

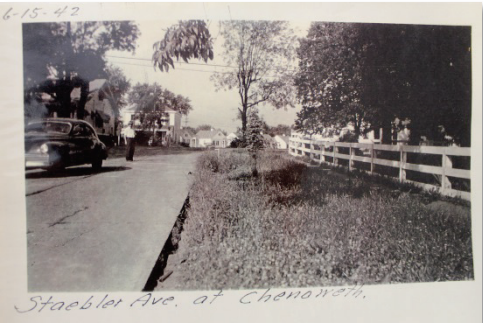
KY 1932 (Chenoweth Lane)

Corridor Study Final Report

US 60 (Shelbyville Road) to US 42 (Brownsboro Road)



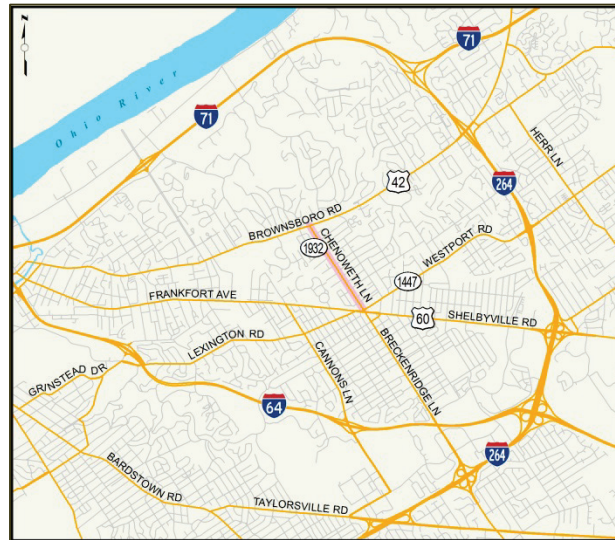
1875 Beers Atlas



1942 Staebler Ave at Chenoweth Ln

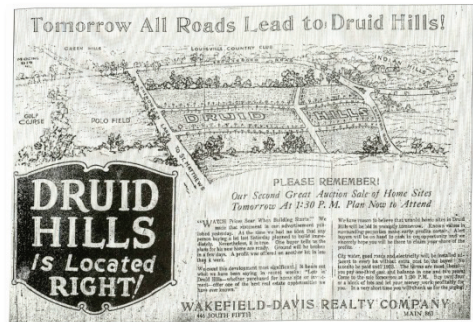


1913 Tax Map



Jefferson County
Item Number: 5-531.00

October 2016



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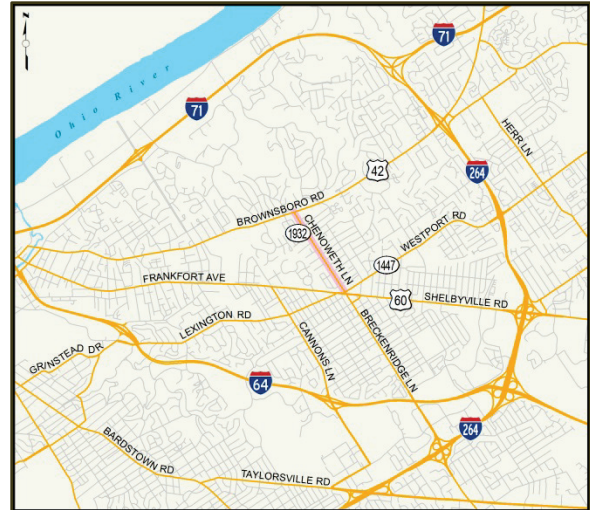
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EXECUTIVE SUMMARY

The Kentucky Transportation Cabinet (KYTC) initiated a planning study in March 2015 to identify ways to improve safety, reduce congestion, and improve mode choice for non-motorists on KY 1932 (Chenoweth Lane) from US 60 (Shelbyville Road) 1.07 miles north to US 42 (Brownsboro Road) in Louisville, Jefferson County, Kentucky (**ES Figures 1 and 2**).

KY 1932 (Chenoweth Lane) is a state-maintained minor arterial route that provides local residents with access to work, school and shopping as well as access to larger regional state routes and destinations beyond. The roadway within this project area traverses or abuts at least six city jurisdictions. Over many decades, the KYTC has received and responded to numerous requests from these local governments to address congestion and safety issues throughout the corridor. Many development plans and access changes have also been implemented and/or proposed. These issues have had a cumulative impact on the functionality and character of the roadway over the years.

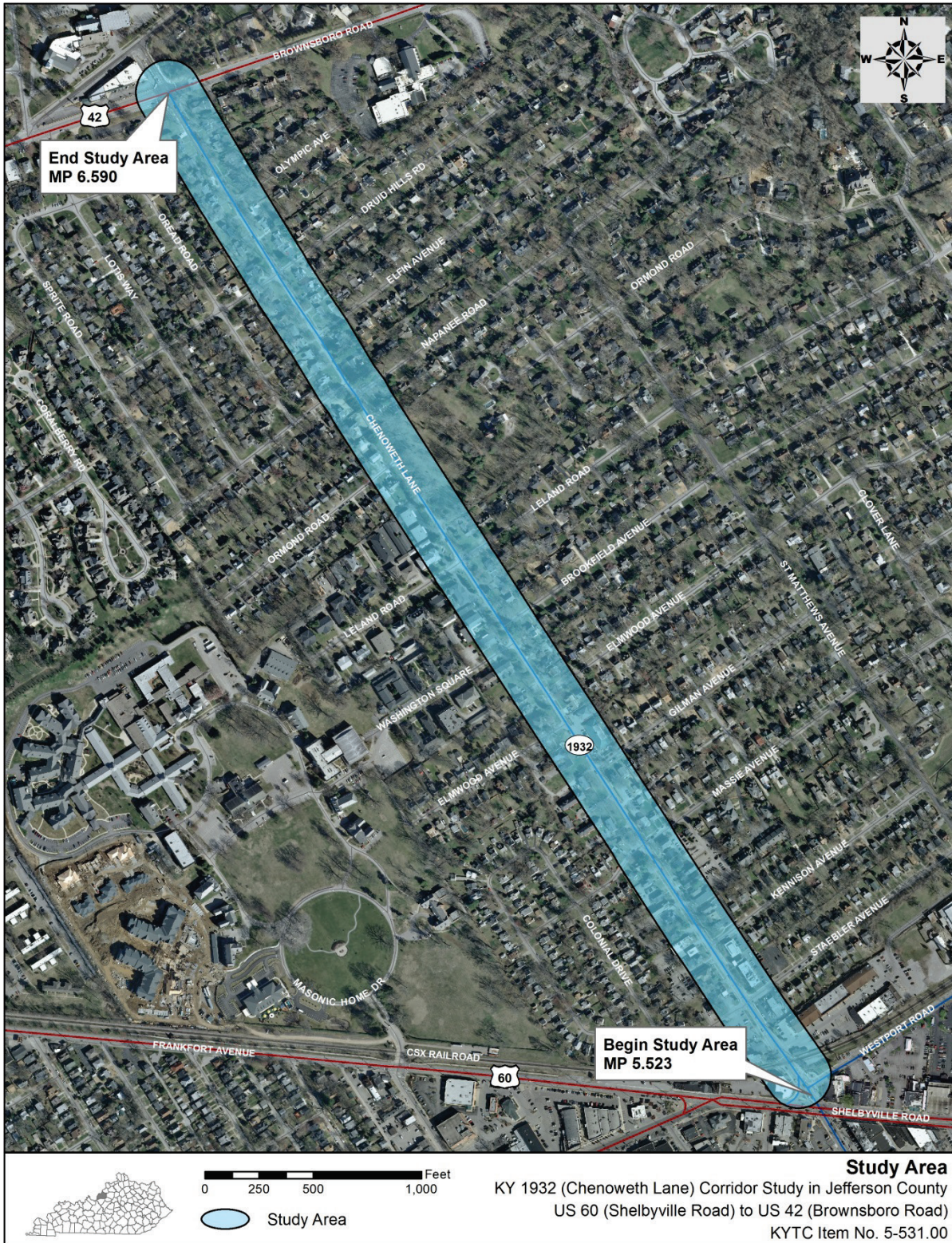


ES Figure 1: Location Map

In 1999, the KYTC proposed to take a comprehensive look at improving Chenoweth Lane between US 60 (Shelbyville Road) and US 42 (Brownsboro Road) by submitting the project for inclusion into the Kentuckiana Regional Planning and Development Agency's¹ (KIPDA) Long Range Transportation Plan. The project would be a mechanism to address the local concerns and to bring the road up to consistent and appropriate state standards. It was initially described and modeled as the most extreme case for improvement—3-lane widening from US 60 to US 42. However, at the time, no specific design concept, 3-lane or otherwise, was committed to construction. That would be determined in the Planning and Design phases. No funding was identified to begin the project.

In January 2014, representatives from the City of St. Matthews and KIPDA approached the KYTC requesting that the Cabinet lead the development of a plan that would identify needs and propose coordinated improvement concepts for Chenoweth Lane. St. Matthews had begun to develop some ideas for the southern half of the corridor, but recognized that their plans needed to be synchronized with those of other cities beyond their northern border at Leland Road and with the Cabinet's ultimate vision for the corridor. The KYTC recognized this as an opportunity to begin the work originally proposed in 1999. A single plan, led by the KYTC, would ensure good coordination of needed improvements, universal buy-in from all parties, and efficient use of available funding.

¹ KIPDA is the regional planning organization comprised of an association of local governments in a nine-county region of southern Indiana and north central Kentucky that includes Jefferson County. KIPDA is Louisville's Metropolitan Planning Organization (MPO).



ES Figure 2: Study Area

The KYTC agreed to lead the study and KIPDA agreed to support the project with SLO federal funding. Initial funding level estimates were based on the extreme case “Three Lane Widening” concept. From the start, the KYTC recognized that a planning study would be needed prior to design to understand corridor needs, coordinate community vision, and establish a widely accepted design concept. It would also provide more accurate cost estimates. All improvement options would be on the table ranging from “No Build/Do Nothing” to “Three Lane Widening.” Thus, in March of 2015, the KYTC initiated this study.

The study funding is identified in the KIPDA Transportation Improvement Program (FY 2015–2018 TIP adopted in 2014) as KIPDA Project ID 213. The project is also identified in Kentucky’s 2016–2022 Highway Plan as Item Number 5-531.002. Project funds for the future phases of design, right-of-way acquisition, and utility relocation are committed. And, although construction funds have not yet been committed, the KYTC expects the project could be ready for construction as early as 2021 or 2022 and would anticipate SLO as a likely source for that funding. This study serves as the first step toward identifying and recommending appropriate investment in the Chenoweth Lane corridor.

The project team was made up of staff from the KYTC, KIPDA, as well as consultants Qk4, Inc., and Stantec Consulting Services, Inc. The team studied existing conditions, developed a Purpose and Need Statement, engaged the public and local officials, completed traffic analyses, examined drainage, studied various alternatives, and made recommendations to be carried forward for further project development phases. A summary of that process is presented below.

PURPOSE AND NEED

The Purpose of the Chenoweth Lane project—from the CSX railroad crossing (just north of Shelbyville Road) to Brownsboro Road—is to (1) improve sight distance and safety for all users, (2) improve drainage along the corridor, and (3) improve pedestrian safety and mobility.

The Needs stem from a higher than average crash rate in the southern section, pedestrian strike history, sight distance obstructions, obstructions in the clear zones, inadequate drainage in the corridor, substandard shoulders, and narrow (east side) and incomplete (west side) sidewalks that do not meet Americans with Disabilities Act of 1990 (ADA) compliance.

This Purpose and Need Statement is a result of this planning process and is, therefore, different (and more current) than the initial Purpose and Need Statement used in the KIPDA programming document. For example, one of the original project purpose elements, improve congestion, was eliminated during the planning process. It was determined through traffic analysis and community input that congestion was not a significant issue affecting the corridor.

Goals of the project are to (1) confine improvements within existing KYTC-owned right-of-way, (2) minimize impacts on established mature trees, and (3) maintain a roadway character that reflects the existing traditional and historic neighborhood setting.

² The FY 2016–2022 Highway Plan is the result of the process through which major highway projects are scheduled for the next six years. The plan was enacted by the Kentucky General Assembly on May 18, 2016.

EXISTING CONDITIONS

Chenoweth Lane is classified as an Urban Minor Arterial. It has two 11-foot travel lanes with a rural (drainage by grass ditches rather than curb and gutter) typical section, a 35-miles-per-hour (mph) speed limit, and numerous driveway access points. A near continuous (although substandard) sidewalk exists on the east side, and a sidewalk exists only along the southern half of the west side. A review of the Kentucky State Police crash data between the years of 2012 and 2014 indicated three pedestrians have been struck by vehicles at various locations along the corridor south of Elmwood Avenue. An at-grade CSX railroad crossing exists just north of US 60 that interrupts traffic flow numerous times throughout the day³. The average daily traffic (ADT) of the corridor is 11,900 vehicles with 9.7% trucks, and the southern section has three contiguous spots with statistically high crash rates (CCRF⁴ greater than 1.0). Numerous utility poles and trees line the corridor, some within the desired clear zone of 14 feet⁵. Drainage is substandard in certain areas. There are no designed bicycle facilities and transit does not serve the corridor, existing only at US 42 and US 60 at the project termini.

The land use is classified by Louisville Metro as a “Town Center” Form District in the southern portion of the corridor, and a “Neighborhood” Form District in the northern portion of the corridor. The south end of Chenoweth Lane is connected to downtown St. Matthews, a thriving, historic small city with genuine character.

PUBLIC INVOLVEMENT

Two meetings with elected officials and two open-house format public meetings were held at the Broadway Baptist Church in the study area. The first set of meetings was held on November 16, 2015, to present existing conditions and a range of typical section options and to gather public input concerning corridor needs. The second set of meetings was held on February 29, 2016, to present a set of build alternatives in addition to a No Build/Do Nothing Alternative.

It is important to note that the theme from the public at each of these meetings was near unanimous opposition to widening Chenoweth Lane. In addition to comments provided at the public meetings, local residents circulated petitions in hard copy and on-line, developed social media pages, wrote letters, and distributed flyers and stickers stating “Stop the Widening of Chenoweth Lane.” This message was communicated by the public to the KYTC and local media before any alternatives were developed as part of this planning study.

TRAFFIC

A detailed traffic analysis was completed for this study. It included a collection of current traffic volumes and turning movements, analysis of existing traffic operations, and a forecast of future

³ In an observed 55-hour period there were 53 train crossings ranging from 3:34-6:19 minutes in non-peak and 2:34-4:37 minutes in peak hours sometimes causing traffic to backup for nearly one-half the length of the corridor.

⁴ A Critical Crash Rate Factor (CCRF) greater than 1.0 is a calculated statistic (developed by the Kentucky Transportation Center) that indicates crashes may not be occurring randomly.

⁵ Clear Zone—The total roadside border area, starting at the edge of the traveled way, available for safe use by an errant vehicle.

(year 2035) conditions assuming no improvements are made (i.e., a No Build/Do Nothing scenario). The 2035 forecast, based on a “worst case” 0.25% annual growth rate, showed traffic on Chenoweth Lane from the railroad crossing north to Brownsboro Road will not be over capacity and will operate at an acceptable level for an urban area, minus the disruptions from the railroad. For example, the 2035 No Build/Do Nothing volume/capacity (V/C) ratio—a standard analysis tool and metric for traffic engineers—ranges from 0.39 to 0.78, below the 0.85 threshold for signaling the onset of capacity-related issues. This discovery was an important factor in the alternatives development process, and was one of the four reasons causing the elimination of a three-lane alternative early in the planning process, before alternative concepts were developed.

ALTERNATIVES DEVELOPMENT

Alternatives were developed in phases. An initial set of alternatives was eliminated early on following the first round of Local Officials and Public meetings, and a short range of alternatives was presented to the public during the second round. A revised set of alternatives and costs based on public feedback was then discussed by the project team, who considered all of the information and public input.

Alternatives Eliminated Early: Widening the entire corridor to three lanes was eliminated early in the process, as was any option to widen the roadway to more than three lanes. There were four general reasons for this decision:

- Capacity analysis does not warrant additional lanes.
- Future growth projection does not warrant additional lanes.
- The public opposes the widening.
- Benefits will not be realized by the cost of a three-lane widening project.

Constructing a 10-foot-wide shared-use (between bicyclists and pedestrians) path along one side of the road was also eliminated early. Likewise, widening the road to provide 5-foot-wide bike lanes adjacent to each travel lane was eliminated early for the following reasons:

- A shared-use path would not connect to like facilities on either US 42 or US 60.
- Most cyclists utilize other routes.
- A bike lane would require widening Chenoweth Lane or a larger footprint, neither of which is desired by the public.
- Other north/south routes are available.
- The KYTC Bicycle/Pedestrian Review did not recommend a shared use path.
- Some cyclists currently ride St. Matthews Avenue to Napanee Road then north on Chenoweth Lane to US 42.

In addition to the listed rationale for eliminating these alternatives, neither of them would have been in concert with the three goals of the project: (1) confine improvements within existing KYTC-owned right-of-way, (2) minimize impacts on established mature trees, and (3) maintain a roadway character that reflects the existing traditional and historic neighborhood setting.

Alternatives Presented to the Public: A No Build/Do Nothing Alternative and two build alternatives were presented to the public.

Alternative 1—No Build/Do Nothing

Improvements would not be made to Chenoweth Lane and existing conditions would remain, except for routine maintenance.

Alternative 2—Urban

Drainage would be managed through curb and gutter (an urban typical section) from the railroad crossing to US 42.

This alternative had four major elements: (1) provide curb and gutter along the entire corridor while replacing the deep grass ditches with an underground storm water system and make other minor site-specific drainage improvements, (2) include improvements to sidewalks and continuous sidewalks on both sides of Chenoweth Lane, (3) include a 135-foot-long left-turn lane in both directions at Massie Avenue as the only element that widens the roadway, and (4) provide signage indicating a bike route from Massie Avenue to Brownsboro Road.

The majority of this alternative could be constructed inside the existing KYTC right-of-way with minimal impacts.

Alternative 3—Urban and Rural

Drainage would be managed through curb and gutter from the railroad crossing to Massie Avenue, then managed through grass ditches (i.e., a rural typical section but with improved ditches and less depth than the existing conditions) from Massie Avenue to US 42.

This alternative is similar to Alternative 2, except for element (1), “curb and gutter along the entire corridor.” Alternative 3 has four elements: (1) provide curb and gutter only in the commercial area of Chenoweth Lane, from Massie Avenue south, while replacing the deep grass ditches with an underground storm water system; but also provide site-specific drainage improvements to the rural section north of Massie Avenue, (2) include improvements to sidewalks and continuous sidewalks on both sides of Chenoweth Lane, (3) include a 135-foot-long left-turn lane in both directions at Massie Avenue as the only element that widens the roadway, and (4) provide signage indicating a bike route from Massie Avenue to Brownsboro Road.

As with Alternative 2, the majority of the improvements could be constructed inside the existing KYTC right-of-way with minimal impacts.

Revised Short-List of Alternatives: Based on public input and the traffic analysis, element (3), “a 135-foot-long left-turn lane in both directions at Massie Avenue,” was eliminated from both build alternatives after the second public meeting. The public opposed this widening element, and the traffic analysis showed it provided minimal benefit—existing and future traffic would operate at acceptable levels at this intersection without these left-turn lanes. It should be noted the future design of this concept would include access management strategies through the commercial section.

RECOMMENDATIONS

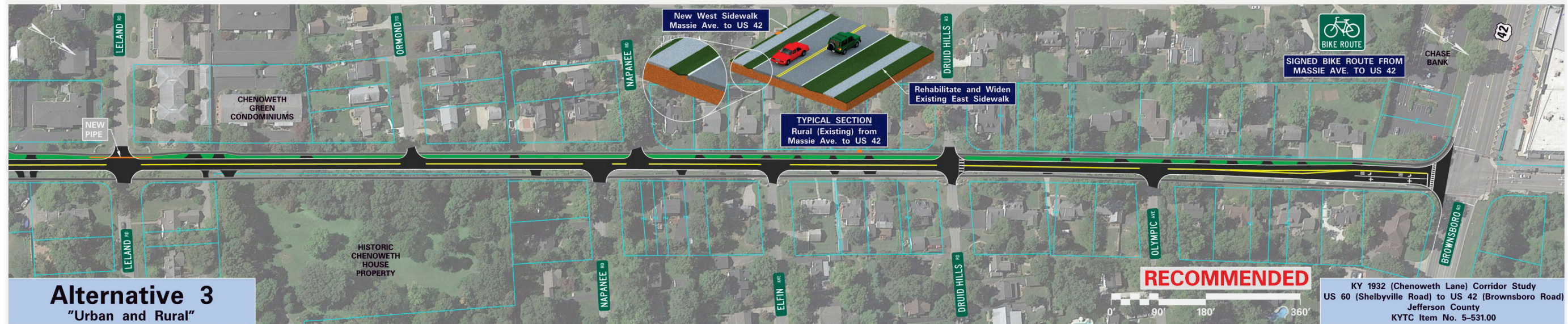
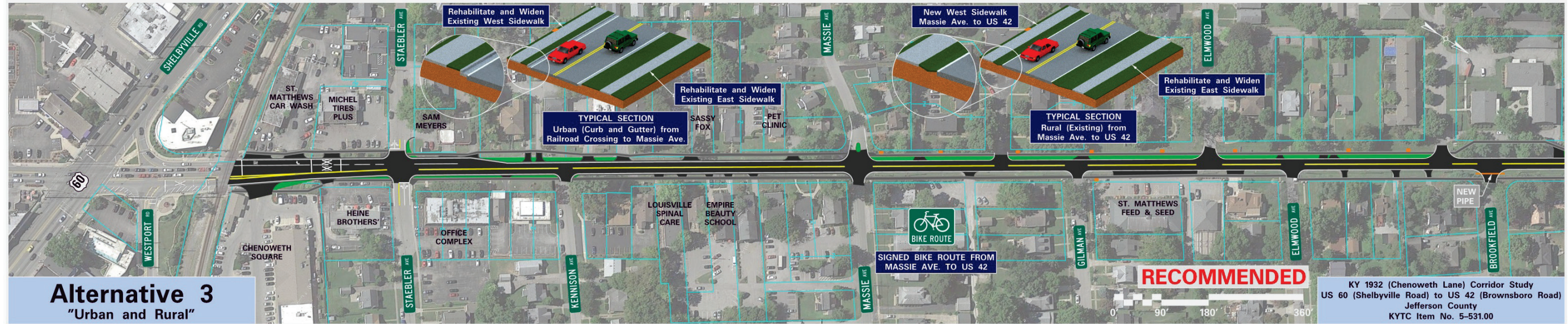
Based on existing conditions, the traffic analysis, impacts, public input, and engineering judgment, the project team recommended Alternative 3 be carried forward to the next project development phase, with the following changes: exclude the left-turn lanes at Massie Avenue, and include access management strategies through the commercial section. North of Massie Avenue, the project would include sidewalks on both sides and site-specific drainage improvements (**ES Figure 3**). It was agreed this build alternative was in line with the Purpose and Need of the project, compatible with the neighborhood setting, and acceptable to the public. The cost estimates for Alternative 3 are presented in **ES Table 1**. It should be noted that these planning-level cost estimates are significantly below the cost estimates presented in the KYTC’s 2016–2022 Highway Plan, which provides a budget that is slightly more than \$5 million for all future phases.

As standard practice, Alternative 1 (No Build/Do Nothing) will be carried forward to the next phase as a comparison to the recommended build alternative.

ES Table 1: Cost Estimate Summary for Alternative 3

Alternative	Design	Right-of-Way	Utilities	Construction		Total
				Railroad to Massie Avenue	Massie Avenue to US 42	
Alternative 3 Urban and Rural	\$800,000	\$215,000	\$625,000	\$350,000	\$550,000	\$2,540,000

Following Project Team Meeting No. 3, cost estimates were revised to include additional contingencies requested by the KYTC and improvements to the existing railroad crossing.



ES Figure 3: Alternative 3—Urban and Rural

1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) initiated a planning study in March 2015 to identify ways to improve safety, reduce congestion, and improve mode choice for non-motorists on KY 1932 (Chenoweth Lane) from US 60 (Shelbyville Road) 1.07 miles north to US 42 (Brownsboro Road) in Louisville, Jefferson County, Kentucky (**Figures 1 and 2**).

This KY 1932 (Chenoweth Lane) Corridor Study was funded in the Kentuckiana Regional Planning and Development Agency's⁶ (KIPDA) Transportation Improvement Program (FY 2015–2018 TIP adopted in 2014) as KIPDA ID 213. The project is identified in Kentucky's 2016–2022 Highway Plan as Item Number 5-531.00⁷. The 2016–2022 Highway Plan project funds for the future phases of design, right-of-way acquisition, and utility relocation are committed. The KYTC expects the project could be ready for construction as early as 2021 or 2022 and would anticipate SLO as a likely source for that funding. This study serves as the first step toward identifying and recommending appropriate investment into the Chenoweth Lane corridor.

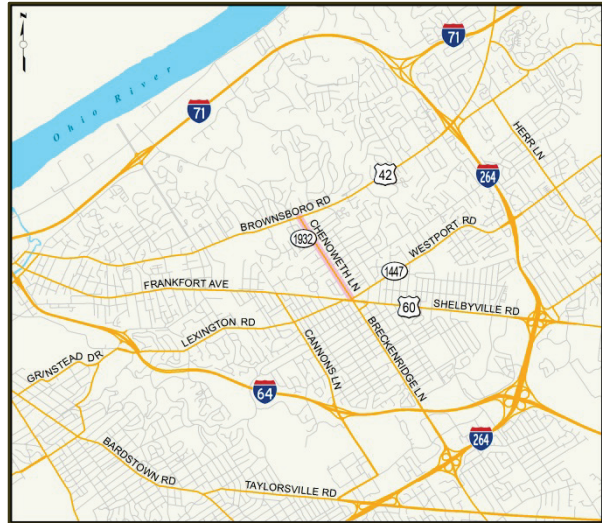


Figure 1: Location Map

The KYTC Project Identification Form (PIF) developed for the study area (**Appendix A**) as well as the KIPDA TIP stated the purpose of the project was to “*widen KY 1932 (Chenoweth Lane) from 2 to 3 lanes (3rd lane will be a center turn lane) from US 60 (Shelbyville Road) to US 42 (Brownsboro Road) to include bicycle and pedestrian facilities.*” It is important to note this project description was revised during the planning process, and widening the road to three lanes is not a recommendation of this corridor study.

The project team was made up of staff from the KYTC, KIPDA, as well as consultants Qk4, Inc. and Stantec Consulting Services, Inc. The team studied existing conditions, developed a Purpose and Need Statement, engaged the public and local officials, completed traffic analyses, examined drainage, studied various alternatives, and made recommendations to be carried forward for further project development phases.

⁶ KIPDA is the regional planning organization comprised of an association of local governments in a nine-county region of southern Indiana and north central Kentucky that includes Jefferson County. KIPDA is Louisville's Metropolitan Planning Organization (MPO).

⁷ The FY 2016–2022 Highway Plan is the result of the process through which major highway projects are scheduled for the next six years. The plan was enacted by the Kentucky General Assembly on May 18, 2016.

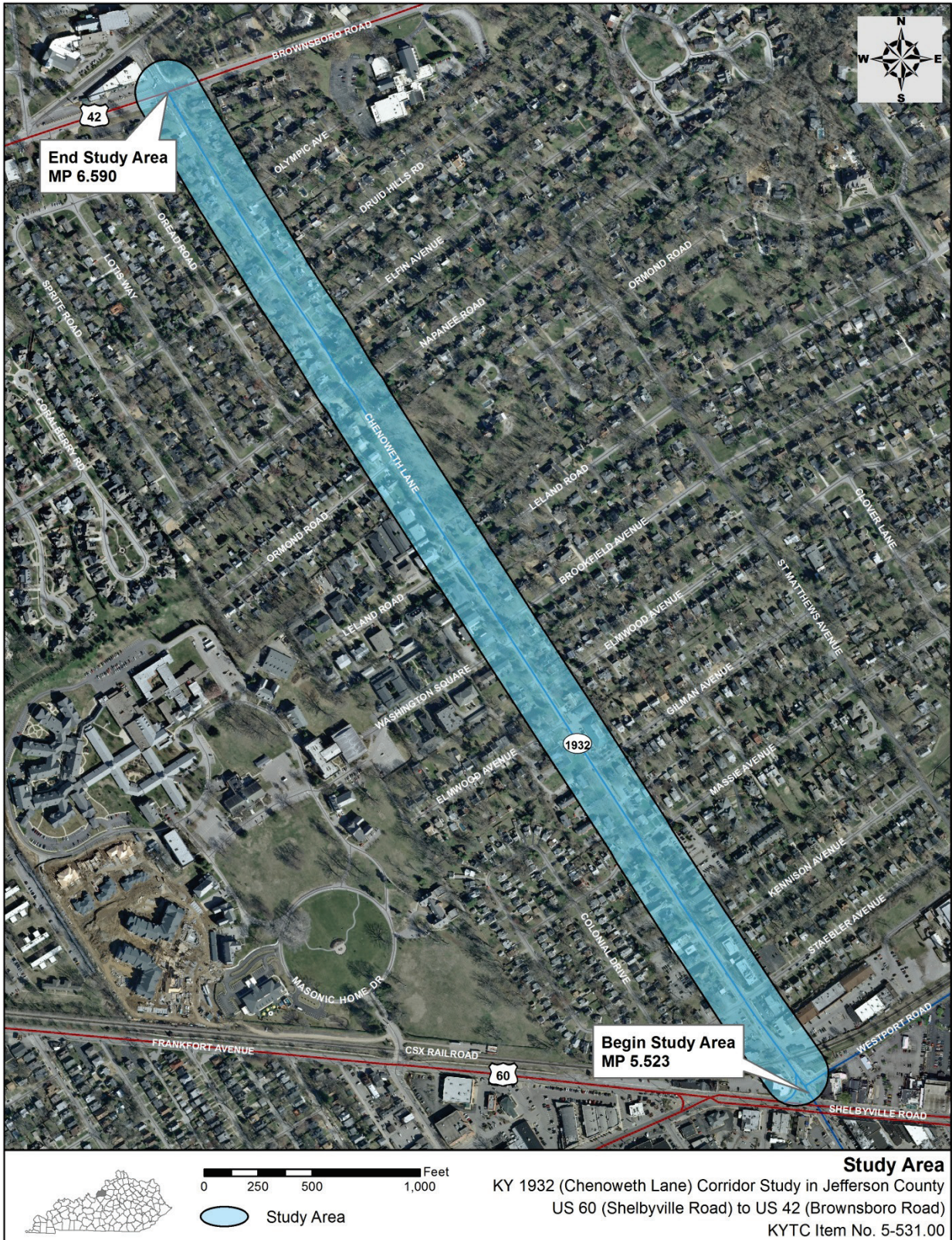


Figure 2: Study Area

1.1 Project Corridor Overview

KY 1932 (Chenoweth Lane) is a state-maintained minor arterial route that provides local residents with access to work, school and shopping as well as access to larger regional state routes and destinations beyond. The roadway within this project area traverses or abuts at least six city jurisdictions (**Figure 3**, p. 4). It is classified as an Urban Minor Arterial. It has two 11-foot travel lanes with a rural (drainage by grass ditches rather than curb and gutter) typical section, a 35-miles-per-hour (mph) speed limit, and numerous driveway access points. A near continuous (although substandard) sidewalk exists on the east side, and a sidewalk exists only along the southern half of the west side. A review of the Kentucky State Police crash data between the years of 2010 and 2015 indicated three pedestrians have been struck by vehicles at various locations along the corridor south of Elmwood Avenue. An at-grade CSX railroad crossing exists just north of US 60 that interrupts traffic flow numerous times throughout the day. The average daily traffic (ADT) of the corridor is 11,900 vehicles with 9.7% trucks, and the southern section has three contiguous spots with statistically high crash rates (CCRF greater than 1.0). Numerous utility poles and trees line the corridor, some within the desired clear zone of 14 feet. Drainage is substandard in certain areas. There are no designed bicycle facilities and transit does not serve the corridor, existing only at US 42 and US 60 at the project termini. The land use is classified by Louisville Metro as a “Town Center” Form District in the southern portion of the corridor, and a “Neighborhood” Form District in the northern portion of the corridor.

1.2 Project History

In 1999, the KYTC proposed to take a comprehensive look at improving Chenoweth Lane between US 60 (Shelbyville Road) and US 42 (Brownsboro Road) by submitting the project for inclusion into the Kentuckiana Regional Planning and Development Agency’s⁸ (KIPDA) Long Range Transportation Plan. The project would be a mechanism to address the local concerns and to bring the road up to consistent and appropriate state standards. It was initially described and modeled as the most extreme case for improvement—3-lane widening from US 60 to US 42. However, at the time, no specific design concept, 3-lane or otherwise, was committed to construction. That would be determined in the Planning and Design phases. No funding was identified to begin the project.

In January 2014, representatives from the City of St. Matthews and KIPDA approached the KYTC requesting that the Cabinet lead the development of a plan that would identify needs and propose coordinated improvement concepts for Chenoweth Lane. St. Matthews had begun to develop some ideas for the southern half of the corridor, but recognized that their plans needed to be synchronized with those of other cities beyond their northern border at Leland Road and with the Cabinet’s ultimate vision for the corridor. The KYTC recognized this as an opportunity to begin the work originally proposed in 1999. A single plan, led by the KYTC, would ensure good coordination of needed improvements, universal buy-in from all parties, and efficient use of available funding.

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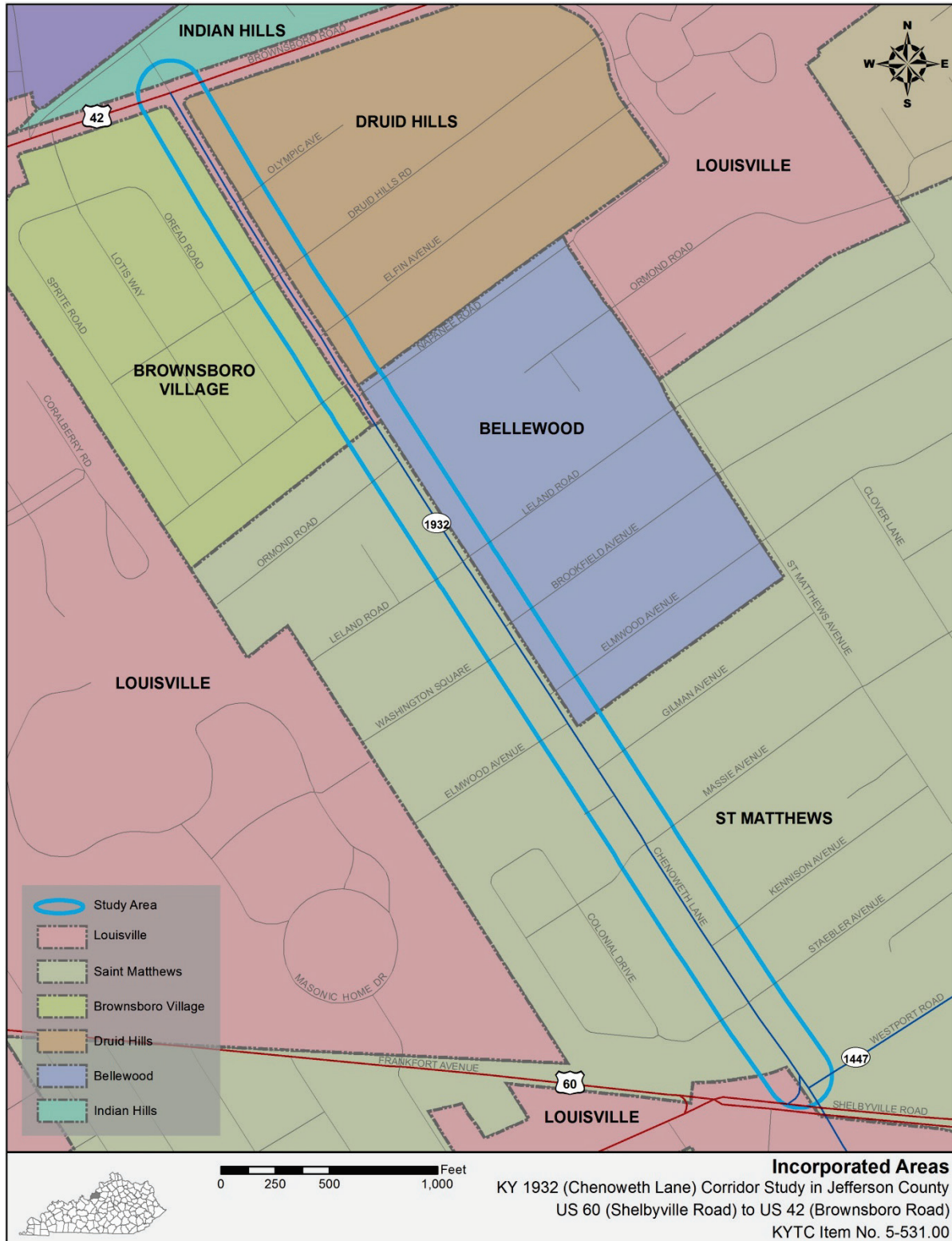


Figure 3: Incorporated Areas

The KYTC agreed to lead the study and KIPDA agreed to support the project with SLO federal funding. Initial funding level estimates were based on the extreme case “Three Lane Widening” concept. From the start, the KYTC recognized that a planning study would be needed prior to design to understand corridor needs, coordinate community vision, and establish a widely accepted design concept. It would also provide more accurate cost estimates. All improvement options would be on the table ranging from “No Build/Do Nothing” to “Three Lane Widening.” Thus, in March 2015, the KYTC initiated this study.

Over many decades, the KYTC has received and responded to numerous requests from these local governments to address congestion and safety issues throughout the corridor. Many development plans and access changes have also been implemented and/or proposed. These issues have had a cumulative impact on the functionality and character of the roadway over the years.

2.0 OTHER PLANNED TRANSPORTATION PROJECTS

The following sections address transportation planning efforts by the KYTC, KIPDA, Louisville Metro, and the City of St. Matthews in the vicinity of the study area. Potential impacts to the Chenoweth Lane Corridor Study are noted.

2.1 KYTC 2016–2022 Highway Plan Projects

This text box identifying this study (“5-531.00 KY-1932”) is highlighted in yellow on **Figure 4**, which illustrates the non-interstate highway projects inside I-264 in Jefferson County. This map was provided by the KYTC Division of Program Management.

No projects in the KYTC’s 2016–2022 Highway Plan are in proximity to or would change traffic on Chenoweth Lane.

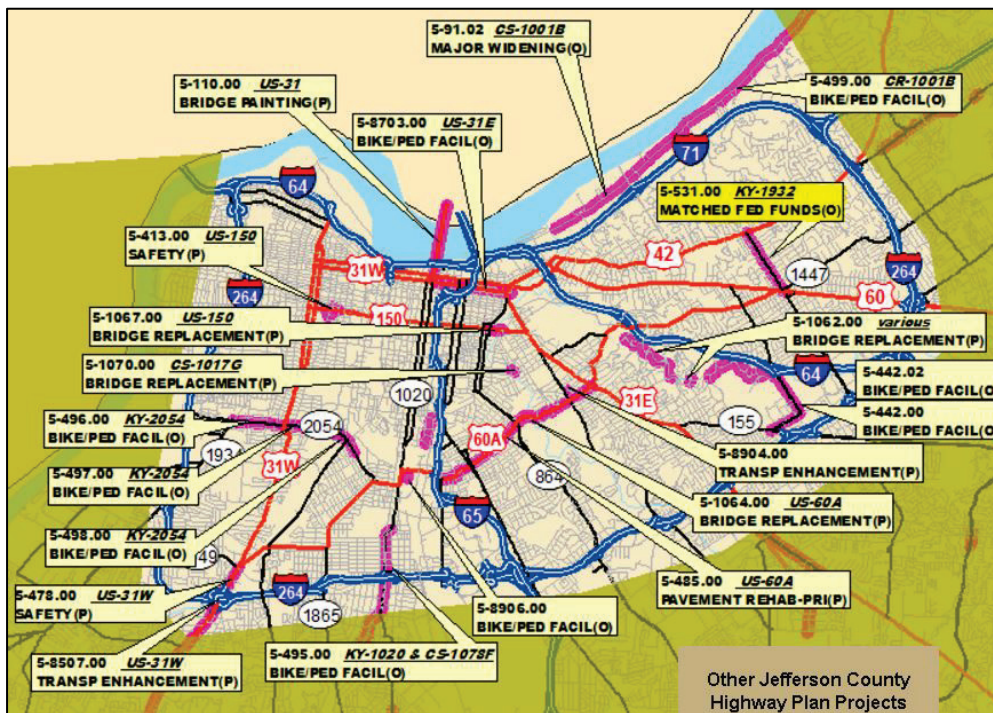


Figure 4: Jefferson County 2016–2022 Highway Plan Projects inside I-264

2.2 KIPDA Metropolitan Transportation Plan (MTP) Projects

Four projects near the Chenoweth Lane Corridor Study (KIPDA ID 213) area are in KIPDA's Metropolitan Transportation Plan (MTP) and Transportation Improvement Program (TIP). As with the KYTC projects, none of these are anticipated to change traffic patterns along the study area. These projects are shown in **Figure 5**, which is from KIPDA's MTP map, and are listed as follows:

- **KIPDA ID 261** — “Transportation System Management (TSM) improvements on KY 1932 (Breckenridge Lane) from KY 1447 (Westport Road) to Kresge Way.”
- **KIPDA ID 287** — “Align US 60 (Frankfort Avenue) intersections of Stilz Avenue and Hillcrest Avenue.”
- **KIPDA ID 384 and KYTC Item No. 5-479** — “Widen Hubbards Lane from 2 to 3 lanes (center turn lane) from US 60 (Shelbyville Road) to KY 1447 (Westport Road) and add bike lanes to Hubbards Lane from Kresge Way to KY 1447. The project length is 1.4 miles.”
- **KIPDA ID 1616** — “Construction of sidewalk improvements along the north and south sides of US 60 (Shelbyville Road), connecting to existing sidewalks from Ten Pin Lane to Hubbards Lane.”



Figure 5: KIPDA's TIP Projects near Chenoweth Lane

2.3 St. Matthews Concept Streetscape Plan

The City of St. Matthews developed a concept streetscape plan in November 2005 for its portion of Chenoweth Lane (**Appendix B**). The plan’s major elements are as follows:

- Removing some asphalt outside the travel lanes, replacing it with landscaping, and reconstructing sidewalks at or near the US 60 intersection and near Heine Brothers’ Organic Fair Trade Coffee. These improvements have been implemented in some form.
- East-side sidewalk replacement from Staebler Avenue to Gilman Avenue.
- A sidewalk and buffer island in front of St. Matthews Feed & Seed, the only place where a sidewalk does not exist on the east side of Chenoweth Lane.
- West side improvements north and south of Staebler Avenue include:
 - Two curbed landscape expansion areas.
 - Reduced apron widths for the two existing entrances along the Michel Tire Plus frontage.
- Landscaping between the road and sidewalk at Kennison Avenue.

St. Matthews has elected to not implement any elements of the plan north of the railroad tracks so as not to invest in improvements if the KYTC would later widen or reconstruct Chenoweth Lane as described in the KIPDA TIP. For illustrative purposes a sample image of the concept landscape plan is included as **Figure 6**.

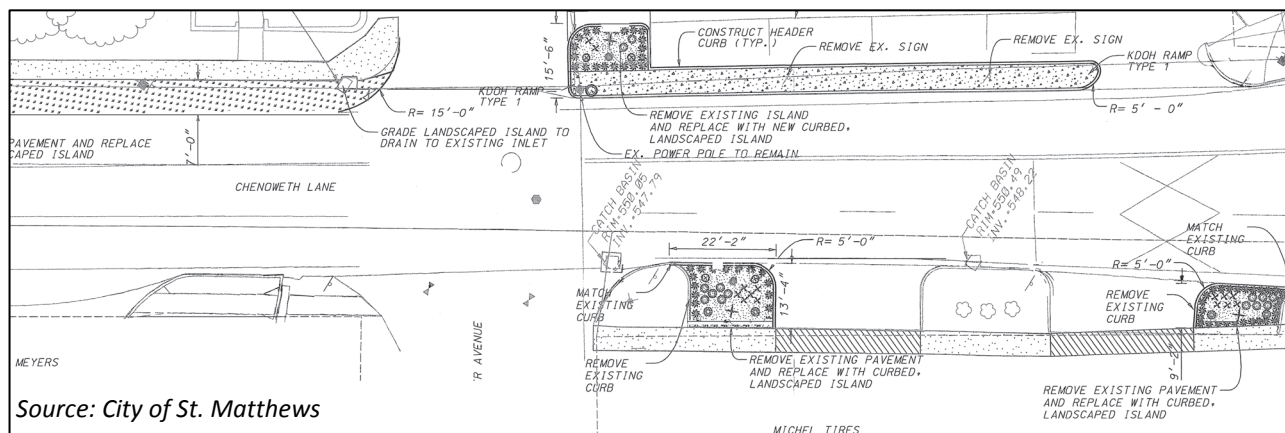


Figure 6: Example of St. Matthews Concept Landscape Plan

3.0 PROJECT PURPOSE AND NEED

The Purpose of the Chenoweth Lane project—from the CSX railroad crossing (just north of US 60) to US 42—is to (1) improve sight distance and safety for all users, (2) improve drainage along the corridor, and (3) improve pedestrian safety and mobility.

The Needs stem from a higher than average crash rate in the southern section, pedestrian strike history, sight distance obstructions, obstructions in the clear zones, inadequate drainage in the corridor, substandard shoulders, and narrow (east side) and incomplete (west side) sidewalks that do not meet Americans with Disabilities Act of 1990 (ADA) compliance.

Goals of the project are to (1) confine improvements within existing KYTC-owned right-of-way, (2) minimize impacts on established mature trees, and (3) maintain a roadway character that reflects the existing traditional and historic neighborhood setting.

This Purpose and Need Statement is a result of this planning process and is, therefore, different (and more current) than the initial Purpose and Need Statement used in the KIPDA programming document and the KYTC Project Identification Form (PIF) document.

The **Needs** along the corridor can be further explained by the following factors:

Safety

- Existing shoulders do not meet current design standards (0–3 feet).
- 75 crashes over a three-year period, many rear-end collisions.
- 3 high crash locations/spots between US 60 and Kennison Avenue with a CCRF > 1.0⁹.
- 59 access points between the railroad tracks and US 42.
- Sidewalks are not continuous along the west side and incomplete on the east side.
- A mid-block crossing for pedestrians is located at Druid Hills Road.
- A history of pedestrian strikes between US 60 and Elmwood Avenue.
- Several obstructions in the clear zone¹⁰.
- Deep ditches that do not allow for vehicle recovery.
- Left turns inhibit traffic flow during peak hours.
- In an observed 55-hour period there were 53 train crossings ranging from 3:34-6:19 minutes in non-peak 2:34-4:37 minutes in peak hours (5 per peak hour) sometimes causing traffic to backup for nearly one-half the length of the corridor.

⁹ A Critical Crash Rate Factor (CCRF) greater than 1.0 is a calculated statistic (developed by the Kentucky Transportation Center) that indicates crashes may not be occurring randomly.

¹⁰ Clear Zone—The total roadside border area, starting at the edge of the traveled way, available for safe use by errant vehicle.

Drainage Issues

- Lack of drainage swells or ditches in north portion of corridor.
- Many ditches and cross drains are silted and possibly undersized.
- A number of poles and other items are located in the ditch lines.
- Drainage flows over the roadway in some locations.

Multi-Modal Considerations

- Lack of dedicated bicycle facilities.
- Lack of transit options.
- Limited pedestrian access.

4.0 EXISTING CONDITIONS

Existing conditions related to mobility and the physical characteristics of the corridor were identified throughout the Chenoweth Lane corridor. Many of these findings are illustrated on **Figure 12** (p. 14).

4.1 Roadway Characteristics

Chenoweth Lane is functionally classified as an Urban Minor Arterial. It has two 11-foot-wide travel lanes. Three locations along Chenoweth Lane have three lanes:

1. Southbound right-turn lane for Staebler Avenue
2. Southbound left-turn lane at US 60
3. Northbound left-turn lane at US 42

Shoulders widths vary from 0 to 3 feet. The speed limit is posted as 35 mph. Between the railroad tracks and Elmwood Avenue west, there are 20 access points or driveways and approximately 39 access points between Elmwood Avenue west and US 42. The intersections with US 60 and US 42 are controlled by traffic signals; there are no other Stop-controls along the corridor. North of the railroad, Chenoweth Lane has curb (no gutter) to Staebler Avenue. A rural template (grass ditches rather than curb and gutter) exists from Staebler Avenue north to US 42 with an average of 3-foot-wide shoulders that are a combination of paved and unpaved.

US 60 is functionally classified as a four-lane, Principal Arterial and provides access to two of Louisville's major shopping centers, Oxmoor Mall and Mall St. Matthews. US 42 is also functionally classified as a 4-lane Principal Arterial.

Chenoweth Lane and Hubbards Lane are the only two north-south connectors in the area between US 60 and US 42. Massie Avenue and Elmwood Avenue are the only through roadways from Chenoweth Lane to Hubbards Lane.

Additional roadway characteristics can be found in **Appendix C**.

4.2 Roadway Geometrics

Existing "as-built" roadway plans are not available for Chenoweth Lane; therefore, project engineers assessed the geometrics based on available mapping and field visits. A profile was

developed and used to identify substandard conditions. Items found during the geometric review were:

- Shoulder widths of 0–3 feet, which are less than the KYTC current design recommendations of 10 feet.
- Once the desirable clear zone is determined during Phase 1 Design, several utility poles, one tree, a signature entrance (**Figure 7**), and culvert headwalls (**Figure 8**) will be evaluated for removal or relocation if necessary.
- The northbound radius from Chenoweth Lane to Massie Avenue is substandard. It is only 20 feet, whereas 30 feet is desirable based on current design criteria.
- Kennison Avenue and Druid Hills Road approaches to Chenoweth Lane are both less than 18 feet in total. The desirable lane width for residential urban local streets is 20 feet in total.
- Grades in some places appear less than the desirable 0.5%.



Figure 7: Signature Entrance at Leland Road

4.3 Drainage

A site visit and review of recent improvement plans near US 42 revealed undersized and silted side road cross drains, undersized ditches, power poles and guy wires in the middle of drainage ditches, and a missing cross drain (**Figure 8**). The size and depth of ditches on the east side of Chenoweth Lane are restricted by the proximity of the existing sidewalk. As a result, portions of the corridor do not have defined ditches or swales.



Figure 8: Utility Poles in Ditches (left) and Silted Pipe (right)

An existing storm sewer trunk line ranging from 24 to 54 inches begins north of Washington Square and extends south to Staebler Avenue. Flow along this portion of Chenoweth Lane is drained by yard basins and drop box inlets. The trunk line extends east along Staebler Avenue toward an existing retention basin located at Kennison Avenue and St. Matthews Avenue. A detailed review of the drainage analysis is located in **Appendix D**.

4.4 Adequacy Ratings

The KYTC uses roadway adequacy ratings as a tool in its efforts to evaluate highway conditions. These ratings have three components:

- Roadway pavement condition.
- Safety.
- Service.

The three component measures are combined into an overall quantitative measure allowing roadway segments to be ranked. Points allocated to the three components vary by the functional classification of the roadway.

For an Urban Minor Arterial, such as Chenoweth Lane, there are 30 points for pavement condition, 45 points for safety, and 25 points for service¹¹. The composite for Chenoweth Lane is 48.6 in 2014.

Each roadway is then ranked with other Kentucky roadways of similar type. The percentile rating for Chenoweth Lane is 8.5%, indicating nearly 92% of roadways of similar type are ranked higher than Chenoweth Lane given these criteria.

4.5 Bicycle Accommodations

Part of the scope of this study was to analyze the need for bicycle connectivity. An initial step was to review Louisville Metro’s Comprehensive Plan Cornerstone 2020 “Core Graphic 13, Bikeways,” which illustrates Chenoweth Lane from Massie Avenue north to US 42 as a bicycle route (**Appendix E**). Bicycle facilities are not present; rather, it is identified as a “share the road” route. Neither of the two intersecting termini roads, US 60 and US 42, are designed as bicycle facilities or are signed as bike routes. The Louisville Metro Latent Demand model, used for planning future bicycle facilities, does not identify the study area as needing bicycle facilities.

A KYTC review of bicycle/pedestrian accommodations within the study area (**Appendix E**) indicated a need for sidewalks and pedestrians elements, but not bicycle facilities. Using the Bicycle Comfort Index (BCI)¹², Chenoweth Lane was rated as “D,” on a grading scale from “A” to “F,” which indicates the compatibility for bicycling on the road is “moderately low.”

Designated bicycle lanes closest to Chenoweth Lane are Westport Road to the east and Grinstead Drive to the west, each approximately one mile away. Therefore, connectivity to the Chenoweth Lane Corridor exists only through bicyclists negotiating with vehicular traffic on other existing roads.

4.6 Pedestrian Accommodations

Pedestrian accommodations are mostly present along the east side of Chenoweth Lane from US 60 to US 42. However, the west side has a sidewalk only from US 60 to Massie Avenue. As stated earlier, a mid-block crossing is located at Druid Hills Road (near US 42). Based on a review of existing sidewalks in the study corridor, the following issues were identified:

4.6.1 West-Side Sidewalk

- Widths vary from 4 to 6 feet; 5 feet is desirable.
- Grade requirements are not met due to the broken sidewalk between Massie and Kennison Avenues (**Figure 9**, top).

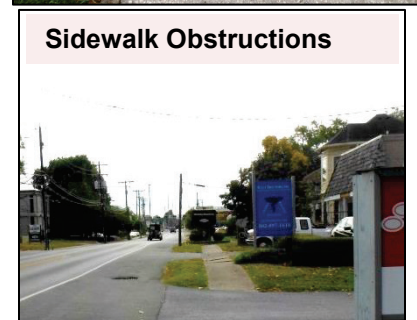


Figure 9: Existing Sidewalk Issues

¹¹ 2003 Kentucky Highway Rating System. Kentucky Transportation Center, University of Kentucky. p. 10. http://www.ktc.uky.edu/files/2012/06/KTC_02_30_SPR_256_01_1F.pdf

¹² <http://transportation.ky.gov/Bike-Walk/Documents/Bicyclists%20Comfort%20Index.pdf>

- Obstructions are present (**Figure 9**, bottom).

4.6.2 East-Side Sidewalk

- Sidewalk not ADA accessible at Kennison Avenue, as pedestrians must negotiate two steps to continue on the sidewalk.
- No sidewalk across the St. Matthews Feed & Seed entrance.

4.6.3 Chenoweth Lane/US 42 Intersection

- Sidewalks are ADA accessible on all sides of the Chenoweth Lane/US 42 intersection.
- Although there is a crosswalk on Chenoweth Lane, there are no sidewalks along the south side of US 42; a sidewalk to the west would benefit pedestrian access to Chenoweth Elementary School.

4.6.4 Cross Streets

Sidewalks are not present along most cross streets intersecting Chenoweth Lane. A few cross streets have a sidewalk on one side only, and even fewer have sidewalks on both sides. Even so, pedestrian walkability is a priority for St. Matthews, and is consistently ranked high as a desirable livability element and public health benefit. Sidewalks exist along the south side of US 60, and the Chenoweth Lane/US 42 intersection was recently improved to include ADA compliant landing areas. The east-side sidewalk along Chenoweth Lane extends northward beyond US 42 to the intersection with Old Brownsboro Road.

4.7 Roadway Access

The one-mile Chenoweth Lane corridor currently has 59 access points. A list of access management issues are identified in **Appendix F**.

Roadway access and efficient traffic flow are often competing needs. Arterial roadways, such as Chenoweth Lane are generally intended to provide high levels of mobility, i.e., the capability of traveling from one place to another; but also to provide lower levels of access to adjacent land uses. On the contrary, local streets typically provide higher levels of access but are not intended to serve higher volumes of faster moving traffic. Collectors provide a more balanced blend of mobility and access. According to the Transportation Research Board, the *Highway Safety Manual*, and the *Geometric Design Manual for Highways and Streets*, additional access points result in more crashes.

4.8 Trains

The rail crossing at the southern end of the study corridor (**Figure 10**) plays a significant role in traffic operation given its proximity to US 60, Westport Road, and the many businesses and commercial driveways. It is a busy crossing and disruptions caused by trains are common. The crossing was recorded for 55 hours between Wednesday, May 20 and Friday, May 22, 2015. **Table 1** (p. 13) presents summary statistics of the data collected during that time period.

Table 1: Train Crossing Statistics

Hours Observed	55 hours
Train Crossings	53
Average Disruption (min.)	3:34
Maximum Disruption (min.)	6:19
7:00–9:00 AM Peak Period Crossings	5
4:00–6:00 PM Peak Period Crossings	5
Peak Period Average Disruption (min.)	2:34



Figure 10: Railroad Crossing at Southern Terminus

4.9 Transit

Transit stops are present on US 60 and US 42 but do not exist along Chenoweth Lane. According to a local official, a Chenoweth Lane transit stop was discontinued several years ago due to lack of use.

4.10 Existing Bridges

There are no bridges in the study corridor.

4.11 Known Utilities

Utility companies were contacted to identify facilities along the corridor, which will ultimately aid in alternatives development and cost estimates. Numerous facilities exist above and below ground on both sides of the road (**Figure 11**). LOJIC data was utilized for locating some of the utilities. Overhead electric, phone, gas, fiber optic, and in-ground gas, water and sewer facilities are present. The following utility companies responded to KYTC’s requests for information:

- Level 3 Communications (on US 42 and US 60)
- Windstream
- Time Warner Communications
- Louisville Water Company
- Metropolitan Sewer District
- LG&E and KU



Figure 11: Existing Utilities

Locations of utilities along the Chenoweth Lane corridor are as follows:

- Sanitary sewer—in the middle except near the northern terminus (Olympic Avenue to US 42) where it is on the west side.



Figure 12: Existing Conditions

- Water—on the west side except for between Olympic Avenue and US 42, where it is on the east side.
- Gas—on the west side except for between Elfin and Olympic Avenues, where it is on the east side.
- Electric—overhead on the east side.
- Communications—overhead Time Warner Communications.

4.12 Crash History

Crashes were analyzed for a three-year period from January 1, 2012 to December 31, 2014. A total of 75 crashes were reported on Chenoweth Lane between US 60 and US 42, including three pedestrian and two bicycle strikes. During this period, the corridor experienced no fatalities, 9 injury crashes, and 66 property damage only (PDO) crashes (**Figure 14**, p. 16).

More than half (40) of the 75 crashes occurred between the US 60 (MP 5.523) and Kennison Avenue (MP 5.704) intersections including three high-crash 0.1-mile spots with a Critical Crash Rate Factor (CCRF) greater than 1.0¹³. **Figure 13** shows rear-end and angle crashes are the most prevalent in these three spots. These 40 crashes consisted of 37 PDO crashes and 3 injury crashes. The number of crashes between Kennison Avenue and US 42 was not statistically significant.

A “distracted” driver (15 crashes, 37.5%) or “aggressive driving” (14 crashes, 35.0%) was cited in nearly three-fourths of the crashes. Only one driver was suspected of alcohol impairment.

Single vehicle crashes, which account for 40% of crashes statewide¹⁴, accounted for only 12.5% at this location. Speeding was not deemed to be a factor in any of these crashes. These patterns are consistent with most urban streets similar to Chenoweth Lane.

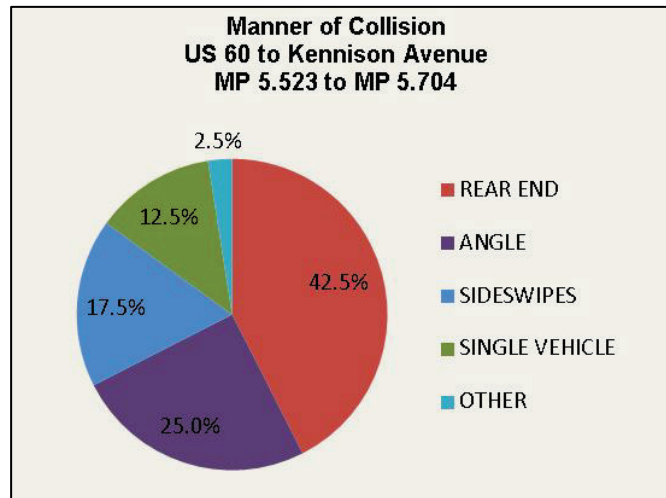


Figure 13: High Crash Locations Manner of Collision

The three crashes involving pedestrians occurred between MP 5.524 and MP 5.829. Two of these three crashes resulted in injuries and two were coded as hit and run. All corridor crashes, including the pedestrian and two bicycle strikes (which occurred at mile points 5.829 and 6.1), by manner of collision, are shown in **Figure 15** (p. 17). A dataset of crashes and a crash spot analysis are located in **Appendix G**.

¹³ A CCRF greater than 1.0 is a calculated statistic (developed by the Kentucky Transportation Center) that indicates crashes may not be occurring randomly.

¹⁴ Kentucky Traffic Collision Facts, 2014 Report. Kentucky Transportation Center.

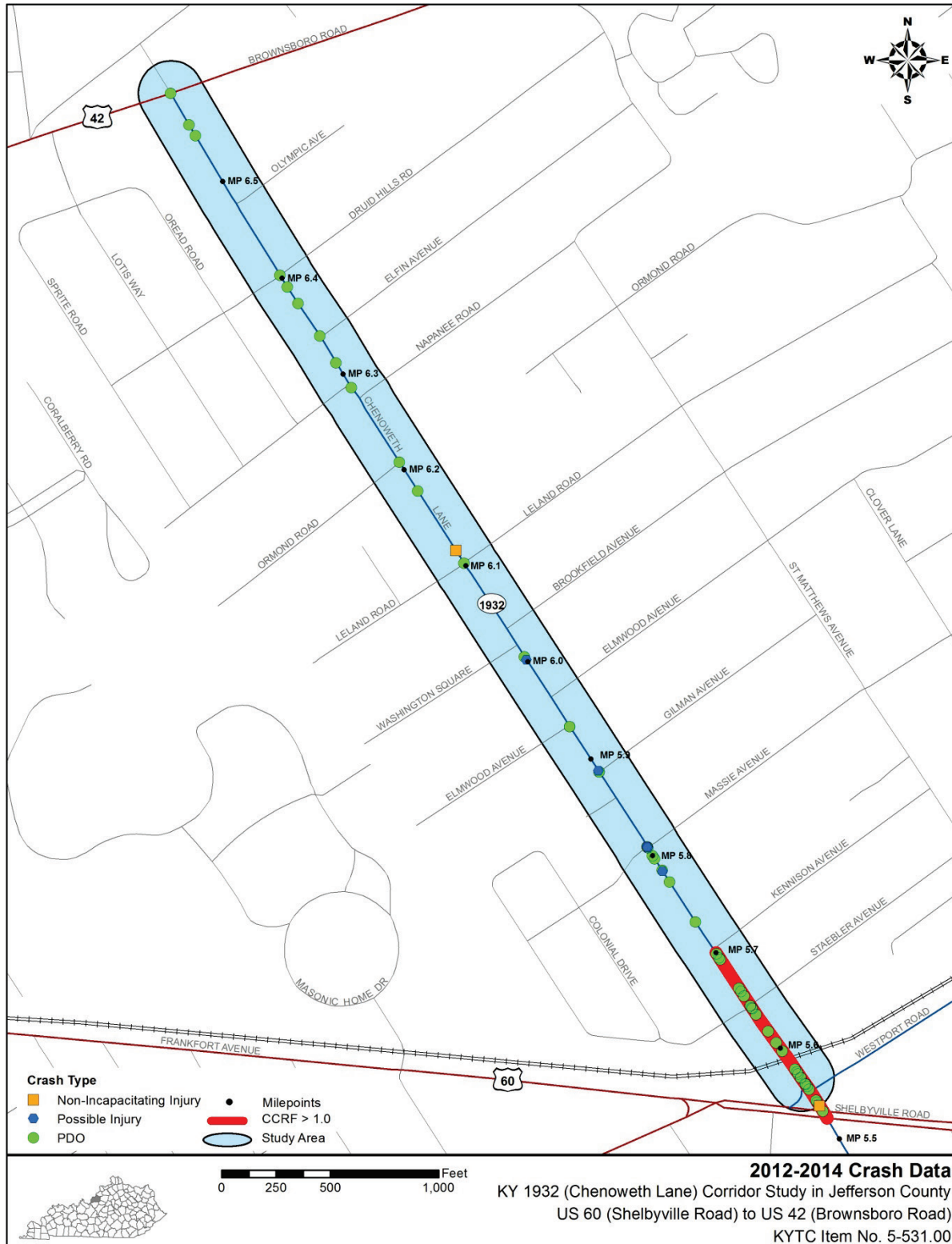


Figure 14: Crashes by Crash Type

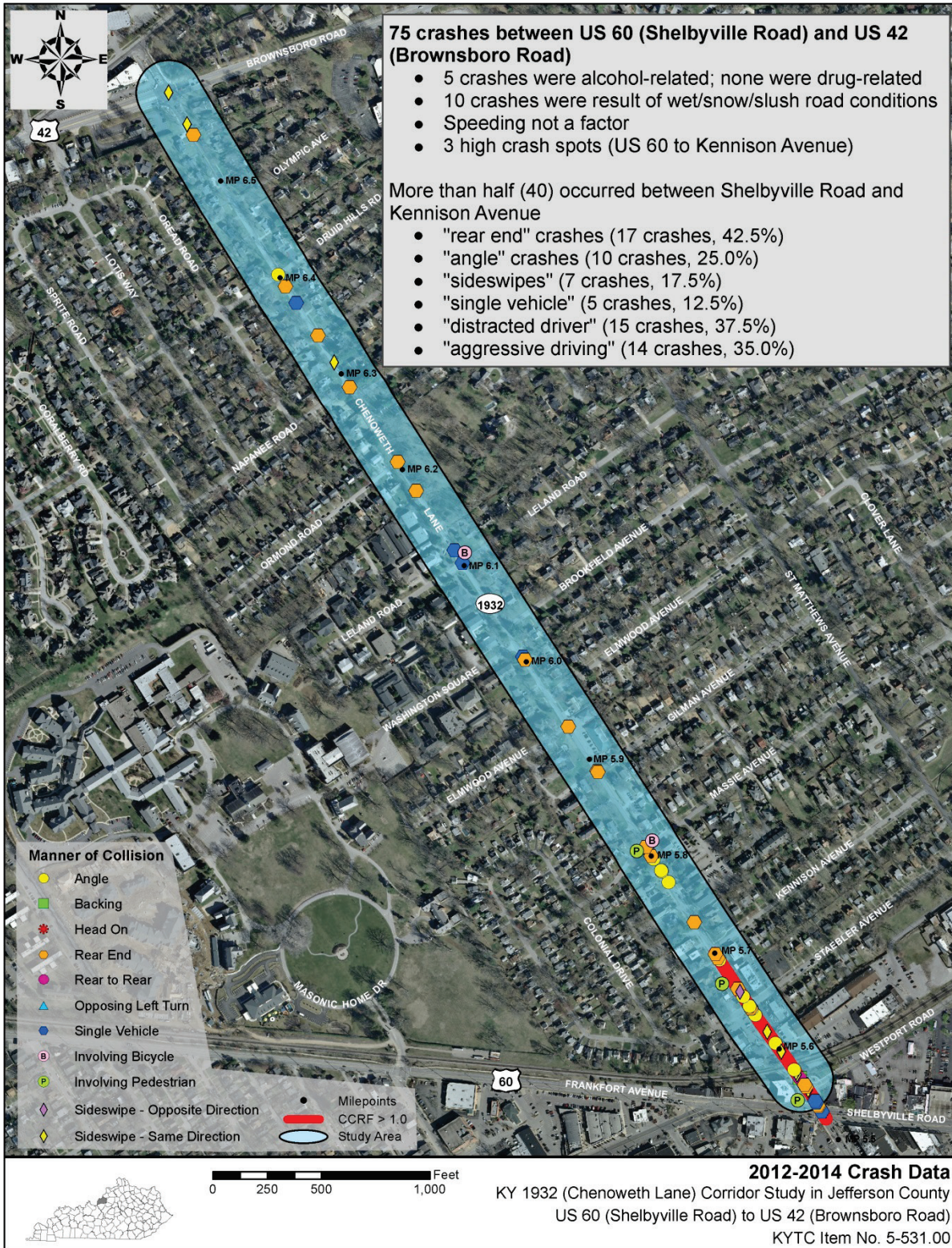


Figure 15: Crashes by Manner of Collision

5.0 TRAFFIC ANALYSIS – CURRENT (2015) AND FUTURE (2035)

The KYTC requested Stantec, Inc. (Stantec) to collect traffic volumes, develop a microsimulation model, provide forecasts and analyze existing and future traffic operations. The full Traffic Simulation and Analysis Report is provided in **Appendix H**.

5.1 Traffic Counts

Traffic counts were collected in May 2015 using cameras at various locations along the corridor. Peak-period turning movement counts (TMCs) were collected from 7:00 AM to 9:00 AM and from 3:00 PM to 6:00 PM at six intersections (**Table 2**), with TMCs collected at Westport Road on an earlier date as part of a previous study. Traffic counts resulted in an average daily traffic (ADT) of 11,900 vehicles with 9.7% trucks (1,160 trucks).

The cross streets are local residential streets with the exceptions of Westport Road and US 42, Most approaches totale less than 50 vehicles in the peak hours, with some exceptions at Leland, Massie, and Staebler Avenues. **Table 2** presents the peak-hour volumes entering and exiting Chenoweth Lane via the cross streets collected through this study. The camera at the rail crossing was set up to record video for a period of 55 hours for the purposes of capturing train movements across Chenoweth Lane.

Table 2: Cross Street Traffic Volumes from Counts

Intersection	AM Peak Hour (8:00 AM – 9: AM)				PM Peak Hour (4:45 PM – 5:45 PM)			
	West Approach		East Approach		West Approach		East Approach	
	Enter	Exit	Enter	Exit	Enter	Exit	Enter	Exit
Westport Road			65	15			135	30
Massie Avenue	25	20	110	60	20	35	145	95
Elmwood Avenue	25	10	35	15	15	20	15	10
Washington Square	20	10			20	15		
Leland Road	25	10	45	45	15	15	40	35
Napanee Road	30	16	35	15	25	15	35	25
US 42 (Brownsboro Road)	660	1,090	1,025	530	1,090	1,055	915	905

5.2 Field Observations

Field inspections were performed including spot counts, a measure of queue counts, travel times, travel speeds, and train counts (as discussed in Section 4.8) to gather information used to calibrate the traffic model. This methodology was followed to simulate as many aspects of actual traffic operation as possible in order to replicate the traffic conditions observed in the field.

5.3 Growth Rates for Design Year 2035

Historical counts and travel demand forecasts indicate either flat or negative growth in the corridor. For this reason, a hypothetical “worst case” annual growth rate of 0.25% was used to create a future scenario. The future, year 2035, scenario has approximately 5% more trips than in 2015.

5.4 Traffic Operations

Traffic operations were analyzed for both existing (2015) and the future year (2035).

The metrics used to describe traffic conditions include traffic volumes on Chenoweth Lane and its cross streets, the volume to capacity (V/C) ratio, the Level of Service (LOS), queue lengths, and travel times.

A V/C ratio reflects the percentage of a roadway's carrying capacity currently utilized. In an urban area, a V/C ratio over 1.0 indicates the roadway is carrying more traffic than it is designed to carry.

The LOS represents a typical driver's perspective of traffic conditions, based on the level of perceived congestion. LOS "A" represents a free-flowing condition in which driver decisions are unaffected by other vehicles. By contrast, LOS "F" represents severe congestion in which a driver's movements are substantially constrained by surrounding traffic. **Figure 16** graphically depicts the typical traffic conditions associated with each LOS designation.

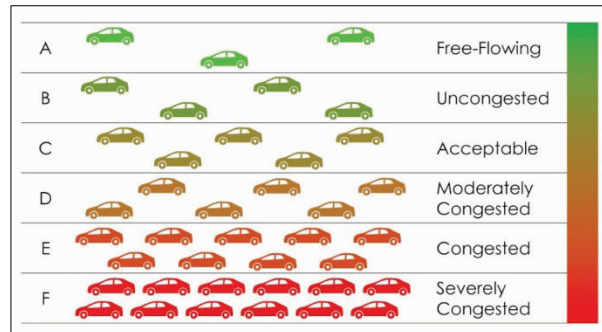


Figure 16: LOS Definition

Within the study area, the 2035 traffic from the railroad crossing north to US 42 will not be over capacity and will operate at an acceptable level for an urban area, minus the disruptions from the railroad. Specifically:

- The 2035 No Build V/C ratio ranges from 0.39 to 0.78, which is below the 0.85 threshold for signaling the onset of capacity related issues.
- The 2035 No Build LOS designations for segments not approaching a signal are "A," while the northbound approach to US 42 is "C" or better and the southbound approach to US 60 slips to a "D"/"E" ("moderately congested"/"congested") in the PM peak hour.

Details of the analysis are presented in the following sections, and included in the Traffic Simulation and Analysis Report located in **Appendix H**.

5.4.1 Existing Year 2015

Figures 18 and 19 (pp. 21–22) summarize the traffic conditions along the corridor for the 2015 base year. For the traffic analysis, the Chenoweth Lane corridor is divided into three sections: "North" in orange, "Middle" in blue, and "South" in red. The volumes indicate the southbound direction is the heavier direction for both the AM and PM peak hours, although generally more pronounced in the AM peak hour. The PM peak hour has slightly more traffic overall. The V/C ratios for both the AM and PM sections demonstrate traffic flows are well below the overall capacity of the roadway.

For those sections of Chenoweth Lane not approaching the two signalized intersections, the LOS is "A," which is considered "free flowing." As northbound traffic approaches US 42, the signal creates some understandable delay and therefore a lower but reasonable LOS. For southbound traffic approaching US 60, the signal, railroad tracks, and traffic turning in and out of commercial driveways create relatively more delay, resulting in an LOS "D," or "moderately congested."

The travel times to travel the entire corridor were compared to off-peak free-flow travel times to show the inherent delay created by increased traffic occurring during the peak hour periods. In the AM peak hour, delay along the mile-long corridor is less than 30 seconds. In the PM peak hour, the delay is almost 60 seconds in the northbound direction. The PM peak hour also experiences an increased number of stops per vehicle, due to a slightly higher rate of left turns along the corridor. However, on average, vehicles experience less than two stops along the corridor per trip, including stops at the signals at either end.

5.4.2 No Build Year 2035

The 2035 future year No Build/Do Nothing condition (**Figures 20 and 21**, pp. 23–24) has an approximate 5% increase in total trips in each peak-hour period over existing conditions (**Figures 18 and 19**, pp. 21–22). Given the flat to negative growth trend based on historical counts for the corridor, this increased growth is intended to assess the corridor’s capacity to handle increased demand, should it occur. Aside from the increased traffic, the future No Build scenario network is the same as the existing conditions.

In 2035 traffic volumes on Chenoweth Lane are expected to increase slightly, between 20 and 90 vehicles in any particular location, with the largest increase occurring in the southbound AM peak. As a result, the V/C ratios in each peak hour and direction do not change substantially, ranging from 0.39 to 0.78, which are below the 0.85 threshold for signaling the onset of potential capacity-related issues. The LOS for segments not approaching a signal are “A,” while the northbound approach to US 42 is “C” or better and the southbound approach to US 60 slips to a “D”/“E” (“moderately congested”/“congested”) in the PM peak hour. Travel times across the corridor increase between 2 and 33 seconds compared to the existing condition travel times; and while the average number of stops experienced per vehicle increases, it remains under two stops.

5.4.2.1 Chenoweth Lane/US 60 Intersection

Table 3 presents the average queue and average maximum queue lengths, which is the average of the longest queue recorded in each simulation run, for vehicles approaching the signalized intersection at US 60 on the south end of the corridor (**Figure 17**).

Table 3: Southbound Queue Lengths Approaching US 60

		2015	2035
AM	Avg. Queue (Feet)	70	80
	Avg. Max Queue (Feet)	290	380
	Avg. Vehicles	4	4
	Avg. Max Vehicles	11	13
PM	Avg. Queue (Feet)	100	100
	Avg. Max Queue (Feet)	430	450
	Avg. Vehicles	4	4
	Avg. Max Vehicles	15	15



Figure 17: Chenoweth Lane/US 60 Intersection

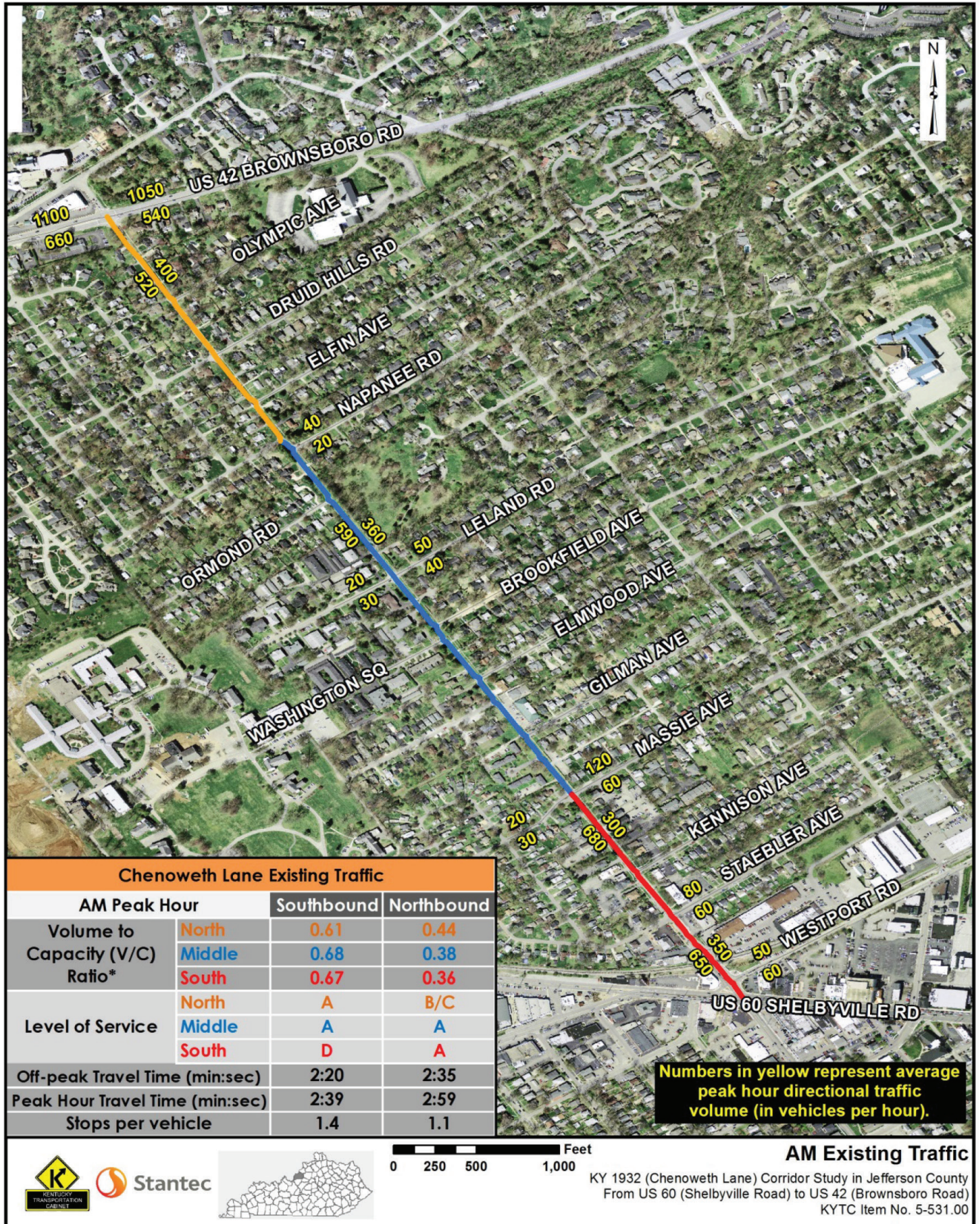


Figure 18: AM Existing Traffic

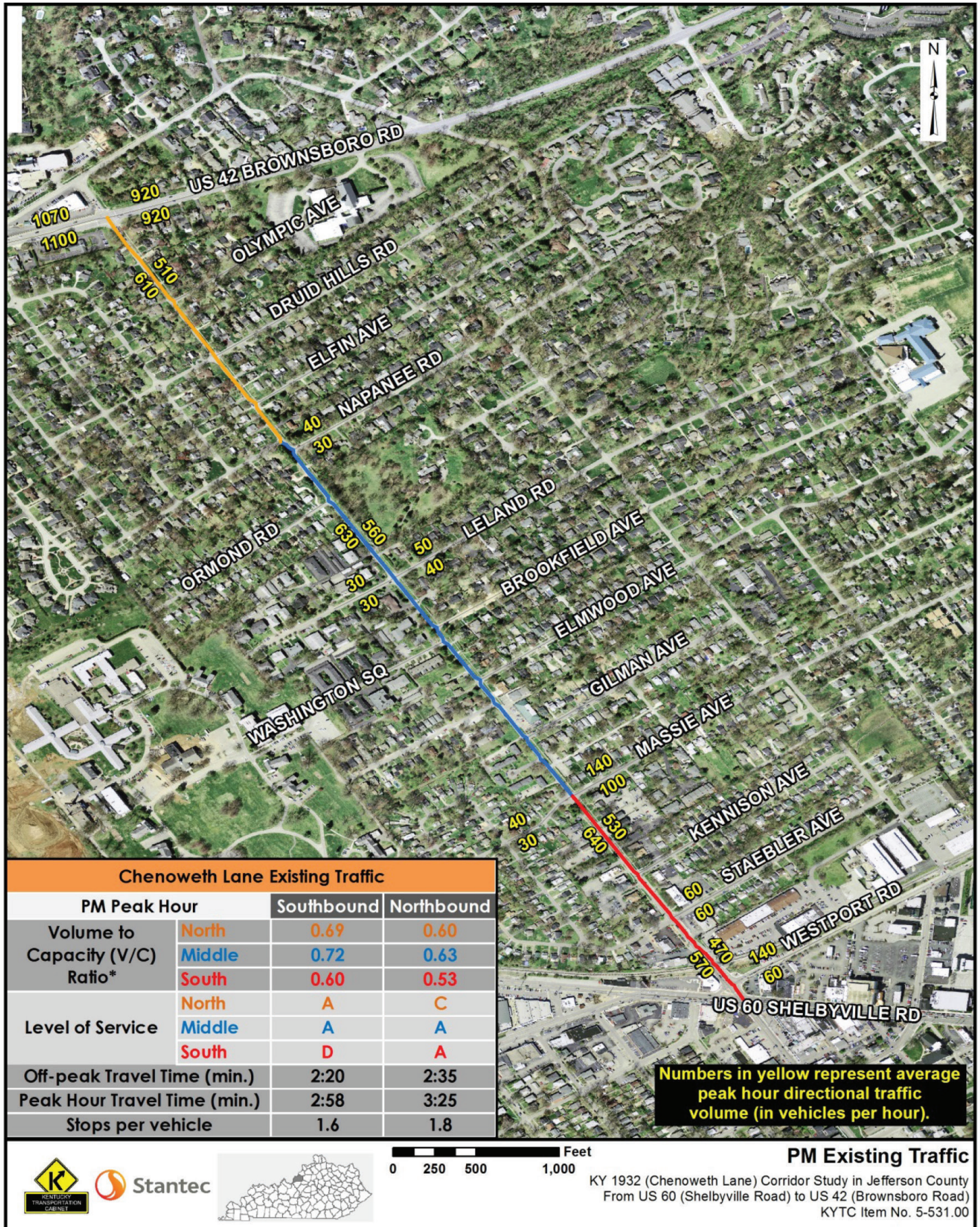


Figure 19: PM Existing Traffic

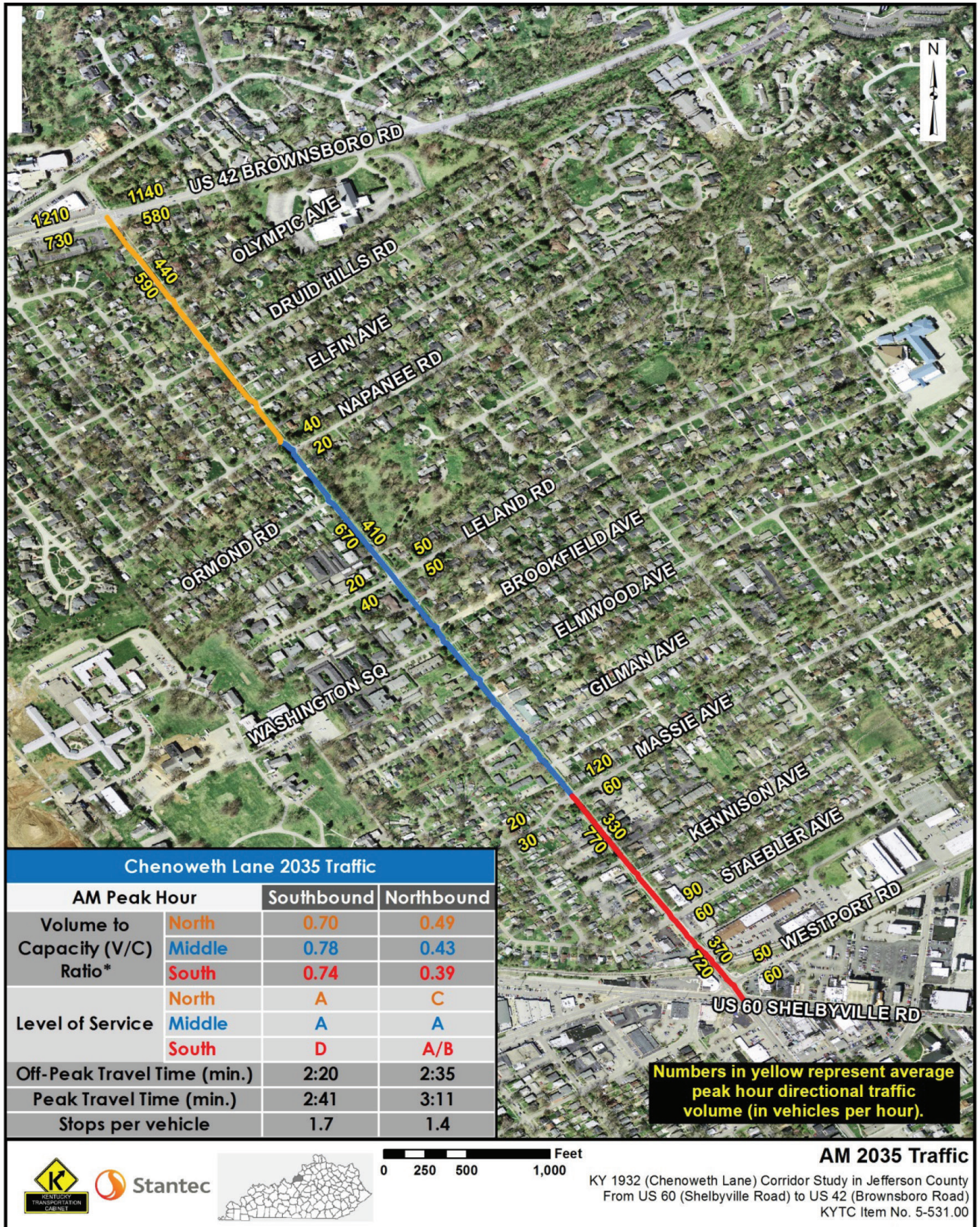


Figure 20: AM 2035 Traffic

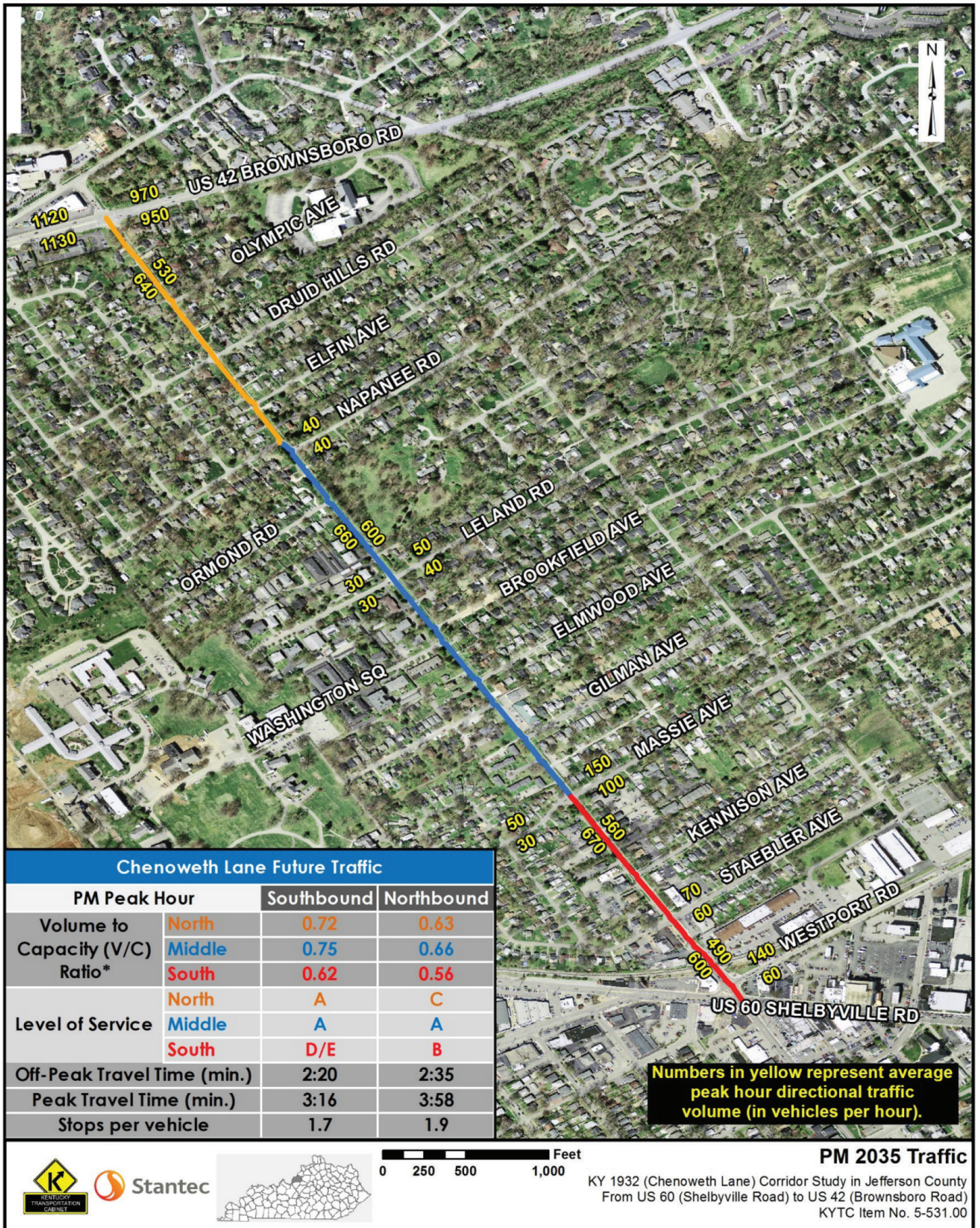


Figure 21: PM 2035 Traffic

The southbound approach at US 60 is two lanes from just north of Staebler Avenue to the rail crossing, and three lanes from the railroad crossing to US 60, which is approximately 220 feet in length. From the rail crossing, one lane each is dedicated to the left-turn, through, and right-turn movements. In the existing AM peak hour, average queues are fairly short, although the average maximum queue can extend beyond the rail crossing almost 300 feet to the entrance of the car wash, and almost 400 feet to the entrance of the Heine Brothers in the 2035 growth scenario. In these situations, the longer queue is in the left inside lane as it approaches US 60.

5.4.2.2 Chenoweth Lane/ US 42 Intersection

Table 4 presents the average and average maximum queue lengths for vehicles approaching the signalized intersection at US 42 on the north end of the corridor (**Figure 22**). The northbound approach at US 42 contains a left-turn lane with approximately 150 feet of storage with an additional 100-foot taper. Vehicles in the right lane may turn left, right, or go straight through the intersection. As **Table 4** shows, the average queue in either the AM or PM peak hour is within the length of the turn lane pockets. The average maximum queue does extend beyond the left-turn pocket, into the single lane. However, even these longer queues are accommodated within a single phase cycle of the traffic signal.

Table 4: Northbound Queue Lengths Approaching US 42

		2015	2035
AM	Avg. Queue (Feet)	80	80
	Avg. Max Queue (Feet)	280	330
	Avg. Vehicles	4	4
	Avg. Max Vehicles	13	14
PM	Avg. Queue (Feet)	130	130
	Avg. Max Queue (Feet)	480	500
	Avg. Vehicles	6	6
	Avg. Max Vehicles	21	22



Figure 22: Chenoweth Lane/US 42 Intersection

The intersection with US 42 was analyzed using the “Urban Streets” module of the Highway Capacity Software (HCS), which incorporates the methodologies of the 2010 Highway Capacity Manual (HCM) produced by the Institute of Transportation Engineers (ITE).

Table 5 (p. 26) presents the HCS analysis for the northbound approach of Chenoweth Lane at its intersection with US 42. The table indicates that the average delay for vehicles turning left onto US 42 is between 46 and 47 seconds in both the AM and PM peak periods, for both the 2015 existing and 2035 growth scenarios. This is approximately 10 seconds longer than the average delay in the right lane, which can turn right on red and has less overall volume. It is almost twice the average delay of the intersection as a whole, indicating the signal timing preference is given to the higher traffic volumes on US 42. The LOS “D” for the Chenoweth Lane approach reflects the signal’s green time favoring the US 42 through traffic. The LOS “C” for the overall intersection is considered an acceptable target for an intersection handling the high volume of peak hour traffic of a principal arterial like US 42. Further, the signal timing plan could be adjusted to provide more time for the Chenoweth Lane northbound approach should it be warranted.

Table 5: Intersection Analysis Chenoweth Lane Northbound at US 42

		AM		PM	
		2015	2035	2015	2035
Adjusted Flow vehicles/hour	NB Left	312	323	337	362
	NB Through/Right	86	99	138	155
Control Delay seconds/vehicle	NB Left	46	47	46	46
	NB Through/Right	34	35	35	36
	NB Approach	43	44	43	43
	Intersection	26	28	29	31
Level of Service	NB Left	D	D	D	D
	NB Through/Right	C	D	D	D
	NB Approach	D	D	D	D
	Intersection	C	C	C	C

6.0 ENVIRONMENTAL OVERVIEW

An environmental overview was performed to identify human and natural environmental resources in the project area. These resources were identified through literature searches, field reviews, and resource agency coordination. If a project is federally funded, the National Environmental Policy Act (NEPA) documentation will address resources, impacts, and mitigation commitments.

The Noise, Air, additional Socioeconomic review and the Environmental Footprint studies were performed by Qk4, Inc. The applicable overviews are located in **Appendix I**; summarized in the following sections; and, when existing in the study area, are illustrated in **Figure 23** (p. 29).

6.1 Natural Environment

Natural resources include streams, wetlands, ponds, floodplains, geology, and threatened and endangered species. These resources are summarized in the following sections.

6.1.1 Watershed

The project corridor is straight and relatively flat, with approximately 20 feet of elevation change through the one-mile corridor. The highest elevations occur near Druid Hills Road in the northern portion of the corridor. Land north of the high point drains northward to the Muddy Fork Beargrass Creek, and land south of the high point drains southward to the Middle Fork Beargrass Creek.

6.1.2 Jurisdictional Waters and Floodplains

Streams, springs, wetlands, ponds, floodplains, or floodways do not exist along the corridor based on a terrestrial and aquatic assessment including a review of the National Wetland Inventory (NWI), field visits, and a review of the Flood Emergency Management Agency (FEMA) maps. Therefore, coordination with the U.S. Army Corps of Engineers and Kentucky Division of Water is not anticipated.

6.1.3 Geotechnical Overview

The overview included field reconnaissance in addition to geologic research of available geologic and topographic quadrangle maps, Soil Survey of Jefferson County, and resources available from the Kentucky Geological Survey (KGS) and the United States Geological Survey. Past reports from geotechnical investigations for roadways and structures in and near the area were also reviewed.

Water wells, oil or gas wells, and gas fields are not present according to the Kentucky Geological Survey (KGS) Map Information Service. Underground or surface mines are not present within the vicinity of the project. No caves, rockshelters, or other underground features were observed within the project corridor during the visit.

KGS's online mapping tool¹⁵ to identify karst areas was also reviewed. The KGS identified the study area and surrounding areas as exhibiting high potential for the development of karst features. No obvious surface depressions were noted during field reconnaissance or from review of available geologic mapping, however prior development and site grading can mask the presence of karst features. One area was highlighted on karst mapping with closed hachures near Kennison Avenue, likely based on previous topographic mapping. A karst-potential map inclusive of the study area is included in **Appendix I**.

In general, low-lying areas in karst terrain, or sinkhole plains, such as the study area, will tend to exhibit soft, silty and wet soils. These areas will also be more prone to sinkhole collapse during and following construction of any new roadway or structures. The clay soils will likely require soil stabilization with any new construction.

New construction within the study area will not likely be at any greater risk to ground subsidence or other impact from karst than existing roadways and structures. A site specific geotechnical investigation would provide site-specific information with regard to karst potential, problematic soils and other pertinent information for design.

6.1.4 Threatened and Endangered Species

Based on coordination and review of available database information from the U.S. Fish and Wildlife Service (USFWS), the Kentucky Department of Fish and Wildlife Resources (KDFWR), and the Kentucky State Nature Preserves Commission (KSNPC), 25 federally listed species are known to occur or have the potential to occur in Jefferson County (**Appendix I**).

For the corridor potential habitat exists for three listed species: Indiana bat, northern long-eared bat (NLEB), and running buffalo clover (RBC).

One area of potential habitat for the RBC was observed in the central portion of the corridor at the historic Chenoweth House. This large estate contains running buffalo clover habitat due to

¹⁵ <http://www.uky.edu/KGS/>

the setting, which is a lawn with widely spaced trees. The western section of the estate adjacent to Chenoweth Lane does not provide potential habitat for RBC due to the presence of evergreen trees with an understory dominated by invasive wintercreeper vines.

The project corridor contains numerous street and landscape trees suitable for Indiana bat and NLEB, per the KDFWR. **Table 6** presents the suitable summer habitat located within the study area (**Figure 23**, p. 29).

Table 6: Known “Summer 1” Bat Habitat

Feature	Acreage
Potential Indiana bat / NLEB “Summer 1” Habitat (trees)	112 trees (equivalent to 10.08 acres)
Potential Indiana Bat/NLE Bat “Summer 1” Habitat (blocks)	2.56 acres
Total	12.64 acres



Figure 23: Environmental Overview

6.2 Human Environment

Human environment resources are summarized as: land use, parks, schools, churches, historic sites, cemeteries, underground storage tanks, hazardous materials or superfund sites, oil and/or gas wells.

6.2.1 Land Use

The southern end of the project corridor is primarily commercial (**Figure 24**). The central business district of St. Matthews is located at the southern end and commercial land use has sprawled along US 60 and Westport Road to Chenoweth Lane. Restaurants, banks, coffee shops, and stores line this portion of the corridor. The middle portion of the project corridor is dominated by “Neighborhood” Form District, per Cornerstone 2020, Louisville Metro’s Comprehensive Plan. It is largely residential with some multifamily condominiums and apartment units (**Figure 25**). The northern end has one commercial spot (a bank) in the southwest quadrant of Chenoweth Lane and US 42, but notably commercial land uses north of US 42.



Figure 24: Commercial Looking North



Figure 25: Residential Looking North

Three schools (green shading in **Figure 26**) are located in the vicinity of the project corridor. The schools and how they are accessed from Chenoweth Lane are summarized below.

- Trinity High School—No access from Chenoweth Lane. It is located between Westport Road and US 60.
- Holy Trinity Parish School—Direct access from Chenoweth Lane via Leland Road–Elmwood Avenue.
- Chenoweth Elementary School—Direct access from US 42.
 - Northern section bus stop located on the north side of US 42 at Chenoweth Lane.
 - Two southern section bus stops located at Elmwood and Massie Avenues.

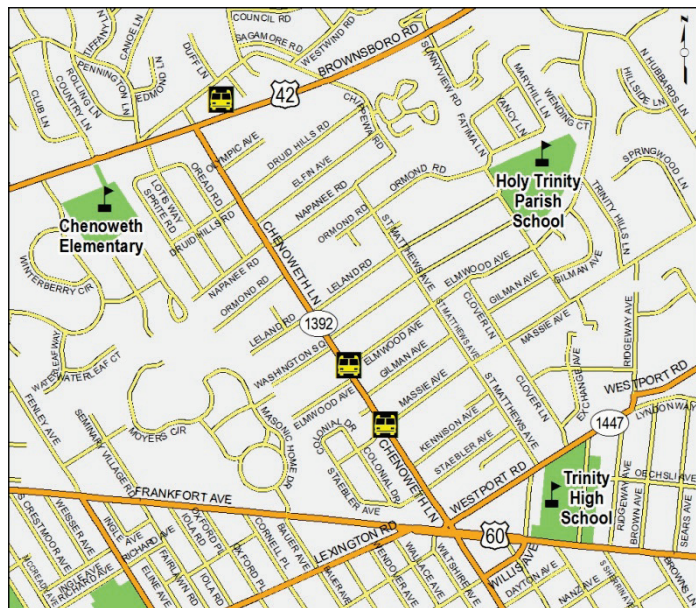


Figure 26: Schools and Bus Stops

- Pedestrian access from the Chenoweth Lane study area is provided by a short-cut sidewalk located on Sprite Road, which connects to Druid Hills Road.
- Sidewalk access from the south side of US 42 should be examined as portions of sidewalks have already been completed.

6.2.2 Socioeconomic Review

The Socioeconomic Study performed by KIPDA used demographic data from the 2009–2013 American Community Survey, and documents the identification of potential Environmental Justice populations (per the Environmental Justice Executive Order 12898) within the study area. **Figure 27** (p. 32) shows the Census Tracts (CTs) and Block Groups (BGs) adjacent to the study area. Based on this data, areas of possible concern include the following:

- For the population group 60 years old and over, the Block Group level distribution was highest in the central section of the corridor. Each of the corridor's Block Groups had densities of older persons at or near the national, state, and county levels.
- As for the Block Groups for minority and low-income persons, the highest percentages were found nearest to US 42. However, each of the three block groups in the corridor had distributions lower than the U.S., Kentucky, or county levels.
- The highest concentration of persons with limited English proficiency was found in Block Group 1. This block group also had the highest concentrations of zero vehicle households. Both of these distributions are lower than those reported for the U.S., Kentucky, and Jefferson County levels.

The Socioeconomic Study is located in **Appendix J**. During future phases of project development, a more detailed analysis may be required for NEPA documentation when assessing the potential for adverse and disproportionate impacts to low-income and minority (i.e., environmental justice) populations.

6.2.3 Noise

Simply put, noise is unwanted sound. Traffic noise is a common complaint among residents; therefore, the KYTC, Federal Highway Administration (FHWA), and Louisville Metro have policies for minimizing and mitigating highway noise. When considering noise there are many factors, including noise sensitive land uses, traffic volumes and speeds, vehicle mix, topography, and public input. The KYTC has a noise policy to determine if a noise impacts and abatement should be considered.

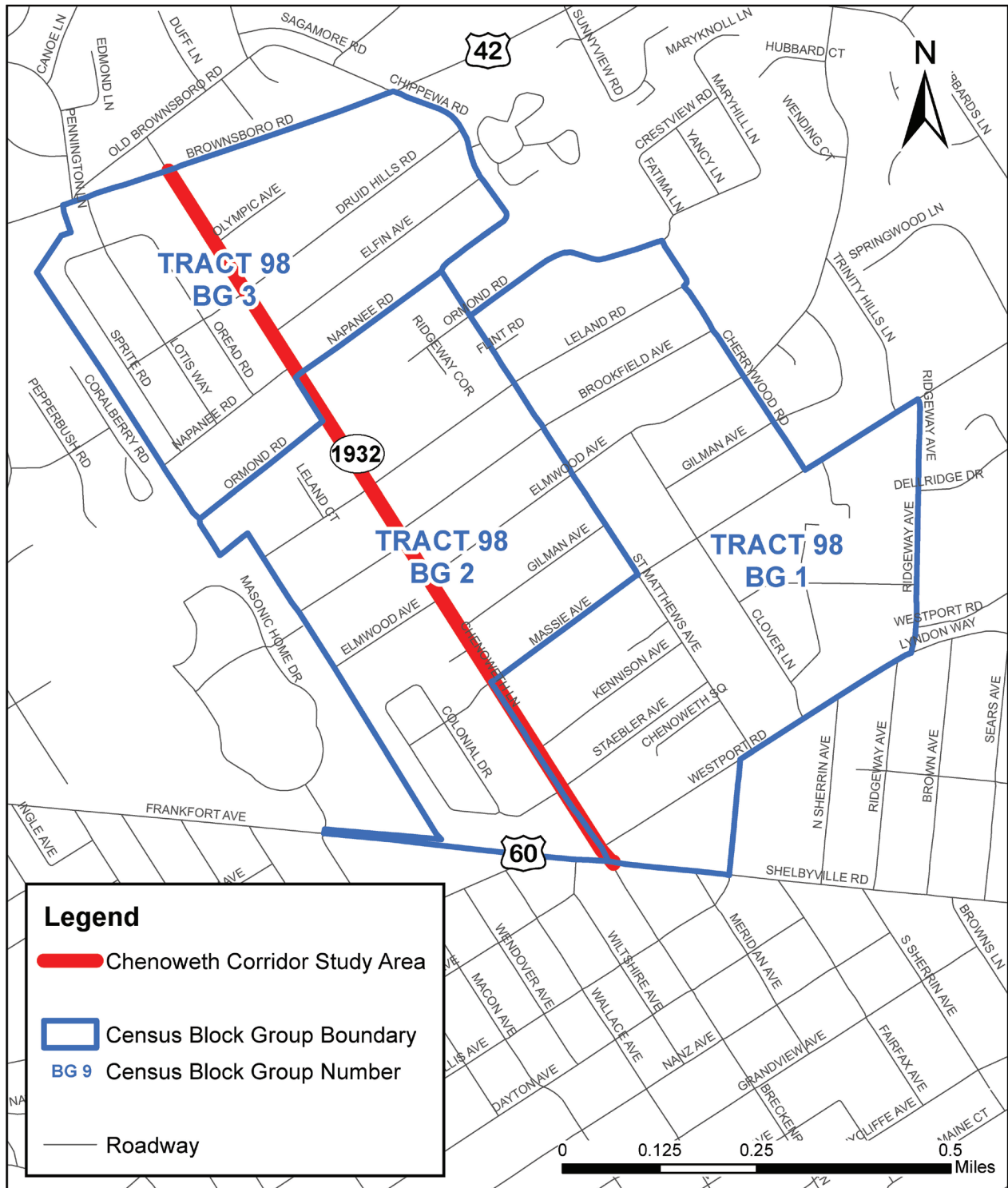


Figure 2

**STUDY AREA CORRIDOR
CENSUS BLOCK GROUP BOUNDARIES**

**KY 1932/CHENOWETH LANE
CORRIDOR STUDY
US 60 (SHELBYVILLE RD) TO US 42 (BROWNSBORO RD)**



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Figure 27: Study Area Census Block Group Boundaries (from Socioeconomic Study)

A field review of the project corridor and a review of available aerial mapping were conducted to identify the noise sensitive areas (NSA) that may be impacted by traffic noise along the corridor. Typical noise sensitive receptors include residences, parks, schools, hospitals, and churches. There are approximately 50 single-family residences as well as multi-family residences (apartments) located adjacent to the corridor.

Traffic volumes are not expected to increase substantially for the design year, and the design speed is projected to remain at 35 mph. Therefore, it is not anticipated that today's noise levels would be notably different than noise levels in the future. In addition, considering the number of cross streets and driveway openings along the corridor and the neighborhood context, there are limited opportunities to provide noise mitigation measures.

6.2.4 Air Quality

Six pollutants and mobile source air toxics (MSATs) associated with transportation projects must be considered. The first step was to research the attainment status for Jefferson County per the National Ambient Air Quality Standards (NAAQS) for each pollutant. At present, Jefferson County is listed as "attainment" for five of the six: sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃), nitrogen dioxide (NO₂), and lead (Pb). For particulate matter (PM_{2.5}), Jefferson County is listed as "moderate nonattainment." Therefore any improvements, if not minor enough to be considered "exempt," will need to be coordinated through the Interagency Coordination process for consideration of reducing exposure to PM_{2.5} pollutants.

Based on the Kentucky CO Screening Criteria 1, this project does not meet the criteria requiring a CO project level analysis and will not produce a projected violation of the CO standards (35 parts per million over a 1-hour period or 9 parts per million over an 8-hour period). Based on the Louisville Air Pollution Control Board, the project is not in a CO "hot spot."

6.2.5 Hazardous Materials

The hazardous materials overview is based upon information provided in the Environmental Data Resources, Inc. (EDR) DataMap Area Study/Map and a limited site reconnaissance. A limited site reconnaissance (windshield survey) was conducted in September 2015 to locate apparent underground storage tank (UST) and hazardous material concerns reported in the EDR DataMap Area Study, and to identify any additional potential sites of concern.

An electronic review of applicable environmental database searches consisting of 54 federal records, 19 state and local records, 5 tribal records and 5 EDR proprietary records was conducted. The Hazardous Materials Overview is included in **Appendix I**.

The EDR database search identified and mapped 40 listed sites in the study area corridor and a surrounding one-mile radius. **Table 7** (p. 34) summarizes the sites having a potential for UST and/or hazardous materials concerns.

Table 7: Listed Sites and Potential Underground Storage Tanks and Hazardous Material Sites

Site ID	Site Name	Site Address	EDR Database Listings	Site Location & Findings Notes
EDR Map ID 6	Rite Aid #4634	3805 Brownsboro Road	RCRA-CESQG	Current location of Rite Aid. Conditionally Exempt Small Quantity Generator. No violations reported.
EDR Map ID 11	Quality Car Protection, Inc.	232 Chenoweth Lane	EDR US Hist Auto Stat	Currently appears to be a single family residence. Only information reported was this business existed in 2002.
EDR Map ID 15	Highland Cleaners	3926, 3928 Chenoweth Square	EDR US Hist Cleaners	Current location of Paul's Fruit Market and Majids Restaurant. No visual signs of Cleaners. Only information reported was this business existed 1981–1986.
ERD Map ID 17	Sam Meyers Cleaners & Shirt Cleaners / Spaldings Service LTD / Spaldings Cleaners & Laundry	130 Chenoweth Lane	EDR US Hist Cleaners	Current location of Sam Meyers Cleaners and Shirt Laundry. Only information reported was these businesses existed 1970–present.
EDR Map ID 21	Thomas Car Wash	108 Chenoweth Lane	UST	Current location of St. Matthews Car Wash, LLC. Four 6,000 gallon gasoline USTs reported removed and verified in 1997.
EDR Map ID 21a	JW Heskamp & Sons Auto Repairs	110 Chenoweth Avenue	EDR US Hist Auto Stat	Exact address not found, site location shown is approximate and appears to be within the project study area in close proximity to Site 21 and Site 21b. Information reported indicates this business existed in 1930.
EDR Map ID 21b	Rear Tonys Wrecker Service Inc. / Chenoweth Lane EXXOC / Tuneomize Auto Tune Up	116 Chenoweth Lane	EDR US Hist Auto Stat	Current location of Michel Tires Plus. Only information reported was these businesses existed 1970–1986.
EDR Map ID 21c	Bobs American Service Gas Station / Pan AM Service Station	119 Chenoweth Lane	EDR US Hist Auto Stat	Current location of Heine Brothers Organic Fair Trade Coffee. No visual signs of a gas station. Only information reported was these businesses existed 1957–1970.
Map ID 100	St. Matthews Seed and Feed	225 Chenoweth Lane	Site was not identified in EDR DataMap Area Study	Potential location for storage and handling of agricultural fertilizers and herbicides.
Map ID 101	CSX Rail Road Crossing	Chenoweth Lane	Site was not identified in EDR DataMap Area Study	Potential location for creosote, pentachlorophenol and metallic arsenate treated ties, fuel leakage (oil, diesel, brake fluid and lubricates) from rail vehicles and right-of-way herbicides.

6.2.6 Historic Architectural Resources

A review of files at the Kentucky Heritage Council (KHC) identified a total of 32 previously recorded architectural properties located within a half-mile of the study area. The majority of these resources are located within subdivisions or districts well beyond the study area. One property (Resource JF-331, Fisher House) was identified in the study area.

Resource JF-384, the Chenoweth House, was listed as part of a thematic nomination for resources in Jefferson County in 1980. Following the field reconnaissance for this project, it is likely the boundary could be extended west to the right-of-way/property boundary at Chenoweth Lane.

Following the archival research, a windshield reconnaissance was conducted to identify other potential historic properties within the study area.

The field survey effort resulted in the identification of 11 platted subdivisions at least 50 years of age. All appear to be potentially eligible historic districts. Individual above-ground resources were also reviewed to assess whether any may be potentially eligible for listing in the National Register of Historic Places (NRHP). Within the recommended eligible districts, 81 properties retain sufficient integrity to be considered “contributing” resources and 22 properties do not contribute to a district because of age or lack of integrity. Sixteen properties not within platted subdivisions were noted as “likely not eligible.” Six properties appear to be individually eligible (three fall within potentially eligible districts), and as noted above, one NRHP-listed property (Chenoweth House) is eligible for a boundary expansion to Chenoweth Lane.

Although 11 potential historic districts exist, it is not likely all would be considered or approved by the State Historic Preservation Officer (SHPO). Official determinations of eligibility were not part of this planning process, and coordination with the SHPO regarding eligibility determinations was not conducted. However, if a build alternative progresses to the next project development phase, and federal funds are used for the project, a historic baseline study should be conducted to make official determinations of eligibility.

6.2.7 Archaeological Resources

A preliminary Archaeological Resources Overview was completed to identify any archaeological sites listed in or eligible for listing in the NRHP. A review of GIS shapefiles and site-specific tabular data provided by the Office of State Archaeology (OSA) indicates five previous studies and seven prior documented archaeological resources were located within a 1.2-mile buffer of the project area. The archaeology surveys occurred between 1989 and 2010 and all studies were void of any archaeology sites.

With the exception of the Chenoweth House property, it was assumed no archaeology sites would be found during further study of the Chenoweth Lane Corridor. Based on the data set provided by OSA, it was assumed any previously existing sites within the 300-foot-wide corridor are no longer intact.

6.2.8 Public Parks

There are no public parks located along the corridor.

7.0 INITIAL MEETINGS/PUBLIC INVOLVEMENT

Over the course of the study the project team held three internal meetings to coordinate key project issues. The project team also held meetings with local officials and the public.

Early meetings were held to review, present, and receive feedback on existing conditions. The Local Officials Meetings and the Public Meetings are documented separately in Public Meeting notebooks. The meetings are summarized below.

7.1 Project Team Meeting No. 1

The first Project Team Meeting was held on October 15, 2015 (**Appendix K**), to present an existing conditions overview for the corridor and discuss preparations for the local officials and public meetings. Key discussion items included the project scope, schedule, history, and Purpose and Need. Specifically, it was noted that the Purpose and Need presented in the KIPDA TIP and KYTC PIF documents was to be revised during this planning process.

7.2 Local Officials Meeting No. 1

The first Local Officials Meeting was held on November 16, 2015 (**Appendix L**). The purpose of the meeting was to present and seek feedback on existing conditions, a “vision for the corridor,” and recommendations for the project team to consider—one of which was to do nothing. Approximately 35 local officials were in attendance.

In addition to a presentation, project information was presented on large exhibit boards for the local officials to review.

Participants requested history on the origin of this study. The former Mayor of St. Matthews stated the City had a streetscape improvement plan but did not want to implement it and start improvements if the KYTC or Louisville Metro would later widen or reconstruct Chenoweth Lane. Therefore, the City of St. Matthews, KIPDA, and the KYTC agreed to initiate this planning study.

Other comments received from Local Officials included:

- The early right-of-way estimate identified for this project is too low.
- The 14-foot clear zone seemed excessive.
- Consider placing utilities underground.
- Include preservation of trees as a goal of the study.
- A possible need for a revised drainage system to improve drainage.
- Consider bicycles and pedestrians sharing the sidewalk.
- Louisville Loop should be given consideration as bicycle and pedestrian uses are addressed.
- Louisville is becoming more bicycle-friendly and if this project helps advance that goal, it would be beneficial to the city.
- TARC had a bus route along Chenoweth Lane, but it was discontinued due to lack of use.

7.3 Public Meeting No. 1

Immediately following Local Officials Meeting No. 1, an informal open house public meeting was held. The purpose was to gather information on existing conditions and verify current issues and needs.

Approximately 183 persons attended the public meeting. A survey was distributed and made available online. A handout with the stated Project Purpose, location of the online survey and contact information was provided. Exhibits included an informational video loop presentation, a traffic simulation video of existing and 2035 conditions, and exhibits illustrating the existing conditions, environmental resources, traffic volumes, and crash data. No exhibits of alternatives were presented.

A petition containing 197 paper signatures and 336 electronic signatures opposing the widening of Chenoweth Lane was presented to the KYTC at the public meeting.

A public opinion survey asked questions with a choice of None, Low, Medium, or High. For instance, one question asked “Please rank your level of concern in the study area for the following:” with a list of concerns. The highest concern in the corridor for the list provided was sidewalks on both sides of Chenoweth Lane from US 60 to US 42 with 36%. In total, 412 surveys were completed. A summary of the survey follows:

- Approximately 40% (166) of the survey respondents lived along the corridor, while another 29% (119) traveled the corridor for personal business/errand purposes.
- Nearly half of the respondents, 48% (197), traveled on Chenoweth Lane several times a day.
- Approximately 35% (138) indicated they either walk or run the corridor while nearly 30% (121) indicated they do neither.
- Over half of the respondents (51%) did not believe Chenoweth Lane needs improvement.
- When asked “What is your ‘vision’ for the corridor?” Nearly half (125) of the 257 comments received were in reference to pedestrian facility improvements. Additional notable responses included 77 for no widening, 75 with a desire for bicycle facility improvements, and 73 in favor of a No Build/Stay the Same alternative.
- Eighty-nine responses were received when prompted, “Please include anything else you would like us to consider.” About 45% (40) of responses stated “no widening,” “no bike lanes,” or “No Build/Do Nothing;” 7% (6) requested pedestrian improvements; and 8% (7) stated support for “maintaining the residential character of the road.”
- In addition, 66 separate written responses (some used the survey, and others used letters or emails) were received after the public meeting. The majority of the written responses implied Do Nothing/Stay the Same (35), No Widening (22), and provide Pedestrian Facility Improvements (13).

In summary, the public sentiment was opposition to three-lane widening of Chenoweth Lane because they felt it is not justified and the impacts would change the neighborhood setting. Reasons include the loss of trees, homes, and right-of-way; it is not warranted from capacity analysis, and a desire to keep the present neighborhood feel. A meeting summary and a copy of the aforementioned petition are located in **Appendix L**.

8.0 RESOURCE AGENCY COORDINATION

Resource agency coordination and public involvement activities were conducted to determine potential environmental “show stoppers,” development plans or other potential impacts. A packet of project-related existing conditions information, including mapping and descriptions of the corridor and the study effort, were mailed to various resource agencies by the KYTC Division of Planning. Alternatives were not a part of this mailing. Twenty-six responses were received, some provided information covered in the existing conditions. **Table 8** (p. 39) lists responses not included in previous discussions.

State and federal agencies provided information about resources; whereas many local interest groups provided comments opposing widening Chenoweth Lane to three lanes, and/or widening shoulders, and/or the addition of bicycle lanes, for the following summarized reasons:

- Environmental concerns

Impacts to many large trees, additional heat generated by increased asphalt, wildlife impacts, relocation of telephone and power line poles closer to homes, increased storm drainage runoff, and the historic character of neighborhoods. Changes to the historic character by decreasing the green space and making it a busier, bigger street with more and faster-moving traffic.

Additionally, there are social and health benefits of living in a city with quiet, tree-lined streets which include the ability to safely take walks and visit with neighbors.

- Traffic concerns

The V/C ratio is less than 1.0 for both AM and PM peak hours traffic indicating that Chenoweth Lane is carrying much less traffic than it is capable of carrying. It is not currently operating at capacity at peak hours.

Chenoweth Lane has a flat traffic growth rate and only 1.1 to 1.8 stops along the stretch during peak times. Travel times are less than 2.5 minutes, with a peak time of around 3.0 minutes, which support the opinion that widening is not needed.

Addition of turn lanes onto US 42 and US 60 from Chenoweth Lane solved most of the problems regarding backups.

Nothing can be done to decrease traffic congestion due to the trains.

- Cost concerns

The cost of the project would be very significant and is unwarranted.

Responses are located in **Appendix M**.

Table 8: Resource Agency Mailing Summary

Representing	Summary of Comments
USFWS–KY Ecological Services Field Section	No significant adverse impacts to wetlands or federally listed endangered or threatened species are anticipated from this proposal.
USDA–NRCS	Does not affect or acquire prime, unique, or statewide important farmlands.
KY Airport Zoning Commission	Jurisdiction starts at 626 feet Mean Sea Level at the intersection of Chenoweth Lane and US 60. If a permanent structure or any construction equipment exceeds 626 feet MSL, then a permit will be required from the Kentucky Airport Zoning Commission.
Energy and Environment Cabinet–KDNR	Wetlands and endangered species may be of concern. Several water wells and utility lines exist.
Tourism, Arts, and Heritage Cabinet–KHC	Concerned the proposed undertaking will have impacts to historic resources.
KSNPC	Endangered Species: Louisville crayfish, Kirtland’s snake, running buffalo clover, Indiana bat, and gray bat.
KY State Police	A turn lane would alleviate some congestion, allowing traffic to continue its flow as individuals wishing to exit with a left turn could enter the turn lane.
Trinity High School	Welcomes improvements for families who travel this way. Might be wise to schedule work in the summer (June–July) as much as possible, lessening impact on many families.
City of Rolling Fields	Strongly opposes widening including the additional traffic lane, bicycle lanes, and 10-foot-wide shoulder/buffers. <ul style="list-style-type: none"> • If timing of US 60 and US 42 traffic lights were adjusted, there would be no backup on Chenoweth Lane. • Sidewalks need to be repaired and completed along Chenoweth Lane to allow for pedestrian and bicycle usage. • Crosswalk at Druid Hills needs to be ADA compliant and more clearly marked to allow residents and school children to safely cross Chenoweth Lane and access Chenoweth Lane Elementary School. • Kennison Avenue to US 60 needs to be closely examined regarding traffic egress and ingress, turning, and sidewalks. Much could be done to that area to improve existing issues, without widening the entire length of Chenoweth Lane.
City of Brownsboro Village	Do Nothing. <ul style="list-style-type: none"> • Could put up signs to alert motorists of mid-block crossing. • Could improve condition of sidewalk.
City of Bellewood, Resolution 1-2015	Does not support the proposed project to widen Chenoweth Lane. <ul style="list-style-type: none"> • Important traffic issues that need to be addressed are at the commercial southern terminus of KY 1932 within 4–5 blocks of US 60. Any other perceived benefits would be marginal at best and harmful to the peaceful enjoyment and current property values of the residential cities along Chenoweth Lane.
City of Bellewood, Commissioner	Does not support the proposed project to widen Chenoweth Lane.
City of Bellewood, Commissioner	Unanimous resolution to not support the proposed project or to make any short- or long-term projected improvements to Chenoweth Lane.
Louisville Metro Council, Councilman	Defers to City of St. Matthews on improvements they feel are important and appropriate, although hopes it includes improved pedestrian facilities. <ul style="list-style-type: none"> • Agrees with the opposition to expanding the roadway to the north. • Divide project into St. Matthews and the section further north. • Pedestrian and bicycle facilities could be improved; hopes these will continue to be studied. If utilities could be relocated from the existing ditch, and drainage could be provided for and improved, there may be opportunity to build a protected and improved path. Supports more study of this possibility.

Color Key: Federal State Study Area

Abbreviations: *KY* = Kentucky *USFWS* = U.S. Fish and Wildlife Service *USDA–NRCS* = U.S. Dept. of Agriculture–Natural Resources Conservation Service
KDNR = Kentucky Dept. for Natural Resources *KSNPC* = Kentucky State Nature Preserves Commission

9.0 ALTERNATIVES DEVELOPMENT

9.1 Project Team Meeting No. 2

An interim team meeting was held January 13, 2016, and the second project team meeting was held February 9, 2016 (**Appendix K**). The purpose of the January 13, 2016, meeting was to determine which alternatives to develop. The purpose of the February 9, 2016, meeting was to review resource agency comments, input received from the first round of Local Officials and Public meetings, and to review the concept plans developed for the alternatives. Outcomes of the alternatives discussion were:

- **Remove** 3-lane widening along the length of Chenoweth Lane from consideration for the following reasons:
 - Capacity analysis does not warrant.
 - Future growth projection does not warrant.
 - Public opposition.
 - Benefits will not be realized by the cost of a three-lane widening project.
- **Remove** 10-foot-wide shared-use pedestrian path and bike lanes along the length of the corridor from consideration for the following reasons:
 - A shared-use path would not connect to similar facilities on US 42 or US 60.
 - Most cyclists utilize other routes.
 - A bike lane would require widening Chenoweth Lane or creating a larger footprint, neither of which are desired by the public.
 - Other north/south routes are available.
 - The KYTC Bicycle/Pedestrian Review did not recommend a shared use path (**Appendix E**).
 - Some cyclists currently ride St. Matthews Avenue to Napanee Road then north on Chenoweth Lane to US 42.

Alternatives recommended for advancement and presentation to the public were:

- **Alternative 1—No Build/Do Nothing**
- **Alternative 2—Urban:** Curb and Gutter along the length of the corridor from US 60 to US 42 and address drainage and deep ditches. Improvement options with this alternative are:
 - Improvements to and continuous sidewalks on both sides of Chenoweth Lane.
 - Left-turn lanes at Massie Avenue (135 feet)—this was considered a practical solution option to mitigate congestion caused by left-turn movements to Massie Avenue.
 - Signage (not sharrows) indicating a bike route from Massie Avenue to US 42.
- **Alternative 3—Urban and Rural:** Curb and Gutter (Urban) from US 60 to Massie Avenue; Rural from Massie Avenue to US 42; and address drainage and deep ditches. Improvement options with this alternative are:

- Improvements to and continuous sidewalks on both sides of Chenoweth Lane.
- Left-turn lanes at Massie Avenue (135 feet)—this was considered a practical solution option to mitigate congestion caused by left-turn movements to Massie Avenue.
- Signage (not sharrows) indicating a bike route from Massie Avenue to US 42.

An alternative to improve **Access Management** in the southern portion of the corridor was considered viable, but was not recommended to be advanced further in this study, nor presented to the public. Rather, it was agreed to defer this concept as an element of the design phase, or one that could be implemented separate of this study, should it be warranted. Access management issues identified during the existing conditions review are found in **Appendix F**.

Figures 28 and 29 (pp. 43–44) illustrate Alternatives 2 and 3 allowing one to compare the conceptual design of the two build alternatives. Due to the length of the corridor, **Figure 28** shows Alternatives 2 and 3 from the railroad tracks to Elmwood Avenue, and **Figure 29** shows Alternatives 2 and 3 from Elmwood Avenue to US 42.

The following sections describe and illustrate the alternatives carried forward for additional study and presentation to the public.

9.2 Alternative 1—No Build/Do Nothing

The No Build/Do Nothing Alternative serves as a baseline for comparison of other alternatives. This alternative indicates existing conditions would remain without new construction improvements and only future maintenance would take place.

9.3 Alternative 2—Urban

This alternative provides improvement options as well as curb and gutter from the railroad tracks north to US 42. As previously mentioned, this alternative has the option to include a northbound and southbound left-turn lane at Massie Avenue.

9.3.1 From the Railroad Crossing to Massie Avenue

Curb and gutter would be added to both sides at the edge of travel lane from the railroad crossing to Massie Avenue (**Figure 28**, top). Additional green space would be created by eliminating existing paved shoulders including the wide shoulder on the west side north of the existing right-turn lane taper before Staebler Avenue. The additional pavement width of Staebler Avenue would be narrowed by extending the curb line to allow for a three-lane eastbound approach to Chenoweth Lane (one lane in and two lanes out). This would shorten the crossing distance for pedestrians and create additional green space.

Short left-turn lanes (135 feet) at Massie Avenue would facilitate eastbound and westbound left turning vehicles by widening equally to the east and west side. The turn-lane width is 11 feet.

Existing sidewalks on both sides would be widened to five feet via in-place construction. To minimize impacts along the corridor, the sidewalks are proposed to be widened toward Chenoweth Lane. Removal of the sidewalk steps at Kennison Avenue is included in this alternative. Consideration could be given to relocating the sign at Merkley Kendrick Jewelers and straightening the sidewalk.

9.3.2 From Massie Avenue to US 42

Alternative 2 would include curb and gutter on both sides at the edge of the travel lane from Massie Avenue to US 42 (**Figures 28 and 29**, top). A new 5-foot-wide west sidewalk offset 3 feet from the face of the curb would be included.

St. Matthews Feed & Seed is shown with curb and gutter and a new sidewalk across the existing wide entrance. In this scenario, a new entrance/exit should be defined on Chenoweth Lane or Gilman Avenue. The northern entrance/exit should also be defined. Coordination with the property owner will be necessary.

Drainage improvements for the corridor would be addressed with curb and gutter. In addition, there are proposed drainage structures outside the sidewalks, new catch basins and storm sewer pipe. An existing storm sewer system on the west side begins near Washington Square and drain south towards the intersection with Staebler Avenue. From this point the system drains east along Staebler Avenue toward an existing retention basin on the east side of St. Matthews Avenue. The new storm sewer system would connect to the existing system at various locations. Alternative 2 would allow for the elimination of deeper ditches along the east side of the roadway, especially between Massie Avenue and Druid Hills Road.

On the west side, the ditches between Washington Square and Napanee Road could be eliminated. Catch basins would be located behind the proposed sidewalk on the west side in certain locations, to intercept flow draining toward the roadway.

Alternative 2 also includes signage indicating a bike route from Massie Avenue north to US 42.

9.4 Alternative 3—Urban and Rural

Alternative 3 was segmented at Massie Avenue due to the commercial nature of the corridor from the railroad tracks north to Massie Avenue, and the rural nature from Massie Avenue north to US 42. Like Alternative 2, this alternative has the option to include a northbound and southbound left-turn lane at Massie Avenue. **Figures 28 and 29** (pp. 43–44) (bottom) illustrate Alternative 3 so that it may be compared to Alternative 2.

9.4.1 From the Railroad Crossing to Massie Avenue—Urban

Alternative 3 is identical to Alternative 2 from the railroad crossing north to Massie Avenue, but repeated here for continuity.

Curb and gutter would be added to both sides at the edge of travel lane from the railroad crossing to Massie Avenue (**Figure 28**, bottom). Additional green space would be created by eliminating existing paved shoulders including the wide shoulder on the west side north of the existing right-turn lane taper before Staebler Avenue. The additional pavement width of Staebler Avenue would be narrowed by extending the curb line to allow for a three-lane eastbound approach to Chenoweth Lane (one lane in and two lanes out). This would shorten the crossing distance for pedestrians and create additional green space.

Short left-turn lanes (135 feet) at Massie Avenue would facilitate east and westbound left turning vehicles by widening equally to the east and west side. The turn-lane width is 11 feet.



Figure 28: Alternatives 2 and 3—Railroad Tracks to Elmwood Avenue



Figure 29: Alternatives 2 and 3—Elmwood Avenue to US 42

Existing sidewalks on both sides would be widened to 5 feet via in-place reconstruction. To minimize impacts along the corridor, the sidewalks are proposed to be widened toward Chenoweth Lane. Removal of the sidewalk steps at Kennison Avenue is included in this alternative. Consideration could be given to relocating the sign at Merkley Kendrick Jewelers and straightening the sidewalk.

9.4.2 Massie Avenue to US 42—Rural

The roadway from Massie Avenue north to US 42 (**Figures 28 and 29**, bottom) would retain the existing 3-foot-wide shoulders.

Alternative 3 would include a new 5-foot wide west sidewalk initially offset eight feet from the edge of the travel lane from Massie Avenue north to US 42. The sidewalk varies from the offset in areas to avoid trees, fence lines, headwalls and signature entrances. If this alternative progresses to the next project development phase, coordination with property owners and survey information will aid in determination of a final sidewalk location.

St. Matthews Feed & Seed is shown with the same wide entrance that exists today. A delineated sidewalk is shown as an option to increase awareness of pedestrians.

Drainage improvements are proposed with drainage structures outside the sidewalks. The addition of the sidewalk on the west side of the rural typical section roadway would entail re-grading and cleaning existing ditches, as well as cleaning existing entrance and side-road pipes.

A new pipe would need to be constructed under Leland Avenue to accommodate the placement of the sidewalk on the west side. Catch basins would be located behind the proposed sidewalk to intercept flow draining toward the roadway.

On the east side of the roadway, between Massie Avenue and just beyond the entrance to the north, the existing deep ditch (a potential roadside hazard) could be eliminated by using a storm sewer pipe (not shown). In addition, a new pipe would be constructed under Brookfield Avenue as water occasionally ponds in the ditch just north of this location.

Signage indicating a bike route from Massie Avenue to US 42 is proposed with Alternative 3.

9.5 Traffic Analysis of Build Alternatives

9.5.1 Left-Turn Lanes

Traffic engineering analyses of left-turn operations were completed because (1) the original project description in the KIPDA TIP and KYTC PIF included a two-way left-turn lane (TWLTL) through the length of the corridor, and (2) public opinion survey results from the first round of local officials and public meetings indicated some concern for turning left at Massie Avenue—26% of respondents indicated medium or high concern at this location, which was higher than at any other location.

For these reasons, an analysis of left turns was performed at the locations where turning movement counts were conducted. The analysis did identify three instances where left-turn lane pockets could be warranted. To be considered for a left-turn lane, the KYTC requires a specific volume threshold of left turns and advancing and opposing traffic be met. The threshold is based on a formula that incorporates these three movements. However, because the threshold is met and a left-turn lane may be warranted, it may not be necessary or desirable. The analysis

only indicates that traffic conditions exist to meet the KYTC’s minimum required criteria for consideration.

Of the eighteen left-turn movements analyzed in the corridor, only three movements/times met the threshold. Those movements/times were southbound at Massie Avenue in the AM and PM peak hours and southbound at Leland Avenue in the AM peak hour.

Using the simulation models of existing and future (2035) conditions, the analysis of left turns at Massie and Leland Avenues did not indicate any substantial delay compared to other left-turn locations in the middle of the corridor. However, as a test to see if left-turn lanes would improve traffic flow, left-turn lanes were added at Massie Avenue in the model’s network. Although only the southbound approach at Massie Avenue warranted a left-turn lane, the KYTC requires left-turn lanes be paired so left-turning traffic in both directions are on the same alignment with an unobstructed line of sight of opposing through traffic. The results are that the left turns to Massie Avenue would provide only minimal benefit to the traffic on Chenoweth Lane—existing and future traffic would operate at acceptable levels at this intersection without these left-turn lanes.

9.5.2 Two-Way Left-Turn Lanes

In addition, TWLTLs were examined from US 60 to Olympic Avenue (just south of US 42) using only left turns counted as a part of this study. For the northbound approach, a TWLTL was warranted in the PM peak hour. The southbound approach warranted a TWLTL in both peak hours. These calculations did not consider trucks or the many entrances/intersections where turn-lane volumes were not available. Even though a TWLTL meets warrants, it is not desirable in the community and therefore eliminated early in this planning process.

9.6 Cost Estimates

Cost estimates for each alternative are summarized in **Table 9**. Detailed estimates are located in **Appendix N**.

Table 9: Cost Estimate Summary

Alternative	Design ¹	Right-of-Way ²	Utilities ³	Construction		Total
				Railroad to Massie Avenue	Massie Avenue to US 42	
1 (No Build/Do Nothing)	\$0	\$0	\$0	\$0	\$0	\$0
2 (Urban)	\$1,200,000	\$205,000	\$870,000	\$350,000	\$1,400,000	\$4,025,000
3 (Urban and Rural)	\$800,000	\$215,000	\$625,000	\$350,000	\$550,000	\$2,540,000

1 – Both estimates include additional fees for enhanced drainage design.

2 – Estimates based on \$250,000/acre.

3 – Both estimates include \$300,000 to install an ADA complaint railroad crossing.

NOTE: Following Project Team Meeting No. 3, cost estimates were revised to include additional contingencies requested by the KYTC and improvements to the existing railroad crossing.

The following provides some detail for each project phase.

9.6.1 Design

The design phase cost estimate was approved by the KYTC and is based on recent past projects of similar nature.

9.6.2 Right-Of-Way

For either alternative, over half of the estimated right-of-way cost is from the railroad tracks to Massie Avenue, because of proposed reconstruction of the Chenoweth Square intersection and the west side sidewalk.

Between Massie Avenue and US 42, the cost was due to permanent easements for drainage structures and temporary easements at a few intersections. Right-of-way estimates were included on the Chenoweth House property and at Washington Square (for Alternative 3 rural section only).

9.6.3 Utilities

The proposed curb, gutter, and inlet construction for Alternative 2 in the urban section between Massie Avenue and US 42 would create the greatest relocation impact to utilities. Sidewalk construction on the west side is also a factor in utility relocations. Relocation costs associated with overhead utilities were estimated based on their relocation above ground. The utility cost estimate also includes installing a new ADA compliant railroad crossing.

9.6.4 Construction

Construction cost estimates were based on quantities provided in **Appendix N**, and the following requested revised contingencies (revised following Project Team Meeting No. 3):

- Temporary easements (20% of land value)
- Right-of-Way (50%)
- Utilities (40%)
- Construction (30%)

10.0 FINAL LOCAL OFFICIALS, PUBLIC, AND PROJECT TEAM MEETINGS

Three additional meetings were held following alternatives development. The Local Officials Meetings and the Public Meetings are documented separately in public meeting notebooks.

10.1 Local Officials Meeting No. 2

The second Local Officials Meeting was held on February 29, 2016, at the Broadway Baptist Church. The purpose was to present results from the public survey, explain project team decisions made since the first public meeting, and present three alternatives for improvements to the corridor. Feedback was also sought via a public survey.

Comments/questions raised by the local officials or their representatives during the presentation were:

- Prior survey may have included portions that were confusing for the public, such as the question relating to environmental concerns. Another question may have been too vague by not specifying the types of facilities, e.g., bike lanes, shared-use path, etc.
- Over 300 electronic signatures (on the *ipetition.com* page) opposed to the 3-lane widening of Chenoweth Lane, should be included in the decision making process.
- The project team decision to update one of the primary purposes to “improve sight distance” was questioned. It was updated based on previous survey questions that referred to eliminating roadside hazards and the difficulty of making turns or maneuvers. It was also noted the Purpose and Need Statement evolves through the course of the study, was not necessarily in priority order and could be rearranged.
- One pedestrian fatality has occurred on Chenoweth Lane at Kennison Avenue.
- Water pools along the newly constructed sidewalk near Chenoweth Lane and US 42.
- Chenoweth Lane has two distinct segments—US 60 to Massie Avenue, and Massie Avenue to US 42. Chenoweth Lane should be widened to 3 lanes between US 60 and Massie Avenue due to the many businesses and left-turn movements.
- A question was posed asking if consideration was given to placing overhead utilities underground. Underground utility relocation has not been analyzed with any of the improvement options. The KYTC can, in certain cases, place utilities underground if there is a significant crash history with utility poles or other fixed objects. In this corridor there is not relevant crash history to qualify this as a safety concern.

Meeting minutes and a copy of the petition are found in **Appendix L**.

10.2 Public Meeting No. 2

Immediately following Local Officials Meeting No. 2, a second open house Public Meeting was held with a similar purpose. In addition, traffic simulations with and without improvements for 2035 No Build and 2035 Build (turn lanes at Massie Avenue) were presented.

Approximately 125 persons attended the Public Meeting. A survey distributed at the meeting and made available online received 171 responses. **Table 10** (p. 49) summarizes survey responses by improvement option. Notable findings include:

- No/low interest (66.0%) in providing curb and gutter along the full length of the corridor from the railroad crossing to US 42. Therefore, Alternative 2 (urban) is not favored by the public.
- Medium/high interest (64.0%) in reconstructing and widening east-side sidewalks to meet ADA compliance. The two options which included the construction of west side sidewalks both received some interest.
- No/low interest in left-turn lanes at Massie Avenue (70.0%) or at other locations along the corridor (91.0%). The public does not favor the addition of turning lanes.

Table 10: Public Meeting No. 2 Survey Summary of Options

Option	No Interest	Low Interest	Medium Interest	High Interest
ROADWAY – QUESTION 7				
No Build/Do Nothing	30.4%	10.1%	6.1%	53.4%
Curb and Gutter from the Railroad Crossing to Massie Avenue Only	33.0%	20.0%	24.0%	23.0%
Curb and Gutter from the Railroad Crossing to US 42	46.0%	20.0%	9.0%	25.0%
SIDEWALKS – QUESTION 8				
No Build/Do Nothing	37.0%	10.0%	17.0%	36.0%
Reconstruct and Widen Existing Sidewalks on the East Side of Chenoweth Lane to Meet ADA Compliance	22.0%	14.0%	19.0%	45.0%
Construct New ADA Compliant Sidewalk on the West Side of Chenoweth Lane from Massie Avenue to US 42 only	51.6%	25.0%	12.5%	10.9%
Reconstruct and Widen Existing Sidewalks on the East Side and Construct New Sidewalk on the West Side from Massie Avenue to US 42 to meet ADA Compliance	46.0%	17.0%	10.0%	27.0%
LEFT TURN LANES – QUESTION 9				
No Left-Turn Lanes	37.0%	7.0%	2.0%	54.0%
Left-Turn Lane in both Directions at Massie Avenue	51.0%	19.0%	10.0%	20.0%
Other Left-Turn Lane Locations (Please specify).	75.0%	16.0%	3.0%	6.0%
DRAINAGE IMPROVEMENTS – QUESTION 10				
No Build/Do Nothing	38.0%	17.0%	7.0%	38.0%
Drainage Improvements	24.0%	18.0%	19.0%	39.0%

10.3 Project Team Meeting No. 3

The final Project Team Meeting was held April 27, 2016, to review input received from the second Local Officials and Public Meetings and identify recommendations to be carried forward (Section 11). Minutes of this meeting are located in **Appendix K**. A comparison of alternatives provided at that meeting is included in **Table 11**.

Table 11: Alternatives Comparison Summary Presented at Project Team Meeting No. 3

	Alternative 1 No Build/Do Nothing	Alternative 2 Urban	Alternative 3 Urban and Rural
Impacts	None	Minimal	Minimal
Pros	No expenditure of funds beyond routine maintenance	Provides additional green space Eliminates ditches Allows for some new storm pipes and yard drains and connects to the existing system New sidewalks <u>Optional</u> turn lane at Massie Avenue removes turning traffic from the mainstream traffic Curb and gutter tends to slow motorists	Maintains neighborhood setting New sidewalks Improves some drainage Least expensive <u>Optional</u> turn lane at Massie Avenue removes turning traffic from the mainstream traffic Curb and gutter tends to slow motorists
Cons	Deep ditches Drainage issues Not pedestrian friendly	Most expensive Turn lane at Massie Avenue does not improve traffic flow Does not keep the neighborhood setting as well from Massie Avenue north to US 42	Turn lane at Massie Avenue does not improve traffic flow
Public Input*	Most favored	More “No/Low Interest” (66%) than Alt 3 (53%)	More “Medium/High Interest (47%) than Alt 2 (34%)
Total Costs*	\$0	\$4,025,000	\$2,540,000

* Updated since Project Team Meeting No. 3

Table 11 continued

	Alternative 1 No Build/ Do Nothing	Alternative 2 Urban	Alternative 3 Urban and Rural
Project Purpose			
Improve Sight Distance and Safety	No	Yes—removes or lowers pillars at Gilman Avenue; removes raised headwalls No at Massie Avenue with turn lane	Yes—removes or lowers pillars at Gilman Avenue; removes raised headwalls No at Massie Avenue with turn lane
Improve Drainage	No	Yes	Yes
Improve Pedestrian Safety and Mobility	No	Yes	Yes
Goals			
Confine Improvements within Existing KYTC-Owned Right-of-Way	N/A	Yes—Minimal right-of-way strip takings only	Yes—Minimal right-of-way strip takings only
Minimize Impacts on Established Mature Trees	Yes	Yes	Yes
Maintain Roadway Character	Yes	Yes—Railroad tracks to Massie Avenue No—Massie Avenue to US 42 would change to curb and gutter	Yes—Railroad tracks to Massie Avenue Yes—Massie Avenue to US 42 would remain rural
Traffic Operations			
Improved Travel Time LOS (2035) V/C over No Build/Do Nothing	N/A	No	No
Improve Intersection 2035 LOS over No Build/Do Nothing	N/A	No	No

11.0 RECOMMENDATIONS

Based on a review of above information, public input, traffic analysis, and engineering judgment, the project team made the following recommendations:

- Advance Alternative 3—Urban and Rural—to the next phase of project development with the following elements:
 - Include ADA compliant sidewalks on both sides of Chenoweth Lane to US 42.
 - Exclude the left-turn lanes at Massie Avenue and any other mid-block intersection.
 - Eliminate the deep ditches near Massie Avenue by utilizing storm sewer pipe.
 - Include an ADA compliant railroad crossing.
 - Include signage (not sharrows) indicating a bike route from Massie Avenue to US 42.
 - Remove steps from Chenoweth Lane to Kennison Avenue sidewalk, and construct an ADA compliant connection.

In keeping with the revised Purpose and Need Statement, Alternative 3 will maintain a rural typical section north of Massie Avenue preserving the neighborhood setting while providing improved pedestrian access and safety. Chenoweth Lane south of Massie Avenue may mirror the proposed St. Matthews streetscape concepts. **Figures 30 and 31** (p. 54) show the recommended build Alternative 3 typical sections. **Figure 32** (p. 55) depicts the recommended Alternative 3.

- The No Build/Do Nothing (Alternative 1) will be advanced for comparative purposes.

As stated above, the following features are **not** recommended to move forward to the next phase:

- Three-lane widening along the full length of Chenoweth Lane from the railroad north to US 42.
 - Capacity analysis does not warrant additional lanes.
 - Future growth projection does not warrant additional lanes.
 - The public opposes the widening.
 - Benefits will not be realized by the cost of a three-lane widening project.
- Left-turn lanes at any intersection.
 - Public stated there is more of an issue turning left onto Chenoweth Lane than turning left from Chenoweth Lane to Massie Avenue.
 - Simulation of the turn lane showed the traffic operation of Chenoweth Lane did not improve.
- Curb and gutter from Massie Avenue to US 42.
 - A goal of the Purpose and Need Statement is to maintain a roadway character that reflects the existing traditional and historical neighborhood setting.
 - Public feedback supported a rural section to the north.
- A 10-foot-wide shared-use pedestrian path and/or bike lanes.

- A shared-use path would not connect to similar facilities on US 42 or US 60.
- Most cyclists utilize other routes.
- A bike lane would require widening Chenoweth Lane or creating a larger footprint, neither of which are desired by the public.
- Other north/south routes are available.
- The KYTC Bicycle/Pedestrian Review did not recommend a shared use path (**Appendix E**).
- Some cyclists currently ride St. Matthews Avenue to Napanee Road then north on Chenoweth Lane to US 42.

It is important to note cost estimates were not revised for the removal of the turn lanes at Massie Avenue because costs were deemed negligible in relation to the total project cost.

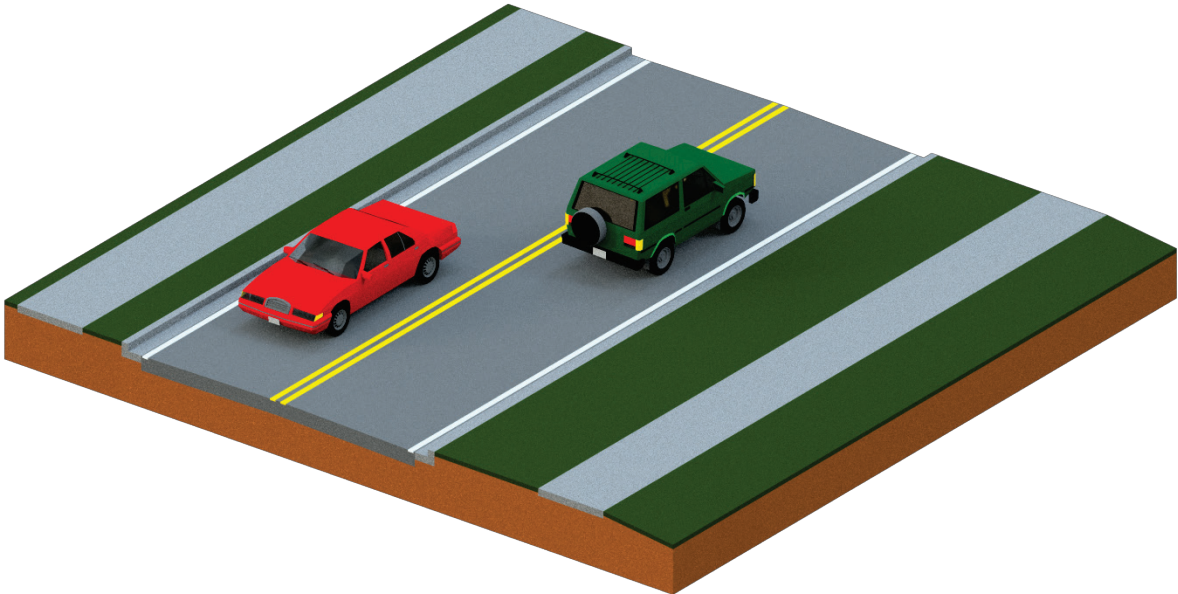


Figure 30: Urban Section (Curb and Gutter)—Railroad Tracks to Massie Avenue

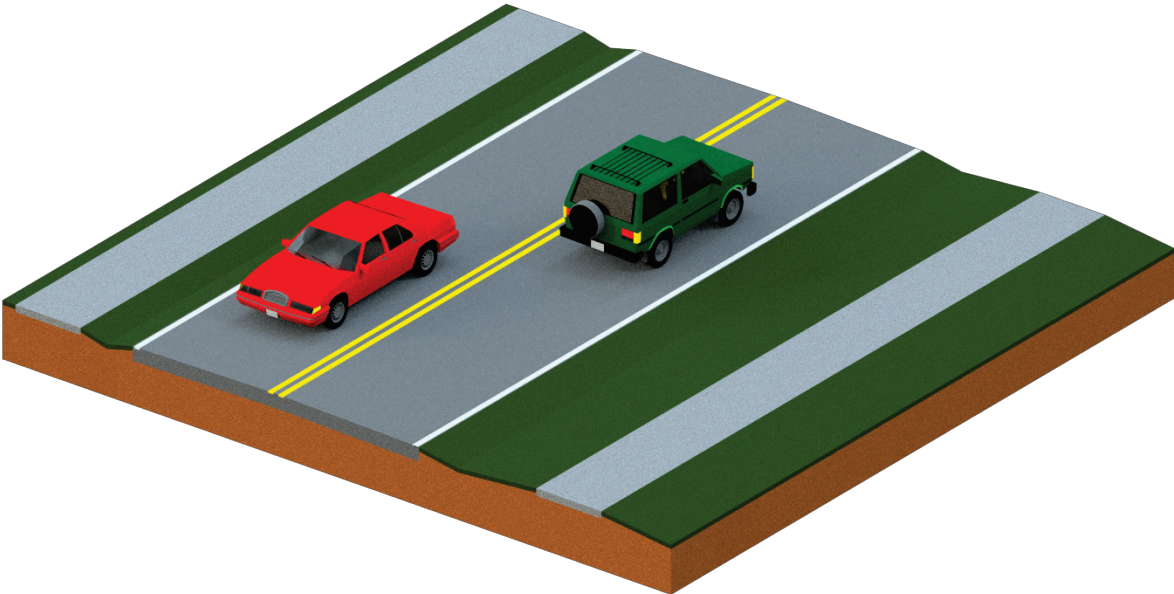


Figure 31: Rural Section—Massie Avenue to US 42

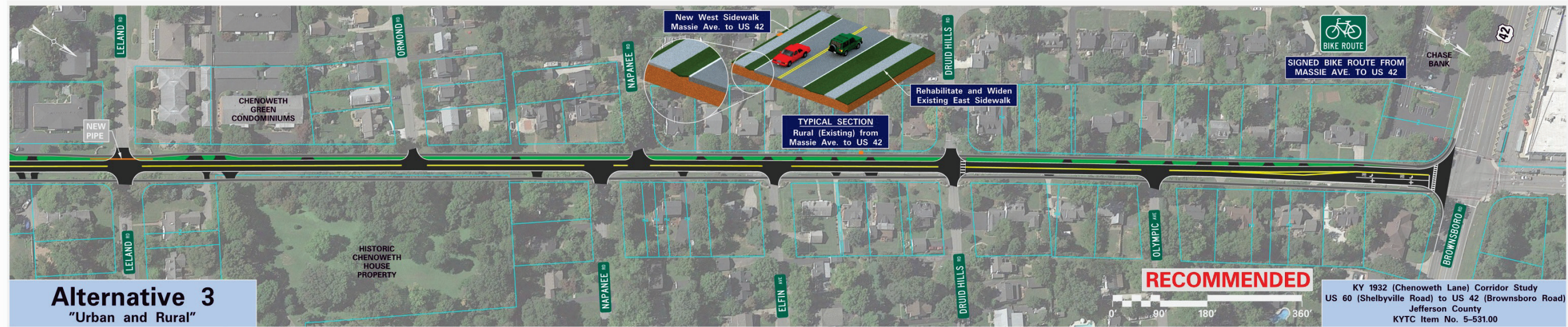
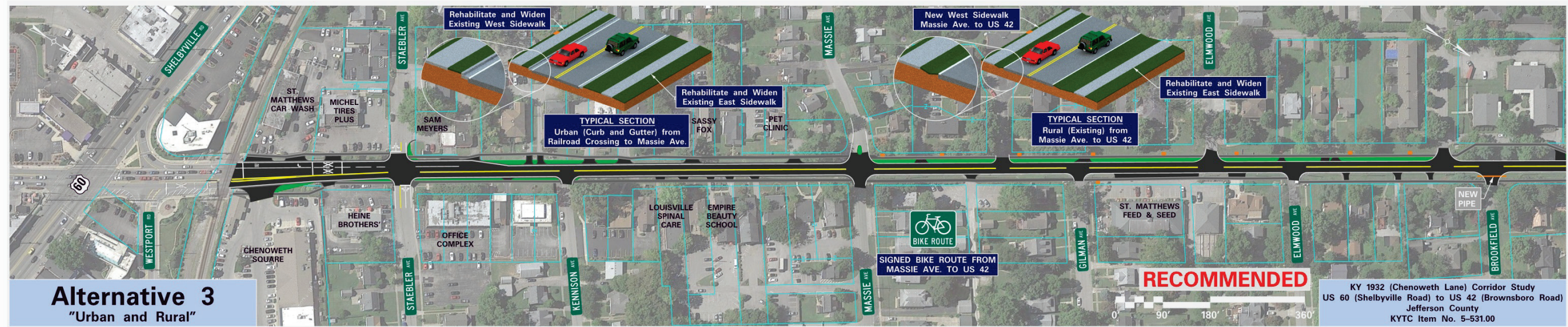


Figure 32: Alternative 3—Urban and Rural

12.0 CONTACTS/ADDITIONAL INFORMATION

Written requests for additional information regarding the Chenoweth Lane Corridor Study should be sent to:

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Mr. Tom Hall, PE

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