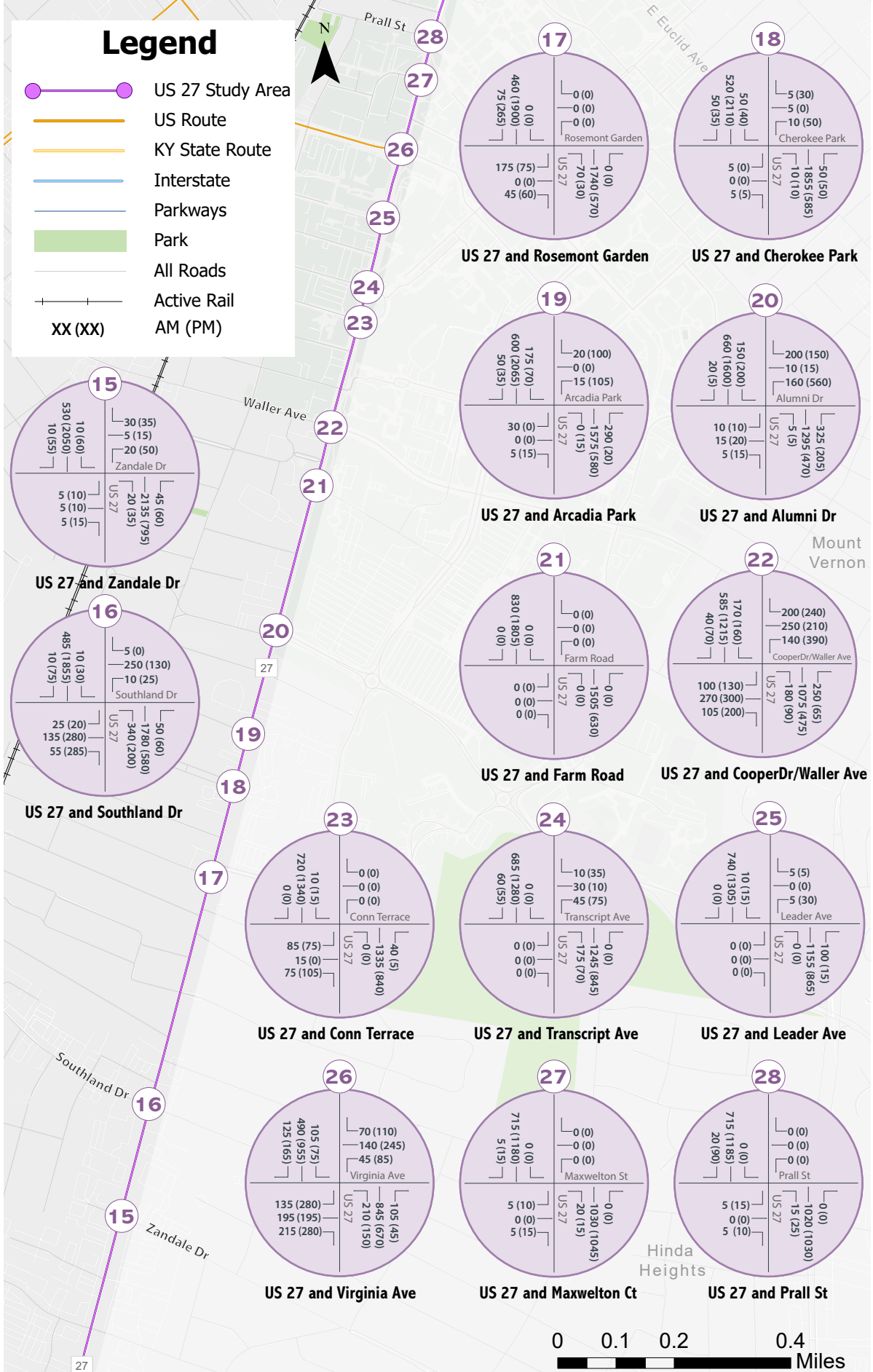


FIGURE 7. 2023 BASE INTERSECTION VOLUMES – ZANDALE DRIVE TO PRALL ST

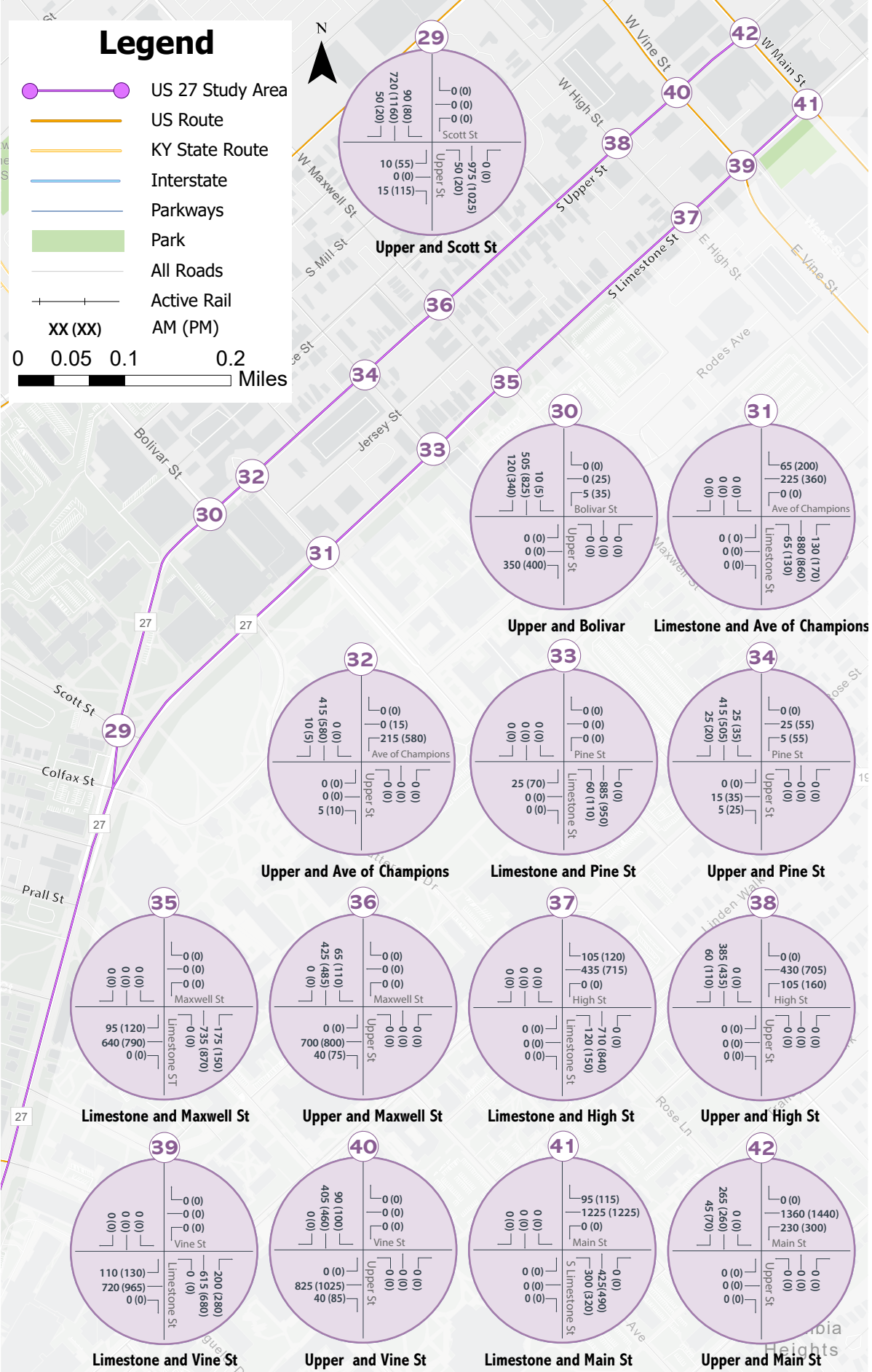


FIGURE 8. 2023 BASE INTERSECTION VOLUMES –SCOTT STREET TO MAIN STREET

FUTURE YEAR BRT AND LAND USE SCENARIOS

Future year traffic volumes were developed for three potential BRT and land use scenarios:

- » **Scenario 1:** 2050 Scenario of the LAMPO regional travel demand model (TDM) based on the most recent census projections. Existing transit with limited improvements.
- » **Scenario 2:** 2050 Scenario with medium growth and development adjustments made to the LAMPO TDM. Adds rapid transit service with more frequent headways to Brannon Crossing with fewer stops and other transit service improvements such as transit signal priority and queue jumps but does not contain dedicated lanes for rapid service.
- » **Scenario 3:** 2050 Scenario with medium growth and development adjustments made to the LAMPO model. This scenario was originally scoped to represent high growth and development as shown in the INR study; however, recent expansions to the Lexington Urban Service Boundary resulted in the project team agreeing that medium growth would more accurately reflect this scenario. Full BRT scenario, adding the transit improvements from Scenario 2, with the addition of dedicated lanes for service, such as a Bus Access Transit (BAT) lane in both directions between Southland Drive and Man O' War Boulevard, and a bidirectional center running bus-only lane between Scott Street and Alumni Drive.

The LAMPO model along with the Federal Transit Administration's (FTA) Simplified Trips-on-Project Software (STOPS) model were used to forecast both traffic and transit volumes for all three scenarios. A detailed methodology is included in *"Appendix C"*.

STOPS MODELING RESULTS

Forecasted transit ridership for Scenarios 2 and 3 was developed for both the base year, 2023, and FTA's horizon year of 2045. A summary of the ridership forecast is included in *Table 2*.

ALTERNATIVE		SCENARIO 1 EXISTING	SCENARIO 2 "RAPID"		SCENARIO 3 BRT	
HEADWAY (MINUTES)		-	10	15	10	15
BASE YEAR 2023	Route 5 Nicholasville Road	1,150	440	580	360	480
	Route 14 UK Blue + White Routes	5,450	4,730	4,820	4,510	4,610
	Total Trips on the Project	-	1,780	1,430	2,590	2,040
	New Transit Riders	-	290	230	510	370
	Change in PMT	-	-1,160	-950	-2,140	-1,500
	Change in VMT	-	-970	-790	-1,790	-1,250
HORIZON YEAR 2045	Route 5 Nicholasville Road	1,660	680	900	560	740
	Route 14 UK Blue + White Routes	6,600	5,420	5,560	5,210	5,370
	Total Trips on the Project	-	2,750	2,220	3,810	2,990
	New Transit Riders	-	480	380	790	600
	Change in PMT*	-	-1,950	-1,610	-3,470	-2,470
	Change in VMT*	-	-1,630	-1,340	-2,890	-2,060

*PMT – Passenger Miles Traveled (average weekday ridership)

*VMT – Vehicle Miles Traveled (average weekday ridership)

TABLE 2. BASE AND FUTURE YEAR FORECASTED TRANSIT RIDERSHIP

FUTURE YEAR (2050) TRAFFIC VOLUMES

Future year traffic volumes were forecasted for the three scenarios. *Figure 9, Figure 10, and Figure 11* show the 2050 turning movement forecasts for Scenario 3. The other two scenarios are included in “Appendix C”.



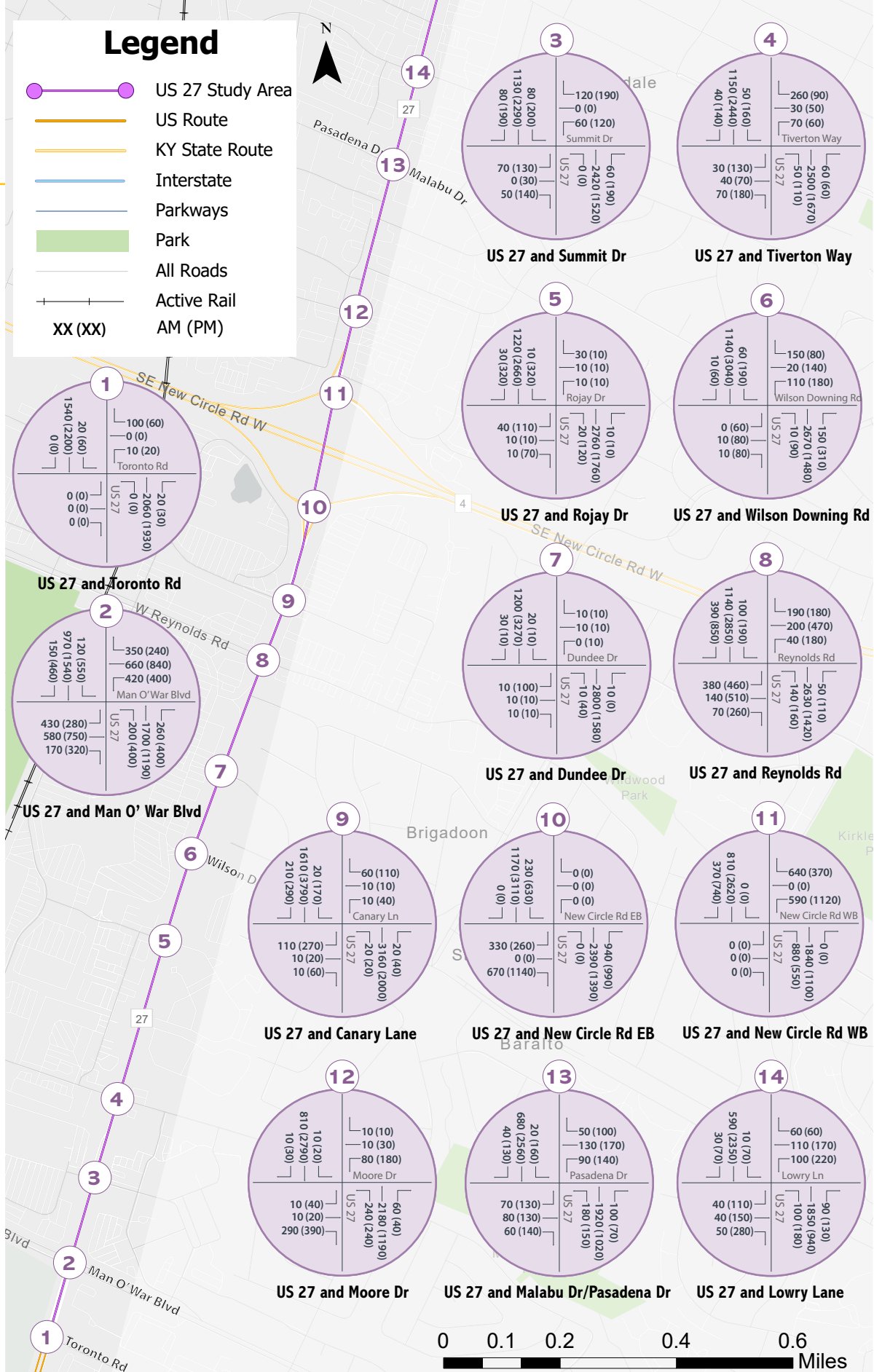


FIGURE 9. 2050 SCENARIO 3 INTERSECTION VOLUMES – TORONTO ROAD TO LOWRY LANE

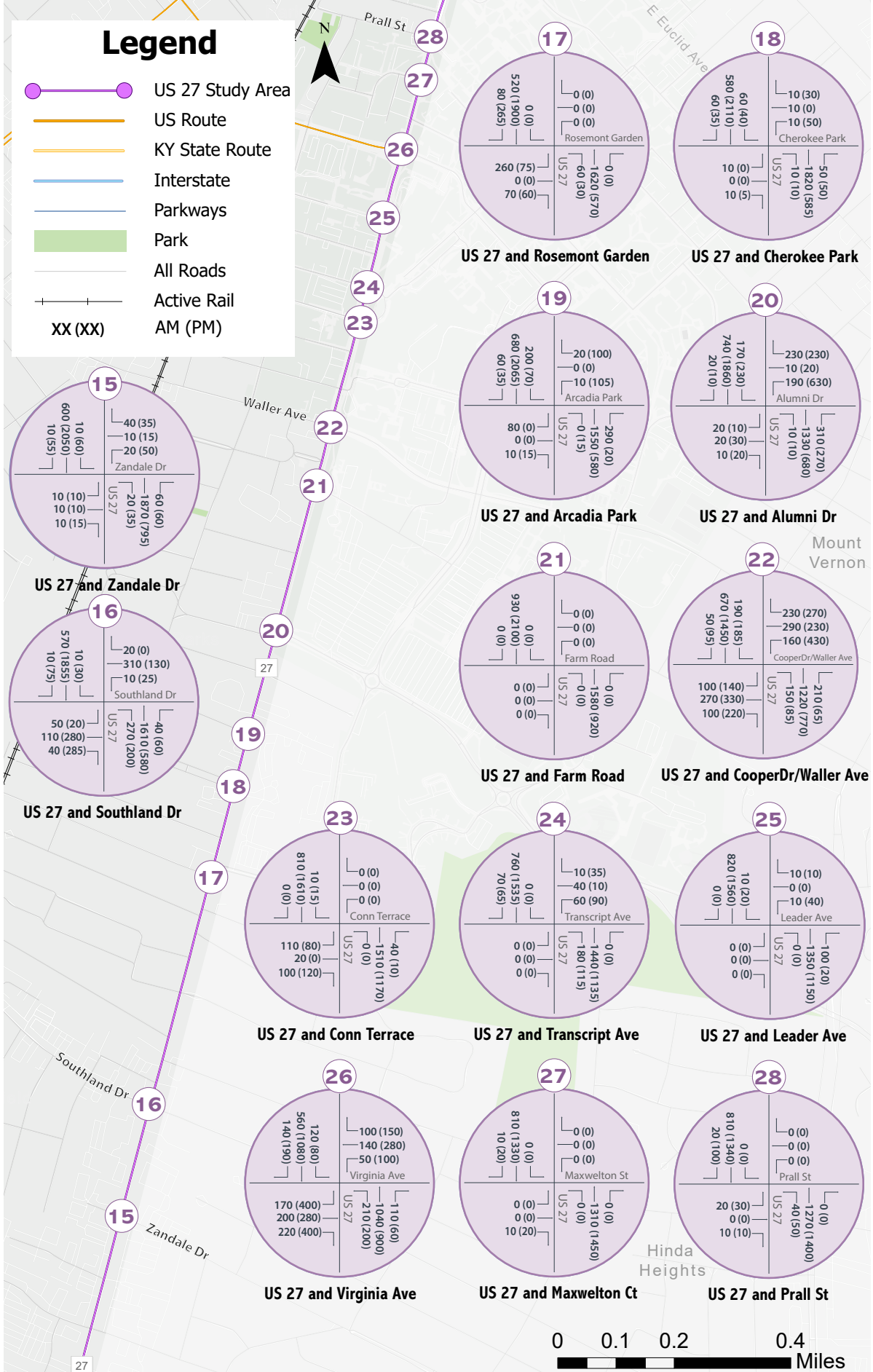


FIGURE 10. 2050 SCENARIO 3 INTERSECTION VOLUMES – ZANDALE DRIVE TO PRALL ST

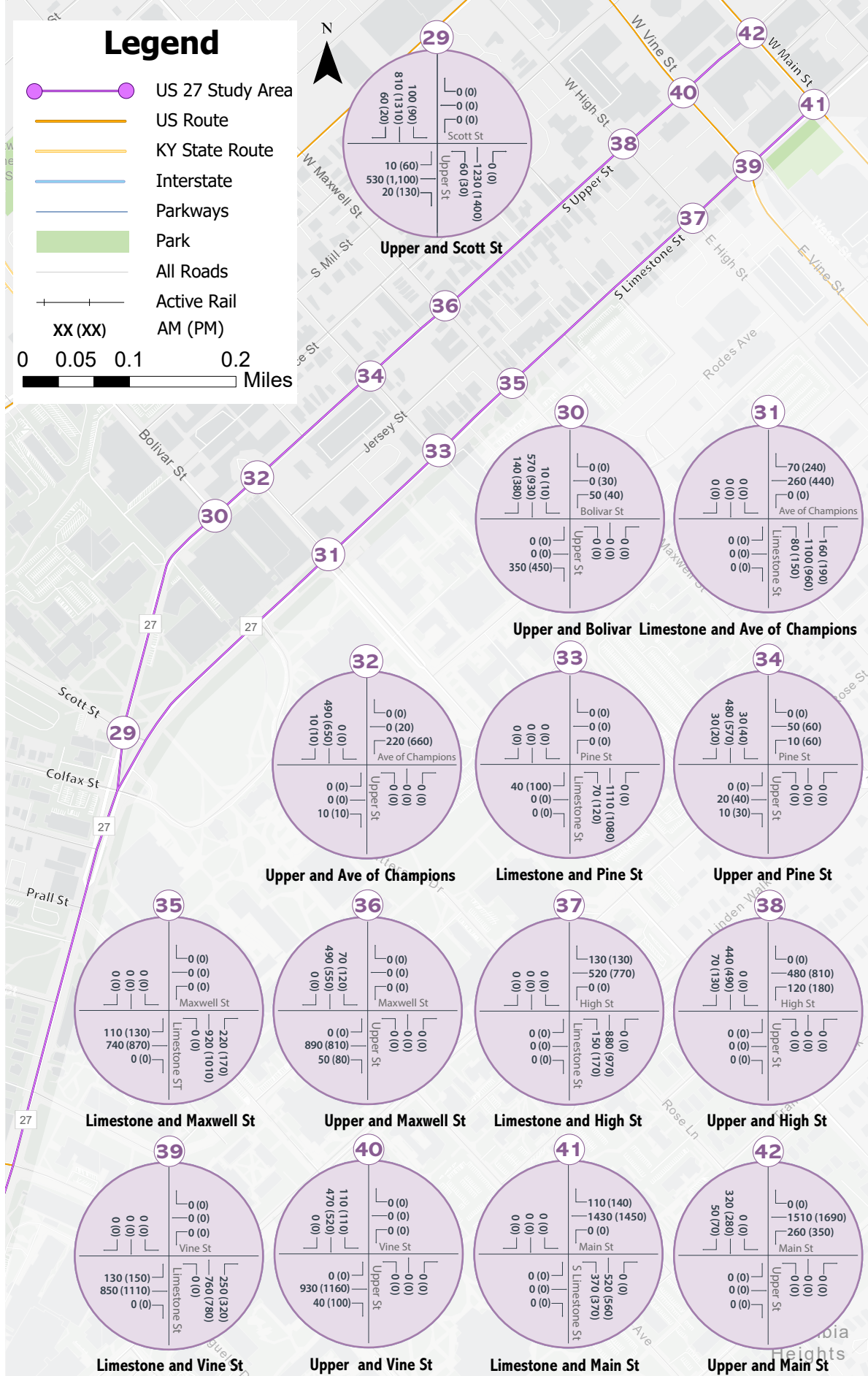


FIGURE 11. 2050 SCENARIO 3 INTERSECTION VOLUMES – SCOTT STREET TO MAIN STREET

4

Environmental

CHAPTER





ENVIRONMENTAL

The environmental overview for the US 27 Corridor Study in “*Appendix D*” extends from Main Street to Toronto Road and encompasses a 250-foot-wide corridor centered on US 27, with 500-foot-radius buffers at major intersections. This environmental overview, prepared by Third Rock Consultants and supported by the Bluegrass Area Development District (BGADD), identifies environmental and community “red flags” that may influence future project development and implementation.

AIR QUALITY & TRAFFIC NOISE

Fayette County is currently in attainment for all National Ambient Air Quality Standards (NAAQS), and no immediate air quality concerns were identified. However, the presence of sensitive receptors such as residences, hotels, restaurants, hospitals, and places of worship along the corridor suggests that traffic noise impacts may be a concern. If a Type I project, defined as construction of highways on new location or the physical alteration of an existing roadway – horizontal or vertically, is proposed, noise monitoring and analysis will be required in accordance with 23 CFR 772. Additionally, mobile source air toxics (MSATs) will be evaluated once traffic forecasts for a preferred alternative are available.

GEOLOGICAL FEATURES

The study area lies within the Bluegrass Region, underlain by Lexington Limestone Formation. This formation is known for its karst features, including sinkholes and springs, which may pose challenges during construction. The area’s soils are primarily silt and clay loams. Portions of the study area lack digital soils data due to urban development. A more detailed geotechnical investigation is recommended in future phases of project development.

HAZARDOUS MATERIALS

A total of 918 sites exist in the study area, and of those, 176 sites were identified as warranting further investigation due to potential petroleum or hazardous material releases. These include gas stations and other facilities with underground storage tanks (USTs). Additionally, 106 monitoring wells and nine remediation wells were documented for the study. A windshield survey also identified one additional site with potential historic contamination. These findings underscore the need for Phase I Environmental Site Assessments (ESAs) during future phases of project development.

COMMUNITY RESOURCES

Two local parks, Henry A. Tandy Centennial Park and Phoenix Park, are present and may be subject to Section 4(f) of the U.S. Department of Transportation Act of 1966. Numerous historic landmarks, educational institutions, including UK, and six places of worship are located within or adjacent to the study area. While no Section 6(f) of the Land and Water Conservation Act recreation resources were identified, the presence of these community assets necessitates careful planning to avoid or minimize impacts during future phases of project development.

CULTURAL RESOURCES

A total of 325 historic properties were identified, including 242 listed on the National Register of Historic Places (NRHP). Three NRHP districts are also present in the study area. While this overview did not include archaeological assessments, such investigations may be necessary in later phases of project development.

SOCIOECONOMICS

The socioeconomic analysis conducted by BGADD revealed several areas of concern. Twelve of the 20 census tracts within the study area have higher poverty rates than the county average. Additionally, several tracts have elevated percentages of racial minorities, elderly residents, individuals with disabilities, and persons with limited English proficiency (LEP). These findings suggest that future project phases should include a detailed socioeconomic analysis and robust public engagement.

RECOMMENDATIONS

In summary, the environmental overview identifies several key considerations for the US 27 Corridor Study. These include potential noise impacts, geotechnical challenges, hazardous materials, cultural and community resources, and vulnerable populations. The report recommends further technical studies and stakeholder coordination to support informed decision-making and minimize environmental and social impacts as the project advances.

5

Potential Improvement Concept Development

CHAPTER





POTENTIAL IMPROVEMENT CONCEPT DEVELOPMENT

Upon completion of the traffic and transit forecasting, initial potential improvement concepts were developed, utilizing feedback from the Project Team, concepts from the INR study, and concepts from the LFUCG Congestion Management Bottleneck Study. *Figure 12* shows the process for evaluating the potential improvement concepts.

1. BRAINSTORMING @ PTM #3

2. IDENTIFICATION OF CRITICAL INTERSECTIONS

- » Virginia
 - » Cooper/Waller
 - » Southland
 - » New Circle
 - » Reynolds
 - » Man O' War
-

3. CAP-X EVALUATION AT CRITICAL INTERSECTIONS

4. CONCEPT DEVELOPMENT FOR NON-CRITICAL INTERSECTIONS

5. GEOMETRIC FEASIBILITY OF BEST CONCEPTS

6. TRAFFIC ANALYSIS OF CONCEPTS FOR SCENARIO 2 (BEST CASE SCENARIO)

7. TRAFFIC ANALYSIS OF CONCEPTS FOR SCENARIO 3

8. GEOMETRIC LAYOUT FOR SCENARIO 3

FIGURE 12. PROCESS FOR EVALUATING POTENTIAL IMPROVEMENT CONCEPTS

Based on project management team meetings, Virginia Avenue, Cooper Drive/Waller Avenue, Southland Drive, New Circle Road, Reynolds Road, and Man O' War Boulevard were identified as critical intersections that cause congestion in the study area and need to be improved. These intersections were evaluated using the Federal Highway Administration's (FHWA) Capacity Analysis for Planning of Junctions (CAP-X) tool, to identify potential improvement concepts.

Additionally, concepts for the non-critical intersections were developed. The consultant team evaluated the geometric feasibility of the various potential improvement concepts, and the project management team determined which concepts best met the goals of the project and should be moved forward for a more detailed evaluation.

TRAFFIC SIMULATION MODELING

Traffic simulation models were created to aid in the evaluation of potential improvement concepts. The study area was divided into four sections for analysis:

01. Southland/Man O' War (Southland Drive to Man O' War Boulevard)
02. Neighborhood/Hospital (Alumni Drive to Southland Drive)
03. University of Kentucky (Scott Street to Alumni Drive)
04. Downtown (Main Street to Scott Street)

The neighborhood/hospital and downtown sections were evaluated using Synchro. The BRT line in Scenario 3 would operate in mixed traffic in these sections; therefore, Synchro would provide a sufficient analysis for the intersections. For individual roundabout intersections, SIDRA roundabout analysis software was used.

The Southland/Man O' War and University of Kentucky sections were evaluated using VISSIM. VISSIM is a more robust and time-intensive modeling software that allows for the modeling of transit vehicles, as well as bus-only lanes. Scenario 3 includes a center-running bidirectional bus-only lane in the University of Kentucky section, and a BAT lane in the Southland/Man O' War section, which would be more accurately modeled using VISSIM.

Scenario 1 was modeled as a future No-Build scenario, since it does not include improvements to transit or any projects not currently in the LAMPO models.

The project management team determined that Scenario 2 was the best scenario to begin modeling potential improvement concepts, as it does not have any dedicated transit lanes. If a concept performed poorly in Scenario 2, it was likely to perform poorly in Scenario 3 as well. The VISSIM and Synchro models were used to evaluate and refine the various concepts. Results were shared at monthly project management meetings, and the team eliminated some concepts, while others were optimized, taking into account the impacts to all modes of transportation (private vehicle, bus, bicyclists, and pedestrians). Meeting minutes detailing these decisions are included in *"Appendix A"*. After the initial screening and refinement, a final set of potential improvement concepts were modeled for Scenarios 2 and 3. Performance measures used for evaluation included levels of service (LOS), delay, and travel times. During the evaluation process the project management team determined that Scenario 3 best met the goals of the study.

6

Potential Improvement Concept Evaluation

CHAPTER





POTENTIAL IMPROVEMENT CONCEPT EVALUATION

The following sections highlight the improvement concepts that were evaluated for each scenario in the Downtown, University of Kentucky, Neighborhood/Hospital, and Southland/Man O' War Boulevard sections of the study area, and *Figure 13* through *Figure 17* show the recommended Scenario 3 concepts for each section.

SOUTHLAND/MAN O' WAR POTENTIAL IMPROVEMENT CONCEPTS EVALUATED

No major roadway improvements in Scenario 1. Potential improvement concepts for the Southland/Man O' War section include the following:

SCENARIO 2

- » Bus operates in mixed traffic with rapid service that runs on a more frequent headway and fewer stops (at stations)
- » TSP at signalized intersections
- » Five full-time stations:
 - » Southland Drive
 - » Pasadena Drive
 - » Lexington Green
 - » Fayette Mall
 - » The Summit
- » Removal of the reversible travel lane
- » Thru-cuts (removing through movements on the side streets) at signalized intersections between Southland Drive and New Circle Road:
 - » Zandale Drive
 - » Lowry Lane
 - » Malabu Drive/Pasadena Drive
 - » Moore Drive
- » Two options for reconstruction of the New Circle Road interchange:
 - » Diverging Diamond Interchange (DDI)
 - » Partial Cloverleaf
- » Triple left turns on west leg of Reynolds Road intersection
- » Widen to three lanes in both directions south of Man O' War Boulevard

SCENARIO 3

- » BRT runs in a bus access transit (BAT) lane that allows only buses and right turning vehicles
- » All Scenario 2 roadway and intersection improvements
- » Restripe to accommodate BAT lanes
 - » 10- or 11-foot lanes from Southland Drive to New Circle Road
 - » Potential for speed limit reduction to 35 mph
 - » 11-foot lanes from New Circle Road to Man O' War Boulevard
 - » Lengthen right turn lane or add BAT lane on blocks where necessary to maintain 3 full access travel lanes in each direction between New Circle Road and Man O' War Boulevard
- » 10-foot shared use path on both sides of road



FIGURE 13. RECOMMENDATIONS FROM TORONTO ROAD TO NEW CIRCLE ROAD

SOUTHLAND/MAN O' WAR SECTION - NEW CIRCLE RD TO SOUTHLAND DR

Scenario 3



FIGURE 14. RECOMMENDATIONS FROM NEW CIRCLE ROAD TO SOUTHLAND DRIVE

NEIGHBORHOOD/HOSPITAL POTENTIAL IMPROVEMENT CONCEPTS EVALUATED

No major roadway improvements in Scenario 1. Potential improvement concepts for the Neighborhood/Hospital section include the following:

SCENARIO 2

- » Bus operates in mixed traffic with rapid service that runs on a more frequent headway and fewer stops (at stations)
- » TSP at signalized intersections
 - » One full-time station at Baptist Health
- » Removal of the reversible lane
- » Roundabout option at signalized intersections:
 - » Arcadia Park/Baptist Health
 - » Cherokee Park/Baptist Health
 - » Rosemont Garden/Hiltonia Park
- » Roundabout option at unsignalized intersection
 - » Tahoma Road/Lackawanna Road for access

SCENARIO 3

- » Bus operates in mixed traffic with rapid service that runs on a more frequent headway and fewer stops (at stations)
- » All Scenario 2 roadway and intersection improvements
- » 10-foot shared use path on both sides of the road

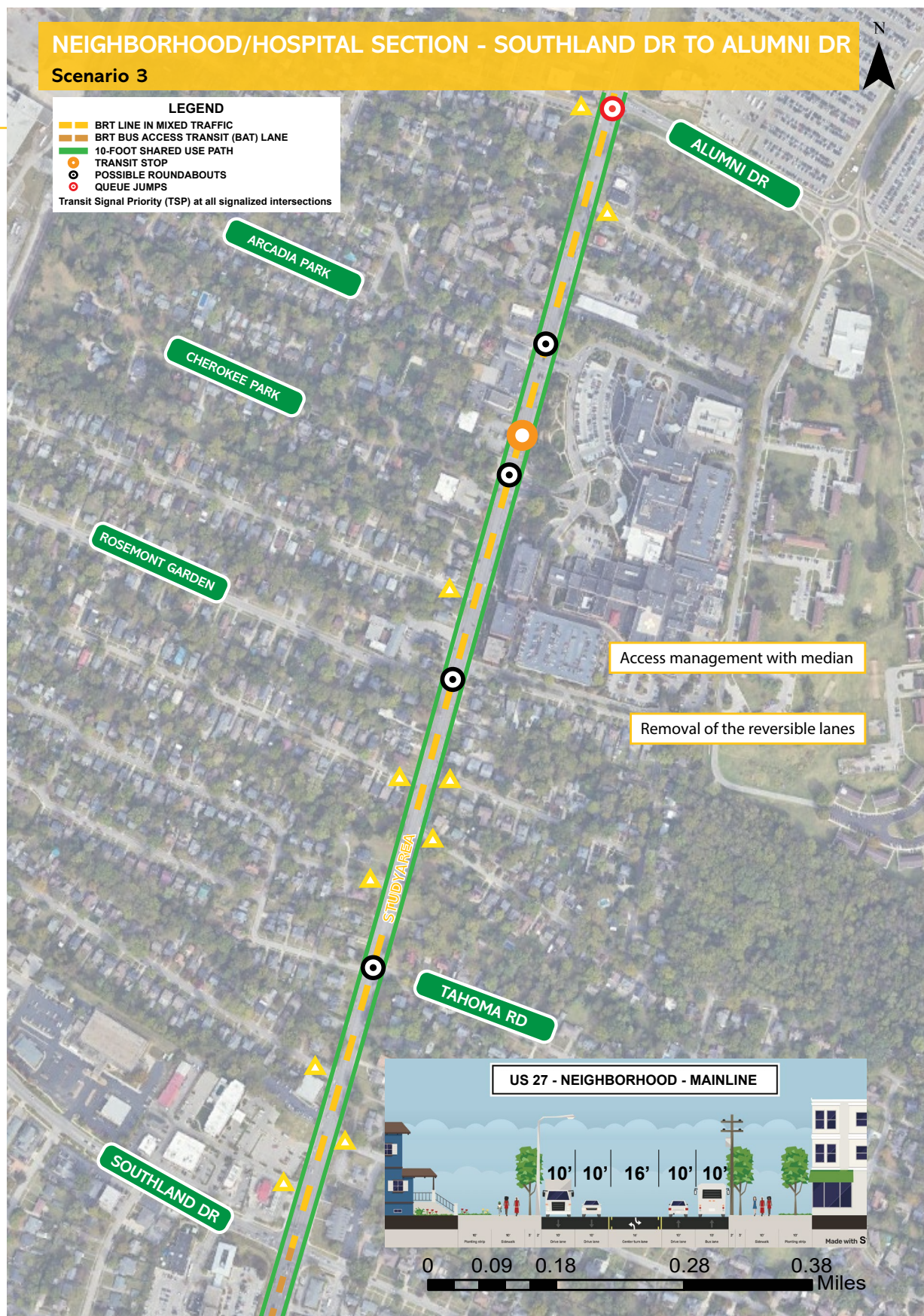


FIGURE 15. RECOMMENDATIONS FROM SOUTHLAND DRIVE TO ALUMNI DRIVE

UNIVERSITY OF KENTUCKY

POTENTIAL IMPROVEMENT CONCEPTS EVALUATED

No major roadway improvements in Scenario 1. Potential improvement concepts for the University of Kentucky section include the following:

SCENARIO 2

- › Bus operates in mixed traffic with rapid service that runs on a more frequent headway and fewer stops (at stations)
- › Two full-time stations and one special event station:
 - › Memorial Hall
 - › UK Hospital
 - › Kroger Field/Westwood Drive (special event station)
- › Removal of the reversible travel lane
- › Widen the east leg of Cooper Drive to two left-turn lanes, one thru lane, and one shared thru-right lane
- › Modify the lane configuration for southbound US 27 at Cooper Drive to two left-turn lanes, one thru lane, and one shared thru-right lane
- › Dantzler Drive becomes right-in/right-out and is not part of the traffic signal at Alumni Drive

SCENARIO 3

- › Full BRT with buses using a center-running bidirectional bus-only lane
- › Traffic Signal Priority (TSP) at signalized intersections
- › Queue jumps at Scott Street and Alumni Drive
- › Two full-time stations and one special event station:
 - › Memorial Hall
 - › UK Hospital
 - › Kroger Field/Westwood Drive (special event station)
- › All Scenario 2 roadway and intersection improvements
- › 10-foot shared use path on both sides of the road
- › Access management with right-in/right-out access only at unsignalized intersections
- › Prall Street evaluated with and without a northbound left turn lane
- › Bowtie intersection at Virginia Avenue with no left turns allowed at the Virginia/Limestone intersection, all turning traffic to utilize the roundabouts at Press Avenue/Winnie Street and the Health Center Parking Garage

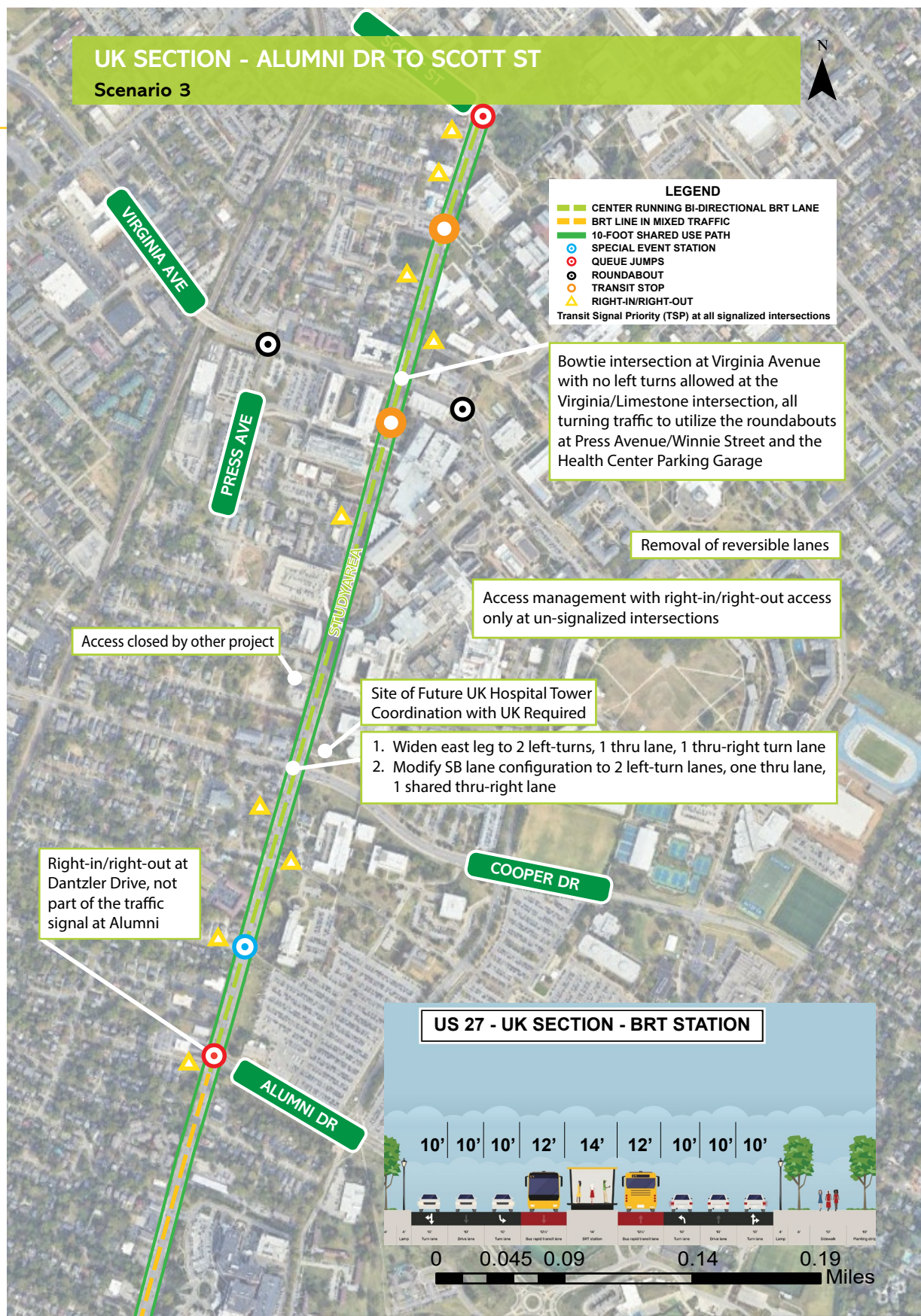


FIGURE 16. RECOMMENDATIONS FROM ALUMNI DRIVE TO SCOTT STREET

DOWNTOWN

POTENTIAL IMPROVEMENT CONCEPTS EVALUATED

Potential improvement concepts for the Downtown section include the following:

SCENARIO 1

- » Intersection upgrades for enhanced visibility and ADA compliant crosswalks
- » Restriping to allow for bike lanes/parking protected bike lanes
- » Sidewalk improvements
- » Historic lighting

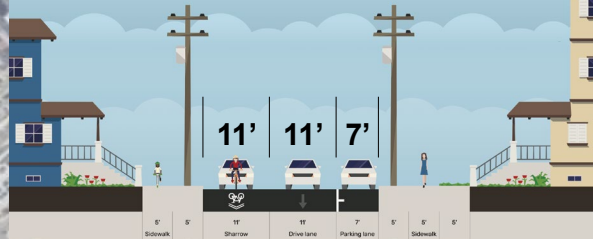
SCENARIO 2 + 3

- » All the improvements from scenario 1
- » BRT running in mixed traffic with stops at three stations:
 - » Downtown Transit Center
 - » Upper Street at Target (southbound direction)
 - » Limestone Street at Good Samaritan (northbound direction)

DOWNTOWN SECTION - SCOTT ST TO MAIN ST Scenario 3



S. UPPER STREET - MAINLINE SB



S LIMESTONE
UPPER ST
MAIN ST
END OF STUDY AREA

HIGH ST
STUDY AREA
ONE WAY

MAXWELL ST
ONE WAY

PROTECTED BIKE LANE
PARKING AND PROTECTED BIKE LANE

AVE OF CHAMPIONS

TRANSIT STOP

Center Running
Bi-Directional
BRT Lane

SCOTT ST

LEGEND

- BRT LINE IN MIXED TRAFFIC
 - CENTER RUNNING
 - BI-DIRECTIONAL BRT LANE TRANSIT STOP
 - PARKING AND PROTECTED BIKE LANE
 - RESTRIPING
 - HISTORIC LIGHTING
 - SIDEWALK IMPROVEMENTS
 - URBAN INTERSECTION UPGRADES
 - RIGHT-IN/RIGHT-OUT
- Transit Signal Priority (TSP) at all signalized intersections

S. LIMESTONE - MAINLINE NB

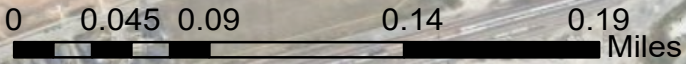
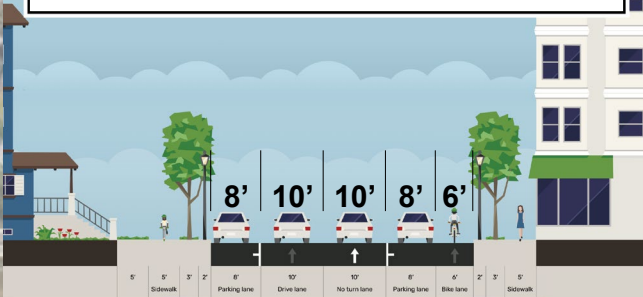


FIGURE 17. RECOMMENDATIONS FROM SCOTT STREET TO MAIN STREET

TRAFFIC EVALUATION RESULTS

The following sections summarize the traffic evaluation results, comparing Scenarios 1, 2, and 3 for each section of the study area.

DOWNTOWN

The Downtown section was evaluated using Synchro traffic analysis software. Average delay and LOS were evaluated for each intersection in the AM and PM peak periods (*Table 3 and Table 4*). Additionally, travel times from one end of this section to the other were collected for both peak periods and are displayed in *Figure 18 and Figure 19*.

AM PEAK PERIOD							
	INTERSECTION	SCENARIO 1		SCENARIO 2		SCENARIO 3	
		DELAY (S)	LOS	DELAY (S)	LOS	DELAY (S)	LOS
Upper Street	Bolivar Street	13.6	B	17.2	B	17.2	B
	Winslow Street	5.5	A	4.1	A	4.3	A
	Pine Street	3.5	A	5.5	A	4.9	A
	Maxwell Street	13.2	B	14	B	13.7	B
	High Street	4.7	A	4.7	A	4.7	A
	Vine Street	18.4	B	11	B	11.2	B
	Main Street	9	A	9.6	A	9.7	A
Limestone Street	Main Street	14.4	B	13.2	B	13.3	B
	Vine Street	8.7	A	9.2	A	10.2	B
	High Street	13.5	B	9.3	A	9.5	A
	Maxwell Street	15.4	B	16.1	B	18.7	B
	Euclid Avenue	14.1	B	14.5	B	14.5	B

TABLE 3. AM LOS AND DELAY FOR THE DOWNTOWN INTERSECTIONS

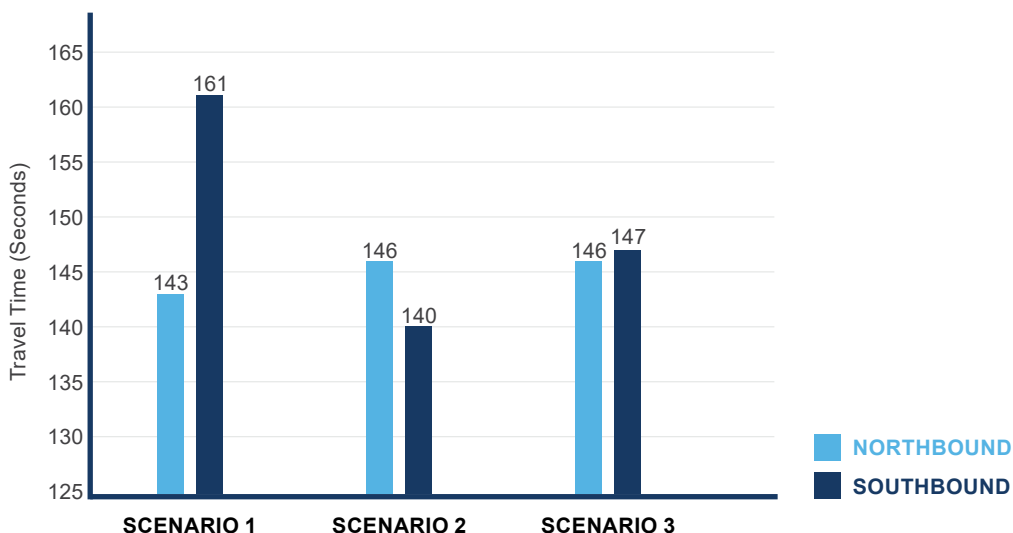


FIGURE 18. DOWNTOWN AM PEAK PERIOD TRAVEL TIMES

PM PEAK PERIOD							
		SCENARIO 1		SCENARIO 2		SCENARIO 3	
	INTERSECTION	DELAY (S)	LOS	DELAY (S)	LOS	DELAY (S)	LOS
Upper Street	Bolivar Street	28.8	C	23.7	C	23.5	C
	Winslow Street	34.4	C	23.8	C	23.8	C
	Pine Street	8.5	A	8.0	A	7.9	A
	Maxwell Street	18.7	B	16.4	B	17.3	B
	High Street	7.7	A	11.0	B	7.9	A
	Vine Street	14.1	B	13.6	B	13.5	B
	Main Street	9.5	A	8.9	A	8.8	A
Limestone Street	Main Street	13.2	B	13.2	B	13.1	B
	Vine Street	10.8	B	10.8	B	12.9	B
	High Street	12.1	B	10.0	A	11.1	B
	Maxwell Street	10.8	B	10.8	B	11.4	B
	Euclid Avenue	15.1	B	15.5	B	15.6	B

TABLE 4. PM LOS AND DELAY FOR THE DOWNTOWN INTERSECTIONS

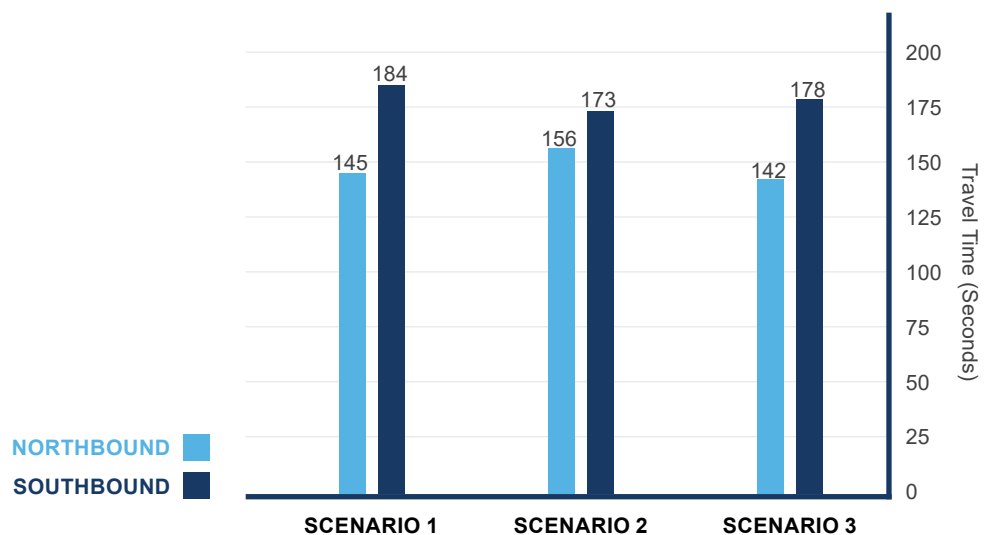


FIGURE 19. DOWNTOWN PM PEAK PERIOD TRAVEL TIMES

TRAFFIC EVALUATION RESULTS

UNIVERSITY OF KENTUCKY

The University of Kentucky section was evaluated using VISSIM. Average delay and LOS were evaluated for each intersection in the AM and PM peak periods (*Table 5 and Table 6*), and end-to-end travel times were collected both for BRT vehicles and general-purpose traffic. Travel times are shown in *Figure 20 and Figure 21*.

AM PEAK PERIOD							
		SCENARIO 1		SCENARIO 2		SCENARIO 3	
INTERSECTION		DELAY (S)	LOS	DELAY (S)	LOS	DELAY (S)	LOS
US 27	Alumni Drive	77.0	E	51.2	D	42.4	D
	Cooper/Waller Drive	109.0	F	60.9	E	56.1	E
	Conn Terrace	16.1	B	11.1	B	19.8	B
	Transcript Avenue	30.0	C	14.4	B	21.7	C
	Leader Avenue	22.8	C	9.9	A	10.0	A
	Virginia Roundabout	-				34.1	D
	Huguelet Roundabout	-				20.5	C
	Virginia Avenue	68.3	E	38.4	D	52.3	D
	Maxwelton Court	15.5	B	6.0	A	6.1	A
	Prall Street	23.8	C	9.2	A	13.1	B
	Scott Street	19.1	B	15.5	B	5.4	A

TABLE 5. AM LOS AND DELAY FOR THE UNIVERSITY OF KENTUCKY INTERSECTIONS

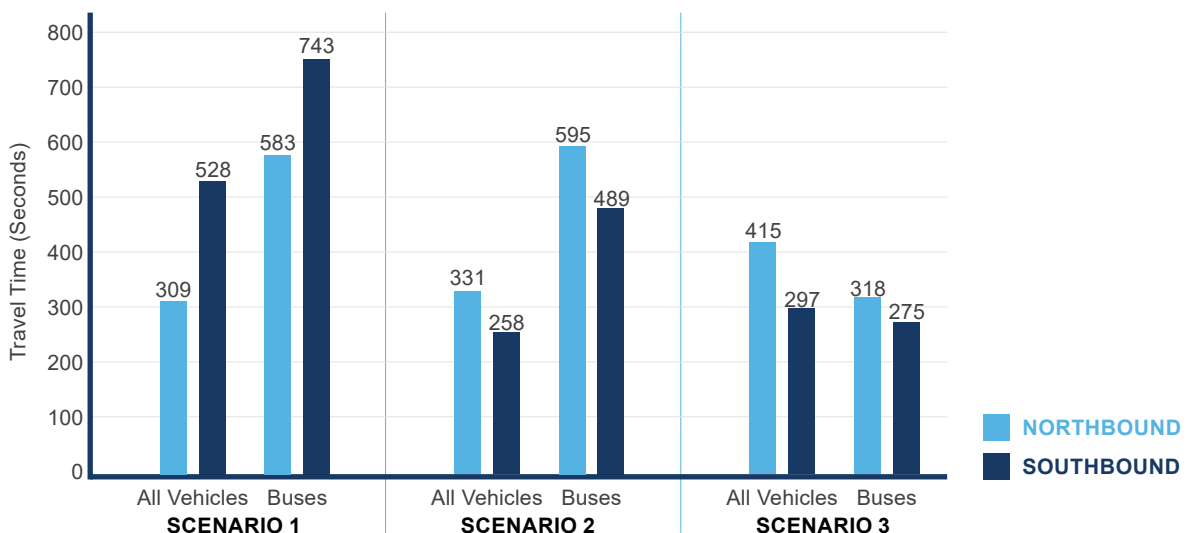


FIGURE 20. UNIVERSITY OF KENTUCKY AM PEAK PERIOD GENERAL PURPOSE AND BRT TRAVEL TIMES

PM PEAK PERIOD							
		SCENARIO 1		SCENARIO 2		SCENARIO 3	
INTERSECTION		DELAY (S)	LOS	DELAY (S)	LOS	DELAY (S)	LOS
US 27	Alumni Drive	64.6	E	55.0	D	59.1	E
	Cooper/Waller Drive	111.5	F	82.2	F	94.1	F
	Conn Terrace	9.9	A	9.3	A	36.9	D
	Transcript Avenue	10.5	B	15.6	B	36.2	D
	Leader Avenue	8.1	A	11.0	B	28.9	C
	Virginia Roundabout	-				12.9	B
	Huguelet Roundabout	-				25.5	D
	Virginia Avenue	72.7	E	59.1	E	60.7	E
	Maxwelton Court	10.8	B	10.7	B	23.9	C
	Prall Street	12.6	B	10.0	A	30.8	C
	Scott Street	17.0	B	20.2	C	23.6	C

TABLE 6. PM LOS AND DELAY FOR THE UNIVERSITY OF KENTUCKY INTERSECTIONS

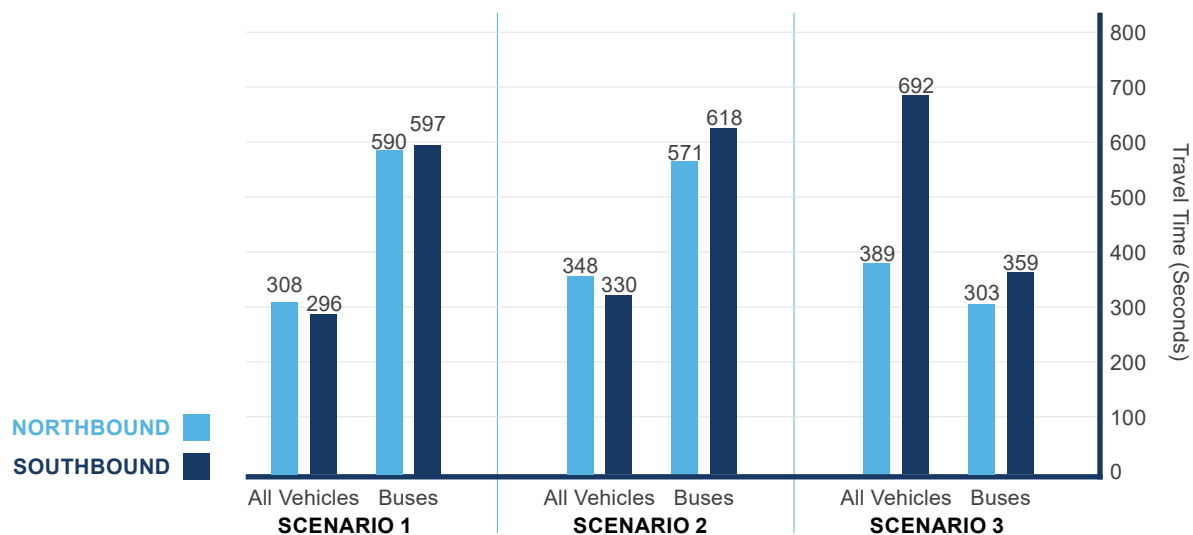


FIGURE 21. UNIVERSITY OF KENTUCKY PM PEAK PERIOD GENERAL PURPOSE AND BRT TRAVEL TIMES

TRAFFIC EVALUATION RESULTS

NEIGHBORHOOD/HOSPITAL

The Neighborhood/Hospital section was evaluated using Synchro. The signalized intersections were also evaluated as roundabouts using SIDRA. The LOS and delay for the intersections are shown in *Table 7 and Table 8*. End-to-end travel times along this section for both the signalized intersections and roundabouts are shown in *Figure 22 and Figure 23*.

AM PEAK PERIOD								
INTERSECTION	SCENARIO 1				SCENARIO 2 + 3			
	SIGNALIZED		ROUNDAABOUT		SIGNALIZED		ROUNDAABOUT	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
Arcadia Park	6.6	A	NA	NA	18.7	C	18.7	C
Cherokee Park	5.1	A	NA	NA	21.5	D	21.5	C
Rosemont Garden	15.2	B	NA	NA	22.0	C	11.5	B

TABLE 7. AM LOS AND DELAY FOR THE NEIGHBORHOOD/HOSPITAL INTERSECTIONS

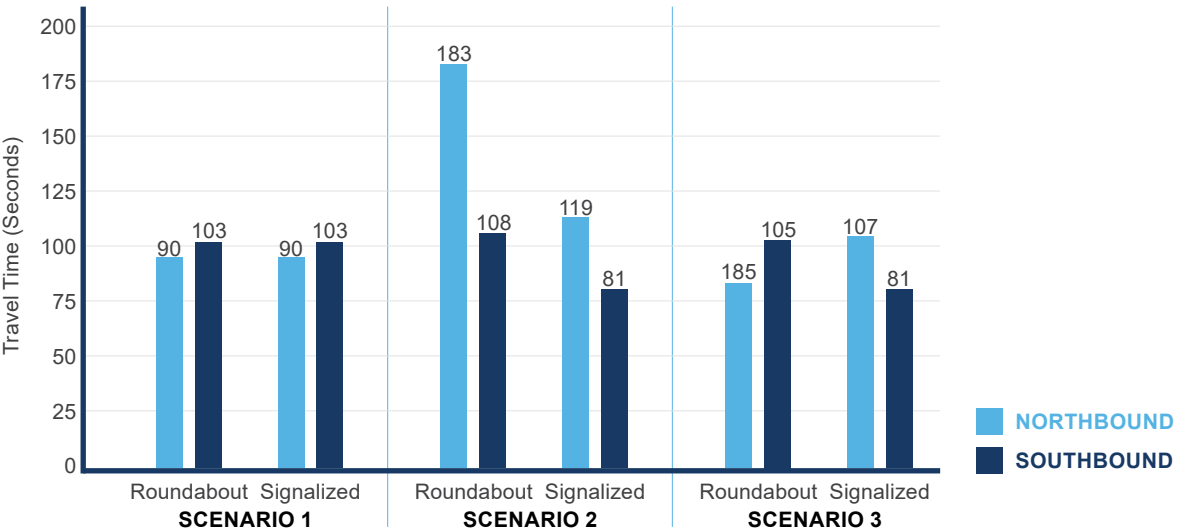


FIGURE 22. NEIGHBORHOOD/HOSPITAL SECTION AM TRAVEL TIMES

PM PEAK PERIOD

INTERSECTION	SCENARIO 1				SCENARIO 2 + 3			
	SIGNALIZED		ROUNDAABOUT		SIGNALIZED		ROUNDAABOUT	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
Arcadia Park	22.0	C	NA	NA	19.9	C	19.9	C
Cherokee Park	8.5	A	NA	NA	15.6	C	15.6	C
Rosemont Garden	9.0	A	NA	NA	49.2	E	22.0	C

TABLE 8. PM LOS AND DELAY FOR THE NEIGHBORHOOD/HOSPITAL INTERSECTIONS

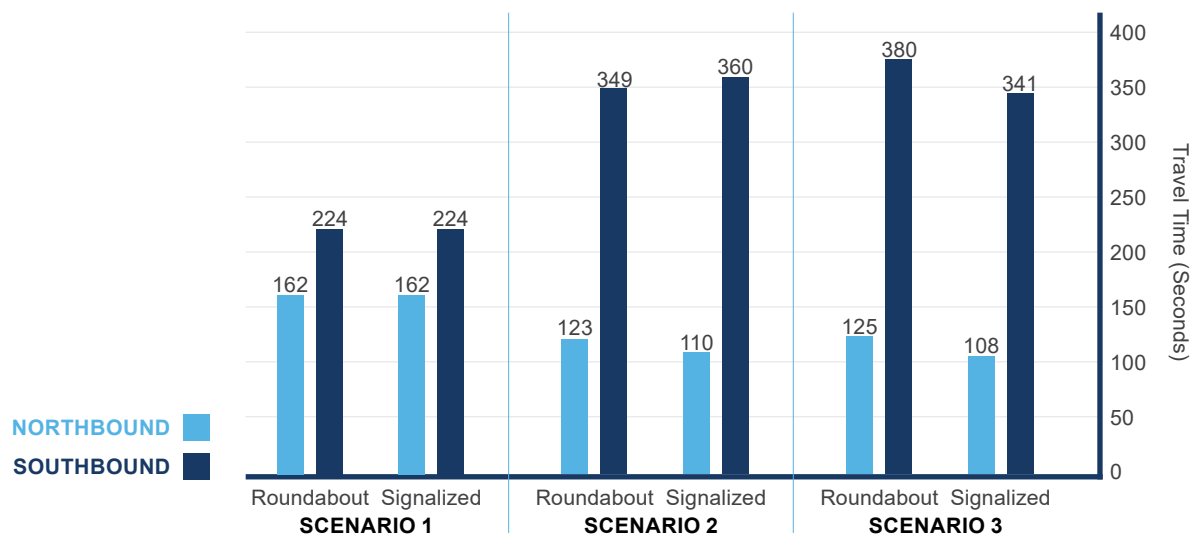


FIGURE 23. NEIGHBORHOOD/HOSPITAL SECTION PM TRAVEL TIMES

TRAFFIC EVALUATION RESULTS

SOUTHLAND/MAN O' WAR

The Southland Man O' War section was evaluated using VISSIM. Average delay and LOS were evaluated for each intersection in the AM and PM peak periods (*Table 9 and Table 10*), and end-to-end travel times were collected for BRT vehicles and general-purpose traffic. Travel times are shown in *Figure 24 and Figure 25*. Note that the difference between Scenario 3a and 3b is that Scenario 3a was analyzed with the New Circle Road interchange as a DDI, and Scenario 3b was analyzed with a partial cloverleaf.

AM PEAK PERIOD

	INTERSECTION	SCENARIO 1		SCENARIO 2		SCENARIO 3A		SCENARIO 3B	
		DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
US 27	Man O' War Boulevard	81.7	F	50.4	D	59.6	E	70.3	E
	Summit Drive	26.7	C	13.7	B	20.2	C	20.0	B
	Tiverton Way	35.6	D	17.8	B	30.6	C	23.9	C
	Rojay Drive	45.9	D	8.1	A	17.6	B	16.6	B
	Wilson Downing Road	30.4	C	16.4	B	33.4	C	32.8	C
	Dundee Drive	26.0	C	8.5	A	15.8	B	20.5	C
	Reynolds Road	67.6	E	36.3	D	53.1	D	54.8	D
	Canary Road	17.9	B	10.5	B	33.0	C	18.4	B
	New Circle Road EB	35.9	D	23.0	C	45.5	D	17.0	B
	New Circle Road WB	36.6	D	22.7	C	47.8	D	27.2	C
	Moore Drive	12.3	B	17.4	B	35.1	D	25.9	C
	Malabu Drive	36.9	D	14.8	B	36.4	D	43.2	D
	Lowry Drive	14.3	B	20.7	C	49.3	D	32.6	C
	Zandale Drive	10.4	B	3.7	A	28.6	C	27.4	C
	Southland Drive	38.1	D	30.8	C	61.1	E	45.8	D

TABLE 9. AM LOS AND DELAY FOR THE SOUTHLAND/MAN O' WAR INTERSECTIONS

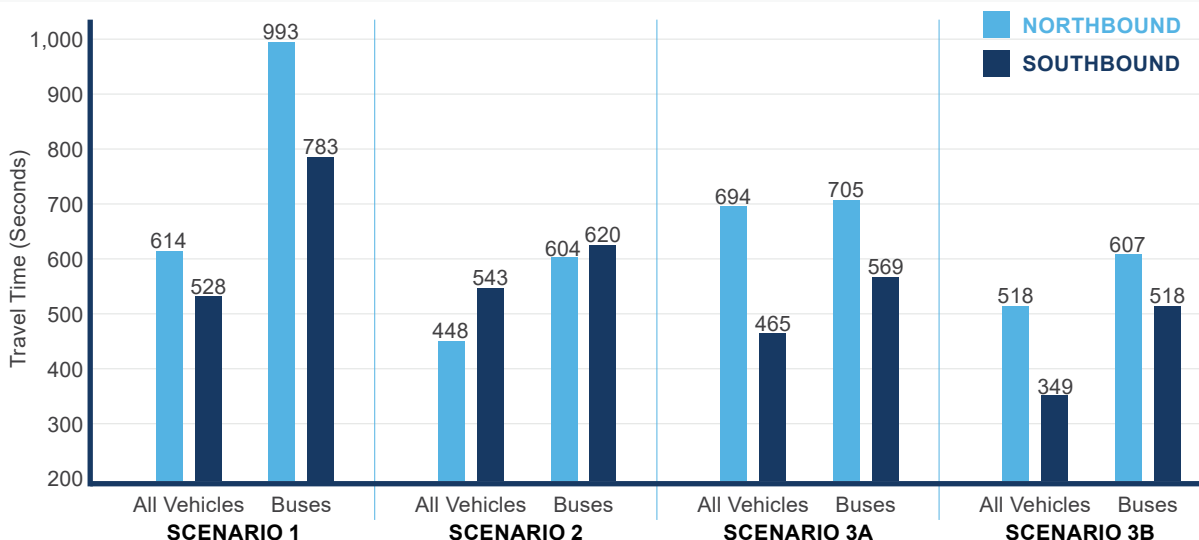


FIGURE 24. SOUTHLAND/MAN O' WAR SECTION AM GENERAL PURPOSE AND BRT TRAVEL TIMES

PM PEAK PERIOD

INTERSECTION	SCENARIO 1		SCENARIO 2		SCENARIO 3A		SCENARIO 3B	
	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS
Man O' War Boulevard	78.0	E	62.2	E	62.7	E	80.1	F
Summit Drive	14.9	B	30.6	C	23.3	C	26.1	C
Tiverton Way	21.3	C	37.5	D	35.2	D	27.5	C
Rojay Drive	40.7	D	38.9	D	19.5	B	29.6	C
Wilson Downing Road	61.0	E	49.8	D	38.5	D	43.7	D
Dundee Drive	38.0	D	23.2	C	17.0	B	26.5	C
Reynolds Road	82.1	F	60.9	E	54.9	D	68.9	E
Canary Road	40.9	D	24.1	C	36.7	D	34.8	C
New Circle Road EB	53.6	D	30.2	C	46.3	D	23.2	C
New Circle Road WB	76.4	E	49.1	D	50.0	D	47.1	D
Moore Drive	74.6	E	30.1	C	36.9	D	33.1	C
Malabu Drive	69.8	E	35.5	D	39.0	D	44.3	D
Lowry Drive	122.4	F	48.0	D	53.4	D	59.3	E
Zandale Drive	82.7	F	14.6	B	30.6	C	19.6	B
Southland Drive	148.0	F	48.2	D	65.0	E	52.1	D

TABLE 10. PM LOS AND DELAY FOR THE SOUTHLAND/MAN O' WAR INTERSECTIONS

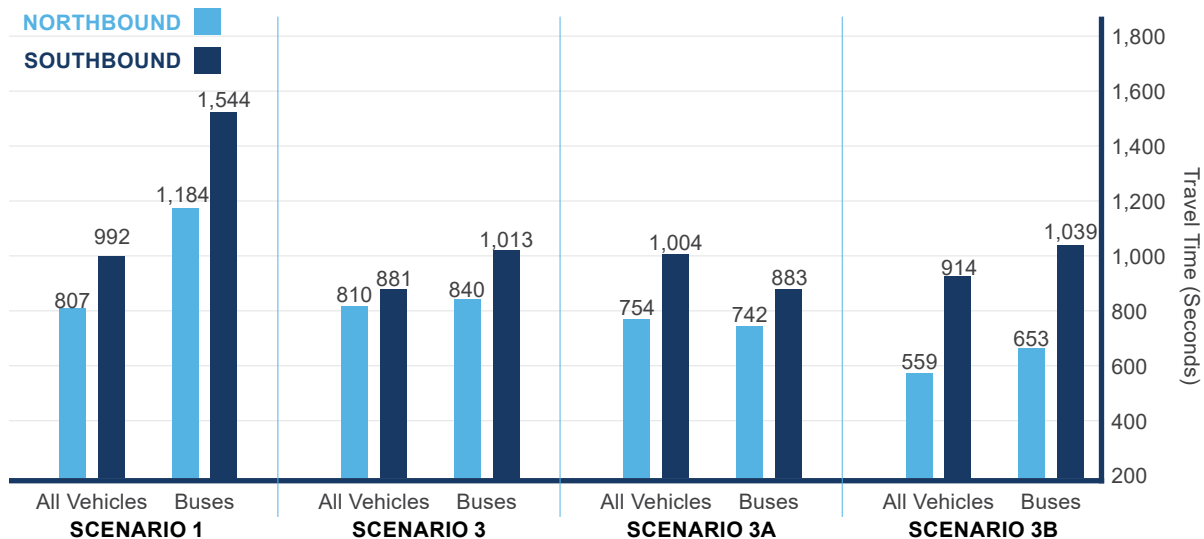


FIGURE 25. SOUTHLAND/MAN O' WAR SECTION PM GENERAL PURPOSE AND BRT TRAVEL TIMES

SAFETY BENEFITS OF POTENTIAL IMPROVEMENT CONCEPTS

A high-level safety analysis was performed to determine the safety benefits of the potential improvement concepts. Crash Modification Factors (CMFs) were used to compute the expected crash reduction after implementing a countermeasure. Not all of the improvement concepts have documented CMFs. For example, the removal of a reversible lane does not have a CMF; however, observation and experience indicates that there would be a safety benefit by reducing driver confusion, especially at the ends of the reversible lanes where a driver may find themselves in what was previously a turn lane that has become a thru lane for oncoming traffic. Other examples of concepts that would likely yield a safety benefit but lacked an associated CMF include the removal of left turns, restriping to narrower lanes and reducing speeds, and adding BAT lanes (which designate a lane for buses and right-turning vehicles, removing them from the general through traffic). **Table 11** lists the potential improvement concepts throughout the corridor along with CMFs for each.

	POTENTIAL IMPROVEMENT CONCEPT	CMF	CMF ID	DESCRIPTION
Southland / Man O' War	TSP at signalized intersections	0.873	9664	Implement transit signal priority
	Thru-cuts	0.455	9459	Change driveway type
	Reconstruct interchange to DDI	0.558	10762	Convert diamond interchange to DDI
	Reconstruct interchange to Partial Cloverleaf	0.96	473	Cloverleaf interchange with crossroad above freeway
	10-foot shared use path on both sides of the road	0.75	9250	Install shared path
Neighborhood / Hospital	TSP at signalized intersections	0.873	9664	Implement transit signal priority
	Roundabouts at signalized intersections	0.79	4184	Convert signalized intersection to modern roundabout
	Roundabout at unsignalized intersection	0.56	215	Convert unsignalized intersection to roundabout
	10-foot shared use path on both sides of the road	0.75	9250	Install shared path
University of Kentucky	TSP at signalized intersections	0.873	9664	Implement transit signal priority
	10-foot shared use path on both sides of the road	0.75	9250	Install shared path
	Access management: right-in/right-out at unsignalized intersections	0.32	9822	Install right-in-right-out (RIRO) operations at stop-controlled intersections
	Bowtie intersection at Virginia Avenue / no left turns	0.79	4184	Convert signalized intersection to modern roundabout
Downtown	Intersection upgrades / enhanced visibility / Americans with Disabilities Act (ADA) compliant crosswalks	0.756; 0.81	Enhanced visibility - 8948; Crosswalk - 4124	Implement systemic signing and visibility improvements at signalized intersections; Install high-visibility crosswalk
	Restriping to allow for bike lanes / parking protected bike lanes	0.51	10738	Install bicycle lanes

TABLE 11. CRASH MODIFICATION FACTORS FOR POTENTIAL IMPROVEMENT CONCEPTS

SUMMARY

The purpose of the traffic and safety analysis was twofold:

01. Evaluate which of the three scenarios best meets the goals of the study; and,
02. Determine which potential improvement concepts would be most beneficial for all users of the US 27 corridor in the selected Scenario.

The traffic analysis showed that Scenario 3 provided the most benefit to BRT travel times (*Table 12*), which will in turn encourage mode shift as well as higher-density Transit-Oriented Development (TOD), which also benefits bicyclists and pedestrians. Key takeaways from the analysis include:

- LOS and delay at the Southland/Man O' War section generally improves in Scenarios 2 and 3 over Scenario 1. Scenarios 3a and 3b, the DDI and Partial Cloverleaf respectively, operate better at some intersections and worse at others, therefore it is recommended to move both forward into preliminary design for further analysis prior to choosing one over the other.
- Through the Neighborhood/Hospital Section, travel times increase in the peak direction and are similar or decrease in the off-peak direction, due to the removal of the reversible lane. Travel times are slightly higher with roundabouts than signalized intersections. All intersections operate at LOS D or better except Rosemont Garden in the PM peak. LOS is C or better when the intersections were analyzed as roundabouts. The roundabouts have slightly higher delays and LOS. The roundabout would provide a safety benefit over the signalized intersection, and it is recommended that both options be considered in the preliminary design phase.
- LOS at signalized intersections through the UK section improve in Scenario 3 over Scenarios 1 and 2 in the AM peak, with the Cooper Drive/Waller Avenue intersection being the only intersection that operates at LOS E, and no intersections operating at LOS F. In the PM peak Virginia Avenue and Alumni Drive operate at LOS E, and Cooper Drive/Waller Avenue operates at LOS F; however, all three intersections have lower delay in Scenario 3 than in Scenario 1.
- In the Downtown section, all intersections operate at LOS C or better during both peak periods, and travel times are consistent across the three scenarios.
- BRT travel times are lowest in Scenarios 3a and 3b, and general-purpose travel times improve in Scenarios 2 and 3 over Scenario 1.
- BRT Travel times through the UK section show significant improvement in Scenario 3 for both the AM and PM peaks. General purpose traffic experiences increased travel time in both peaks, with the exception of southbound travel in the AM peak, which is likely due to the removal of the reversible lane.

During the evaluation phase, the project management team agreed that Scenarios 1 and 2 did not meet the goals of making Nicholasville Road a Complete Street. These two scenarios do not make transit a more viable option compared to Scenario 3 (both 3a and 3b). Scenarios 1 and 2 keep Nicholasville Road car-centric, do not promote mode-shift to bicycle, pedestrian, or transit options, which does not make the roadway safer for all modes. In Project Team Meeting #4, it was determined that Scenario 3 would move forward in the project development cycle.

	SCENARIO 1	SCENARIO 2	SCENARIO 3A	SCENARIO 3B
AM NB	32.7	30.2	24.4	22.9
AM SB	41.6	28.4	23.9	26.4
PM NB	40.1	31.5	25.4	27.9
PM SB	35.8	33.2	28.5	27.5

TABLE 12. US 27 TRANSIT TRAVEL TIMES (IN MINUTES)

7

Cost Estimates and Project Packages

CHAPTER





COST ESTIMATES AND PROJECT PACKAGES

Cost estimates were developed for Scenario 3 and include the Design, Right-of-Way, Utility, and Construction (DRUC) costs for roadway capital improvements, as well as capital costs for the transit infrastructure and vehicles. Additional costs not included in this study are the yearly operational costs for Lextran to operate the BRT system, which Lextran estimates to be \$5,000,000 per year.

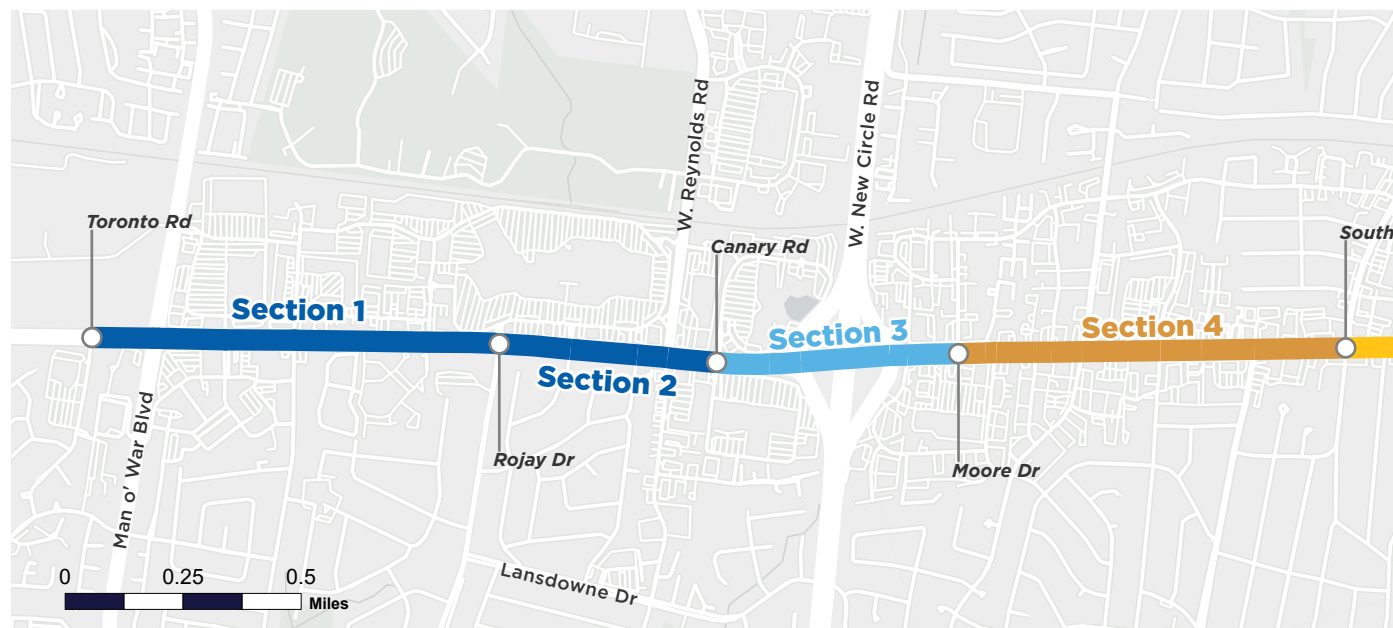
ROADWAY IMPROVEMENT COSTS

Cost estimates for roadway capital improvement costs were developed utilizing quantified major pavement and roadway bid items including:

- › Mill and overlay of existing pavement
- › Concrete shared use path
- › Curb box inlets and storm sewer pipes
- › Guardrail
- › Lump sums for items like maintenance of traffic, mobilization, etc.

The cost estimates assumed that no bridges would be needed, as both concepts at the New Circle Road interchange maintain the existing bridge width. Lighting was not included in the estimate and is part of a separate estimate for streetscape improvements which are included in the transit costs. It was assumed that traffic signals would need to be rebuilt, at a cost of \$200,000 per signal, which were added to the construction costs. Construction costs include 100% inflation and 100% contingency per KYTC direction. KYTC provided right-of-way and utility cost estimates.

To prepare the cost estimates, the study area was divided into 11 segments, shown in [Figure 26](#). [Table 13](#) shows the Design, Right-of-Way, Utilities, and Construction costs in millions for each segment.



IN MILLIONS	1	2	3 Parclo	3 DDI	4	5	6	7	8*	9	10*	11*
Construction	\$ 23.2	\$ 22.0	\$ 21.1	\$ 21.8	\$ 25.1	\$ 22.3	\$ 15.7	\$ 16.7	\$ 9.0	\$ 8.0	\$ 14.3	\$ 26.7
Design (15% of C)	\$ 3.2	\$ 3.2	\$ 2.9	\$ 3.0	\$ 3.5	\$ 3.0	\$ 2.3	\$ 2.3	\$ 1.4	\$ 1.2	\$ 2.0	\$ 3.3
Right-of-Way (ROW)	\$ 0.7	\$ 1.5	\$ 0.2	\$ 0.7	\$ 2.0	\$ 2.5	\$ 1.6	\$ 2.5	\$ 0.2	\$ 2.9	\$ 1.5	\$ 2.3
Utilities	\$ 3.5	\$ 4.4	\$ 3.3	\$ 3.3	\$ 3.7	\$ 5.2	\$ 3.4	\$ 4.0	\$ 3.4	\$ 1.9	\$ 3.4	\$ 3.7
Total	\$ 30.6	\$ 31.1	\$ 27.5	\$ 28.8	\$ 34.3	\$ 33.0	\$ 23.0	\$ 25.5	\$ 14.0	\$ 14.0	\$ 21.2	\$ 36.0
	1	2	3 Parclo	3 DDI	4	5	6	7	8	9*	10*	11*

* Segments 1 through 8 are on the KYTC roadway network, and segments 9 through 11 are on the LFUCG roadway network.

TABLE 13. ROADWAY CAPITAL IMPROVEMENT COST ESTIMATES



FIGURE 26. STUDY AREA SEGMENTS FOR COST ESTIMATES

TRANSIT INFRASTRUCTURE COSTS

An estimate was prepared for transit infrastructure costs, which includes the following:

- › Transit Stations
- › Intelligent Transportation Systems (ITS) at Stations
- › Transit Signal Priority (TSP)
- › Streetscape and Lighting Improvements
- › BRT Vehicles

Table 14 shows the transit infrastructure cost estimates.

		UNIT COST (IN MILLIONS)	UNIT TYPE	TOTAL UNITS	TOTAL COST (IN MILLIONS)
Transit Stations	SIDE STATION	\$ 1.65	Per Station	16 Stations	\$ 26.4
	CENTER STATION	\$ 2.20	Per Station	3 Stations	\$ 6.6
	TRANSIT SIGNAL PRIORITY (TSP)	\$ 0.08	Per Intersection	38 Intersections	\$ 2.9
	ITS AT STATIONS	\$ 0.13	Per Station	19 Stations	\$ 2.4
	LIGHTING/STREETSCAPE	\$ 3.20	Per Mile	7 Miles	\$ 22.7
	BRT VEHICLES	\$ 4.60	Per Vehicle	10 Vehicles	\$ 46.0
	TOTAL				\$ 106.9

TABLE 14. TRANSIT INFRASTRUCTURE COST ESTIMATES

PROJECT PACKAGES + IMPLEMENTATION

To develop project packages, the project management team estimated when the design, right-of-way, utility and construction phases of each segment for the roadway capital improvements would likely be funded. This estimation was based on the priorities of KYTC District 7 and LFUCG, as well as an assumption of how much funding could realistically be programmed for this project in each biennium. Projects were assigned to one of three time periods: 2026-2030, 2031-2035, or 2035 and beyond. These projects will likely be funded through a combination of the KYTC Highway Plan and the City of Lexington's transportation funding.

Transit infrastructure improvements will likely be funded through the Federal Transit Administration (FTA) Capital Investment Grant (CIG) program. Based on the [November 2025 Capital Investment Grants Program Policy Guidance](#), the FTA evaluates and rates projects seeking funding. Projects must receive a medium or higher rating in order to be eligible for CIG. For Small Starts projects, which is the type of project US 27 BRT would most likely be categorized, one of the evaluation criteria is cost effectiveness. For Small Starts projects, cost effectiveness is based on the federal share of the capital cost and the forecast ridership on the project.

The current ridership forecasts from this study range from 2,200-3,800 average riders. As a result, if the project were to seek CIG funding as a Small Starts project under the current guidance¹, the maximum federal share² the project could reasonably seek and still anticipate receiving a medium rating for cost effectiveness is between \$60-\$100 million in federal funds. Additionally, project sponsors in the CIG program, utilizing federal funds for a project, must also provide non-federal local match contribution. [Table 15](#) shows the ridership to funding share comparison.

The estimated roadway project packages and anticipated CIG funding were utilized to develop a proposed implementation plan for the US 27 BRT project, illustrated in [Figure 27](#). Because the total transit infrastructure costs are close to the maximum federal share for the CIG grant, the majority of the roadway capital improvements will need to be completed prior to entering into CIG Project Development. Roadway segments 6, 7, and 10, which is the center-running bidirectional bus-only lane section, could be included in the CIG Project Development phase because of the tie between those improvements and the start of the BRT service.

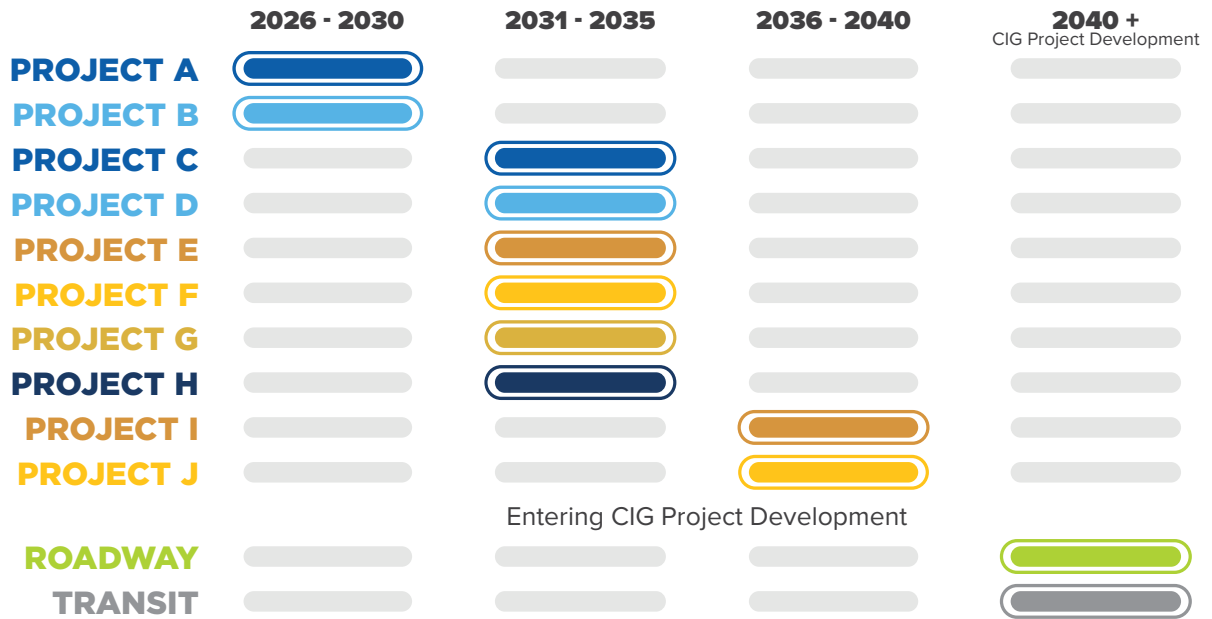
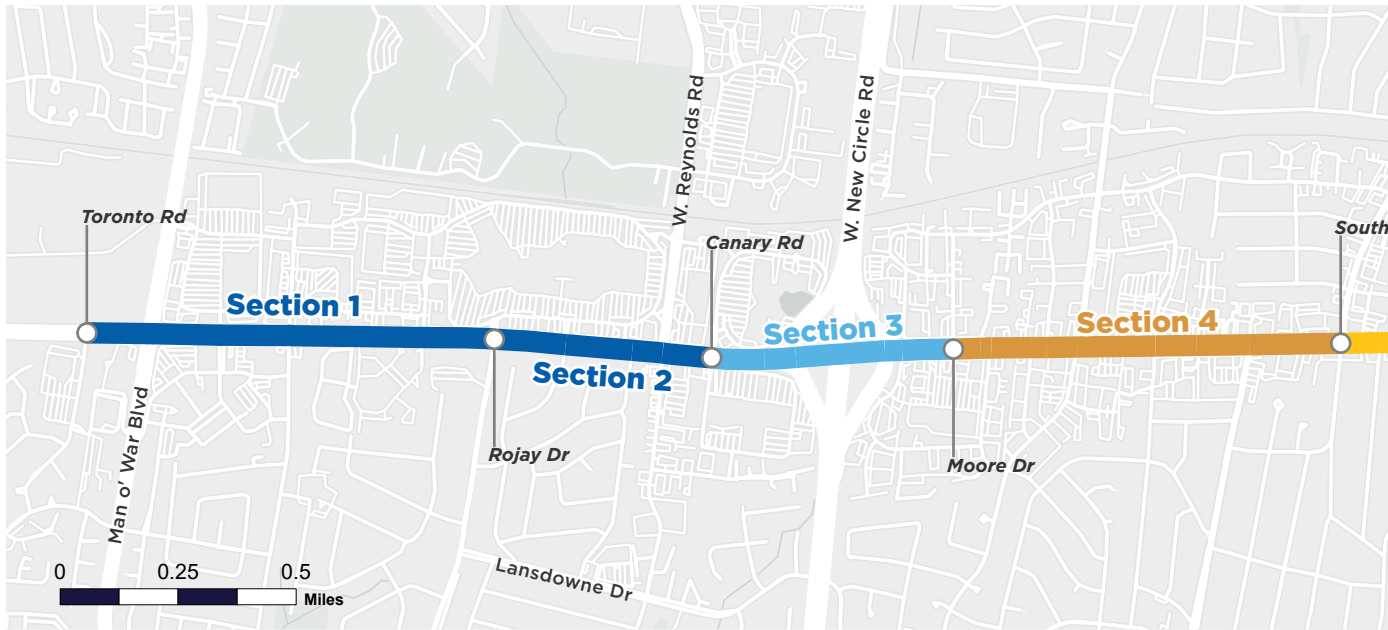
Additionally, the roadway costs for that section could be used as the local match for the grant. If the CIG program were to become unavailable, BRT could still be pursued using another source of federal or non-federal dollars; however it should be noted that the cost of the BRT system is more than Lextran's regular appropriations could afford and outside grants or resources will be necessary for the capital costs.

¹ 49 USC 5309 (g)(5)(B) – States that FTA must issue updated policy guidance “each time the Secretary makes significant changes to the process and criteria, but not less frequently than once every 2 years”

² Federal share includes all federal funds used for project. So this would include FTA formula funds, FHWA funds, other discretionary grants, or any other federal funds used for the project. It is not limited to the CIG grant amount.

DAILY RIDERSHIP (Average)	RIDERSHIP FACTOR (Annualization)	ANNUAL RIDERSHIP (Average)	MAX FED SHARE (Annualization)	COST FACTOR (Annualization)	MAX FED SHARE (Anticipated)
2,200	300	660,000	\$ 3,000,000	0.049699	\$ 60,000,000
3,800	300	1,140,000	\$ 5,000,000	0.049699	\$ 100,000,000

TABLE 15. ANTICIPATED CIG FUNDING AVAILABILITY BASED ON RIDERSHIP





PROJECT A

**Section 1-2
Design**
\$6.4 M

PROJECT B

**Section 3
Design**
\$3.0 M

PROJECT C

**Section 1-2
Right-of-Way**
\$2.2 M
Utilities
\$7.9 M
Construction
\$45.2 M

PROJECT D

**Section 3
Right-of-Way**
\$0.7 M
Utilities
\$3.3 M
Construction
\$21.8 M

PROJECT E

**Section 4
Design**
\$3.5 M

PROJECT F

**Section 5
Design**
\$3.0 M

PROJECT G

**Section 8 & 9
Design**
\$2.6 M
Right-of-Way
\$3.1 M
Utilities
\$5.3 M
Construction
\$17.0 M

PROJECT H

**Section 11
Design**
\$3.3 M
Right-of-Way
\$2.3 M
Utilities
\$3.7 M
Construction
\$26.7 M

PROJECT I

**Section 4
Right-of-Way**
\$2.0 M
Utilities
\$3.7 M
Construction
\$25.1 M

PROJECT J

**Section 5
Right-of-Way**
\$2.5 M
Utilities
\$5.2 M
Construction
\$22.3 M

CIG Project Development

Roadway

**Section 6 - 7 & 10
Design**
\$6.6 M
Right-of-Way
\$5.6 M
Utilities
\$10.8 M
Construction
\$46.7 M

Transit

Transit Stations
Side Stations
\$26.4 M (\$1.65 M/Station)
Center Stations
\$6.6 M (\$2.2 M/Station)

General Streetscape
\$25.2 M
Vehicle Procurement
\$46.0 M

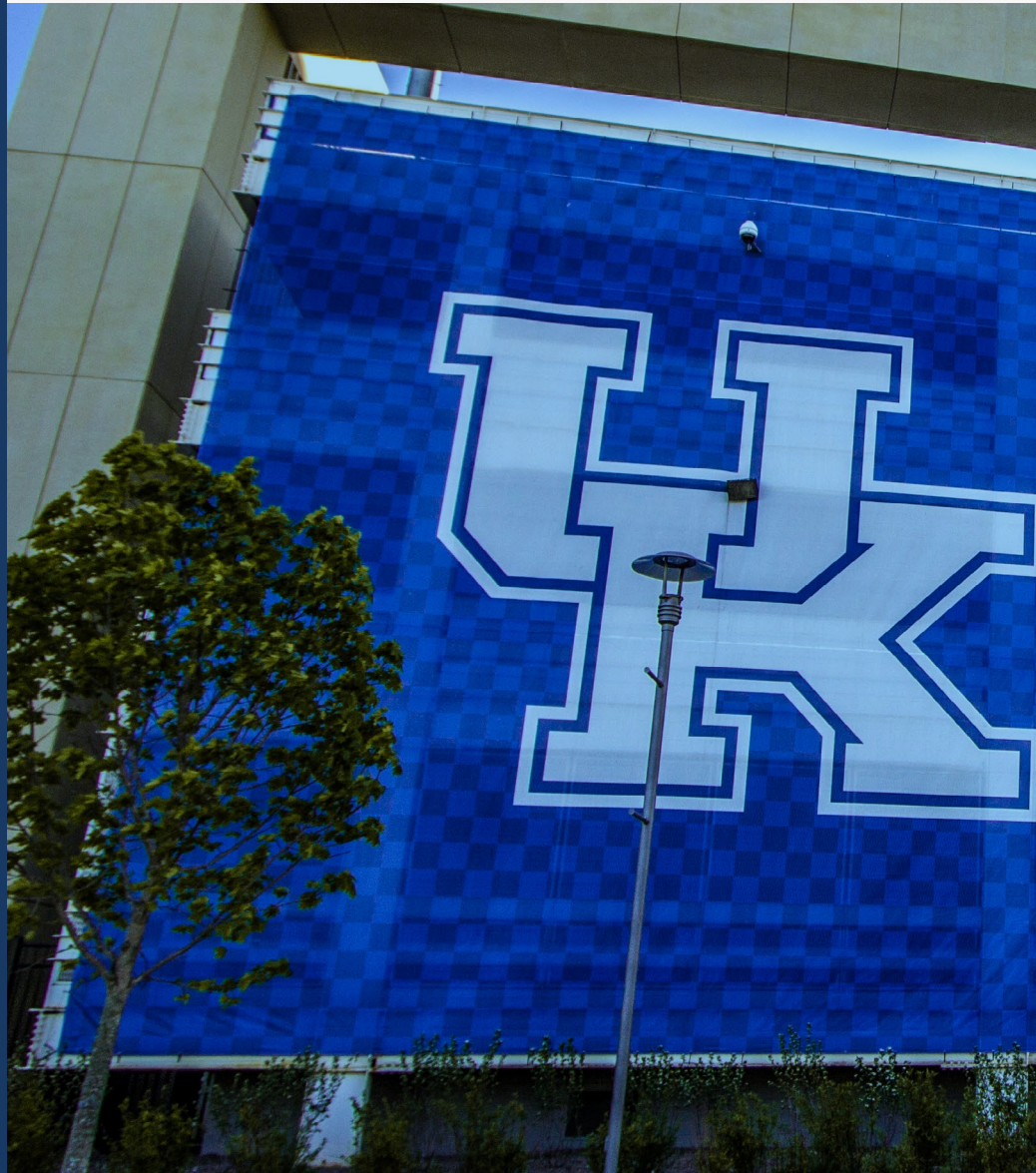
ITS
\$2.75 M (\$125,000/Station)
TSP
\$2.9 M

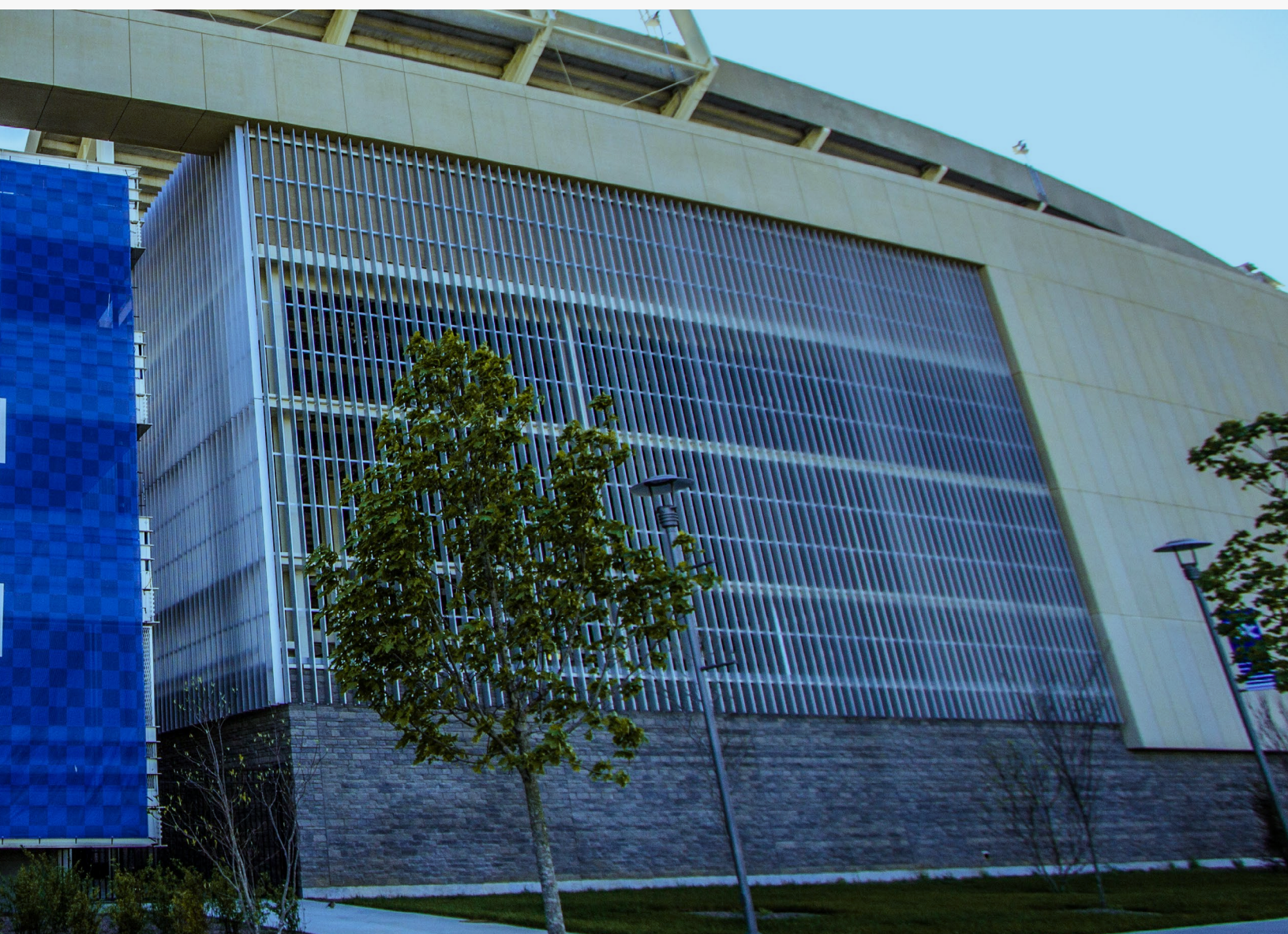
FIGURE 27. US 27 BRT PROPOSED IMPLEMENTATION PLAN

8

CHAPTER

Next Steps





NEXT STEPS

KYTC District 7 will use the recommendations from this study to move forward with programming the roadway capital improvement projects along the US 27 corridor. Segments 1, 2, and 3 have item numbers and will be a high priority to request funding in upcoming Highway Plans.

The Lexington Area MPO will be developing the 2050 Metropolitan Transportation Plan Amendment as well as the 2027 to 2030 Transportation Improvement Program. The recommendations from this study will be included so that funding can be allocated for the roadway improvements.

Lextran is updating its Long-Range Plan, which will include the US 27 BRT. Lextran will work on securing funding for future BRT operations and will continue coordination with KYTC, LFUCG, and LAMPO while working towards entering into the FTA Small Starts program.

ADDITIONAL INFORMATION

Written requests for additional information should be sent to the KYTC Division of Planning Director, 200 Mero Street, Frankfort, Kentucky, 40622.



APPENDIX A

Project Meeting Minutes





APPENDIX B

Safety Analysis





APPENDIX C

Traffic Forecast





APPENDIX D

Environmental Overview





