

APPENDIX B:

Traffic Forecast

Traffic Forecast Report

Owensboro Outer Loop Feasibility Study

Daviess County

Item No. N/A

Prepared for:

Kentucky Transportation Cabinet



Prepared by:

HMB Professional Engineers



September 2021

Revised November 2021

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Appendix A: Traffic Count Data, 2020, and 2045 Volumes

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COMMONLY USED ABBREVIATIONS

AADT	Average Annual Daily Traffic	Adjusted for seasonal and monthly factors
AADTT	Average Annual Daily Truck Traffic	Total truck volume for a year
DHV	Design Hour Volume	30 th highest hour of a year
%T	Truck Percentage	Percentage of trucks to total volume
FC	Functional Class	Street or highway's group based on service
GR	Growth Rate	Calculated value to estimate future volumes
PHF	Peak Hour Factor	Considers 15 min. spike in an hourly count
K-Factor	30 th Highest Hour Factor	DHV divided by ADT (DHV/ADT)
D-Factor	Directional Factor	Percentage of dominant flow to total
MP	Mile Point	Miles increase easterly and northerly
ATR	Automatic Traffic Recorder	Permanent and continuous recording station
KYSTM	Kentucky Statewide Model	Computerized representation of KY roads

INTRODUCTION AND STUDY AREA

The Owensboro Outer Loop Feasibility Study was initiated by the Kentucky Transportation Cabinet (KYTC) in coordination with the Owensboro Metropolitan Planning Organization (MPO) and the Green River Area Development District (GRADD). The objective of the study is to evaluate the feasibility of an “outer loop” around Owensboro in Daviess County, Kentucky. This includes identification and evaluation of potential connections that would enhance the transportation network around Owensboro. The current project phase is a feasibility study. Traffic impacts will be evaluated for the base year (2020) and future year (2045).

The study area encompasses the surrounding area of Owensboro in Daviess County, Kentucky as shown in **Figure 1**. This includes US 60 from the intersection with US 231 in the east to the intersection with KY 1554 in the west. It extends into the county south to the area where I-165 intersects with KY 142. All state-maintained routes within this boundary are included for consideration of this study.

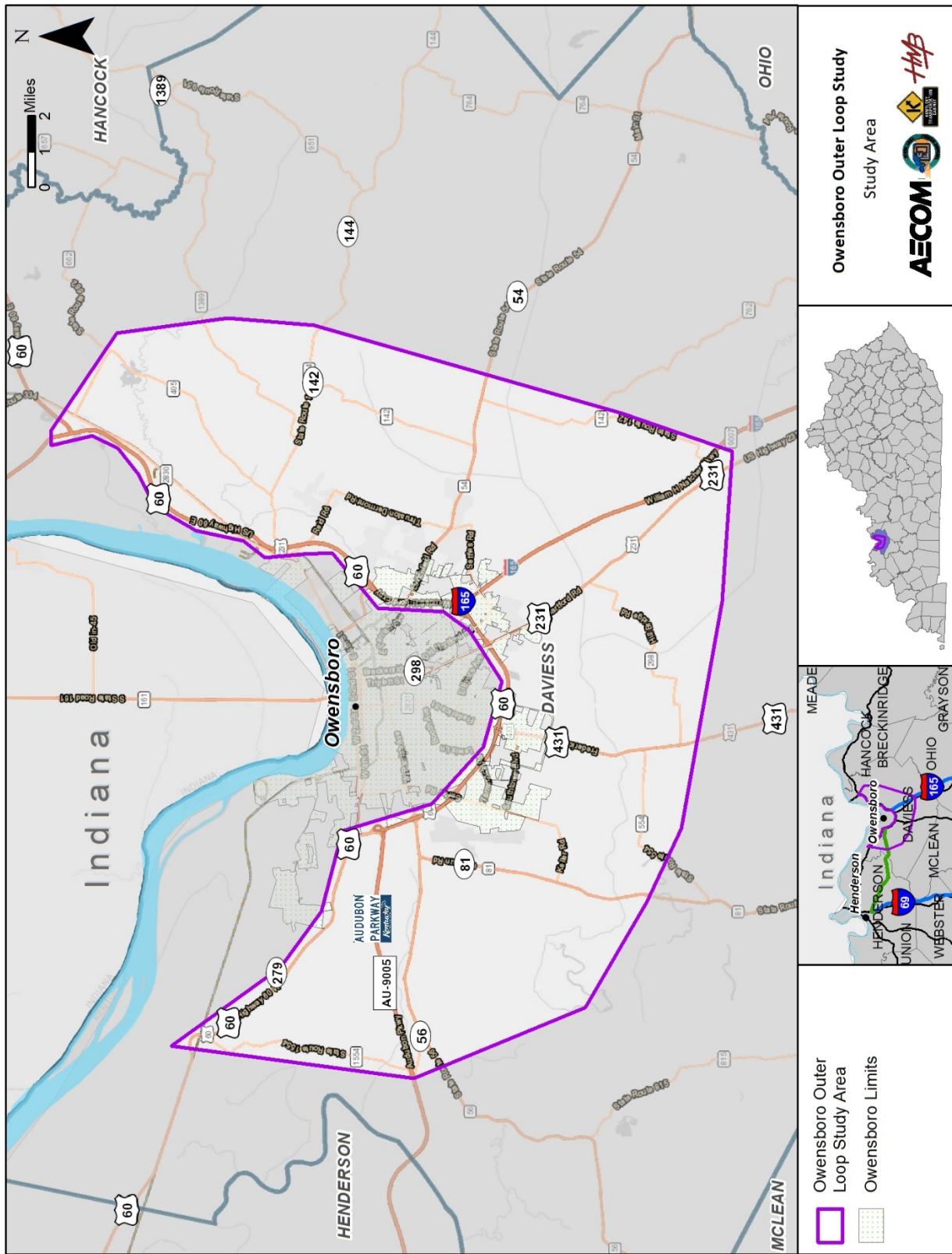
This document summarizes the traffic forecast procedure and presents the following types of forecasts:

- 2020 Base Year Mainline Volumes (AADT)
- 2045 Future Year Mainline Volumes (AADT)
- Identified Corridor Future Year (2045) Volumes (AADT)
- Identified Segment Future Year (2045) Volumes (AADT)

The Owensboro MPO Regional Travel Demand Model provides the basis of information for these forecasts. In conjunction with this feasibility study, the model was updated from years 2010/2040 to 2018/2045 in TransCAD 8 version 22330. This includes updating socioeconomic data and committed and identified projects. The new number of traffic analysis zones (TAZs) was 589. For information regarding the model update, please refer to the model documentation provided to KYTC.

The following sections provide the information relative to the development and presentation of the traffic forecast numbers for this study.

Figure 1. Study Area



EXISTING TRAFFIC VOLUMES

The most recent Average Daily Traffic (ADT) volumes on the state-maintained routes within the study area were obtained from the KYTC traffic count reporting system (CTS). The station numbers, last year of count, and traffic volumes (ADT) are shown in **Appendix A**.

FUTURE TRAFFIC VOLUMES

The proposed growth rates for this study area were based on the Owensboro MPO Regional Travel Demand Model. Model runs were completed for the base year 2018 and 2045 and compared to determine a per year growth rate. The 2045 model run included identified and committed projects (**Table 1**) that would either affect capacity or travel time within the study area. These were determined by the Project Team and discussed during the second Project Team Meeting on March 3, 2021.

Table 1. Identified and Committed Projects Included in Owensboro MPO Regional Travel Demand Model

County	Item No.	Route	Type	Description
Daviess	2-8300	KY 54	Major Widening	Convert section to 5 lanes
Daviess	2-8854	KY 3143	Minor Widening	Convert section to 3 lanes
Daviess	N/A	Fairview Dr.	Extension	Extend Fairview Dr. to Pleasant Valley Rd.
Daviess / Henderson	N/A	Audubon Pkwy.	Conversion	Convert to interstate facility
Henderson	N/A	I-69	New River Crossing	New route across the Ohio River

Applying the growth rates to existing counts, AADT forecasts were developed for 2020 and 2045. Growth rate percentages and volumes are shown in **Appendix A**.

CORRIDOR AND SEGMENT FORECASTS

The Owensboro MPO Regional Travel Demand Model was also used to help determine traffic volumes / usage of the preliminary corridors identified through the feasibility study. The preliminary corridors included:

- No Build – no “Outer Loop” construction; routine maintenance and rehabilitation of existing infrastructure in study area.
- Green – At an approximate length of 35 miles, this is the longest of all corridors that provides full connectivity between US 60 east and west of Owensboro. It is the farthest option from / outside the city and is comprised of Segments A, B, C, D, E, F, G, H, I, J, K, L, W, and X. From the

scoring perspective, this option is the lowest ranked outer corridor based on the comparative technical analysis.

- Red – At an approximate length of 22 miles, this is the shortest of all corridors that provides full connectivity between US 60 east and west of Owensboro. It is the closest option to the city and is comprised of Segments Z, AA, AB, AC, AD, AE, AF, AG, AH.
- Blue – This corridor is a hybrid option of the Red and Green corridors and has an approximate length of 31 miles. It is comprised of Segments Z, AA, AB, P, D, E, F, G, H, I, J, K, L, W, and X. This corridor ranked the highest meaning it would have less impacts and more benefits compared to the other routes.

Figure 2 shows the preliminary corridors in the context of the study area. The resulting traffic volumes for 2045 are shown in **Table 2**. A 4-lane typical section was analyzed, and all corridors are assumed to connect to major intersecting roadways including new interchanges with I-165. As this is a high-level feasibility study, no additional adjustment / calibration was performed on the model results except rounding. Volumes provided should be used for comparative purposes and not as an indication of absolute future usage. For a breakdown of volumes by segment and changes from the No Build, please refer to **Appendix B**.

Table 2. Preliminary Corridors 2045 AADT

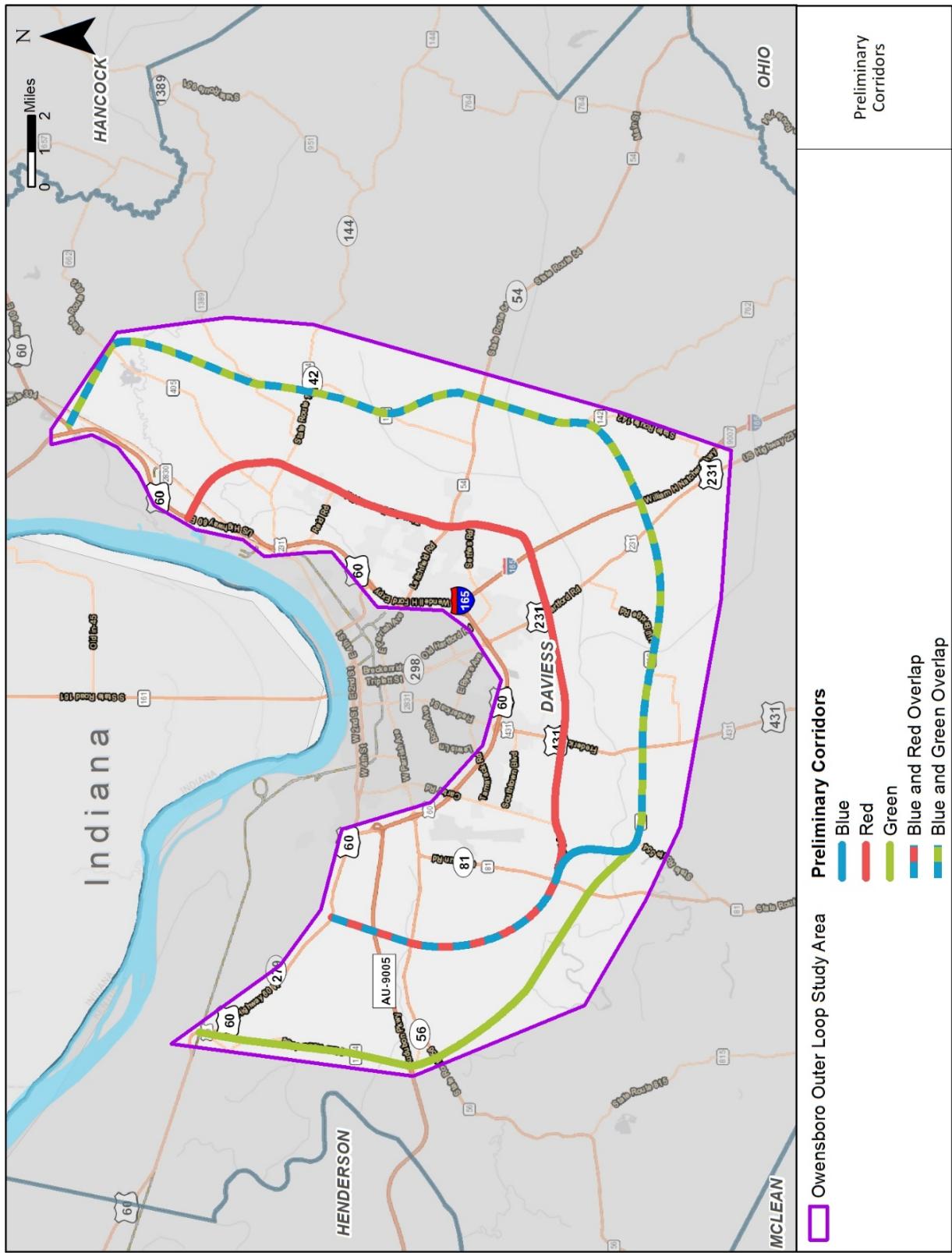
Corridor	Lowest Volume AADT		Highest Volume AADT		Corridor Weighted Average AADT
Green	340	Audubon Pky to US 60	11,670	US 231 to I-165	2,370
Blue	790	Near KY 81 / KY 2698	11,770	US 231 to I-165	2,240
Red	790	US 60 to W 5 th St Rd	16,220	KY 144 to KY 1456	8,490

As part of the feasibility study, the Project Team also determined there was merit in evaluating three segments that have the potential to be independent projects with consideration to go into the CHAF Database. The segments include AE, AF, G, and a combination of AE and AF. Using the Owensboro MPO Regional Travel Demand Model, **Table 3** displays the resulting volumes.

Table 3. Additional Segments of Analysis 2045 AADT

Segment	2045 AADT
G	12,580
AE	5,580
AF	10,680
AE + AF	12,130

Figure 2. Preliminary Corridors



DESIGN FACTORS

Level of Service analysis utilized AADT volumes for the spreadsheet analysis. Hourly factors (K-Factor) directional factors (D-Factor) were not required for this analysis.

TRUCK VOLUMES

Truck percentages were derived from count information where available through the KYTC Traffic Count Reporting System and the KYTC Vehicle Classification spreadsheet.

The same growth rate used for overall traffic growth per year is recommended to be applied for the truck volumes.

Truck percentages are shown in **Appendix A** by segment.

POPULATION

Population data was obtained from the Kentucky State Data Center for Kentucky and all Daviess County for additional information. **Table 4** provides historical population growth by decade. **Table 5** displays population projections by decade.

Table 4. Historical Population Growth

Area	1990	2000	2010	% Growth (2000 – 2010)
Kentucky	3,685,296	4,041,769	4,339,367	7.4%
Daviess County	87,189	91,545	96,656	5.6%

Source: Kentucky State Data Center (Vintage 2016)

Table 5. Population Forecasts

Area	2010 Census	2015 Estimate	2020 Projection	2030 Projection	2040 Projection	% Growth (2010 – 2040)
Kentucky	4,339,367	4,425,092	4,533,464	4,762,382	4,886,381	12.6%
Daviess County	96,656	99,259	102,033	106,676	110,129	13.9%

Source: Kentucky State Data Center (Vintage 2016)

Historically population growth is slightly less than that for the state. Population forecasts show a slightly higher growth in population numbers between 2010 and 2040 for Daviess County compared to Kentucky.

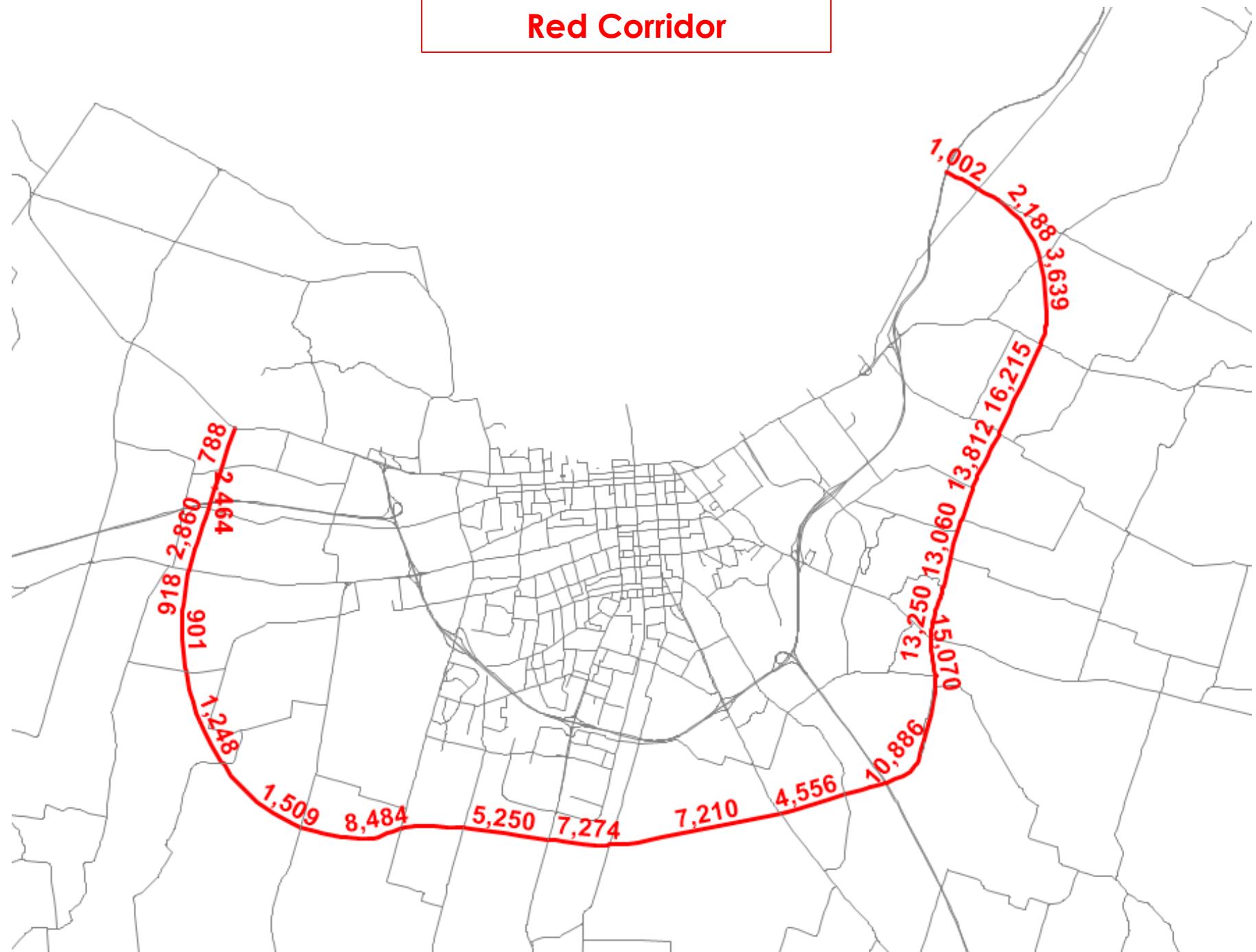
APPENDIX A

Route Description	Route #	Beginning Description	End Description	Begin MP	End MP	Last Count		Station ID	Growth Rate	2020 AADT	2045 AADT	Truck %
						Year2	Year2					
US-60	US 60	US 231-ROCKPORT FERRY ROAD	KY 334	27.71	33.178	9169	2017	030001	1.0%	9450	12110	24
US-60	US 60	OAKFORD ROAD	KY 279	0	8.955	3429	2018	030763	0.0%	3430	3430	14.439
WENDELL FORD EXPY+US-60	US 60	I-165	KY 54	10.179	23.606	37427	2019	030032	0.3%	37540	40460	7.618
WENDELL FORD EXPY+US-60	US 60	I-165	KY 54	10.179	23.606	37427	2019	030032	0.3%	37540	40460	7.618
US-60	US 60	WRIGHTS LANDING ROAD	US 231-ROCKPORT FERRY ROAD	23.606	25.457	10042	2014	030049	0.0%	10040	10040	24
US-60	US 60	WRIGHTS LANDING ROAD	US 231-ROCKPORT FERRY ROAD	25.457	27.71	10042	2014	030049	0.0%	10040	10040	24
US-60	US 60	KY 603	KY 144	10.179	23.606	15619	2018	03062	0.3%	15710	16930	18.833
US-60	US 60	MURPHY ROAD-STEAMBOAT ROAD	OAKFORD ROAD	0	8.955	2003	2018	030800	0.0%	2000	2000	14.439
US-60	US 60	MURPHY ROAD-STEAMBOAT ROAD	OAKFORD ROAD	0	8.955	2003	2018	030800	0.0%	2000	2000	14.439
US-60	US 60	MURPHY ROAD-STEAMBOAT ROAD	OAKFORD ROAD	0	8.955	2003	2018	030800	0.0%	2000	2000	14.439
NEW HARTFORD RD	US 231	KY 298	KY 3143/VEACH ROAD	9.936	11.294	9208	2016	03023	0.0%	9210	9210	8.7
NEW HARTFORD RD	US 231	KY 298	KY 3143/VEACH ROAD	9.936	11.294	9208	2016	030253	0.0%	9210	9210	8.7
NEW HARTFORD RD	US 231	KY 298	KY 3143/VEACH ROAD	0	9.936	9208	2016	030253	0.0%	9210	9210	8.7
NEW HARTFORD RD	US 231	KY 298	KY 3143/VEACH ROAD	0	9.936	9208	2016	030253	0.0%	9210	9210	8.7
NEW HARTFORD RD	US 231	KY 298	KY 3143/VEACH ROAD	0	9.936	9208	2016	030253	0.0%	9210	9210	8.7
NEW HARTFORD RD	US 231	KY 298	KY 3143/VEACH ROAD	0	9.936	9208	2016	030253	0.0%	9210	9210	8.7
US-231	US 231	US 60 DEPARTURE	NW END OF W H NATCHER BRIDGE	11.294	14.851	8254	2018	030499	0.5%	8340	9440	39.123
US-231	US 231	OHIO COUNTY LINE	KY 142	0	9.936	4402	2018	030317	0.2%	4420	4650	7.207
US-231	US 231	KY 142	KY 298	0	9.936	6700	2018	030305	0.3%	6740	7260	0
US-231	US 231	KY 142	KY 298	0	9.936	6700	2018	030305	0.3%	6740	7260	0
US-231	US 231	KY 142	KY 298	0	9.936	6700	2018	030305	0.3%	6740	7260	0
NEW HARTFORD RD	US 231	KY 3143/VEACH ROAD	KY 2155 JUNCTION	9.936	11.294	12002	2017	030457	0.0%	12000	12000	8.7
NEW HARTFORD RD	US 231	KY 3143/VEACH ROAD	KY 2155 JUNCTION	9.936	11.294	12002	2017	030457	0.0%	12000	12000	8.7
NEW HARTFORD RD	US 231	KY 3143/VEACH ROAD	KY 2155 JUNCTION	9.936	11.294	12002	2017	030457	0.0%	12000	12000	8.7
NEW HARTFORD RD	US 231	KY 3143/VEACH ROAD	KY 2155 JUNCTION	9.936	11.294	12002	2017	030457	0.0%	12000	12000	8.7
US-431	US 431	KY 140	KY 298/SHARP ROAD	0	10.246	7266	2017	030526	0.1%	7290	7470	11.337
US-431	US 431	KY 140	KY 298/SHARP ROAD	0	10.246	7266	2017	030526	0.1%	7290	7470	11.337
FREDERICA ST	US 431	SOUTHTOWN BOULEVARD	KY 2831	10.246	11.389	23864	2018	030C09	0.0%	23860	23860	11.337
FREDERICA ST	US 431	SOUTHTOWN BOULEVARD	KY 2831	10.246	11.389	23864	2018	030C09	0.0%	23860	23860	11.337
US-431+FREDERICA ST	US 431	MARTIN LUTHER KING JR LOOP	SOUTHTOWN BOULEVARD	10.246	11.389	9831	2018	030E01	0.0%	9830	9830	11.337
US-431+FREDERICA ST	US 431	MARTIN LUTHER KING JR LOOP	SOUTHTOWN BOULEVARD	10.246	11.389	9831	2018	030E01	0.0%	9830	9830	11.337
US-431+FREDERICA ST	US 431	MARTIN LUTHER KING JR LOOP	SOUTHTOWN BOULEVARD	10.246	11.389	9831	2018	030E01	0.0%	9830	9830	11.337
US-431	US 431	KY 554	MARTIN LUTHER KING JR LOOP	0	10.246	10628	2019	030532	0.1%	10640	10910	5.657
US-431	US 431	KY 554	MARTIN LUTHER KING JR LOOP	0	10.246	10628	2019	030532	0.1%	10640	10910	5.657
US-431	US 431	KY 554	MARTIN LUTHER KING JR LOOP	0	10.246	10628	2019	030532	0.1%	10640	10910	5.657
US-431	US 431	KY 298/SHARP ROAD	KY 554	0	10.246	9274	2018	030507	0.1%	9290	9530	11.337

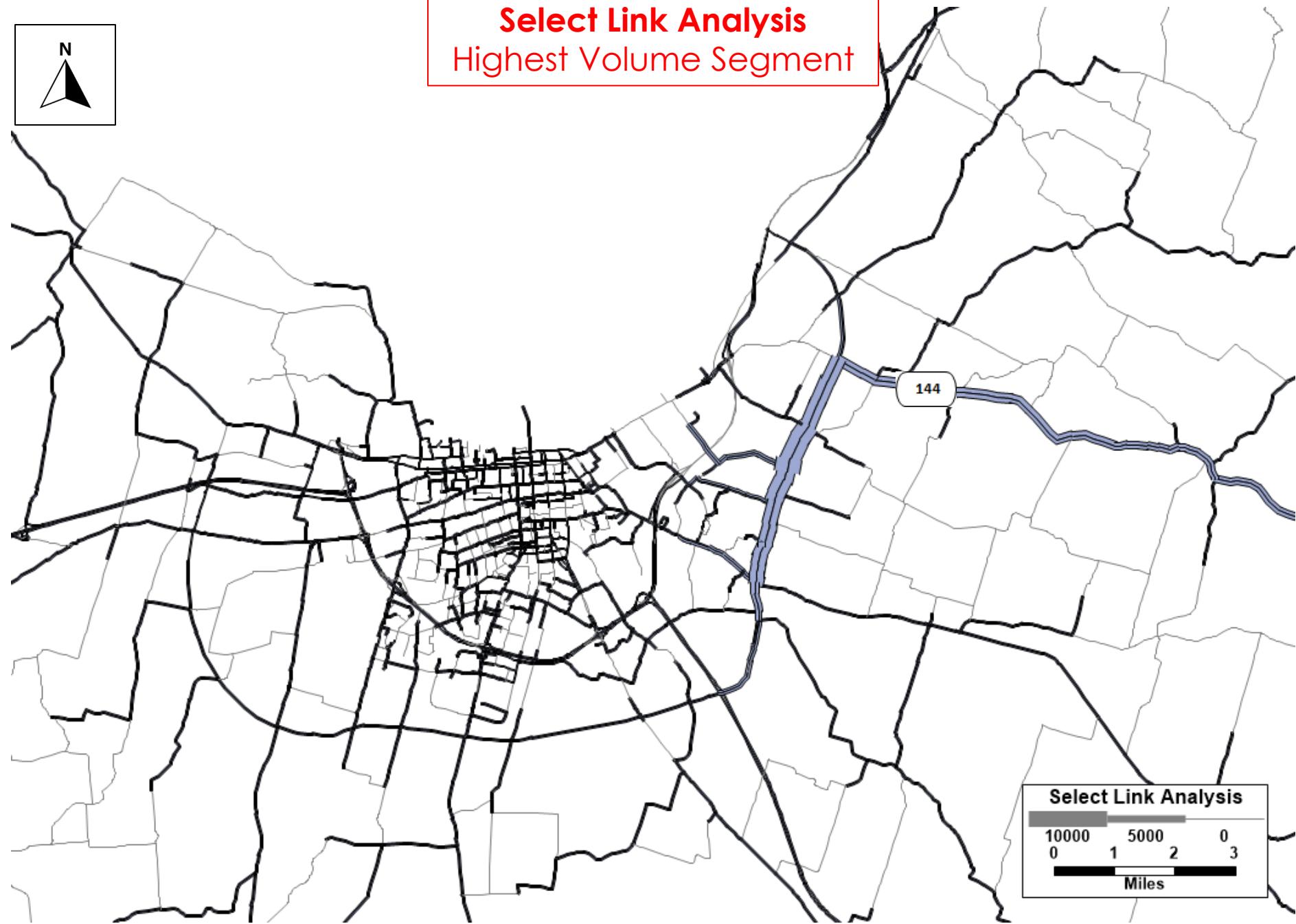
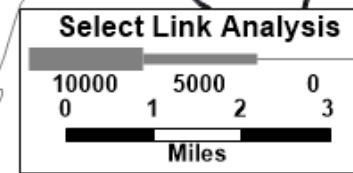
APPENDIX B

RED CORRIDOR

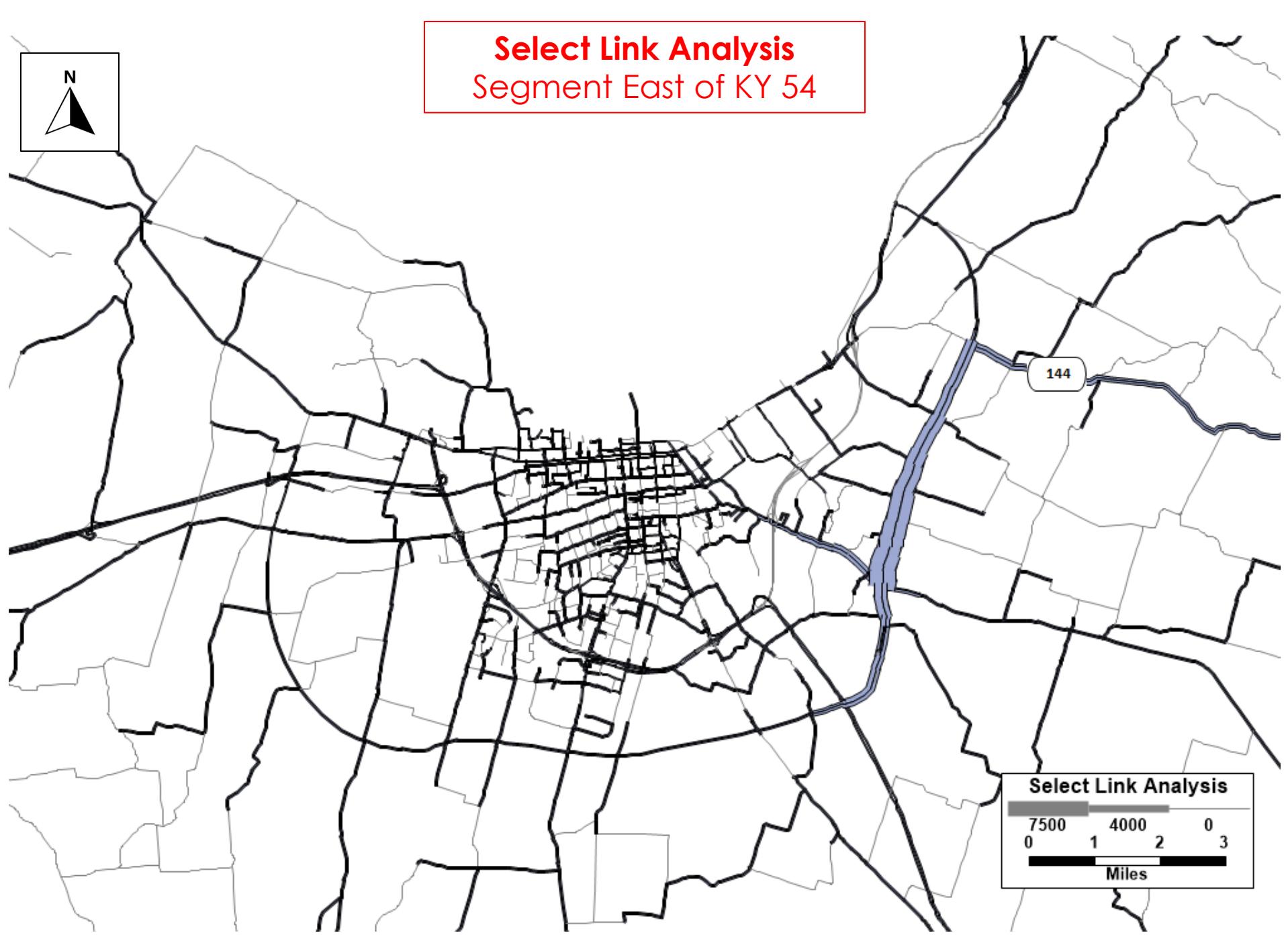
Red Corridor



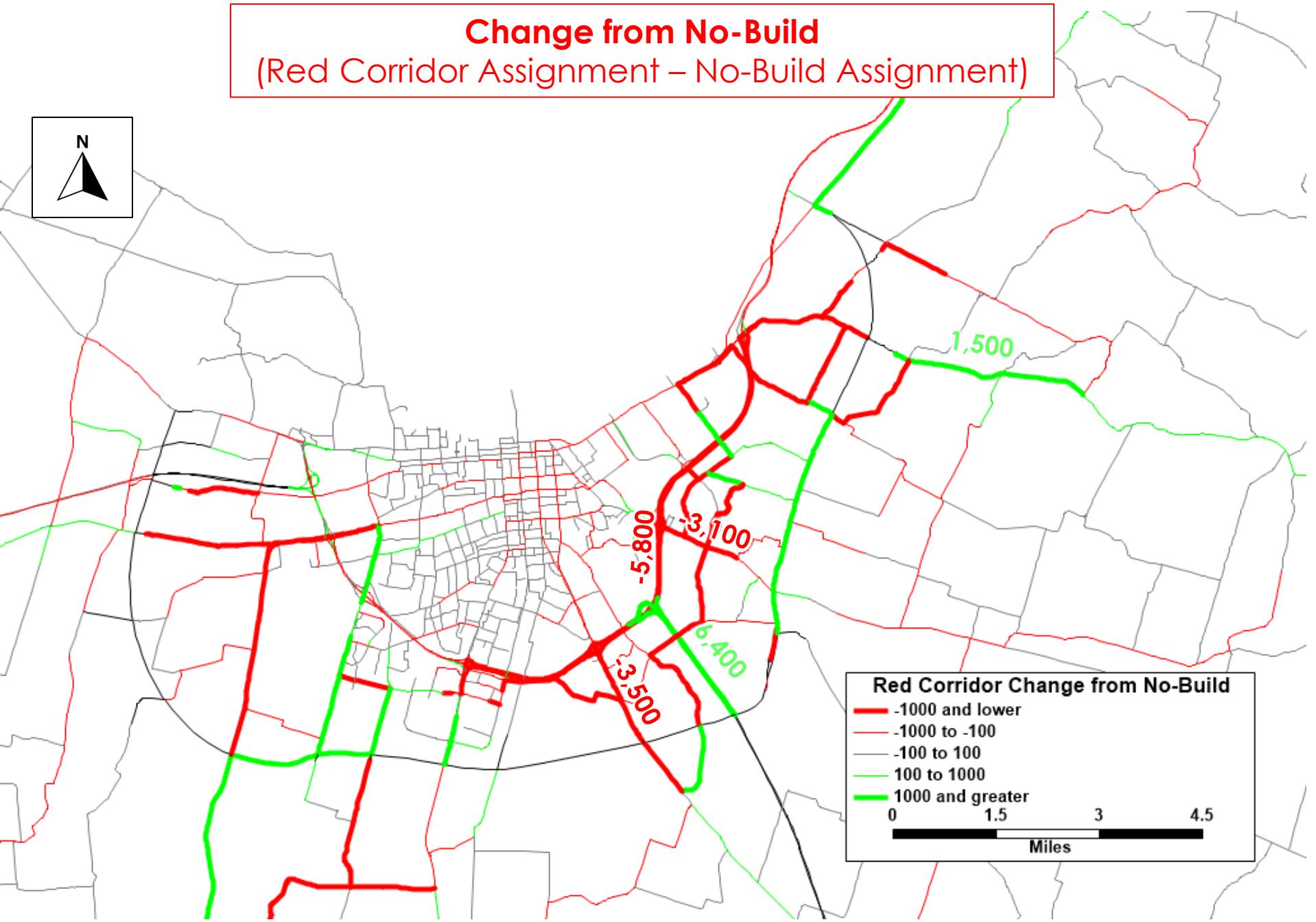
Select Link Analysis
Highest Volume Segment



Select Link Analysis
Segment East of KY 54

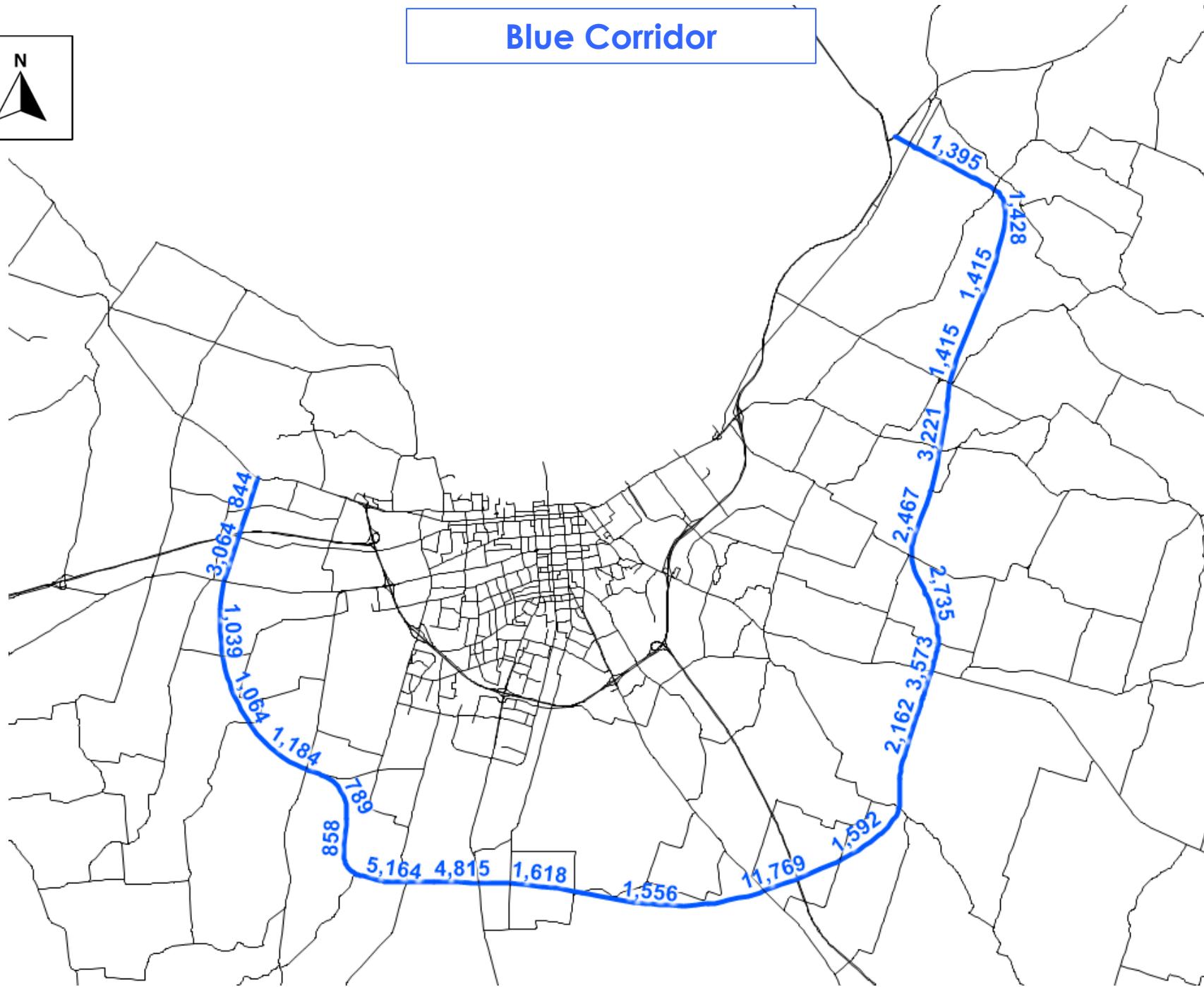


Change from No-Build (Red Corridor Assignment – No-Build Assignment)

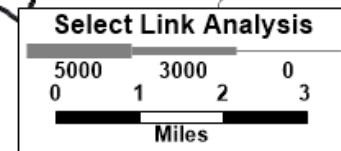
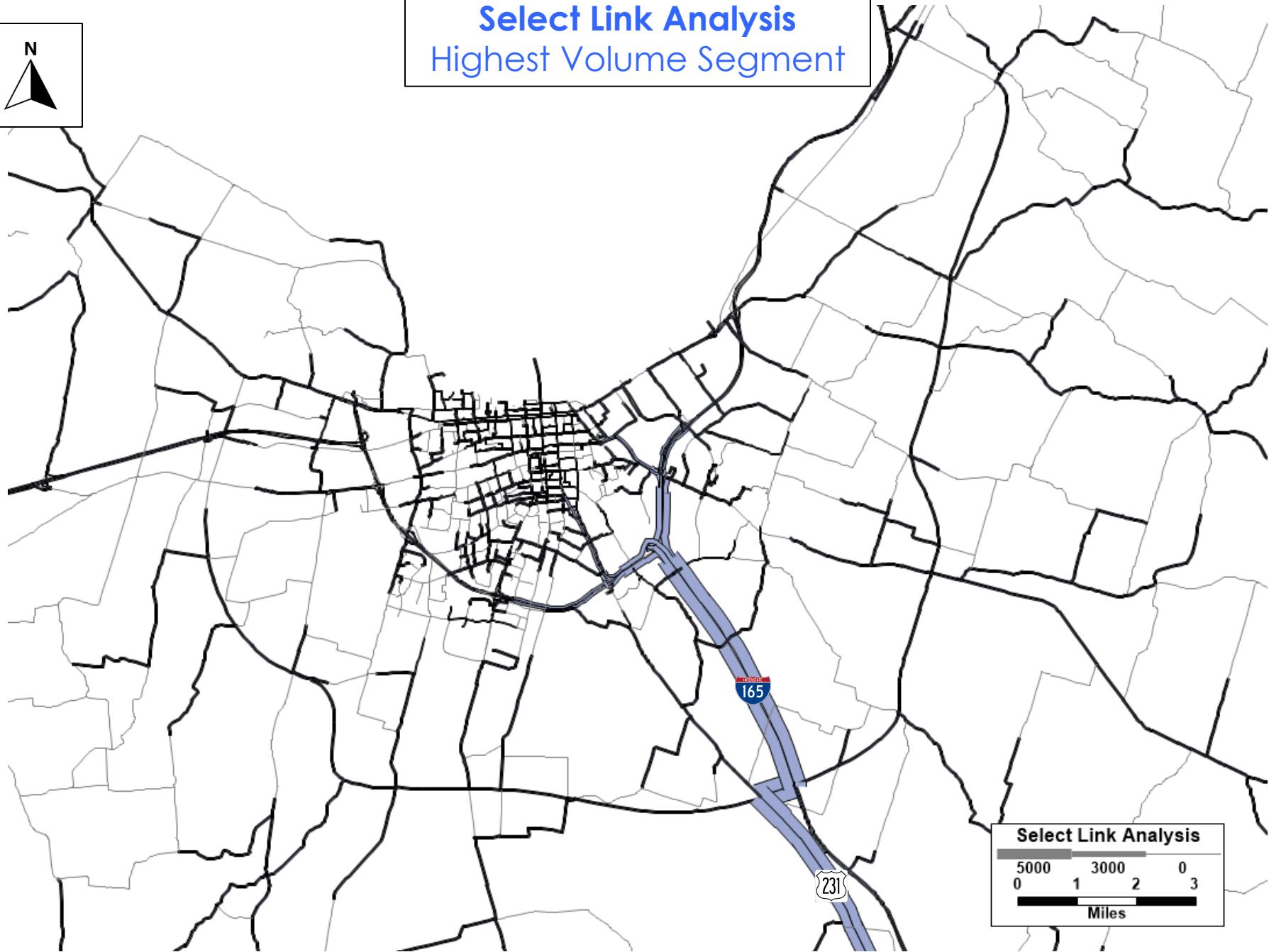
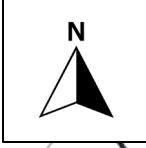


BLUE CORRIDOR

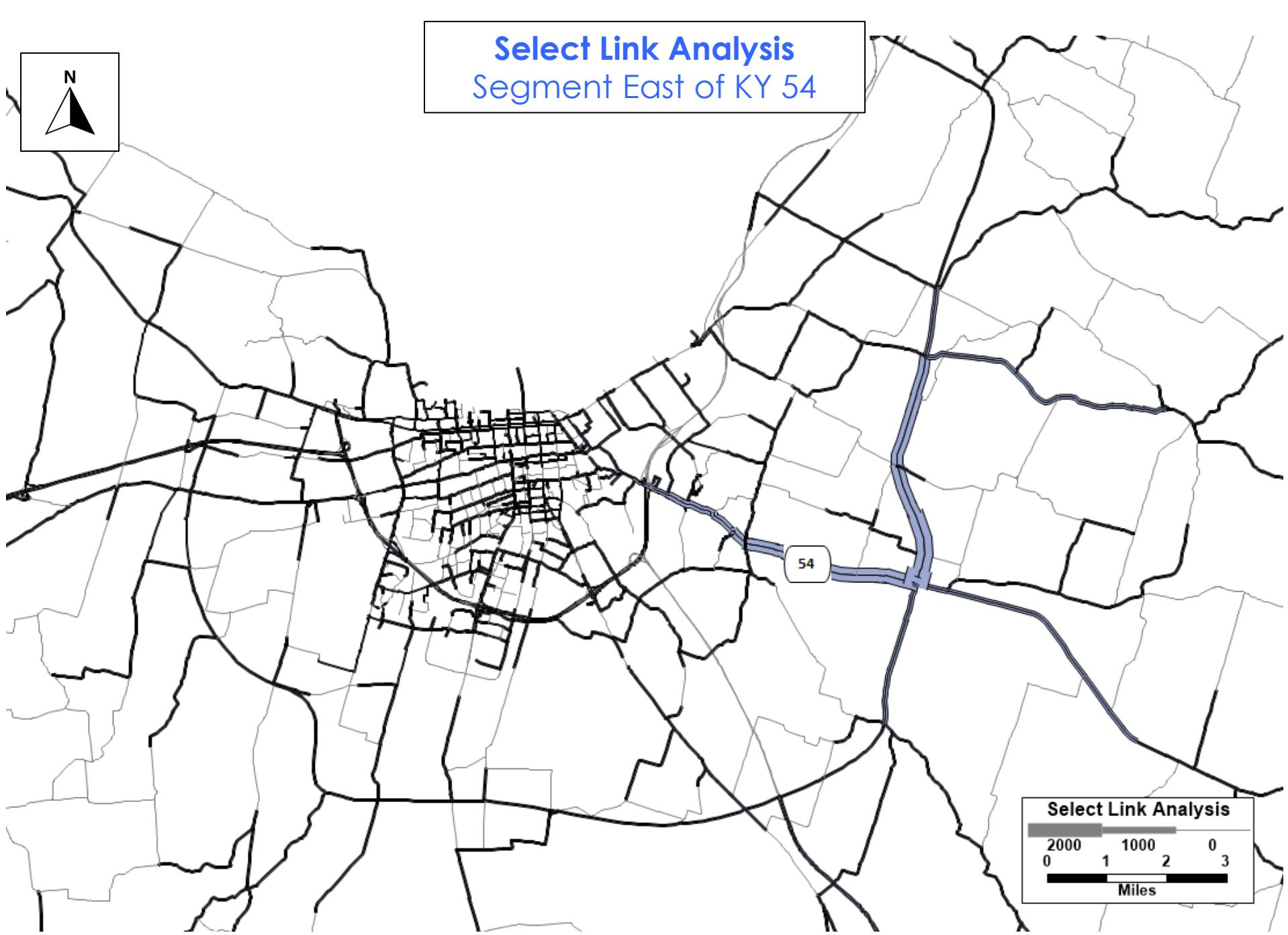
Blue Corridor



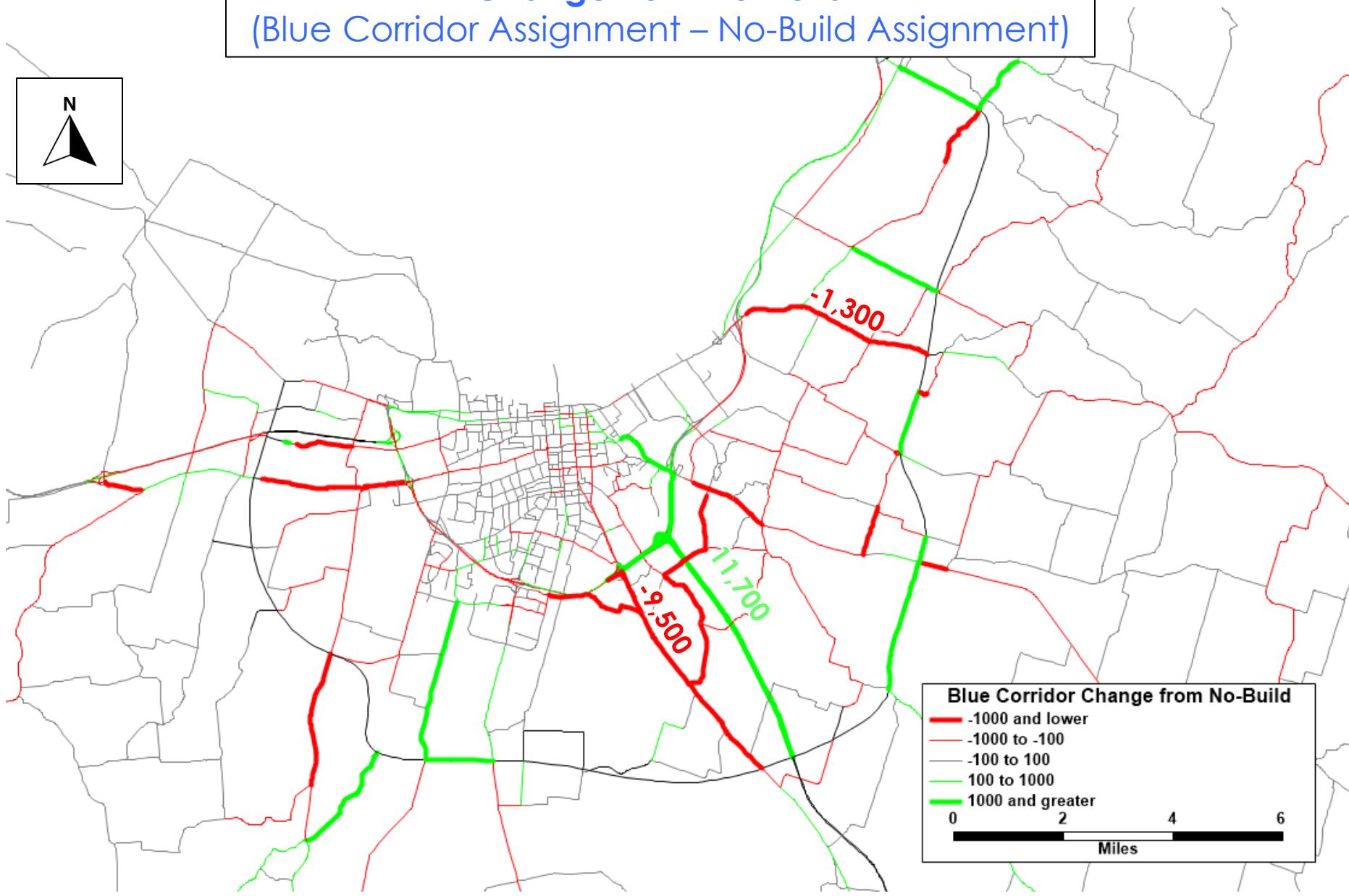
Select Link Analysis
Highest Volume Segment



Select Link Analysis
Segment East of KY 54

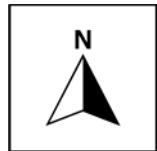


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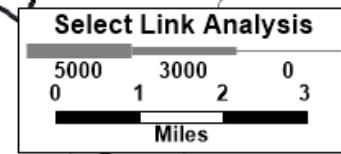
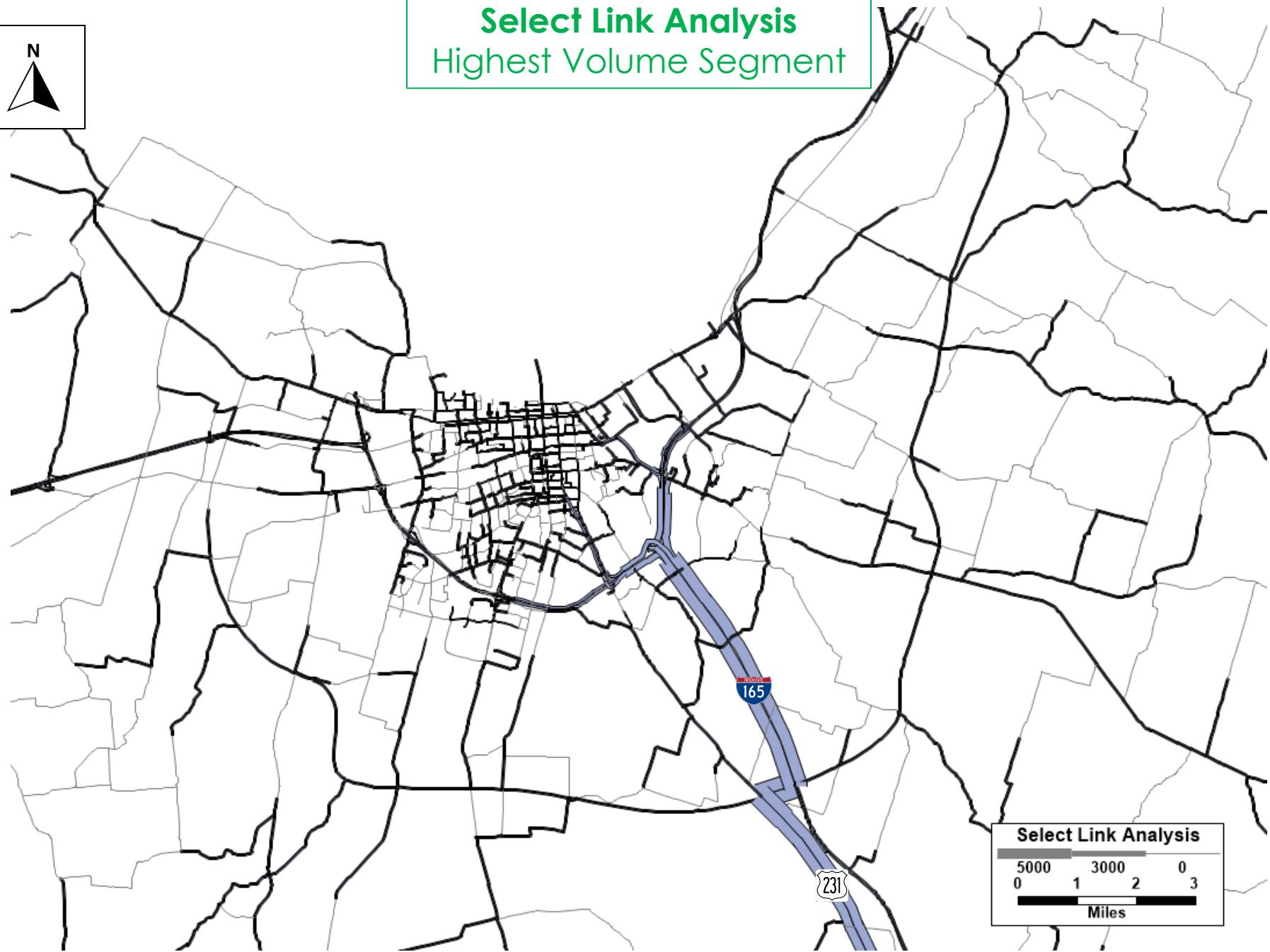
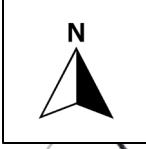
GREEN CORRIDOR

Green Corridor

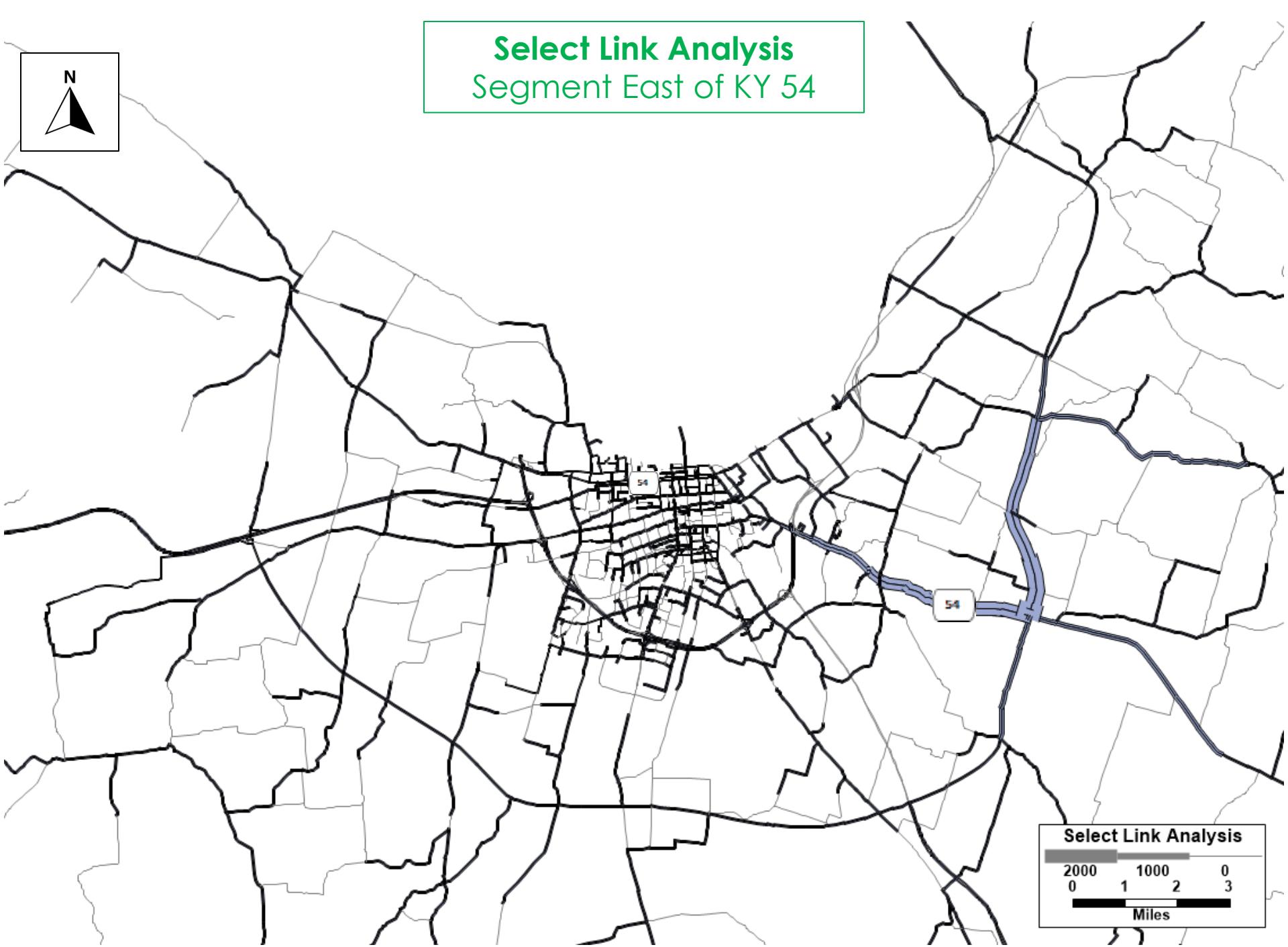


Select Link Analysis

Highest Volume Segment



Select Link Analysis
Segment East of KY 54



Change from No-Build (Green Corridor Assignment – No-Build Assignment)

