# KY 716
## CORRIDOR STUDY
Boyd County

Item No. 9-180

Final Report | July 2024




TEAM KENTUCKY®
TRANSPORTATION CABINET

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# Executive Summary

The Kentucky Transportation Cabinet (KYTC) initiated the *KY 716 Corridor Study*, KYTC Item No. 9- 180.00, in Boyd County to identify and evaluate the need for and scope of potential options to improve safety, mobility, and capacity between US 60 and Summit Road / KY 3293 (Little Garner Road).

## Existing Conditions

The study corridor shown in **Figure ES-1**, includes KY 716 from the US 60 intersection at milepoint 0.0 to the Summit Road / KY 3293 intersection at milepoint 0.565. KY 716 provides access to the people who live and work in Summit, Kentucky and US 60, a direct, regional connection between I-64 and Ashland, Kentucky, the largest city in Boyd County. Summit is an unincorporated community in Boyd County on the southwest side of the city of Ashland.

KY 716 is a two-lane minor arterial with 10-foot lanes and a posted speed limit of 35 miles per hour (MPH). There are several utilities within the study area, including gas, water, sewer, electric, and communication. The latest daily traffic count in 2021 shows 3,900 vehicles per day (VPD) on KY 716. At the east end of the study corridor, KY 716 intersects US 60 at a signalized intersection adjacent to Armco Park and multiple businesses, including Speedway and Crisp Dairy Treat. On the west side of the study corridor, KY 716 intersects Summit Road at an all-way stop-controlled intersection with a westbound channelized right-turn lane. There is one active Federally Funded Safety Program project to construct a mini roundabout at the KY 716 intersection with Summit Road / KY 3293. The Federal Correctional Institution (FCI) Ashland and the Federal Prison Camp Ashland are located in the northwest and southwest quadrants respectively of the intersection. Along the study corridor, KY 716 serves residences and small businesses along with Summit Missionary Baptist Church and Summit Elementary School.

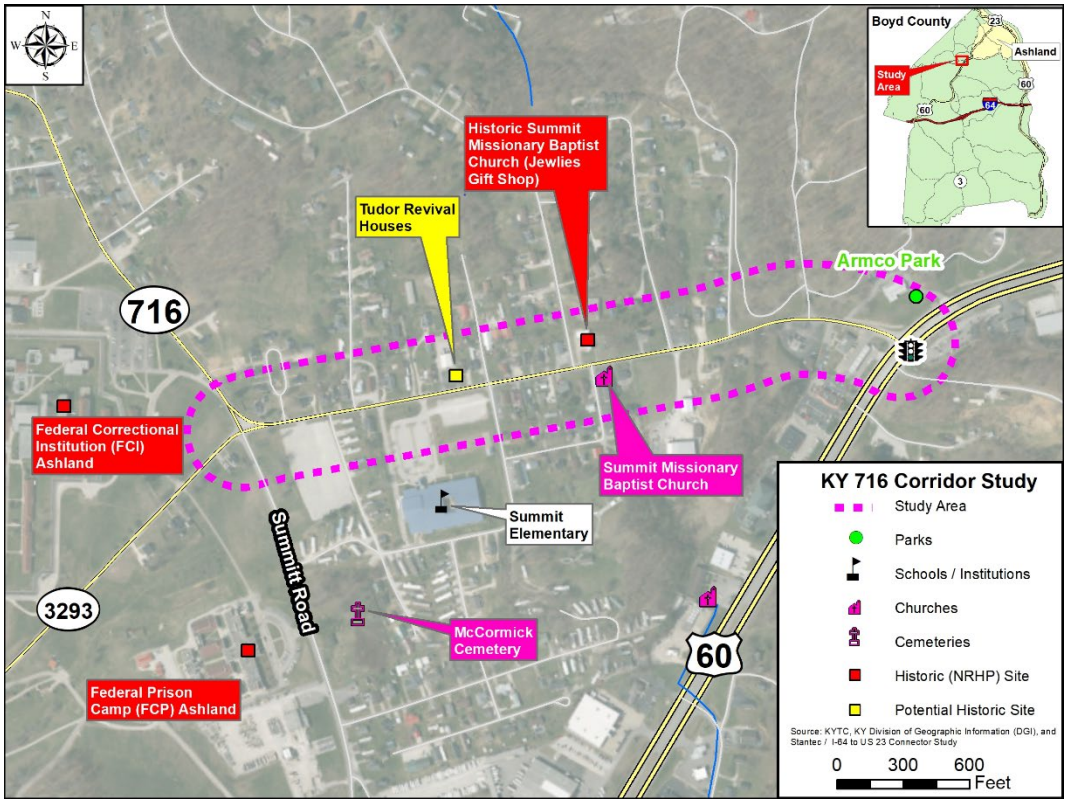


**Figure ES-1: KY 716 Study Area**

Crash data were collected on KY 716 for the five-year period between 2018 – 2022. Over the course of the five years, a total of 86 crashes were reported on KY 716, 14 of which resulted in one or more injuries, all of which were at the KY 716 intersections with US 60 and KY 3293. The most common crash types were rear end collisions (29 percent), angle collisions (28 percent), and single vehicle collisions (19 percent).

## Future Conditions

**Current and future traffic volumes along KY 716 have acceptable traffic operations without the need for additional capacity.**

Population data, including data from the 2020 Census, were obtained from the Kentucky State Data Center (KSDC). Between 2000 and 2020, population in Boyd County and the City of Ashland slightly declined. This decline in population is expected to continue in Boyd County to 2050. Daily traffic has also decreased over the past 20 years in the study area. Study area growth rates from the KYOVA regional travel demand model range from 0.39 to 0.73 percent per year on KY 716 while rates on US 60 range from 0.66 to 0.85 percent per year. These positive growth rates reflect US 60 being used as a regional connection and growing even while the local population slightly declines. Based on the historical count data, study area population estimates and projections, and annual growth rates from the KYOVA regional travel demand model, an annual growth rate of 0.75 percent was selected to reflect the high end of potential growth for the KY 716 study area through the year 2045. Based on this annual growth rate, KY 716 is expected to carry 4,600 VPD in 2045. Operational analyses were conducted, and it was determined that roadway capacity is not an issue on KY 716 and is not expected to be an issue in 2045.

## Preliminary Concept Development

Improvement concepts were developed based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, and field reconnaissance. Initial improvement concepts included three-lane widening with multimodal improvements, an improved two-lane section with sidewalks, and spot improvements focused on improving safety.

Based on a review of data from STRAVA, an athletic app that tracks bicycle and pedestrian movement using heat maps with brighter colors representing more activity, ARMCO Park was found to have heavy pedestrian activity. The KY 716 study corridor was shown as warm, indicating moderate pedestrian activity on the north side of KY 716. Activity for bicyclists was highest on KY 716, with moderate activity in ARMCO Park. While STRAVA data only shows activity for users of its app and does not present a full picture of the bicycle and pedestrian activity in the area, the data showed that there is a need for multimodal accommodations on KY 716.

### Concept 1: Three-Lane Widening

Concept 1 includes widening the travel lanes to 11-feet and constructing a center two-way left-turn lane (TWLTL) with curb and gutter and sidewalks on both sides of the roadway, as shown in **Figure ES-2**. The existing right-of-way and utilities would be maintained on the north side of KY 716, with widening occurring to the south. This concept would require major utility relocations and several home relocations.

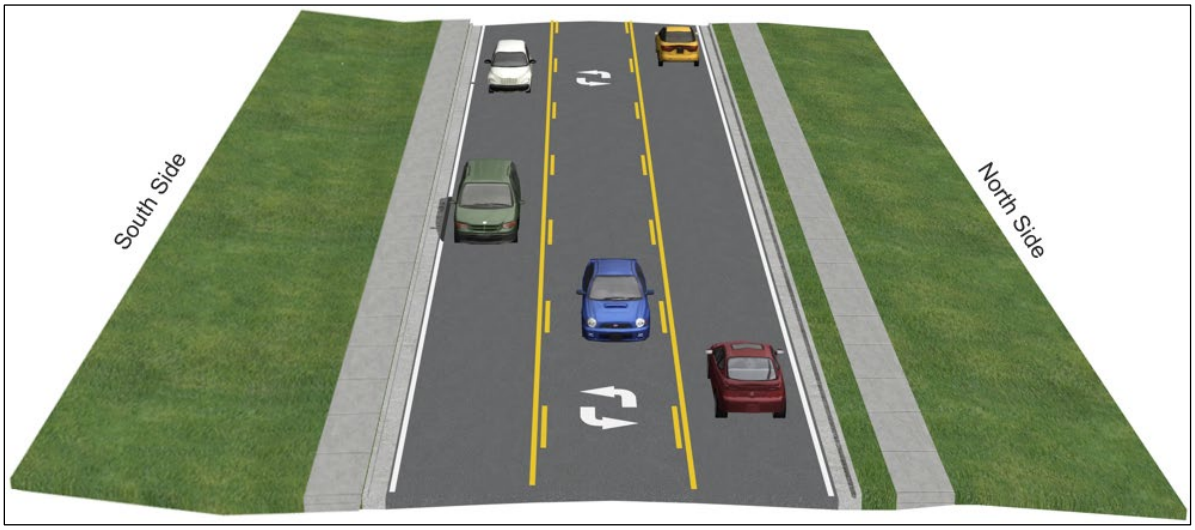


**Figure ES-2: Concept 1**

**Concept 2A: Improved Two-Lane Section with a Sidewalk on One Side of the Roadway**

Concept 2A includes constructing a sidewalk with curb and gutter on one side (north) of the roadway to minimize impacts due to the large number of utilities along the corridor - both aerial and buried, as shown in **Figure ES-3**. The utility poles on the north side of KY 716 support transmission / communication lines and are generally located approximately seven to nine feet from the edge of the paved roadway. The utility poles on the south side of KY 716 support electrical service drop / communication lines and are located approximately three feet from the edge of the roadway.

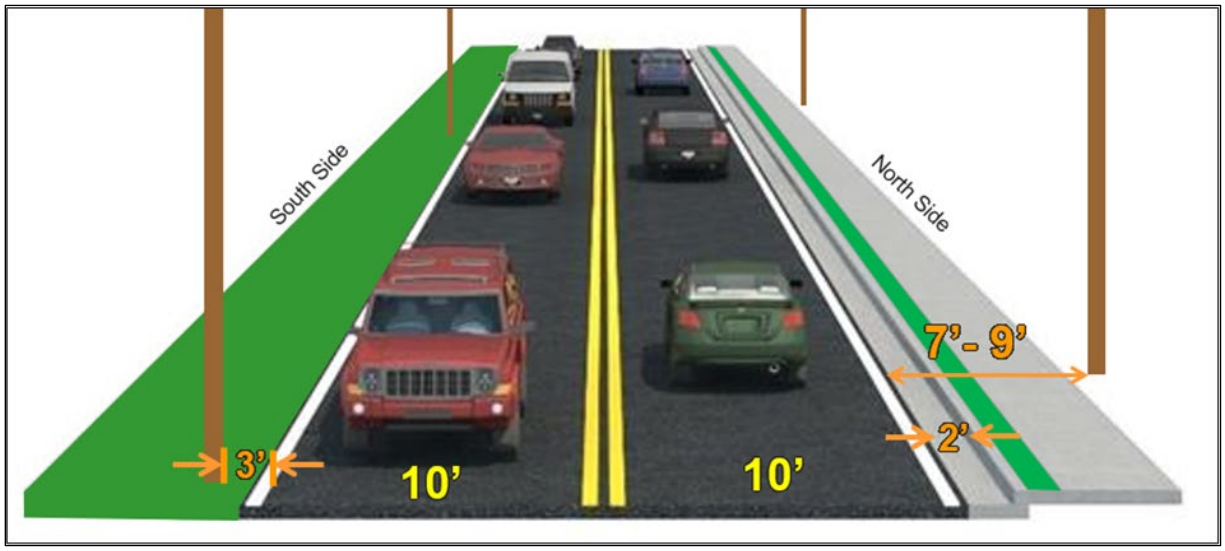


**Figure ES-3: Concept 2A**

**Concept 2B: Improved Two-Lane Section with Sidewalks on Both Sides of the Roadway**

Concept 2B includes curb and gutter with sidewalks on both sides of KY 716 as shown in **Figure ES-4**. This option would require the relocation of the utility poles and some above ground gas meters on the south side of KY 716 but would be envisioned to stay within existing right-of-way (although temporary construction easements will likely be required).

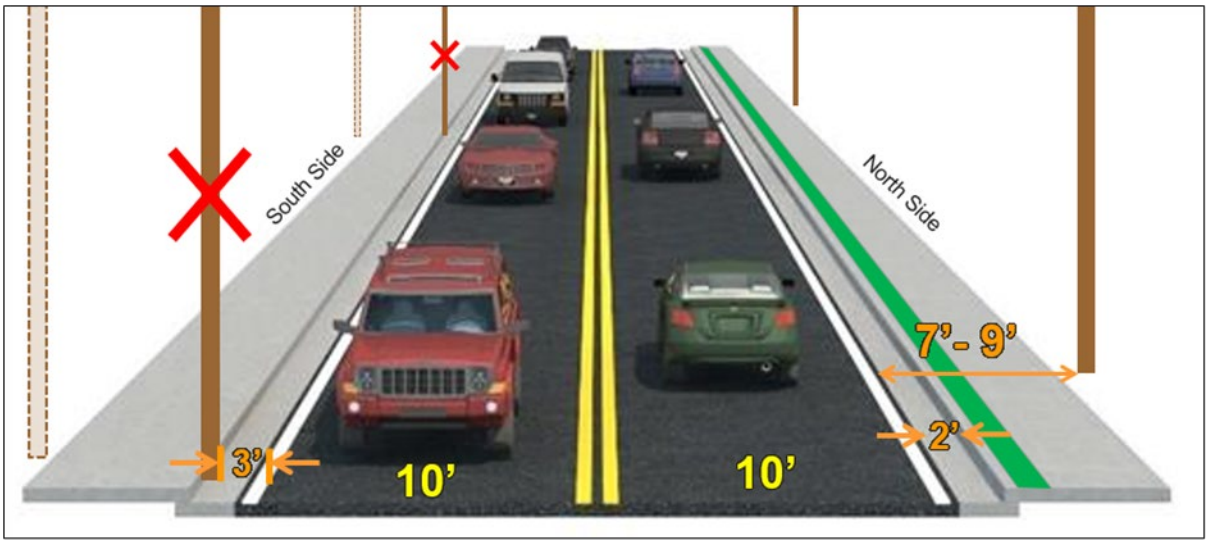


**Figure ES-4: Concept 2B**

**Spot Improvement 1**

The first spot improvement includes improving safety by prohibiting left turns to/from Speedway along KY 716 by installing a median barrier on KY 716, as shown in **Figure ES-5**.

The entrance would operate as right-in / right-out only. The distance between the stop bar for the eastbound KY 716 approach at the US 60 traffic signal and the easternmost Speedway entrance is approximately 60 feet. Queued vehicles on eastbound KY 716 frequently extend across the Speedway entrance. The driver of a queued vehicle may leave a gap in traffic to allow left turning motorists to proceed to/from Speedway which can result in a "courtesy" crash (when the left-turning vehicle crosses a lane of traffic and fails to yield the right of way).


**Figure ES-5: Spot Improvement No. 1**

**Spot Improvement 2**

The second spot improvement is to restripe the left-turn lane for northbound US 60 as a tapered (diagonal) offset left-turn with a raised median to further designate the left-turn lane, as shown in **Figure ES-6**.


**Figure ES-6: Spot Improvement No. 2**

The existing concrete paved median is flush with a width over 30 feet wide and the markings for the parallel offset left turn lane are faded making it difficult for motorists to ascertain where to enter the left-turn lane. FHWA's Handbook for Designing Roadways for the Aging Population provides guidance for design of offset left-turn lanes. Offset left-turn lanes are used to reduce the risk of crashes due to sight restrictions from opposite left-turn vehicles. Although the left-turn signal indication from northbound US 60 to westbound KY 716 is protected-only, a tapered offset left-turn lane is suitable for higher speed arterials like US 60 and can be constructed with a raised median to further delineate the lane. Further consideration is required prior to implementing this concept as additional costs to address drainage may be necessary due to storm drain in median.

**Spot Improvement 3**

The third spot improvement is to eliminate the westernmost entrance at the Crisp Dairy Treat which does not have adequate sight distance, as shown in **Figure ES-7**. The crash analysis identified two angle crashes which were in front of the Crisp Dairy Treat, and the property owners have posted a sign in their parking lot notifying existing customers to use only the east driveway. The figure depicts an access management strategy to close the west entrance and create a narrower east entrance which lines up better with the entrance to Armco Park across the street. This would provide adequate sight distance, allow for more orderly merging of traffic, reduce potential conflict points, and presents fewer challenges to drivers. This concept would require coordination with the Crisp Dairy Treat.


**Figure ES-7: Spot Improvement No. 3**

## Local Official / Stakeholder Outreach

Two Local Officials / Stakeholder Meetings were held over the course of the study to provide information on the study and solicit feedback on transportation issues and improvement concepts. School traffic was identified as the top concern, followed by safety and lack of sidewalks. Most of the survey respondents indicated that corridor-wide improvements are needed in the study area, and all eight chose the corridor-wide Improvement Concept 2A (Curb & Gutter with a Sidewalk on the North Side Only) as the preferred concept. Respondents were asked which of the three Spot Improvements, if any, that they support. There was support for all three Spot Improvements, with Spot Improvement 2, restriping the left-turn on northbound US 60 to westbound KY 716, as the most popular. One respondent noted that Spot Improvement 1 (prohibit left turns from Speedway) should be removed due to number of staff from FCI who frequent Speedway.

**Top 3 Concerns Identified by Local Officials / Stakeholders**

1. **School Traffic**
2. **Safety**
3. **Lack of Sidewalks**

Summit Elementary School has an efficient process during their convening and dismissal hours to circulate vehicles. The on-campus gravel lot and well-organized process avoid storing queued vehicles on KY 716. However, traffic volumes and turning vehicles are highest during convening and dismissal times, which is likely the reason school traffic was identified by local officials as an issue on KY 716. Based on the results from a turn lane warrant analysis, neither a left turn lane nor a right turn lane is warranted at Summit Elementary.

## Conclusions

The objective of this study was to identify and evaluate the need for and scope of potential options to improve safety, mobility, and capacity between US 60 and KY 3293 (Summit Road). An evaluation matrix was developed to summarize the improvement concepts' ability to satisfy the study objectives. **Table ES-1** presents the evaluation matrix, which includes estimated cost and whether the concept improves safety, mobility, and capacity and reduces right-of-way and utility impacts. Based on results from the traffic analysis, roadway capacity is not an issue and is not expected to be an issue in the future. As a result, Concept 1 was removed from further consideration.

While Concept 1 improves safety and mobility, it will likely require home, electric, gas, water, sewer, and communication line relocations. Concept 2A provides improved safety and mobility for all modes of travel while limiting the right-of-way and utility impacts.

As part of the design of Concept 2A, Condition No. 1 and Condition No. 3 in KYTC's Standard Drawing for Concrete Entrance Pavement and Sidewalk[1] should both be considered, as shown in **Figure ES-8**. Condition No. 1 is preferred and incorporates a small utility strip between the curb and sidewalk to accommodate roadside mailboxes as well as other utilities and maintains a consistent grade across entrances for the sidewalks. Condition No. 3 removes the utility strip which would reduce right-of-way and utility impacts but provides less of a buffer between traffic and pedestrians.

**Table ES-1: Evaluation Matrix**

| Issues / Project Goals | Existing (No Build) | Concept 1 (3-Lane Section with TWLTL and Sidewalks on Both Sides) | Concept 2A (Sidewalk on Northside Only) | Concept 2B (Sidewalks on Both Sides) | Concept 3 (Spot Improvements) |
|---|---|---|---|---|---|
| Estimated Total Cost | $0 | $8,300,000 | $2,800,000 | $4,700,000 | Low Cost |
| Improves Safety | ✗ | ✓ | ✓ | ✓ | ✓ |
| Improves Mobility | ✗ | ✓ | ✓ | ✓ | NA |
| Improves Capacity | NA | NA | NA | NA | NA |
| Reduces Right-of-Way Impacts | ✓ | ✗ 1 | ✓ | ● 2 | ✓ |
| Reduces Utility Impacts | ✓ | ✗ 3 | ● 4 | ✗ 3 | ✓ |

Note 1: Potential 4 home relocations
Note 2: ROW easements likely / ROW acquisition possible
Note 3: Assumes electric, gas, water, sewer & communication relocations
Note 4: Assumes water & sewer relocations

Key:
✗ Not addressed
● Somewhat addressed
✓ Addressed

[1] https://transportation.ky.gov/Highway-Design/Standard%20Drawings%20DGNS%202020/rpm150.pdf

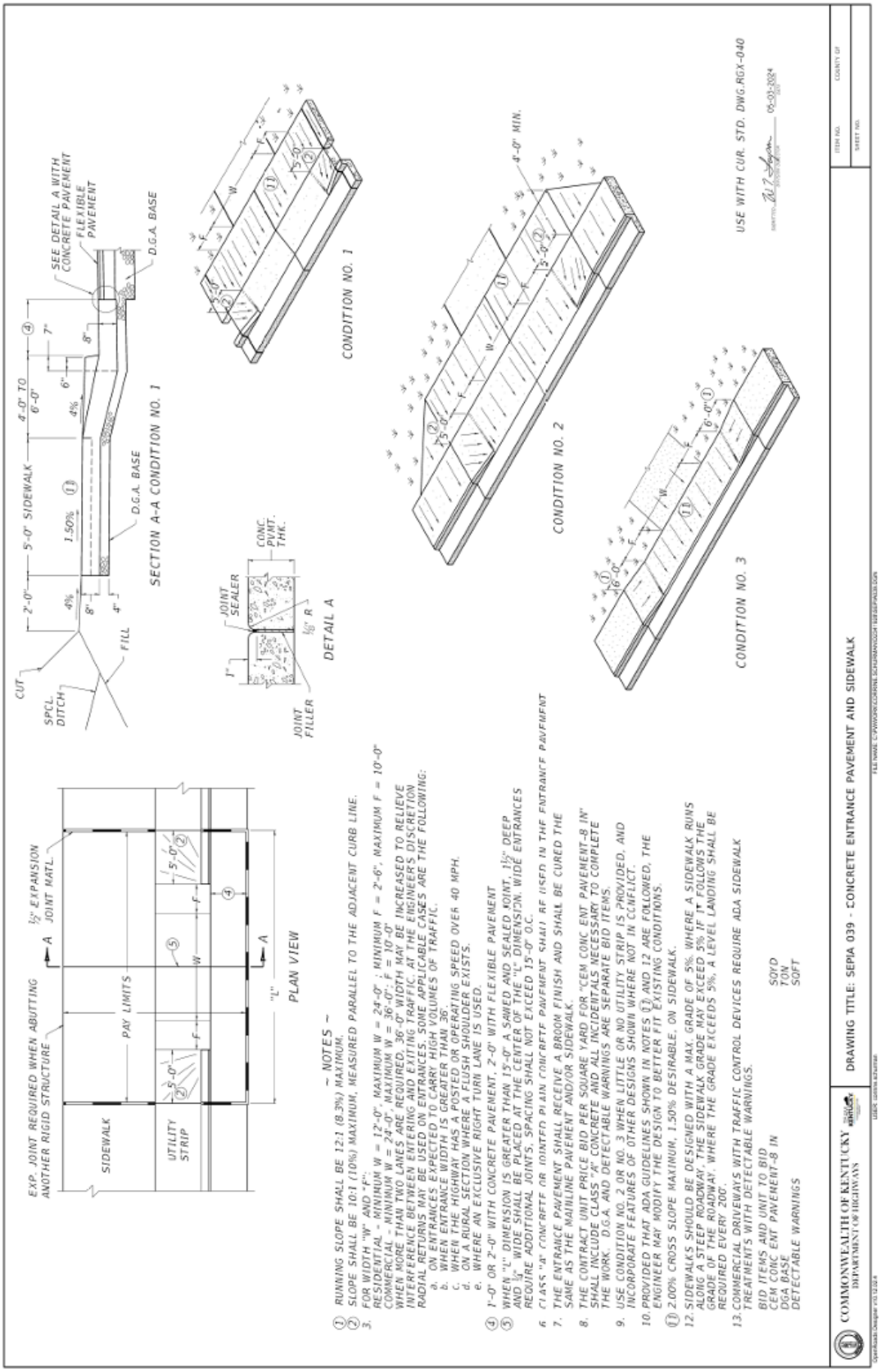


**Figure ES-8: KYTC's Standard Drawing for Concrete Entrance Pavement and Sidewalk**

Based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, and field reconnaissance, the following improvements are recommended to move forward to Phase 1 Design:

- **Concept 2A**: construct a sidewalk with curb and gutter on one side (north) of the roadway to minimize impacts due to the large number of utilities along the corridor.
- **Spot Improvement 1**: prohibit left turns to/from Speedway from/to KY 716 by installing a median barrier on KY 716.
- **Spot Improvement 2**: restripe the left-turn lane for northbound US 60 as a tapered (diagonal) offset left-turn with a raised median to further designate the left-turn lane. Further consideration is required prior to implementing this concept as additional costs to address drainage may be necessary.
- **Spot Improvement 3**: eliminate the westernmost entrance at the Crisp Dairy Treat and tighten the easternmost entrance. It is envisioned that this improvement would be implemented by the property owner with District approval or incorporated with the project for Concept 2A.

## Next Steps

The next step following this study for any potential improvements would be Phase 1 Design (Preliminary Engineering and Environmental Analysis). Funding for the Design phase is programmed in *Kentucky's FY 2024 – FY 2030 Enacted Highway Plan*.

Concept 2A could also be developed at the local level or through the Kentucky Ohio West Virginia Interstate Planning Commission (KYOVA) using federal funding and/or grants. Multi-modal grant opportunities are an emphasis in current federal funding programs. Due to the proximity of Summit Elementary, there may be federal funding available through programs such as Safe Routes to School.

# Final Report

## KY 716 Corridor Study

KYTC Item No. 9-180.00

Kentucky Transportation Cabinet Central Office, Division of Planning
Highway District 9, Flemingsburg

In partnership with:

July 2024

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# 1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) initiated the *KY 716 Corridor Study*, KYTC Item No. 9-180.00, in Boyd County to identify and evaluate the need for and scope of potential options to improve safety, mobility, and capacity between US 60 and Summitt Road / KY 3293 (Little Garner Road). Boyd County is part of KYTC District 9, as shown in **Figure 1.**

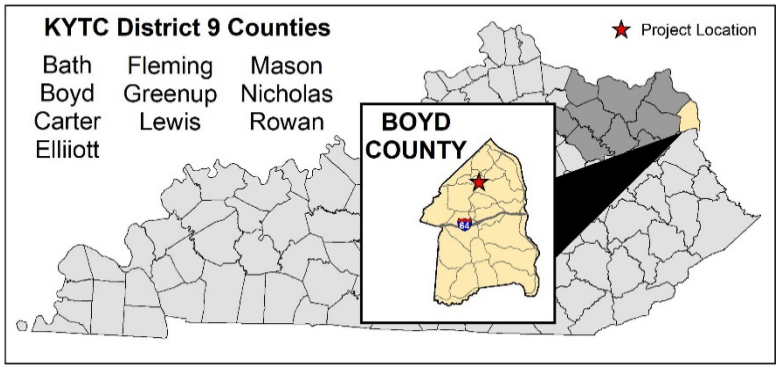


**Figure 1: KYTC District 9 Map**

## 1.1 STUDY AREA

The study area, shown in **Figure 2**, includes KY 716 from the US 60 intersection at milepoint 0.00 to the Summitt Road / KY 3293 intersection at milepoint 0.56. KY 716 provides access to the people who live and work in Summit, Kentucky to US 60, a direct, regional connection between I-64 and Ashland, Kentucky, the largest city in Boyd County.

At the east end of the study corridor, KY 716 intersects US 60 at a signalized intersection adjacent to Armco Park and multiple businesses, including Speedway and Crisp Dairy Treat. On the west side of the study corridor, KY 716 intersects Summitt Road at an all-way stop-controlled intersection with a westbound channelized right-turn lane. The Federal Correctional Institution (FCI) Ashland and the Federal Prison Camp Ashland are located in the northwest and southwest quadrants respectively of the intersection. Along the study corridor, KY 716 serves residences and small businesses along with Summit Missionary Baptist Church and Summit Elementary School.

Situated in Appalachia and located at the northeastern corner of Kentucky near the Ohio River, Boyd County spans a total of 160 square miles. Within the county, Summit is an unincorporated community located southwest of Ashland. As of 2020, Boyd County had a census population of 48,261[1], a slight decline from the 2000 population of 49,752.

## 1.2 PLANNED AND COMMITTED PROJECTS

This is the only active project in the study area listed in *Kentucky's 2024-2030 Enacted Highway Plan*.

KYTC Item No. 9-180.00 seeks to improve safety and decrease congestion on KY 716 from MP 0.00 (US 60) to MP 0.56 (KY 3293). (Design = $1.2 million, Right-of-Way = $4.6 million, Utilities = $2.0 million, Construction = $5.0 million). There is one active Federally Funded Safety Program project to construct a mini roundabout at the KY 716 intersection with Summitt Road / KY 3293. This roundabout project will address the safety issues at the intersection and is anticipated to cost $2 million.

[1] https://www.census.gov/quickfacts/fact/table/boydcountykentucky#

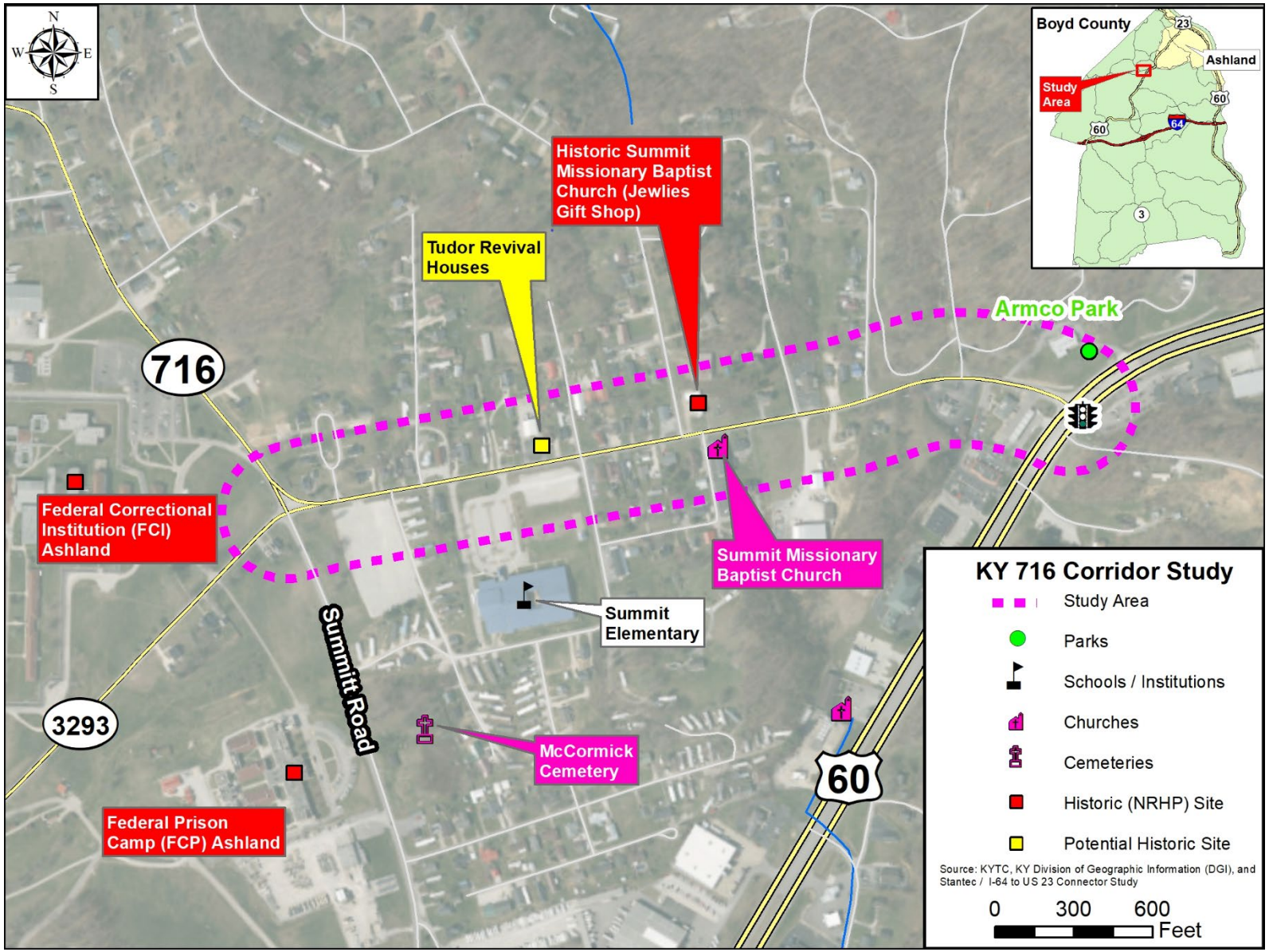


**Figure 2: KY 716 Study Area**

# 2.0 EXISTING CONDITIONS

Conditions of the existing transportation network were examined and are shown in the following sections. The information compiled includes roadway facilities and geometrics, crash history, and traffic volumes within the study area. Data for this section were collected from KYTC's Highway Information System (HIS) database, KYTC's Traffic Count Reporting System, aerial photography, and field inspection.

## 2.1 FUNCTIONAL CLASSIFICATION

Functional classification is the process of grouping streets and highways according to the character of travel service they provide. The functional classifications of the study corridor and adjacent routes are shown in **Figure 3.** KY 716 is classified as an urban minor arterial, serving trips of moderate length to smaller geographic areas such as the unincorporated community of Summit. US 60, located at the boundary of the study area, is an urban principal arterial, which provides a high level of traffic mobility for substantial statewide travel between major activity centers such as the city of Ashland. West of the study corridor, KY 3293 is classified as an urban minor collector and Summitt Road is classified as an urban minor collector, roadways that distribute and channel trips between the lower classifications.

## 2.2 ROADWAY GEOMETRY

KYTC's HIS database was used to identify roadway geometry. The current number of lanes and estimated lane widths within the study area are shown in **Figure 4**. The KY 716 corridor has 10-foot travel lanes.

The shoulder widths for roadways near the study corridor are shown in **Figure 5**. KY 716 and KY 3293 have narrow shoulders, ranging between one to four feet.

**KY 716 Typical Section**

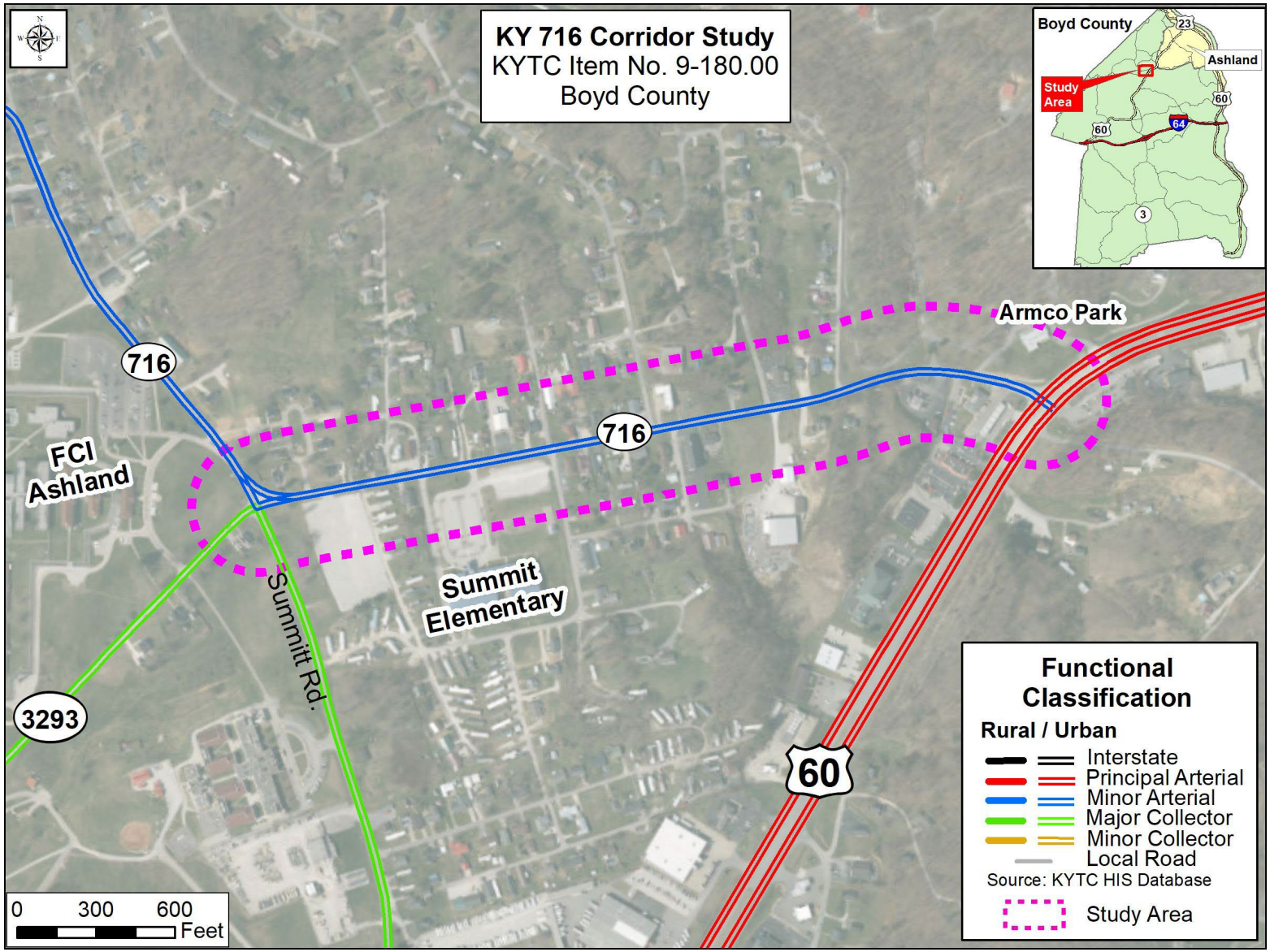


**Figure 3: Functional Classification**

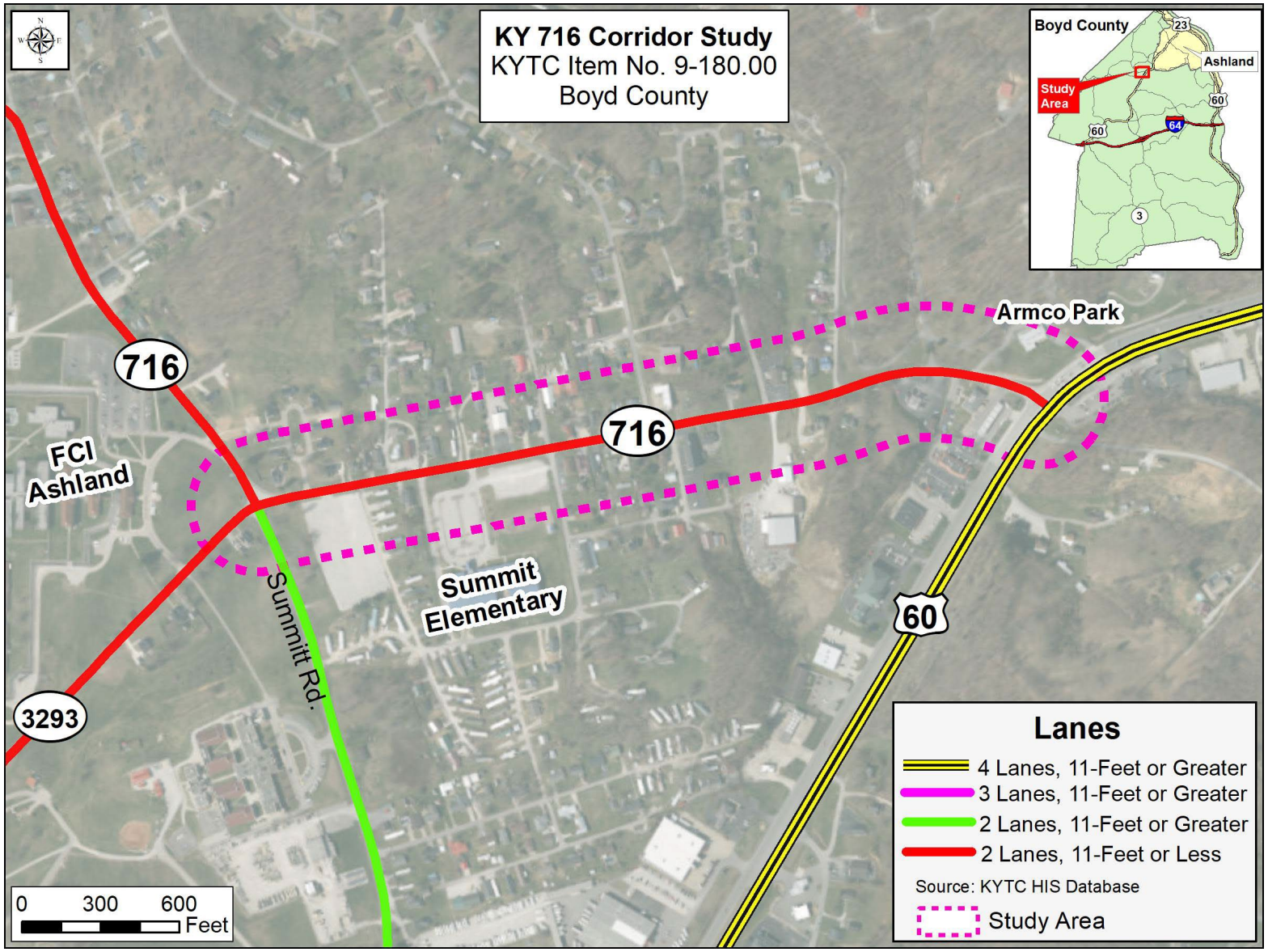


**Figure 4: Number of Lanes and Lane Widths**

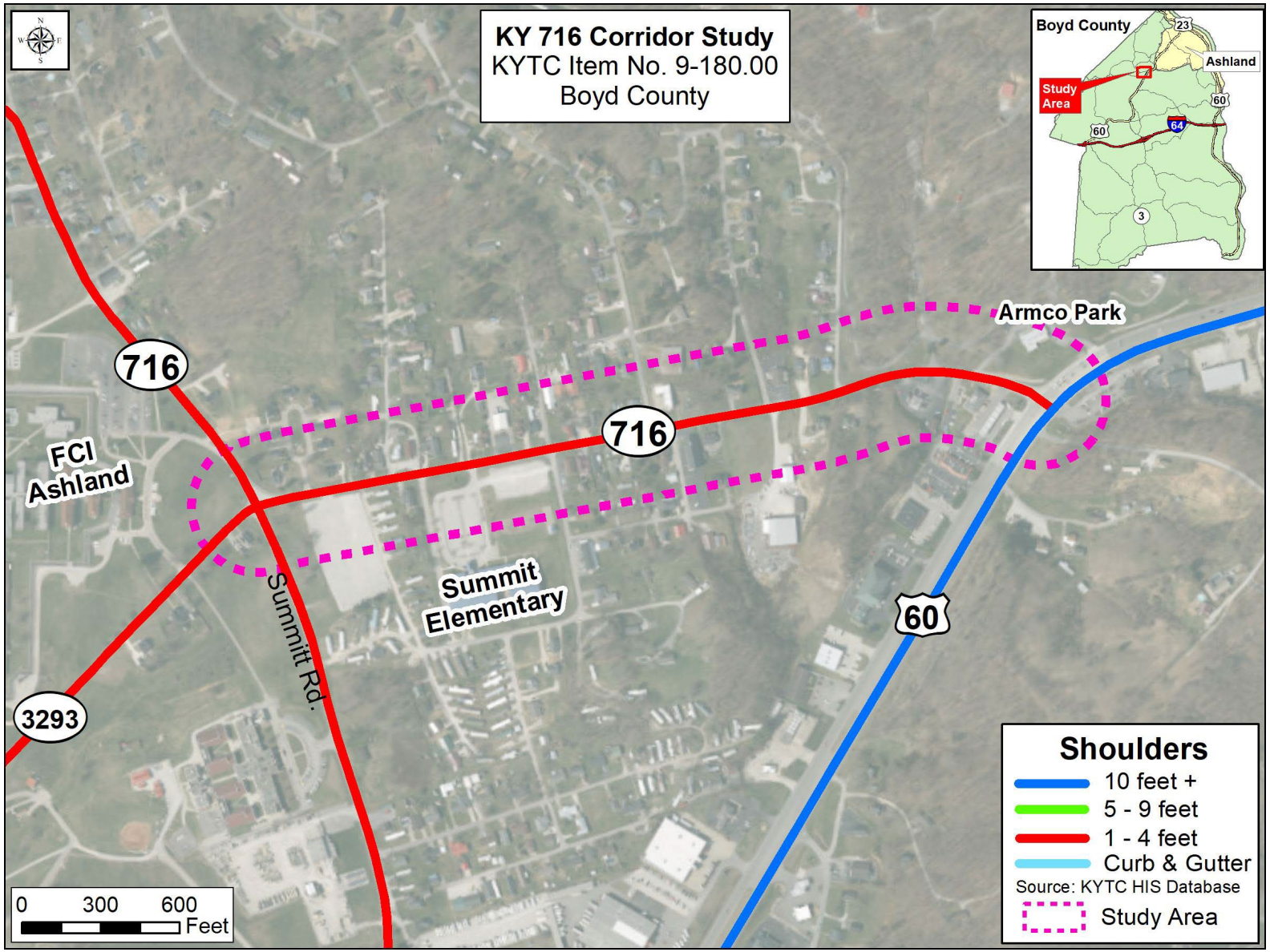


**Figure 5: Shoulder Width**

## 2.3 SPEED LIMIT

Posted speed limits for roadways within the study area are shown in **Figure 6**. KY 716 has a posted speed limit of 35 miles per hour (mph). School flashers for Summit Elementary School reduce the speed limit to 25 mph during convening and dismissal hours. US 60 has a speed limit of 45 mph where it intersects KY 716. To the west, KY 3293 has a 55-mph speed limit and Summitt Road has a 25-mph speed limit.

## 2.4 UTILITIES

Based on a review of available data, the following utilities were found to be in and around the study area (as shown in **Figure 7**):

- Overhead electrical distribution lines
- Water lines
- Sewer lines
- Natural energy lines
- Gas lines
- Windstream
- Fiber optic cable

## 2.5 EXISTING TRAFFIC ANALYSIS

Existing traffic volumes on study area roads were reviewed and the most current annual average daily traffic (AADT) volumes from KYTC's count stations are shown in **Figure 8.** Daily traffic on KY 716 is 3,900 (2021) vehicles per day (vpd) with 4.7 percent trucks. The heaviest daily traffic volumes near the study corridor are on US 60, with 16,100 vpd south of the KY 716 intersection. To the west, KY 716 carries 4,800 vpd, Summitt Road carries 3,900 vpd, and KY 3293 carries 1,400 vpd.

12-hour turning movement counts were collected at the KY 716 intersections with US 60, Summit Elementary School, and KY 3293. Based on a review of the counts, the AM peak hour was determined to be 7:00 AM to 8 AM and the PM peak hour was 2:45 PM to 3:45 PM. These times directly lined up with the start and dismissal times of Summit Elementary School.

### 2.5.1 Summit Elementary School Traffic Patterns

Summit Elementary School officials implement and direct an efficient process during their convening and dismissal hours. During the AM drop-off, drivers are directed to turn from KY 716 into the school's main entrance, circulate the paved parking lot to drop off the student in front of the school, and exit on Bertha Drive via the gravel parking lot. During the PM pick-up, vehicles enter the gravel lot from Bertha Drive and are queued in rows in the gravel parking lot until dismissal. Upon dismissal, rows of vehicles are systematically released to circulate the paved parking lot, load the students, and then exit from the school's main entrance by a right-only turn onto eastbound KY 716. The on-campus gravel lot and well-organized process avoids the need to store queued vehicles on KY 716.

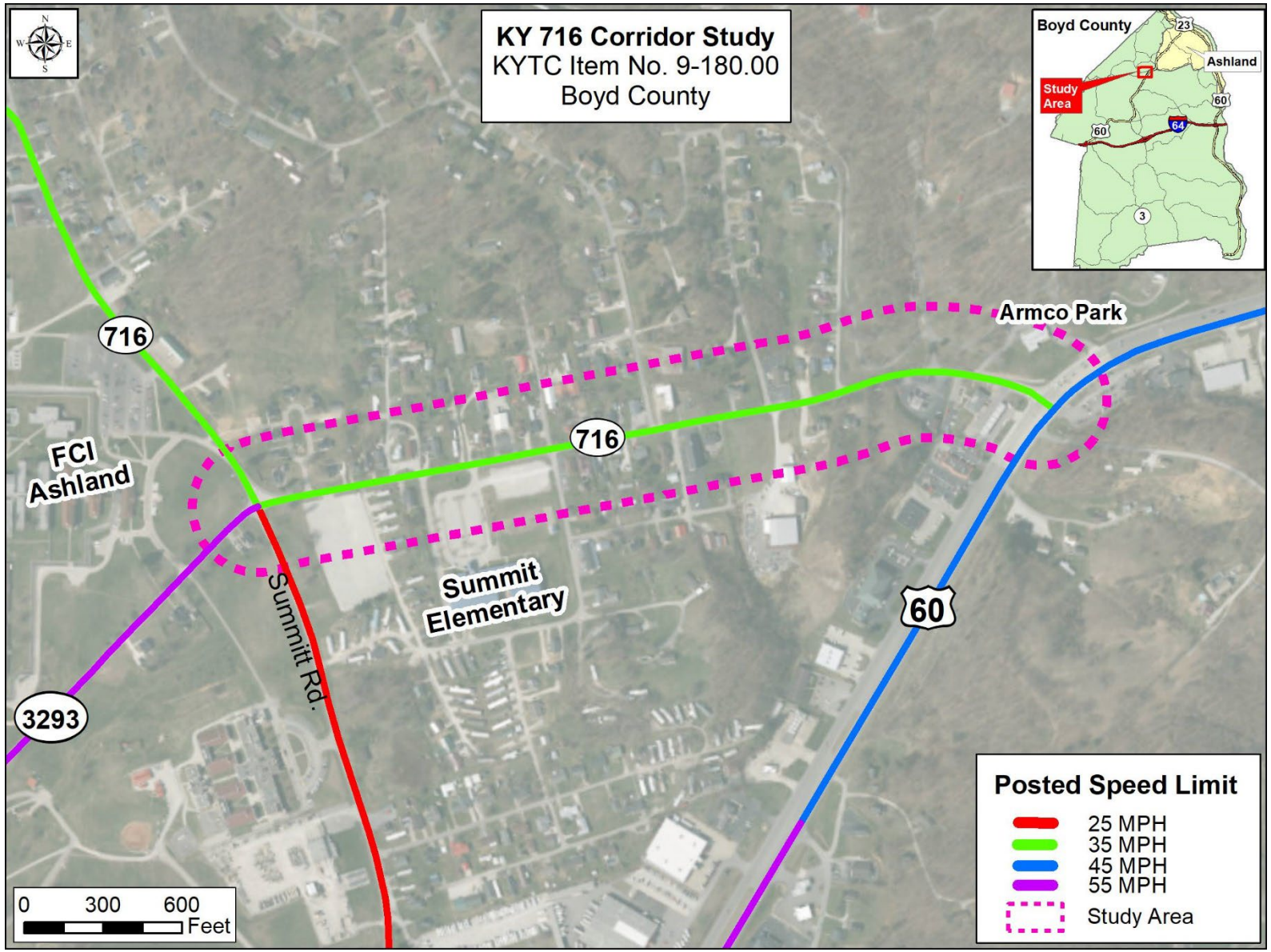


**Figure 6: Speed Limit**

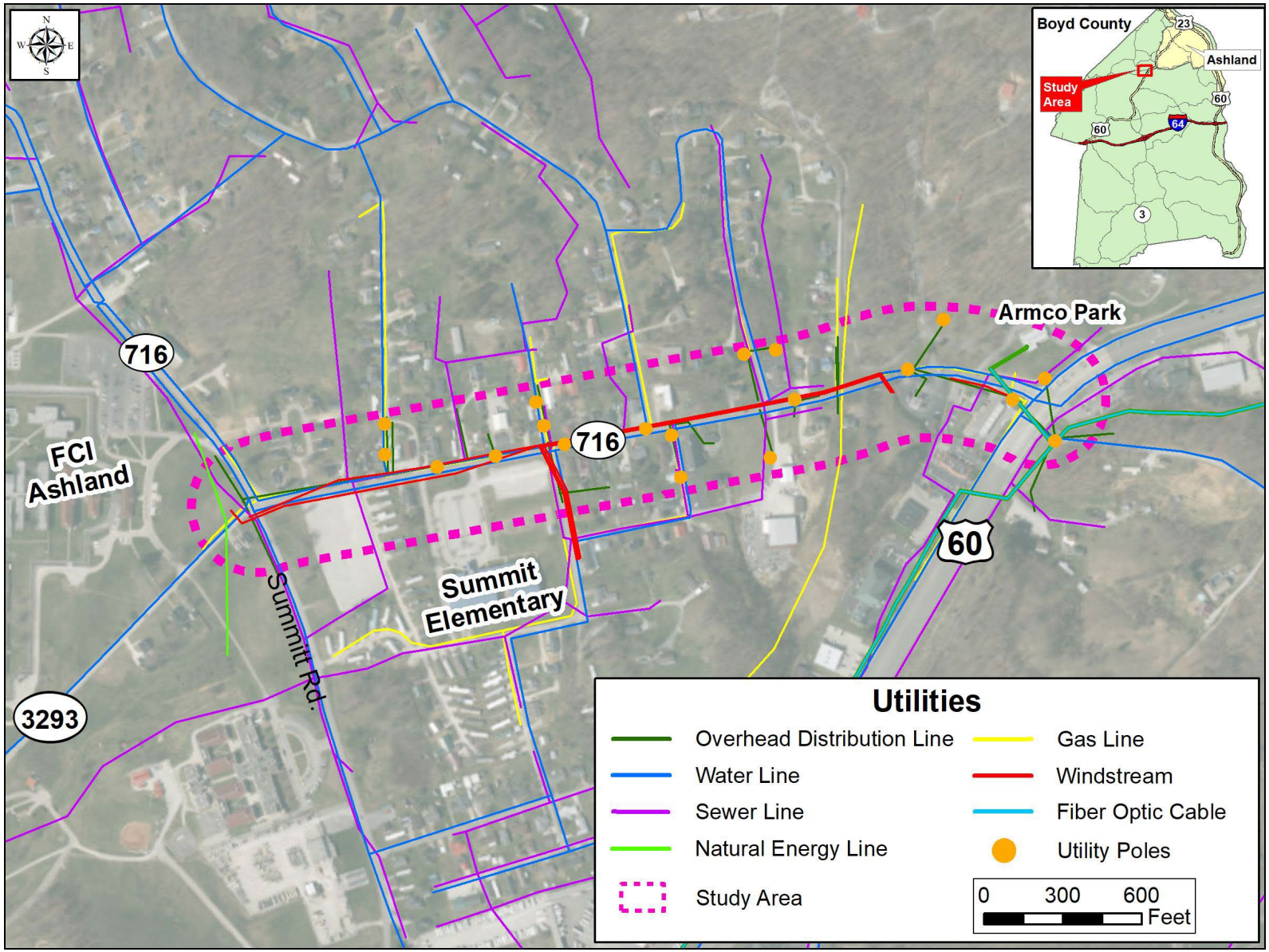


**Figure 7: Utilities**

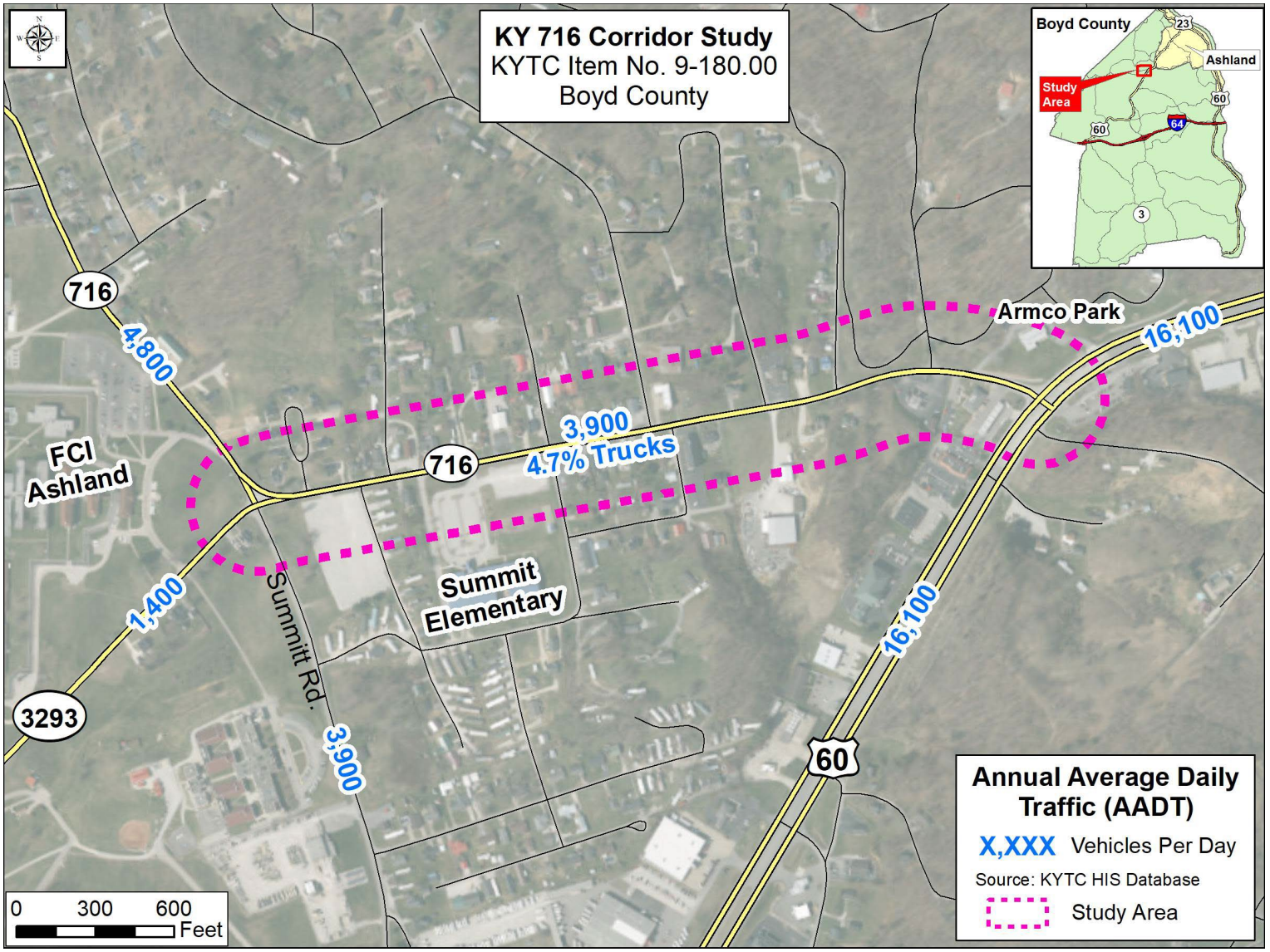


**Figure 8: Average Daily Traffic (ADT)**

### 2.5.2 Highway Capacity Software (HCS) Analysis

Highway capacity software (HCS) was used to analyze the peak hour traffic conditions at the three study area intersections. Level of service (LOS), a qualitative measure describing operational conditions from A (free flow / no delay) to F (forced flow / excessive delays), was used to evaluate the adequacy of the existing roadway. In rural areas, LOS C or better is acceptable and in urban areas, LOS D or better is acceptable.

A summary of the existing traffic operations at KY 716 intersections are shown in **Table 1.** All study area intersections operate at an acceptable LOS during both the AM and PM peak hours. Based on this analysis, it was determined that the capacity is adequate to handle existing traffic.

**Table 1: 2023 No-Build HCS Traffic Analysis**

| Intersection | Approach | AM Peak | | PM Peak | |
|---|---|---|---|---|---|
| | | LOS | Delay (s/veh) | LOS | Delay (s/veh) |
| KY 716 at US 60 | EB KY 716 | C | 27.8 | C | 28.9 |
| | WB Car Lot | C | 23.3 | C | 23.4 |
| | SB US 60 | B | 11.9 | B | 12.9 |
| | NB US 60 | A | 6.4 | A | 8.9 |
| | **Total** | **B** | **11.3** | **B** | **13.9** |
| KY 716 at Summit Elementary | EB KY 716 | A | 0.0 | A | 0.0 |
| | WB KY 716 | A | 4.0 | A | 0.3 |
| | SB Private Drive | A | 9.6 | A | 9.5 |
| | NB Elementary | B | 12.3 | B | 14.1 |
| | **Total** | **A** | **2.0** | **A** | **4.4** |
| KY 716 at KY 3293 | EB KY 716 | A | 9.5 | A | 9.7 |
| | WB KY 716 | A | 9.2 | A | 9.9 |
| | SB Summitt Road | B | 11.4 | B | 11.9 |
| | NB Summitt Road | A | 9.3 | B | 11.1 |
| | **Total** | **B** | **10.3** | **B** | **11.1** |

## 2.6 CRASH HISTORY

Crash data were collected on KY 716 for the five-year period between 2018 – 2022. Over the course of the five years, a total of 86 crashes were reported on KY 716. A complete summary of the crashes can be found in **Appendix A**. Of the 86 total crashes, 14 resulted in one or more injuries (16 percent), and 72 resulted in property damage only (84 percent). **Figure 9** presents the locations of the crashes by crash severity. All of the collisions resulting in an injury occurred at the US 60 and KY 3293 intersections.

The most common crash types were rear end collisions (29 percent), angle collisions (28 percent), and single vehicle collisions (19 percent). Sideswipe collisions (eight percent) were typically on the intersection of KY 716 at KY US 60. **Figure 10** presents the locations of the crashes by crash type.

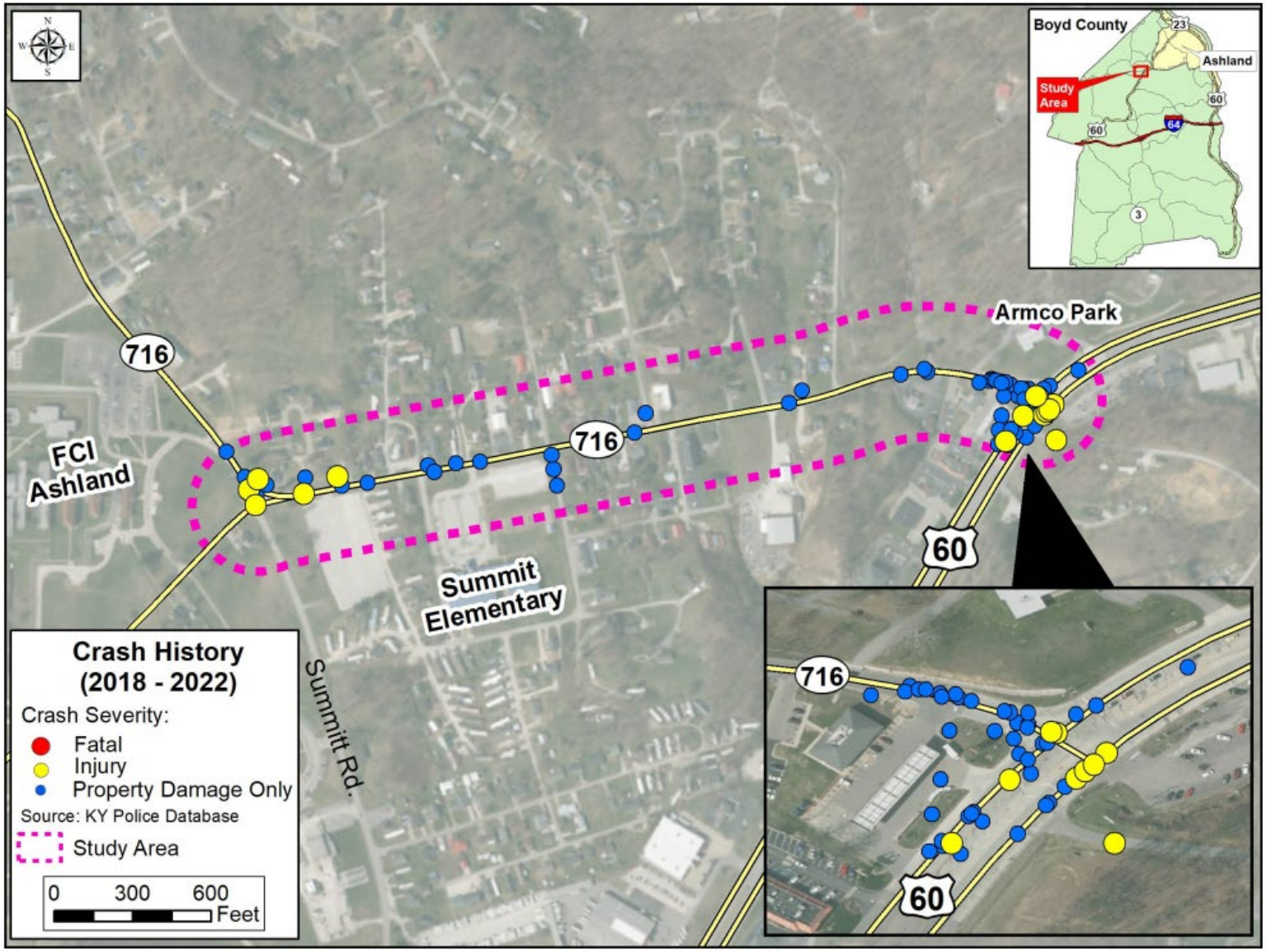


**Figure 9: Crash Severity (2018 - 2022)**

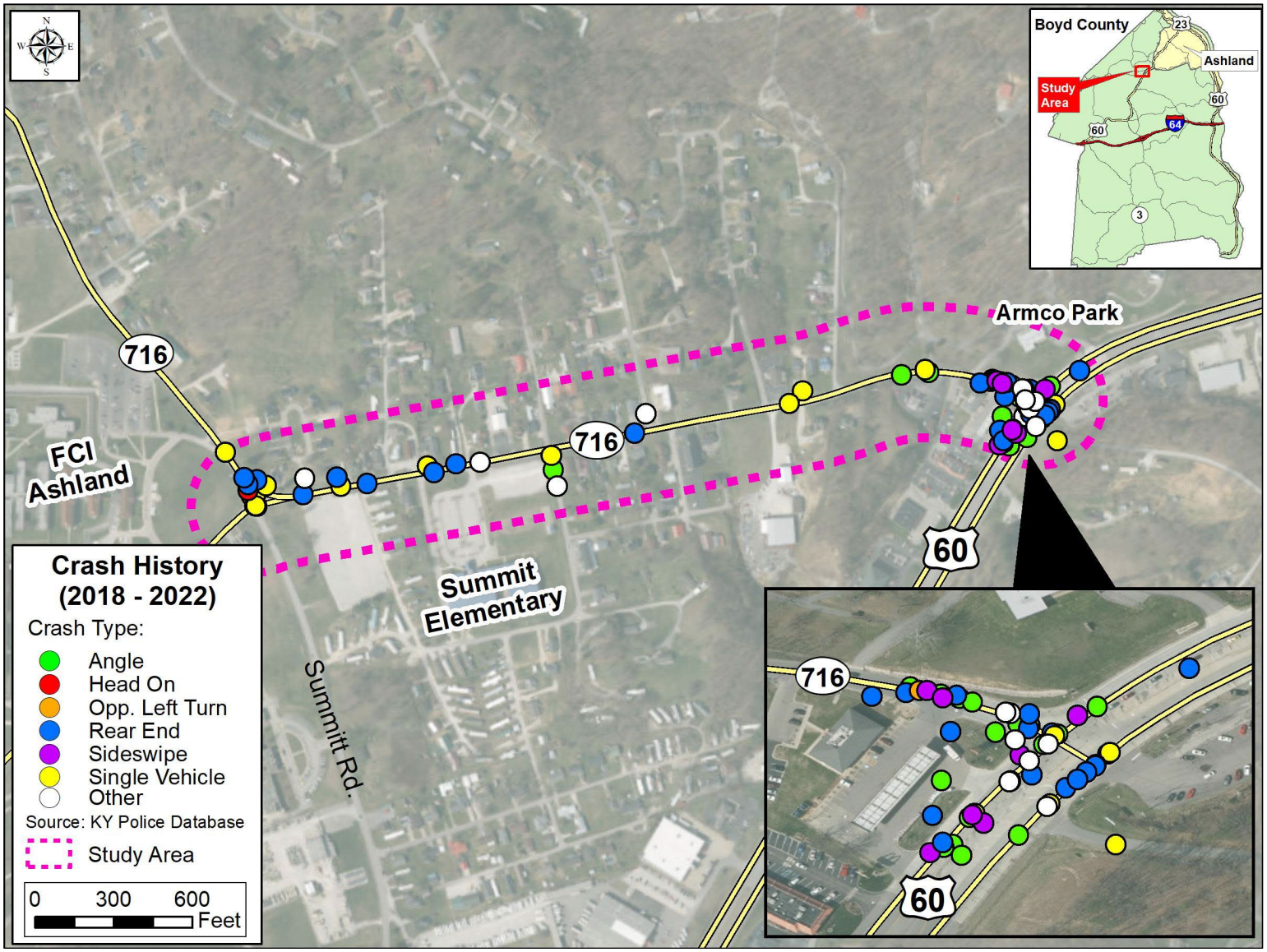


**Figure 10: Crash Type (2018 - 2022)**

### 2.6.1 Excess Expected Crash (EEC) Analysis

The Crash Data Analysis Tool (CDAT), developed by the Kentucky Transportation Center (KTC), was used to perform an Excess Expected Crash (EEC) analysis. EEC is a measure of the crash frequency at a given site compared to what is expected based on current conditions (geometrics, traffic, etc.). A positive EEC indicates more crashes are occurring than should be expected when compared to similar facilities. Results from the safety analysis showed the study portion of KY 716 has an EEC of 2.2 crashes per year and a Level of Service of Safety (LOSS) of three, indicating a moderate to high potential for crash reduction. However, if the segment is analyzed by excluding the last 0.1 mile in advance of intersections of KY 716 with US 60 and KY 716 with Summit Road / KY 3293, then the EEC is only 0.2. As discussed previously, most of the crashes were concentrated at the intersections with US 60 and KY 3293, which is where the moderate to high potential for crash reduction is expected.

# 3.0 ENVIRONMENTAL OVERVIEW

An Environmental Overview (EO) was developed to identify known natural and human features which occur within the study area. These features were considered during the development and advancement of improvement concepts along with avoidance or minimization of impacts to the environment. The complete document is included in **Appendix B**.

## 3.1 NATURAL ENVIRONMENT

There are no National Wetland Inventory (NWI) mapped wetlands or 100-year Federal Emergency Management Agency (FEMA) designated floodway areas identified within the study area, as shown in **Figure 11**. Subsurface flow is assumed to flow generally south.

Although not within the study area, there is a Source Water Protection Area for Russell Water Company and Ashland Water Works approximately 0.25 miles north. Implementation of best management practices is recommended if disturbance in the vicinity of surface waters occurs.

The Environmental Database Report (EDR) Well Report and a search of the University of Kentucky Groundwater Data Repository found no public water supply system and 50 water well records within the environmental research study area. Of these, 33 were marked as Active and only 11 were within 0.25 miles of the project study area.

Based on information from the United States Geological Survey (USGS) US Karst Occurrence Map, the majority of the study area is underlain by bedrock with limited or no potential for karst development.

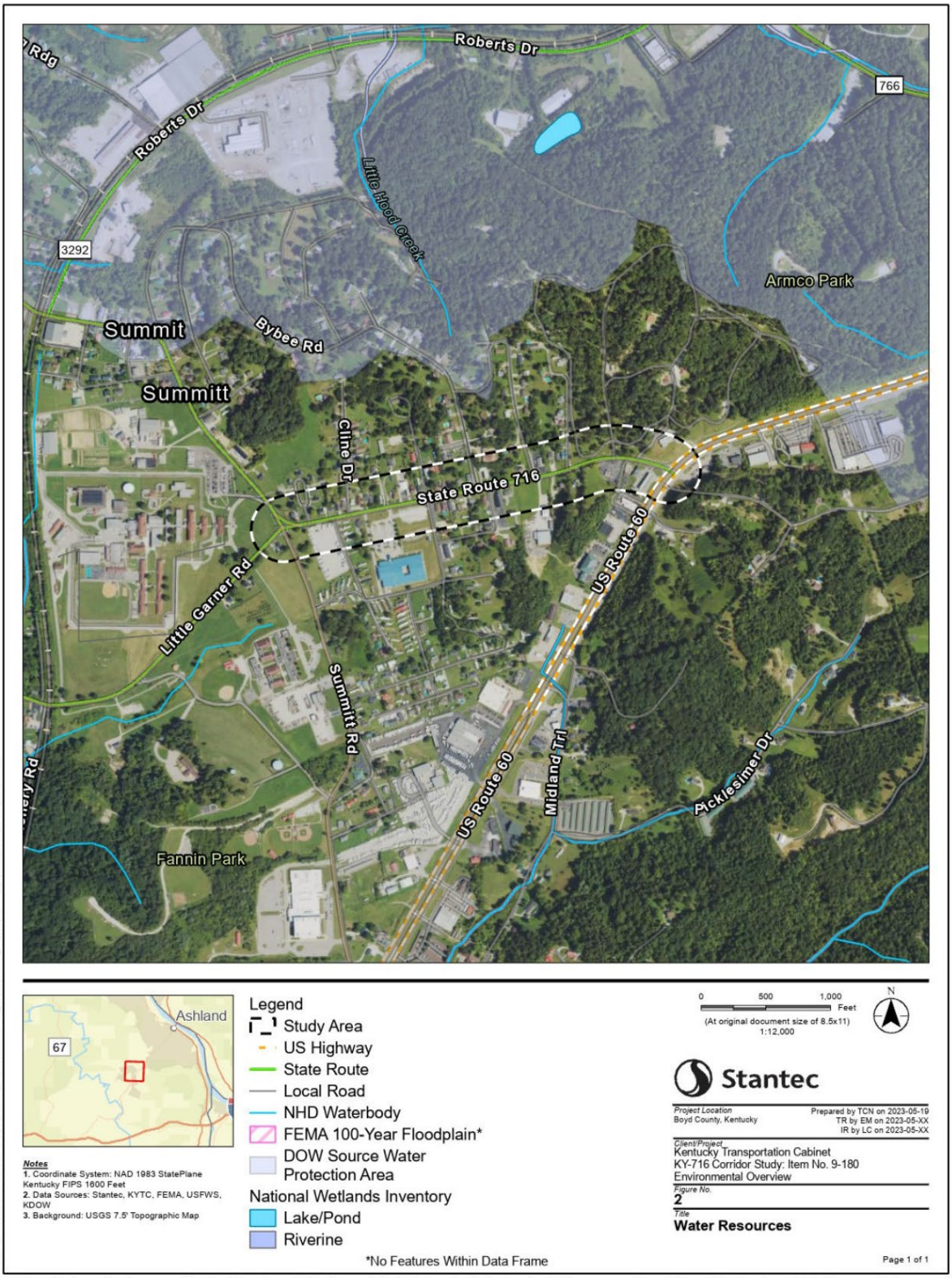


**Figure 11: Water Resources**

According to U.S. Fish and Wildlife Service's Information for Planning and Consultation (IPaC), there are 11 federally listed endangered species, one federally listed threatened species, and one federally listed candidate species with the potential to occur within the study area. Some forested areas are present that could provide suitable bat habitat, including the area near Armco Park.

Approximately 24.2 acres (61 percent) of the soils in the study area, including most of the area along KY 716, are identified as 'Prime Farmland'.

## 3.2 HUMAN ENVIRONMENT

**Figure 12** shows the human environment in and around the study area. The Kentucky Office of State Archaeology (OSA) preliminary records review indicated no previously recorded archaeological sites within the study area or its additional 30-meter buffer. A records review of Kentucky Heritage Council (KHC) data revealed that there are 14 previously recorded historic properties located within or adjacent to the study area. Two properties, the Federal Corrections Institute Ashland and Summit Missionary Baptist Church have been previously determined eligible for listing in the National Register of Historic Places (NRHP). Two historic properties that are associated with the Federal Corrections Institute Ashland are located just outside of the study area and have been determined ineligible for listing in the NRHP. The ten remaining previously recorded properties are residential structures.

Armco Park encompasses the northeast end of the study area on the north side of the intersection of KY 716 and US 60 and is a 4(f) public recreational park. It is also a 6(f) protected resource because the Boyd County Fiscal Court received Land and Water Conservation Funds (LWCF) in 2002 for a development project and the Kentucky Department for Local Government also received LWCF in 2015 for development of an outdoor recreational complex (Trust for Public Land 2023). The playground at Summit Elementary School may also serve as a 4(f) public recreational facility.

Community resources and sensitive noise receptors in the study area include numerous houses and residential neighborhoods. Two houses of worship were identified within the study area. There is a Kentucky State Police Post located adjacent to the ARMCO park's eastern boundary, along US 60. Summit Elementary has two primary entrances on this segment of KY 716.

The EDR report revealed two Historical Auto sites: Borders Summit Market and Speedway SuperAmerica within approximately 0.125 mile of the study area. There are five database records for underground storage tanks (UST) sites within 0.25 miles of the study area, two aboveground storage tank sites, and four Resource Conservation Recovery Act (RCRA) non-generator / no longer regulated sites [Dollar General Store, Family Dollar, Speedway, KY National Guard-OM Shop]. Potential hazardous materials concerns exist throughout the study area.

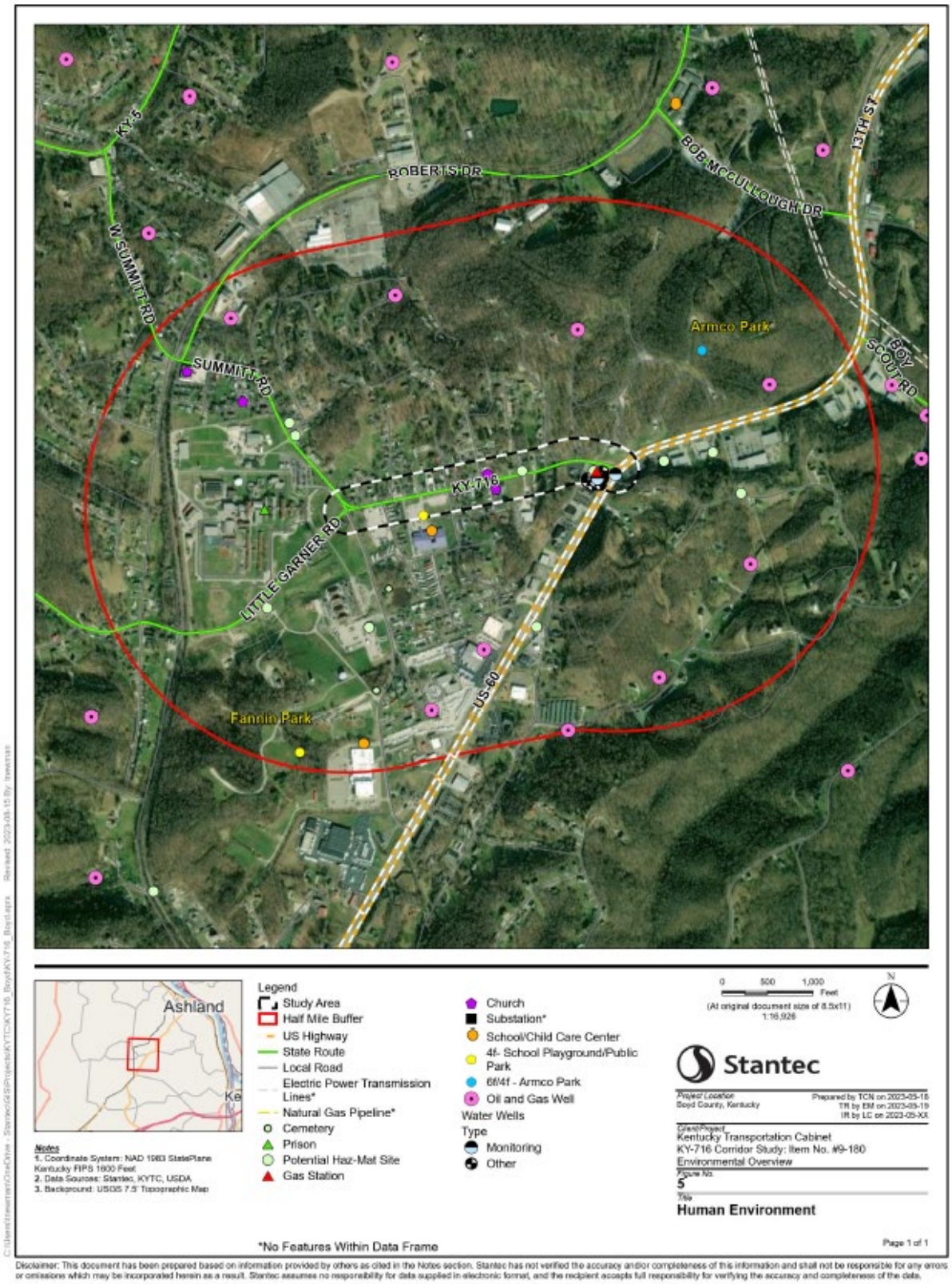


**Figure 12: Human Environment**

## 3.3 SOCIOECONOMIC STUDY

The FIVCO Area Development District conducted a socioeconomic study for the study area. A complete copy of the report is found in **Appendix C**. The information in this report outlines data from the 2017-2021 American Community Survey (ACS) statistics in the study area vicinity using tables, charts, and maps. The information is intended to aid KYTC in making informed and prudent transportation decisions in the study area. Statistics are provided for minority, elderly, poverty status, limited English proficiency (LEP), and disabled populations for the nation, state, and Boyd County, as shown in **Table 2**. The study area has lower rates of minority representation, people below the poverty line, adults with a disability, and limited English proficiency compared to Boyd County. Boyd County and the study area have higher percentages of adults over 65 than the rest of the state.

**Table 2: Socioeconomic Summary**

| Category | United States | Kentucky | Boyd County | Study Area |
|---|---|---|---|---|
| Percent of Minority Population | 39.91% | 15.92% | 7.46% | 0.00% |
| Percent of Adults over 65 | 16.03% | 16.36% | 19.46% | 20.90% |
| Percent Below the Poverty Line | 12.84% | 16.61% | 10.17% | 1.24% |
| Percent of Adults with a Disability | 15.25% | 21.19% | 20.96% | 11.11% |
| Percent with Limited English Proficiency | 8.25% | 2.34% | 2.07% | 0.00% |

During future phases of project development, a more detailed and robust analysis would be required for the National Environmental Policy Act (NEPA) documentation when assessing the potential for adverse and disproportionate impacts to those with disabilities, poverty status, minority populations, and limited English proficiency.

# 4.0 FUTURE CONDITIONS

To determine the need for and purpose of potential transportation improvement options, it is necessary to estimate future conditions. This chapter summarizes the anticipated future conditions within the study area. A complete summary of traffic forecasting can be found in **Appendix D**.

## 4.1 POPULATION TRENDS

Population data, including data from the 2020 Census, were obtained from the Kentucky State Data Center (KSDC) at the University of Louisville, Kentucky's official clearinghouse for Census data. Population estimates and projections for the state of Kentucky, Boyd County, and Ashland are summarized in **Table 3**. Between 2000 and 2020, population in Boyd County and Ashland slightly declined. This decline in population is expected to continue in Boyd County to 2050.

**Table 3: Population Estimates & Projections**

| Area | Census Estimates | | | Annual Growth | 2050 Projection | Annual Growth |
|---|---|---|---|---|---|---|
| | 2000 | 2010 | 2020 | 2000 - 2020 | | 2020 - 2050 |
| **Kentucky** | 4,041,769 | 4,339,367 | 4,505,836 | 0.54% | 4,785,233 | 0.20% |
| Boyd County | 49,752 | 49,542 | 48,261 | -0.15% | 41,028 | -0.54% |
| Ashland | 21,879 | 21,712 | 21,588 | -0.07% | N/A | N/A |

## 4.2 HISTORICAL TRAFFIC COUNTS

Historical AADT volumes and annual growth rates, between 2000 and 2022, for study area roadways are summarized in **Table 4**. Daily traffic has generally decreased over the past 20 years in the study area. While counts can fluctuate significantly from year to year for many reasons, they still provide an opportunity to identify different growth trend lines. The red text in the tables represents traffic counts from 2020 which are not considered an accurate representation of recent traffic patterns due to COVID shutdowns. Therefore, the traffic counts from 2020 were omitted in the calculation of compound annual growth rates.

## 4.3 KYOVA REGIONAL TRAVEL DEMAND MODEL

Study area growth rates from the KYOVA regional travel demand model were reviewed. **Figure 13** presents the annual growth rates on the study corridor and adjacent roadways between 2020 and 2040. Annual growth rates on KY 716 range from 0.39 to 0.73 percent per year while rates on US 60 range from 0.66 to 0.85 percent per year. These positive growth rates reflect US 60 being used as a regional connection and growing even while the local population slightly declines.

**Table 4: Historical Daily Traffic**

| Year | KY 716 | KY 716 North | KY 3293 | Summitt Rd. | US 60 |
|---|---|---|---|---|---|
| | Sta. 010C20 | Sta. 010C27 | Sta. 010C30 | Sta. 010C35 | Sta. 010C36 |
| 2000 | | | | | |
| 2001 | | | | | |
| 2002 | 6,430 | 7,590 | | | 26,700 |
| 2003 | | | 2,510 | | |
| 2004 | | | | | 26,700 |
| 2005 | | 8,880 | | | |
| 2006 | 6,230 | | 2,280 | | |
| 2007 | | | | | 21,500 |
| 2008 | | 6,810 | | | |
| 2009 | 6,280 | | 2,280 | | |
| 2010 | | | | | 21,300 |
| 2011 | | 6,650 | | | |
| 2012 | 4,840 | | 2,115 | | |
| 2013 | | | | | 16,369 |
| 2014 | | 5,879 | | | |
| 2015 | 4,477 | | 2,054 | | |
| 2016 | | | | | 17,893 |
| 2017 | | 5,506 | | | |
| 2018 | 4,675 | | 1,823 | 4,271 | |
| 2019 | | | | 3,900 | 16,081 |
| 2020 | | 4,796 | | | |
| 2021 | 3,857 | | 1,370 | 3,831 | |
| 2022 | | | | 4,095 | 17,804 |
| **Long Term GR** | -2.65% | -2.12% | -3.31% | N/A | -2.01% |
| **Medium Term GR** | -3.98% | -2.33% | -4.16% | -1.05% | -1.48% |

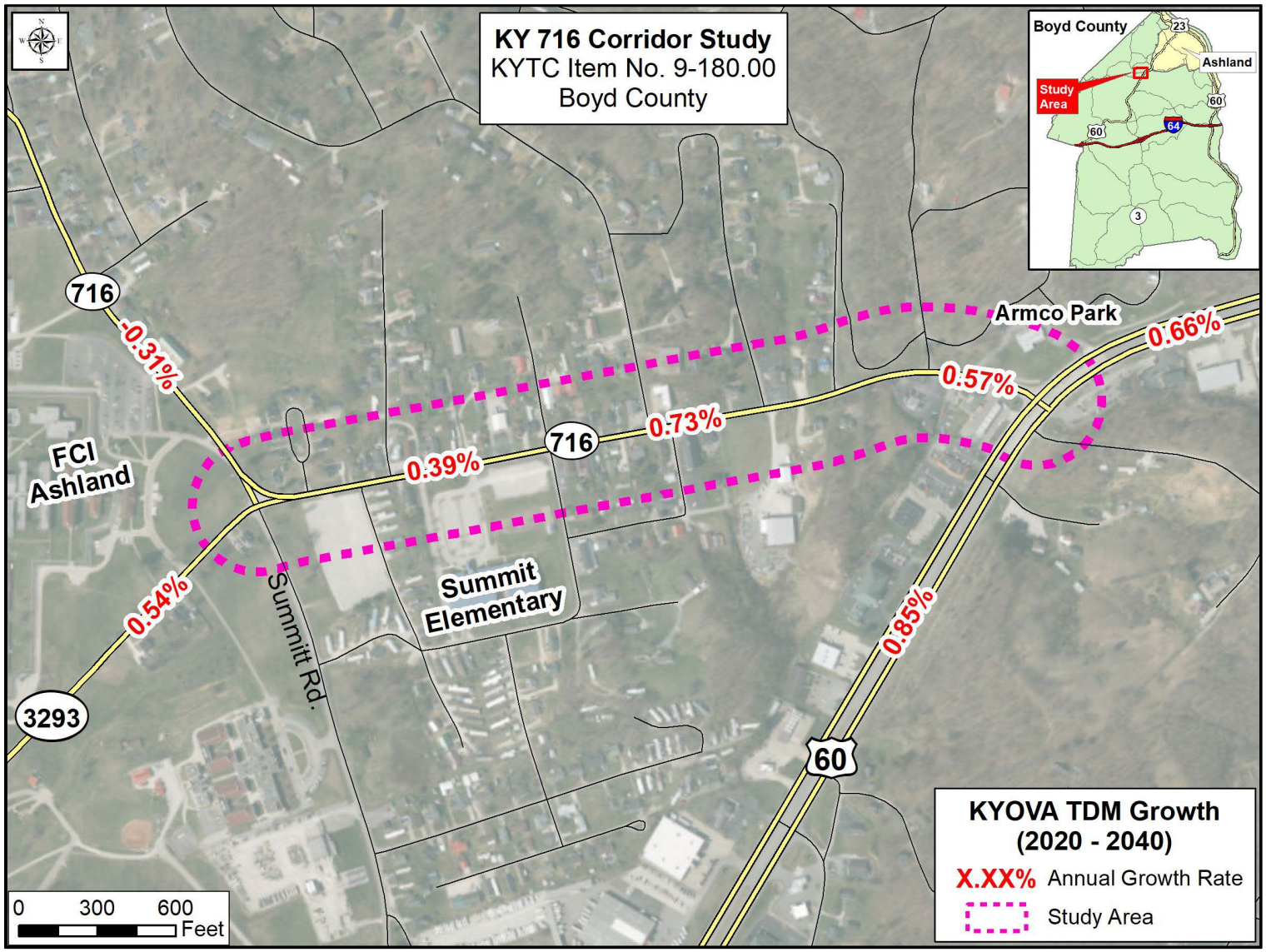


**Figure 13: KYOVA Model Annual Growth Rates (2020 - 2045)**

## 4.4 TRAFFIC FORECASTS

Based on the historical count data, study area population estimates and projections, and annual growth rates from the KYOVA regional travel demand model, an annual growth rate of 0.75 percent was selected to reflect the high end of potential growth for the KY 716 study area through the year 2045. The annual growth rate was then used to develop 2045 daily traffic forecasts, as shown in **Figure 14.** KY 716 is expected to carry 4,600 vpd in 2045.

### 4.4.1 2045 HCS Analysis

The annual growth rate was also used to develop 2045 turning movement forecasts at the three study area intersections along KY 716 where traffic counts were collected. HCS was then used to analyze the peak hour traffic operations based on the turning movement forecasts. **Table 5** presents the results from the analysis. All three intersections are expected to operate at LOS B or better in 2045 without any improvements.

# 5.0 STUDY OBJECTIVES

The objective of the *KY 716 Corridor Study* was to identify and evaluate the need for and scope of potential options to improve safety, mobility, and capacity between US 60 and KY 3293 (Summitt Road). Based on results from the traffic analysis, roadway capacity is not an issue on KY 716 and is not expected to be an issue by 2045. Capacity improvements were therefore not considered.

A review of existing utilities revealed water, sewer, gas, and electric lines along the study portion of KY 716. It should be noted that there are number of aboveground gas meters located in front of properties just outside of the right-of-way for KY 716. Minimizing impacts to these utilities is an objective of this study.

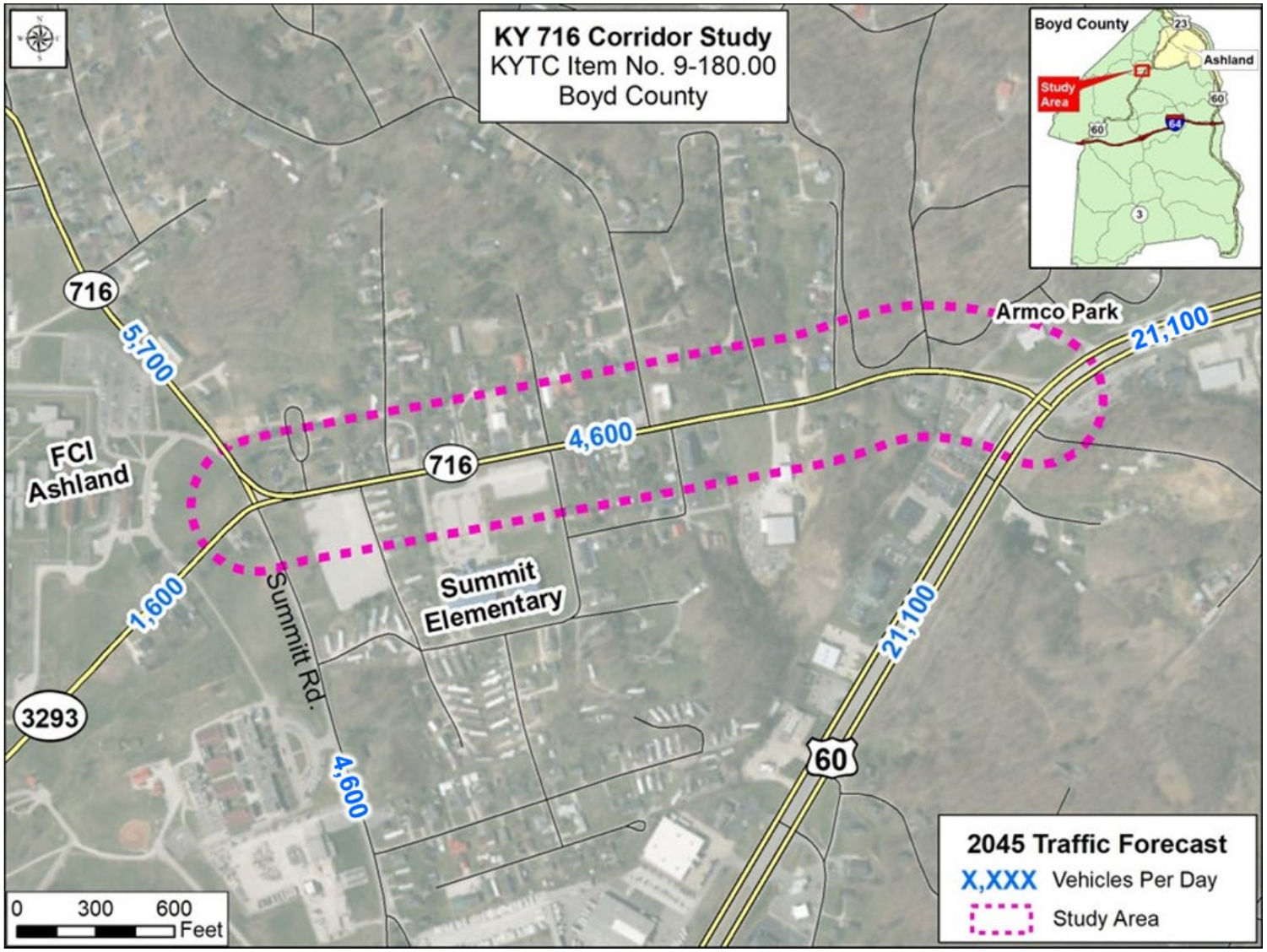


**Figure 14: 2045 Daily Traffic Forecasts**

**Table 5: 2045 No-Build HCS Traffic Analysis**

| Intersection | Approach | AM Peak | | PM Peak | |
|---|---|---|---|---|---|
| | | LOS | Delay (s/veh) | LOS | Delay (s/veh) |
| KY 716 at US 60 | EB KY 716 | C | 27.9 | C | 29.4 |
| | WB Car Lot | C | 22.9 | C | 23.3 |
| | SB US 60 | B | 13.4 | B | 14.6 |
| | NB US 60 | A | 7.7 | B | 15.5 |
| | **Total** | **B** | **13.0** | **B** | **17.2** |
| KY 716 at Summit Elementary | EB KY 716 | A | 0.0 | A | 0.0 |
| | WB KY 716 | A | 4.5 | A | 0.3 |
| | SB Private Driveway | A | 9.9 | A | 9.7 |
| | NB Elementary School | B | 13.2 | C | 17.3 |
| | **Total** | **A** | **2.7** | **A** | **4.9** |
| KY 716 at KY 3293 | EB KY 716 | A | 9.8 | B | 10.1 |
| | WB KY 716 | A | 9.5 | B | 10.4 |
| | SB Summitt Road | B | 12.2 | B | 13.0 |
| | NB Summitt Road | A | 9.7 | B | 12.0 |
| | **Total** | **B** | **10.8** | **B** | **11.9** |

# 6.0 INITIAL PROJECT TEAM AND STAKEHOLDER COORDINATION

Over the course of the study, the project team held three meetings to coordinate on key issues. The project team included representatives from KYTC Central Office, KYTC District 9, KYOVA, FIVCO, and the consultant, Stantec. Detailed summaries of each meeting are presented in **Appendix E**.

## 6.1 PROJECT TEAM MEETING NO. 1

The first project team meeting was held at Boyd County Middle School and virtually via Microsoft Teams on June 29, 2023. The purpose of the meeting was to present the results from the existing conditions analysis and to get feedback from the project team on transportation issues in the study area. Key discussion items included the following:

- Armco Park is designated Section 4(f) and 6(f), meaning the property is publicly owned and was purchased / developed with LWCF. Purchasing right-of-way in this area may be possible but only if the proposed project improves the park or public safety. Right-of-way which is acquired from a 6(f) resource shall also be replaced with land of equal or greater value.

- The KYTC HIS database showed the study portion of KY 716 with three-foot shoulders. It was noted that this is likely an overestimation. The KYTC HIS database showed a small section of KY 716 near US 60 as having a 55-mph speed limit. The District subsequently addressed the issue, and this section of KY 716 is now shown to be 35 mph.
- During a recent site visit, the drop-off and pick-up traffic patterns at Summit Elementary were observed.
    - It was noted that several eastbound vehicles on KY 716 were observed making a U-turn using the State Farm parking lot to travel westbound due to the prohibition of left-turn movements onto westbound KY 716 for parents exiting Summit Elementary in the afternoon.
- Because future funding was unknown at the time, various possibilities were explored. There is potential for KYOVA to fund a portion of the project along the corridor if the concept increased public safety and reduced emissions. Utilizing KYOVA funding and additional sources such as Safe Routes to School and the Highway Safety Improvement Program (HSIP), there is a possibility of full funding for the project with no match necessary.
- It was noted that the US 60 intersection had been restriped in the last three years. All signals and detectors are currently working properly.

## 6.2 LOCAL OFFICIAL / STAKEHOLDER MEETING NO. 1

The first Local Officials / Stakeholder meeting was held at Boyd County Middle School and virtually with Microsoft Teams on June 29, 2023. In addition to the project team, individuals / representatives from Boyd County Emergency Management, Boyd County Public Schools, Federal Bureau of Prisons, and Boyd County Fiscal Court were in attendance. The purpose of the meeting was to present the results from the existing conditions analysis and to get feedback from the local officials and stakeholders on transportation issues in the study area. Key discussion items from the meeting include:

- Representatives from FCI Ashland (the prison) indicated they do not want sidewalks in front of the facility on West Little Garner Road.
- Summit Elementary School has an enrollment of approximately 500 students and between 30 and 40 staff. The school system has no plans to expand Summit Elementary.
- Local officials mentioned that crashes were common at the Speedway entrance when a well-meaning driver leaves a gap in the queue of eastbound traffic on KY 716 to allow a vehicle to turn left from Speedway and possibly even motions for the driver to proceed. Subsequently, the driver from Speedway pulls out and is involved in a collision with another vehicle heading westbound on KY 716 which was obstructed from their view.
- Local officials believe there will be an increase in population due to the development of a new casino and racetrack being constructed in the area.

### 6.2.1 Local Officials / Stakeholder Survey No. 1

A survey was presented to local officials and stakeholders at the first Local Officials Meeting. The survey first asked the seven participants how often they drive on KY 716 in the study area. All respondents indicated they travel the corridor at least two to three times per month with most traveling multiple times per week. The respondents were then asked if they think improvements were needed long KY 716. Six of the seven respondents indicated that improvements are needed while one indicated that improvements are not needed.

The local officials were then asked to rank their top three transportation issues along the KY 716 corridor. The ranking was tallied by giving 3 points to the top priority of each respondent, 2 points to the second priority, and 1 point for the third priority. School traffic was the highest ranked issue by the local officials, followed by safety and lack of sidewalks, as shown in **Figure 15**.

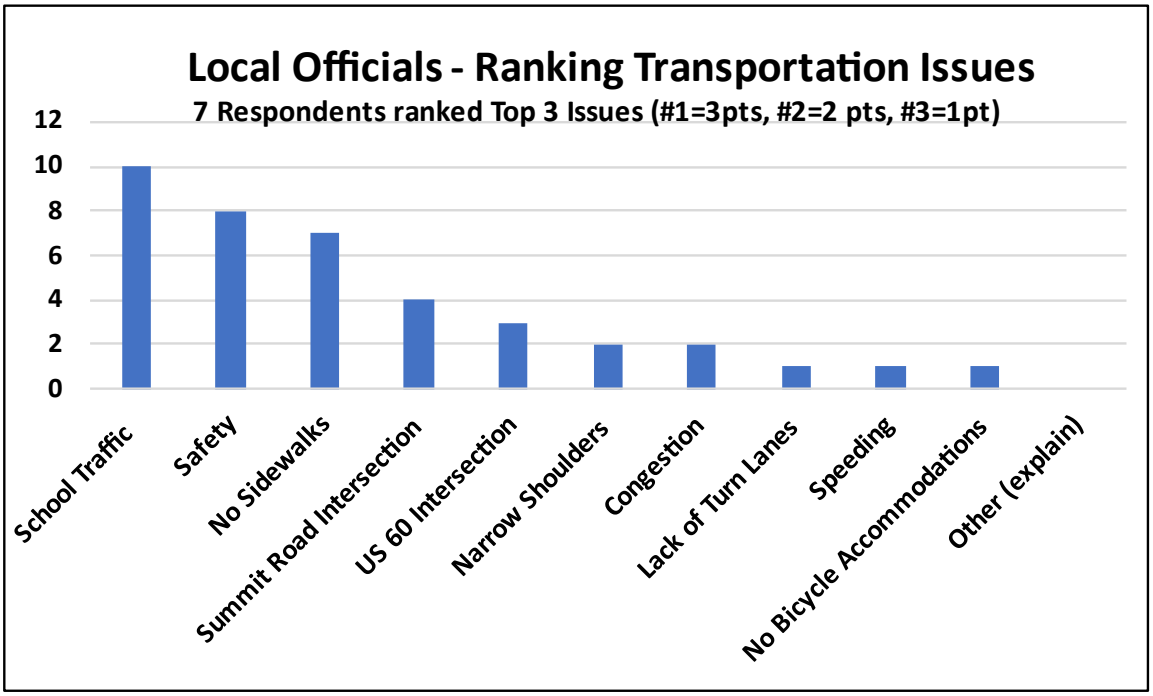


**Figure 15: Local Official Survey No. 1 - Ranking Transportation Issues**

As mentioned in Section 2, Summit Elementary School has an efficient process during their convening and dismissal hours to circulate vehicles. The on-campus gravel lot and well-organized process avoid storing queued vehicles on KY 716. However, traffic volumes and turning vehicles are highest during convening and dismissal times, which is likely the reason school traffic was identified by local officials as an issue on KY 716. Based on the results from a turn lane warrant analysis, neither a left turn lane nor a right turn lane is warranted at Summit Elementary.

Finally, respondents were asked if they had any specific suggestions for improvements along KY 716. The responses included improvements to the Summitt Road Intersection, adding turn lanes at Summit Elementary School, and adding sidewalks. It was noted at the meeting that the KY 716 intersection with Summitt Road is being improved through an HSIP project.

# 7.0 INITIAL IMPROVEMENT CONCEPTS

Improvement concepts were developed based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, and field reconnaissance. Initial improvement concepts included three-lane widening with multimodal improvements, an improved two-lane section with sidewalks, and spot improvements focused on improving safety.

Based on a review of data from STRAVA, an athletic app that tracks bicycle and pedestrian movement using heat maps with brighter colors representing more activity, ARMCO Park was found to have heavy pedestrian activity. The KY 716 study corridor was shown as warm, indicating moderate pedestrian activity on the north side of KY 716. Activity for bicyclists was highest on KY 716, with moderate activity in ARMCO Park. While STRAVA data only shows activity for users of its app and does not present a full picture of the bicycle and pedestrian activity in the area, the data showed that there is a need for multimodal accommodations on KY 716. The corridor wide improvement concepts discussed below improve multimodal mobility by providing sidewalk(s).

## 7.1 CONCEPT 1: THREE-LANE WIDENING

Concept 1 includes widening the travel lanes to 11-feet and constructing a center two-way left-turn lane (TWLTL) with curb and gutter and sidewalks on both sides of the roadway, as shown in **Figure 16**. The existing right-of-way and utilities would be maintained on the north side of KY 716, with widening occurring to the south. A utility strip is shown between the curb and sidewalk on the north side of KY 716 as all mailboxes are located on the north side.

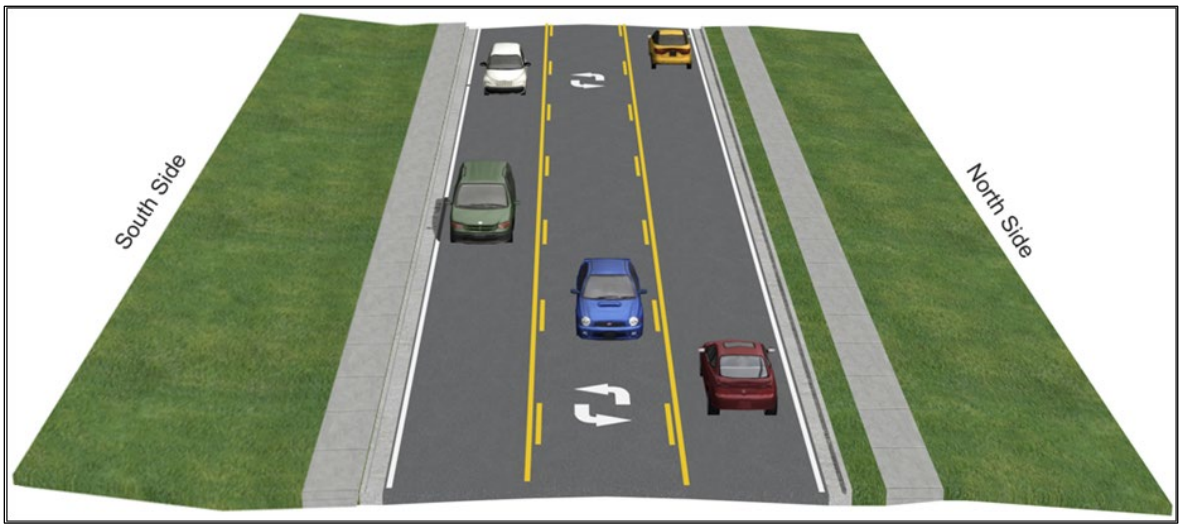


**Figure 16: Concept 1**

## 7.2 CONCEPT 2A: IMPROVED TWO-LANE SECTION WITH SIDEWALKS ON ONE SIDE OF THE ROADWAY

Concept 2A includes constructing a sidewalk with curb and gutter on one side (north) of the roadway to minimize impacts due to the large number of utilities along the corridor - both aerial and buried, as shown in **Figure 17**. The utility poles on the north side of KY 716 support transmission / communication lines and are generally located approximately seven to nine feet from the edge of the paved roadway. The utility poles on the south side of KY 716 support electrical service drop / communication lines and are located approximately three feet from the edge of the roadway.

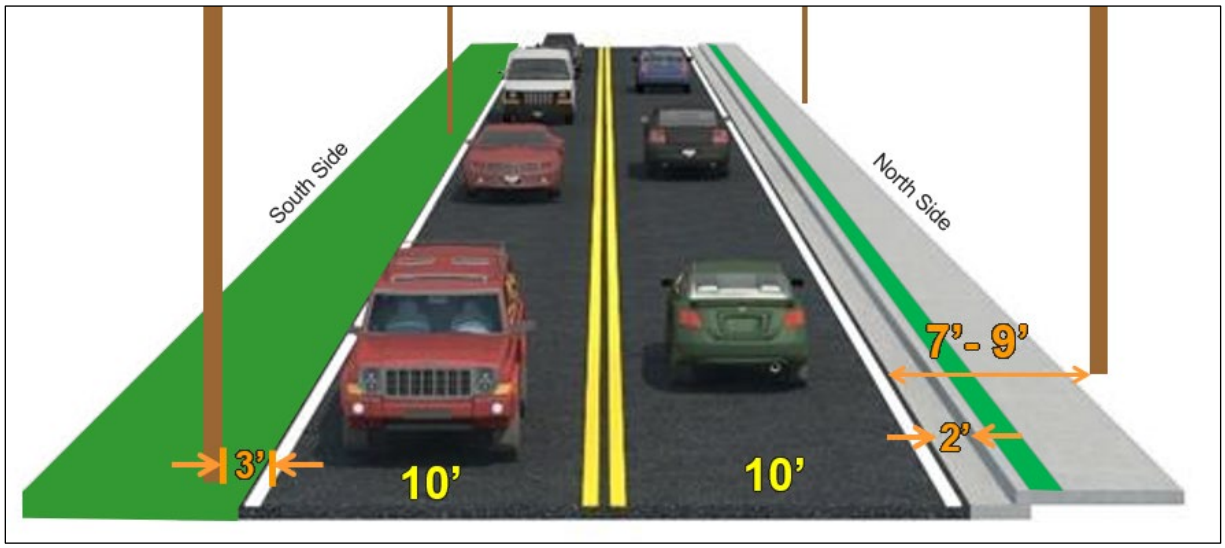


**Figure 17: Concept 2A**

## 7.3 CONCEPT 2B: IMPROVED TWO-LANE SECTION WITH SIDEWALKS ON BOTH SIDES OF THE ROADWAY

Concept 2B includes curb and gutter with sidewalks on both sides of KY 716, as shown in **Figure 18**. This option would require the relocation of the utility poles and some above ground gas meters on the south side of KY 716 but would be envisioned to stay within existing right-of-way (although temporary construction easements will likely be required). A utility strip is not shown between the curb and sidewalk on the south side of KY 716 as all mailboxes would remain on the north side.

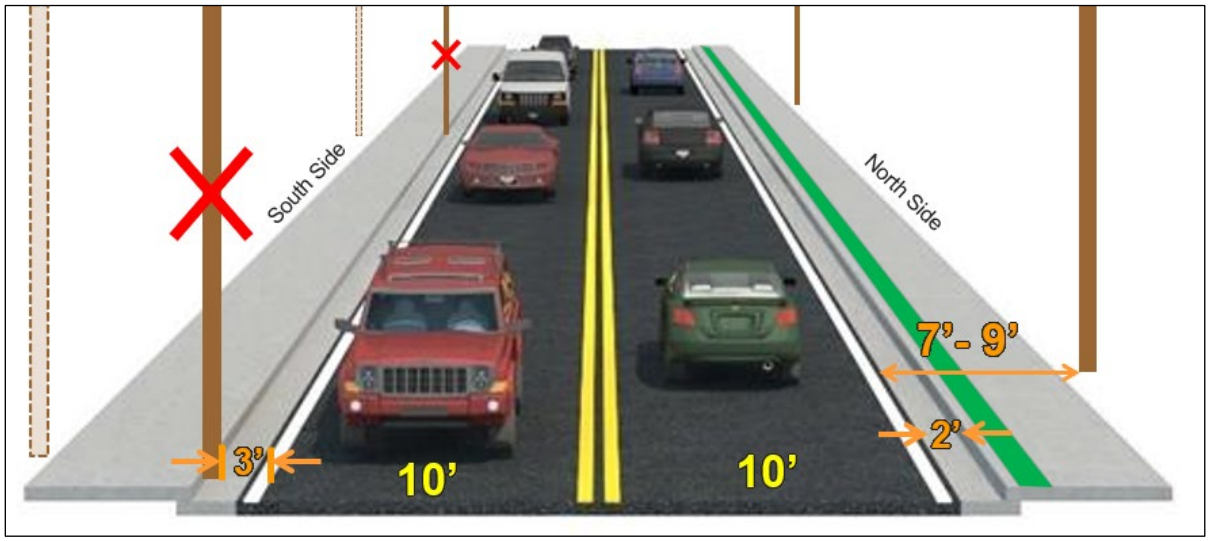


**Figure 18: Concept 2B**

## 7.4 SPOT IMPROVEMENTS

Based on results from the safety analysis, most of the injury collisions occurred at the KY 716 intersections with US 60 and KY 3293. There is a current HSIP project to improve safety at the KY 3293 intersection, so spot improvements were focused on the US 60 intersection.

### 7.4.1 Spot Improvement No. 1

The first spot improvement includes improving safety by prohibiting left turns to/from Speedway from/to KY 716 by installing a barrier or channelization system on KY 716, as shown in **Figure 19**.


**Figure 19: Spot Improvement No. 1**

The entrance would operate as right-in / right-out only. The distance between the stop bar for the eastbound KY 716 approach at the US 60 traffic signal and the easternmost Speedway entrance is approximately 60 feet. Queued vehicles on eastbound KY 716 frequently extend across the Speedway entrance. The driver of a queued vehicle may leave a gap in traffic to allow left turning motorists to proceed to/from Speedway which can result in a "courtesy" crash (when the left-turning vehicle crosses a lane of traffic and fails to yield the right of way).

### 7.4.2 Spot Improvement No. 2

The second spot improvement is to restripe the left-turn lane for northbound US 60 as a tapered (diagonal) offset left-turn with a raised median to further designate the left-turn lane, as shown in **Figure 20**.

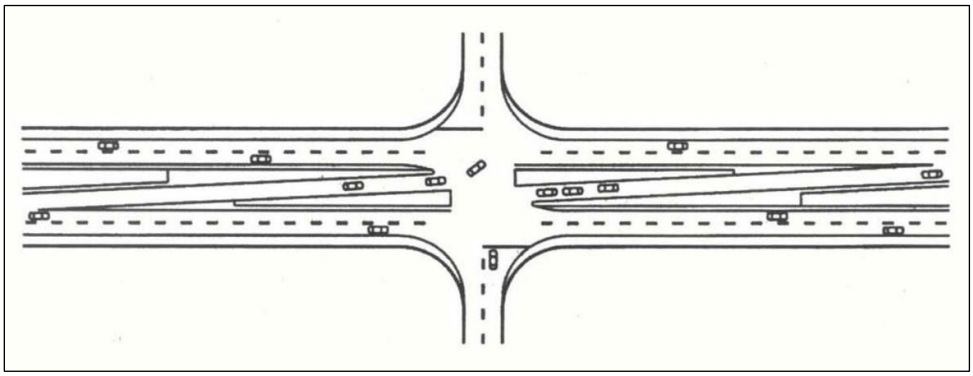

**Figure 20: Tapered Offset Left Turn**

The existing concrete paved median is flush with a width over 30 feet wide and the pavement striping for the parallel offset left turn lane are faded making it difficult for motorists to ascertain where to enter the left-turn lane. FHWA's Handbook for Designing Roadways for the Aging Population provides guidance for design of offset left-turn lanes. Offset left-turn lanes are used to reduce the risk of crashes due to sight restrictions from opposite left-turn vehicles. Although the left-turn signal indication from northbound US 60 to westbound KY 716 is protected-only, a tapered offset left-turn lane is suitable for higher speed arterials like US 60 and can be constructed with a raised median to further delineate the lane, as shown in **Figure 21**. It should be noted that there is a storm drain in the median and evidence of potential ponding water. Further consideration is required prior to implementing this concept as additional costs to address drainage may be necessary.


**Figure 21: Spot Improvement No. 2**

### 7.4.3 Spot Improvement No. 3

The third spot improvement is to eliminate the westernmost entrance at the Crisp Dairy Treat and tighten the easternmost entrance, as shown in **Figure 22**. The crash analysis identified two angle crashes which were in front of the Crisp Dairy Treat, and the property owners have posted a sign in their parking lot notifying existing customers to use only the east driveway. The figure depicts a hypothetical access management strategy to close the west entrance and create a narrower east entrance which lines up better with the entrance to Armco Park across the street and improves sight distance. This would allow for more orderly merging of traffic, reduces potential conflict points, improves sight distance, and presents fewer challenges to drivers. This concept would require coordination with the Crisp Dairy Treat.


**Figure 22: Spot Improvement No. 3**

# 8.0 SECOND PROJECT TEAM AND STAKEHOLDER MEETINGS

Following the development of the initial improvement concepts, the project team met for a second time. During the meeting, improvement concepts were presented, and attendees were asked to provide feedback regarding their concerns and priorities. Summaries for all meetings are found in **Appendix E**.

## 8.1 PROJECT TEAM MEETING NO. 2

The second Project Team Meeting for the subject project was held at the District 9 office in Flemingsburg, Kentucky and virtually with Microsoft Teams on November 13, 2023. The purpose of the meeting was to present the results from the stakeholder survey and to get feedback from the project team on improvement concepts. Key discussion items included the following:

- The roundabout project will address the safety issues mentioned at the intersection of KY 3293 / Summitt Road with KY 716.
- KYTC did not want to create a new queueing location on KY 716 to store vehicles waiting to pick up students.
- The crash summary identified one angle crash on Bertha Drive at the parking lot entrance to the school but no angle crashes on KY 716 in the vicinity of the school between 2018 and 2022.
- During discussion regarding about the prohibition of left turns to/from the Speedway onto KY 716, Stantec advised that another district had good results from Pexco "FG-300 Interstate Grade Curb System" as a cost-effective channelization device. The system withstood traffic impacts and required less maintenance than "Qwick Kurb."

## 8.2 LOCAL OFFICIALS MEETING NO. 2

The second Local Officials Meeting was held at the Boyd County Library Midland Branch on March 7, 2024. In addition to the project team, individuals / representatives from Boyd County Emergency Management, Federal Bureau of Prisons, and Boyd County Fiscal Court were in attendance. The purpose in this meeting was to solicit feedback from the local officials / stakeholders on improvement concepts. Key discussion items included the following:

- There was a question if speeding is a factor on KY 716. It was noted that the goal of the study is not to widen the roadway and encourage faster speeds.
- No pedestrians have been observed walking to or from Summit Elementary during the morning and afternoon.
- Due to the proximity of Summit Elementary, there may be federal funding available such as Safe Routes to School.
- Mailboxes for homes located on the south side of the KY 716 roadway are on the northern side of the roadway. While the locations of some mailboxes may be consolidated to one area to decrease crossing points, further collaboration with the United States Postal Service is likely needed.
- Employees of the federal prison west of the study area do not support closing the left turn out of Speedway as shown in Spot Improvement No. 1.

### 8.2.1 Local Officials / Stakeholder Survey No. 2

Surveys were distributed to the local officials present at the meeting. The purpose of the survey was to gather feedback on the proposed improvement concepts. Respondents were asked to complete the survey before leaving the meeting.

Nine respondents completed the seven-question survey. Seven of the nine respondents either live, work, or both live and work in the study area and eight of the nine respondents travel through the study area at least monthly with six respondents traveling even more frequently.

Eight of the nine respondents think that corridor-wide improvements are needed in the study area while one respondent said improvements are not needed. Of the eight respondents that indicated improvements are needed, **all eight chose the corridor-wide Improvement Concept 2A** (Curb & Gutter with a Sidewalk on the North Side Only) as the preferred concept.

Respondents were asked which of the three Spot Improvements, if any, that they support. Although the survey specified that respondents should "check all that apply", only two of the nine respondents selected more than one, which could indicate that there was some confusion. There was support for all three Spot Improvements, with Spot Improvement 2, restriping the left-turn on northbound US 60 to westbound KY 716, as the most popular, as shown in **Figure 23**.

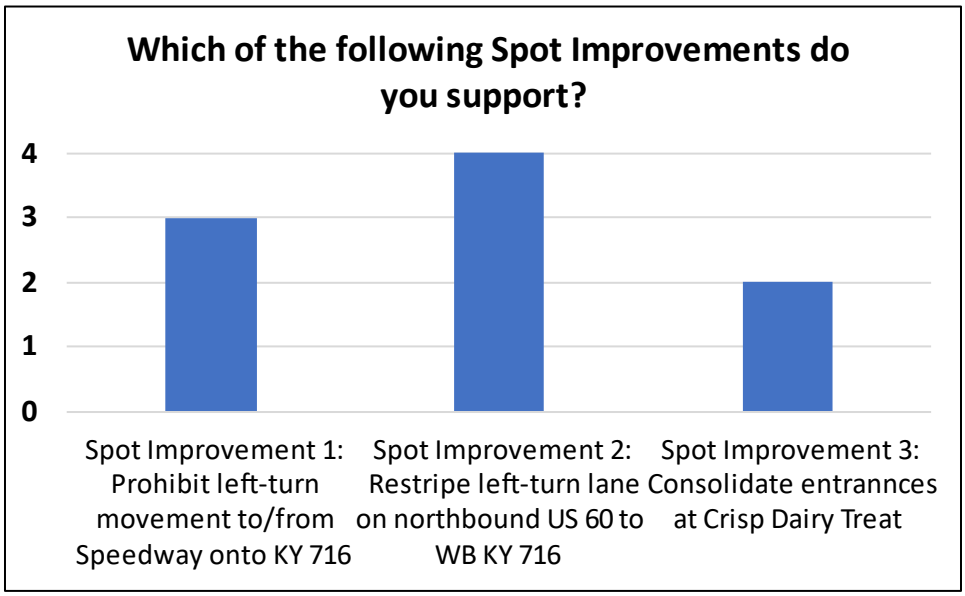


**Figure 23: Local Official Survey No. 2 - Spot Improvements**

The survey asked if there were other improvements that respondents would like the project team to consider. Three respondents indicated a need for street / sidewalk lighting and one respondent suggested consolidating the entrances for Speedway, McDonalds, and Crisp Dairy Treat together.

The survey also asked if there were any improvements that the respondents would like the project team to remove from consideration. Three respondents noted that Concept 1 (Three-Lane TWLTL with Curb & Gutter with Sidewalks) should be removed. One respondent noted that Spot Improvement 1 (Prohibit left turns to/from Speedway from/to KY 716) should be removed due to number of staff from Federal Correctional Institution (FCI) Ashland that use this entrance to get to the prison from Speedway.

# 9.0 REVISED IMPROVEMENT CONCEPTS

Improvement concepts were revised based on feedback from the project team and local officials / stakeholders.

## 9.1 SIDEWALK DESIGN

The preliminary layout for sidewalks was based on Condition No. 3 of KYTC Standard Drawing for Concrete Entrance Pavement and Sidewalk[2] as a way to reduce both right-of-way and utility impacts. Based on comments from the project team, Condition No. 1 from the same standard drawing was used, which incorporates a small utility strip between the curb and sidewalk. Condition No. 1 can accommodate roadside mailboxes and maintains a consistent grade (running slope parallel to the direction of travel) across entrances for a sidewalk but does require more right-of-way.

## 9.2 MAILBOX IMPACTS

A field survey of mailboxes was conducted for the north side of KY 716 to determine the number of mailboxes and the number of locations of mailboxes, as some mailboxes were co-located or mounted on a common base. There were 26 mailboxes at 16 different locations. Five locations also had a separate newspaper box which could be combined with a mailbox for those properties.

The United States Postal Services (USPS) has a specific guideline standard that must be followed for both manufacturers of approved mailboxes and the installation of such mailboxes for curbside use. The latest standard, USPS-STD-7C[33], provides design dimensions for a traditional mailbox. Other mailbox designs classified as contemporary that do not conform to shape of traditional design but meet limited capacity requirements while not exceeding the maximum dimensions are allowed. The standard also specifies that curbside mailboxes should be set 6 to 8 inches back from the front face of the curb or the edge of the road and 41 to 45 inches from the ground or street surface and up to the inside floor of the mailbox.

## 9.3 PROJECT TEAM MEETING NO. 3

The third Project Team Meeting for the subject project was held at the Boyd County Library Midland Branch and virtually with Microsoft Teams on March 7th, 2024. The purpose of the meeting was to discuss results from the second Local Officials / Stakeholder survey and determine prioritization for improvement concepts. Key discussion items included the following:

- KYTC requested a preliminary layout and construction cost estimate for Condition No. 1 with a four-foot minimum utility strip. District 9 will develop right-of-way and utility cost estimates for this option. Condition No. 1 and Condition No. 3 provide KYTC with alternatives for consideration in the design phase.
- KYTC requested Stantec review and quantify the available sight distance for eastbound KY 716 from each of the two Crisp Dairy Treat approaches. As-built roadway plans are not available showing the vertical alignment on KY 716.
    - Following the Project Team Meeting, a field review was conducted and the time (seconds) between when a vehicle on eastbound KY 716 was visible to a motorist

[2] https://transportation.ky.gov/Highway-Design/Standard%20Drawings%20DGNS%202020/rpm150.pdf
[3] https://about.usps.com/publications/engineering-standards-specifications/spusps-std-7c.pdf

crossing the Crisp Dairy Treat entrances was measured. From the westernmost approach from Crisp Dairy Treat, the time between when a vehicle was visible until it was at the entrance was 2 seconds. Based on an approach speed of 35 miles per hour (51.3 feet/sec), there is a sight distance of 103 feet. From the easternmost approach, the time between when a vehicle was visible until it was at the approach was five seconds which equates to sight distance of 257 feet.

Stopping Sight Distance is the distance required for a vehicle traveling at or near the design speed to stop safely. The design Stopping Sight Distance for 35 mph is 250 feet (AASHTO A Policy on Geometric Design of Highways and Streets) meaning that the easternmost approach provides adequate sight distance (>250 feet) for an approaching eastbound vehicle on KY 716, but the westernmost approach does not. This would support Spot Improvement No. 3 of closing the westernmost approach to Crisp Dairy Treat and compressing the width of easternmost approach. Furthermore, during the field visit, a sign identified in the parking lot of Crisp Dairy Treat facing customers at the westernmost approach states "Danger Please Use Other Exit" with an arrow pointing toward the easternmost approach. This indicates that closure of the westernmost approach would be supported by the property owner.

# 10.0 CONCLUSIONS

The objective of this study was to identify and evaluate the need for and scope of potential options to improve safety, mobility, and capacity between US 60 and KY 3293 (Summitt Road). Improvement concepts were developed based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, and field reconnaissance.

## 10.1 EVALUATION MATRIX

An evaluation matrix was developed to summarize the improvement concepts' ability to satisfy the study objectives. **Table 6** presents the evaluation matrix, which includes estimated total cost and whether the concept improves safety, mobility, and capacity and reduces right-of-way and utility impacts. Based on results from the traffic analysis, roadway capacity is not an issue and is not expected to be an issue in the future. Therefore, capacity improvements were not considered.

**Table 6: Evaluation Matrix**

| Issues / Project Goals | Existing (No Build) | Concept 1 (3-Lane Section with TWLTL and Sidewalks on Both Sides) | Concept 2A (Sidewalk on Northside Only) | Concept 2B (Sidewalks on Both Sides) | Concept 3 (Spot Improvements) |
|---|---|---|---|---|---|
| Estimated Total Cost | $0 | $8,300,000 | $2,800,000 | $4,700,000 | Low Cost |
| Improves Safety | ✗ | ✓ | ✓ | ✓ | ✓ |
| Improves Mobility | ✗ | ✓ | ✓ | ✓ | NA |
| Improves Capacity | NA | NA | NA | NA | NA |
| Reduces Right-of-Way Impacts | ✓ | ✗ 1 | ✓ | ● 2 | ✓ |
| Reduces Utility Impacts | ✓ | ✗ 3 | ● 4 | ✗ 3 | ✓ |

Note 1: Potential 4 home relocations
Note 2: ROW easements likely / ROW acquisition possible
Note 3: Assumes electric, gas, water, sewer & communication relocations
Note 4: Assumes water & sewer relocations

Key:
✗ Not addressed
● Somewhat addressed
✓ Addressed

While Concept 1 improves safety and mobility, it will likely require home, electric, gas, water, sewer, and communication line relocations. Concept 2A provides improved safety and mobility for all modes of travel while limiting the right-of-way and utility impacts.

As part of the design of Concept 2A, Condition No. 1 and Condition No. 3 in KYTC's Standard Drawing for Concrete Entrance Pavement and Sidewalk should both be considered. Condition No. 1 incorporates a small utility strip between the curb and sidewalk to accommodate roadside mailboxes and maintains a consistent grade (running slope parallel to the direction of travel) across entrances for the sidewalks. Condition No. 3 removes the utility strip which would reduce right-of-way and utility impacts. **Table 7** presents an Opinion of Probable Cost for the cost per phase (Design, Right-of-Way, Utilities, and Construction) for both Sidewalk Condition No. 1 and Condition No. 3

**Table 7: Opinion of Probable Cost for Concept 2A**

| Description | 2024 Opinion of Probable Cost | | | | |
|---|---|---|---|---|---|
| | Design | Right-of-Way | Utilities | Construction | Total |
| Concept 2A (Sidewalk on Northside Only w Utility Strip - Condition No. 1) | $200,000 | $150,000 | $750,000 | $1,700,000 | $2,800,000 |
| Concept 2A (Sidewalk on Northside Only - Condition No. 3) | $200,000 | $100,000 | $600,000 | $1,600,000 | $2,500,000 |

## 10.2 RECOMMENDATIONS

Based on a combination of input from the project team, a review of existing conditions, local officials / stakeholder input, public input, and field reconnaissance, the following improvements are recommended to move forward to Phase 1 Design:

- **Concept 2A**: construct sidewalks with curb and gutter on one side (north) of the roadway to minimize impacts due to the large number of utilities along the corridor.
- **Spot Improvement 1**: prohibit left turns to/from Speedway from/to KY 716 by installing a barrier or channelization system on KY 716.
- **Spot Improvement 2**: restripe the left-turn lane for northbound US 60 as a tapered (diagonal) offset left-turn with a raised median to further designate the left-turn lane. Further consideration is required prior to implementing this concept as additional costs to address drainage may be necessary.
- **Spot Improvement 3**: eliminate the westernmost entrance at the Crisp Dairy Treat and tighten the easternmost entrance. It is envisioned that this improvement would be implemented by the property owner with District approval or incorporated with the project for Concept 2A.

## 10.3 NEXT STEPS

The next step following this study for any potential improvements would be Phase 1 Design (Preliminary Engineering and Environmental Analysis). Funding for the Design phase is programmed in *Kentucky's FY 2024 – FY 2030 Enacted Highway Plan*.

Concept 2A could also be developed at the local level or through the Kentucky Ohio West Virginia Interstate Planning Commission (KYOVA) using federal funding and/or grants. Multi-modal grant opportunities are an emphasis in current federal funding programs. Due to the proximity of Summit Elementary, there may be federal funding available through programs such as Safe Routes to School.

# 11.0 CONTACTS/ADDITIONAL INFORMATION

Written requests for additional information should be sent to Mikael Pelfrey, Director, KYTC Division of Planning, 200 Mero Street, Frankfort, KY 40622. Additional information regarding this study can also be obtained from the KYTC District 9 Project Manager, Michael Read, at (606) 845-2551 (email at Michael.Read@ky.gov).

# Appendices are located on the KYTC Division of Planning Website:

SCAN ME

https://transportation.ky.gov/Planning/Pages/Project-Details.aspx?Project=KY%20716%20Corridor%20Study