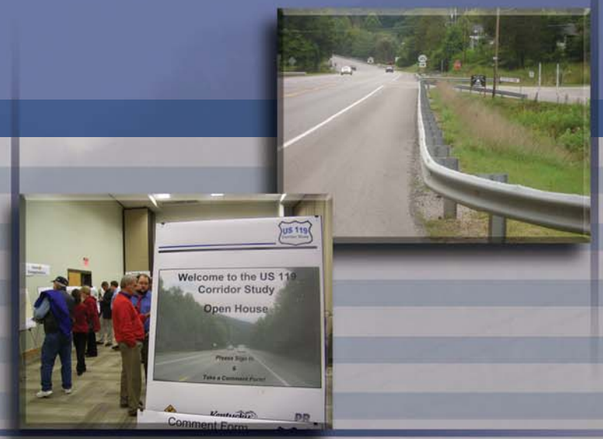
Item Number: 11-8511.00



US 119 Corridor Study

Summary of Findings and Recommendations

Prepared for:

Kentucky Transportation Cabinet

Kentucky UNBRIDLED SPIRIT

KENTUCKY TRANSPORTATION CABINET

Prepared by:

PB 125 YEARS PARSONS BRINCKERHOFF

April 2010

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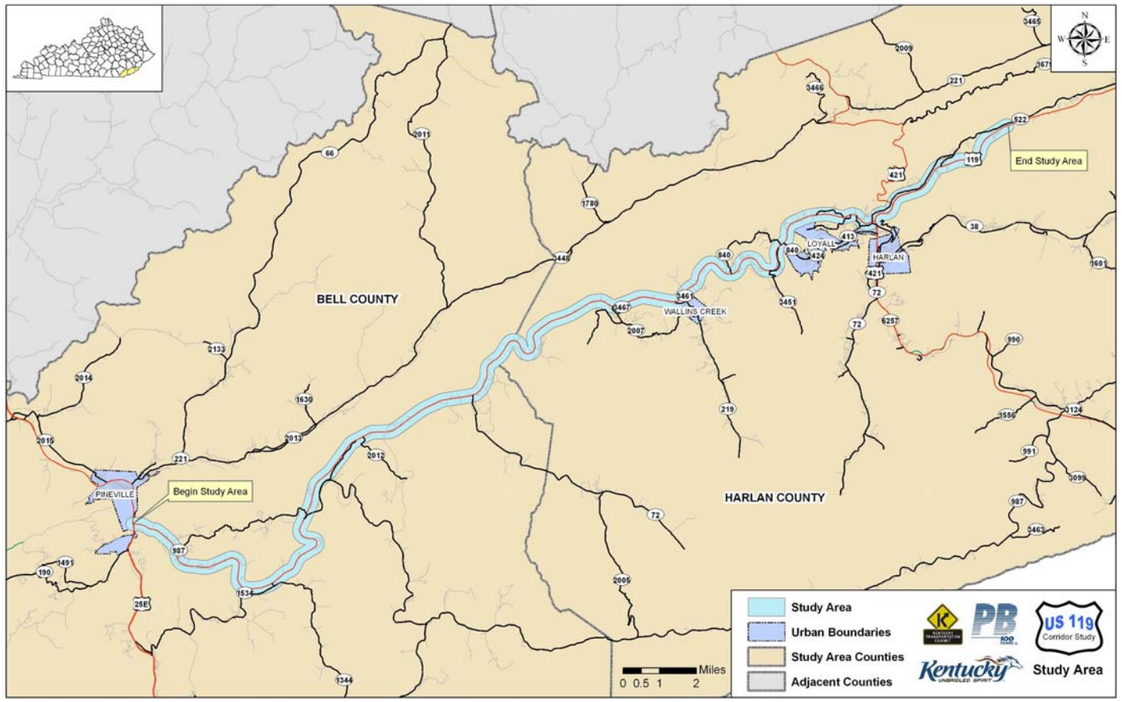
Introduction and Study Area
The Kentucky Transportation Cabinet (KYTC) has contracted with Parsons Brinckerhoff (PB) to examine the need for and reasonable solutions for improvements to US 119 from Bell County MP 0.0 to Harlan County MP 18.0 (a distance of approximately 33 miles). US 119 is the primary east-west access route for this region. The study area is shown in **Figure ES 1** below.

Figure ES 1: Study Area Map



Purpose and Need
The purpose of this project is to examine the need for and reasonable solutions to improve safety, reliability and mobility between Pineville and Harlan on US 119 in Bell and Harlan Counties. Supporting the project purpose is the project need. Project needs include connectivity, vehicle safety, travel time reliability, and economic development.

Existing and Future Conditions
Existing and future highway characteristics, geometrics, traffic volumes, truck traffic, speed, levels of service (LOS), and crash rates were all evaluated as part of the existing conditions analysis. The key transportation issues identified from this analysis are summarized below:

- Existing (2009) Average Daily Traffic (ADT) volumes range from 5,000 to 11,600 vehicles per day.
- There are several geometric deficiencies with regards to horizontal curvature.
- The historical traffic growth rates (0.4% to 1.0%) are relatively low along most segments of the roadway.
- Trucks comprise up to 9% of the total ADT along US 119
- Current year LOS is LOS B and LOS C for corridor segments.
- Year 2040 LOS remains at LOS B and LOS C for corridor segments.
- All segments of the roadway have a critical crash rate factor less than one, but many have a section crash rate greater than the statewide average crash rate.
- High spot crash rates were found at two locations:
  - The intersection of US 119 and US 25E; and
  - The signalized intersection of US 119 and US 421.
- Single vehicle crashes are the most common type of crash in the study area.
- There were 8 fatalities that occurred between September 1, 2006 and August 31, 2009.

Both human natural and environmental overviews were performed as part of the existing conditions analysis. The Environmental Justice (EJ) review showed that there were several areas within the study area that exceed the regional, state, and national rates of poverty, primarily located near Pineville and just inside the Harlan County line. There is one bridge in the area over the Cumberland River that is eligible for the National Register of Historic Places. There are very few archaeological resources that have been identified in the study area.

Aquatic resources include the Cumberland River and its tributaries. There are also 23 palustrine wetlands in the area and US 119 goes through several designated flood plains. There are thirteen threatened, rare and / or endangered species that occur within the study area, but no wildlife refuges, wildlife management areas, nature preserves, or other managed areas.

Key geotechnical concerns included numerous oil and gas wells located within the study area, the types of slope cuts depending on the formation, and underground abandoned and active mines. Identification and avoidance is recommended if possible.

Public Involvement
Public involvement for the US 119 Corridor Study was comprised of several key elements designed to encourage participation and obtain feedback from the stakeholders in Bell and Harlan Counties. The key aspects included: meetings with local elected officials, public meetings, and meetings with the Project Development Team (PDT).

Two meetings were held with local elected officials. The purpose of the first meeting was to present the existing conditions and obtain feedback on issues and potential solutions. KYTC District 11 also presented some short-term spot improvements they developed, and requested feedback on which of these improvements should move forward. The purpose of the second meeting was to present the progress to date on the project, findings from the public meetings, and the list of potential corridor improvements.

Two public meetings were held, one at the Harlan Civic Center in Harlan County, the other at the Page Elementary School Center in Bell County. The public meetings were held in a traditional open house-style format. Key goals for these meetings were to gather input on the issues and

concerns of the project, to propose potential improvements and to help choose the improvements to be recommended.

Meetings were held with the project development team throughout the study to discuss project issues. These included the elected officials and stakeholder meetings, public meetings (preparation and results), issues and goals, development of improvements, evaluation of improvements, and a meeting to discuss project recommendations

Development of Potential Improvements
A detailed, multi-step process was used to develop and evaluate potential projects for the US 119 corridor. The process included an evaluation of spot improvements previously developed by KYTC, field reviews, technical analysis, and public input.

Improvement Recommendation
Additional analysis, field review, and public input refined the list of potential improvements to a list of recommended projects. These are shown on the following figures **Figure ES 2** and **Figure ES 3.** Note that not all the projects are shown in these graphics as some, such as the D-11 projects for Harlan County, were not included in the study. In addition, the corridor wide centerline rumble strips and pavement markings are also not shown as they were added late in the study.

Ten projects were recommended for Bell County including:

- 1 curve improvement
- 4 turn lane projects
- 2 passing lane projects
- 1 two-way left-turn lane project
- 1 side roadway closure project
- Corridor-wide rumble strips and reflective pavement markings

Total estimated cost (including design, right-of-way, utilities, and construction) in 2010 dollars is $33.4 million for the ten projects.

Nine projects were recommended for Harlan County including:

- 1 curve improvement
- 4 turn lane projects
- 1 passing lane extension
- 2 safety improvement projects
- Corridor-wide rumble strips and reflective pavement markings

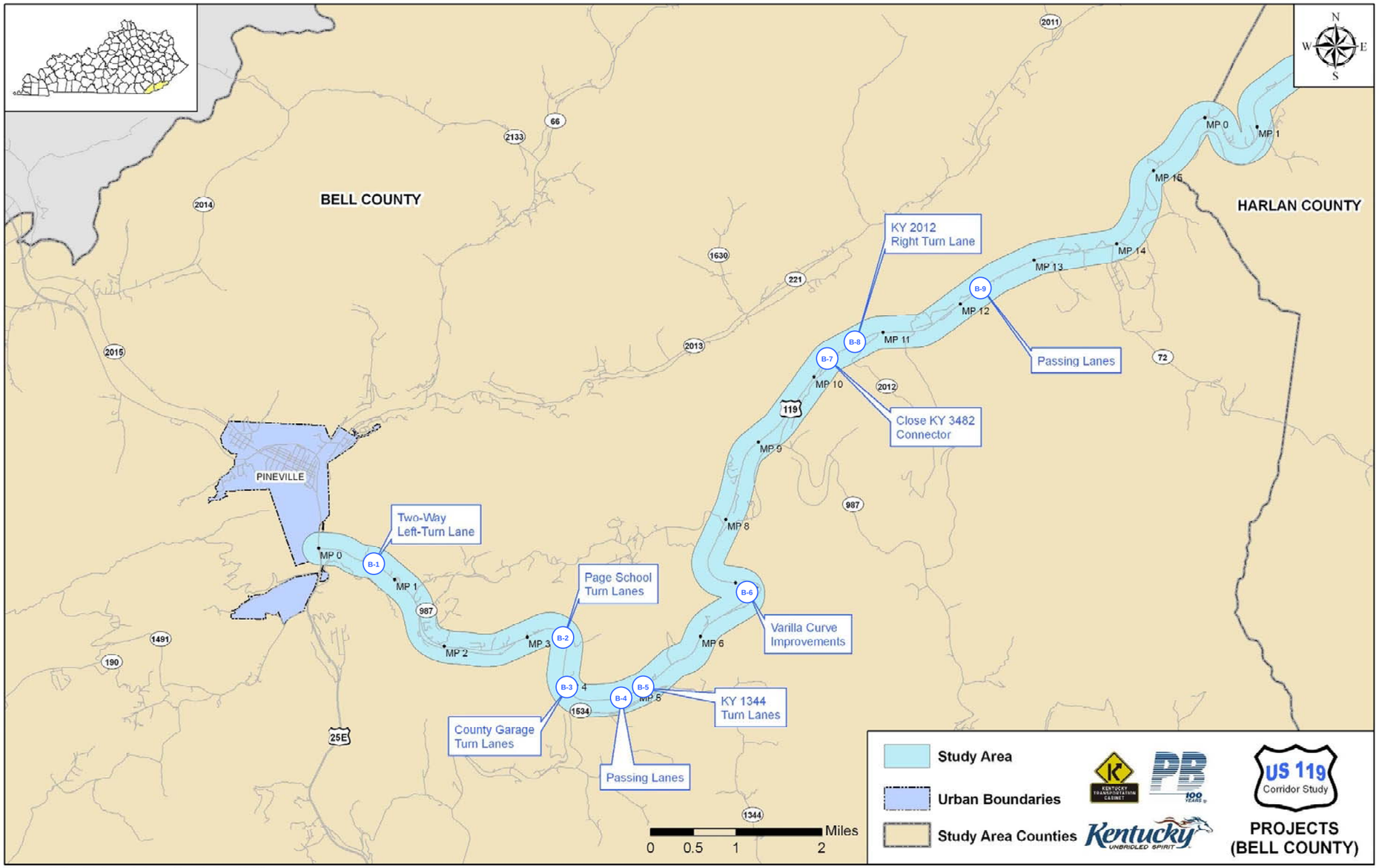
In addition, the KYTC D-11 staff had previously identified five (5) projects for Harlan County as part of the on-going US 119 improvements. These projects are included in the project prioritization presented in Table ES 1. Note that they are NOT included in the report however.

Total estimated cost (including design, right-of-way, utilities, and construction) in 2010 dollars is $49.9 million for the 14 projects.

Project Prioritization
Project prioritization was completed following the second meeting with the elected officials and stakeholders. Initially two projects were selected for top priority out of each county. KYTC District 11 further developed a project prioritization list for all projects, including projects they are currently pursuing for Harlan County (projects not currently in this study). This list of projects is shown in **Table ES 1**.

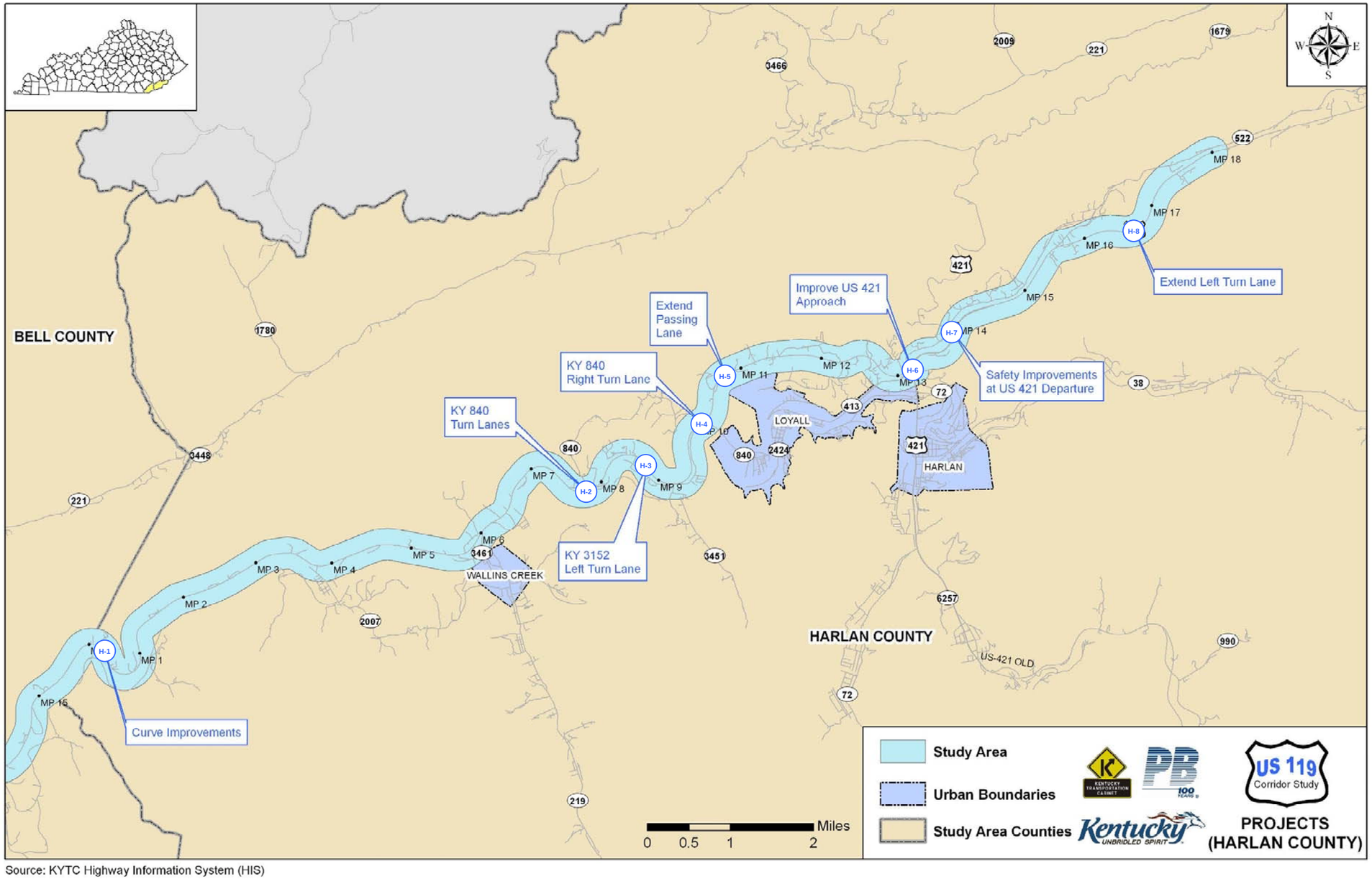
Projects H-9 and B-10 are listed but not given a project priority. It was determined that these projects are related to safety improvements that would best be completed during corridor re-surfacing or other maintenance activities.

Figure ES 2: Bell County Improvements



Source: KYTC Highway Information System (HIS)

Figure ES 3: Harlan County Improvements



Source: KYTC Highway Information System (HIS)

Table ES-1: US 119 Project Prioritization for Bell and Harlan Counties

Project Priority	Project Number	Located County	Project Description	Roadway Location From MP	To MP	Length	Estimated Costs - 2010 Dollars Design	ROW	Utilities	Construction	Total
1	B-1	Bell	Construct Two Way Left Turn Lane	0.50	1.00	0.50	$65,000	$25,000	$65,000	$650,000	$805,000
2	B-2	Bell	Construct Left and Right Turn Lanes at Page Elementary Schol	3.28	3.55	0.27	$100,000	$10,000	$72,000	$450,000	$632,000
3	B-6	Bell	Realign US 119 near Varilla Curve (Alt. 2)	6.59	6.97	0.55	$500,000	$75,000	$50,000	$22,300,000	$22,925,000
4	B-4	Bell	Widen US 119 to Provide Passing Lanes	4.20	5.20	1.00	$100,000	$50,000	$100,000	$1,100,000	$1,350,000
5	B-9	Bell	Widen US 119 to Provide Passing Lanes	11.20	13.60	2.40	$300,000	$100,000	$300,000	$3,600,000	$4,300,000
6	B-5	Bell	Widen US 119 to Provide Left and Right Turn Lanes for KY 1344	4.98	5.25	0.27	$125,000	$25,000	$75,000	$1,300,000	$1,525,000
7	B-8	Bell	Widen US 119 to Provide Right Turn Lane for KY 2012	10.51	10.60	0.09	$35,000	$25,000	$25,000	$360,000	$445,000
8	B-3	Bell	Widen US 119 to Provide Left and Right Turn Lanes for County Garage	4.01	4.28	0.27	$100,000	$25,000	$50,000	$1,100,000	$1,275,000
9	B-7	Bell	Remove Secondary Access to KY 3482	10.24	10.26	0.02	$0	$0	$0	$20,000	$20,000
N/A	B-10	Bell	Add a center line rumble strip and reflective pavement markings	0.00	15.88	15.88	$0	$0	$0	$100,000	$100,000
										Total	**$33,377,000**
1	**N/A**	**Harlan**	**Provide Left and Right Turn Lanes for KY 1084**	**12.44**		**0.25**	**$75,000**	**$35,000**	**$75,000**	**$707,000**	**$892,000**
2	**N/A**	**Harlan**	**Provide Two Way Left Turn Lane**	**10.80**	**11.70**	**0.90**	**$100,000**	**$15,000**	**$25,000**	**$1,287,000**	**$1,427,000**
3	H-1	Harlan	Realignment of US 119	0.00	1.45	1.05	$800,000	$350,000	$100,000	$16,100,000	$17,350,000
4	N/A	Harlan	Widen US 119 to Provide Passing Lanes	1.30	3.00	1.70	$250,000	$25,000	$150,000	$2,800,000	$3,225,000
5	N/A	Harlan	Extend Passing Lanes	6.50	7.50	1.00	$150,000	$75,000	$100,000	$1,570,000	$1,895,000
6	H-6	Harlan	Realign US 119 (Alt.1)	12.44	13.16	1.00	$900,000	$550,000	$250,000	$18,300,000	$20,000,000
7	H-8	Harlan	Widen US 119 to Extend Harlan County High School Turn Lanes	16.34	16.53	0.19	$75,000	$0	$25,000	$650,000	$750,000
8	H-5	Harlan	Widen US 119 to Extend Passing Lanes	10.66	10.79	0.13	$75,000	$15,000	$35,000	$650,000	$775,000
9	N/A	Harlan	Provide Right Turn Lane for KY 3451	9.10		0.25	$10,000	$10,000	$25,000	$123,000	$168,000
10	H-2	Harlan	Widen US 119 to Provide Left and Right Turn Lanes for KY 840	7.56	7.83	0.27	$100,000	$25,000	$75,000	$1,300,000	$1,500,000
11	H-3	Harlan	Widen US 119 to Provide Left Turn Lane for Freshmeadows Road	8.48	8.75	0.27	$100,000	$25,000	$50,000	$1,100,000	$1,275,000
12	H-4	Harlan	Widen US 119 to Provide Right Turn Lanes for KY 840	10.04	10.13	0.09	$50,000	$15,000	$50,000	$360,000	$475,000
13	H-7	Harlan	Provide Lighting at the US 119 and US 421 Intersection	13.83	13.96	0.13	$30,000	$0	$0	$70,000	$100,000
N/A	H-9	Harlan	Add a center line rumble strip and reflective pavement markings	0.00	17.26	17.26	$0	$0	$0	$110,000	$110,000
										Total	**$49,942,000**

Note: KYTC District Eleven is actively working on these two projects with the initial funding in Item No. 11-8511.00

1.0 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) initiated the US 119 Corridor Study in August 2009 to examine the need for and reasonable solutions to improve US 119 from Bell County MP 0.0 to Harlan County MP 18.0 for a total of approximately 33 miles. This section of US 119 was completed during the early 1970s and serves as a primary access route in southeastern Kentucky. This study identifies locations and priorities for new passing lanes, minor alignment improvements and solutions to improve overall traffic operations, focusing on safety, reliability and mobility throughout the corridor.

KYTC contracted with the consulting firm of Parsons Brinckerhoff (PB) to perform the study through the current Statewide Planning contract. Other members of the Project Development Team (PDT) included: KYTC District 11, KYTC Central Office Division of Planning, KYTC Central Office Division of Highway Design, and the Cumberland Valley Development District (CVADD).

1.1 Study Objectives

Based on the initial direction provided by the KYTC, six primary study objectives were developed as summarized below.

1. Examine existing traffic, highway, environmental, and safety conditions along the existing roadway;
2. Determine where there are problems or deficiencies;
3. Define project purpose and need;
4. Develop a list of long term improvements to satisfy the project purpose and need and address the identified problems;
5. Evaluate and prioritize the list of improvements, considering public input as well as transportation, community, environmental, and economic benefits and impacts; and
6. Recommend a set of improvements for implementation.

While KYTC has the ultimate responsibility for constructing and maintaining safe and efficient highways, KYTC desires to incorporate public and agency input into the evaluation and decision-making process. Therefore, all six of these study objectives were completed in coordination with public and agency involvement.

1.2 Project Location and Study Area

As noted, the study area includes the US 119 corridor between MP 0.00 in Bell County and MP 18.0 in Harlan County, approximately 33 miles long. Refer to **Figure 1** for more details. The existing roadway is largely bounded by Pine Mountain to the north and the Cumberland River to the south. Given these constraints, improvements were sought that could be completed within the existing right-of-way as much as possible.

1.3 Study Process

The study process used to evaluate potential alternates consisted of five major elements:

1. Evaluate the existing conditions;
2. Define the purpose and need of the study;
3. Develop potential improvement options;
4. Evaluate the improvements; and
5. Recommend a list of improvements for the corridor.

The following chapters of this report follow these steps with additional detail provided in appendices. The first chapter outlines the purpose and need of the study. The following chapter provides an overview of existing conditions (traffic and safety operations, environmental overview, and a geotechnical overview). The existing conditions documentation is used to confirm the purpose and need and develop improvements.

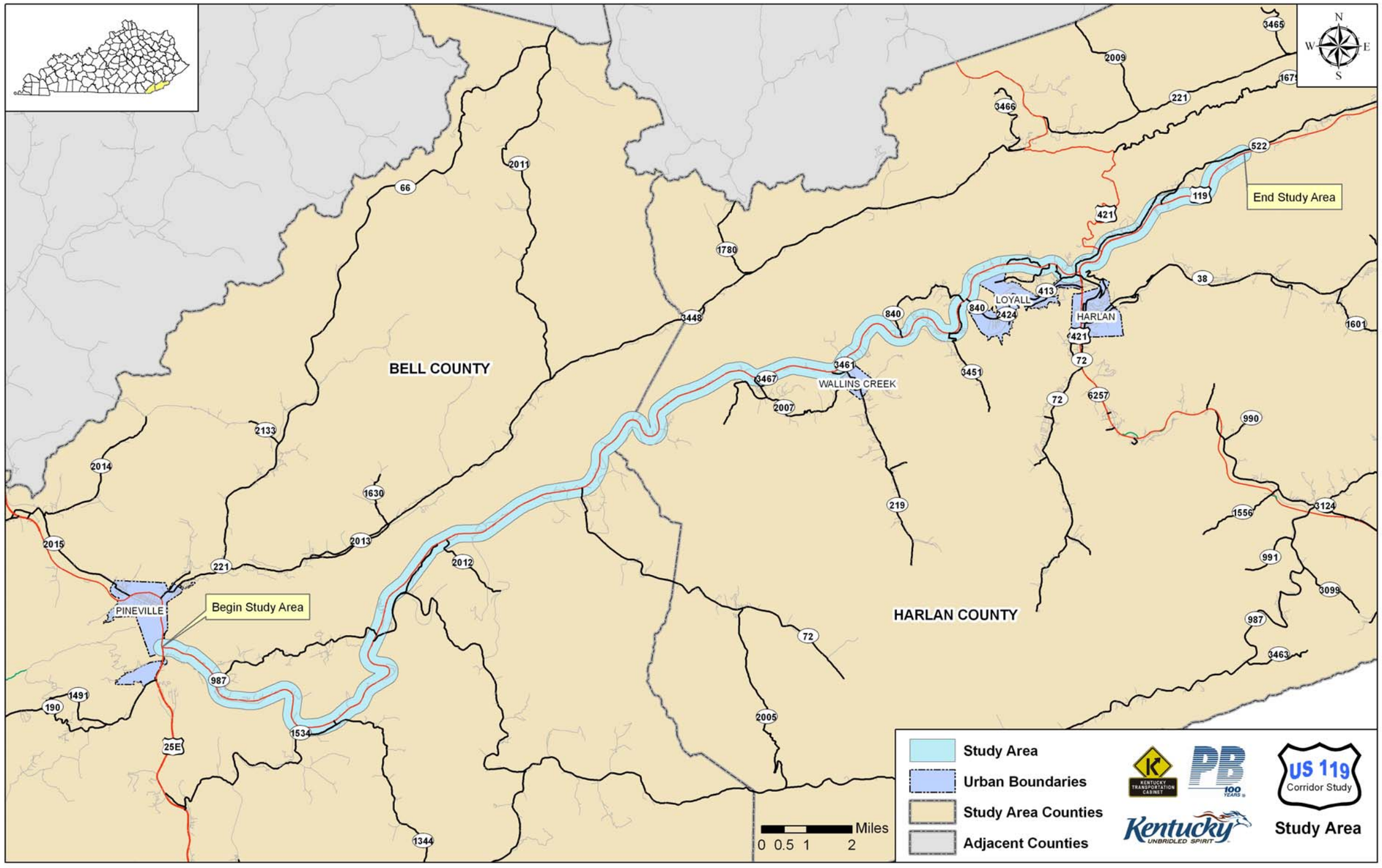
In addition to the technical analysis, public input and feedback was gathered throughout the study process. The framework for including the public in the study process is presented in the chapter following the technical analysis. Next, discussion related to the development of the list of improvements and evaluation is presented.

The final stage in the study process was to provide a list of improvement recommendations. This is presented in the form of project summary sheets. Each sheet details the individual project issue(s) along with the improvement project to address the issue(s). A list of prioritized projects completes the study.

1.4 Schedule

Traditionally, a corridor study such as this current study is completed within a twelve-month schedule. However, at the request of the KYTC, the schedule for this study was reduced to approximately six months. The intent of this reduction was to provide any recommended improvements to the local elected officials within the study area in a timeframe that was consistent with funding allocations at the state and federal level.

Figure 1: **Study Area**



2.0 PURPOSE AND NEED

It is important to establish the Purpose and Need for a project during its early stages since it defines the actual reason(s) for doing the study and provides the basis for the development, evaluation, and comparison of potential improvements. According to current KYTC policy, there are three parts to a complete Purpose and Need statement: (1) the Purpose, (2) the Need, and (3) Goals and Objectives. The Purpose identifies the problem to be solved by the study and is supported by the Need. Goals and Objectives are other elements of the study that go beyond the transportation issues in the study and should be considered and addressed as part of a successful solution to the problem.

The Purpose and Need statement for this study was developed from issues identified in field reviews, through stakeholder and public input, and from deficiencies identified in the Existing Conditions technical analysis. A complete description of these project phases is included in the following chapters of this report.

2.1 Purpose

The Purpose of this study is to examine the need for and reasonable solutions to improve safety, reliability and mobility on US 119 between Pineville and Harlan in Bell and Harlan Counties.

2.2 Need

Supporting the study Purpose above is the study Need. Input was requested regarding project issues, goals, and objectives from a meeting with local elected officials and stakeholders held at the beginning of the study on October 21, 2009. Additional input was requested about project issues and goals during the public meetings held on December 8 and 9, 2009. Attendees were given the opportunity to voice their thoughts at the meeting as well as on the survey forms provided. This input, along with the initial technical analysis, has shown a documented need exists. The supporting need is discussed below:

Connectivity – US 119 is the only route that connects Harlan west to Pineville, US 25, and further west to I-75. In addition, US 119 is the only route that connects Harlan east to Whitesburg and further east to Virginia. Regionally, US 119 is a critical link for east-west mobility in southeastern Kentucky.

Vehicle Safety – Safety is a critical issue for US 119. US 119 is located in a mountainous region; therefore, there are areas with steep grades and tight curves. Several locations along this road have been identified with safety concerns including Varilla curve, Molus curve, and the approach to US 421 at Harlan. In addition, there are a high percentage of heavy vehicles, mainly coal and logging trucks. The weather can also be attributable to hazardous driving conditions as some sections of US 119 are blocked from the sun during the winter months by the mountains, not allowing icy sections to thaw.

Travel Time Reliability – According to the Federal Highway Administration, travel time reliability is defined as "the consistency or dependability in travel time, as measured from day-to-day and/or across different times of the day." In other words, drivers that travel a route regularly have an expectation of the time it takes to travel that route. Any deviation from that expected typical travel time results in unexpected delay which can be measured in travel time reliability. As mentioned previously, US 119 is the only route between Pineville and Harlan; therefore, travel time reliability is important. Currently, it is a two-lane road (one lane per direction) with passing lanes in some locations. Slow moving vehicles such as heavily-loaded coal trucks or farm equipment can lead to vehicle platoons if there is not an opportunity to pass, thus affecting travel time on this route. Vehicles slowing down or stopped in the travel lane to turn can also affect travel time reliability if there are not adequate gaps in the opposing traffic for the vehicles to turn in a timely manner.

Economic Development – For many years, cities and towns within the study area such as Harlan were very active in coal mining. However, as coal resources have been extracted, the population has decreased and employment opportunities are limited. A good transportation network with safe roads, reliable travel time and good connectivity can be tools for promoting economic development and bringing residents and jobs to an area.

2.3 Goals and Objectives

In accordance with KYTC's policy on Purpose and Need statements, the following goals and objectives were developed to balance environmental and community issues with transportation issues.

- Provide solutions to meet the purpose of the project while avoiding / minimizing / mitigating impacts to human and natural environmental features.
- Consider cost-effective solutions to address identified deficiencies.

3.0 EXISTING CONDITIONS

The existing conditions analysis was conducted to create a baseline of known information within the study area. For detailed information of the existing conditions review (including maps and graphics) refer to **Appendix A.** The following lists the relevant sections of the Appendix where more detailed information can be found.

- Traffic and Safety - Section 1.0 - Pages A-1 to A-18
- Human Environment Overview - Section 2.0 - Pages A-19 to A-28
- Natural Environment Overview - Section 3.0 - Pages A-29 to A-31
- Geotechnical Overview - Section 4.0 - Pages A-32 to A-33

3.1 Traffic and Safety

A detailed traffic and safety analysis was completed to identify any deficiencies and issues with the existing roadway. The following were examined:

- Existing highway characteristics and geometrics
- Existing (2009) and future (2040) traffic volumes
- Truck percentages
- Highway levels of service (LOS)
- Segment and spot crash rates

The analysis considered current and future traffic conditions assuming no geometric changes to the existing highway. The key transportation issues identified from the analysis are summarized below:

- Existing (2009) Average Daily Traffic (ADT) volumes range from 5,000 to 11,600 vehicles per day.
- There are several geometric deficiencies with regards to horizontal curvature.
- The historical traffic growth rates (0.4% to 1.0%) are relatively low along most segments of the roadway.
- Trucks comprise up to 9% of the total ADT along US 119
- Current year LOS is LOS B and LOS C for corridor segments.
- Year 2040 LOS remains at LOS B and LOS C for corridor segments.
- All segments of the roadway have a critical crash rate factor less than one, but many have a section crash rate greater than the statewide average crash rate.
- High spot crash rates were found at two locations:
    - The intersection of US 119 and US 25E; and
    - The signalized intersection of US 119 and US 421.
- Single vehicle crashes are the most common type of crash in the study area.
- There were 8 fatalities that occurred between September 1, 2006 and August 31, 2009.

3.2 Human Environment Overview

In addition to existing roadway conditions, an overview was conducted to determine the general characteristics of the human environment in the study area. This includes general socioeconomic characteristics, Environmental Justice, community facilities, underground storage tanks and other hazardous materials sites, and cultural / historic and archaeological characteristics. Some key points from the overview include:

- Bell and Harlan County both have high percentages of populations living below the poverty threshold compared to the national and state average. However, compared to the regional averages, the percentage is similar except for two locations. These include an area just north of US 119 near Pineville in Bell County and an area just south of US 119 just past the county line in Harlan County.
- There are also areas with some elevated percentages of persons over the age of 65. These areas are found in the urban areas of Pineville and Harlan.
- The cultural, historic, and archaeological review found one existing bridge over the Cumberland River that is listed as eligible for the National Register of Historic Places.

3.3 Natural Environment Overview

A natural environmental overview was conducted for this study as well. Resources that were addressed in this overview include aquatic resources, threatened, rare and endangered species, air quality, traffic noise and floodplains. Key points to note from this overview include:

- Aquatic resources include the Cumberland River and its tributaries.
- There are 23 palustrine wetlands in the area.
- US 119 is located in several floodplains, with the largest being the Cumberland River.
- There are thirteen threatened, rare and / or endangered species that occur within the study area, but no wildlife refuges, wildlife management areas, nature preserves, or other managed areas.

3.4 Geotechnical Overview

A geotechnical overview of the area was conducted by the Geotechnical Branch of KYTC. The study area is located within the Balkan, Harlan, Middlesboro North, Wallins Creek, Varilla, and Bledsoe Geologic Maps. The study area is underlain by the following formations: Alluvium, Colluvium and Landslide Debris, Lee Formation, Breathitt Group, Hance Formation, Upper Member (Breathitt Group), and the Mingo Formation. Key geotechnical concerns included numerous oil and gas wells located within the study area, the types of slope cuts depending on the formation, and underground abandoned and active mines. Identification and avoidance is recommended if possible.

4.0 PUBLIC INVOLVEMENT

Public involvement for the US 119 Corridor Study was comprised of several key elements designed to encourage participation and obtain feedback from the stakeholders in Bell and Harlan Counties. The key aspects included meetings with local elected officials and stakeholders as well as public meetings. The process and methods for public involvement are outlined in this chapter. The results and feedback from the public involvement aspect of this project are considered throughout the entire report, particularly in the development and evaluation of improvements. Copies of the public involvement meeting summaries are included in **Appendix B** for reference including summaries of the input received at the public meetings.

4.1 Local Elected Officials and Other Stakeholders

Meetings were held with locally elected officials and other stakeholders from Bell and Harlan Counties, as well as other elected officials from the area. Locally elected officials included County Judge-Executives, Magistrates, state representatives and senators, members of the local chamber of commerce, and the local school district. Two meetings with local elected officials and stakeholders were held, one towards the beginning of the study and one towards the end. Brief summaries of each meeting are given below, and meeting minutes are provided in **Appendix B**.

- Elected Official / Stakeholder Meeting #1 – A meeting with local elected officials and stakeholders was held on October 21, 2009. The purpose of this meeting was for the Project Development Team (PDT) to present the existing conditions and obtain feedback on issues and potential solutions. In addition, the KYTC District 11 presented some short-term spot improvements they developed. Feedback was requested on which improvements should be advanced to the next stage of design. The majority of comments from attendees at this meeting were related to the need to widen US 119 to a four lane road.

- Elected Official / Stakeholder Meeting #2 – A second meeting with local elected officials and stakeholders was held on January 22, 2010. The purpose of this meeting was for the PDT to present the progress to date on the project, findings from the public meetings and the list of revised corridor improvements. The attendees of this meeting generally agreed that the improvements presented would be an improvement to US 119; however, the attendees also requested an estimate of the cost for a four lane road throughout the study area. Any additional work related to a four lane facility will need to be completed independently from this study as it is outside the project scope of work.

4.2 Public Meetings

Two public meetings were held for this study, occurring at two locations on two consecutive evenings (December 8 and 9, 2009). One was held in Harlan County at the Harlan Civic Center and the other was held in Bell County at the Page Elementary School. The public meetings were held in an open house style format. Key goals for these meetings were to gather input on the issues and concerns of the project, to propose potential improvements and to help choose the improvements to be recommended.
A total of 132 people attended the two meetings. Eighty signed in at the Harlan meeting and fifty-two signed in at the Bell County meeting. Thirty-two comment forms were returned from the Harlan meeting and eighteen from the Bell County meeting. The results of the comment forms are summarized in **Appendix B.**

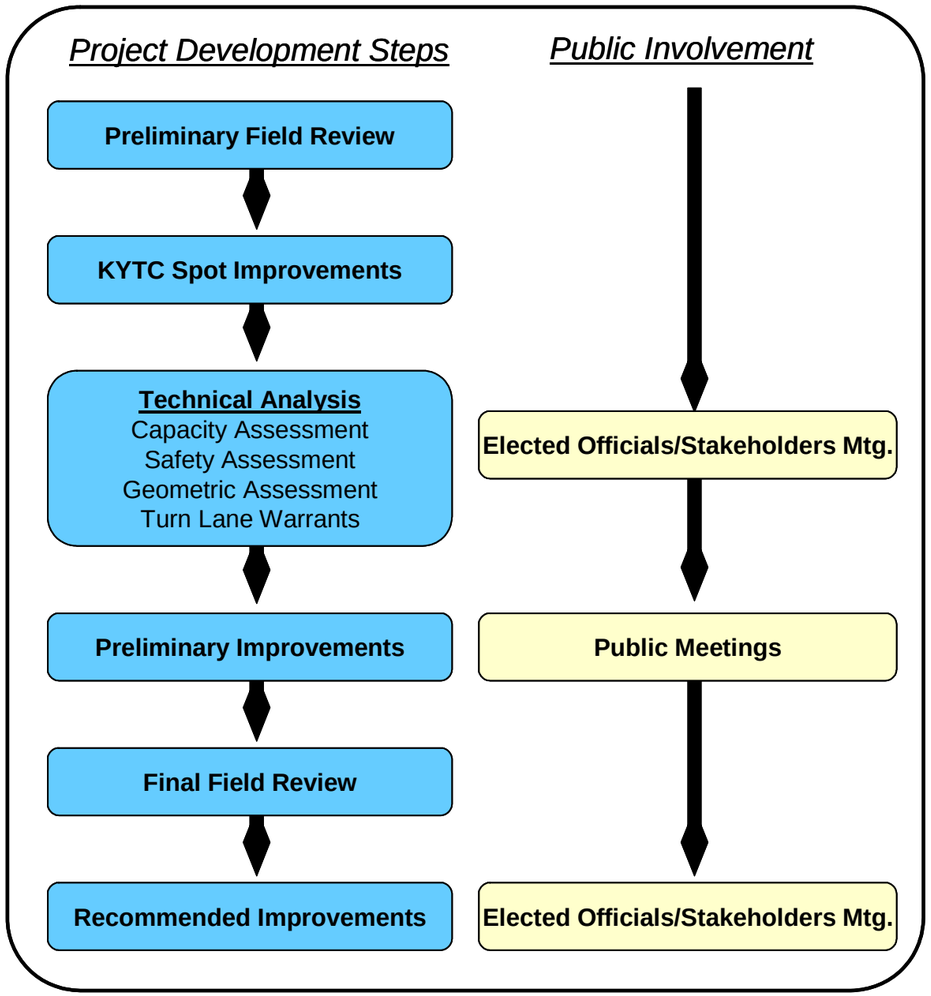
4.3 Project Development Team (PDT) Meetings

Several meetings were also held with the KYTC, the Cumberland Valley Area Development District, and PB to discuss project issues including the elected officials and stakeholder meetings as well as public meetings (preparation and results), issues and goals, development and evaluation of improvements, and recommendations.

5.0 PROJECT DEVELOPMENT

A detailed, multi-step process was used to develop and evaluate potential projects for the US 119 corridor. The process included an evaluation of spot improvements previously developed by KYTC, field reviews, technical analysis, and public input. The framework for developing and evaluating improvement projects is shown in **Figure 2** below.

Figure 2: **Project Development Steps**



5.1 Preliminary Field Review

In conjunction with the PDT project kick-off meeting, a preliminary field review with the PDT was conducted to provide an overview of project needs and issues. This initial field review was held on September 1, 2009. Items of particular interest included:

- Passing lane locations / lack of passing opportunities in western Bell County
- Limited right-of-way (US 119 bounded by Pine Mountain and the Cumberland River)
- School access (Page Elementary School and Harlan County High School)
- Access management

5.2 KYTC Spot Improvements

At the outset of this study, the KYTC District 11 staff provided a preliminary list of improvements they were evaluating with initial funds obtained by the local elected officials to improve US 119. The funds (totaling $3 million) were intended to be used to provide spot improvements at locations identified by the District as well as to fund this corridor study.

The initial list of projects developed by the District included the following:

- Bell County: Two-Way Left-Turn Lane (MP 0.5 – 1.0)
- Bell County: Page Elementary School Left Turn Lane (MP 3.6)
- Bell County: Passing Lanes (MP 4.2 – 5.2)
- Bell County: Passing Lanes (MP 11.2 – 13.6) and Left Turn Lane (MP 11.4)
- Harlan County: Passing Lanes (MP 1.3 – 3.0)
- Harlan County: Passing Lanes / Left Turn Lane at Dorcas Jane Lane (MP 6.6 – 7.6)
- Harlan County: Access Management at KY 3451 (MP 9.2)
- Harlan County: KY 3152 Approach Improvements (MP 10.0)
- Harlan County: Left Turn Lane / Access Management (MP 10.8 – 11.2)
- Harlan County: Left Turn Lane / Access Management (MP 11.5 – 11.7)
- Harlan County: Left Turn Lane into Airport Road / Fix Sight Distance Issue (MP 12.4)

Upon further discussion with the local elected officials / stakeholders and the PDT at the meeting held on October 21, 2009, it was determined that the initial funding was to be used for improvements to US 119 in Harlan County only. Therefore, all projects that the KYTC was currently pursuing for US 119 in Harlan County would not be included as recommended projects for this study. The remaining projects for Bell County are included in this study.

5.3 Technical Analysis

To further develop improvements for US 119 as identified by the project Purpose and Need, several evaluation measures were used. These utilized data collected through the existing conditions review as well as existing US 119 design documentation. The existing US 119 design documentation developed to assist with the improvements development consisted of the following elements:

- Aerial photography overlain with the existing US 119 alignment
- Contour lines (USGS)
- Vertical curvature (including grades)
- Passing lanes
- Crash data by severity (3-year period from 9/1/2006 – 8/31/2009)
- Blueline streams
- Known churches / cemeteries
- Additional design criteria where applicable

This documentation for the entire corridor is provided as **Appendix C**.

5.3.1 Capacity Assessment

The initial step in determining improvements for US 119 was to review traffic volumes and examine the current and future capacity of US 119. Current (2009) traffic volumes range from 5,000 – 11,600 vehicles per day. In the future year of 2040, traffic volumes range from 5,800 – 15,800. These average daily traffic volumes equate to design hour volumes of 540 – 1,240 in 2009 and 620 – 1,690 in 2040.

For this study, level of service (LOS) C was determined to be the acceptable threshold for traffic operations (refer to **Appendix A** for additional information). For a two-lane highway, the Highway Capacity Manual 2000[1] states that for a LOS C, a service flow rate of up to 1,190 pc/h (passenger cars per hour) total in both directions can be accommodated under base conditions. Under LOS D, maximum service flow rates of 1,830 pc/h total in both directions can be maintained under base conditions. The volumes in the lower range (540 and 620 vehicles per hour or pc/h) do not approach these thresholds, though the higher volumes are near these thresholds or exceed them (1,240 and 1,690 vehicles per hour or pc/h). These higher volumes occur in the section just before the US 119 / US 421 signalized intersection. The section where US 119 and US 421 are merged is currently four lanes.

Though higher volumes exist near the US 119 / US 421 signalized intersection in Harlan, the rest of the study area has volumes that are much less than the given capacity for a two-lane highway achieving an acceptable LOS. Based on historic traffic counts, traffic along US 119 is growing between 0.4 and 1.0 percent per year. In order to exceed the given capacity of a two-lane highway, traffic volumes would need to grow by between 2.0 and 4.0 percent per year for the next thirty years or if continuing to grow at the current rate it would take between 35 to over 100 years for traffic operations to decline to a LOS D.

5.3.2 Safety Assessment

A crash rate analysis was conducted over a three-year period from September 1, 2006 through August 31, 2009 as part of the existing conditions review. There were no sections along US 119 with a critical crash rate factor greater than one, however, there were two spot locations with a critical crash rate factor greater than one. Those two spots were at the beginning of the study area in Pineville and at the US 119 / US 421 signalized intersection in Harlan. In addition, there were some locations where the section crash rate exceeded the statewide average crash rate.

Given that the critical crash rate analysis did not indicate major safety concerns aside from the two identified spot locations, the crash data was still reviewed given local opinion that US 119 has numerous safety issues.

As mentioned above, the existing design documentation of US 119 was overlain with the crash data stratified by crash severity. The corridor was then reviewed to determine areas with multiple crashes. Areas with clusters of crashes were investigated further to determine primary crash type. Also, locations where improvements were being considered, including the KYTC spot improvements, were reviewed. Below is a summary of findings from this review. Refer to **Appendix C** for specific locations along the corridor.

- 4 crashes occurred near MP 5.0 in Bell County at KY 1534, one of which was a fatality. The fatality was a sideswipe from the opposite direction while the other three were of varying type.
- 6 crashes occurred near MP 7.0 in Bell County at the Varilla curve, one of which was a fatality. The fatality was a collision with a fixed object. The other crash types were primarily single vehicle crashes (collision with fixed object or vehicle run off road).
- 6 crashes occurred at the Bell / Harlan County line at Molus. All were property damage only crashes with varying crash types.
- 5 crashes occurred near MP 8.0 in Harlan County at KY 840. Several were caused by a collision with an animal or by a rear-end collision, and one was listed as a collision with a bicyclist.
- 8 crashes occurred along the curve beginning at MP 9.0 in Harlan County. Several involved a collision with an animal. One crash was a head-on collision that resulted in a fatality.
- 16 crashes occurred at the US 119 / US 421 signalized intersection in Harlan County (classified as a high crash rate spot). The majority of crashes were rear-end collisions on the steep downgrade to the signalized intersection.
- 5 crashes occurred at the US 119 departure from US 421 east of Harlan in Harlan County with varying crash types.

[1] Highway Capacity Manual 2000, Transportation Research Board.

5.3.3 Geometric Assessment

Consultation of the existing US 119 design sheets (found in **Appendix C**) showed locations with design exceptions for vertical and horizontal curvature. These locations included:

- Vertical curve does not meet stopping sight distance criteria at the beginning of the study area in Bell County.
- Vertical curve does not meet stopping sight distance criteria near MP 2.0 in Bell County.
- Vertical curve does not meet stopping sight distance criteria and horizontal curve does not meet minimum radius criteria at the Varilla curve in Bell County.
- Several vertical curves do not meet stopping sight distance criteria between MP 8.0 and MP 9.0 in Bell County.
- Vertical curve does not meet stopping sight distance criteria near Tejay in Bell County.
- Vertical curve does not meet stopping sight distance criteria just before MP 15.0 in Bell County.
- The horizontal curve at Molus at the Bell / Harlan County does not meet minimum radius criteria.
- Vertical curve does not meet stopping sight distance criteria at MP 6.0 in Harlan County.
- Vertical curve does not meet stopping sight distance criteria and horizontal curve does not meet minimum radius criteria at Fresh Meadows in Harlan County.
- On the approach to the US 119 / US 421 signalized intersection in Harlan County, there is a vertical curve that does not meet stopping sight distance criteria as well a 7 percent grade down to the intersection that exceeds maximum grade criteria.
- The horizontal curve where US 119 and US 421 are combined in Harlan County does not meet minimum radius criteria.

An evaluation of passing lane frequency, location, and length showed the following:

- No passing lanes in Bell County from Pineville (MP 0.0) until just before the Varilla curve (MP 7.0)
- Several locations with short passing lanes (1300 feet or less)

5.3.4 Turn Lane Warrants

Many locations along the corridor may benefit from additional turn lanes, thus improving the travel speed by separating turning vehicles from through traffic and improving safety by reducing the exposure to certain crash types such as rear-end collisions. Some locations for turn lanes were identified by KYTC as part of their spot improvements. Others were identified by estimated traffic volumes and crash history.

To determine the warrant of auxiliary turn lanes, KYTC developed an Auxiliary Turn Lane Policy (Design Memorandum No. 03-09). According to the policy, left and right turn lanes at unsignalized intersections can be justified if design hour traffic volumes meet identified thresholds or if they are required as a safety countermeasure where sight distance of advancing traffic is limited.

For the evaluation of turn lanes warrants based on the design hour traffic volumes, turning movement counts were performed by KYTC. Counts were generally performed between 7:00 AM – 9:00 AM and 2:00 PM – 6:00 PM. Counts were completed for the following locations:

- US 119 at US 25E
- US 119 at Sav-A-Lot
- US 119 at Page Elementary School
- US 119 at KY 987
- US 119 at Balkan Road
- US 119 at KY 219
- US 119 at KY 840
- US 119 at KY 1084
- US 119 at US 421
- US 119 at Harlan County High School

Using the interactive Excel spreadsheet provided by KYTC based on the auxiliary turn lane policy warrants, turn lanes were warranted in several locations:

- Left and right turn lanes at the Sav-A-Lot Store near Pineville in Bell County (based on PM volumes)
- Left and right turn lanes at KY 987 in Bell County (based on PM volumes)
- Left turn lane at KY 1084 (Airport Road) (based on PM volumes)
- Left turn lane at Harlan County High School (based on AM volumes)

The turn lane analysis files can be found in the supplemental documentation contained in electronic format (CD) in the back of this report.

It should be noted that a left turn lane into the Harlan County High School currently exists, though based on the warrant analysis, the length could be extended.

While turn lanes were not justified at some locations based on design hour volumes, they may be warranted from a safety perspective.

5.4 Preliminary Improvements

A list of potential improvements was compiled just before the public meetings in December 2009 to provide an initial list of locations and project types for the public to provide comments. At this point, project types were not fully defined, rather listed in a more categorical description such as “safety improvement” or “add turn lanes”. The locations and types of improvements were identified based on the KYTC spot improvements for Bell County as well as the technical analysis. From the technical analysis, areas where there were multiple crashes and geometric issues were identified as potential project locations. The initial list of potential improvements is listed in **Table 1**. The supplemental documentation contained in electronic format (CD) in the back of this report contains the figure with these improvements that was displayed at the public meeting.

Table 1: **Potential Improvements**

County	Project Description	Location
Bell	Widen to 3-Lane Section; Access Management	Beginning of Study Area
Bell	Add Turn Lanes	Page Elementary School
Bell	Add Turn Lanes	County Garage
Bell	Add Turn Lanes	KY 1344
Bell	Safety Improvements	Varilla Curve
Bell	Widen to 3-Lane Section; Add Turn Lanes	Near KY 3482 / KY 2012
Harlan	Safety Improvements	Molus Curve
Harlan	Safety Improvements; Add Turn Lanes	KY 219 near MP 6.0
Harlan	Add Turn Lanes	KY 840 between MP 7.0 and MP 8.0
Harlan	Extend Passing Lane	Just East of MP 8.0
Harlan	Add Turn Lanes	KY 3152
Harlan	Safety Improvements; Access Management	Near Wilhoit
Harlan	Widen to 3-Lane Section; Add Turn Lanes	KY 840 near MP 10.0
Harlan	Extend Passing Lane	Between MP 10.0 and MP 11.0
Harlan	Add Turn Lanes; Access Management	Near MP 11.0
Harlan	Add Turn Lanes	Near Airport Road
Harlan	Safety Improvements	US 119 Approach to US 421
Harlan	Safety Improvements	US 119 Departure from US 421

5.5 Final Field Review

After the public meetings, the list of improvements was refined based on additional technical analysis and a final field review. Additional work was completed to fully define the improvement options and a field visit was taken to finalize the proposed improvements before they were presented to local elected officials and stakeholders. During the field review, additional photographs were taken to assist with determination of project termini and project feasibility. In addition, project recommendations were reviewed to determine the most appropriate solution for each identified project location.

5.6 Recommended Improvements

Based on the final field review, public input, and technical analysis, several projects were removed from consideration. Others were modified as appropriate and a few new projects were developed. **Table 2** illustrates the revisions from the initial potential improvements to the final revised list of improvements. As part of the revisions, project numbers were assigned to the projects. A letter, either “B” for Bell County, or “H” for Harlan County was assigned in the beginning with a number system going from west to east in each county.

As noted above and in **Table 2**, several projects initially listed were removed from further consideration. The project in Bell County to widen US 119 to a 3-lane section and add turn lanes near KY 3482 / KY 2012 was modified to form two new projects (B-7 and B-8). It has been KYTC’s policy that a 3-lane section (or two-way left-turn lane) is not appropriate (based on safety) for a highway with a posted speed greater than 45 mph. At this location the speed limit is 55 mph, therefore it was decided to pursue other improvement options at this location. The final field review showed that due to sight distance and safety issues, closing the secondary access to KY 3482 and providing a right turn lane to KY 2012 were preferable projects.

Several of the projects listed previously in Harlan County were removed from consideration following the final field review if improvements were noted as not being warranted. In addition, two of the projects previously listed for Harlan County (Add Turn Lanes; Access Management near MP 11.0 and Add Turn Lanes near Airport Road) coincided with KYTC spot improvements that were being considered separately from this study. These were also removed from further consideration in this study,

For the new projects, Projects B-4 and B-9 were previously considered as KYTC spot improvements with the project milepoints modified slightly to reflect adjusted termini based on the final field review. The left turn lane considered in the KYTC spot improvements at MP 11.4 (Balkan Road) was determined to not be warranted based on auxiliary turn lane warrants per KYTC policy. As mentioned above, Projects B-7 and B-8 formed two projects from a previous project. Project H-8 was added based on the final field review and a review of the auxiliary turn lane warrants. Projects B-10 and H-9 were added based on safety considerations noted during the final field review.

Table 2: Revised List of Improvements

Initial Potential Improvements			Revised Improvements				New Improvements			
County	Project Description	Location	Assigned Project #	County	Revised Project Description	Revised Location	Assigned Project #	County	Project Description	Location
Bell	Widen to 3-Lane Section; Access Management	Beginning of Study Area	B-1	Bell	Construct Two-Way Left-Turn Lane	MP 0.37 - MP 1.17	B-4	Bell	Widen US 119 to Provide Passing Lanes	MP 4.30 - MP 4.81
Bell	Add Turn Lanes	Page Elementary School	B-2	Bell	Construct Left and Right Turn Lanes at Page Elementary School	MP 3.28 - MP 3.55	B-7	Bell	Remove Secondary Access to KY 3482	MP 10.24 - MP 10.26
Bell	Add Turn Lanes	County Garage	B-3	Bell	Widen US 119 to Provide Left and Right Turn Lanes for County Garage	MP 4.01 - MP 4.28	B-8	Bell	Widen US 119 to Provide Right Turn Lane for KY 2012	MP 10.51 - MP 10.60
Bell	Add Turn Lanes	KY 1344	B-5	Bell	Widen US 119 to Provide Left and Right Turn Lanes for KY 1344	MP 4.98 - MP 5.25	B-9	Bell	Widen US 119 to Provide Passing Lanes	MP 11.55 - MP 12.29
Bell	Safety Improvements	Varilla Curve	B-6	Bell	Realign US 119 near Varilla Curve	MP 6.59 - MP 6.97	B-10	Bell	Provide Centerline Rumble Strips and Reflective Pavement Markings	Entire Corridor Length
Bell	Widen to 3-Lane Section; Add Turn Lanes	Near KY 3482 / KY 2012	-	-	-	-	H-8	Harlan	Widen US 119 to Extend Left Turn Lane into Harlan County High School	MP 16.34 - MP 16.53
Harlan	Safety Improvements	Molus Curve	H-1	Harlan	Realignment of US 119	MP 0.00 - MP 1.45	H-9	Harlan	Provide Centerline Rumble Strips and Reflective Pavement Markings	Entire Corridor Length
Harlan	Safety Improvements; Add Turn Lanes	KY 219 near MP 6.0	-	-	-	-				
Harlan	Add Turn Lanes	KY 840 between MP 7.0 and MP 8.0	H-2	Harlan	Widen US 119 to Provide Left and Right Turn Lanes for KY 840	MP 7.56 - MP 7.83				
Harlan	Extend Passing Lane	Just East of MP 8.0	-	-	-	-				
Harlan	Add Turn Lanes	KY 3152	H-3	Harlan	Widen US 119 to Provide Left Turn Lane for Freshmeadows Road	MP 8.48 - MP 8.75				
Harlan	Safety Improvements; Access Management	Near Wilhoit	-	-	-	-				
Harlan	Widen to 3-Lane Section; Add Turn Lanes	KY 840 near MP 10.0	H-4	Harlan	Widen US 119 to Provide Right Turn Lanes for KY 840	MP 10.04 - MP 10.13				
Harlan	Extend Passing Lane	Between MP 10.0 and MP 11.0	H-5	Harlan	Widen US 119 to Extend Passing Lanes	MP 10.66 - MP 10.79				
Harlan	Add Turn Lanes; Access Management	Near MP 11.0	-	-	-	-				
Harlan	Add Turn Lanes	Near Airport Road	-	-	-	-				
Harlan	Safety Improvements	US 119 Approach to US 421	H-6	Harlan	Realign US 119	MP 12.44 - MP 13.16				
Harlan	Safety Improvements	US 119 Departure from US 421	H-7	Harlan	Provide Lighting at the US 119 and US 421 Intersection	MP 13.83 - 13.96				

Two projects also had multiple improvement options, Project B-6 (improvements at Varilla curve) and Project H-6 (improvements at US 119 / US 421 intersection approach). Both options were presented to the elected officials and stakeholders at the January 22, 2009 meeting. Following that meeting, a preferred alternate was selected by the District. The two alternates for improvements at Varilla Curve included:

1. Alternate 1 – A cut through the mountain that eliminated the curve at a cost of $110,100,00 (2010 dollars – construction only)
2. Alternate 2 – Re-alignment of the curve to reduce the curve radius at a cost of $22,300,000 (2010 dollars – construction only)

These two alternates are shown in **Figures 3** and **4**.

Figure 3: **Project B-6 – Alternate 1**

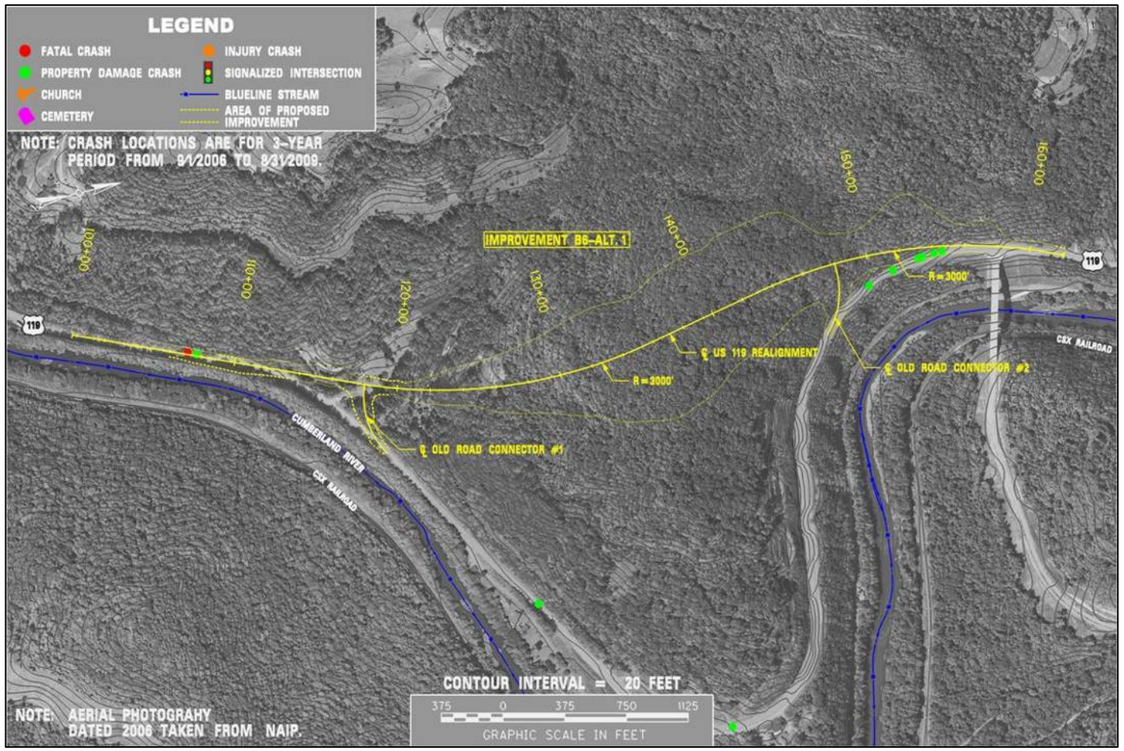
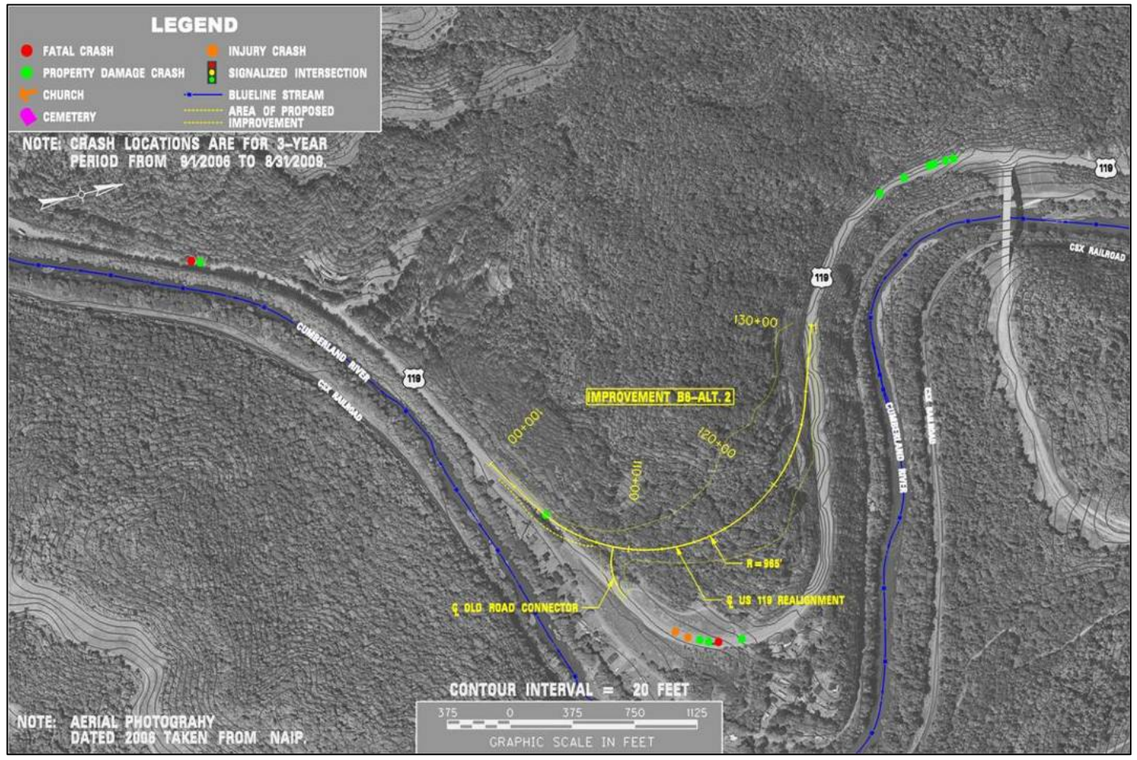


Figure 4: **Project B-6 – Alternate 2**



Alternate 2 was selected as the preferred alternate by the District. With the lower cost, the project is more feasible.

In Harlan County, two improvement alternates were developed to address the issues at the US 119 / US 421 signalized intersection approach. These alternates include:

1. Alternate 1 – Create new intersection and new alignment for US 119 at a cost of $18,300,000 (2010 dollars – construction only)
2. Alternate 2 – Provide a longer and flatter approach to US 421 with a new US 119 intersection with US 421 at a cost of $28,300,000 (2010 dollars – construction only).

These two alternates are shown in **Figures 5** and **6**.

Figure 5: **Project H-6 – Alternate 1**

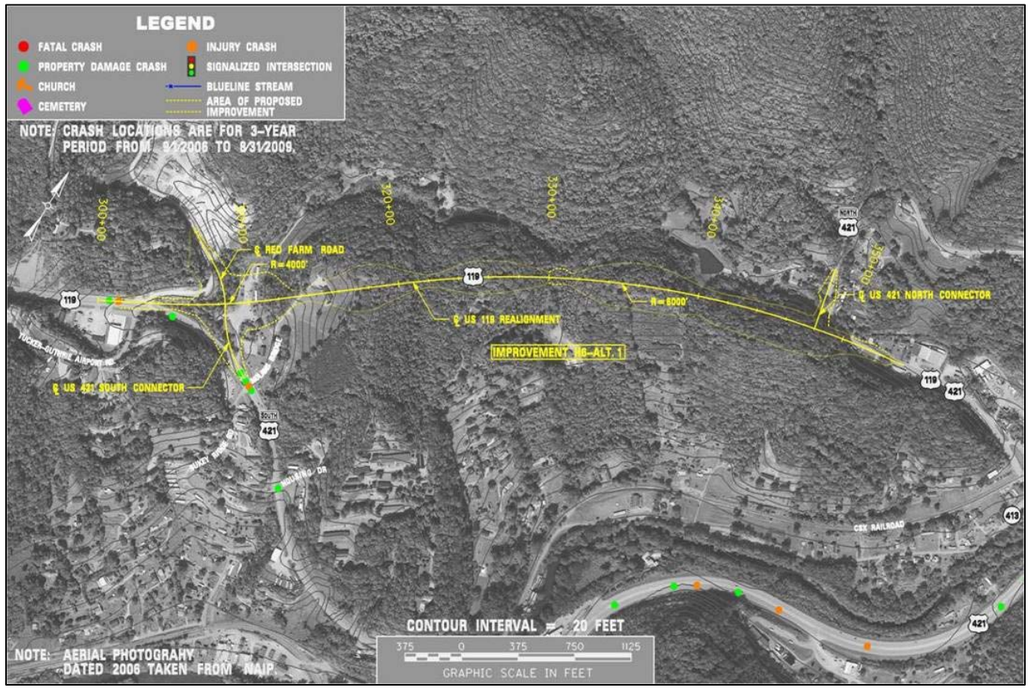


Figure 6: **Project H-6 – Alternate 2**

Alternate 1 was selected as the preferred alternate by the District. Again, with the lower cost, the project is more feasible.

The finalized list of proposed improvements included ten improvement projects in Bell County and nine improvement projects in Harlan County. The project types include:

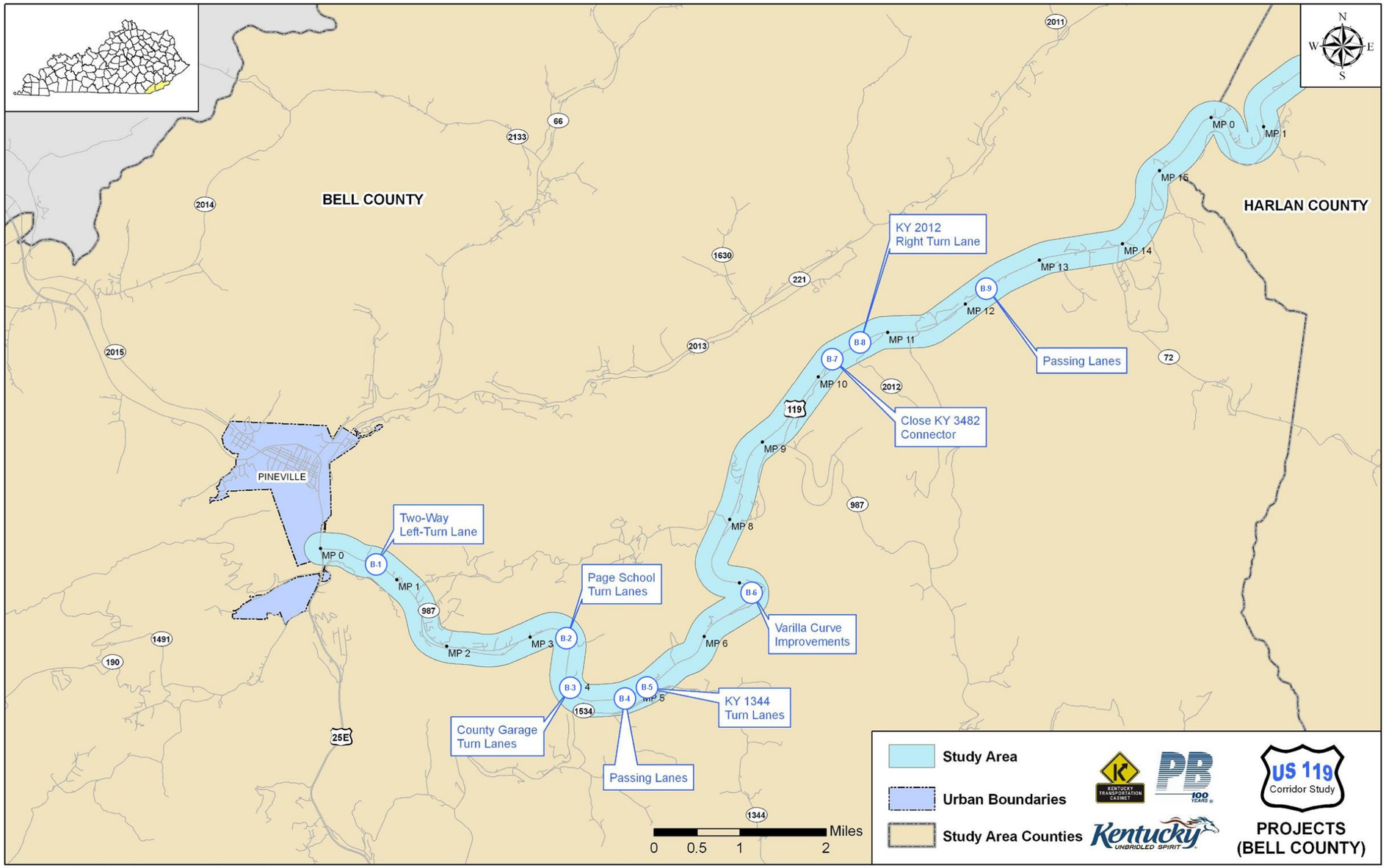
- adding a two-way left-turn lane
- adding turn lanes
- adding passing lanes
- improving roadway curvature
- realigning geometrics
- closing an access point
- adding lighting
- adding center line rumble strips and reflective pavement markings

For each project, planning-level construction costs were developed in current year dollars (2010). Design, right-of-way, and utility relocation costs were developed by KYTC District 11.

Figures 7 and **8** provide an overview of most of the project locations. Note that not all the projects are shown in these graphics as some, such as the D-11 projects for Harlan County, were not included in the study. In addition, the corridor wide centerline rumble strips and pavement markings are also not shown as they were added late in the study.

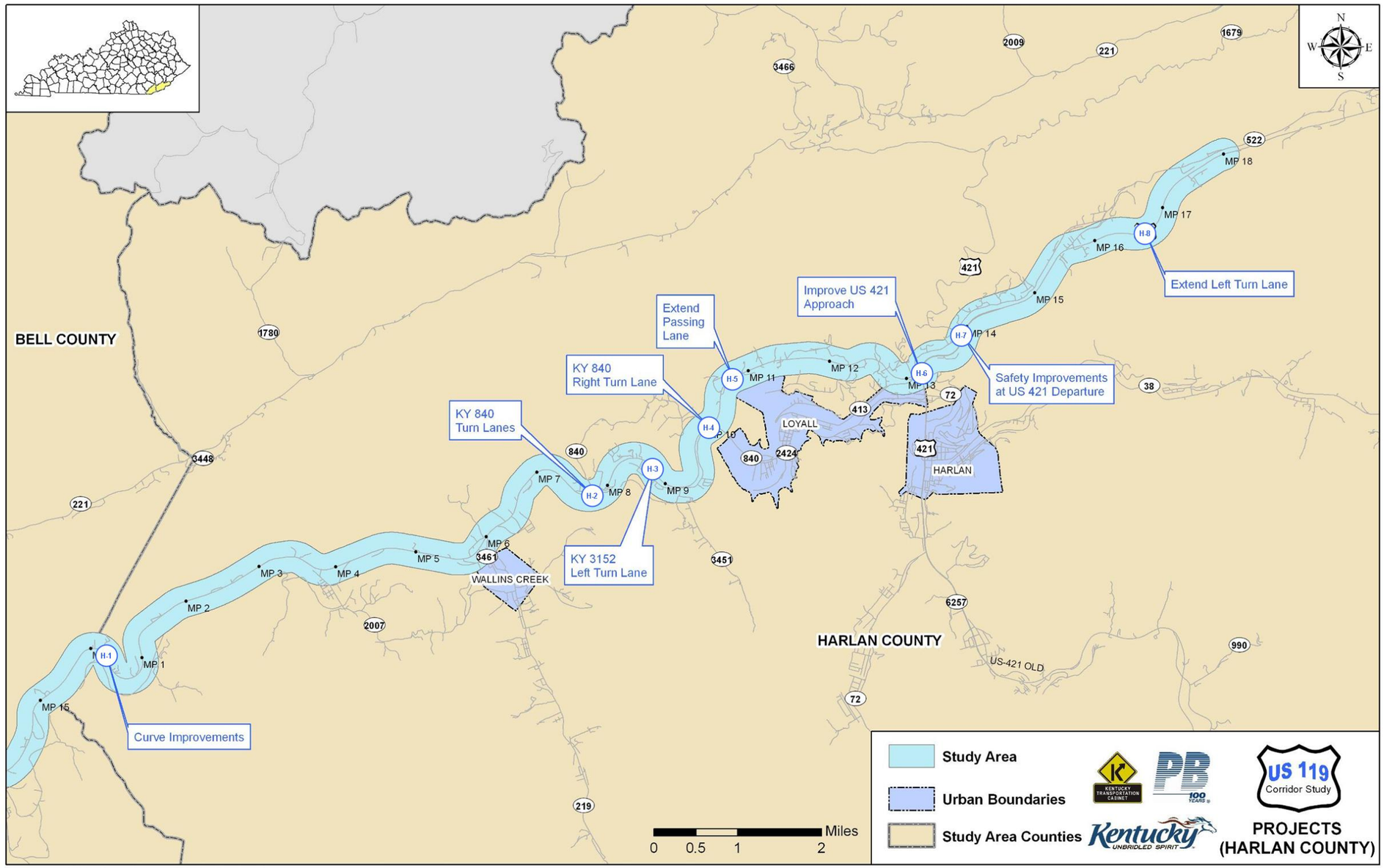
The following project sheets list in geographical order, from the southwestern end of the study area in Bell County to the northeastern end in Harlan County, the list of proposed improvements to the US 119 Corridor.

Figure 7: **Bell County Improvements**



Source: KYTC Highway Information System (HIS)

Figure 8: **Harlan County Improvements**



Source: KYTC Highway Information System (HIS)

US 119 Corridor Study

Bell County
Two-Way Left-Turn Lane

Project #B-1

ISSUES

- ***SAFETY***
- Multiple access points and turns in and out of shopping area.
- Limited sight distance.
- Cars stopping in travel lanes to turn left.
- During the PM peak period, 25 vehicles turn left into shopping area, 77 vehicles turn right.
- Multiple comments from the public requesting improvements at this location.

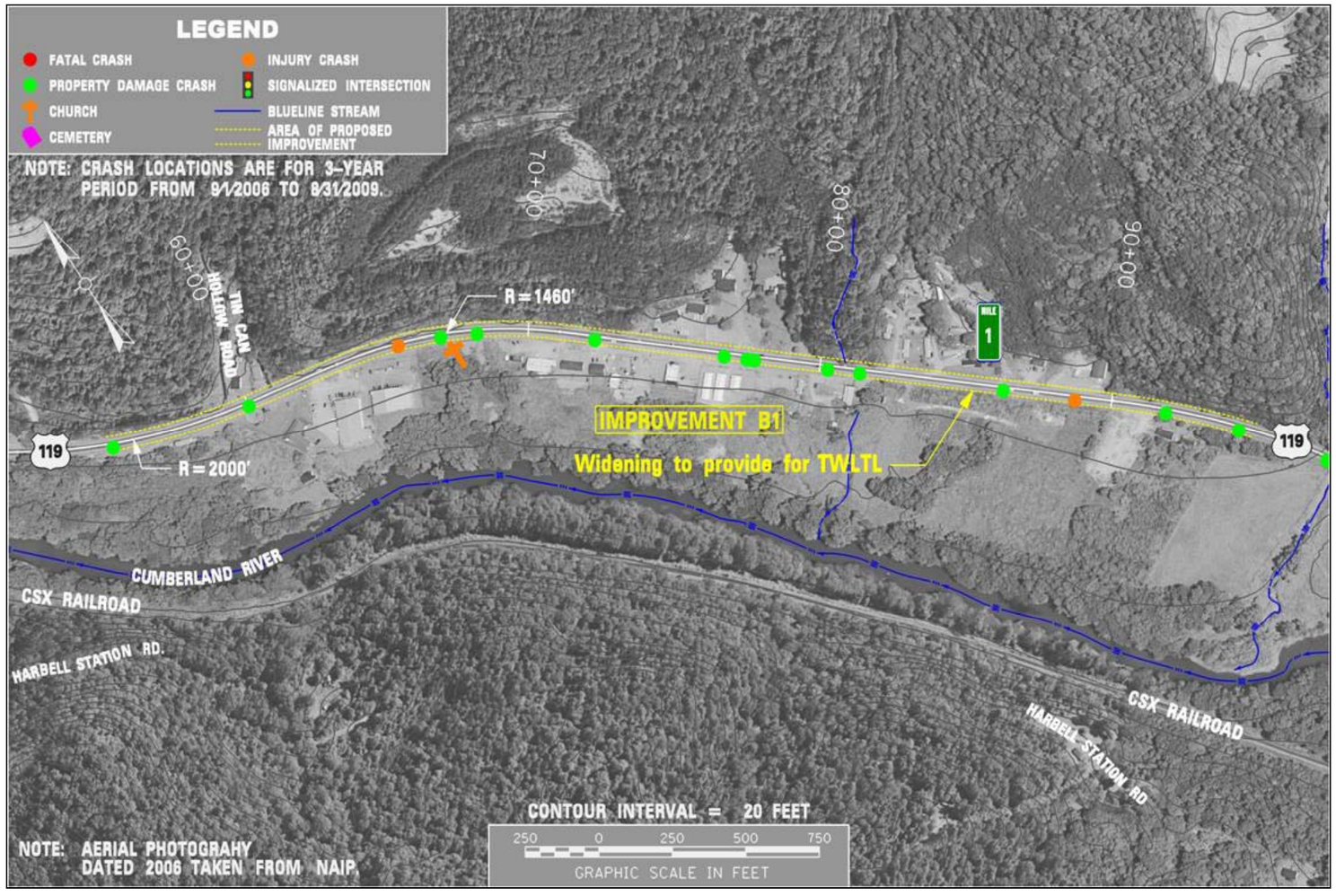
IMPROVEMENT

Project:

Add two-way left-turn lane (TWLTL) and access management from MP 0.37 to MP 1.17. In addition, given the current KYTC policy on TWLTLs, a reduction in the posted speed limit through this area to 45 mph is recommended.

Project Cost Estimate (in 2010 Dollars):

Design:	$65,000
ROW:	$25,000
Utilities:	$65,000
Construction:	$2,500,000
Total:	$2,655,000



Bell County

Page School Left and Right Turn Lanes

Project #B-2

ISSUES

- ***SAFETY***
- High right turn volume (62 vehicles during AM peak period).
- Limited sight distance
- Cars stopping in travel lanes to turn left.
- Multiple comments from the public requesting improvements at this location.

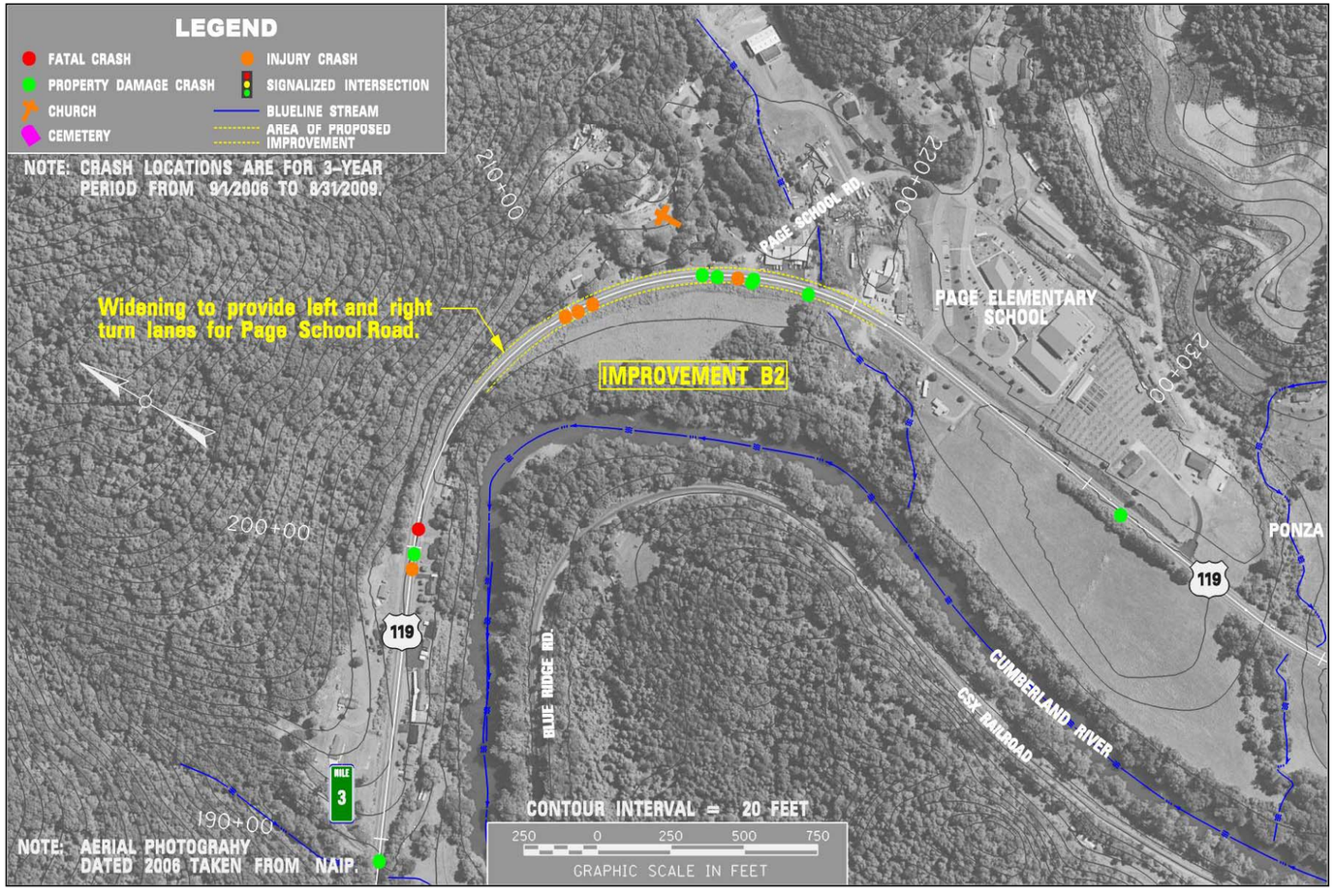
IMPROVEMENT

Project:

Add left and right turn lanes into Page Elementary School's entrance off of Page School Road from MP 3.28 to MP 3.55. Pavement is available for a right turn lane, and should be striped to delineate the turn lane.

Project Cost Estimate (in 2010 Dollars):

Design:	$100,000
ROW:	$10,000
Utilities:	$72,000
Construction:	$450,000
Total:	$632,000



US 119 Corridor Study

Bell County

County Garage Left and Right Turn Lanes

Project #B-3

ISSUES

- ***SAFETY***
- Limited sight distance.
- Trucks turning left in a curve.
- Entrance to County Garage and Veteran's Park.

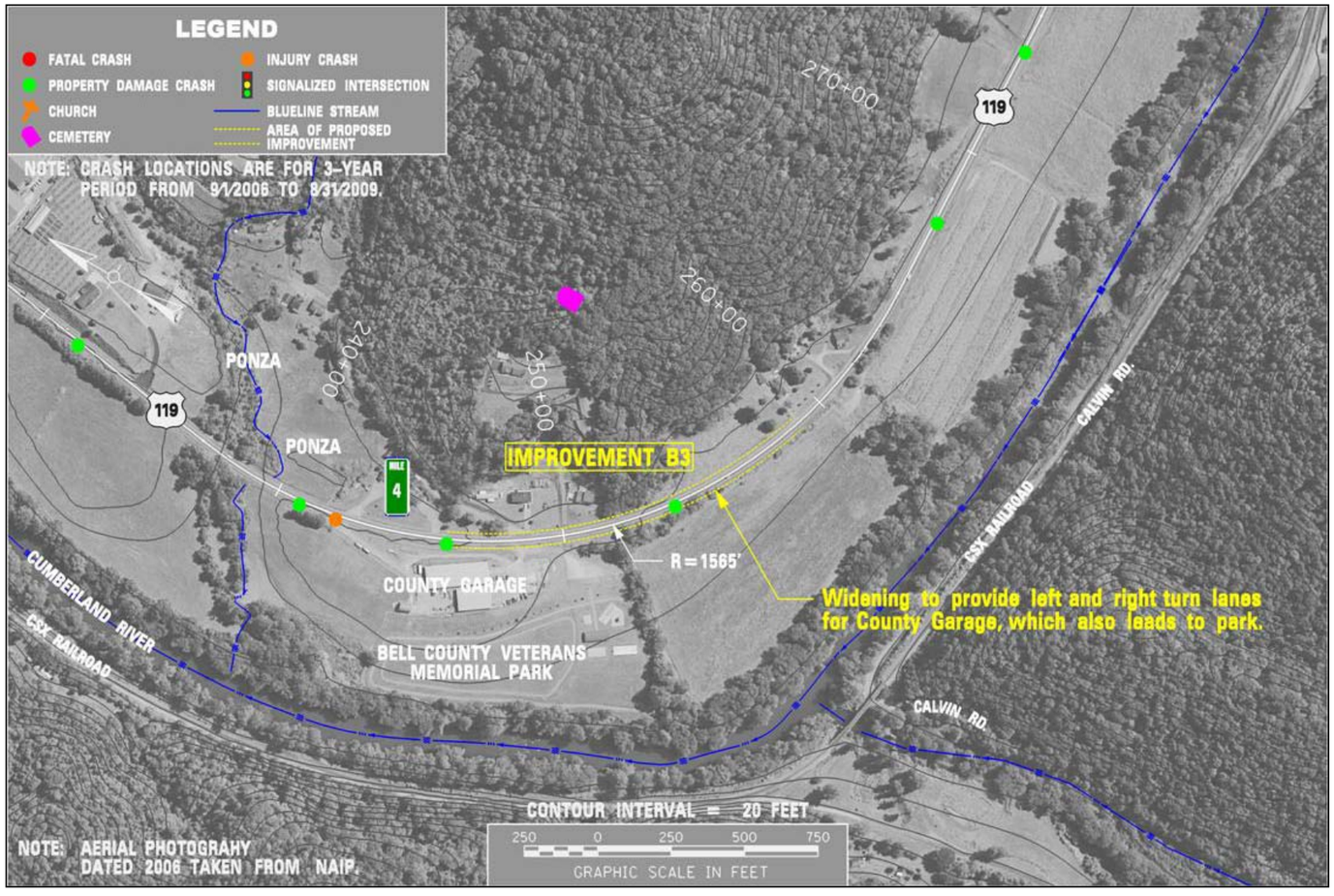
IMPROVEMENT

Project:

Add left and right turn lanes into the County Garage / Veteran's Park entrance from MP 4.01 to MP 4.28.

Project Cost Estimate (in 2010 Dollars):

Design:	$100,000
ROW:	$25,000
Utilities:	$50,000
Construction:	$1,100,000
Total:	$1,275,000



US 119 Corridor Study

Bell County
Passing Lanes

Project #B-4

ISSUES

- ***CONGESTION***
- High truck percentage.
- Slow travel speeds when cars follow trucks.
- No existing passing lanes in this area.

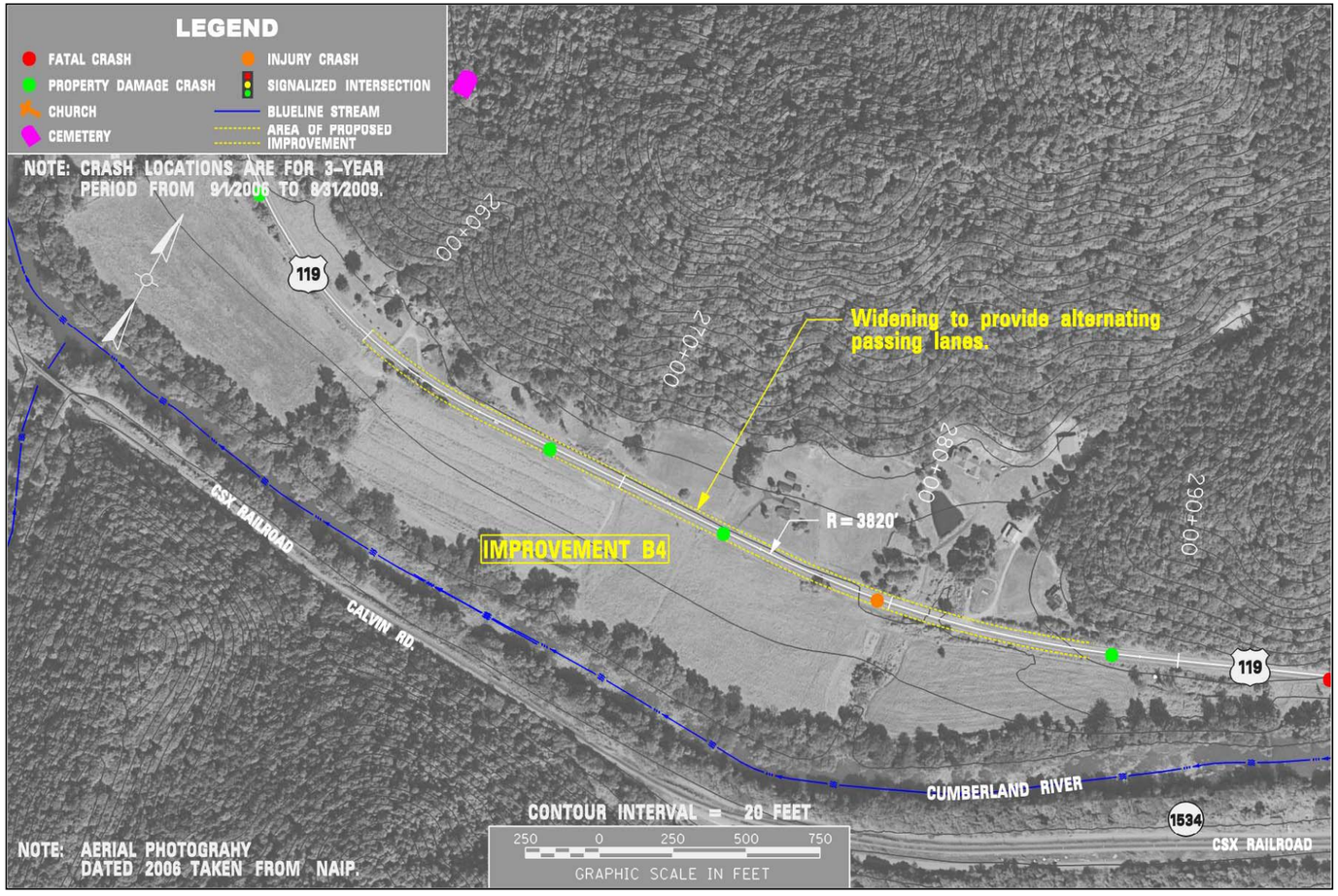
IMPROVEMENT

Project:

Add alternate passing lanes from MP 4.30 to MP 4.81. EB and WB passing lanes to be provided.

Project Cost Estimate (in 2010 Dollars):

Design:	$100,000
ROW:	$50,000
Utilities:	$100,000
Construction:	$3,450,000
Total:	$3,700,000



US 119 Corridor Study

Bell County

KY 1334 Left and Right Turn Lanes

Project #B-5

ISSUES

- ***SAFETY***
- Numerous crashes including a fatality approaching this junction.
- Crash types include several sideswipes and an angle collision.
- Poor sight distance in westbound direction.

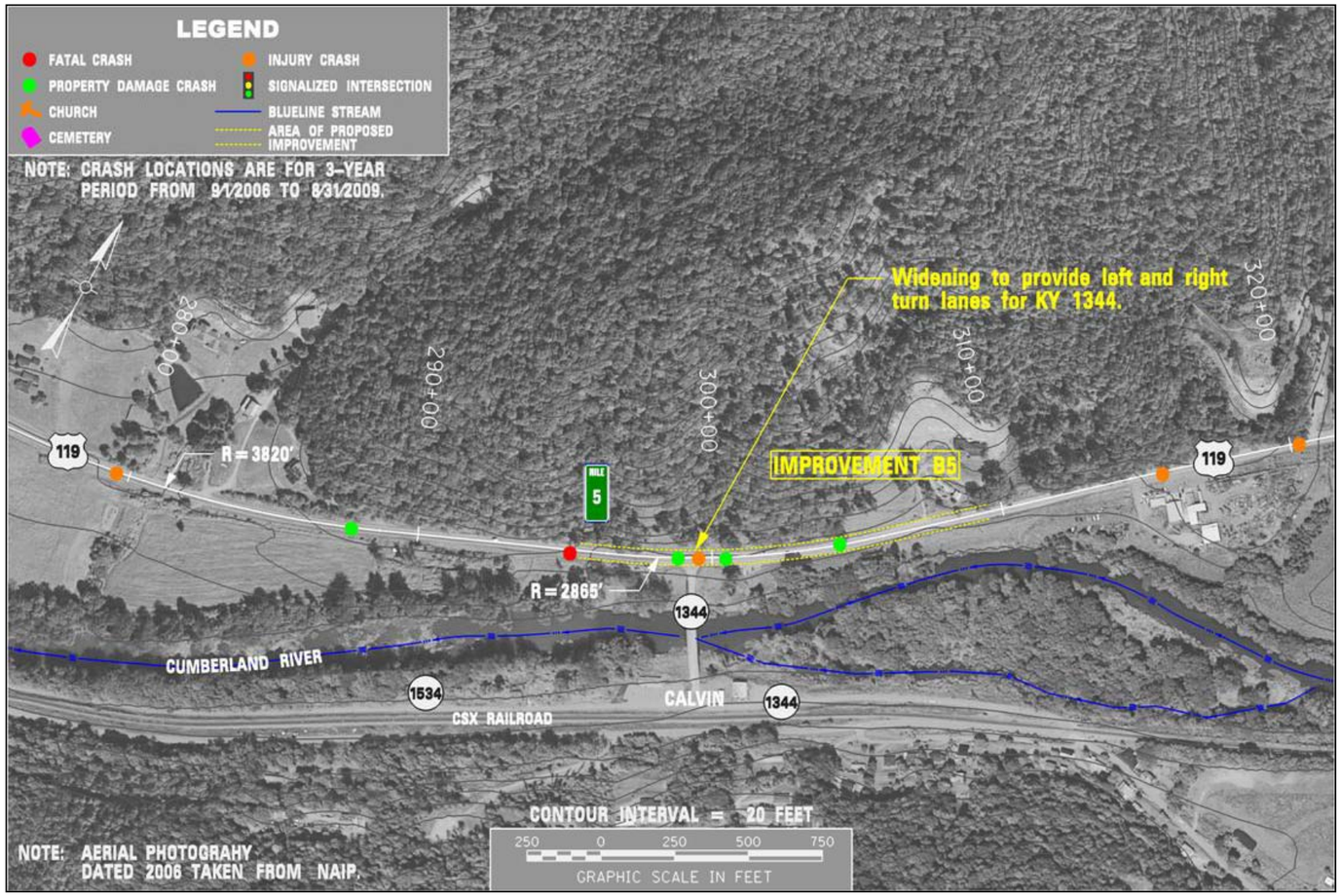
IMPROVEMENT

Project:

Add left and right turn lanes into KY 1344 / KY 1534 from MP 4.98 to MP 5.25.

Project Cost Estimate (in 2010 Dollars):

Design:	$125,000
ROW:	$25,000
Utilities:	$75,000
Construction:	$1,300,000
Total:	$1,525,000



US 119 Corridor Study

Bell County
Varilla Curve Improvements

Project #B-6

ISSUES

- ***SAFETY***
- Tight horizontal curvature.
- Roadway is behind mountain so when it freezes sun does not thaw pavement.
- Multiple crashes occurred along curve including a fatality.
- Crash types included several collisions with fixed objects.
- Highest number of comments from the public requesting improvements at this location in Bell County.

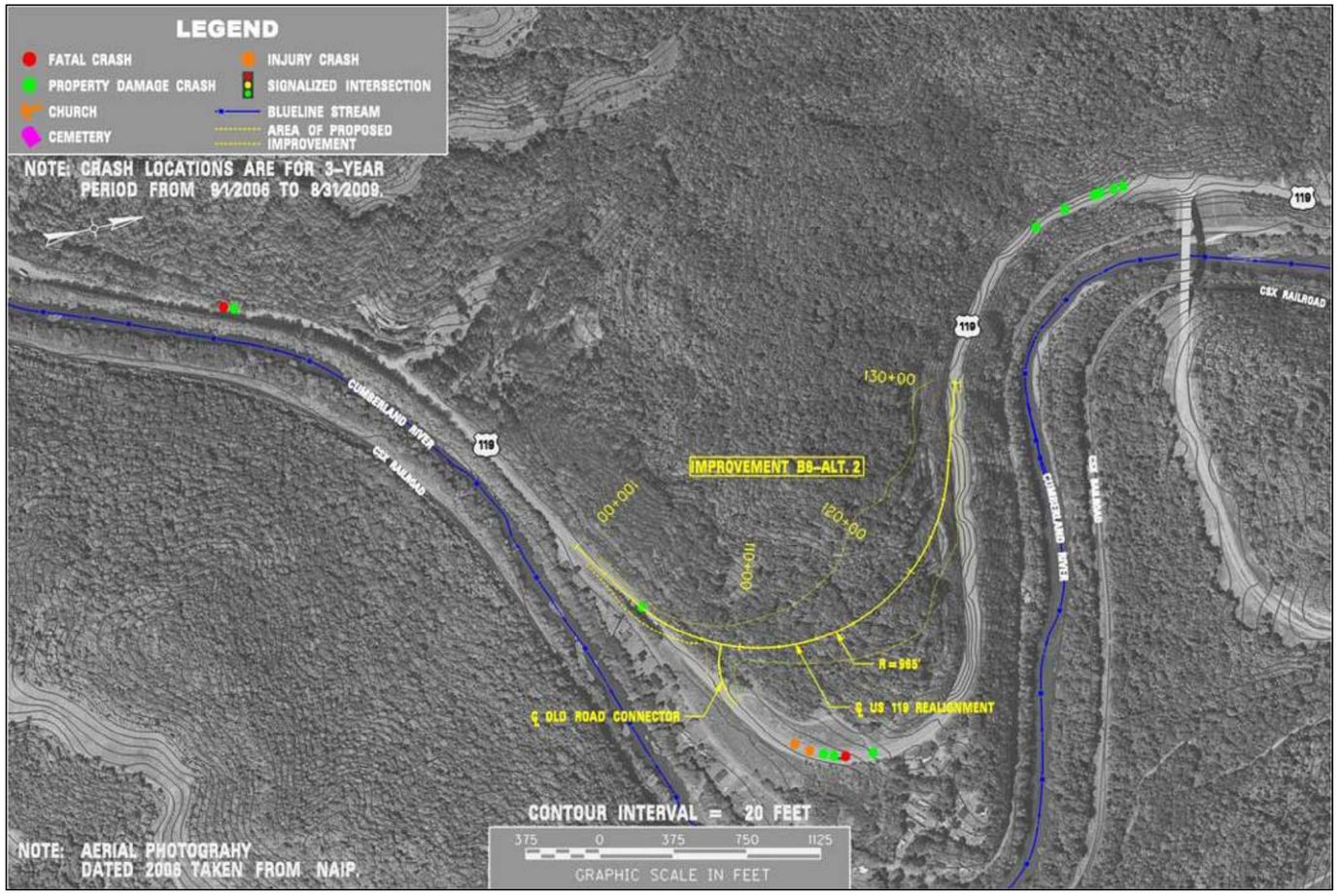
IMPROVEMENT

Project:

Increase curve radius from MP 6.59 to MP 6.97.

Project Cost Estimate (in 2010 Dollars):

Design:	$500,000
ROW:	$75,000
Utilities:	$50,000
Construction:	$22,300,000
Total:	$22,925,000



US 119 Corridor Study

Bell County
Close Connector to KY 3482

Project #B-7

ISSUES

- ***SAFETY***
- Multiple crashes on US 119 near entrance.
- Poor sight distance in both directions.
- EB passing lane ends just prior to intersection.
- WB passing lane goes by this intersection.
- Alternate access to Tanyard Loop / KY 3482 exists.

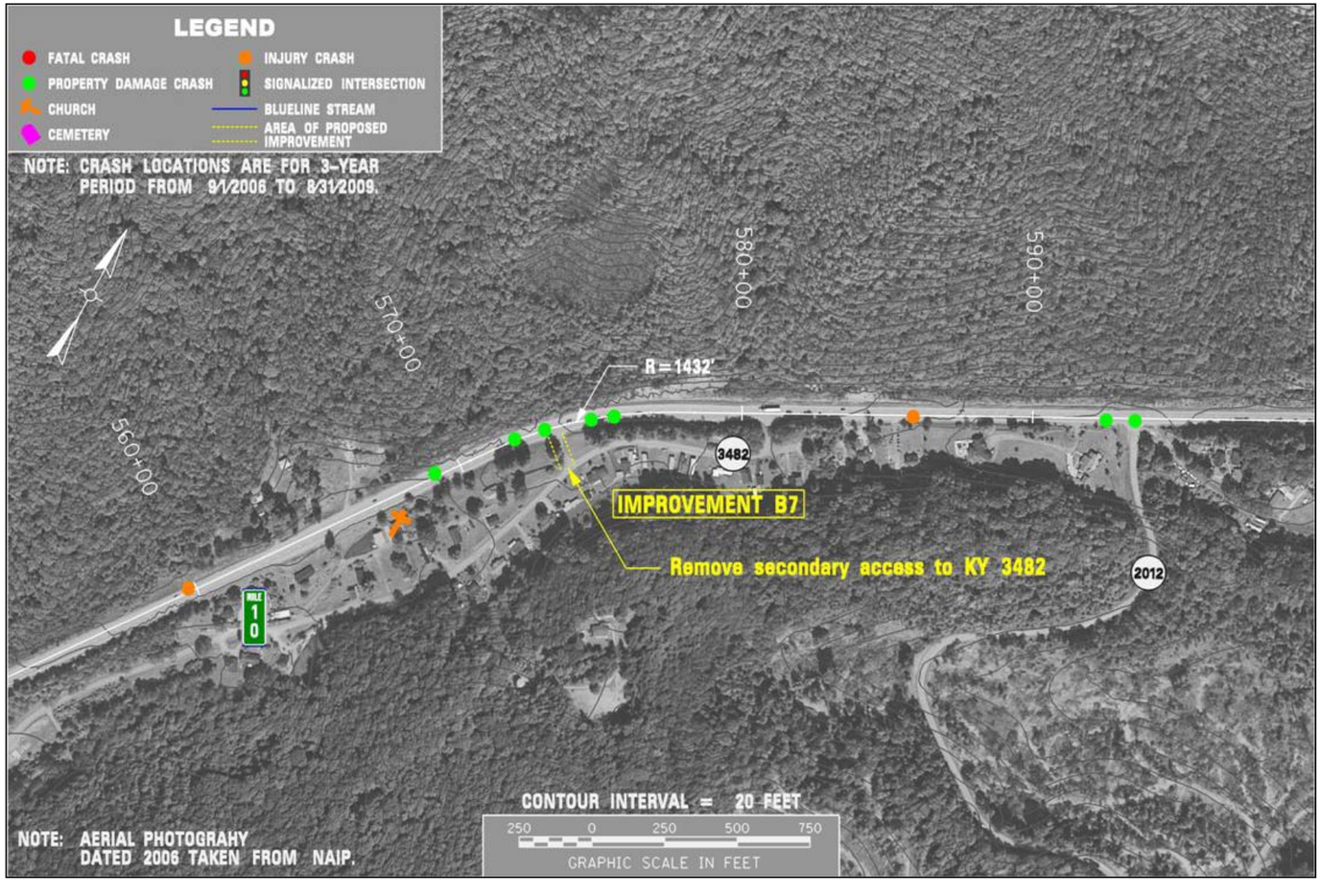
IMPROVEMENT

Project:

Remove secondary access from US 119 to Tanyard Loop / KY 3482 access point at MP 10.24.

Project Cost Estimate (in 2010 Dollars):

Design:	$0
ROW:	$0
Utilities:	$0
Construction:	$20,000
Total:	$20,000



US 119 Corridor Study

Bell County
KY 2012 Right Turn Lane

Project #B-8

ISSUES

- ***SAFETY***
- Heavily-accessed truck route.
- Coal trucks make right turn onto KY 2012 on a downhill grade.
- Steep grade on approach to US 119.

IMPROVEMENT

Project:

Add a right turn lane from US 119 onto KY 2012 from MP 10.51 to MP 10.60.

Project Cost Estimate (in 2010 Dollars):

Design:	$35,000
ROW:	$25,000
Utilities:	$25,000
Construction:	$360,000
Total:	$445,000

US 119 Corridor Study

Bell County
Passing Lanes

Project #B-9

ISSUES

- ***SAFETY***
- ***CONGESTON***
- High truck percentage.
- Steep grade.
- Slow travel when cars follow trucks.
- No passing lanes at this location.

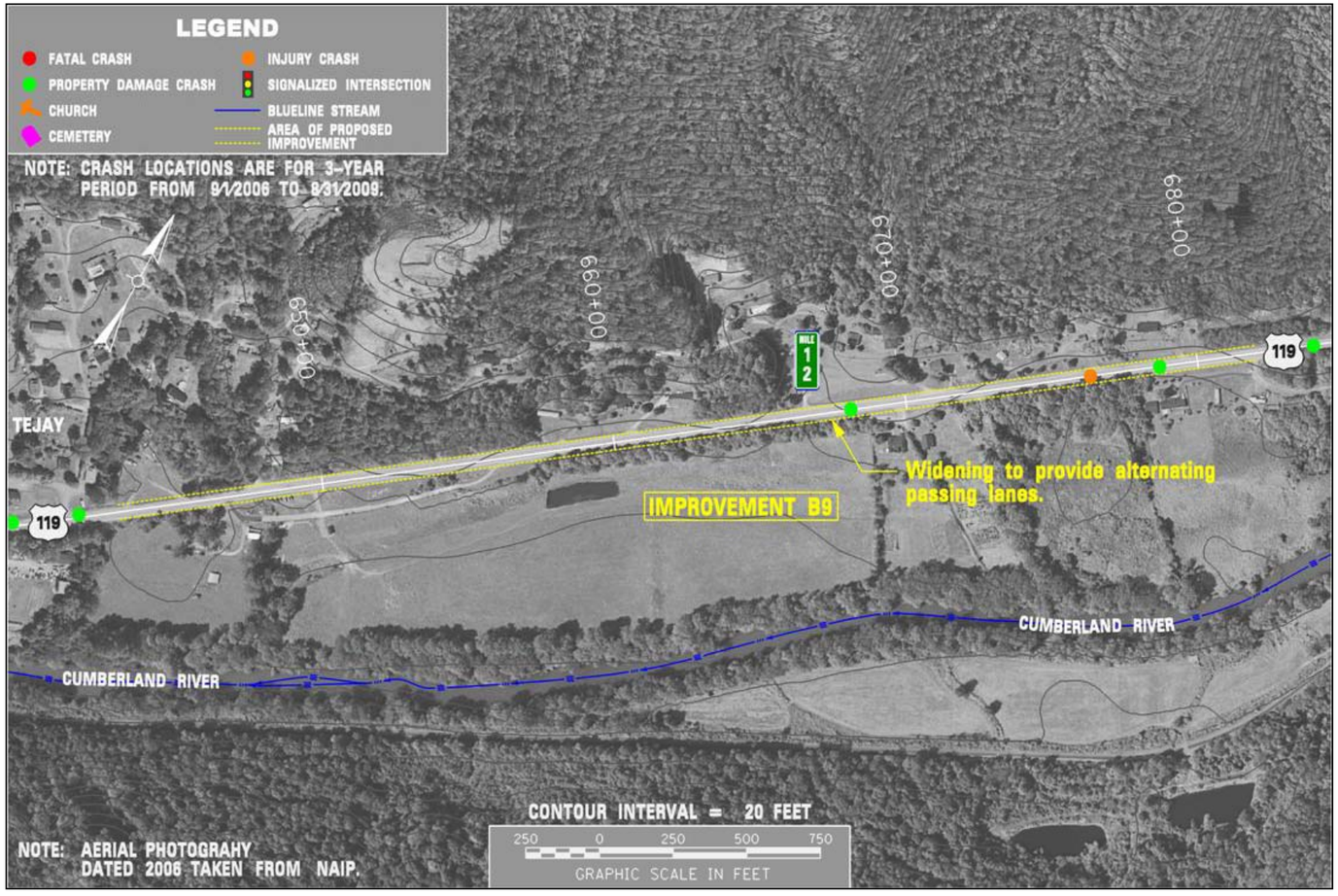
IMPROVEMENT

Project:

Add alternate passing lanes from M.P. 11.55 to M.P. 12.29. EB and WB passing lanes to be provided.

Project Cost Estimate (in 2010 Dollars):

Design:	$300,000
ROW:	$100,000
Utilities:	$300,000
Construction:	$3,200,000
Total:	$3,900,000



Bell County

Center Line Rumble Strip and Reflective Pavement Markings

Project #B-10

ISSUES

- ***SAFETY***
- Difficulty seeing lane markings at night.
- Vehicles cross into opposing lanes

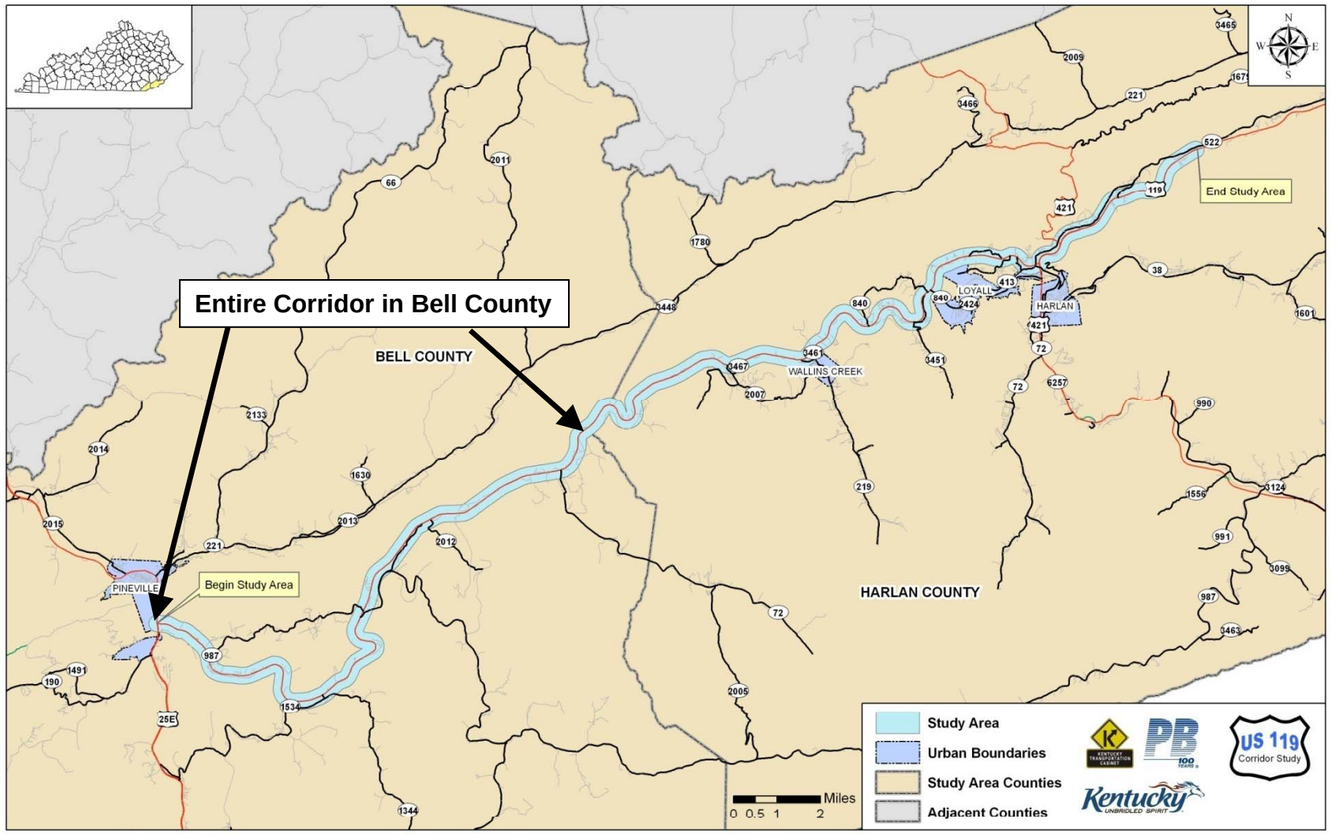
IMPROVEMENT

Project:

Add a center line rumble strip and reflective pavement markings along the corridor from MP 0.00 to MP 15.88 in Bell County. Includes 4 inch thermoplastic edge line and HD-21 centerline paint.

Project Cost Estimate (in 2010 Dollars):

Design:	$0
ROW:	$0
Utilities:	$0
Construction:	$100,000
Total:	$100,000



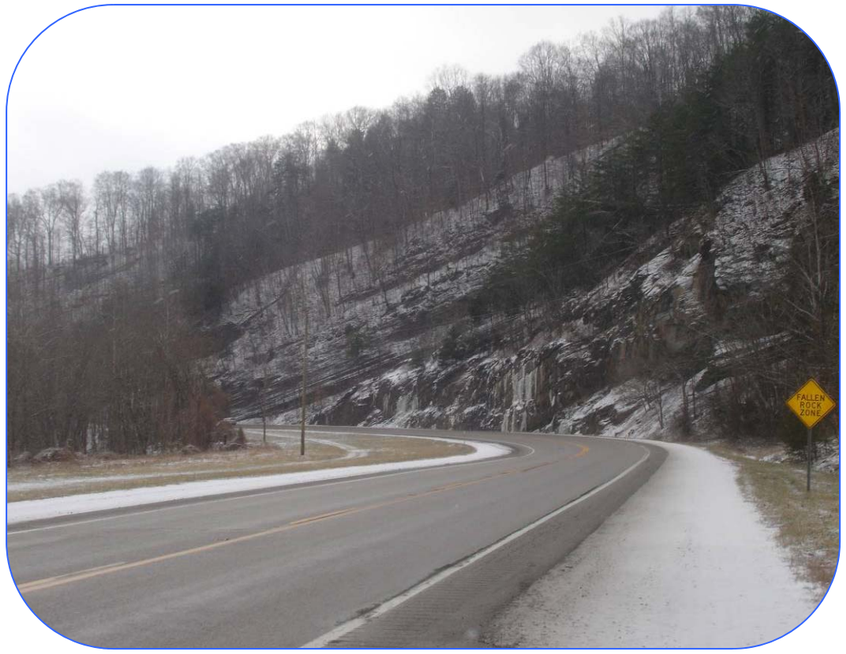
US 119 Corridor Study

Harlan County
Curve Improvement at Molus

Project #H-1

ISSUES

- ***SAFETY***
- Horizontal geometric deficiencies.
- Multiple crashes along curve.
- Two crashes were head-on collisions, others included a collision with an animal, a rear-end, and collisions with fixed and non-fixed objects.
- Highest number of comments from the public requesting improvements at this location for entire corridor.



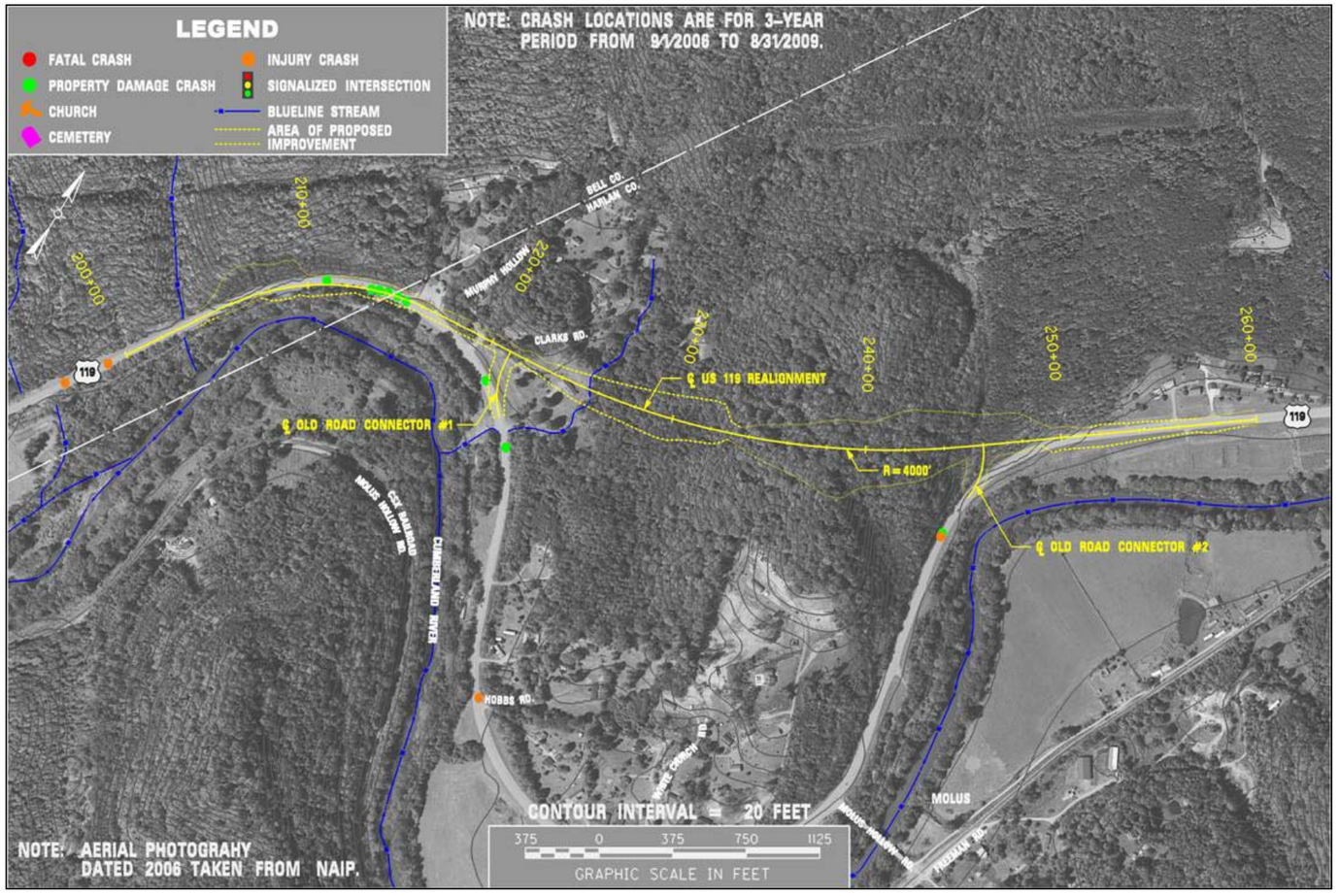
IMPROVEMENT

Project:

Realign Curve at MP 0.00 to MP 1.45.

Project Cost Estimate (in 2010 Dollars):

Design:	$800,000
ROW:	$350,000
Utilities:	$100,000
Construction:	$16,100,000
Total:	$17,350,000



US 119 Corridor Study

Harlan County

KY 840 Left and Right Turn Lanes

Project #H-2

ISSUES

- ***SAFETY***
- Multiple crashes approaching junction with KY 840.
- Primary crash types include collision with an animal and rear-end collisions.
- Poor sight distance approaching KY 840 in SB direction.

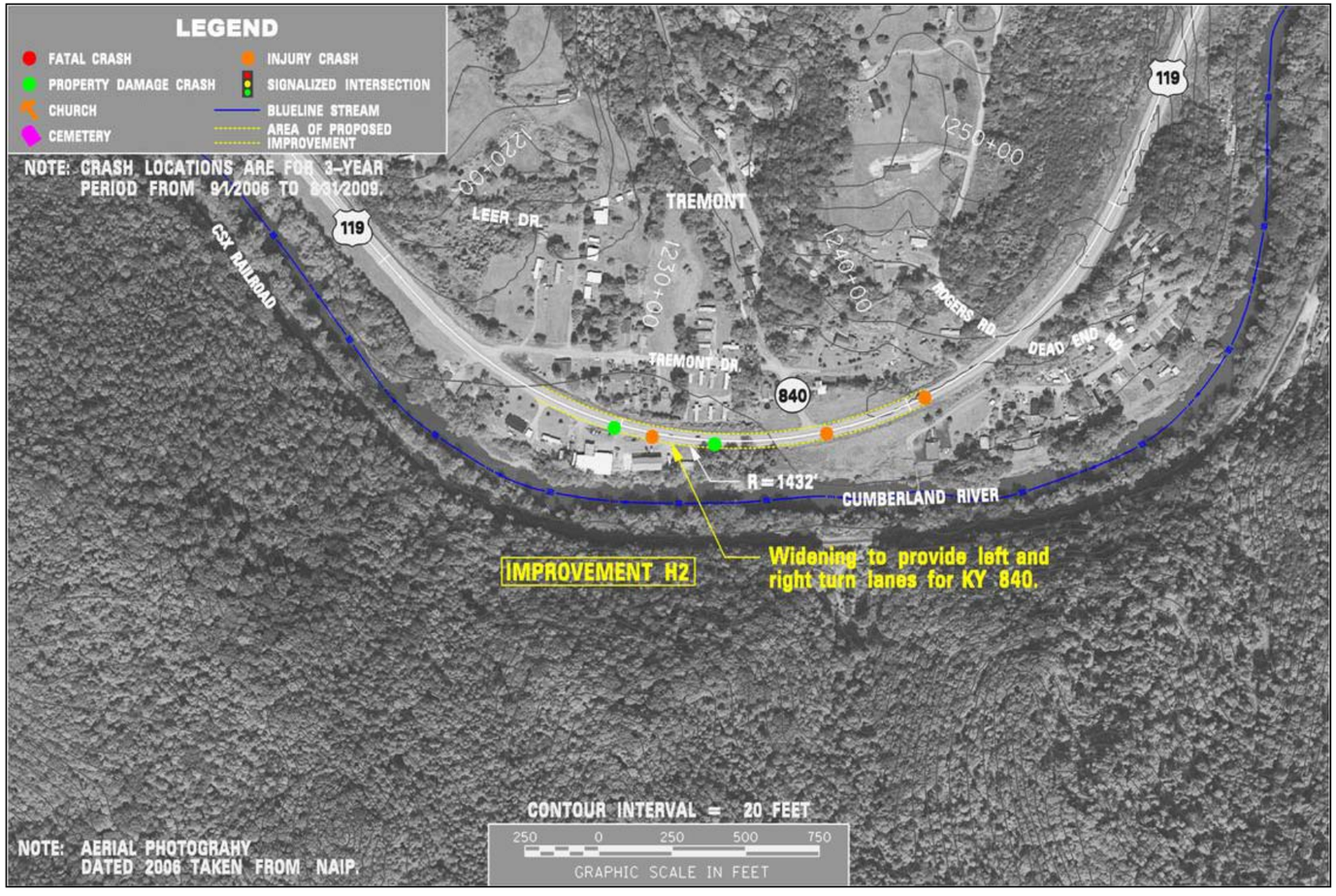
IMPROVEMENT

Project:

Add left and right turn lanes from US 119 onto KY 840 from MP 7.56 to MP 7.83.

Project Cost Estimate (in 2010 Dollars):

Design:	$100,000
ROW:	$25,000
Utilities:	$75,000
Construction:	$1,300,000
Total:	$1,500,000



US 119 Corridor Study

Harlan County

KY 3152 (Freshmeadows Road) Left Turn Lane

Project #H-3

ISSUES

- ***SAFETY***
- Primary access to community.
- Provides access to housing and Dayhoit Community Church.
- Poor sight distance approaching KY 3152 junction.
- Multiple crashes approaching KY 3152 junction

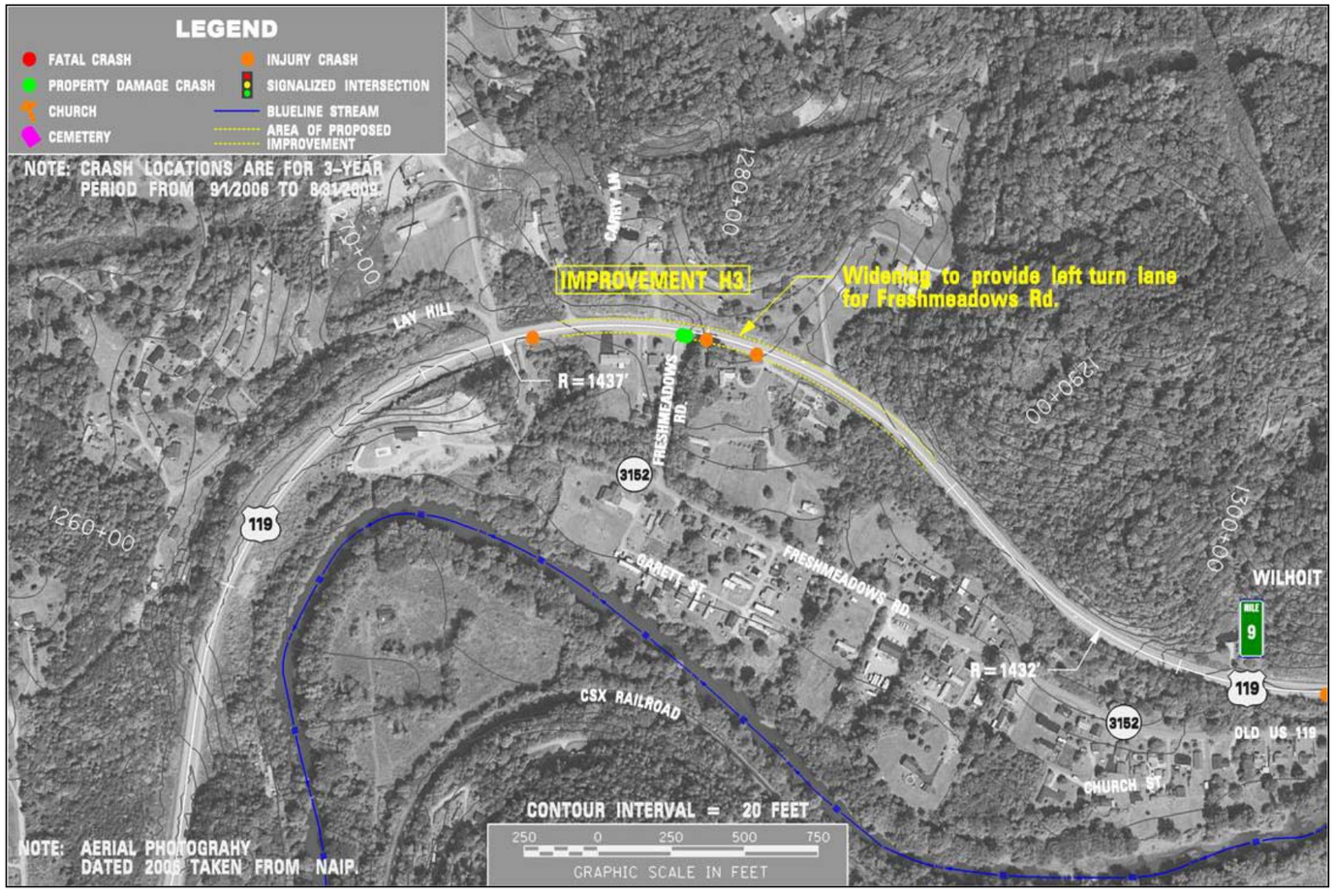
IMPROVEMENT

Project:

Add left turn lane onto KY 3152 (Freshmeadows Road) from US 119 at MP 8.48 to MP 8.75.

Project Cost Estimate (in 2010 Dollars):

Design:	$100,000
ROW:	$25,000
Utilities:	$50,000
Construction:	$1,100,000
Total:	$1,275,000



US 119 Corridor Study

Harlan County
KY 840 Right Turn Lane

Project #H-4

ISSUES

- ***SAFETY***
- Poor sight distance.
- High right turn volumes (72 vehicles during PM peak period).
- KY 840 provides access to Loyall and to Harlan.
- Multiple cemeteries are located along KY 840 leading to the intersection with US 119.

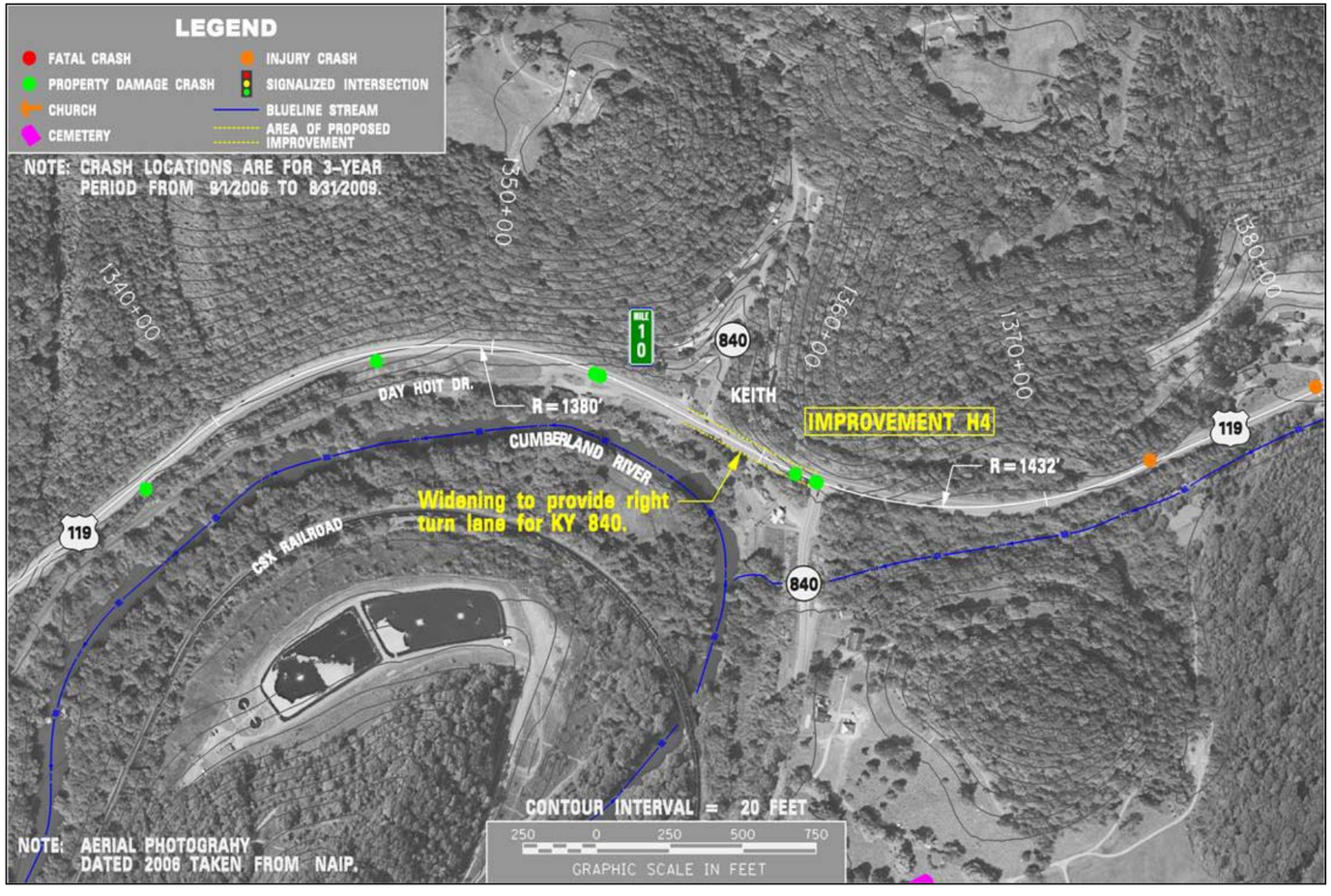
IMPROVEMENT

Project:

Add right turn lane onto KY 840 from US 119 at MP 10.04.

Project Cost Estimate (in 2010 Dollars):

Design:	$50,000
ROW:	$15,000
Utilities:	$50,000
Construction:	$360,000
Total:	$475,000



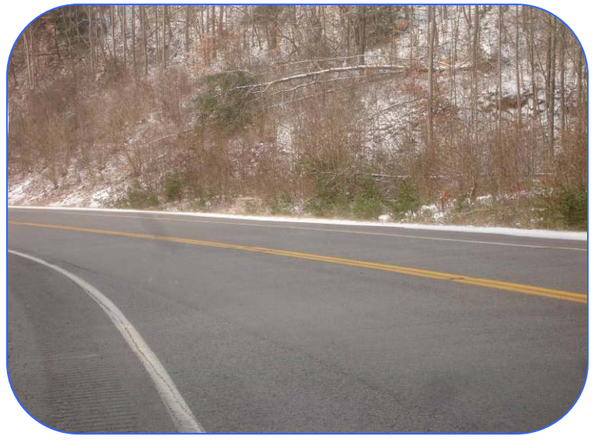
US 119 Corridor Study

Harlan County
Extend Passing Lane

Project #H-5

ISSUES

- ***SAFETY***
- Existing passing lanes do not begin at the bottom of the hill.
- Small area of retail / housing alongside road in EB direction.



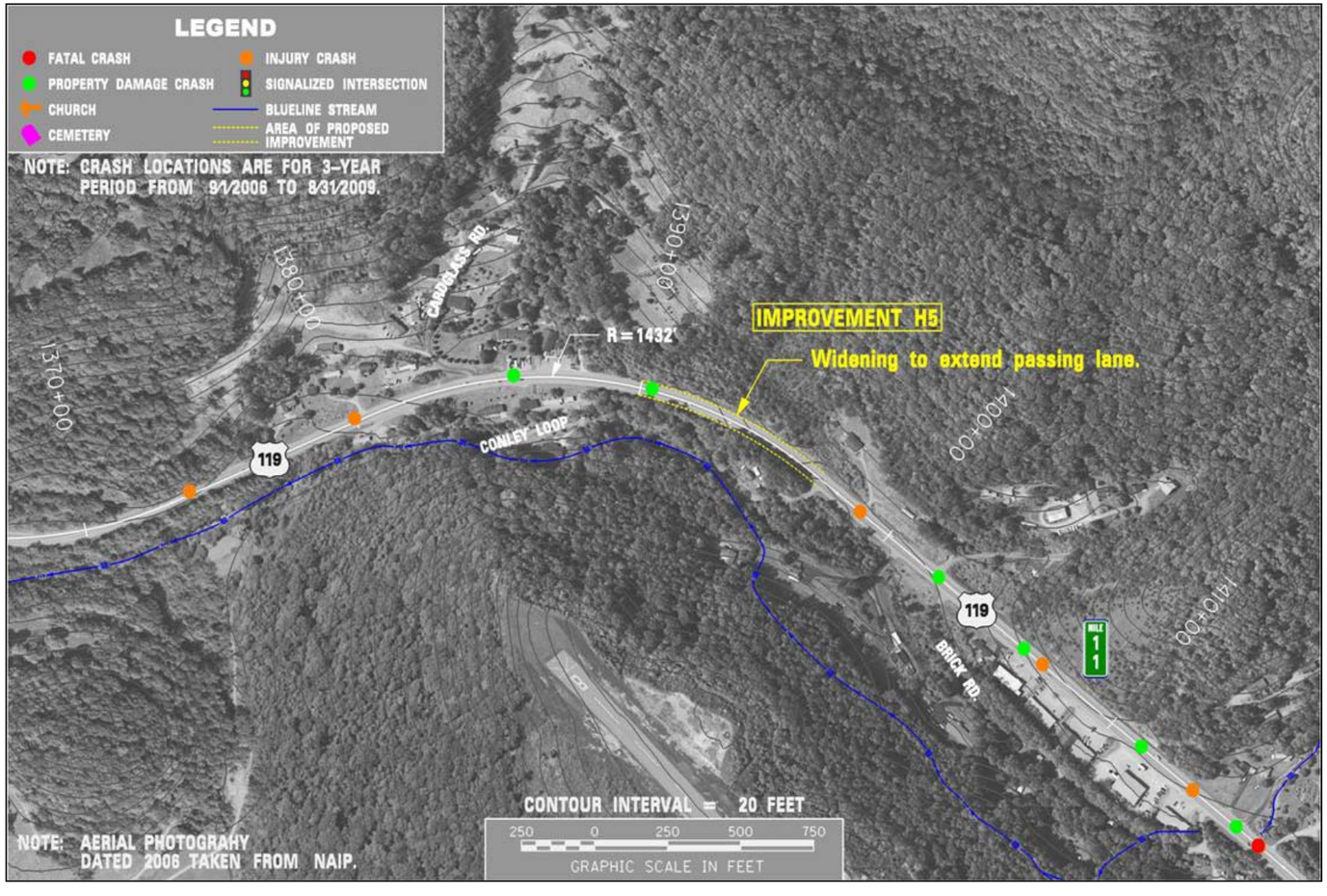
IMPROVEMENT

Project:

Extend EB Passing Lane at MP 10.66 to MP 10.79.

Project Cost Estimate (in 2010 Dollars):

Design:	$75,000
ROW:	$15,000
Utilities:	$35,000
Construction:	$900,000
Total:	$1,025,000



US 119 Corridor Study

Harlan County
US 421 Approach

Project #H-6

ISSUES

- ***SAFETY***
- Steep grade / limited sight distance.
- High truck percentages
- Vehicles need to be prepared to stop at when traffic signal is red at bottom of steep hill.
- High spot critical crash rate factor (1.60).
- Primary crash type is rear-end collisions.

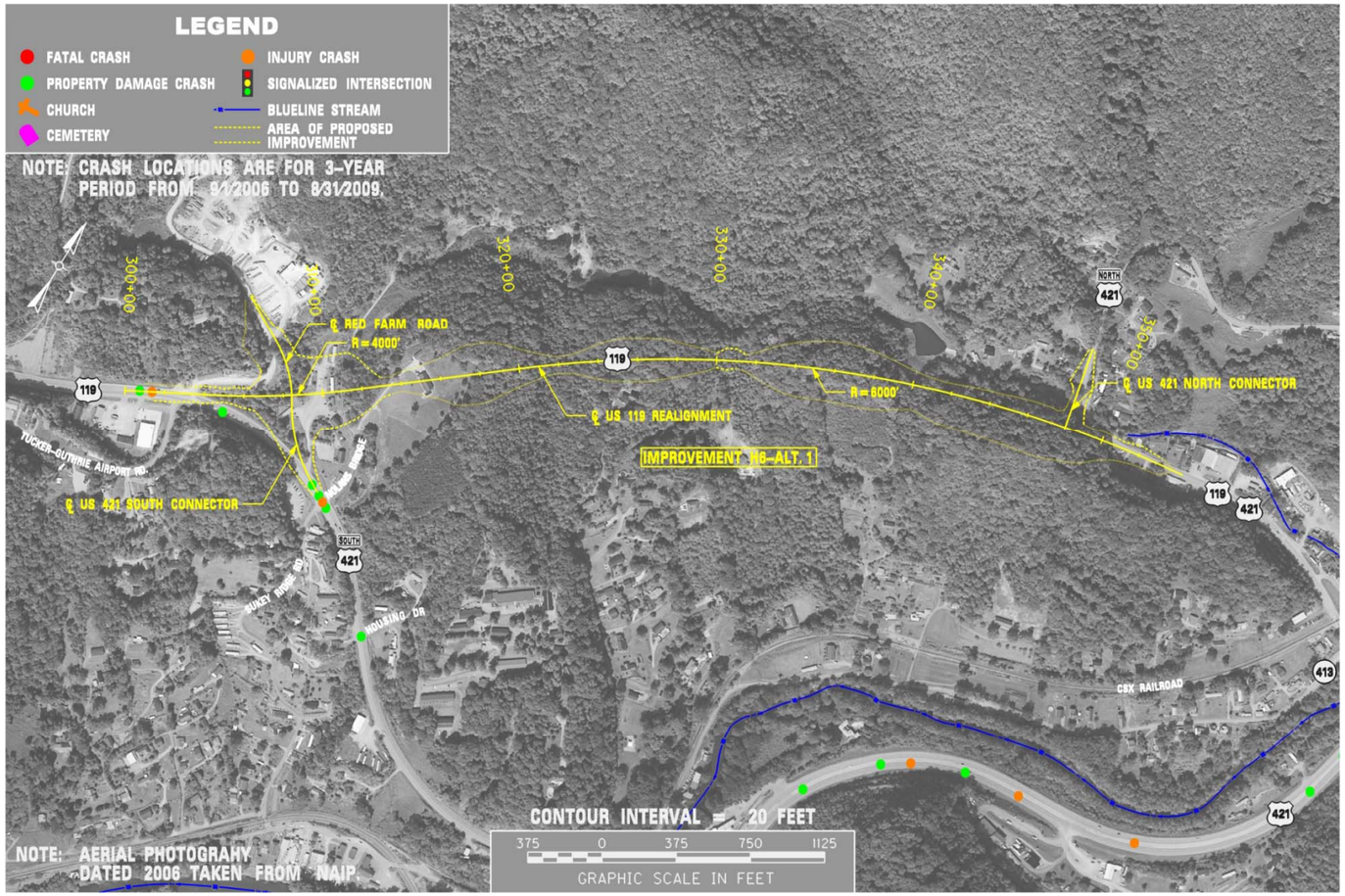
IMPROVEMENT

Project:

Improve approach to US 421 from MP 12.44 to MP 13.16 through a new intersection and new alignment for US 119.

Project Cost Estimate (in 2010 Dollars):

Design:	$900,000
ROW:	$550,000
Utilities:	$250,000
Construction:	$18,300,000
Total:	$20,000,000



US 119 Corridor Study

Harlan County

Safety Improvements at US 421 Departure

Project #H-7

ISSUES

- ***SAFETY***
- Multiple crashes at approach to US 421 departure.
- Crash types range from collision with a non-fixed object, collision with an animal, and rear-end collision.
- Intersection is not well lit.

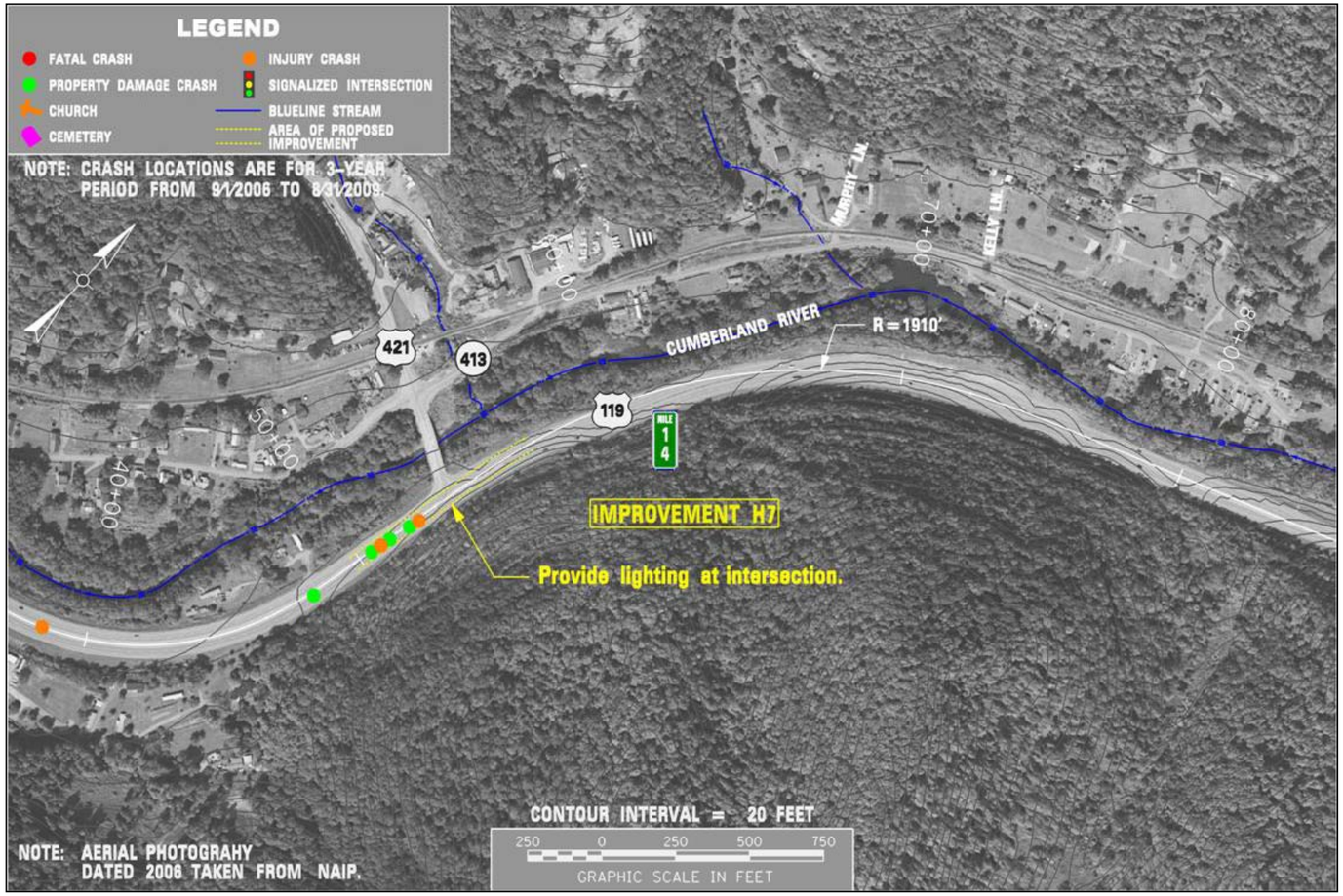
IMPROVEMENT

Project:

Add lighting at US 421 departure at MP 13.83.

Project Cost Estimate (in 2010 Dollars):

Design:	$30,000
ROW:	$0
Utilities:	$0
Construction:	$70,000
Total:	$100,000



US 119 Corridor Study

Harlan County
Extend Left Turn Lane

Project #H-8

ISSUES

- ***SAFETY***
- ***CONGESTION***
- Left turn lane into high school is short.
- During the AM peak period, 240 vehicles turn left into the high school.

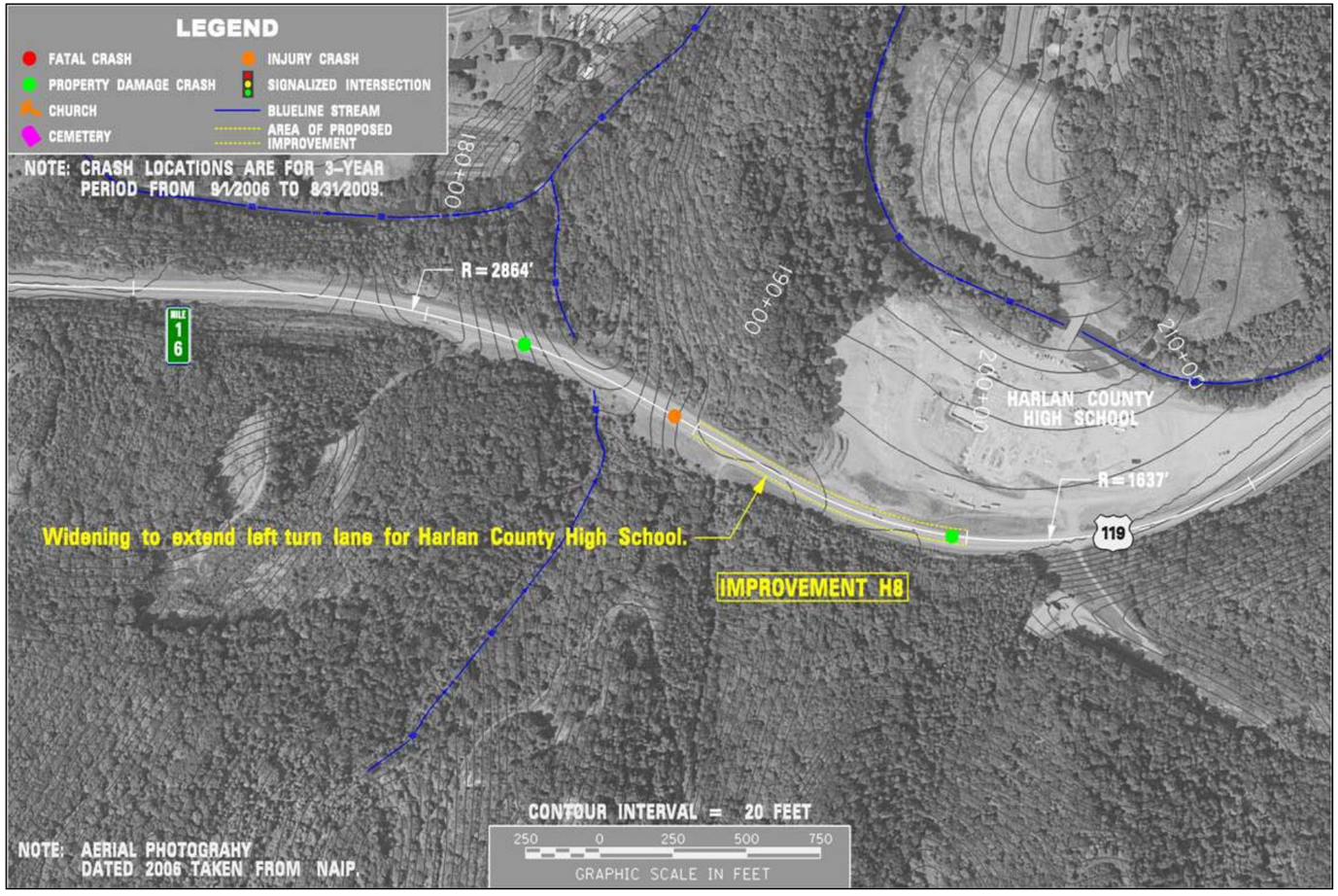
IMPROVEMENT

Project:

Extend left turn lane into Harlan County High School from MP 16.34 to MP 16.53.

Project Cost Estimate (in 2010 Dollars):

Design:	$75,000
ROW:	$0
Utilities:	$25,000
Construction:	$650,000
Total:	$750,000



Harlan County

Center Line Rumble Strip and Reflective Pavement Markings

Project #H-9

ISSUES

- ***SAFETY***
- Difficulty seeing lane markings at night.
- Vehicles cross into opposing lanes

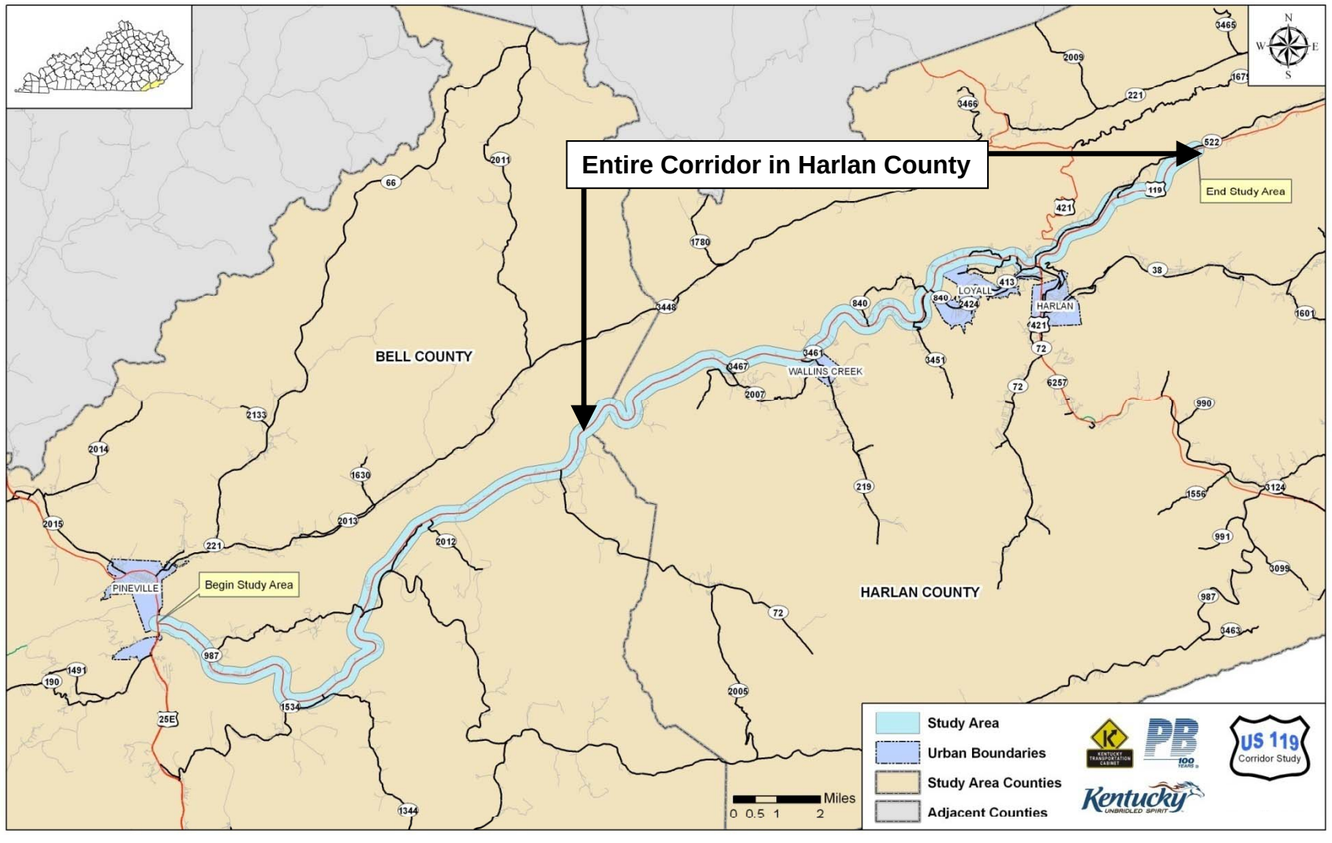
IMPROVEMENT

Project:

Add a center line rumble strip and reflective markings along the corridor from MP 0.00 to MP 13.21 and MP 13.95 to MP 18.0 in Harlan County (excludes four-lane portion of US 119). Includes 4 inch thermoplastic edge line and HD-21 centerline paint.

Project Cost Estimate (in 2010 Dollars):

Design:	$0
ROW:	$0
Utilities:	$0
Construction:	$110,000
Total:	$110,000



6.0 PROJECT PRIORITIZATION

With the numerous projects identified for both counties, the identified projects were prioritized to provide future direction on subsequent project development. Originally, the Project Development Team (PDT) identified two projects per county as high priorities. These included the following:

Bell County:

#1: Improvements to Varilla Curve (B-6)
#2: Two-way left-turn lane (B-1)

Harlan County:

#1: US 421 approach (H-6)
#2: Curve at Molus (H-1)

These priorities were presented at the final elected officials and stakeholders meeting on January 22, 2010.

Following the meeting, the project priorities were evaluated by the KYTC District 11 staff and a new, final set of priorities were assigned to all projects. The priority ranking was still assigned by county. The following table **(Table 3**) lists the projects by the final ranking. It should be noted that several additional projects are included for Harlan County that were not part of this study. These were included by the District in their efforts to provide an overall ranking for all projects for US 119 in Harlan County (projects developed by this study as well as the KYTC's previously identified projects).

In addition, Projects H-9 and B-10 are listed but not given a project priority. It was determined that these projects are related to safety improvements that would best be completed during corridor re-surfacing or other maintenance activities.

This final list of projects with priority ranking provides assistance in the next project steps which include securing additional funding for projects in Harlan County and funding for projects in Bell County.

Table 3: US 119 Priority Projects for Bell and Harlan Counties

Project Priority	Project Number	Located County	Project Description	Roadway Location From MP	To MP	Length	Estimated Costs - 2010 Dollars Design	ROW	Utilities	Construction	Total
1	B-1	Bell	Construct Two Way Left Turn Lane	0.50	1.00	0.50	$65,000	$25,000	$65,000	$650,000	$805,000
2	B-2	Bell	Construct Left and Right Turn Lanes at Page Elementary Schol	3.28	3.55	0.27	$100,000	$10,000	$72,000	$450,000	$632,000
3	B-6	Bell	Realign US 119 near Varilla Curve (Alt. 2)	6.59	6.97	0.55	$500,000	$75,000	$50,000	$22,300,000	$22,925,000
4	B-4	Bell	Widen US 119 to Provide Passing Lanes	4.20	5.20	1.00	$100,000	$50,000	$100,000	$1,100,000	$1,350,000
5	B-9	Bell	Widen US 119 to Provide Passing Lanes	11.20	13.60	2.40	$300,000	$100,000	$300,000	$3,600,000	$4,300,000
6	B-5	Bell	Widen US 119 to Provide Left and Right Turn Lanes for KY 1344	4.98	5.25	0.27	$125,000	$25,000	$75,000	$1,300,000	$1,525,000
7	B-8	Bell	Widen US 119 to Provide Right Turn Lane for KY 2012	10.51	10.60	0.09	$35,000	$25,000	$25,000	$360,000	$445,000
8	B-3	Bell	Widen US 119 to Provide Left and Right Turn Lanes for County Garage	4.01	4.28	0.27	$100,000	$25,000	$50,000	$1,100,000	$1,275,000
9	B-7	Bell	Remove Secondary Access to KY 3482	10.24	10.26	0.02	$0	$0	$0	$20,000	$20,000
N/A	B-10	Bell	Add a center line rumble strip and reflective pavement markings	0.00	15.88	15.88	$0	$0	$0	$100,000	$100,000
										Total	**$33,377,000**
1	**N/A**	**Harlan**	**Provide Left and Right Turn Lanes for KY 1084**	**12.44**		**0.25**	**$75,000**	**$35,000**	**$75,000**	**$707,000**	**$892,000**
2	**N/A**	**Harlan**	**Provide Two Way Left Turn Lane**	**10.80**	**11.70**	**0.90**	**$100,000**	**$15,000**	**$25,000**	**$1,287,000**	**$1,427,000**
3	H-1	Harlan	Realignment of US 119	0.00	1.45	1.05	$800,000	$350,000	$100,000	$16,100,000	$17,350,000
4	N/A	Harlan	Widen US 119 to Provide Passing Lanes	1.30	3.00	1.70	$250,000	$25,000	$150,000	$2,800,000	$3,225,000
5	N/A	Harlan	Extend Passing Lanes	6.50	7.50	1.00	$150,000	$75,000	$100,000	$1,570,000	$1,895,000
6	H-6	Harlan	Realign US 119 (Alt.1)	12.44	13.16	1.00	$900,000	$550,000	$250,000	$18,300,000	$20,000,000
7	H-8	Harlan	Widen US 119 to Extend Harlan County High School Turn Lanes	16.34	16.53	0.19	$75,000	$0	$25,000	$650,000	$750,000
8	H-5	Harlan	Widen US 119 to Extend Passing Lanes	10.66	10.79	0.13	$75,000	$15,000	$35,000	$650,000	$775,000
9	N/A	Harlan	Provide Right Turn Lane for KY 3451	9.10		0.25	$10,000	$10,000	$25,000	$123,000	$168,000
10	H-2	Harlan	Widen US 119 to Provide Left and Right Turn Lanes for KY 840	7.56	7.83	0.27	$100,000	$25,000	$75,000	$1,300,000	$1,500,000
11	H-3	Harlan	Widen US 119 to Provide Left Turn Lane for Freshmeadows Road	8.48	8.75	0.27	$100,000	$25,000	$50,000	$1,100,000	$1,275,000
12	H-4	Harlan	Widen US 119 to Provide Right Turn Lanes for KY 840	10.04	10.13	0.09	$50,000	$15,000	$50,000	$360,000	$475,000
13	H-7	Harlan	Provide Lighting at the US 119 and US 421 Intersection	13.83	13.96	0.13	$30,000	$0	$0	$70,000	$100,000
N/A	H-9	Harlan	Add a center line rumble strip and reflective pavement markings	0.00	17.26	17.26	$0	$0	$0	$110,000	$110,000
										Total	**$49,942,000**

Note: KYTC District Eleven is actively working on these two projects with the initial funding in Item No. 11-8511.00

APPENDIX A:

EXISTING CONDITIONS

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1.0 TRAFFIC AND SAFETY OPERATIONS OVERVIEW

To determine if there are traffic and safety issues along the existing US 119 corridor, a detailed analysis was completed examining the existing highway characteristics and geometrics, traffic volumes, truck traffic, levels of service (LOS), crash rates, and other key issues. The analysis considered current and future traffic conditions assuming no major changes are made to the existing highway in the future. In support of the analysis, highway and traffic data was collected from a variety of sources including:

- KYTC Highway Information System database
- KYTC District 11 data sources
- Kentucky State Police Collision Report Analysis for Safer Highways (CRASH) database
- Study area field reviews
- Turning movement counts

In addition, geographic files used for mapping were obtained from the Kentucky Office of Geographic Information as well as KYTC.

1.1 Existing Highway Characteristics and Geometrics

The following highway characteristics were compiled for US 119:

- Functional class
- Facility type
- Lane width
- Shoulder width
- Median type
- Median width
- Percent no-passing zones
- Posted speed-limit
- Most recent average daily traffic (ADT) volume / count station / year of count
- Percent trucks

US 119 was divided into segments based on these characteristics. A summary of these features is included in **Table A-1**.

Exact data was not available through KYTC to determine the percentage of no-passing zones per section. Based on the existing plan drawings of US 119, aerial photography and the known passing / truck climbing lanes, an estimate of 60 percent no-passing zones was made and applied to the corridor.

Data on the horizontal curvature of US 119 was also collected, and is shown in **Figure A-1.** From this data, one curve has a degree of curvature that exceeds 9.0 degrees which is the curve at Varilla.

1.2 Traffic Volumes

Current Traffic Volumes

The average daily traffic (ADT) volumes used for this project included traffic counts from the KYTC 'CTS' database. These counts were conducted during the years of 2006 – 2009. To provide current (i.e., 2009) volumes for the entire corridor, the counts from 2006 to 2008 were forecasted to a base year of 2009 using the growth rates discussed in the next section. The current ADT volumes as determined from an existing count from Year 2009 or by applying the selected growth rate to previous counts are listed in **Table A-1** and shown in **Figure A-2**.

Historic Traffic Volumes and Growth Rates

Growth rates for the study were based upon a historical traffic growth analysis along US 119. The analysis utilized traffic counts obtained from the KYTC's 'CTS' traffic count program which includes counts from 1963 to 2009. The historical counts were entered into a spreadsheet provided by the KYTC Division of Planning. The spreadsheet calculates growth rates using both exponential and trend line analyses. The historical growth rates along US 119 range from -0.72% to 2.43%.

In selecting an appropriate traffic growth rate, several factors were considered along with the historical growth. These factors include recent traffic volumes and geography. As such, roadway segments were grouped together by location:

- The first group began at US 25E and went to KY 219 (MP 0.0 in Bell County to MP 5.582 in Harlan County). The growth rate for this group was 0.6%.
- The second group began at KY 219 and went to KY 1084 (MP 5.582 to MP 12.435 in Harlan County). The growth rate for this group was 0.8%.
- The third group began at KY 1084 and went to US 421 (MP 12.435 to MP 13.952 in Harlan County) and had a growth rate of 1.0%.
- The fourth group began at US 421 and went to KY 522 (MP 13.952 to MP 15.730 in Harlan County) and had a growth rate of 0.5%.
- The last group extended from KY 522 to the end of the study area (MP 15.730 to MP 18.000 in Harlan County) and had a growth rate of 0.4%.

The growth rates determined for each section are shown in **Table A-1**. The growth rates reflect historical trends along US 119, but do not include specific developments that may be constructed within or adjacent to the project area.

Future No-Build Traffic Volumes

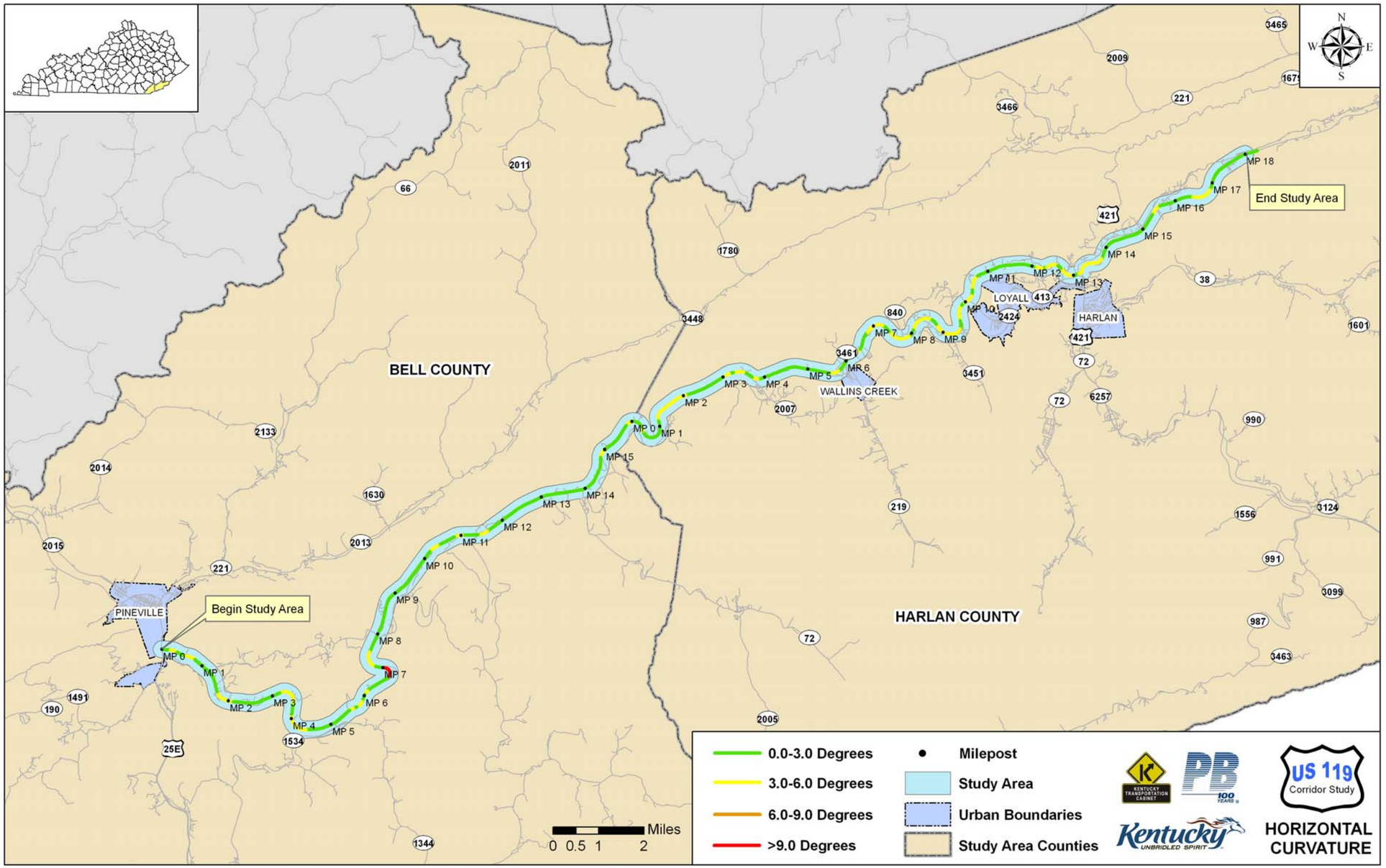
The 2040 future year No-Build traffic volumes were calculated by applying historic growth rates, as discussed above, to the various segments of roadway. The historic growth rates and 2040 No-Build traffic volumes are shown in **Table A-1** and **Figure A-3**.

Table A-1: US 119 Highway Characteristics Summary

Section	County	Begin Milepoint	End Milepoint	Section Length (miles)	Functional Class	Facility Type	Lane Width (feet)	Shoulder Width (feet)	Median Type	Median Width (feet)	% No Passing Zones	Posted Speed Limit (MPH)	Most Recent ADT	Count Station	Count Year	Growth Rate	2009 ADT[1]	% Trucks[2]	2040 ADT[1]
1	Bell	0.000 (US 25E)	0.1490 (East of US 25E)	0.149	Rural Principal Arterial	2 Lane Divided Highway	12	4	Raised Non-Mountable	4	60	55	9,010	753	2008	0.6%	9,100	8.0%	11,000
2	Bell	0.1490 (East of US 25E)	1.496 (Old Bell High Rd / KY 987)	1.347	Rural Principal Arterial	2 Lane Undivided Highway	12	4	None	0	60	55	9,010	753	2008	0.6%	9,100	8.0%	11,000
3	Bell	1.496 (Old Bell High Rd / KY 987)	3.513 (Page School Road)	2.017	Rural Principal Arterial	2 Lane Undivided Highway	12	4	None	0	60	55	7,730	262	2008	0.6%	7,800	*8.0%*	9,400
4	Bell	3.513 (Page School Road)	7.796 (KY 987)	4.283	Rural Principal Arterial	2 Lane Undivided Highway	12	4	None	0	60	55	7,130	251	2007	0.6%	7,200	*7.0%*	8,700
5	Bell	7.796 (KY 987)	13.949 (KY 72 / Old 119 Loop)	6.153	Rural Principal Arterial	2 Lane Undivided Highway	12	4	None	0	60	55	5,540	003	2009	0.6%	5,500	*7.0%*	6,600
6	Bell	13.949 (KY 72 / Old 119 Loop)	15.880 (Harlan County Line)	1.931	Rural Principal Arterial	2 Lane Undivided Highway	12	4	None	0	60	55	5,290	009	2009	0.6%	5,300	*6.0%*	6,400
7	Harlan	0.000 (Bell County Line)	3.827 (KY 2007)	3.827	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	5,290	009	2009	0.6%	5,300	*6.0%*	6,400
8	Harlan	3.827 (KY 2007)	5.582 (KY 219)	1.755	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	4,970	507	2007	0.6%	5,000	*6.0%*	6,000
9	Harlan	5.582 (KY 219)	7.787 (KY 840)	2.205	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	7,650	775	2007	0.8%	7,800	*6.0%*	10,000
10	Harlan	7.787 (KY 840)	11.479 (KY 3452 Four Mile Road)	3.692	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	9,900	P18	2008	0.8%	10,000	6.0%	12,800
11	Harlan	11.479 (KY 3452 Four Mile Road)	12.435 (KY 1084)	0.956	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	8,700	764	2008	0.8%	8,800	*6.0%*	11,300
12	Harlan	12.435 (KY 1084)	13.213 (US 421)	0.778	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	11,600	767	2009	1.0%	11,600	*6.0%*	15,800
13	Harlan	13.213 (US 421)	13.952 (US 421)	0.739	Rural Principal Arterial	4 Lane Divided Highway	12	10	Raised Mountable	16	60	55	10,300	778	2008	1.0%	10,400	7.0%	14,200
14	Harlan	13.952 (US 421)	14.016 (East of US 421)	0.64	Rural Principal Arterial	4 Lane Divided Highway	12	10	Raised Mountable	16	60	55	7,440	753	2007	0.5%	7,500	*8.0%*	8,800
15	Harlan	14.016 (East of US 421)	14.38 (East of US 421)	0.364	Rural Principal Arterial	4 Lane Divided Highway	12	10	Concrete Barrier	3	60	55	7,440	753	2007	0.5%	7,500	*8.0%*	8,800
16	Harlan	14.38 (East of US 421)	14.552 (East of US 421)	0.172	Rural Principal Arterial	4 Lane Divided Highway	12	10	Raised Mountable	16	60	55	7,440	753	2007	0.5%	7,500	*8.0%*	8,800
17	Harlan	14.552 (East of US 421)	15.730 (KY 522)	1.178	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	7,440	753	2007	0.5%	7,500	*8.0%*	8,800
18	Harlan	15.730 (KY 522)	18.000 (West of River Lane)	2.27	Rural Principal Arterial	2 Lane Undivided Highway	12	10	None	0	60	55	5,080	777	2006	0.4%	5,100	9.0%	5,800

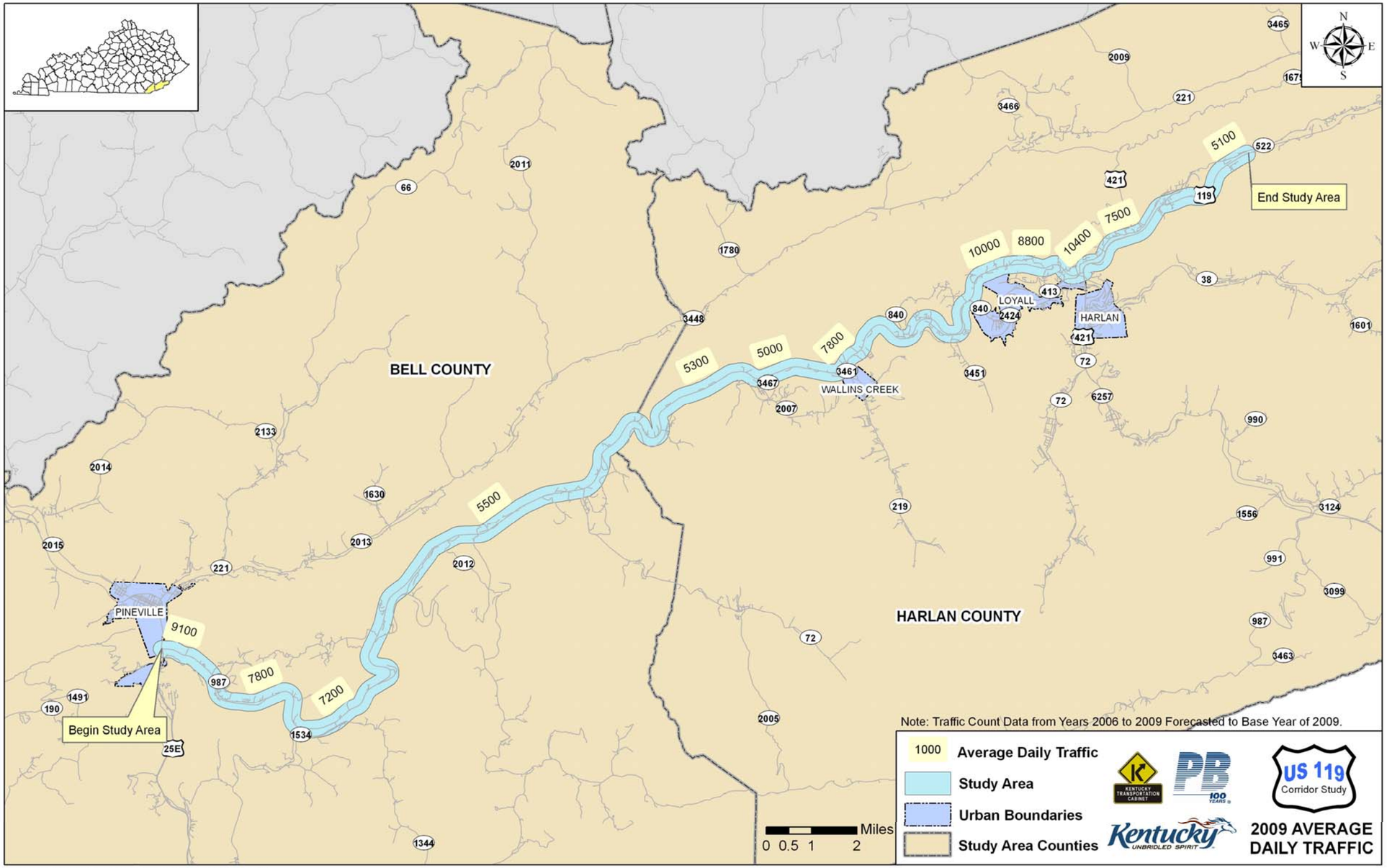
Notes: [1] 2009 and 2040 ADT rounded to nearest hundred.
[2] The italicized numbers for the truck percentages represent assumed values.

Figure A-1: Horizontal Curvature



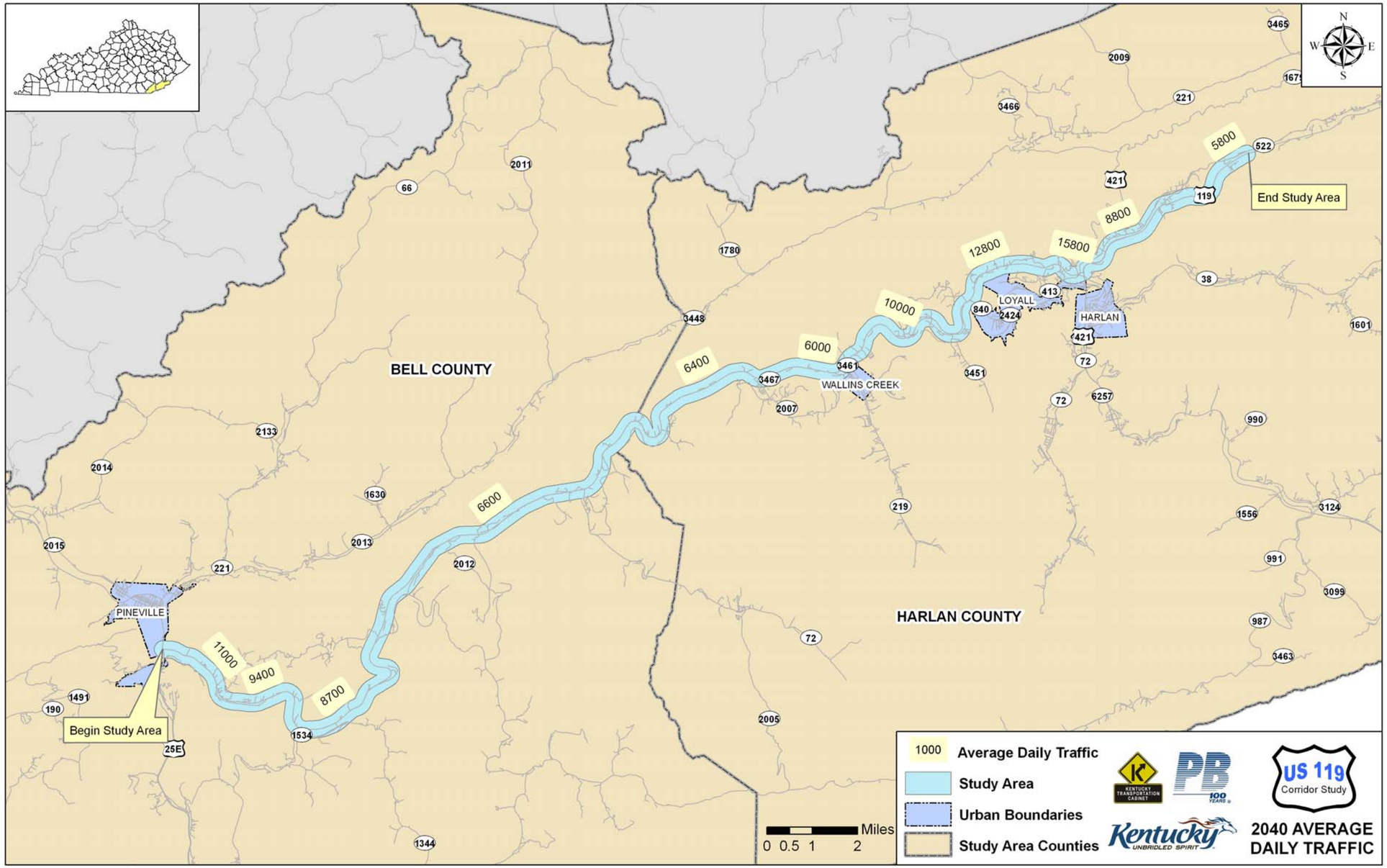
Source: KYTC Highway Information System (HIS)

Figure A-2: 2009 Average Daily Traffic Volumes



Source: KYTC Highway Information System (HIS)

Figure A-3: 2040 Average Daily Traffic Volumes



Source: KYTC Highway Information System (HIS)

Truck Percentages

Truck percentages along US 119 were determined from the KYTC vehicle classification database where data was available. Typically, if truck percentages are not available for a specific roadway section, the 2008 Traffic Forecasting Report[1] developed by the Kentucky Transportation Center (KTC) is consulted to supplement the data from the vehicle classification database. Truck percentages in the report are based on vehicle classification data and listed by functional classification. As US 119 in the study area is a rural principal arterial, the corresponding truck percentage in the forecasting report (based on a combination of data from similar statewide routes) is 16.8%. Compared to the available truck percentages for this route, the number from the forecasting report is much higher. Therefore, to be realistic, truck percentages were assumed based on data from adjacent or nearby sections instead of the forecasting report. These truck percentages are shown in **Table A-1**.

1.3 Level of Service Analysis

1.3.1 Methodology

Within the study area, US 119 is primarily a two-lane road that connects Pineville, Kentucky with Harlan, Kentucky. According to KYTC, it is classified as a rural principal arterial. Lane widths are 12 foot and shoulder widths are approximately 4 foot on both sides of the road. Multiple passing lanes exist along the corridor. For the majority of the corridor, the posted speed limit is 55 mph. There are only two signalized intersections along the corridor, one at the beginning at the US 25E / US 119 intersection and another at the US 119 / US 421 intersection at Harlan. Trucks make up approximately 6.0% of the traffic along the corridor.

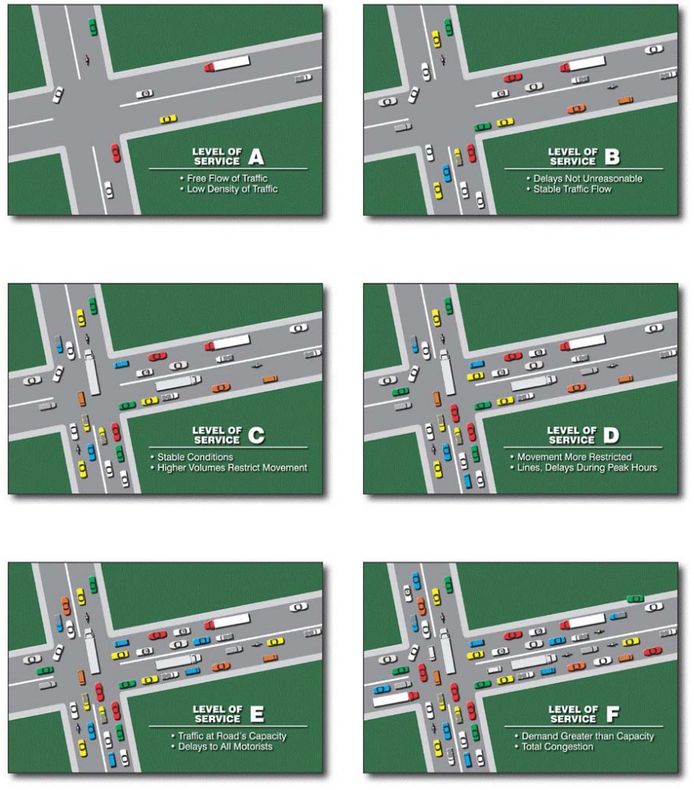
Using the gathered geometric and existing highway information, the Highway Capacity Software Plus (HCS+) was used to determine level of services (LOS). LOS is used to provide a rating scale for congestion and operations of a roadway.

LOS A represents a free flowing facility with little time spent following another vehicle and plenty of opportunities for passing. Percent time following increases and opportunities to pass and travel speeds decrease with LOS down to LOS F which represents a congested roadway that is over capacity with no opportunities to pass and low travel speeds. Refer to **Figure A-4** for a graphical representation of what each LOS looks like from a capacity perspective.

According to the Highway Capacity Manual 2000[2], Class I highways include higher speed arterials and daily commuter routes while Class II highways include lower speed collector roadways and roads primarily designed to provide access. For this analysis, US 119 is considered a Class I facility as it is a primary arterial, serves as a major east/west route, and links the cities of Pineville and Harlan. Level of service is based on the average travel time and percent time vehicles spend following other vehicles, as shown in **Table A-2** for a Class I facility.

LOS C is the threshold for desirable traffic operations in this study, based on guidance from the AASHTO Policy on Geometric Design of Highways and Streets[3] for a rural mountainous arterial roadway. The LOS C threshold for this study corresponds to an average travel speed of >45 miles per hour with ≤65 percent time spent following another vehicle for a Class I highway.

Figure A-4: Levels of Service



Presentation Based On HIGHWAY CAPACITY MANUAL,
Special Report 209, Transportation Research Board, 1985

[1] Traffic Forecasting Report - 2008, Kentucky Transportation Center Research Report KTC-07-06/PL14-07-01F.
[2] Highway Capacity Manual 2000, Transportation Research Board.
[3] Policy on Geometric Design of Highways and Streets. AASHTO.

Table A-2: LOS Criteria for Two-Lane Highways

LOS	Two-Lane Highways: Percent Time Spent Following	Two-Lane Highways: Average Travel Speed
A	≤ 35	>55
B	>35 – 50	>50 – 55
C	>50 – 65	>45 – 50
D	>65 – 80	>40 – 45
E	>80	≤40
F	LOS F applies whenever the flow rate exceeds the capacity	

Source: Highway Capacity Manual (2000)

In the Highway Capacity Software Plus (HCS+) software package, there are two modules available to analyze two-lane highways such as US 119. One is the HCS+ Two-Lane Module while the other is called HIGHPLAN.

HCS+ Two-Lane Module

To analyze US 119 using the HCS+ Two-Lane Module, the corridor was subdivided into 14 different segments for analysis. The segments were determined by changes in the traffic count stations or geometric characteristics. The 2009 HCS+ output showed every segment operated at either LOS C or LOS D (refer to **Table A-3** for the LOS results). LOS D is considered to be near the limit of acceptable operating conditions for this type of facility. Considering the relatively low traffic volume on US 119, in addition to generally adequate geometrics, the LOS results were lower than expected.

Several reasons exist for some of the poorer LOS operations (LOS D) that resulted from this analysis. The first is that this HCS+ module does not take into account the fact that there are currently several passing lanes in the corridor. The percent no-passing zones adjustment factor assumes that there are no passing lanes within the vehicle's same direction of travel, only opportunities to pass using the opposite direction lane of traffic. In addition, as US 119 is evaluated as a Class I facility, this puts more stringent restrictions on the percent time following calculation upon which the LOS is based in part on. Therefore, given these two factors, HCS+ may be more restrictive in the evaluation of this type of highway than actual field conditions represent.

HCS+ HIGHPLAN Module

Rather than classifying two-lane highways as either Class I or Class II highways, the HIGHPLAN module allows the user to classify whether the roadway is in a large/urbanized area, a transitioning/urban area, a rural developed area or a rural undeveloped area. For the segments near Pineville and Harlan, US 119 was classified as rural developed, and for the segments in between, it was classified as rural undeveloped. In rural undeveloped areas, the volume to capacity ratio is used to determine LOS for the segment. In the rural developed areas, percent free flow speed is used to determine LOS.

The same 14 segments were used to analyze US 119 in the HIGHPLAN module as were used in the Two-Lane Module. The HIGHPLAN output resulted in LOS B and C throughout the entire corridor (refer to **Table A-3** for the LOS results). Based on field visits, these values seemed much more similar to actual field operating conditions.

Several reasons exist that explain the better results from the HIGHPLAN module. One is the fact that the analysis took into account that this is a rural roadway, and also allowed the roadway to be classified as developed or undeveloped. Also, this module allowed the user to check whether or not there are passing lanes, and indicate the frequency of them. The multiple passing lanes throughout the corridor are a significant contributor to the increased LOS.

Additional Documentation

When determining which software module was more appropriate for this project, an additional document was referenced. The Alabama Department of Transportation (ALDOT) and the Maryland State Highway Association (MSHA) published a quick reference to determine LOS for different facility types based on average daily traffic (ADT). Based on this spreadsheet, a two-lane rural arterial achieves:

- LOS A with an ADT of less than 8,400;
- LOS B with an ADT between 8,400 and 12,000; and
- LOS C with an ADT between 12,000 and 14,000.

According to this guidance, the entire corridor would operate at LOS A or B. **Table A-3** shows the LOS comparison with the other two methodologies.

Methodology Recommendation

Based on the comparison of methodologies of the two software modules as well as a comparison to field conditions and comparison with guidance from Alabama and Maryland, the HIGHPLAN software module was determined to be the preferred methodology to evaluate US 119 with regard to LOS operations. This recommendation was approved by KYTC.

1.3.2 Existing Traffic Operating Conditions

Utilizing the HIGHPLAN methodology, the 2009 ADT volumes were used to evaluate corridor operating conditions. Peak hour traffic volumes for highway segments were estimated based on the ADT volumes for those segments using K-factors (factor based on the 30th highest hour of the year) derived from the KYTC counts. The current lane widths, shoulder widths, percent passing, and other design factors were also used.

The segment LOS is listed in **Table A-4** and is shown on **Figure A-5** for the existing traffic operations.

1.3.3 Future Traffic Operating Conditions

Similar to the existing traffic operating conditions, levels of service were calculated for the future analysis year of 2040. The segments, geometric data, and roadway data remained the same. The resulting 2040 segment levels of service are listed in **Table A-5** and are shown on **Figure A-6**.

Table A-3: LOS Comparison

Section	Begin Milepoint	End Milepoint	Section Length (miles)	2009 ADT	K-Factor	2009 DHV	Peak Direction %	Off Peak Direction %	Posted Speed Limit (MPH)	% Trucks	HCS+ Two-Lane LOS	HIGHPLAN LOS	ALDOT & MSHA LOS
1	0.000 (US 25E)	1.496 (Old Bell High Rd / KY 987)	1.496	9,100	0.107	970	57	43	55	8.0%	D	B	B
2	1.496 (Old Bell High Rd / KY 987)	3.513 (Page School Road)	2.017	7,800	0.107	830	57	43	55	8.0%	D	B	A
3	3.513 (Page School Road)	7.796 (KY 987)	4.283	7,200	0.107	770	57	43	55	7.0%	D	B	A
4	7.796 (KY 987)	13.949 (KY 72 / Old 119 Loop)	6.153	5,500	0.107	590	57	43	55	7.0%	C	B	A
5	13.949 (KY 72 / Old 119 Loop)	15.880 (Harlan County Line)	1.931	5,300	0.107	570	57	43	45	6.0%	C	B	A
6	15.880 (Bell County Line)	3.827 (KY 2007)	3.827	5,300	0.107	570	57	43	55	6.0%	C	B	A
7	3.827 (KY 2007)	5.582 (KY 219)	1.755	5,000	0.107	540	57	43	55	6.0%	C	B	A
8	5.582 (KY 219)	7.787 (KY 840)	2.205	7,800	0.107	830	57	43	55	6.0%	D	C	A
9	7.787 (KY 840)	11.479 (KY 3452 Four Mile Road)	3.692	10,000	0.107	1070	57	43	55	6.0%	D	C	B
10	11.479 (KY 3452 Four Mile Road)	12.435 (KY 1084)	0.956	8,800	0.107	940	57	43	55	6.0%	D	C	B
11	12.435 (KY 1084)	13.213 (US 421)	0.778	11,600	0.107	1240	57	43	55	6.0%	D	C	B
12	13.213 (US 421)	13.952 (US 421)	0.739	10,400	0.107	1110	57	43	55	7.0%	D	B	B
13	13.952 (US 421)	15.730 (KY 522)	1.778	7,500	0.107	800	57	43	55	8.0%	D	B	A
14	15.730 (KY 522)	18.000 (West of River Lane)	2.270	5,100	0.107	550	57	43	55	9.0%	C	B	A

LOS E - F

LOS D

LOS A - C

Notes:
ADT = 2009 Average Daily Traffic (count or estimate) from CTS Traffic Count Information
K-Factor = Design Hour Factor obtained from KYTC 2008 Traffic Forecasting Report
DHV = 2009 Design Hour Volume (Average Daily Traffic x K-Factor)
Posted Speed Limit obtained from Highway Information System
% Trucks obtained from 2007 Vehicle Classification System Database. Roadways where data did not exist were estimated based on known data.
Level of Service (LOS) calculated using Highway Capacity Software Plus.
ALDOT = Alabama Department of Transportation; MSHA = Maryland State Highway Administration

Sources: Highway Information System Database, KYTC 2008 Traffic Forecasting Report, KYTC Vehicle Classification Database

Table A-4: 2009 Corridor Levels of Service

Section	Begin Milepoint	End Milepoint	Section Length (miles)	2009 ADT	K-Factor	2009 DHV	Peak Direction %	Off Peak Direction %	Posted Speed Limit (MPH)	% Trucks	HIGHPLAN LOS
1	0.000 (US 25E)	1.496 (Old Bell High Rd / KY 987)	1.496	9,100	0.107	970	57	43	55	8.0%	B
2	1.496 (Old Bell High Rd / KY 987)	3.513 (Page School Road)	2.017	7,800	0.107	830	57	43	55	*8.0%*	B
3	3.513 (Page School Road)	7.796 (KY 987)	4.283	7,200	0.107	770	57	43	55	*7.0%*	B
4	7.796 (KY 987)	13.949 (KY 72 / Old 119 Loop)	6.153	5,500	0.107	590	57	43	55	*7.0%*	B
5	13.949 (KY 72 / Old 119 Loop)	15.880 (Harlan County Line)	1.931	5,300	0.107	570	57	43	45	*6.0%*	B
6	15.880 (Bell County Line)	3.827 (KY 2007)	3.827	5,300	0.107	570	57	43	55	*6.0%*	B
7	3.827 (KY 2007)	5.582 (KY 219)	1.755	5,000	0.107	540	57	43	55	*6.0%*	B
8	5.582 (KY 219)	7.787 (KY 840)	2.205	7,800	0.107	830	57	43	55	*6.0%*	C
9	7.787 (KY 840)	11.479 (KY 3452 Four Mile Road)	3.692	10,000	0.107	1070	57	43	55	6.0%	C
10	11.479 (KY 3452 Four Mile Road)	12.435 (KY 1084)	0.956	8,800	0.107	940	57	43	55	*6.0%*	C
11	12.435 (KY 1084)	13.213 (US 421)	0.778	11,600	0.107	1240	57	43	55	*6.0%*	C
12	13.213 (US 421)	13.952 (US 421)	0.739	10,400	0.107	1110	57	43	55	7.0%	B
13	13.952 (US 421)	15.730 (KY 522)	1.778	7,500	0.107	800	57	43	55	*8.0%*	B
14	15.730 (KY 522)	18.000 (West of River Lane)	2.270	5,100	0.107	550	57	43	55	9.0%	B

LOS E - F

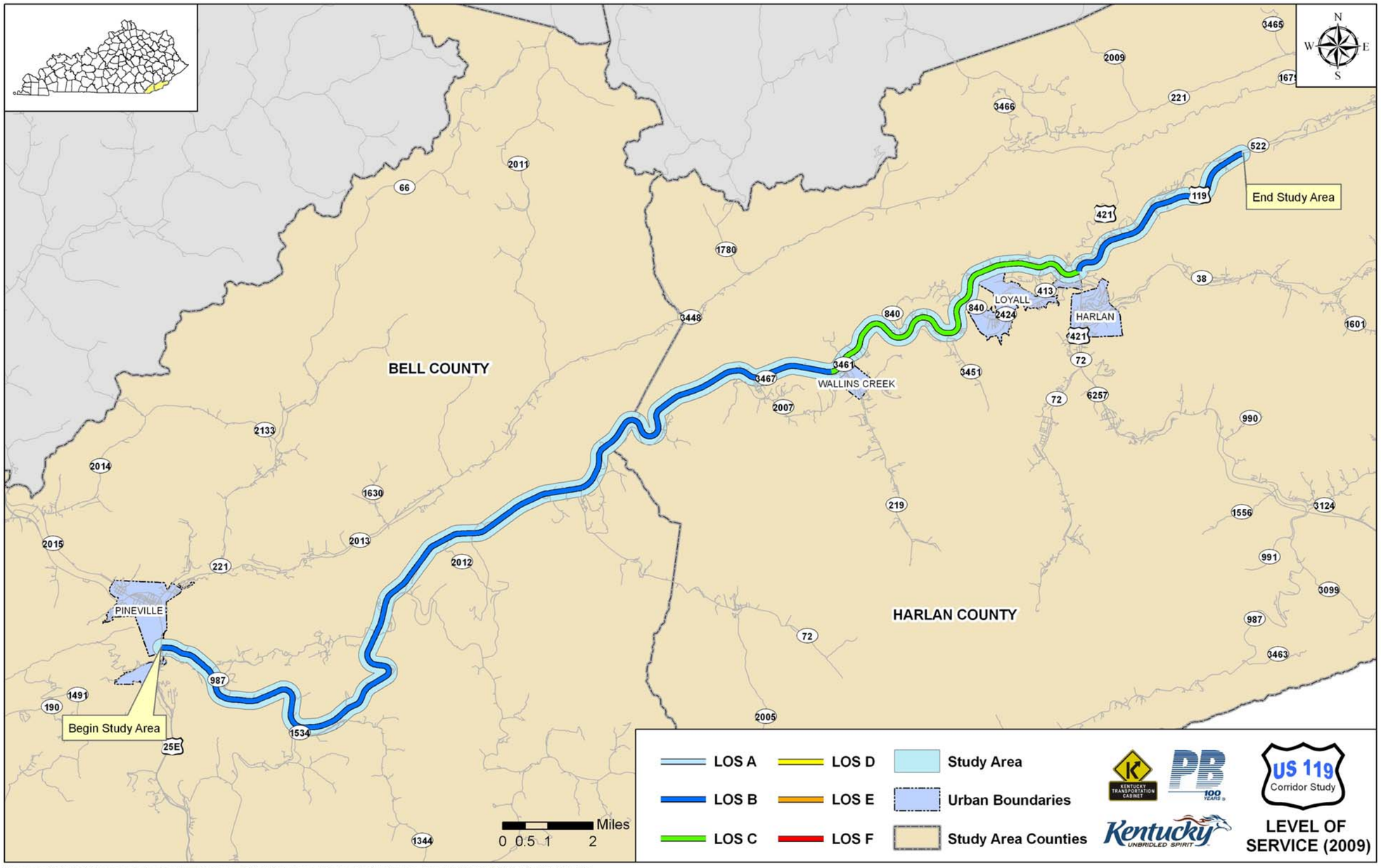
LOS D

LOS A - C

Notes:
ADT = 2009 Average Daily Traffic (count or estimate) from CTS Traffic Count Information
K-Factor = Design Hour Factor obtained from KYTC 2008 Traffic Forecasting Report
DHV = 2009 Design Hour Volume (Average Daily Traffic x K-Factor)
Posted Speed Limit obtained from Highway Information System
% Trucks obtained from 2007 Vehicle Classification System Database. Roadways where data did not exist were estimated based on known data.
Level of Service (LOS) calculated using Highway Capacity Software Plus.

Sources: Highway Information System Database, KYTC 2008 Traffic Forecasting Report, KYTC Vehicle Classification Database

Figure A-5: 2009 Corridor Levels of Service



Source: KYTC Highway Information System (HIS); Highway Capacity Software Plus (HCS+) HIGHPLAN Module

Table A-5: 2040 Corridor Levels of Service

Section	Begin Milepoint	End Milepoint	Section Length (miles)	2040 ADT	K-Factor	2040 DHV	Peak Direction %	Off Peak Direction %	Posted Speed Limit (MPH)	% Trucks	HIGHPLAN LOS
1	0.000 (US 25E)	1.496 (Old Bell High Rd / KY 987)	1.496	11,000	0.107	1180	57	43	55	8.0%	C
2	1.496 (Old Bell High Rd / KY 987)	3.513 (Page School Road)	2.017	9,400	0.107	1010	57	43	55	*8.0%*	B
3	3.513 (Page School Road)	7.796 (KY 987)	4.283	8,700	0.107	930	57	43	55	*7.0%*	B
4	7.796 (KY 987)	13.949 (KY 72 / Old 119 Loop)	6.153	6,600	0.107	710	57	43	55	*7.0%*	B
5	13.949 (KY 72 / Old 119 Loop)	15.880 (Harlan County Line)	1.931	6,400	0.107	680	57	43	45	*6.0%*	B
6	15.880 (Bell County Line)	3.827 (KY 2007)	3.827	6,400	0.107	680	57	43	55	*6.0%*	B
7	3.827 (KY 2007)	5.582 (KY 219)	1.755	6,000	0.107	640	57	43	55	*6.0%*	B
8	5.582 (KY 219)	7.787 (KY 840)	2.205	10,000	0.107	1070	57	43	55	*6.0%*	C
9	7.787 (KY 840)	11.479 (KY 3452 Four Mile Road)	3.692	12,800	0.107	1370	57	43	55	6.0%	C
10	11.479 (KY 3452 Four Mile Road)	12.435 (KY 1084)	0.956	11,300	0.107	1210	57	43	55	*6.0%*	C
11	12.435 (KY 1084)	13.213 (US 421)	0.778	15,800	0.107	1690	57	43	55	*6.0%*	C
12	13.213 (US 421)	13.952 (US 421)	0.739	14,200	0.107	1520	57	43	55	7.0%	C
13	13.952 (US 421)	15.730 (KY 522)	1.778	8,800	0.107	940	57	43	55	*8.0%*	B
14	15.730 (KY 522)	18.000 (West of River Lane)	2.270	5,800	0.107	620	57	43	55	9.0%	B

LOS E - F

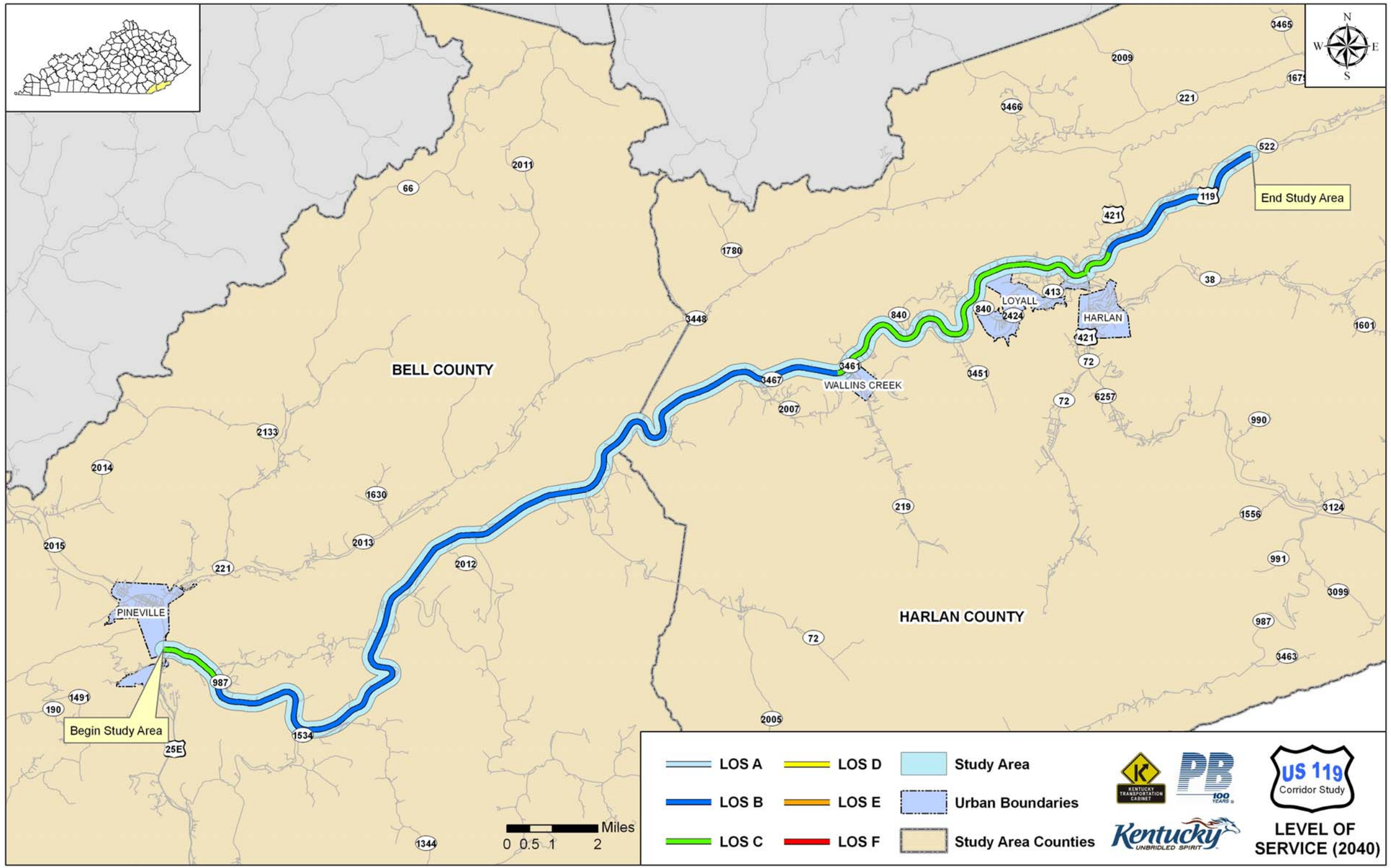
LOS D

LOS A - C

Notes:
ADT = 2040 Average Daily Traffic estimate based on growth rate factors
K-Factor = Design Hour Factor obtained from KYTC 2008 Traffic Forecasting Report
DHV = 2040 Design Hour Volume (Average Daily Traffic x K-Factor)
Posted Speed Limit obtained from Highway Information System
% Trucks obtained from 2007 Vehicle Classification System Database. Roadways where data did not exist were estimated based on known data.
Level of Service (LOS) calculated using Highway Capacity Software Plus.

Sources: Highway Information System Database, KYTC 2008 Traffic Forecasting Report, KYTC Vehicle Classification Database

Figure A-6: 2040 Corridor Levels of Service



Source: KYTC Highway Information System (HIS); Highway Capacity Software Plus (HCS+) HIGHPLAN Module

1.4 Crash Analysis

The Kentucky Transportation Cabinet provided crash data for a three-year period from September 1, 2006 through August 31, 2009. **Figure A-7** shows the locations of these crashes by crash type (fatality, injury or property damage only) as well as the primary crash type for the corridor (single vehicle crashes). Below is a breakdown of the crash severity by number and percentage occurring along US 119 in the study area.

Severity	Number of Crashes	Percentage
Property Damage Only	192	67.1%
Injury	86	30.1%
Fatality	8	2.8 %
	286	100.0 %

Crash Analysis Methodology

Crash rates were computed for each segment of US 119 using the methodology provided in the crash analysis report periodically published by the Kentucky Transportation Center (KTC)[4]. The section crash rates are based on the number of crashes on a specified section, the average daily traffic on the roadway, the time frame of analysis, and the length of the section. They are expressed in terms of crashes per 100 million vehicle-miles. A section's crash rate was then compared to a statewide critical crash rate[5] derived from critical crash rate tables for highway sections in the KTC crash report (Appendix D of the KTC crash report). This comparison is expressed as a ratio of the section crash rate to the critical crash rate and is referred to as the critical crash rate factor. Sections with a critical crash rate factor greater than one indicate a safety concern.

The section crash rate is also compared directly to the statewide average crash rate presented in the KTC crash report. The statewide averages consider all crashes for a specified period that are listed in the Collision Report Analysis for Safer Highways (CRASH) database maintained by the Kentucky State Police and stratified by functional classification (Table B-2 in KTC crash report). Section rates that exceed the statewide average crash rate but not the critical crash rate may be problem areas, but they are not statistically proven to be higher crash areas. Therefore, this second comparison is used to identify a second tier of highway sections that may have crash problems and could be considered for safety improvements if warranted based on further analysis.

Section Crash Analysis

For US 119, there are several sections that have a section crash rate below the average for this road type. The remaining sections are not confirmed high crash rate sections, as they do not exceed the critical crash rate, but their current crash rates exceed the statewide average crash rate. **Table A-6** shows the crash statistics for the segments analyzed and **Figure A-8** shows the segments on a map.

As an added measure of determination of locations with safety issues, the Buildup Program used by KYTC to analyze 5-mile sections of roadway throughout the state was consulted to determine where US 119 ranked in comparison to other roadways. For all crash types statewide, the KYTC analysis indicated that the first section of US 119 in either Bell or Harlan County was number 2,083 on the list when sorted by crash rate factors. For all crash types in District 11 only, the first section of US 119 in Bell County ranked 151 on the list. For lane departure crashes statewide, the first section of US 119 in either Bell or Harlan county was number 2,349 on the list. These rankings from the KYTC program support the analysis determined by the provided crash record data that US 119 does not have a high critical crash rate.

Spot Crash Analysis

To determine if there are any crash rate problems in specific locations throughout the study area a spot crash analysis was conducted. A spot location is defined as a section of highway 0.3 miles in length. The methodology used to calculate the spot crash rates is similar to that used for calculating the section crash rates. The crash rates at these "spots" were compared to the critical crash rates for similar facilities derived from critical spot crash rate tables in the KTC crash report (Appendix E in KTC crash report). Areas with numerous crashes were evaluated. From this analysis, there are two high crash spots in the study area (refer to **Table A-7** for more details). The first is at the western end of the study area in Pineville from MP 0.0 to MP 0.30. The second is at the signalized US 421 intersection with US 119, from MP 12.998 to MP 13.298. These spots are shown on the crash segment map in **Figure A-8.**

Though perceived as a high crash spot location, the data analyzed did not show the Varilla curve location to have a high spot crash rate. While the crash rate analysis assists in determining safety improvement locations, it is still one component in the determination of improvements. Public input and geometric deficiencies also are considered in determining improvement location and types. Therefore, though a section or spot was not listed with a high critical crash rate factor does not necessarily mean safety improvements will not be considered during the improvement development phase.

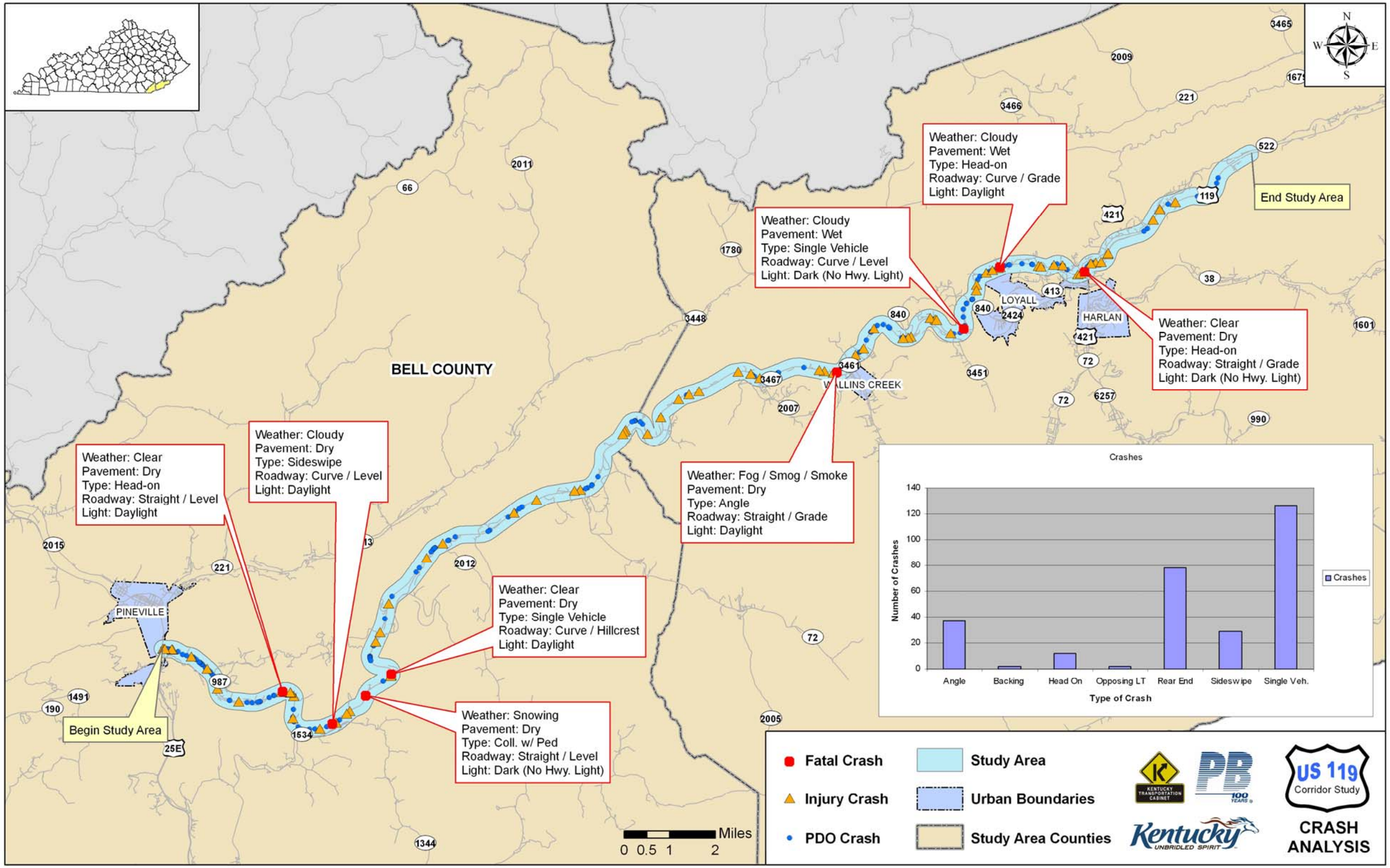
Public Comments

When presented to the public, many attendees at the public meetings noted either verbally or on their comment sheets a disagreement with the crash rate data. From their perspective, US 119 is a dangerous roadway with multiple crashes occurring frequently, particularly at the previously noted curve near the Varilla and the regional airport access along US 119.

[4] Analysis of Traffic Crash Data in Kentucky (2004 – 2008), Kentucky Transportation Center Research Report KTC-09-16/KSP2-09-1F.

[5] The critical crash rate is the threshold above which an analyst can be statistically certain (at a 99.5% confidence level) that the section crash rate exceeds the average crash rate for a similar roadway and is not mistakenly shown as higher than the average due to randomly occurring crashes.

Figure A-7: Crash Locations, Crash Severity, and Crash Types



Source: KYTC and Kentucky State Police.
Note: Crashes occurred between September 1, 2006 and August 31, 2009.

Table A-6: Crash Rates by Segment

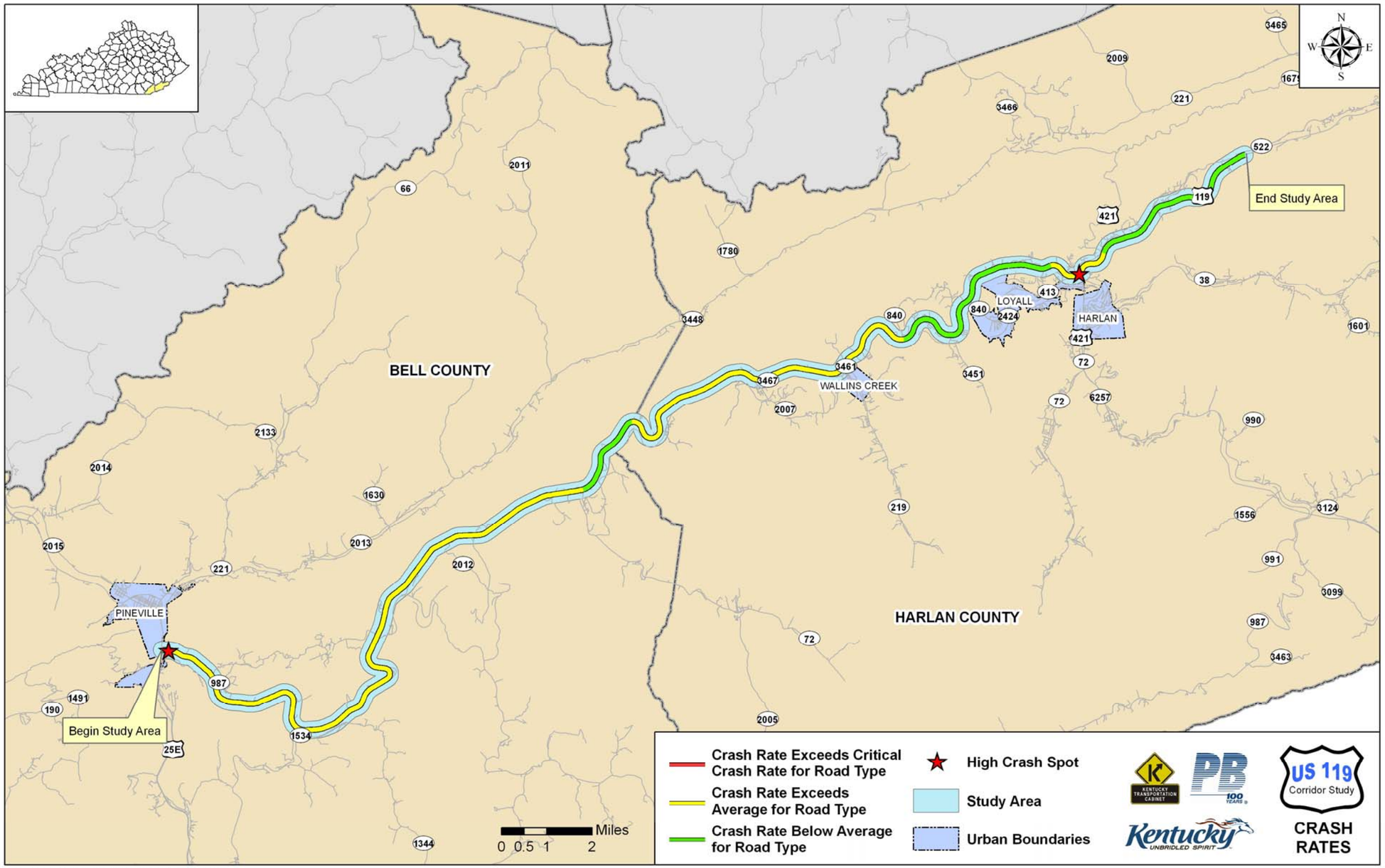
Section	Begin Milepoint	End Milepoint	Total Crashes	Average Daily Traffic	Section Length (miles)	Exposure "M" (100 or 1 MVM)	Statewide Average Crash Rate	Section Crash Rate	Statewide Critical Crash Rate	Critical Crash Rate Factor
1	0.000 (US 25E)	1.496 (Old Bell High Rd / KY 987)	36	9,100	1.496	0.149	88	241	299	0.81
2	1.496 (Old Bell High Rd / KY 987)	3.513 (Page School Road)	24	7,800	2.017	0.172	88	139	287	0.49
3	3.513 (Page School Road)	7.796 (KY 987)	36	7,200	4.283	0.338	88	107	272	0.39
4	7.796 (KY 987)	13.949 (KY 72 / Old 119 Loop)	30	5,500	6.153	0.371	88	81	272	0.30
5	13.949 (KY 72 / Old 119 Loop)	15.880 (Harlan County Line)	8	5,300	1.931	0.112	88	71	312	0.23
6	0.000 (Bell County Line)	3.827 (KY 2007)	19	5,300	3.827	0.222	88	86	288	0.30
7	3.827 (KY 2007)	5.582 (KY 219)	10	5,000	1.755	0.096	88	104	319	0.33
8	5.582 (KY 219)	7.787 (KY 840)	18	7,800	2.205	0.188	88	96	289	0.33
9	7.787 (KY 840)	11.479 (KY 3452 Four Mile Road)	41	10,000	3.692	0.404	88	101	269	0.38
10	11.479 (KY 3452 Four Mile Road)	12.435 (KY 1084)	8	8,800	0.956	0.092	88	87	316	0.27
11	12.435 (KY 1084)	13.213 (US 421)	24	11,600	0.778	0.099	88	243	327	0.74
12	13.213 (US 421)	13.952 (US 421)	19	10,400	0.739	0.084	88	226	334	0.68
13	13.952 (US 421)	15.730 (KY 522)	7	7,500	1.778	0.146	88	48	299	0.16
14	15.730 (KY 522)	18.000 (West of River Lane)	6	5,100	2.270	0.127	88	47	305	0.16

Critical Crash Rate Factor >1, Section Crash Rate Exceeds Statewide Critical Rate (High Crash Rate Section)
Critical Crash Rate Factor <1, Section Crash Rate Exceeds Statewide Average Rate
Critical Crash Rate Factor <1, Section Crash Rate Lower Than Statewide Average Rate

Notes:
Analysis Period: 3 Years (9/1/2006 to 8/31/2009)
Crash rates are expressed in crashes per 100 MVM (100 million vehicle miles traveled)
Exposure (M) = [(ADT) x (365) x (Time Frame of Analysis (Years)) x (Section Length)] / 100,000,000
Section Crash Rate = Total Crashes / Exposure
Critical Crash Rate Factor = Section Crash Rate / Statewide Critical Crash Rate
ADT = Average Daily Traffic, MVM = Million Vehicle Miles

Sources:
Crash data for 9/1/2006 to 8/31/2009 from Kentucky State Police Data Provided by KYTC
Statewide Rates from KTC Research Report KTC-09-16/KSP2-09-1F, Analysis of Traffic Crash Data in Kentucky (2004 - 2008)

Figure A-8: Crash Rates by Segment



Source: KYTC and Kentucky State Police.

Table A-7: Crash Rates by Spot

Section	Begin Milepoint	End Milepoint	Total Crashes	Average Daily Traffic	Spot Crash Rate (per million veh.)	Critical Crash Rate (per million veh.)	Critical Crash Rate Factor
1	0.000 (US 25E)	0.300 (East of US 25E)	14	9,100	1.40	1.31	1.07
2	5.300 (Varilla Curve)	5.600 (Varilla Curve)	6	7,200	0.76	1.28	0.59
3	10.000 (West of Tanyard Loop)	10.300 (East of Tanyard Loop)	7	5,500	1.16	1.42	0.82
4	0.000 (Bell County Line)	0.300 (East of Bell Co. Line)	7	5,300	1.21	1.39	0.87
5	12.998 (West of US 421)	13.298 (East of US 421)	23	11,600	1.81	1.11	1.63

Notes:
Spot Crash Rates are per 1,000,000 vehicles
Analysis Period: 3 Years (9/1/2006 to 8/31/2009)
Spot Crash Rate = [(1,000,000) x (Total Crashes)] / [(365) x (Analysis Period in Years) x (Average Daily Traffic)]
Critical Crash Rate Factor = Spot Crash Rate / Critical Crash Rate

Sources:
Crash data for 9/1/2006 to 8/31/2009 from Kentucky State Police Data Provided by KYTC
Critical Crash Rate from KTC Research Report KTC-09-16/KSP2-09-1F, Analysis of Traffic Crash Data in Kentucky (2004 - 2008)

1.5 Multimodal Facilities (Pedestrian, Bicycle, and Transit)

It is KYTC's policy to consider provision of bicycle and pedestrian facilities as appropriate. There are currently no plans for bicycle or pedestrian facilities in the study area. Due to the nature of the roadway being high speed and rural, as well as a lack of pedestrian and bicycle generators, it is unlikely that bicycle and pedestrian facilities would be required or safe along US 119.

With the same characteristics, established transit currently does not exist and is not planned for the future. However, demand response type, human services and some smaller scale subscription type transit services do exist in each of the counties respectively:

- In Harlan County, the Harlan County Community Action Agency (HCCAA), a private non-profit 501(C)(3) corporation provides transportation services to all residents of Harlan County, regardless of income or age. One service, Non-Emergency Medical, is primarily for those in need of medical services. Another type is referred to as "local transportation". For a nominal fee, based on the client's specific needs, transportation is provided so that citizens may have access to educational facilities, places of employment, shopping centers, agencies, and other sites. The HCCAA currently covers the entire county as well as any out of town medical facilities.
- In Bell County, Rural Transit Enterprises Coordinated, Inc. (RTEC) is a non-profit corporation providing transportation services in the county and surrounding region. Services include a demand response public transit system for the elderly and the disabled, intercity routes providing access to larger area such as Lexington, rides for jobs access and new freedom rides also for the elderly / disabled.

2.0 HUMAN ENVIRONMENT OVERVIEW

An overview was conducted to determine the general characteristics of the human environment in the study area. The analysis addresses: general socioeconomic characteristics, Environmental Justice, community facilities, underground storage tanks and other hazardous materials sites, and cultural / historic and archaeological characteristics. **Figure A-9** depicts many of the human environmental characteristics with **Figure A-10** displaying the community facilities. The following sections summarize the overview findings.

2.1 Socioeconomic Profile

A socioeconomic profile of Bell County and Harlan County was conducted which provides an overview of populations and economic characteristics of each county as a whole. The next section provides a more detailed overview of similar characteristics within the US 119 study area.

Population Growth
Table A-8 shows population data from the 1990 and 2000 US Census, for Bell and Harlan Counties. The 2040 population projections are also shown.

Table A-8: Study Area Populations

	1990	2000	2040	% Growth (1990-2000)	% Growth (2000-2040)
Bell County	31,506	30,060	25,004	-4.6%	-16.8%
Harlan County	36,574	33,202	24,544	-9.2%	-26.1%

Source: Kentucky State Data Center

The 2000 Census shows the city of Pineville having a population of 2,093 and the city of Harlan having a population of 2,081.

Minority Populations
According to the 2000 US Census, minority populations in Bell County represented 4.0% of all residents. In Harlan County, minority population represented a total of 4.4% of residents. As a comparison, the total minority population percentage of the entire Commonwealth of Kentucky is 9.9%.

Low – Income Populations
In 2000, approximately 31.1% of the Bell County population was below the poverty line. In Harlan County, approximately 32.5% was below the poverty line. Both counties exceed the statewide average of 15.8%.

Age of Population
Both Bell and Harlan Counties have a higher percentage of residents age 60 and over, 18.5% and 18.4% respectively compared to the statewide average of 17.0%.

Local Economy
Unemployment information was obtained from the Kentucky Education and Workforce Development Cabinet.[6] In December 2009, Bell County's unemployment rate was 12.6%, which is higher than the 2000 unemployment rate for Kentucky of 10.7%. The rate for Harlan County was 12.5% which is also above the Kentucky unemployment rate.

The highest percentage of employees in Bell County is in the Service industry while the highest percentage of employees in Harlan County is in the Trade, Transportation, and Utilities industry. Large private employers in the area include: Cumberland Gap Provision Company, Dura-Line Corporation, Coca Cola Bottling of Middlesboro, and Southeastern Kentucky Rehabilitation Industries, Inc.

Refer to **Tables A-9** and **A-10** for employment by major industry in Bell and Harlan County. Refer to **Table A-11** for key employers in Bell and Harlan County.

Commuting
Approximately 89.0% of employed Bell County residents work in the county, with the remaining 11.0% commuting to other nearby counties. In 2000, the average travel time to work was 24.8 minutes. In 1990, the average travel time to work was 17.5 minutes. The dominant mode for travel to work in 2000 was the single occupant vehicle (SOV) which accounted for 79%, carpooling represented 15%, while transit, walking and other modes made up the remaining 6%.

Approximately 95% of employed Harlan County residents work in the county, with the remaining 5% commuting to nearby counties. In 2000 the average travel time to work was 27 minutes. Approximately 80% of those that commute to work utilized the SOV, while 13% carpooled, and the remainder used transit, walked or took other modes representing 7%.

2.2 Environmental Justice

The Environmental Justice (EJ) assessment prepared by the Cumberland Valley Area Development District (CVADD) examined potential disproportionate adverse community impacts on selected groups (minority, low-income and elderly) within the defined project study area for the proposed transportation improvement(s) along US 119 in Bell and Harlan Counties. The US 119 corridor within Bell and Harlan Counties consist of 12 Block Groups within 7 Census Tracts.

The ADD's purpose of the assessment was to:

- Assist the Kentucky Transportation Cabinet in carrying out the Division of Planning's mission "… to collect, maintain, analyze and report accurate data for making sound fiscally responsible recommendations regarding the maintenance, operation and improvement of our transportation network";
- Fulfill applicable federal Environmental Justice commitments; and
- Further the goals and objectives and cooperative nature of the metropolitan transportation planning process.

[6] Kentucky Education and Workforce Development Cabinet. http://workforce.ky.gov/Dec09charts.pdf. 02/23/2010.

Figure A-9: Human Environmental Characteristics

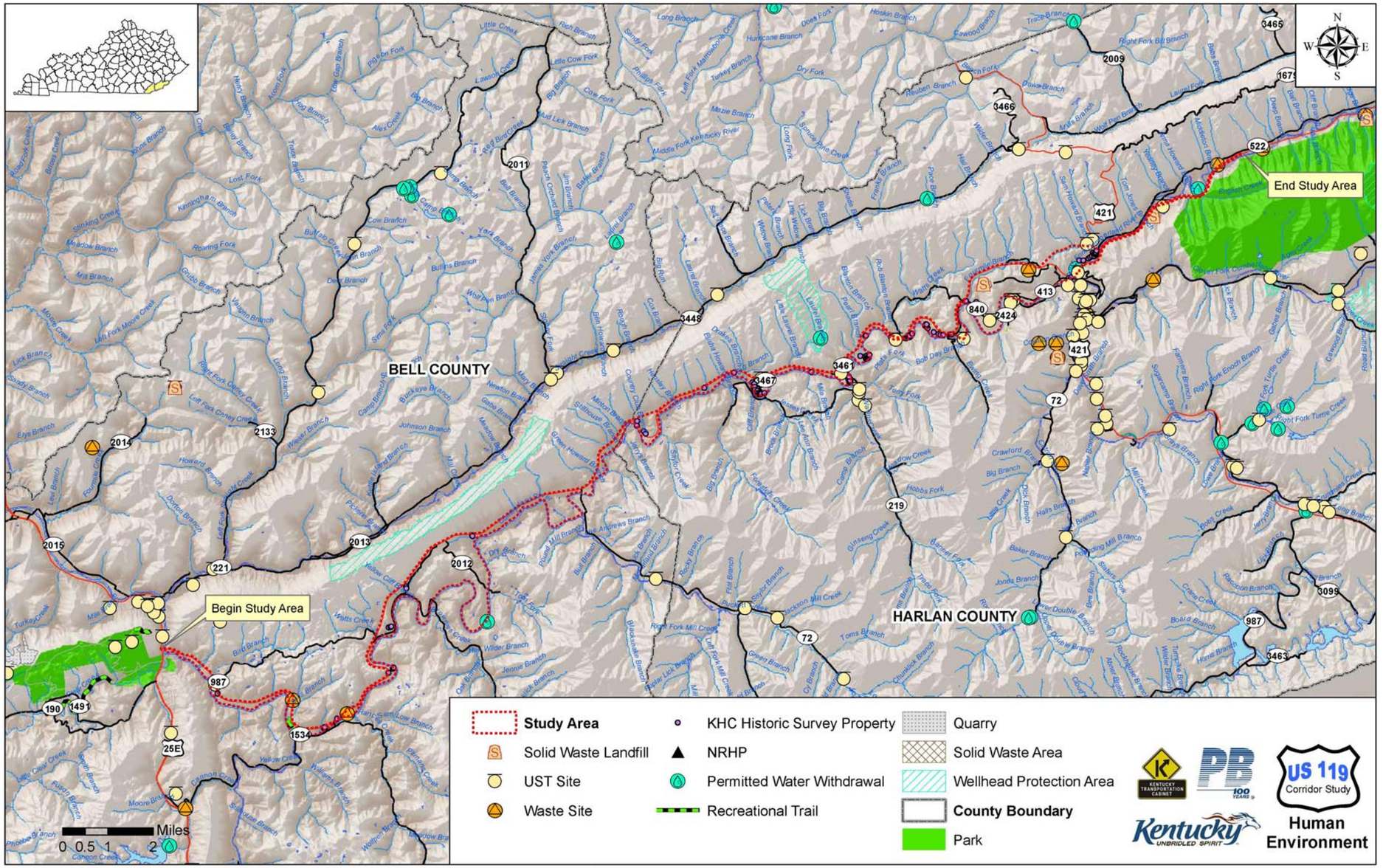


Figure A-10: Community Facilities

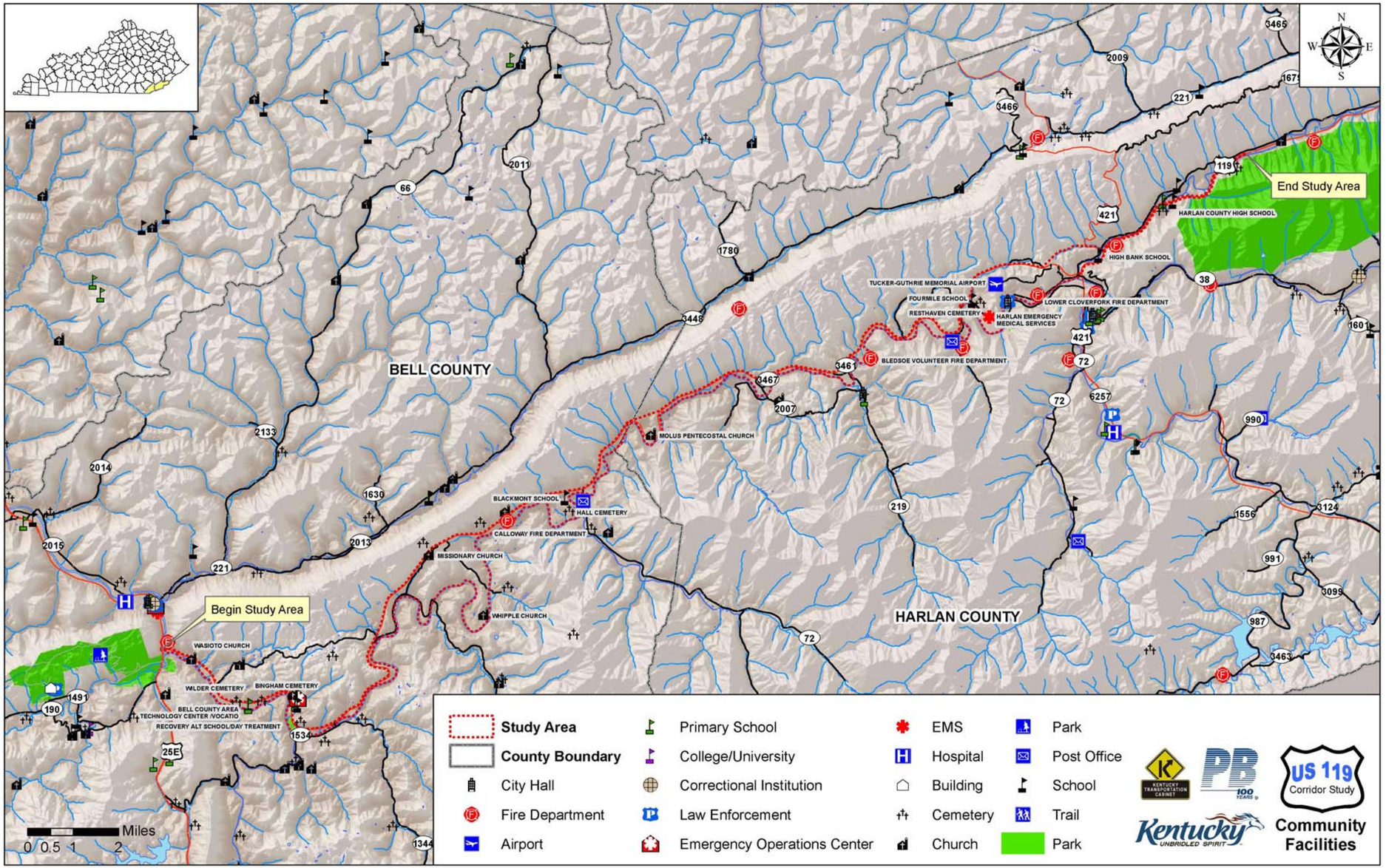


Table A-9: Bell County Employment by Major Industry (2008)

Bell County	Employment	Percent
Agriculture, Forestry, Fishing and Hunting	21	0.2
Mining	1,091	11.5
Construction	140	1.5
Manufacturing	858	9.0
Trade, Transportation, and Utilities	2,051	21.6
Information	75	0.8
Financial Activities	367	3.9
Services	**3,152**	**33.2**
Public Administration	264	2.8
Other	1	0.0
All Industries	9,488	100.0

Source: US Department of Labor, Bureau of Labor Statistics

Table A-10: Harlan County Employment by Major Industry (2006)

Harlan County	Employment	Percent
Agriculture, Forestry, Fishing and Hunting	18	0.2
Mining	1,516	18.6
Construction	258	3.2
Manufacturing	161	2.0
Trade, Transportation, and Utilities	**1,625**	**19.9**
Information	82	1.0
Financial Activities	218	2.7
Services	467	5.7
Public Administration	328	4.0
Other	8	0.1
All Industries	8,169	100.0

Source: US Department of Labor, Bureau of Labor Statistics

Table A-11: Key Employers in Bell County and Harlan County

Firm	Product(s)/Service(s)	Emp.	Year Established
B & C Machine Shop Inc	Machine shop, general machining	7	1988
Bell Concrete Industries Inc	Precast concrete & dry cement	18	1966
Concrete Products	Ready-mixed concrete	5	1991
Cumberland Gap Provision Co	Smoked ham & sausage processing	400	1979
Dura-Line Corporation	Gas pipe and fiber optic cable	170	1971
Elmo Greer & Sons Inc	Crushed stone, limestone & asphalt	15	1990
H T Hackney	Wholesale/Distribution	28	1986
Ideal Print Shop	Commercial offset printing, computer typesetting, plastic & saddle stitch binding, textile & flat surface screen printing, novelty hems/embroidery, process color work.	10	1980
J R Hoe & Sons Inc	Iron castings, gray and ductile. Pattern tooling services. CNC machined castings. Prototypes. Metal fabrications-steel, stainless and aluminum. AISC structural and miscellaneous. AutoCAD design and engineering.	45	1909
Kirby Steel Products Inc	Metal truck equipment.	3	1965
Logan Corp	Metals service center: steel cutting; custom metal fabricating	25	1981
Logan Corp	Machine shop: drill steel stems, CNC & precision machining	8	1984
Martin Manufacturing Corp	Elastic webbing	4	1922
Middlesboro Coca-Cola Bottling	Carbonated soft drinks and water & bottling	119	1904
Middlesboro Daily News	Newspaper publishing	21	1911
Mountain Tarp	Tarps and tarping systems	91	1987
Solid Steel Solutions	After-market parts for heavy equipment, welding & manufacturing	16	2007
Three States Printing Co	Offset printing & computer typesetting	3	1948
Yeary Auto Electric	Automobile starters, alternators & drive shafts	4	1977
Southeastern Kentucky Rehabilitation Industries Inc	Textile-related products (DOD contract)-Apparel manufacturing for US Military and other cut and sew customers	88	2000
Tri-City News	Newspaper publishing & offset printing	4	1929
Data Futures Inc	Create, install, train, and support LunchBox school nutrition software for K-12 schools and CareScope software for community health care coalitions to manage clients and cases	24	1983
Harlan County Leader, The	Advertising paper publishing	6	1983
Harlan Daily Enterprise	Newspaper publishing & computer typesetting	23	1901
Mountain Construction Co	Ready-mixed concrete	5	1977
Hurberries Inc	Metal fabrication	4	2008

Source: Kentucky Cabinet for Economic Development

KYTC's purpose for assessing Environmental Justice impacts is to identify minority, low-income, or elderly, or disabled populations that may be affected by recommended projects.

The assessment focused on identifying, through a demographic analysis, the extent to which EJ populations and other groups of concern reside in or near the study area and may be impacted by improvement projects. Subsequent actions (determination of disproportionately high and adverse effects; proposing measures to avoid, minimize, and/or mitigate such effects; and providing specific opportunities for public involvement) may be undertaken, as appropriate, contingent upon the results of the demographic analysis.

Population by Race

The preliminary analysis showed that Bell and Harlan County's population, by race percentages, is lower than the national and state averages. All of the Census Tracts within the study area are below or comparable with state and national averages. Refer to **Figures A-11** and **A-12** for details. It should be noted that all Environmental Justice figures were developed by CVADD.

Population by Poverty

Bell and Harlan County's population below poverty level exceeds the state and national levels. Although the Census Tracts defined in the study have higher levels of population below poverty that are higher than state and national levels, they are comparable to the regional percentages. However, there are two Block Groups within the study are that have a much higher percentage than the remaining Block Groups. They include Census Tract 9602 Block Group 4 at 46.9% and Census Tract 9706 Block Group 2 at 41.9%. Refer to **Figure A-13** for details.

Census Tract 9706 has the highest percentage of the population below poverty level in the study area at 37.3%. That percent is three times the national average of 12.4%. Block Group 2 is listed as containing 41.9% of the population below poverty level, which exceeds the regional averages by approximately 10 percent. A subsequent review of poverty data within affected Census divisions should be undertaken to insure that these groups are not disproportionately affected by any improvement projects.

Population by Persons 65 and Over

The aging characteristics and percentages for Bell and Harlan Counties are similar to other Census Tracts in the counties, the state, and the nation. However, there are some elevated percentages of 65 and over age groups in two Census Tracts. Census Tract 9602 Block Group 3 and 4 and Census Tract 9708 Block Group 1 and 2 show an elevated percentage. Census Tract 9602 Block Group 3 (18.7%) and Block Group 4 (16.8%) and Census Tract 9708 Block Group 1 (19.3%) and Block Group 2 (19.2%) show potential higher levels of aging population. Refer to **Figure A-14** for details. After discussions with other community members, it appears that the higher percentages are the result of older sections of the City of Pineville in Bell County and the City of Harlan in Harlan County. It is anticipated that the implementation of projects would not have a disproportionate affect on the population of persons age 65 and over residing in the area.

For more details of the EJ analyses, including the full EJ Report by the CVADD, refer to the supplemental files on the accompanying CD.

2.3 Community Facilities

There are two parks in the vicinity of the study area, Bell County Veterans Memorial Park (BCVMP) and Black Mountain Off-Road Adventure Area (BMORAA) in Harlan County. BCVMP is located in the western portion of the study area directly off of US 119 to the southwest. BMORAA is located south of US 119 near the northeastern portion of the study area. BMORAA has over 200 miles of ATV trails on approximately 7,000 acres of mountainous terrain. BMORAA is operated by the Harlan County Outdoor Recreation Board and in conjunction with the Harlan County Fiscal Court holds a 25-year lease to the property. BMORAA is open all day year round and there are paid permits required to use the trails. There are only two access points to BMORAA. The southern location, Evarts Trailhead is located on KY 2430, eight miles east of Harlan on KY 38, which is outside of the study area. The northern access location to BMORAA is located closer to the study area, directly off US 119 eight miles north of Harlan.

There are multiple churches and cemeteries located in and along the study area as shown in **Figure A-9**. Two schools are located along the study area including the Page School Center in Bell County and the new Harlan County High School at the easternmost end of the study area. There is one volunteer fire department in Bell County near the Page School Center wthin the study area and there are two fire departments in Harlan County within the study area (Bledsoe Volunteer Fire Department and Lower Cloverfork Fire Department). Other fire departments are depicted on the map, but they may not necessarily be within the study area proper. The primary EMS provider is the Harlan Emergency Medical Service in Harlan County. There is one airport in the area, the Tucker-Guthrie Memorial Airport in Harlan.

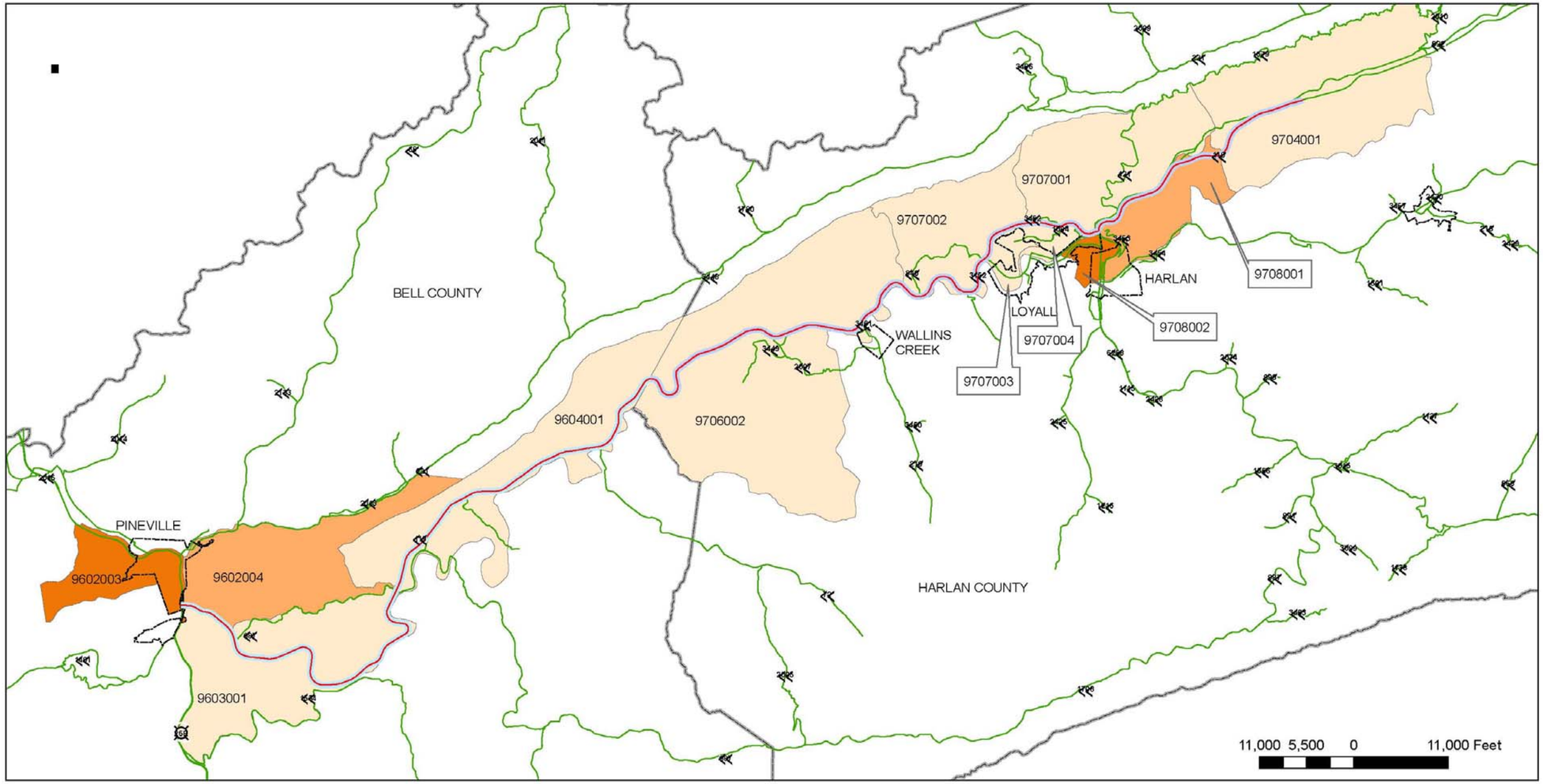
2.4 Underground Storage Tanks and Hazardous Materials

There are 23 underground storage tank sites identified within the study area. Eight of the sites are active, two are listed as verified closed in place, and the remaining 13 are listed as verified removal. There is one solid waste landfill in the study area at / near the Harlan County Airport, which is outside the US 119 study area. There are three waste sites in the study area, one solid waste landfill in Harlan County, one solid waste landfill in Bell County, and one solid waste treatment and disposal site in Bell County.

2.5 Previously Documented Cultural Historic and Archaeological Sites

A records search was conducted through the Kentucky Heritage Council and the Kentucky Office of State Archaeology to determine the existence of any known cultural resources, including historical resources and archaeological sites within the study area. Within the study area, 163 historic survey resources were identified. These historic survey resources included six churches or religiously affiliated structures, one school, and one bridge, with the vast majority of identified historic resources being houses. The status of all but one of these resources is listed as "undetermined" with only a single bridge over the Cumberland River being listed as eligible for the National Register. Two clusters of identified historic resources are located in the vicinity of Pineville and Wallins Creek.

Figure A-11: Population by Black or African American



Population by Black or African American

Legend

- US119 Corridor Study
- City Boundary
- State Routes
- Block Groups
- County Boundary

Percent (Bell)	Percent (Harlan)
0.00	0.00
0.01 - 1.78	0.01 - 3.13
1.78 - 3.83	3.13 - 5.38

KENTUCKY TRANSPORTATION CABINET
Division of Planning

Figure A-12: Population by Hispanic or Latino

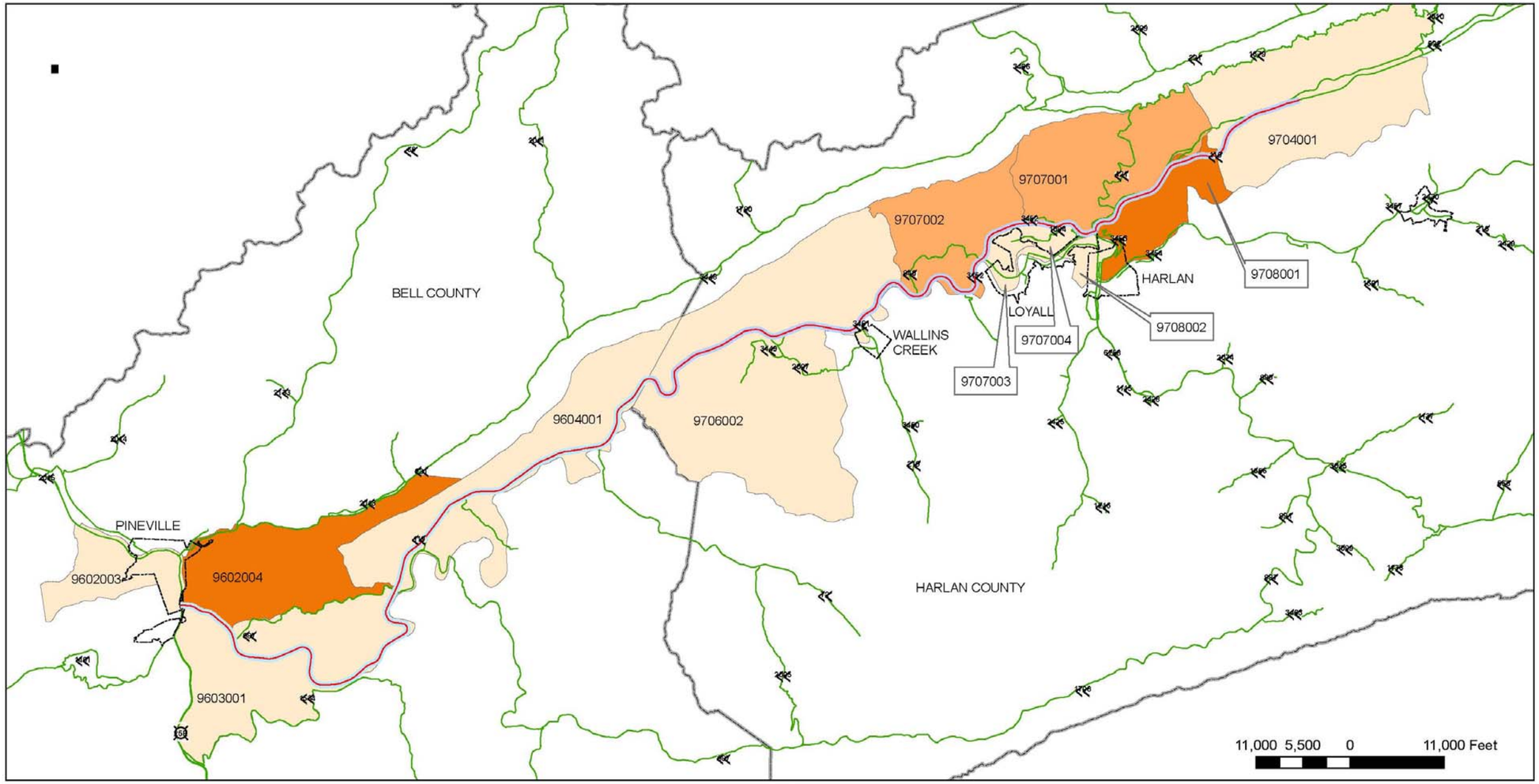


Figure A-13: Population by Poverty Level

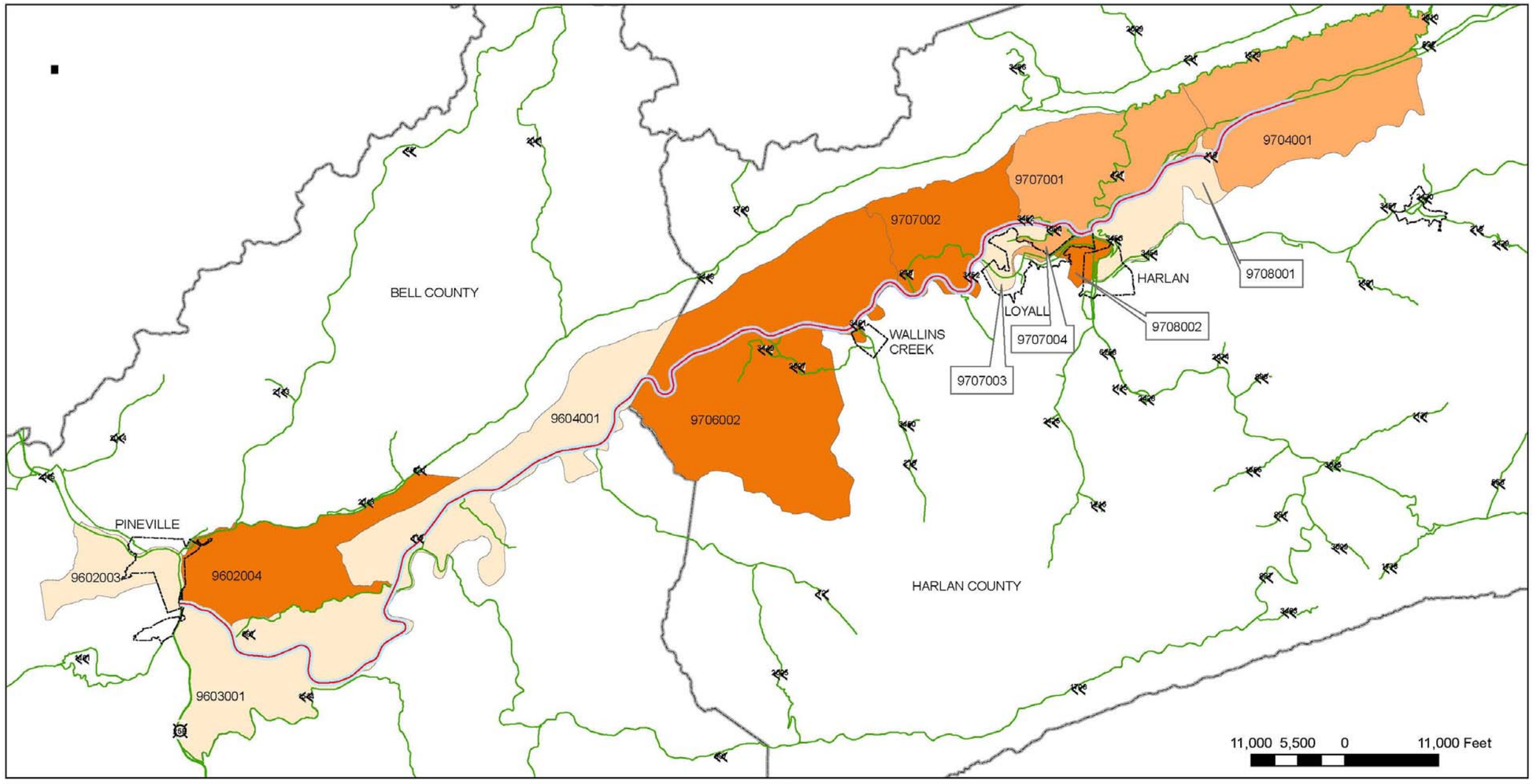
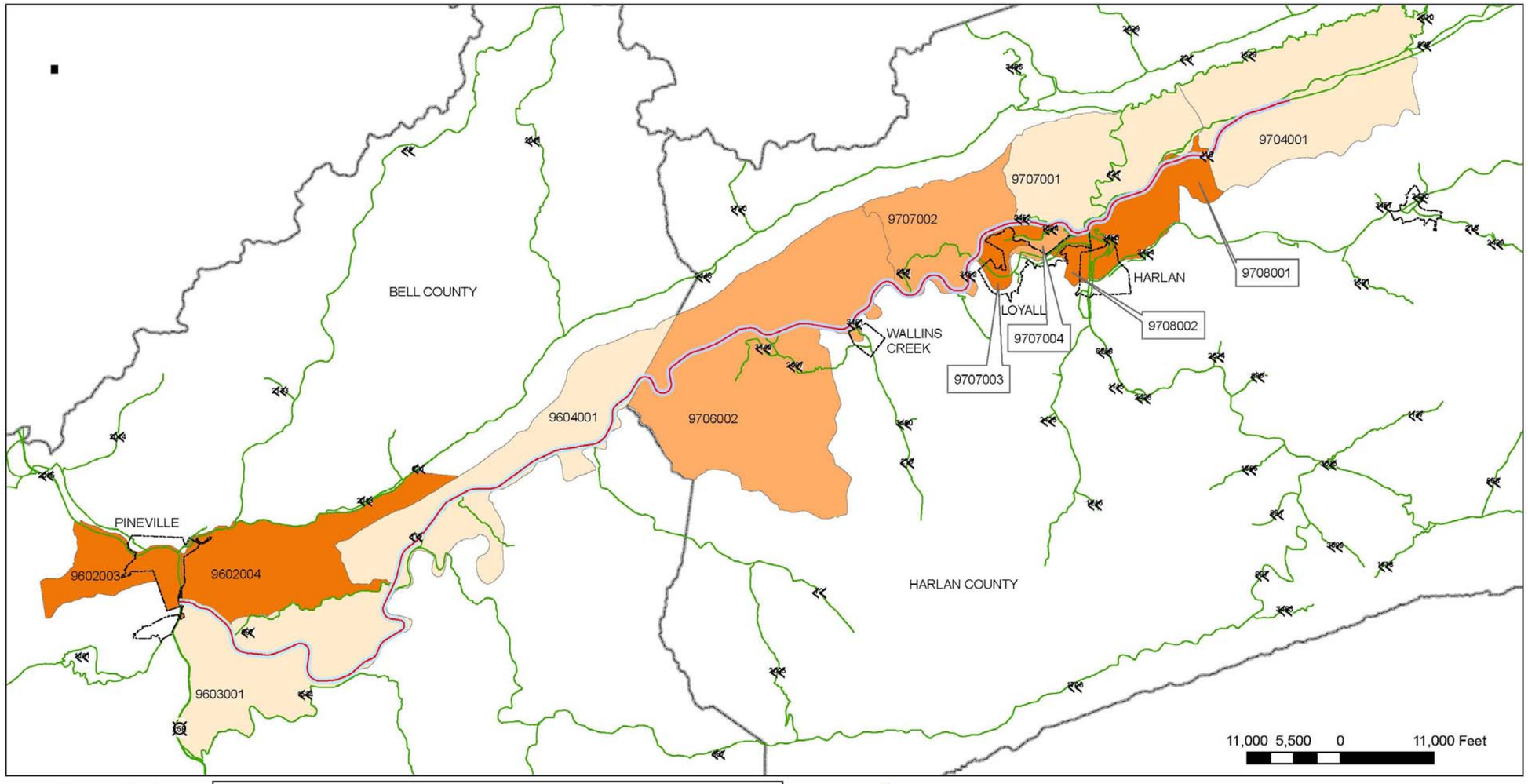


Figure A-14: Population by Persons 65 and Over



Archaeological resources were much less prevalent throughout the study area with only 15 archaeological sites having been identified within the study area. It should be noted however, that only around 3 percent of the state of Kentucky has been examined for archaeological remains. Once the needed improvements have been identified, various state and federal environmental regulations will require a more thorough assessment of the cultural resources within the study area be completed.

If is it determined that the project will have any adverse impacts to historic resources identified within the study area, Section 106 consultation and review would be initiated with the State Historic Preservation Office (SHPO). Should a proposed improvement require the use of cultural resources, including identified historic resources or archaeological sites, then a Section 4(f) evaluation will be conducted.

3.0 NATURAL ENVIRONMENT OVERVIEW

An environmental overview was conducted to determine the characteristics of the natural environment in the study area. Resources addressed in this section include: aquatic resources, threatened, rare, and endangered species, air quality, traffic noise, and floodplains. Below is a summary of key points from the overview. **Figure A-15** shows the natural environment features in the study area.

3.1 Aquatic Resources

The Cumberland River and its tributaries run through the study area. The river is located to the southeast of the existing US 119 alignment. The tributaries include:

Big Branch	Fourmile Branch	Poor Fork Cumberland River
Bills Branch	Green Howard Branch	Rob Blanton Branch
Bird Branch	Hensley Branch	Sam Howard Branch
Burst Branch	Laurel Branch	Second Branch
Country Club Branch	Meetinghouse Branch	Stillhouse Branch
Crooked Branch	Minton Branch	Watts Creek
Drakes Branch	Nolan Branch	Yellow Cliff Branch
Elisha Howard Branch	Oldhouse Branch	
English Creek	Pearl Branch	

According to National Wetlands Inventory data there are 23 palustrine wetlands in the study area. Also, there is one municipality that has a permitted water withdrawal location in the study area for the Harlan Municipal Water Works but no wellhead protection areas. There are no national wild and scenic rivers or Kentucky Division of Water designated wild rivers within the study area. There are no waters with Kentucky Division of Water designated uses within the study area. A portion of Watts Creek in Harlan County has been designated as an Exceptional Water, Reference Reach Water and Outstanding State Resource Water, but this is for a reach that is located approximately two miles outside of the study area.

3.2 Threatened, Rare, and Endangered Species

Data to determine threatened, rare and /or endangered species that may occur within the study area was compiled from the United States Fish and Wildlife Service, the Kentucky State Nature Preserves Commission, and the Kentucky Ecological Services.

Table A-12 contains federally listed endangered, threatened and candidate species that may occur in Bell and Harlan Counties, and therefore, may occur in the study area. **Table A-13** lists monitored elements occur within a one mile radius of the US 119 study corridor.

There are no wildlife refuges, wildlife management areas, nature preserves, or other managed areas in the study area.

3.3 Air Quality

There are six air pollutants designated as “criteria air pollutants” by the United States Environmental Protection Agency (USEPA). These six include: Carbon Monoxide (CO), Lead (Pb), Nitrogen Dioxide (NO2), Ozone (O3), Particulate Matter (PM10 and PM 2.5) and Sulfur Dioxide (SO2). Bell County monitors for three out of the six, including: particulate matter at 2.5 microns and larger (PM 2.5), O3 and metals including lead. Bell County’s ambient air quality monitoring station is located in the vicinity of 34th Street and Dorchester Avenue in Middlesboro, approximately 10 miles to the south-southwest of the project’s western terminus. There are no monitoring stations in Harlan County. The Kentucky Division of Air Quality Fiscal Year 2009 Annual Report (Kentucky Division of Air Quality, 2009) indicates that Bell and Harlan Counties are in attainment for criteria pollutants. However, Bell County exceeded the 8 hour ozone standard for two days in 2008.

The project proposes improvements to US 119 are not of the nature to add trips to the roadway corridor. They would improve existing traffic flow, reduce delays from vehicles awaiting turning movements and improve safety. With respect to air quality, the improvements in traffic flow would mean less idling time and less episodic emissions from acceleration events after stopping or slowing. These improvements are anticipated to improve the air pollutant emissions attributes of US 119 over that of the existing conditions.

3.4 Traffic Noise

Potential noise sensitive receptors counted for the project area include residences, churches and schools within 250 feet of the existing and proposed roads. No other potential noise sensitive receptors (i.e. retirement homes or medical care facilities) were found in the project area. The existing noise conditions are those that are characteristic of being adjacent to a multi-lane highway. Some sensitive receptors have man made and/or natural barriers between them and the roadway, others do not. Improvement projects identified as part of the study will not add capacity or are likely to bring traffic closer to the receptors; therefore, more in-depth analysis of noise impacts is not needed.

3.5 Floodplains

There are designated floodplains in the study area along either sections of or the entire length of Bird Branch, Bills Branch, Crooked Branch, Big Branch, Laurel Branch, Pearl Branch, Watts Creek, Fourmile Branch, Poor Fork Cumberland River and Cumberland River. The largest floodplain areas are along the Cumberland River, which also include floodway areas. The existing US 119 corridor goes through floodway and 1 percent flood hazard areas (100-year floodplain) in a number of locations.

Figure A-15: Natural Resources

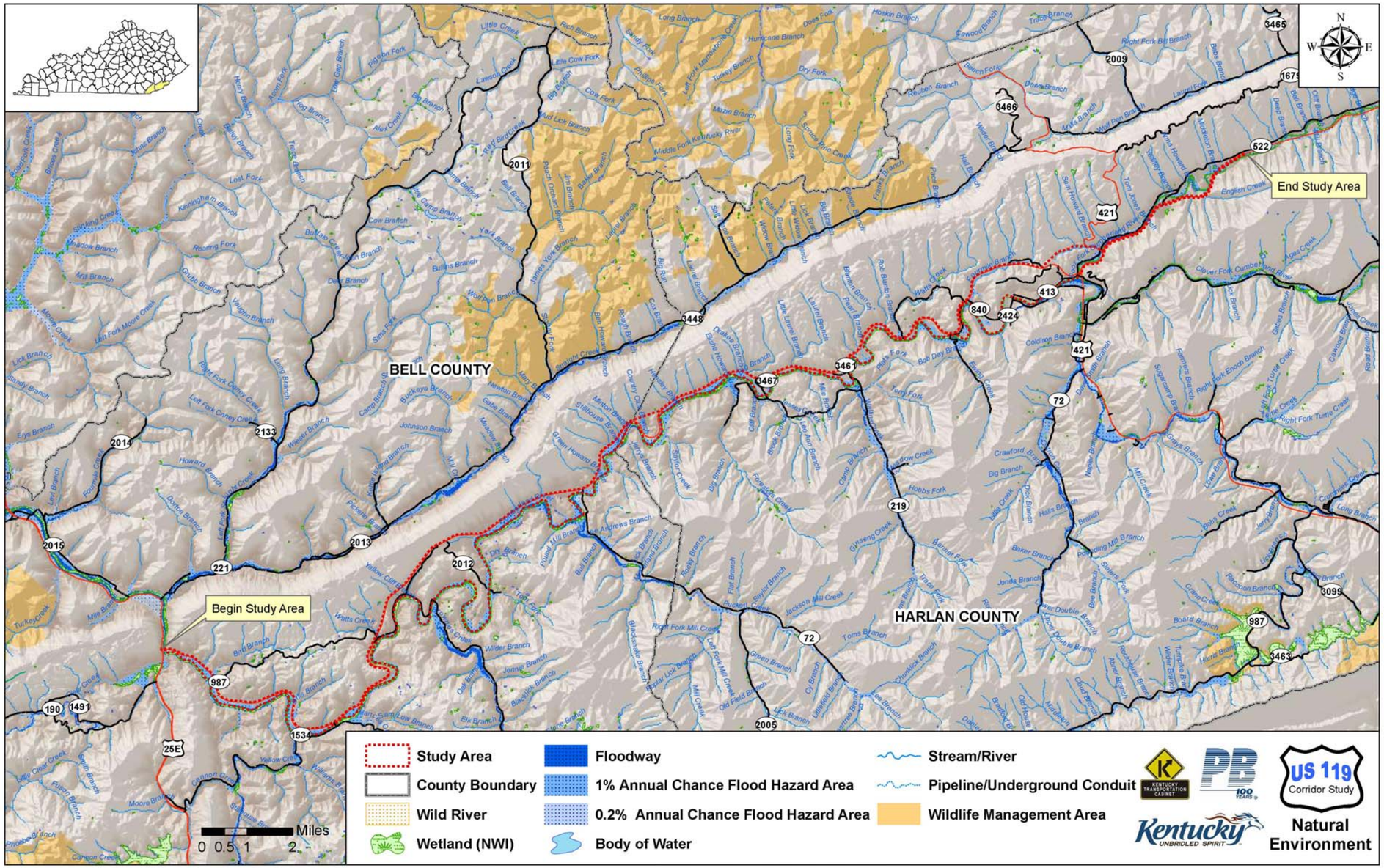


Table A-12: Federally Listed Threatened and Endangered Species

Group	Species	Common Name	Legal Status	Known Potential*	County
Mammals	*Myotis grisescens*	Gray Bat	Endangered	Known	Harlan
	Myotis sodalis	Indiana Bat	Endangered	Known	Bell, Harlan
Mussels	*Epioblasma torulosa rangiana*	Northern Riffleshell	Endangered	Potential	Bell
	Lampsilis arupta	Pink Mucket	Endangered	Potential	Bell
	Obovaria retusa	Ring Pink	Endangered	Potential	Bell
	Plethobasus cooperianus	Orangefoot Pimpleback	Endangered	Potential	Bell
	Plethobasus cyphyus	Sheepnose	Candidate	Potential	Bell
	Pleurobema clava	Clubshell	Endangered	Potential	Bell
	Cyprogenia stegaria	Fanshell	Endangered	Potential	Bell
	Pleurobema plenum	Rough Pigtoe	Endangered	Potential	Bell
	Alasmidonta atropurpurea	Cumberland Elktoe	Endangered	Potential	Bell
Fishes	*Phoxinus cumberlandensis*	Blackside Dace	Threatened	Known	Bell, Harlan
Insects	*Pseudanopthalmus frigidus*	Icebox Cave Beetle	Candidate	Known	Bell

Known = Known occurrence record within the county, Potential = Potential for the species to occur within the county based upon historic range, proximity to known occurrence records, biological, and physiographic characteristics.

Source: U.S. Fish & Wildlife Service, Kentucky Ecological Services Field Office

Table A-13: State Listed Threatened and Endangered Species

Group	Species	Common Name	Status	County
Mosses	*Entodon brevisetus*		Endangered	Harlan
	Herzogiella turfacea		Endangered	Harlan
	Oncophorus raui		Endangered	Harlan
Vascular Plants	*Calopogon tuberosus*	Grass Pink	Endangered	Bell
	Carex appalachica	Appalachian Sedge	Threatened	Harlan
	Chrysosplenium americanum	American Golden-saxifrage	Threatened	Bell
	Dryopteris carthusiana	Spinulose Wood Fern	Special Concern	Harlan
	Gentiana decora	Showy Gentian	Special Concern	Bell, Harlan
	Monotropsis odorata	Sweet Pinesap	Threatened	Bell
	Prosartes maculata	Nodding Mandarin	Special Concern	Bell
	Solidago roanensis	Roan Mountain Goldenrod	Threatened	Harlan
Terrestrial Snails	*Anguispira rugoderma*	Pine Mountain Tigersnail	Endangered	Bell
	Patera panselenus	Virginia Bladetooth	Special Concern	Bell
Freshwater Mussels	*Anodontoides denigratus*	Cumberland Papershell	Endangered	Bell
	Lampsilis ovata	Pocketbook	Endangered	Bell
Crustaceans	*Cambarus buntingi*	Longclaw Crayfish	Special Concern	Bell, Harlan
	Cambarus parvolculus	Mountain Midget Crayfish	Threatened	Bell
Insects	*Lytrosis permagnaria*	A Geometrid Moth	Endangered	Bell
	Pseudanophtalmus frigidus	Icebox Cave Beetle	Threatened	Bell
Fishes	*Phoxinus cumberlandensis*	Blackside Dace	Threatened	Bell, Harlan
Amphibians	*Plethodon wehrlei*	Wehrle's Salamander	Endangered	Harlan
Reptiles	*Eumeces inexpectatus*	Southeastern Five-lined Skink	Special Concern	Bell
Breeding Birds	*Vermivora chrysoptera*	Golden-winged Warbler	Threatened	Harlan
Mammals	*Clethrionomys gapperi maurus*	Kentucky Red-backed Vole	Special Concern	Harlan
	Myotis grisescens	Gray Myotis	Threatened	Bell
	Myotis leibii	Eastern Small-footed Myotis	Threatened	Harlan
	Myotis sodalist	Indiana Bat	Endangered	Harlan
	Sorex cinereus	Cinereus Shrew	Special Concern	Harlan
	Ursus americanus	American Black Bear	Special Concern	Harlan

4.0 GEOTECHNICAL OVERVIEW

The Geotechnical Branch of KYTC completed a review of the project study area. Below is a summary of the findings. For the full geotechnical documentation, refer to the supplemental files on electronic format at the back of this report.

The study area is located within the Balkan, Harlan, Middlesboro North, Wallins Creek, Varilla, and Bledsoe Geologic Quadrangle Maps.

The study area is underlain by the following formations:

4.1 Geologic Overview

Alluvium
The Quaternary Alluvium consists of silt, sand gravel and clay deposits, and is located along streams and Valleys. The thickness of these deposits range from 0-50 feet.

Colluvium and Landslide Debris
The Quaternary Colluvium consist of angular sandstone boulders and blocks in unsorted sand, silt and clay matrix it is widespread as veneer on most hill sides merging near the base of slopes with alluvium. Landslide debris mainly consists of sandstone and siltstone blocks tens of feet in diameter surrounded by plastic clay, silt and shale matrix it occurs in deposits as much as 80 feet thick.

Lee Formation
The Lee Formation in the study area contains the upper and lower Members of the Lee Formation (Pennsylvanian Age) which includes Sandstone Member A, Sandstone and shale member B, Sandstone member C, sandstone and shale member D, Naese Sandstone Member, and the Bee Rock Sandstone Member.

Sandstone member A of the Lee Formation is sandstone white to very light gray, fine to coarsegrained, massive crossbedded, and quartzose it is conglomeratic in lower part with well-rounded quartz pebbles about ½ inch in diameter.

Sandstone and shale member B of the Lee Formation, shale, underclay, and sandstone: Shale is medium gray and slightly calcareous in part. Medium-dark –gray shale with thin beds of coal, underclay, and very fine grained sandstone locally.

The sandstone member C of the Lee Formation is white to very light gray, fine to coarse grained, massive, and crossbedded, quartzose, and conglomeratic with well-rounded quartz pebbles commonly ½ to inch in diameter. Locally the member is divided into four conglomeratic sandstone beds by intervening beds of very fine to fine grained platy bedded sandstone and shale. The Unit forms prominent cliffs and hogbacks at top of Rocky Face and on the slopes of Pine and Cumberland Mountains.

The Sandstone and shale member D of the Lee Formation consists of shale, sandstone, coal and underclay. The lower part of the shale is medium-gray, with few thin beds of fine to very fine-grained platy-bedded sandstone. The Middle part of the sandstone is light-gray, very fine-grained, and thick bedded to massive. The upper part of the shale and sandstone is medium-gray to grayish-black, fine to very fine-grained, platy to thick bedded. The member contains only one coal bed with underclay.

The Bee Rock Sandstone Member of the Lee Formation consists of sandstone and siltstone. The sandstone is generally white to light- gray, mostly fine to medium-grained, moderately well sorted coarse-grained sandstone; it is mostly quartz with abundant quartz pebbles as much as 1 inch in diameter near the base and generally scattered throughout. Large scale crossbed sets occur in massive sand deposits that grade upward to a siltstone. The siltstone is medium to dark-gray and may locally contain a thin coal bed unit at the top of the unit. The siltstone at the top of the member locally includes several feet of shale breccia in a sandstone matrix. On Cumberland Mountain the siltstone is as much as 60 feet thick and is mapped as a tongue of the Breathitt Formation. The siltstone unit is truncated to the northwest by an unconformity at the base of overlying Naese Sandstone Member.

The Naese Sandstone member of the Lee Formation comprises of sandstone, siltstone and coal. The sandstone is generally very light to light-gray, fine to coarse-grained, moderately well sorted, and mostly quartz with some quartz pebbles as much as 1 inch in diameter. It grades southeastward to a sparsely conglomeratic sandstone. It has large scale sets of low and high angle crossbeds. The unit grades vertically from massive quartzose conglomeratic sandstone to a thick bedded micaceous sandstone in the upper part. The siltstone is clayey to sandy generally medium to olive gray, and weathers moderate to light brown and olive gray. It locally contains a thin coal bed about 30 feet below the top.

Thickness of the Lee Formation including all of the above members is 0-350 feet in the scoping study area.

Breathitt Group
The Breathitt group (Pennsylvanian Age) in the study area includes the Hance Formation and the Mingo Formation.

Hance Formation
The Hance Formation in the study area consists of the Yellow Creek Sandstone Member, and the Middle and Upper sandstone members.

The Hance Formation of the Breathitt Group is composed of shale, sandstone, underclay, and coal. The shale is medium to dark-gray in color. Locally the formation is silty and interbedded with siltstone or very fine grained sandstone, which commonly contains fossil plant imprints and iron stone nodules. The sandstone is very light to light gray in color, mostly very-fine to fine-grained, thin to thick bedded, and weathers to a burr brown. Fine to medium-grained sandstone crops out locally in cliffs below and above the Path Fork coal bed. Underclay, silty in part, occurs in beds up to six feet thick.

Upper Member (Breathitt Group)
The Upper member is composed of sandstone light-gray in color weathers to a brown color. The sandstone is fine to medium-grained, and is micaceous. The Sandstone is thick bedded to massive it forms a prominent benches or cliffs. The upper part locally grades into medium- gray shale overlain by 1 to 2 feet of underclay.

Mingo Formation
The Mingo formation of the Breathitt Group consists of shale, silty shale, sandstone, underclay, and coal. The medium-to dark –gray shale and silty shale is interbedded with light-gray, mostly very fine to fine-grained micaceous, thin-bedded to massive sandstone. It contains a few beds of mediumgray argillaceous siltstone; medium-gray clayey to silty underclay; and coal.

4.2 Geotechnical Concerns

1. Oil and gas wells are present within the study area. The wells should be avoided if possible within any corridor. Any wells encountered will add additional cost to the project. A more detailed evaluation should be completed to identify all wells within the study area.

2. Shales in the Breathitt Formation will likely require flatter than normal cut slopes.

3. Embankment less than 30 feet high should be stable on normal fill slopes. Embankments over 30 feet high maybe required to have flatter than normal slopes and require additional right of way. Embankments found in Alluvium and along streams maybe soft and saturated. Structures founded in Alluvium plains should be founded in bedrock with Spread footings. Deep Foundations are not anticipated.

4. Any corridor or alignment that utilizes existing cut slopes will likely need to be re-designed. This may require additional right of way.

5. The following coal seams are present in the existing corridor the Canny City Coal Bed, Fire Clay Coal Bed, Grassy City Coal Bed, Haddix Coal Bed, Coal Bed in the Prather Coal Zone, a Coal Bed in the Peach Orchard Zone, Harlan Coal bed, Harlan rider coal bed, Kellioka coal bed, Amburgy coal bed and two unnamed coal beds in the Mingo Formation. No surface or underground mines are present along the existing roadway.

6. Soil depths may vary from six inches on the ridge tops to more than 30 feet along the Cumberland River.

7. The proposed study area may encounter abandoned and active underground mines. Multiple coal seams mines are present within the study area. Deep mines are typically room and pillar mines with secondary recovery in certain areas of the mines. Subsidence related problems are possible where roadways cross the mines. Given the potential problems which can arise from coal mine subsidence, avoidance in these areas is recommended if possible. In areas where avoidance of these mines is not possible, detailed studies with appropriate site-specific recommendations will be required.

8. A rock fall protection system was in place on a cut around the Varilla area at the time of the site investigation.

9. Cuts in shale where the dip is toward the roadway (mainly north of proposed center line) will require removing all material above the bedding plane intersecting the ditch line, and following the apparent bedding plane up dip. Cuts in sandstones dipping into the roadway should be kept less than 30 in feet in height and may require special construction practice such as bolts, dowels and shooting or breaking up sliding planes in order to maintain stable slopes. May it also be noted that throughout the life of the proposed roadway maintenance of cut will be required to insure the stability of the cut. This may include scaling operations to prevent cleaved rock from falling into the roadway. The branch recommends avoiding any cuts higher than 30’in dipping bedrock. Slope failures in dipping bed rock may occur during and after construction. The branch recommends keeping cut heights to minimum in dipping bed rock strata. To minimize the amount of excavation along bedding planes.

10. Embankments maybe constructed on dipping strata and talus filled drains. The external stability of the fills may require use of shear keys, tie back walls, and limiting embankment heights to 20-30 feet.

11. Special compaction procedures may be required where non-durable shales are utilized.

12. Sandstone and siltstone maybe required in the bottom of fills up to the maximum high water elevation.

13. Durable sandstone and durable shale are suitable for all roadway uses. Frriable sandstone is suitable for free draining fill and embankments.

14. This project is in a classified seismic risk zone 2 that is defined as an area of moderate damage due to earthquake activity.

APPENDIX B:

PUBLIC INVOLVEMENT SUMMARY

PUBLIC MEETINGS SUMMARY

US 119 Public Meetings Overview

Two public meetings were held during the US 119 Corridor Study to engage and solicit feedback regarding the project from the public. The meetings were held on consecutive nights in December 2009 (December 8th and 9th), first in Harlan County at the Harlan County Civic Center then in Bell County at the Page School Center.

The purpose of the meetings was to present the existing conditions information for US 119, present identified issues and goals, and preliminary improvement locations. Feedback on all of these project aspects was requested from attendees either verbally at the meeting or through the provided comment form.

The meetings were held in an open-house style format with multiple boards depicting the following information:

- Welcome / Orientation
- Study Purpose
- Study Area
- Existing Conditions
  - Traffic Volumes
  - Levels of Service
  - Crash Data
- Environmental Features
- Project Issues
- Preliminary Improvement Locations
- Next Steps

The comment forms distributed at the meeting were designed to solicit input on highway, community, and environmental issues as well as the types of highway-related improvements that are needed in the corridor.

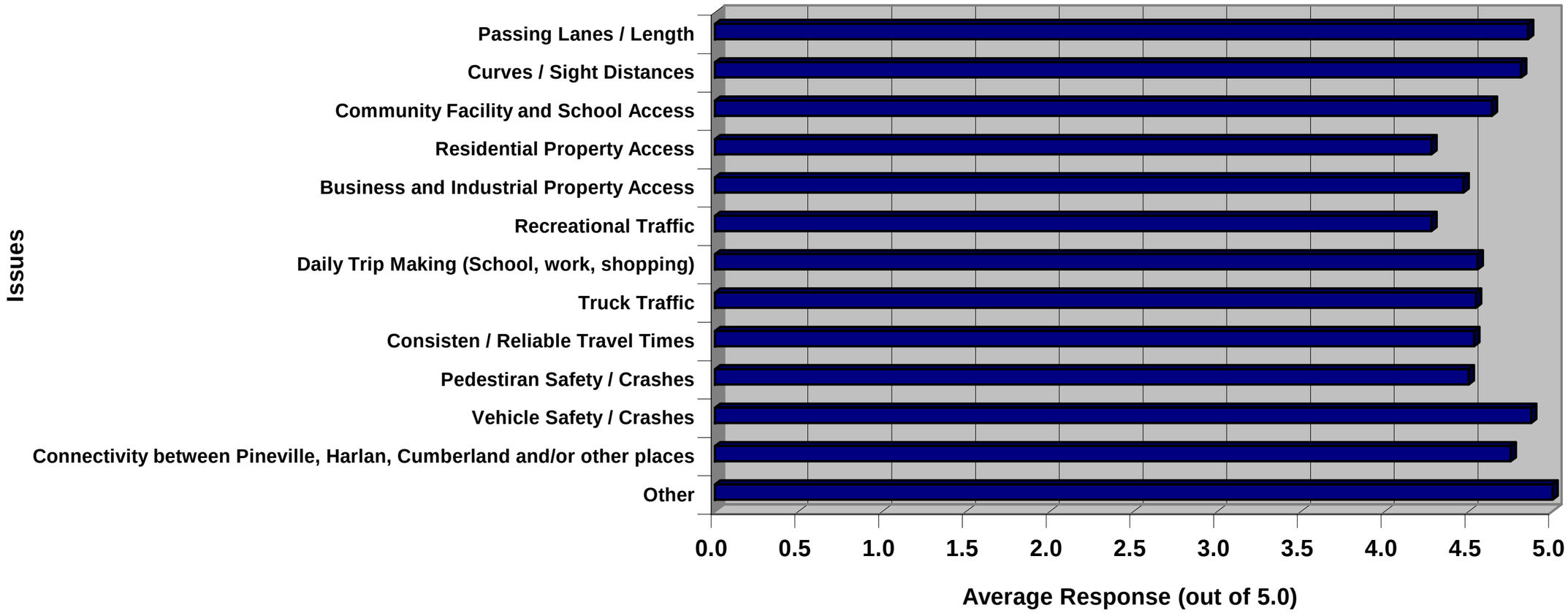
Overall, 80 people signed-in at the meeting in Harlan County and 52 people signed-in at the meeting in Bell County. Either during the meeting or following the meeting, 32 comment forms were returned from people in Harlan County and 18 comment forms returned from people in Bell County.

Overall, some common issues noted in the free response sections of the comment form include:

- More turn lanes are needed
- Rock slides are a problem
- Consideration should be given to the fact that there are numerous crashes along US 119
- US 119 is prone to flooding / water on the road
- Improvements are needed for economic development / sustainability.

The responses from the returned comment forms are provided on the following pages. It should be noted that the responses from the open-ended questions were not altered when they were included in this document. Therefore, spelling and / or grammar errors were not corrected.

Question 1: How important to you are the following highway issues for this study?



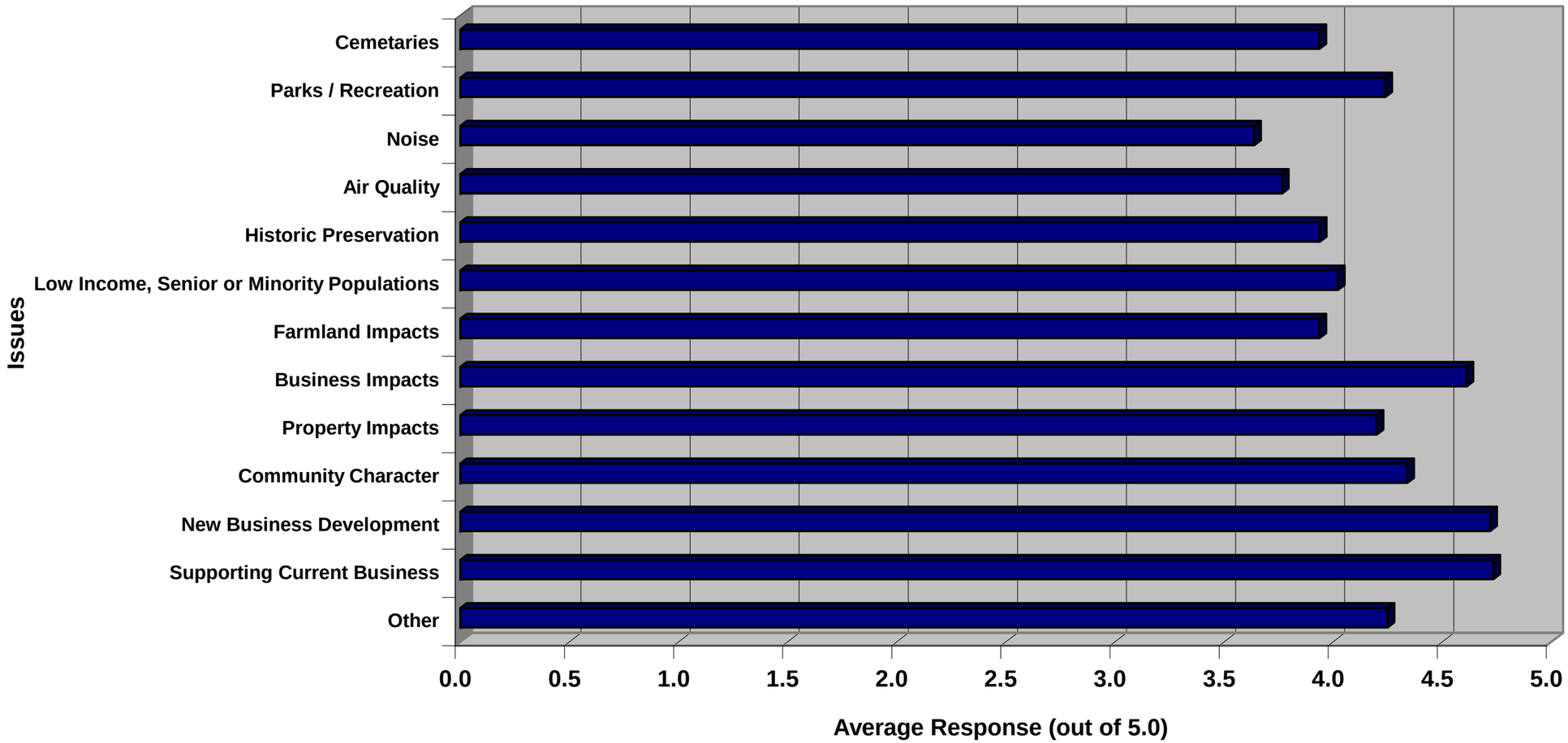
1. Other Highway Issues:

- Saving Life
- Turn Lanes
- Economic Development
- Turn Lanes
- ATV Use/Safety
- Falling Debris for High Walls
- Turning Lanes
- Turning Lanes
- 4 Lanes
- Enforcement of 4 Wheelers
- Traffic on Shoulders
- Turn Lanes
- Speed of Trucks
- Safety and Economic Improvements to the County
- Road Access; Road Quality; Road Up-Keep; Road Structure; Road Width
- Keep rights-of-way clean and clear; remove abandoned buildings, trailers, garbage
- More Turn Lanes
- Over Hanging Cliffs
- 4 Lane

2. Please discuss any other highway related issues you would like to have considered in this study.

- Rumble strips in center of “no pass” zones
- High death rate and truck speed coming out of tan yard are danger to schools
- Turn lanes – right onto Balkan Rd, Left onto Calloway Fire Dept, pulling out of Calloway Fire Dept, turning left to Blackmont
- Turn Lanes
- Varilla curve re-embankment, take out curve at Molus
- People drive too slowly through curves, and speed up in passing lanes, making it difficult to pass and/or maintain a constant speed
- 4 lanes from Pineville to bridge 6 miles to the industrial yard
- Increased should widths on sections of road that are not in improvement study
- Speed and visibility
- Economic impact moving forward
- Road is inferior to others
- Condition of high walls along 119
- Length of turning lanes at several spots including Harlan Co. High Schools, addition of fence an issue
- Safety, speeding, curves
- Accidents
- Accidents
- Prevention of Accidents
- North-south corridor for economic development – road system is a detriment to survival
- Lots of accidents, fatal, injury and non-injury, several places where they are repeated
- Turn lanes needed especially at busy side streets, stores and schools
- Reduce number of curves and remove high walls which allow for rock slides
- Upfront costs should not be sacrificed to provide long term durability of road surface
- Crash data from 10 years should be considered when looking at safety
- North-south corridor, complete road to Virginia from Cawood
- Complete the highway between Harlan and Pennington Gap, VA, north-south corridor
- Developing a bypass of the Varilla Curve by connection 119 across the 987 route.
- In order to have the best travel you must have access to 4 lanes when possible. Our area is one of the few that do not have a 4 lane road leading to our county.
- Economic development; open the region for jobs.
- Approach from side roads; traffic control; especially commercial trucks
- Approaches to 119 from side roads; speed controls strictly controlled – especially trucks.
- We need longer turn lanes into the different communities and towns along Hwy 119 especially Wallins.
- Slides – very dangerous. US 119 between Dayhoit and 840 cut off to Loyall / Rest Haven Cemetery.
- Increasing US 119 from Harlan to Pineville to a 4 lane highway as much as possible!
- Access into and out of my driveway. 4 lane would greatly aid this for me and many more neighbors.
- This is a very dangerous road. Pulling in/out of our driveways is risky. Many accidents/deaths have occurred. Four lane needs to be considered for increased safety and to save lives.

Question 3: How important to you are the following community and environmental issues for this study?



3. Other community and environmental issues:

- Saving Life
- Flooding
- It hasn't been that long Hwy 25E was 4 laned and no adverse effects occurred in the environment or community.

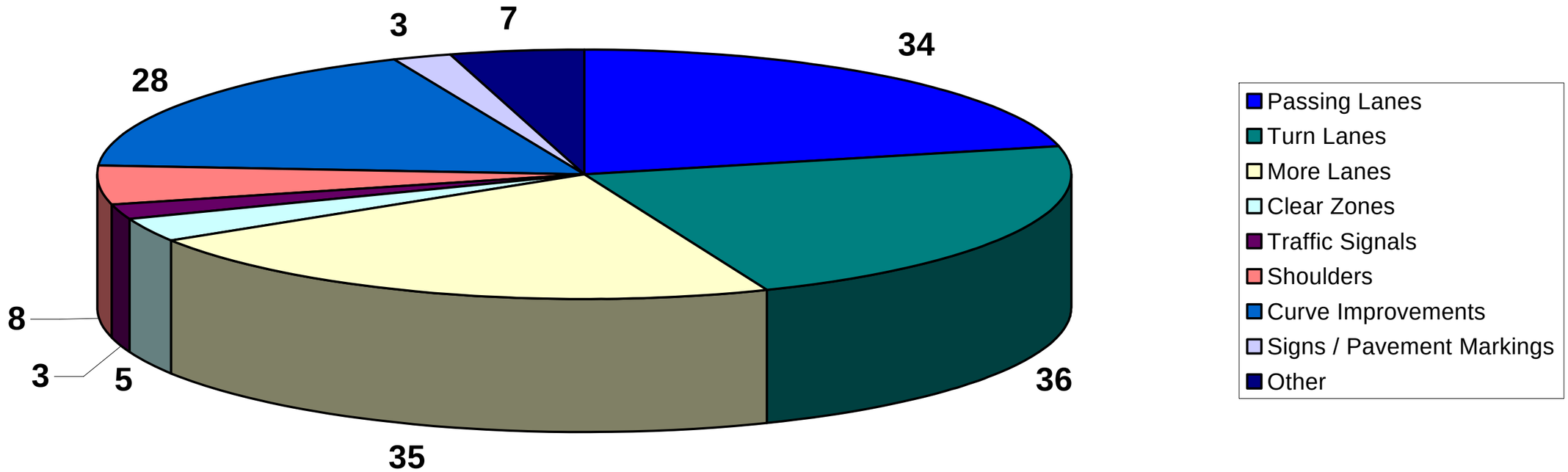
4. Please list any environmental or community features in the study area which we should be aware of and/or have not identified.

- If you go back more than 3 years it is the most dangerous highway in bell county
- Pavement the shoulders
- Low portions of road should be brought up higher than the 1977 flood level
- Flooding over 119 – in the 1977 flood many areas of the highway were flooded and it is impossible to travel if there is an emergency
- Accident reduction, safe semi traffic
- Blanton Forest Nature Lane Trust and Cemetery at Resthaven? Enough buffer to widen or add more lanes?
- Several schools that no longer exist were represented on the map; some schools were not listed at all; FD in wrong sections of county; EMS – one incorrect and one not listed
- There are no environmental features that should take precedence over construction and improvement of roads
- Use of highway for movement of large mining equipment and numerous coal hauling trucks
- Kingdom Come State Park Cumberland
- Environmentally by shortening the road approx. 3 miles would be advantageous
- Access from Helton Road into 119; also exit from 119. 119 needs to be widened to 4 lanes in many places for passing safety. Keep litter cleaned up on both sides of 119.
- Abandoned buildings, trailers, cars, trucks
- There are several areas that have water running across 119 during a heavy rain.
- Environmental – 1) maybe the trees that are ready to fall and pose a threat to travel; 2) gas and water lines which run adjacent to 119, 3) water running onto highway certain areas.
- If not now? A 4lane highway would in the future greatly put OUR BRIDGE (how much money) TO NOWHERE to its full potential.
- If the first eight miles were four laned it would improve the economical development of the Mountain Drive Property and help justify the money spend to build the bridge for access to that property.

5. Please discuss any other issues you would like to have considered in this study.

- New business study if turned into a safer and larger road
- Per capita income and future business for Harlan Co. Harlan Co will completely die after coal because access on 119 will not allow any companies to consider this area for any type of expansion or location
- People drive too fast and disregard warning devices
- The overall and long term survivability of Harlan County, both economic and socially, depends on the continues and ongoing road improvements to provide better and more dependable accessibility
- Varilla curve in Bell County, high wall problem at P…. exchange, reduce slope of Sukey Ridge
- Greatest impact we can have to connect with an interstate, especially a north-south corridor
- Safety issues with the turning lane at the Industrial Park Bridge before Varilla curve going S 119
- Congestion from Rosspoint Elementary to Harlan County High School
- Possibility of lanes from Pineville to Harlan
- I truly believe that these improvements would help our community
- The study of accidents only goes back 3 years. That is ridiculous for many reasons. Studies should show at least 1 to 2 decades on the same stretch of road.
- Consider the cost of doing spot improvements and being obsolete before or as soon as it is finished, with building a 4 lane which is the only way to solve the problem permanently
- ATV traffic – paved shoulders to end the dust from those, 4 lanes are better than 3 * passing lanes can be dangerous because of heal on collisions, the extreme curves @ Molus should be taken out
- Removing 4 wheeler traffic would improve safety, dust storms in summer cross highway and obstruct visions, night time can be mistaken for a car at a distance, with those head lights so close together. I think they should be completely banned, the road is dangerous enough already.
- 4 lane from Bell to Harlan
- Varilla Curve, turn lanes for Veteran's Park
- Put turn lanes at Veterans Park. Turn lane at Calloway Fire Station. Slow truck speeds down. State police need to monitor highway 119. Spray Varilla Curve brush.
- Clear trees, debris such as 25E work performed in past, more working lights and signs
- Keep bushes, trees cleaned more often, from rights-of-way. Abandoned house, trailers removed from rights-of-way. This is so very important to tourist travel.
- The junction of 119 and 421 ends abruptly and with 2 lanes. Traffic is going too fast and ends too quickly at a bridge and red light.
- The number of fatalities that have occurred in certain areas on 119. Considering most traffic collisions occur due to driver error, even if a driver does make an error there is not enough safe road to correct in time.
- US 119 is vital to the cities of Harlan and Cumberland as well as Harlan and Bell County. It needs to become 4 lanes as much as possible if not all of it.
- How much traffic has increased just due to the 4-wheeler traffic and it will only grow in the years to come.
- I feel additional monitoring should be done of the traffic volume on Hwy 199. I live in sight of the road and have observed an increase in volume especially with the 4 wheeler opportunities in Bell and Harlan Co. A large volume of coal trucks and 18 wheelers travel this road daily.

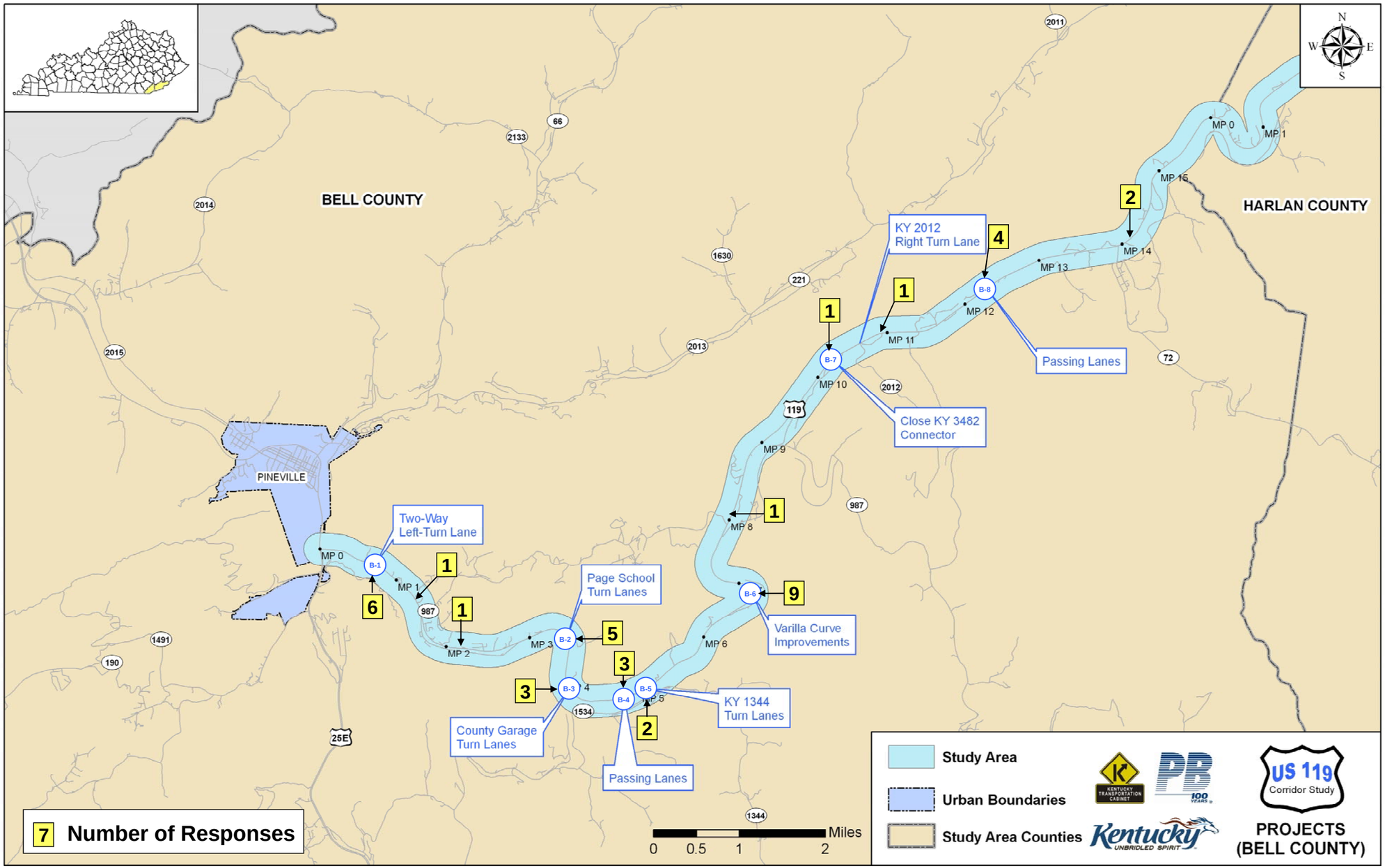
Question 6: What type of highway related improvements are most needed in the corridor?



6. Other highway related improvements most needed in the corridor:

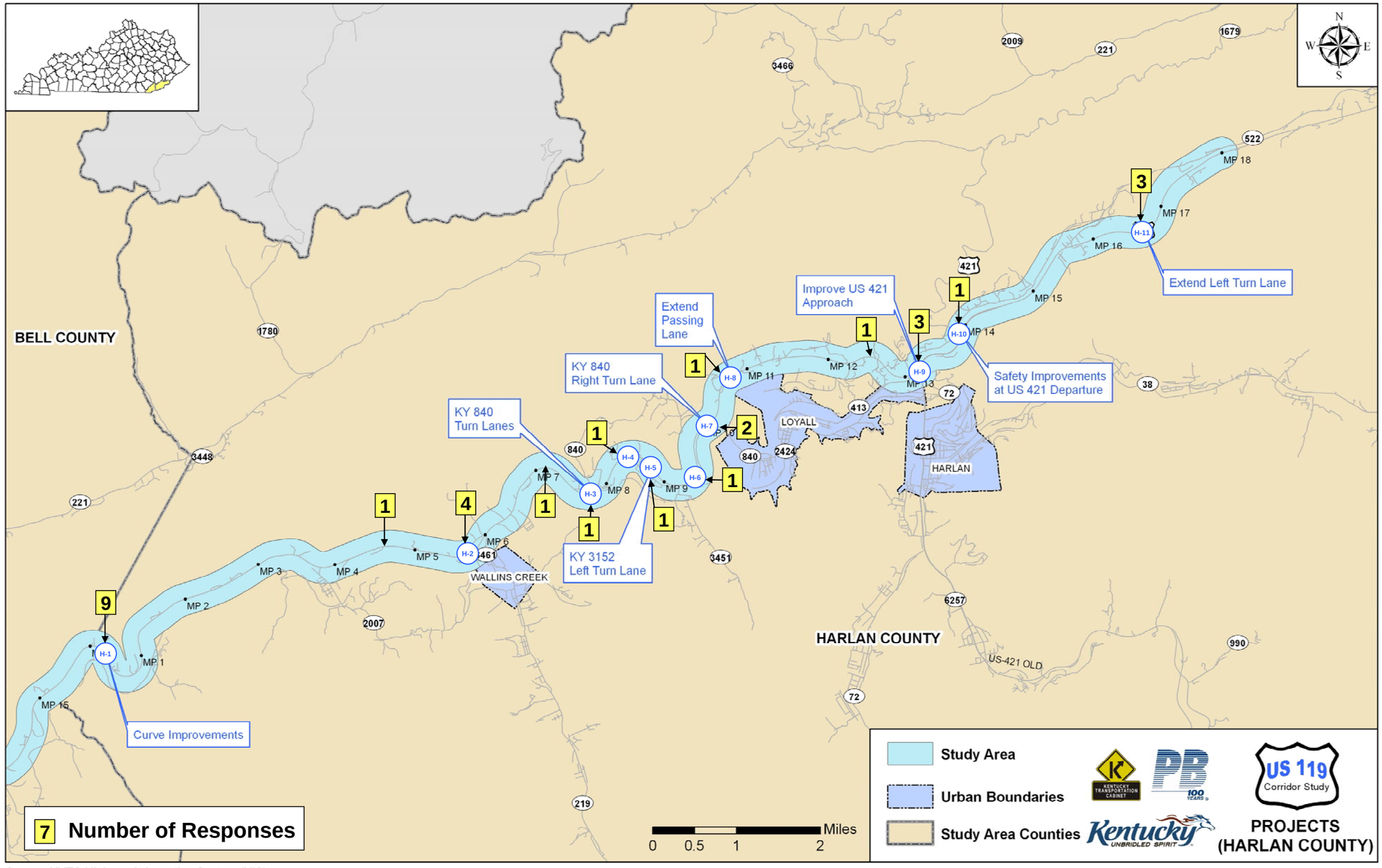
- Bypass of Varilla area
- 4-lane highway
- More reinforced guardrail where need to be replaced
- Lighting

Question 7: Please mark on the map specific locations for projects you listed as needed in Question 6.



Source: KYTC Highway Information System (HIS)

Question 7: Please mark on the map specific locations for projects you listed as needed in Question 6. (cont.)



Source: KYTC Highway Information System (HIS)

Note: 4 respondents circled the entire corridor; 2 circled the corridor in Harlan County only

8. What else should we know about or look at?

- 4 laning all the way! – Unrelated: Bell County 74/441 from bridge behind Wal-Mart along route to just 1 bock past 500' past Brightontown market needs: sidewalks and lighting for pedestrians.
- Narrow shoulders on road when people have to pull over or breakdown. Water on road at Page School, dusty conditions on 2012 turn off.
- Exit 119 and come on to one 119 from Bell to Harlan
- The 1977 flood crossed the road in several places stranding us to very small areas about 1 mile where I lived. We couldn't get to a store or gas station or even other relatives, because of the dips in the road allowed the road to be completely blocked just above Molus at Bren's Cabinets to just below the Bell County line.
- Keep in mind many people from other areas are afraid of 119. I have friends and family who believe I live at the end of the earth because of that fear. It needs to be more flat-lander friendly.
- If the industrial park is no considered the first section built, the rest of 119 becomes elementary. We need this area 4-lanes from Pineville to the bridge before this area can move forward with jobs for this area. Very important! This 5 miles of road is more important than any area of 119.
- Local residents that have lived here all our lives can make the best suggestions concerning improvements. Those that do not know this highway cannot tell what improvements need to be made. Studies do not improve that need. I have seen a lifetime of lives lost due to poor engineering and lack of funds.
- Our county is very low on average income, we are also without good roads. I feel the our opportunities are very much limited due to a very limited road system.
- To have 119 expanded would increase the economy in Harlan County.
- I would support completing 421 to Va. Line – also widening of 21 to Hyden, KY
- Access to VA corridors 23 and Interstates
- A new route for 119 to bypass Sukey Ridge
- Our community is dying. An improved transportation system is vital to our survival. Good roads will allow our people to access outside jobs and reduce the welfare roles.
- More/better reflective markings in the new additions at the new high school.
- Expand passing lanes in all areas available. Widen to a main two-lane road with passing lane available. Connect highwall by laying back to current eng guidelines.
- Numbers and statistics do not tell the complete story. Past actions to not construct and improve roads in this area have now put us in the position that we don't have enough population or economic impact to justify the high costs of road building.
- Update the community data (i.e. facility locations) on maps.
- Accident statistic for long period than 3 yr past. Economic impact of a road expansion. Area drainage into roadways.
- The feasibility of connecting 119 from the Bird branch area to Tanyard hill should be examined or re-examined before spending millions on a "bad road". The money saved by shortening a commute to Harlan would more than compensate. *The shortest distance between two points is a straight line.
- Remove more rock from Varilla Curve upper end at 987 – Laurel Hill and Brownies Creek Road.
- We have many school buses using 119 between Pineville and Harlan. Children are our most important heritage. Keep speeding down always, more state trooper presence and citations.
- I'm sorry I could not stay at the meeting and discuss this project with the representatives, but his is one of the major projects that could improve Harlan County's future.
- Turning lanes – major problem turning on to airport road (Harlan County). No turning lanes on hill. Water that drains onto the road when it rains and in the winter will freeze causing black ice. Especially dangerous in the early am and evenings.
- US 119 is a vital link to Harlan and Bell Counties. Why is it other sections of 119 have been 4-laned years ago, and not this section? We need this highway 4-laned!
- The road at Harlan County High School is not very well visualized. It would help to have lighting there because in the dark it is tricky. A traffic signal at the main entrance of the school would help with safety. The turn lane at the main entrance of the school needs to be longer – especially with the installation of the new automatic locking gates. Each car will have to stop and buzz in to open the gate.
- How much this (4 lane) would do economically for our area. Pineville is not spelled very differently than Pikeville.
- I totally agree with the turning lanes (with the 4 lane) proposed at the businesses and schools. I feel the 4 lane is vital for jobs and economical development of this area. I am willing to move to improve the area – I have lived adjacent to US 119 for nearly 28 years. Don't waste money for a temporary project while stimulus money is available and can help this depressed area of Southeastern, KY. Better roads can help us attract industry and tourism. This is a very dangerous road and deserves improvements for improved safety and to save lives.

ELECTED OFFICIALS AND STAKEHOLDER MEETING MINUTES

FINAL MEETING MINUTES

PROJECT: **US 119 CORRIDOR STUDY**

MEETING: Elected Officials and Stakeholders Meeting

DATE & TIME: October 21, 2009 – 12:00 PM

LOCATION: Ken and Paul's Steakhouse and Pizza
Harlan, Kentucky

ATTENDEES:

Name	Agency / Company	Telephone	Email
Sen. Brandon Smith	State Senator	606-233-2660	brandon84@yahoo.com
Rep. Fitz Steele	State Representative	606-438-5474	
Rick Nelson	State Representative	606-248-8828	rick.nelson@lrc.ky.gov
Albey Brock	Bell Co. Judge Exec.	606-337-3076	brock@bcje.com
Joe Grieshop	Harlan Co. Judge Exec.	606-573-2600	
Jim Ward	Letcher Co. Judge Exec.	606-633-2129	letchercountyjudge@yahoo.com
Regina Crawford	U.S. Sen. Jim Bunning	606-521-5520	regina_crawford@bunning.senate.gov
Danielle Smoot	U.S. Rep. Hal Rogers	606-439-0794	danielle.smoot@mail.house.gov
Jim Roddy	Harlan Co. Magistrate	606-573-7058	
David Kennedy	Harlan Co. Magistrate	502-564-7183	PO Box 27 Cumberland, KY 40823
Dan Mosley	Harlan Co. Chamber	606-521-6624	danmosley@harlanonline.net
Roger Fannin	Harlan Co. Chamber	606-573-4575	roger_fannin@kyfbtns.com
Pete Poynter	Harlan Co. Chamber	606-573-6836	pete@cveinc.com
Ralph Souleyret	Harlan Co. Chamber	606-573-5159	rsouleyret@harlanonline.net
Jim Roark	Harlan Co. Fiscal Court	606-664-2883	jroark46@bellsouth.net
Brent Roark	Harlan Co. Schools	606-573-4330	brent.roark@harlan.kyschools.us
Jeff Phillips	Harlan Co. Schools & Chamber	606-573-4330	jeff.phillips@harlan.kyschools.us
Lakis Mavinidis	Harlan Co. Fiscal Comm.	606-573-2600	
David Wiggins	Waste Connections	606-595-0054	
John Henson	Harlan Daily Enterprise	606-573-4510	editor@harlanonline.net
Adam Knuckles	KYTC D-11 Planning	606-598-2145	adam.knuckles@ky.gov
Joseph Mosley	KYTC D-11 Design	606-598-2145	joseph.mosley@ky.gov
Cass T. Napier	KYTC D-11 CDE	606-598-2145	cass.napier@ky.gov
Sonya Begley	KYTC D-11	606-598-2145	sonya.begley@ky.gov
Mike Calebs	KYTC D-11	606-598-2145	mike.calebs@ky.gov
Tonya Higdon	KYTC C.O. Planning	502-564-7183	tonya.higdon@ky.gov
Thomas Witt	KYTC C.O. Planning	502-564-7183	thomas.witt@ky.gov
Allen Rust	KYTC C.O. Planning	502-564-7183	allen.rust@ky.gov
Anne Warnick	PB	859-245-3877	warnick@pbworld.com
Shawn Dikes	PB	502-479-9312	dikes@pbworld.com
Scott Walker	PB	859-245-3873	walkersc@pbworld.com
Amos Hubbard	PB	859-245-3875	hubbarda@pbworld.com

MEETING SUMMARY:

The purpose of this meeting with the local elected officials and stakeholders was to present the spot improvements that the Kentucky Transportation Cabinet (KYTC) District 11 had developed and to present existing conditions and receive input on issues and potential solutions from the local elected officials and stakeholders on longer term improvements to US 119 in Bell and Harlan Counties.

Dan Mosley of the Harlan County Chamber of Commerce began the meeting by discussing the history of the project and explaining that $3 million dollars of funding has been obtained to 1) perform spot improvements on US 119, and 2) to fund a planning study to determine long term improvements. He asked everyone in the room to introduce themselves. Next, Tom Napier of KYTC further explained the purpose of the meeting.

Shawn Dikes, the project manager for Parsons Brinckerhoff (PB), then began to discuss the meeting and study purposes, focusing on the longer term improvements. He noted the importance of travel time reliability on US 119 along with other important study issues, safety and mobility. He showed a study area map and also reviewed the study schedule. Next, Shawn and Scott Walker of PB discussed the existing conditions analysis that was performed by PB. This included existing roadway geometrics, traffic volumes, Level of Service (LOS), an environmental overview, and a crash analysis.

After the existing conditions presentation, the question was asked how future growth is determined and the weight that has on this project. Scott Walker explained that growth can be based on either historical traffic counts or a travel demand model, and that for this project it will likely be based on a trend line analysis of historical traffic counts. Shawn Dikes explained that traffic is only one component of the project and that others like safety and reliability are important as well.

Next, a comment was made by an attendee that US 119 should have been widened to four lanes years ago but that money went to West Virginia and elsewhere in Kentucky. He opined that money was not allocated based on traffic but on politics. The people of Harlan County are frustrated because money that should have gone to them went to others in the past even thought Harlan County was an economic and population center; now they need help to restore economically viability and believe that making US 119 four lanes will help them. They want to

know what they can do locally to get US 119 widened to four lanes. Shawn Dikes addressed this comment and said that this study will get all of the information about the existing operations and future needs accurately and objectively identified so that they can be clearly expressed. He explained that everyone needs to be willing to think of different and potentially unconventional solutions to address the needs of this project; whatever they are. He referenced a KYTC project conducted by PB, the US 27 to I-75 Corridor Feasibility Study, as an example of coming up with unconventional solutions such as a "super 2 lane" using a toll that still addresses the needs of the community.

Joey Mosley of KYTC discussed the spot improvements that District 11 identified. Several attendees stated that the money was to be used only in Harlan County. Nine projects were identified between the two counties, mostly consisting of adding turning lanes, passing lanes or managing access. Joey explained that it was important that the short term improvements match the longer term recommendations of the planning study so that work is not duplicated or redundant. Next, Joey asked for feedback regarding which of the identified spot improvements the meeting attendants would like to see addressed because the $3 million available is not enough to cover all of them.

One attendee noted that the airport road (KY 1084) area along US 119 has bad crashes and has recent fatalities. Another attendee believed that all of the spot improvements identified are areas that could use improvement. One attendee suggested that the three least expensive projects be pursued and the rest be addressed with additional funding. He also added that Varilla Curve is one of the most dangerous curves in the state, and in the winter due to the terrain causing a lack of direct sunlight often experiences icy conditions. While the $3 million will not be enough to address this, it is a priority.

The remainder of the comments and questions (and some answers) is listed below:

- Is it possible to see if US 119 is in the top 10 for the least safe roads in the state based on ADT?
  - KYTC will obtain the list.
- Is there a strategy by the state to get additional funding?
  - The planning study will be given to U.S. Representative Rogers and U.S. Senators Bunning and McConnell at the end of January and additional funding will be sought.
- If funding is secured for this project, could it go elsewhere?
  - This would depend on how the money is allocated and what language if any is attached to its allocation. The attendees discussed the hierarchy of project funding.
- One attendee suggested that US 119 be shown as a high priority so that another project would siphon money away from it.
- Can this money be earmarked?
  - Money could come through an earmark. The only way money in an earmark can be used for a different project is if it is in the same congressional district and for the same type of project / purpose and with the sponsoring Congress member's approval.
  - The amount of money that comes from earmarks is a relatively small amount of the total transportation spending in the state.
- One attendee noted that there are no red areas on the crash analysis map indicating no major crash problems. However, he noted that there are no statistics for near-misses.
- One attendee noted that a better job of explaining the needs and issues of US 119 is necessary so that it can be considered a higher priority in the state.
- Another attendee stated that Harlan County has the highest insurance rates in the state because of the amount of crashes.
- Does the population play a factor in the crash rate calculation?
  - It is based on the number of crashes normalized by the vehicle miles traveled and annual average daily traffic. Therefore, population is not a direct factor but the number of people who drive on the road every day and the amount of miles traveled is.
- One attendee requested a calculation be done to determine the number of fatalities per capita.
- Another attendee noted that 12 people have been killed in Harlan County so far this year, which is just behind Jefferson County, which is the most populous county in the state.
- A question directed toward Tom Napier: If funding is secured for a specific project, what is the likelihood that it will be used for that project?
  - Funding usually stays with a particular project. The fact that there is already $3 million is a good indication.
- How are cost estimates determined?
  - Based on historical averages for materials on similar projects in the area.
- One attendee noted that there may not be a formula or statistic for all of the issues that exist in this project.
- Another attendee noted that a "super two-lane" road won't work for this study area as it would in other parts of the state. The coal and log trucks make it more difficult. Also, this is the only road that connects through; there are no other options, like there are in other parts of the state.
- Amos Hubbard from PB said that everyone needs to be willing to look at solutions in addition to a four lane road. If you say you want a four lane road or nothing, you severely limit options.
- One attendee noted that stimulus earmarks (for assistance to trouble homeowners) were not used in this area because so many people live in trailers.
- Another attendee suggested it is difficult to do a project that costs hundreds of millions of dollars at a rate of only $3 million at a time.
- A cost estimate for a four lane road was requested. They were told several years ago it would be around $900 million to make US 119 four lanes through Harlan County. The attendees requested to know how much money to ask for.
- Harlan County wants to be linked up with the rest of the world and it was felt that a four lane roadway would help it achieve this by promoting local businesses and the economy.
- One attendee noted that if the people of Harlan and Bell Counties are content with improvements other than a four lane road, then they will never get a four lane road. Instead

they need to "stick to their guns" and get a four lane road since it may be the only way to save Harlan.
- One attendee presented a petition that was started that asks for a four lane roadway and it has 1,600 signatures.
- Another attendee presented a study that shows the per capita income of counties with four lane roads and counties without four lane roads. Counties with four lane roads have much higher per capita incomes than counties without them. Harlan will die economically if a four lane road is not constructed was their belief.
- The bulk of money for roads comes from federal funds. Transportation money needs to go to transportation projects and not elsewhere. Other programs "divert" money from the transportation fund.
- One attendee noted that this area does not currently receive much in the way of investment from the Appalachian Regional Commission, although it is a part of the ARC. This could be a source for additional funding.
- Another attendee noted that at some point, coal will be gone, and a road is not going to get cheaper over time. A four lane road is needed now for economic development so that when coal does run out, there is additional industry in Harlan.
- Judge Ward discussed the benefits of the four lane roadway in Letcher County and how it connected them to US 23. He said it took him 1 hour to get from Whitesburg to Harlan.

Next Shawn Dikes, asked meeting participants to identify any additional issues to the issues that PB already listed. Additional issues include:

- Economic Development
- Travel Time Reliability
- Near Misses
- Connectivity
- Ice
- Visibility
- Sight Distance (e.g. Airport Road)
- US 119 and US 421 Intersection – if there is a fatal crash there the whole county is shut down.
- Signals don't work well
- Steepness of grades

Next, Shawn asked for any additional solutions to the list PB provided. None were given at the meeting, and Shawn asked them to send any to us if they think of them.

A few more comments / questions regarding funding were made including:

- Could US 119 qualify for National Highway System (NHS) funds?
- US 119 may be eligible for APD money.
- What about surface transportation funds? It was explained that SAFETEA-LU had expired.

The next steps of the project were discussed, which include a public meeting at the beginning of December. There will likely be one meeting in Harlan and one in Pineville. One attendee asked if there could be an additional meeting closer to Cumberland. Meeting participants were asked if they know of good locations and specific times for the meetings, and if they would provide the project development team with that information.

The meeting adjourned at 2:40 pm.

FINAL MEETING MINUTES

PROJECT: **US 119 CORRIDOR STUDY**

MEETING: Elected Officials and Stakeholders Meeting

DATE & TIME: January 22, 2010 – 12:00 PM

LOCATION: Ken and Paul's Steakhouse and Pizza
Harlan, Kentucky

ATTENDEES:

Name	Agency / Company	Telephone	Email
David Kennedy	Harlan Co. Magistrate	606-589-2963	dkskrmrta@windstream.net
Jim Roark	Harlan Co. Magistrate	606-664-2883	jroark46@bellsouth.net
Joe Grieshop	Harlan Co. Fiscal Court	606-573-2600	joegrieshop@harlanonline.net
Dan Mosley	Harlan Co. Chamber	606-505-6005	danmosley@harlanonline.net
Ralph Souleyret	Harlan Co. Chamber	606-573-5159	rsouleyret@harlanonline.net
Roger Fannin	Harlan Co. Chamber	606-573-4575	roger_fannin@kyfbtns.com
Pete Poynter	Harlan Co. Chamber	606-573-6836	pete@cveinc.com
Janice Poynter	Harlan Co. Chamber	606-573-6520	Janice.poynter@cveinc.com
John Henson	Harlan Daily Enterprise	606-573-4510	editor@harlanonline.net
Darlene Steele	Big Sandy ADD	606-573-2120	darlene.steele@bigsandy.org
Jeff Phillips	Harlan Co. Schools	606-573-4330	jeff.phillips@harlan.kyschools.us
Mary Mosley	Cumberland Comp Care	606-837-0100	cumberlandhopecommunity@windstream.net
Mike Howard	Harlan Co. Schools	606-573-4330	mike.howard@harlan.kyschools.us
Ryan Creech	Harlan Co. Fiscal Court	606-733-0129	ryancreech@harlanonline.net
Jason Edwards	HDE	606-573-4510	
Jeff Belcher	citizen	606-558-3943	Bledsoe, KY 40810
David Caldwell	Magistrate	606-558-3352	Bledsoe, KY 40810
Adam Knuckles	KYTC D-11	606-598-2145	adam.knuckles@ky.gov
Joseph Mosley	KYTC D-11 Design	606-598-2145	joseph.mosley@ky.gov
David Fields	KYTC D-11 Design	606-598-2145	david.fields@ky.gov
Thomas Witt	KYTC C.O. Planning	502-564-7183	thomas.witt@ky.gov
Jill Asher	KYTC C.O. Planning	502-564-7183	jill.asher@ky.gov
Anne Warnick	PB	859-245-3877	warnick@pbworld.com
Shawn Dikes	PB	502-479-9312	dikes@pbworld.com
Lindsay Walker	PB	859-245-3869	walkerli@pbworld.com
Amos Hubbard	PB	859-245-3875	hubbarda@pbworld.com
Arlen Sandlin	PB	859-245-3867	sandlin@pbworld.com

MEETING SUMMARY:

The purpose of this meeting with the local elected officials and stakeholders was to provide and receive feedback on a more detailed list of potential projects along US 119 in Bell and Harlan Counties per the scope of the project.

Dan Mosley of the Harlan County Chamber of Commerce began the meeting by providing a brief introduction of the project. Everyone in attendance introduced themselves and the meeting was then turned over to Shawn Dikes, the project manager for Parsons Brinckerhoff (PB).

The presentation material began with a brief review of progress to date, then a review of the study purpose / study area. Lindsay Walker (also with PB) provided a summary of the public meetings held in December 2009. Then Shawn resumed with the presentation of potential improvement projects and concluded with the next steps.

After the presentation, the meeting was opened up for comments. The following are the general discussion points from the remainder of the meeting.

- All of the projects that were presented at this meeting do not have any committed dollars to them.
- It was noted at a previous meeting that the gates at the new Harlan County High School would be locked and accessed via a keypad code. This was discussed as it affects traffic queuing on US 119, waiting to turn into the high school. The school board representative informed those present that the gates are open during the beginning and end of the school day but are otherwise closed during the other hours of the day. This system has been in operation for approximately one week.
- $3 million was originally available for improvements; given the projects proposed during this presentation, some in attendance were concerned about what was going to be done immediately with the money. Joseph Mosley with KYTC informed them that KYTC was beginning two projects – one is the construction of a left turn lane near the airport, and the other is a two-way left-turn lane at the back of Sukey Ridge near the retail development. There are still several other projects the KYTC is considering including additional passing lanes, but the rest of their projects equate to approximately $20 million in unfunded projects.
- The total construction cost estimates provided in the presentation for all projects are presented as a range due to the fluctuation of costs for the projects with two alternatives.
- Improvements at Varilla curve were discussed with some in attendance wondering if it was possible to go up and over the mountain instead of straightening the curve. It is possible, but would require a longer road project to achieve the appropriate elevation. This may result in a more expense project overall than a cut into the mountain.

The remainder of the meeting focused on discussion of improving US 119 to a four-lane highway. The development of a cost estimate for a four-lane highway and evaluation of the operation of a four-lane highway was not completed as part of this project. The initial scope and study purpose for this project was to evaluate the need for and reasonable solutions for improving US 119. A

review of traffic volumes and future projected volumes showed that a four-lane highway is not justified by traffic alone - neither now or in the year 2040.

Though it was understood that further pursuance of a four-lane improvement to US 119 is not part of this study, the discussion focused on the need for a four-lane versus spot improvements as proposed by this study. The consensus of the group was that a four-lane highway is needed to increase traffic volumes on US 119 and provide economic stimulus through jobs, bringing prosperity to Harlan County.

While the completion of this study was appreciated by those in attendance, it is not the material that they would like to have to take to Washington DC to request additional federal funding. They would prefer to have a cost for a four-lane highway. To do this, Dan Mosely will coordinate setting up a meeting with the local officials and the Secretary of Transportation in Frankfort to request funds to develop a cost estimate for a four-lane highway. If possible, it was the opinion of the group that it would be desirable to have PB do any additional work as they are familiar with the study and area.

In addition to the meeting to request further funds to study a four-lane highway, the local officials and stakeholders plan to contact the Appalachian Regional Commission and the local Area Development District to obtain information on economic impacts related to four-lane highways in other areas in southeastern Kentucky (Hazard, Pikeville, Jenkins areas).

With regard to this study, PB will continue to finalize the study through documentation, providing the final product in late March 2010.

The meeting was adjourned at approximately 1:30 PM.

APPENDIX C:

EXISTING CORRIDOR LAYOUT AND PROPOSED IMPROVEMENTS

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	1

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

NOTE: CRASH LOCATIONS ARE FOR 3-YEAR PERIOD FROM 9/1/2006 TO 8/31/2009.

NOTE: AERIAL PHOTOGRAHY DATED 2006 TAKEN FROM NAIP.
CONTOURS TAKEN FROM DEM'S KY SINGLE STATE PLANE ZONE – USGS.

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750
GRAPHIC SCALE IN FEET

WASIOTO

TIN CAN HOLLOW ROAD

R = 1460'

R = 2000'

R = 2050'

R = 2845'

IMPROVEMENT B1
Widening to provide for TWLTL

CUMBERLAND RIVER

CSX RAILROAD

HARBELL STATION RD.

BIRD BRANCH RD.

LAUREL HILL RD.

MATCHLINE STA. 110+00

TO PINEVILLE APPROX. 0.9 MI.

MILE 1

119

25E

987

50+00 60+00 70+00 80+00 90+00 100+00 360+00 370+00

NOTE: EXISTING US 119 PROFILE TAKEN FROM ORIGINAL DESIGN PLANS.

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

RED DENOTES THAT VERTICAL CURVATURE DOES NOT MEET CURRENT SIGHT DISTANCE CRITERIA.

V.C. DOES NOT MEET SSD CRITERIA.

V.C. DOES NOT MEET SSD CRITERIA.

L 52.50'
SD 127.08'

-1.19%

3.00%

L 294.00'
SD 506.56'

0.00%

L 367.00'
SD 446.71'

-4.10%

L 400.00'
SD 404.27'

0.34%

L 300.00'
SD 1430.89'

+0.50%

L 200.00'

0.00%

L 300.00'

1.00%

L 300.00'
SD 869.43'

-0.50%

L 300.00'

0.00%

L 300.00'

0.50%

L 300.00'
SD 1229.15'

-0.50%

EB TURN LANE

GRAPHIC SCALES IN FEET
25
0
0 250 500

1045.4 1059.1 1052.5 1037.8 1027.6 1028.4 1026.0 1023.5 1022.5 1022.5 1022.5 1022.5 1022.8 1025.9 1024.5 1025.5 1025.5

1150 1100 1050 1000 950

360+00 365+00 370+00 45+00 50+00 55+00 60+00 65+00 70+00 75+00 80+00 85+00 90+00 95+00 100+00 105+00 110+00

BELL COUNTY US 119 - MP 0.0 TO MP 1.5
STA. 358+89 TO STA. 110+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	2

MATCHLINE STA. 110+00

LAUREL HILL RD.

ROY FRANCE RD.

EAST PINEVILLE

HARBELL HEIGHTS RD.

120+00

130+00

140+00

150+00

160+00

170+00

180+00

MATCHLINE STA. 190+00

119

R=1270'

R=2720'

R=5000'

R=3274'

ROY FRANCE ROAD

OLD EAST PINEVILLE RD.

OLD EAST PINEVILLE SPUR

WILDER RD.

MINK LN.

CAPPS HILL RD.

TIPTON MIL RD.

MEYERS LN.

OLD EAST PINEVILLE RD.

CUMBERLAND RIVER

CSX RAILROAD

MILE 2

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DATUM

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

V.C. DOES NOT MEET SSD CRITERIA.

L 300.00'
SD 238.84'

L 1200.00'
SD 608.27'

L 300.00'
SD 1662.56'

L 200.00'
SD 933.33'

L 300.00'
SD 811.06'

L 400.00'
SD 782.04'

L 500.00'
SD 502.61'

-0.50%

1.20%

0.49%

-1.15%

-3.00%

1.27%

1150
1100
1050
1000
950

1025.5 1025.4 1049.4 1061.9 1061.7 1067.5 1070.7 1073.1 1075.6 1078.0 1080.4 1078.0 1072.2 1066.5

1059.0 1044.6 1042.3

110+00 115+00 120+00 125+00 130+00 135+00 140+00 145+00 150+00 155+00 160+00 165+00 170+00 175+00

180+00 185+00 190+00

GRAPHIC SCALES IN FEET

50 0

0 250 500

BELL COUNTY US 119 - MP 1.5 TO MP 2.9
STA. 110+00 TO STA. 190+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	3

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

Widening to provide left and right turn lanes for Page School Road.

IMPROVEMENT B2

IMPROVEMENT B3

IMPROVEMENT B4

Widening to provide EB passing lane.

Widening to provide left and right turn lanes for County Garage, which also leads to park.

R = 1042'

R = 1565'

PAGE SCHOOL RD.

PAGE ELEMENTARY SCHOOL

PONZA

COUNTY GARAGE

BELL COUNTY VETERANS MEMORIAL PARK

BLUE RIDGE RD.

CUMBERLAND RIVER

CSX RAILROAD

CALVIN RD.

MILE 3

MILE 4

119

MATCHLINE STA. 190+00

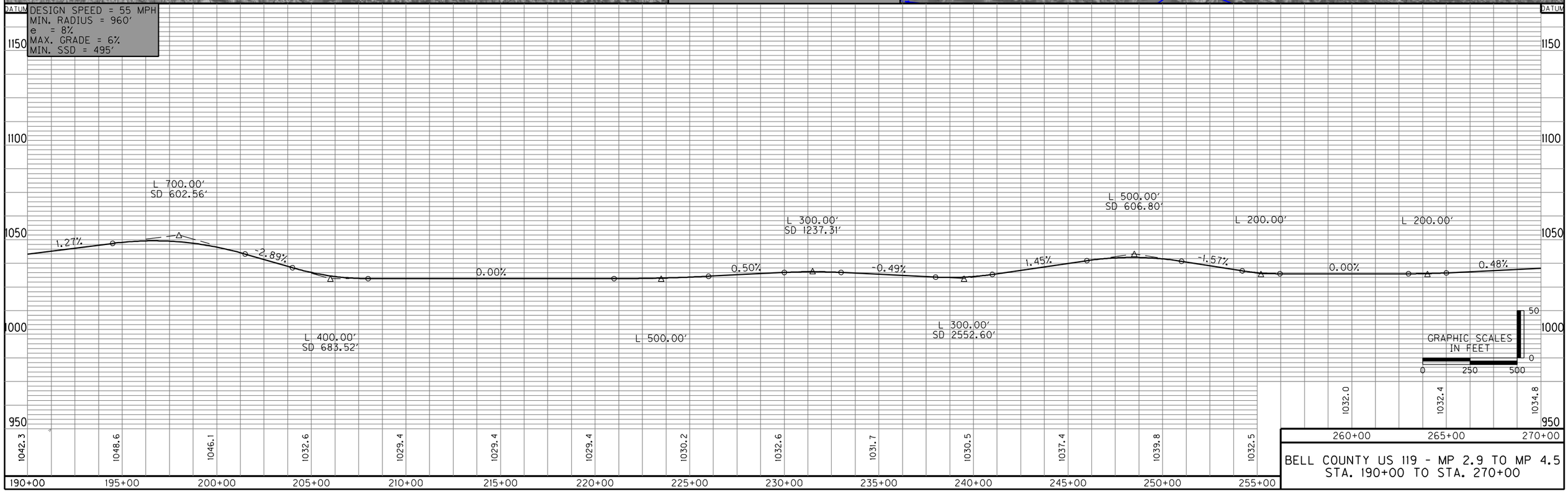
MATCHLINE STA. 270+00

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



BELL COUNTY US 119 - MP 2.9 TO MP 4.5
STA. 190+00 TO STA. 270+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	4

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENTS

MATCHLINE STA. 270+00

MATCHLINE STA. 350+00

119

R = 3820'

280+00

290+00

300+00

310+00

320+00

330+00

340+00

Widening to provide alternating passing lanes.

Widening to provide left and right turn lanes for KY 1344.

IMPROVEMENT B4

IMPROVEMENT B5

MILE 5

MILE 6

R = 2865'

R = 1654'

R = 1100'

1344

CUMBERLAND RIVER

1534

CSX RAILROAD

CALVIN

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

1150 1100 1050 1000 950

L 300.00'
SD 1277.75'

L 400.00'
SD 1892.31'

L 600.00'
SD 587.71'

L 400.00'
SD 1577.65'

L 200.00'

L 300.00'
SD 1272.01'

L 200.00'

L 300.00'
SD 1229.15'

L 300.00'

0.48% -0.47% 1.60% -2.15% 0.00% 0.50% -0.46% 0.50% -0.50% 0.53%

GRAPHIC SCALES IN FEET

50 0

0 250 500

1034.8 1036.6 1034.4 1037.2 1044.5 1040.1 1033.6 1033.6 1035.3 1034.0 1035.7 1038.2 1040.7 1042.5 1040.2 1037.7 1038.6

270+00 275+00 280+00 285+00 290+00 295+00 300+00 305+00 310+00 315+00 320+00 325+00 330+00 335+00 340+00 345+00 350+00

BELL COUNTY US 119 - MP 4.5 TO MP 6.1
STA. 270+00 TO STA. 350+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	5

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

MATCHLINE STA. 350+00

MATCHLINE STA. 410+00

119

R = 1909'

R = 6000'

R = 645'

CUMBERLAND RIVER

CSX RAILROAD

OLD US 119

VARILLA

VARILLA RD.

MILE 7

360+00

370+00

380+00

390+00

400+00

IMPROVEMENT B6-ALT. 1

IMPROVEMENT B6-ALT. 2

HORIZONTAL CURVE DOES NOT MEET MIN. RADIUS CRITERIA.

Realignment to improve curvature of roadway.
See Sheets 5A & 5B.

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

V.C. DOES NOT MEET SSD CRITERIA.

L 500.00'
SD 490.97'

0.53%

4.93%

BEGIN EB PASSING LANE

END WB PASSING LANE

300'

0.50%

L 700.00'
SD 584.11'

2800'

GRAPHIC SCALES IN FEET

50 0

0 250 500

DATUM

1200 1150 1100 1050 1000

1038.6 1041.2 1043.9 1046.6 1049.2 1058.9 1083.1 1107.8 1132.4 1157.1 1181.6 1196.8 1200.0

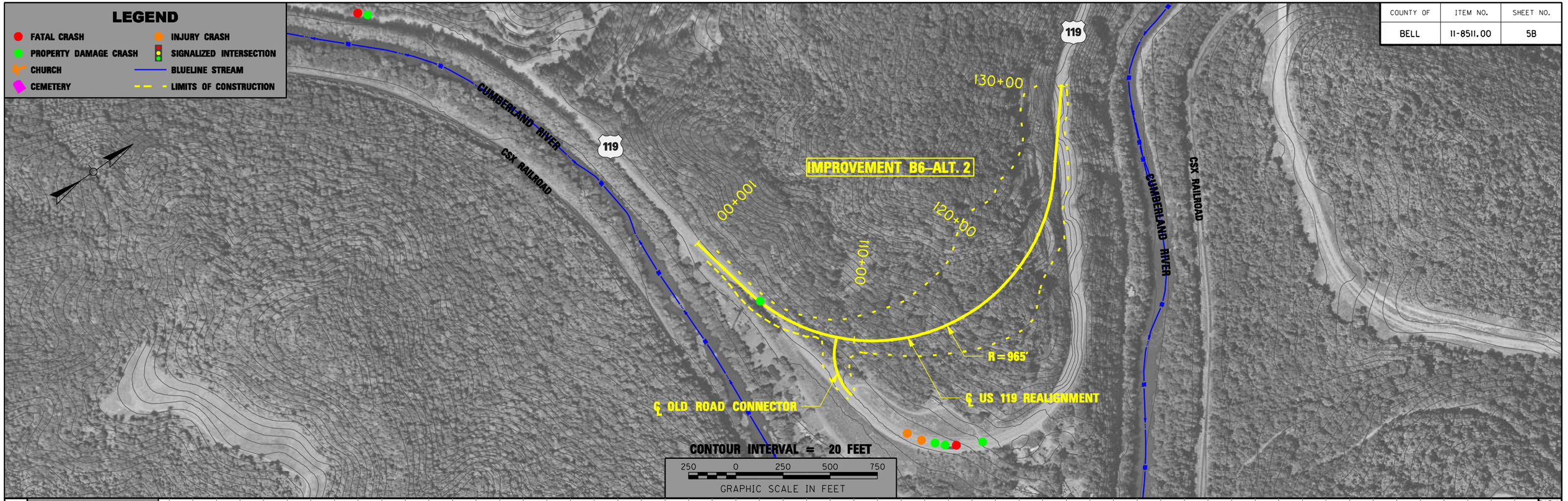
350+00 355+00 360+00 365+00 370+00 375+00 380+00 385+00 390+00 395+00 400+00 405+00 410+00

BELL COUNTY US 119 - MP 6.1 TO MP 7.2
STA. 350+00 TO STA. 410+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	5B

LEGEND

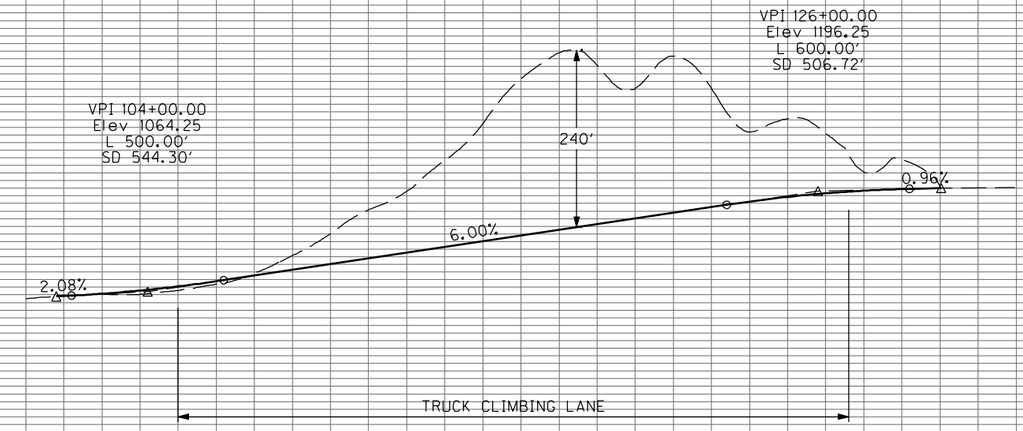
- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- LIMITS OF CONSTRUCTION



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

EARTHWORK ESTIMATE:

EXCAVATION = 2,400,000 C.Y.
EMBANKMENT = 20,000 C.Y.



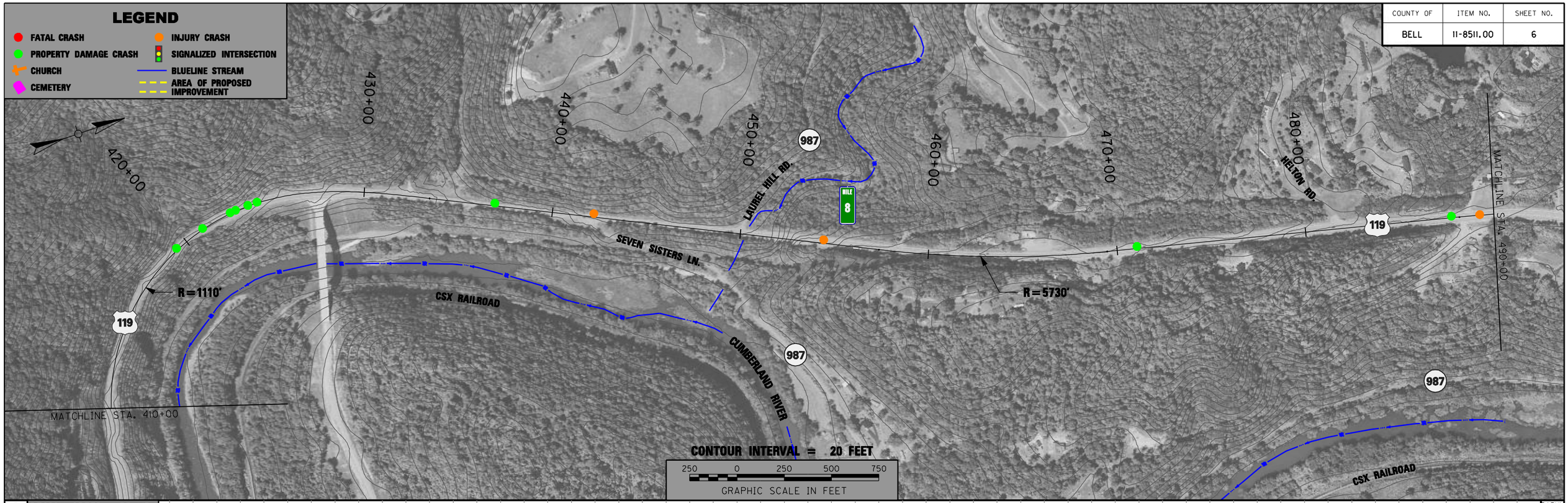
GRAPHIC SCALES IN FEET
0 250 500
0 100

IMPROVEMENT B6 - ALT. 2

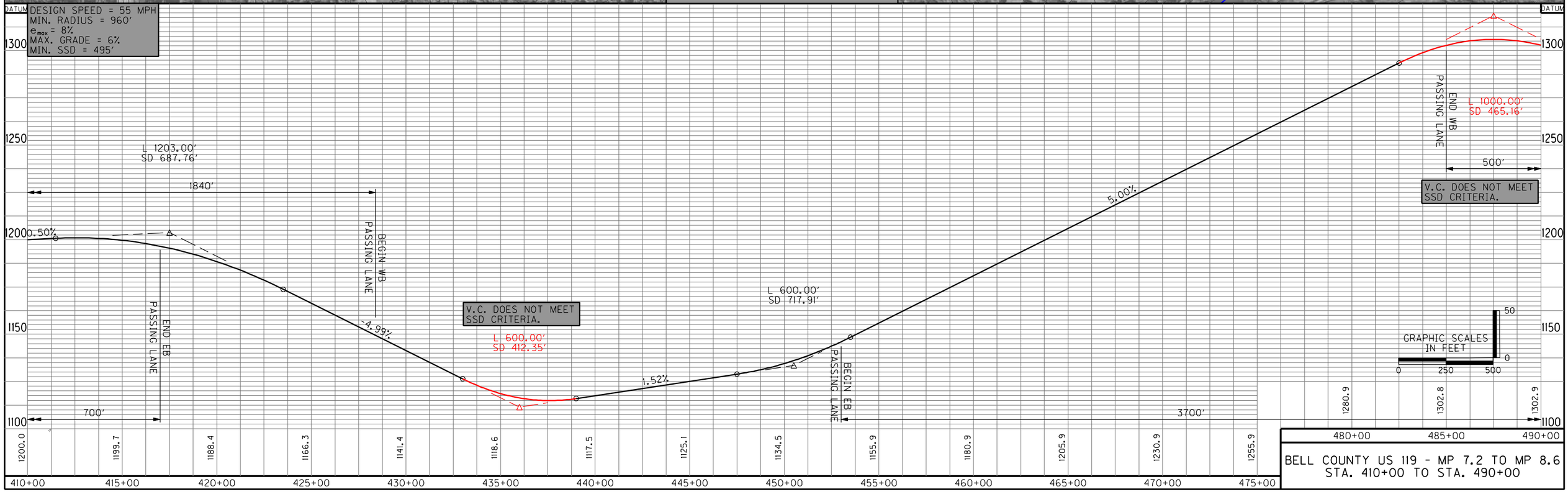
COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	6

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

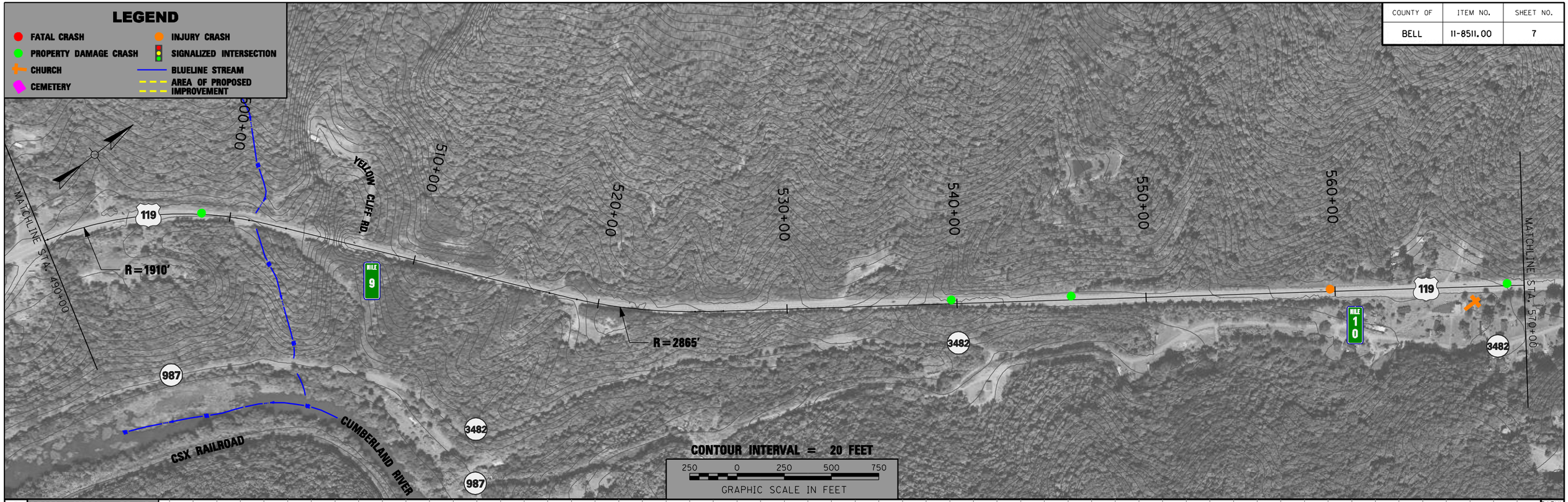


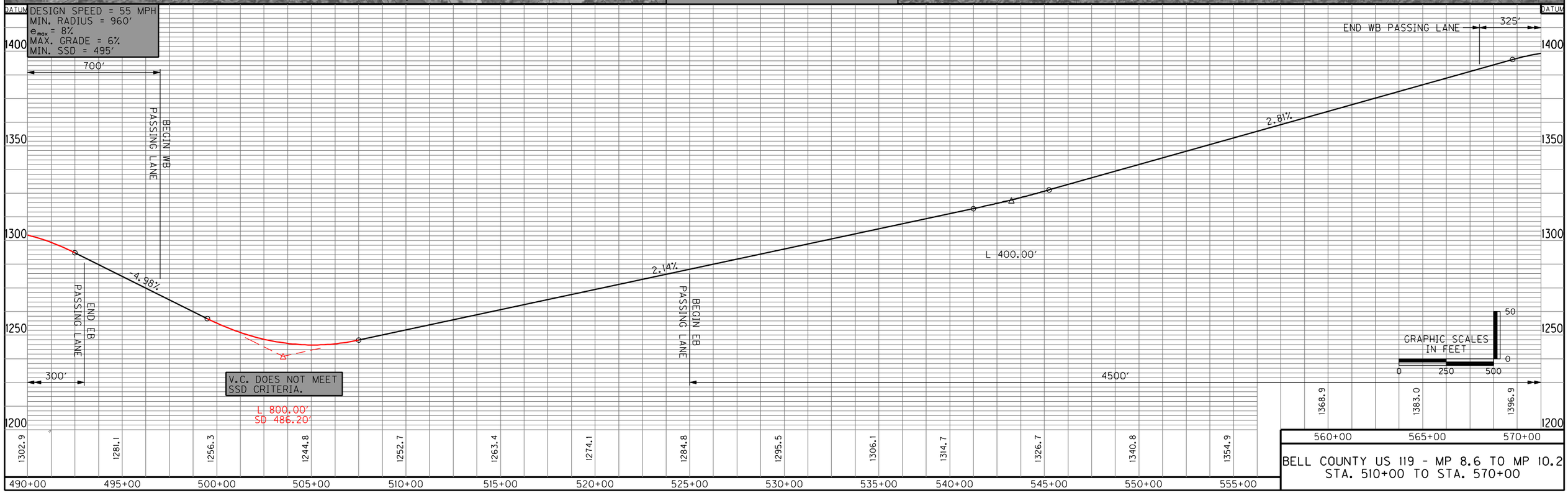
BELL COUNTY US 119 - MP 7.2 TO MP 8.6
STA. 410+00 TO STA. 490+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	7

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- AREA OF PROPOSED IMPROVEMENT





BELL COUNTY US 119 - MP 8.6 TO MP 10.2
STA. 510+00 TO STA. 570+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	8

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

580+00 590+00 600+00 610+00 620+00 630+00 640+00

IMPROVEMENT B8

IMPROVEMENT B7

IMPROVEMENT B9

R=1432'

R=1910'

R=1910'

119

3482

2012

MILE 11

MATCHLINE STA. 570+00

MATCHLINE STA. 650+00

Widening to provide right turn lane for KY 2012.

Remove secondary access to KY 3482

Widening to provide alternating passing lanes.

TEJAY

OLD US 119

TEJAY SPUR

CUMBERLAND RIVER

CSX RAILROAD

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DATUM

6200'

L 900.00'
SD 499.65'

END EB PASSING LANE

750'

-4.97%

BEGIN WB PASSING LANE

-4.97%

L 500.00'
SD 489.27'

-0.56%

V.C. DOES NOT MEET SSD CRITERIA.

GRAPHIC SCALES IN FEET

50 0

0 250 500

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

1400 1350 1300 1250 1200

1400 1350 1300 1250 1200 1150 1100 1050

1250 1200 1150 1100

1396.9 1398.0 1378.5 1353.6 1328.8 1303.9 1279.1 1254.3 1229.4 1204.6 1179.7 1154.9 1130.0 1105.6 1095.8 1093.7 1091.9 1089.1

570+00 575+00 580+00 585+00 590+00 595+00 600+00 605+00 610+00 615+00 620+00 625+00 630+00 635+00 640+00 645+00 650+00

BELL COUNTY US 119 - MP 10.2 TO MP 11.9
STA. 570+00 TO STA. 650+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	9

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

660+00 670+00 680+00 690+00 700+00 710+00 720+00

MATCHLINE STA. 650+00

MILE 12

119

IMPROVEMENT B9

Widening to provide alternating passing lanes.

R=5730'

R=3200'

MILE 13

CSX RAILROAD

CUMBERLAND RIVER

HALLS HOLLOW RD.

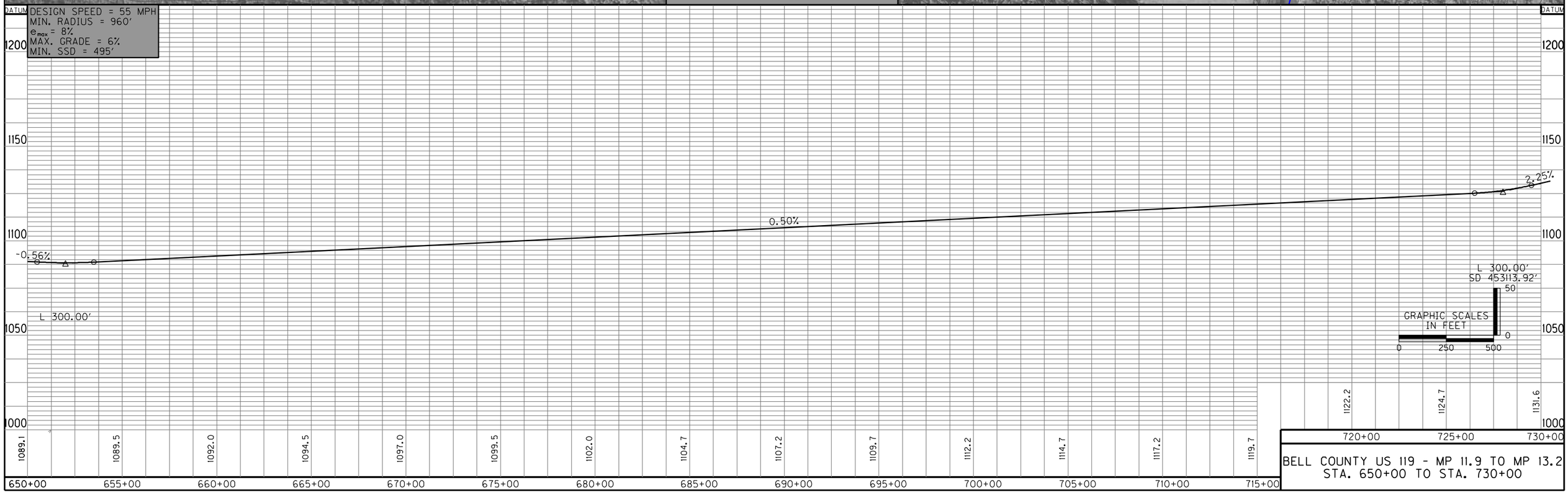
MATCHLINE STA. 730+00

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

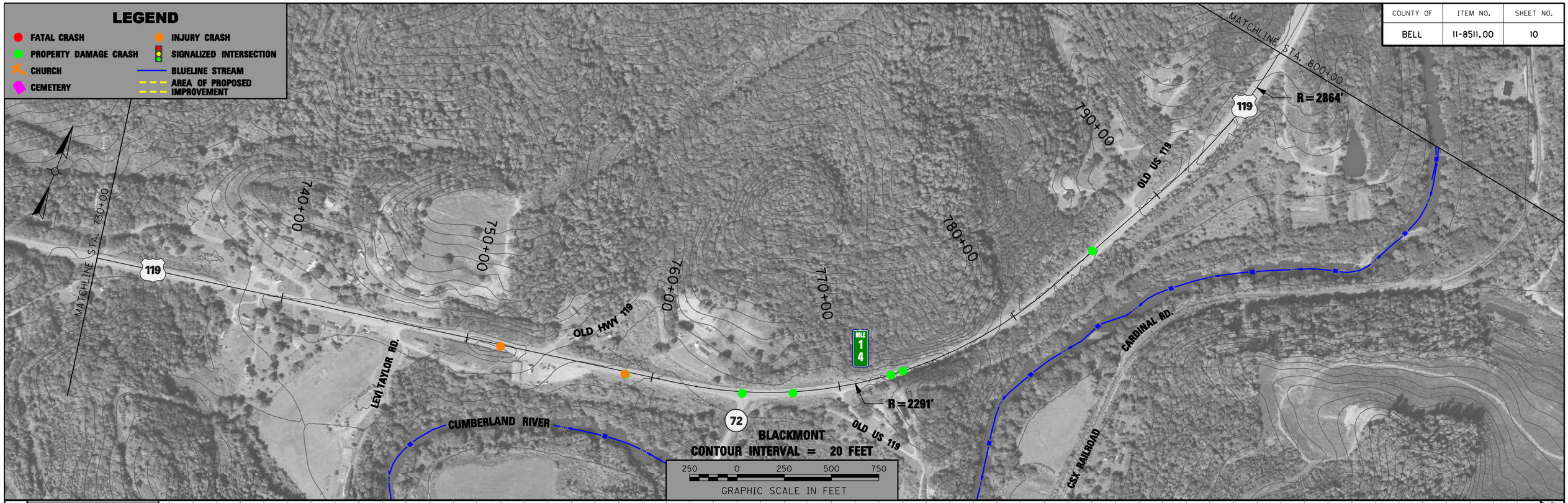


BELL COUNTY US 119 - MP 11.9 TO MP 13.2
STA. 650+00 TO STA. 730+00

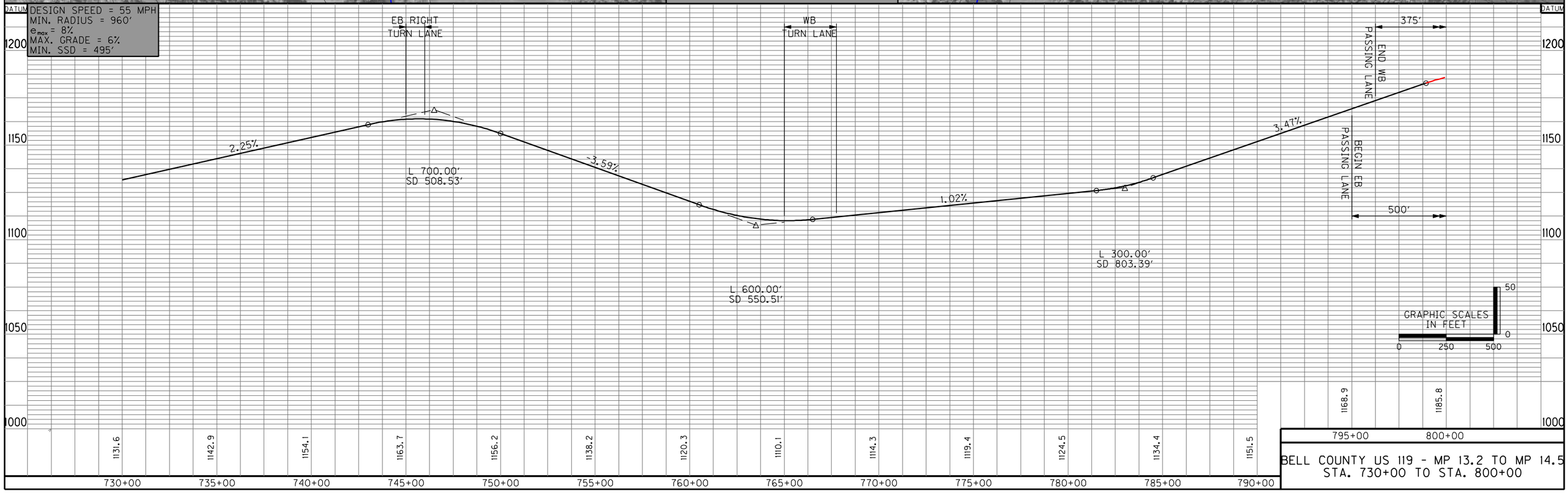
COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	10

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

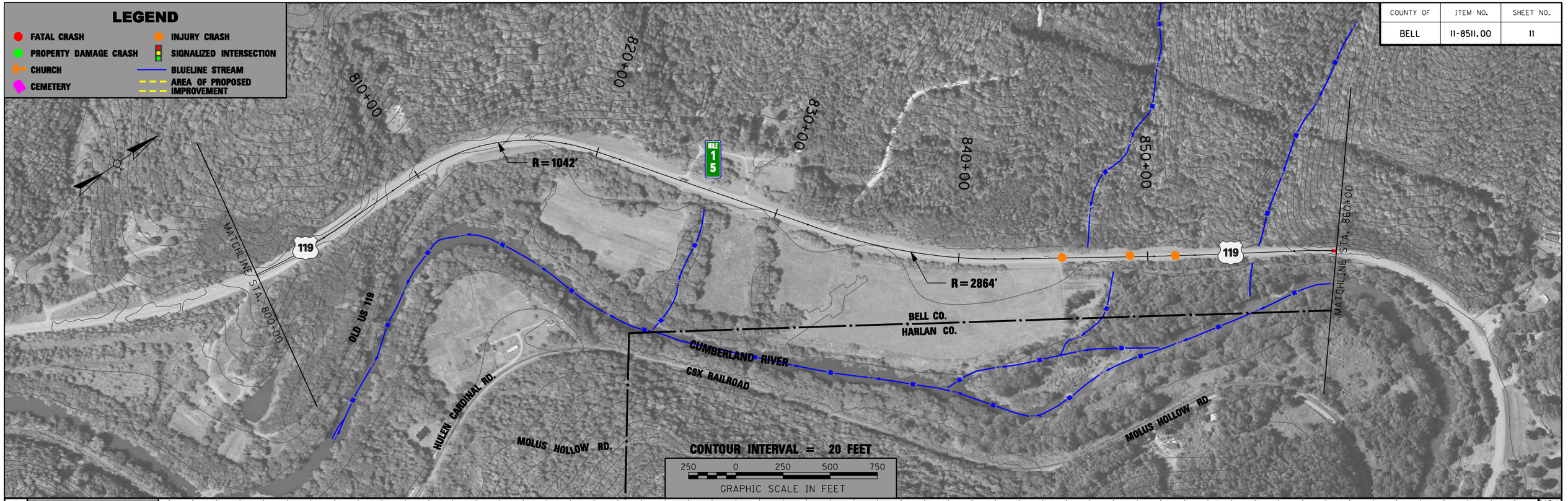


BELL COUNTY US 119 - MP 13.2 TO MP 14.5
STA. 730+00 TO STA. 800+00

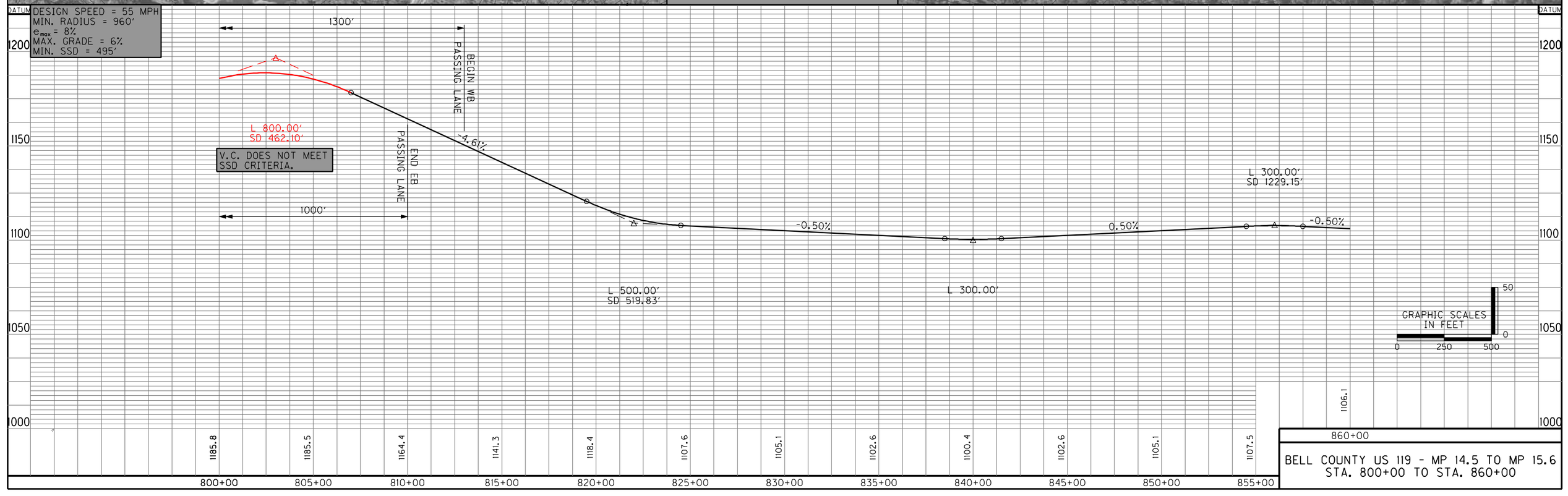
COUNTY OF	ITEM NO.	SHEET NO.
BELL	11-8511.00	11

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



BELL COUNTY US 119 - MP 14.5 TO MP 15.6
STA. 800+00 TO STA. 860+00

COUNTY OF	ITEM NO.	SHEET NO.
BELL HARLAN	11-8511.00	12

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

IMPROVEMENT H1

Realignment to improve curvature of roadway. See Sheet 12A.

HORIZONTAL CURVE DOES NOT MEET MIN. RADIUS CRITERIA.

R=954'

R=1030'

MATCHLINE STA. 860+00

MATCHLINE STA. 920+00

BELL CO.
HARLAN CO.

MURPHY HOLLOW

CLARKS RD.

CSX RAILROAD
MOLUS HOLLOW RD.

CUMBERLAND RIVER

HOBBS RD.

WHITE CHURCH RD.

MOLUS

MOLUS HOLLOW RD.

FREEMAN RD.

BRIGMAN LN.

FUGATE RD.

SAYLOR CREEK RD.

MILE 1

119

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750
GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

-0.50%
0.50%
-0.50%
0.50%

L 300.00'
SD 1229.15'

L 300.00'

L 300.00'

L 300.00'
SD 1069.82'

1200
1150
1100
1050
1000

1106.1 1104.2 1106.6 1105.6 1107.1 1109.6 1112.1 1114.6 1117.1 1119.6 1122.1 1124.6 1126.3

860+00 865+00 870+00 875+00 880+00 885+00 890+00 895+00 900+00 905+00 910+00 915+00 920+00

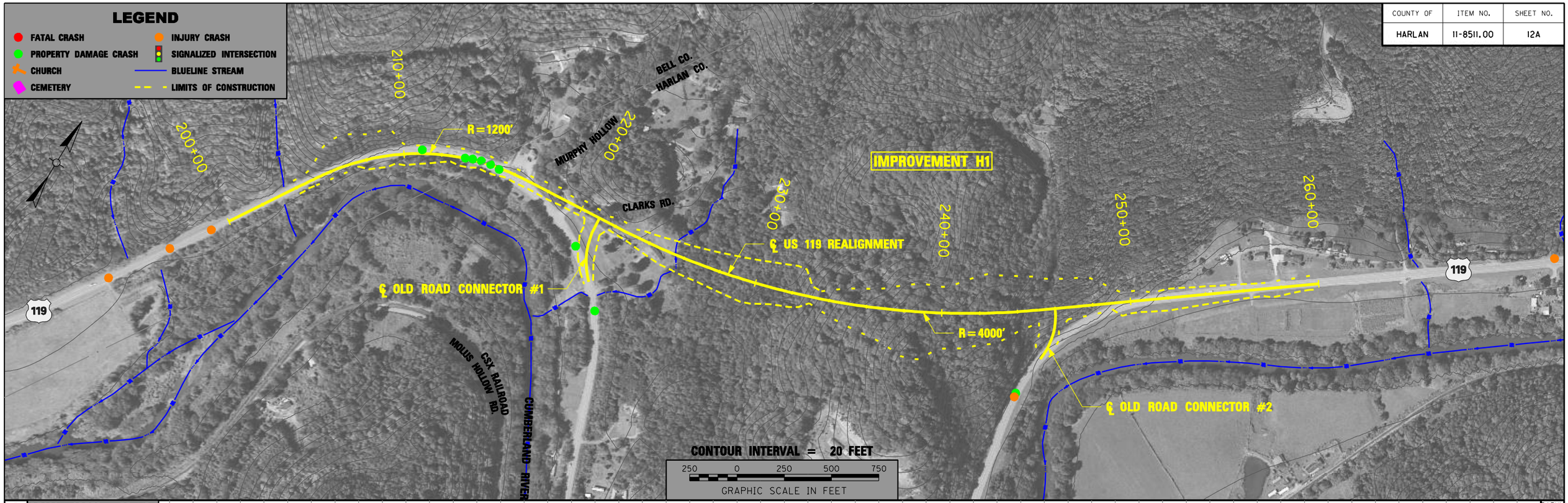
GRAPHIC SCALES IN FEET
50
0
0 250 500

BELL AND HARLAN COUNTY US 119
MP 15.6 TO MP 16.5 - MP 0.0 TO MP 1.1
STA. 860+00 TO STA. 920+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	12A

LEGEND

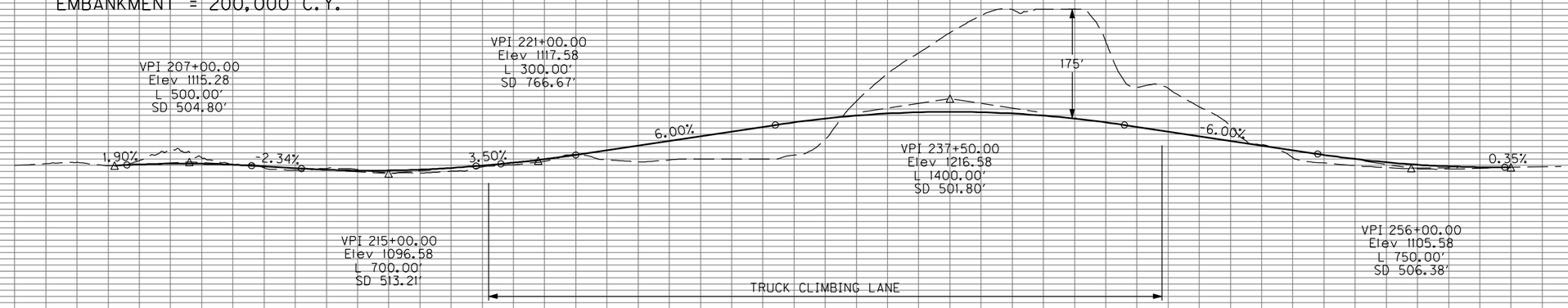
- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- LIMITS OF CONSTRUCTION

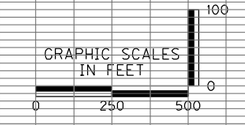


DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

EARTHWORK ESTIMATE:

EXCAVATION = 1,250,000 C.Y.
EMBANKMENT = 200,000 C.Y.





1110.3	1117.6	1105.8	1098.0	1110.9	1115.6	1120.0	1256.6	1359.8	1235.2	1142.9	1106.3	1107.0
	1111.37	1108.27	1101.69	1114.19	1141.58	1171.58	1192.90	1192.90	1171.58	1141.58	1114.78	1107.00

200+00 205+00 210+00 215+00 220+00 225+00 230+00 235+00 240+00 245+00 250+00 255+00 260+00

IMPROVEMENT H1

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	13

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- AREA OF PROPOSED IMPROVEMENT

940+00 950+00 960+00 970+00 980+00 990+00

930+00

Realignment to improve curvature of roadway.
See Sheet 12A.

IMPROVEMENT H1

R = 920'

R = 1909'

R = 11000'

HORIZONTAL CURVE DOES NOT MEET MIN. RADIUS CRITERIA.

CUMBERLAND RIVER

MILE 2

119

MATCHLINE STA. 920+00

FREEMAN RD.

CSX RAILROAD

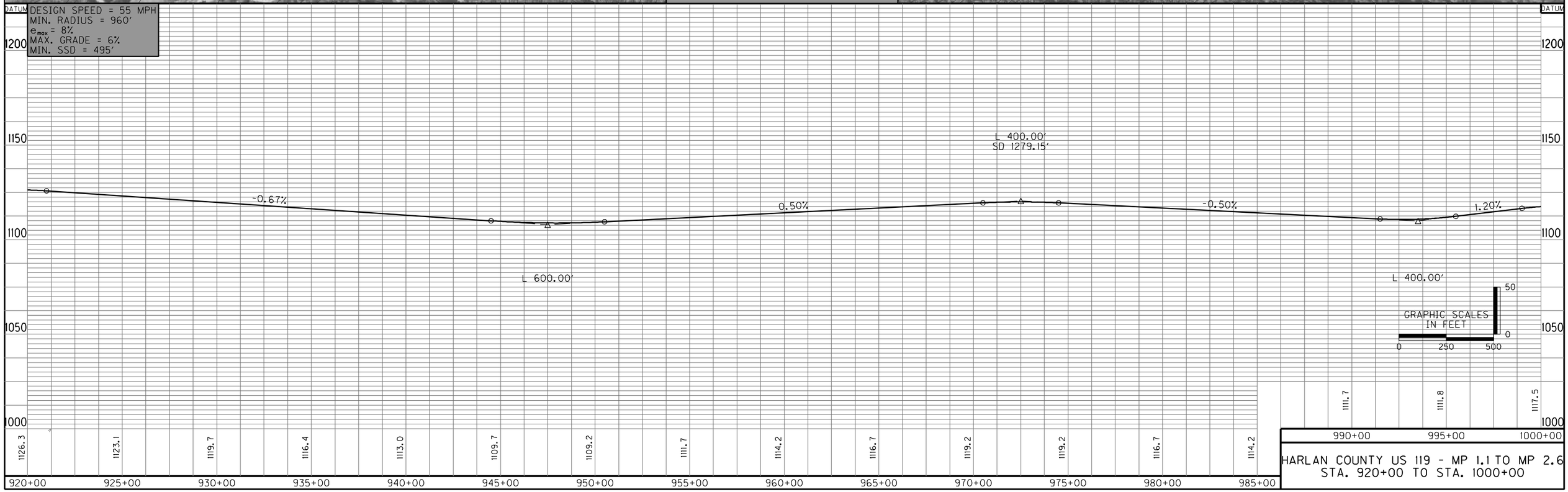
MATCHLINE STA. 1000+00

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



HARLAN COUNTY US 119 - MP 1.1 TO MP 2.6
STA. 920+00 TO STA. 1000+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	14

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

1010+00 1020+00 1030+00 1010+00 1020+00 1030+00

MILE 3 MILE 4

R=1432' R=1432' R=1432'

CUMBERLAND RIVER

BIG BRANCH LN.

LAYMAN

WILLOW LN.

CSX RAILROAD

FORESTER CREEK RD.

3449

OLD US 119

EPHIE DR.

COLDIRON

119 119

MATCHLINE STA.1000+00

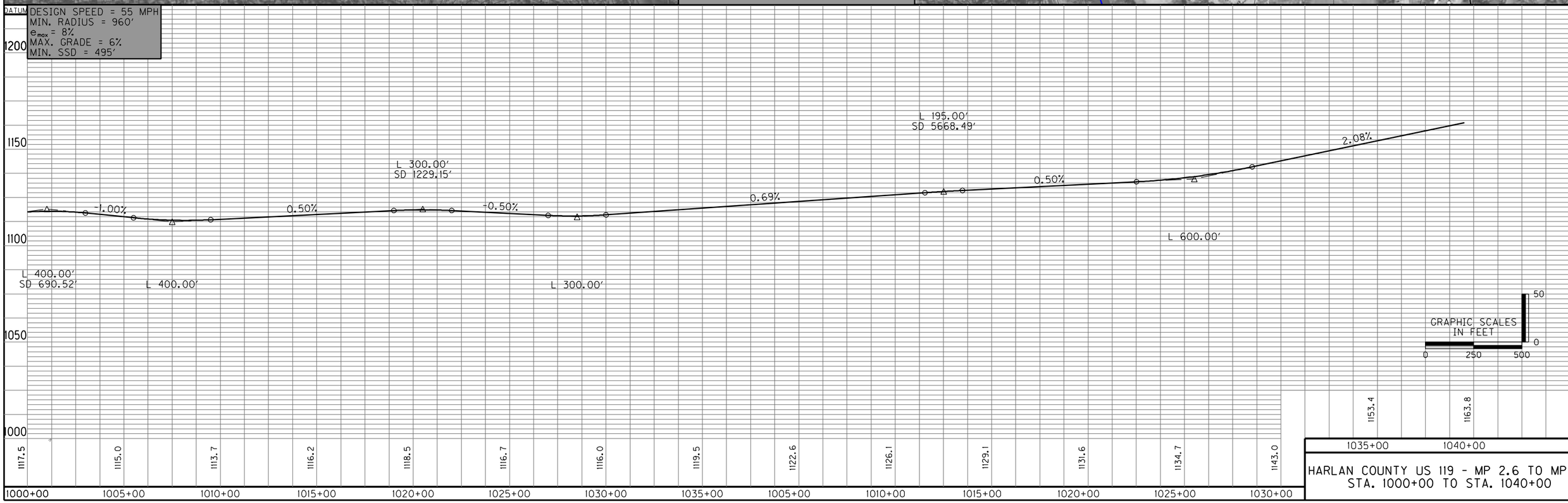
MATCHLINE STA.1040+00

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



GRAPHIC SCALES IN FEET

0 250 500 50 0

HARLAN COUNTY US 119 - MP 2.6 TO MP 4.1
STA. 1000+00 TO STA. 1040+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	15

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- AREA OF PROPOSED IMPROVEMENT

1070+00 1080+00 1090+00 1100+00 1110+00

1060+00 1050+00

R=2900'

MILE 5

OLD US 119

CUMBERLAND RIVER

CSX RAILROAD

BRADFORD LOOP

119

CONNECTOR RD.

MATCHLINE STA. 1040+00

MATCHLINE STA. 1120+00

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

1400'

END WB PASSING LANE

BEGIN WB PASSING LANE

L 1300.00'
SD 1041.87'

2.08%

-0.51%

3.50%

BEGIN EB PASSING LANE

END EB PASSING LANE

1300'

L 500.00'
SD 532.13'

100'

GRAPHIC SCALES IN FEET

0 250 500

50 0

1300 1250 1200 1150 1100

1163.8 1174.2 1184.6 1195.0 1204.2 1208.6 1208.1 1205.6 1203.0 1200.5 1198.0 1195.5 1192.9 1190.4 1187.9 1187.9 1202.9

1040+00 1045+00 1050+00 1055+00 1060+00 1065+00 1070+00 1075+00 1080+00 1085+00 1090+00 1095+00 1100+00 1105+00 1110+00 1115+00 1120+00

HARLAN COUNTY US 119 - MP 4.1 TO MP 5.6
STA. 1040+00 TO STA. 1120+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	16

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

MATCHLINE STA. 1120+00

DANIEL MT.

1130+00

1140+00

1150+00

MILE 6

R=1432'

219

119

R=1432'

BILLY G. HOLLOW

1160+00

1170+00

1180+00

1190+00

MILE 7

R=1145'

R=1432'

OLD US 119

CUMBERLAND RIVER

CSX RAILROAD

MATCHLINE STA. 1200+00

CUMBERLAND RIVER

3461

CUMBERLAND RIVER

CSX RAILROAD

BLACK ST.

LONGTON RD.

LONGTON

PEARL BRANCH RD.

R=1432'

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

1800'

WB TURN LANE

1500'

L 1600.00'
SD 602.77'

L 1200.00'
SD 722.61'

L 800.00'
SD 1223.78'

L 1100.00'
SD 484.53'

PASSING LANE END WB

PASSING LANE BEGIN WB

PASSING LANE END EB

PASSING LANE BEGIN EB

PASSING LANE END WB

PASSING LANE BEGIN WB

PASSING LANE END EB

1200'

2000'

6.00%

-6.00%

3.82%

-1.14%

-2.45%

V.C. DOES NOT MEET SSD CRITERIA.

GRAPHIC SCALES IN FEET

50 0

0 250 500

1300 1250 1200 1150 1100

1202.9 1213.0 1208.2 1188.6 1159.0 1142.4 1148.1 1167.1 1186.2 1202.8 1209.5 1206.3 1200.6 1194.6

1185.2 1173.0 1160.8

1120+00 1125+00 1130+00 1135+00 1140+00 1145+00 1150+00 1155+00 1160+00 1165+00 1170+00 1175+00 1180+00 1185+00

1190+00 1195+00 1200+00

HARLAN COUNTY US 119 - MP 5.6 TO MP 7.1
STA. 1120+00 TO STA. 1200+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	17

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- AREA OF PROPOSED IMPROVEMENT

MATCHLINE STA. 1200+00

MATCHLINE STA. 1260+00

119

R=1145'

1210+00

1220+00

1230+00

1240+00

1250+00

LEER DR.

TREMONT

TREMONT DR.

CSX RAILROAD

IMPROVEMENT H2

ROGERS RD.

DEAD END RD.

POSSUM RD.

MILE 8

840

R=1432'

Widening to provide left and right turn lanes for KY 840.

CUMBERLAND RIVER

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

DATUM

1300
1250
1200
1150
1100

-2.45%
0.50%
-0.50%
3.96%
-1.46%

L 800.00'
SD 1150.00'

L 400.00'
SD 1279.15'

L 700.00'
SD 646.44'

L 1000.00'
SD 631.04'

BEGIN EB PASSING LANE

END EB PASSING LANE

960'

GRAPHIC SCALES IN FEET

50 0

0 250 500

1160.8 1151.5 1151.0 1153.5 1155.5 1153.5 1151.0 1152.4 1168.3 1188.1 1201.2 1200.6 1193.3

1200+00 1205+00 1210+00 1215+00 1220+00 1225+00 1230+00 1235+00 1240+00 1245+00 1250+00 1255+00 1260+00

HARLAN COUNTY US 119 - MP 7.1 TO MP 8.2
STA. 1200+00 TO STA. 1260+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	18

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED IMPROVEMENT

IMPROVEMENT H3

Widening to provide left turn lane for Freshmeadows Rd.

HORIZONTAL CURVE DOES NOT MEET MIN. RADIUS CRITERIA.

R=1437'

R=1432'

R=955'

MATCHLINE STA. 1260+00

MATCHLINE STA. 1330+00

1280+00

1290+00

1300+00

1310+00

1320+00

LAY HILL

CARRY LN

FRESHMEADOWS RD.

FRESHMEADOWS RD.

GARETT ST.

CSX RAILROAD

FRESH MEADOWS

HOLIDAY ACRES

DAY HOIT DR.

DAY HOIT DR.

WILHOIT

OLD US 119

CHURCH ST.

CUMBERLAND RIVER

RIVER RD.

EWING CREEK RD.

CSX RAILROAD

MILE 9

119

3152

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

L 1300.00'
SD 630.41'

L 1000.00'
SD 1107.34'

L 950.00'
SD 450.11'

V.C. DOES NOT MEET SSD CRITERIA.

WB TURN LANE

L 1100.00'
SD 703.06'

-1.46%

2.06%

-5.00%

4.26%

-0.54%

GRAPHIC SCALES IN FEET

0 250 500

50 0

1300
1250
1200
1150
1100

1193.3 1186.0 1183.1 1189.0 1199.3 1209.6 1218.8 1216.9 1201.4 1176.7 1162.7 1173.0 1190.8 1198.0 1196.1

1260+00 1265+00 1270+00 1275+00 1280+00 1285+00 1290+00 1295+00 1300+00 1305+00 1310+00 1315+00 1320+00 1325+00 1330+00

HARLAN COUNTY US 119 - MP 8.2 TO MP 9.5
STA. 1260+00 TO STA. 1330+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	19

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED CONSTRUCTION

1350+00 1340+00 1360+00 1370+00 1380+00 1390+00 1400+00

MILE 10 MILE 11

840 119 840 119

DAY HOIT DR. R=1380' KEITH IMPROVEMENT H4 R=1432' CARDGLASS RD. IMPROVEMENT H5 Widening to extend passing lane.

CUMBERLAND RIVER CONLEY LOOP

Widening to provide right turn lane for KY 840.

CSX RAILROAD BRICK RD.

MATCHLINE STA. 1330+00 MATCHLINE STA. 1410+00

GOOD NEIGHBORHOOD RD.

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

EB TURN LANE

WB TURN LANE EB TURN LANE WB TURN LANE

L 500.00'
SD 964.25'

-0.54% -2.05% 1.80% -0.50% 3.50%

L 700.00'
SD 736.05'

L 500.00'
SD 718.52'

L 500.00'
SD 533.33'

L 800.00'
SD 759.24'

PASSING LANE BEGIN EB

GRAPHIC SCALES IN FEET

0 250 500

50 0

1295'

1300 1250 1200 1150 1100

1196.1 1193.4 1190.7 1185.6 1175.5 1165.2 1161.9 1169.8 1177.9 1177.4 1175.0 1175.0 1190.0 1207.5 1225.0 1242.4 1254.3

1330+00 1335+00 1340+00 1345+00 1350+00 1355+00 1360+00 1365+00 1370+00 1375+00 1380+00 1385+00 1390+00 1395+00 1400+00 1405+00 1410+00

DATUM DATUM

HARLAN COUNTY US 119 - MP 9.5 TO MP 11.1
STA. 1330+00 TP STA. 1410+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	20

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- AREA OF PROPOSED CONSTRUCTION

MATCHLINE STA. 1410+00

1420+00

1430+00

1440+00

1450+00

1460+00

1470+00

1480+00

MATCHLINE STA. 1490+00

R = 3020'

R = 3020'

R = 3020'

R = 1433'

R = 1146'

119

3452

3452

1084

ATHELLA RD.

SOUTHERLAND DR.

FOUR MILE RD.

FOUR MILE RD.

RED FARM RD.

TUCKER-GUTHRIE AIRPORT RD.

MILE 12

IMPROVEMENT H6 – ALT 1

Realignment to improve approach to US 421. See Sheet 20A.

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

V.C. DOES NOT MEET SSD CRITERIA.

0.50%

A

4.88%

L 500.00'
SD 493.13'

7000'

4.88%

A

2400'

END WB PASSING LANE

L 2200.00'
SD 632.32'

-7.00%

END EB PASSING LANE

EXCEEDS MAX. GRADE CRITERIA.

GRAPHIC SCALES IN FEET

50 0

0 250 500

1400 1350 1300 1250 1200

1400 1350 1300 1250 1200

1500 1450 1400 1350 1300

1500 1450 1400 1350 1300

1254.3 1258.0 1260.5 1270.0 1294.0 1318.3 1342.7 1367.1 1391.5 1415.9 1440.2 1463.5 1475.8 1474.5

1459.8 1431.5 1396.5

1410+00 1415+00 1420+00 1425+00 1430+00 1435+00 1440+00 1445+00 1450+00 1455+00 1460+00 1465+00 1470+00 1475+00

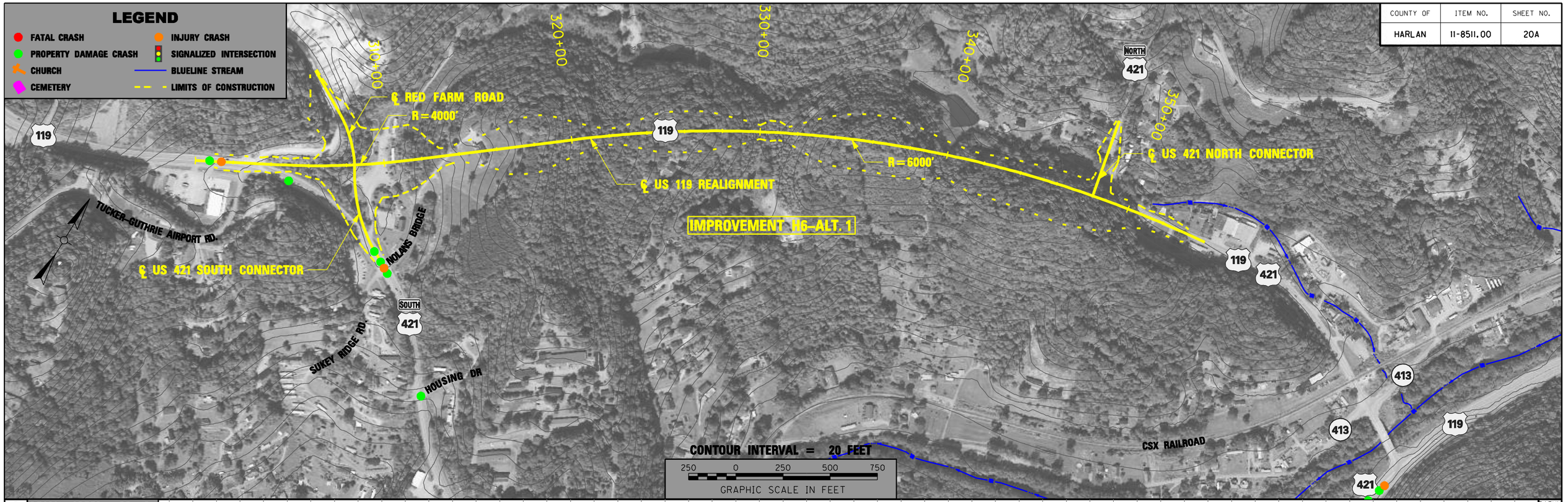
1480+00 1485+00 1490+00

HARLAN COUNTY US 119 - MP 11.1 TO MP 12.5
STA. 1410+00 TO STA. 1490+00

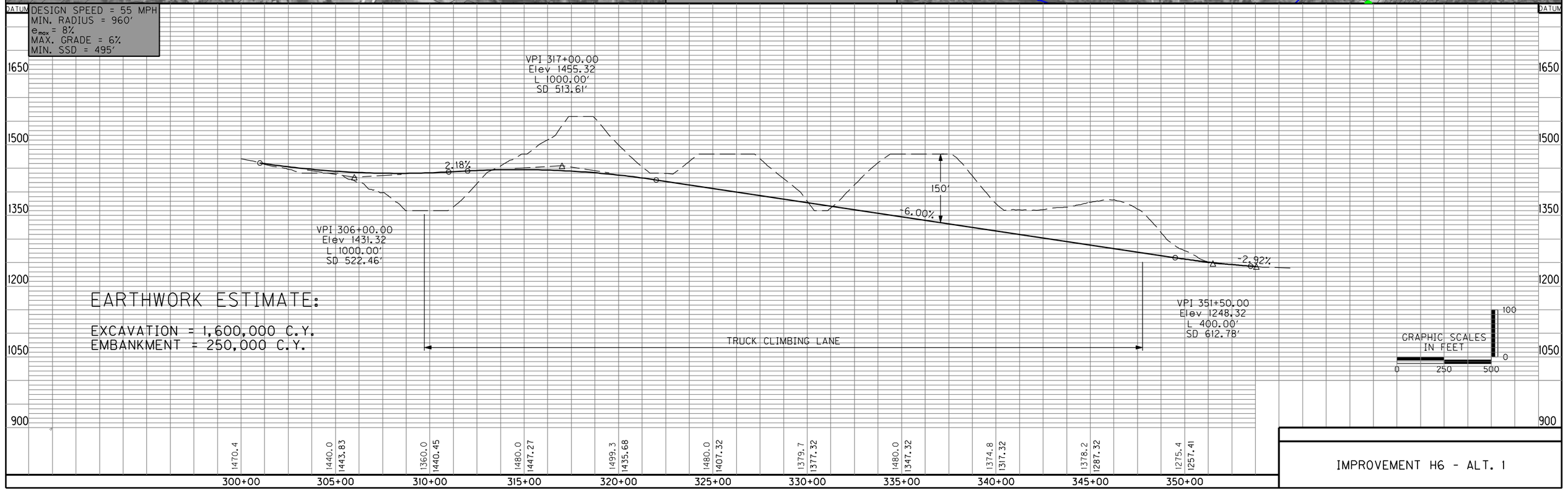
COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	20A

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- LIMITS OF CONSTRUCTION



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



EARTHWORK ESTIMATE:

EXCAVATION = 1,600,000 C.Y.
EMBANKMENT = 250,000 C.Y.

IMPROVEMENT H6 - ALT. 1

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	21

MATCHLINE STA. 1490+00

NOLANS BRIDGE

119

SUKEY RIDGE RD.

HOUSING DR

1500+00

BAXTER

1510+00

INTERMONT HEIGHTS DR.

SUKEY RIDGE RD.

PARSONS DR.

R = 1146'

MILE 13

PARSONS DR.

1520+00

CSX RAILROAD

20+00

413

30+00

40+00

MATCHLINE STA. 50+00

R = 1042'

119

R = 882'

HORIZONTAL CURVE DOES NOT MEET MIN. RADIUS CRITERIA.

R = 980'

IMPROVEMENT H6 – ALT. 2

Realignment to improve approach to US 421. See Sheet 21A.

421

413

72

CUMBERLAND RIVER

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750

GRAPHIC SCALE IN FEET

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- AREA OF PROPOSED CONSTRUCTION

DATUM

2350'

-7.00%

EXCEEDS MAX. GRADE CRITERIA.

PASSING LANE BEGIN WB

V.C. DOES NOT MEET SSD CRITERIA.

L 400.00'
SD 471.23'

-3.22%

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

1396.5 1361.5 1326.5 1291.5 1256.5 1221.8 1200.7

1490+00 1495+00 1500+00 1505+00 1510+00 1515+00 1520+00

EB TURN LANE

WB TURN LANE

3575'

PASSING LANE END WB

PASSING LANE BEGIN EB

-3.22%

-1.18%

0.48%

-0.50%

L 500.00'

L 400.00'
SD 1296.70'

3575'

GRAPHIC SCALES IN FEET

50 0

0 250 500

L 100.00'
SD 1039.94'

1200.7 1190.1 1184.2 1183.3 1185.7 1188.1 1190.5 1190.0 1187.5

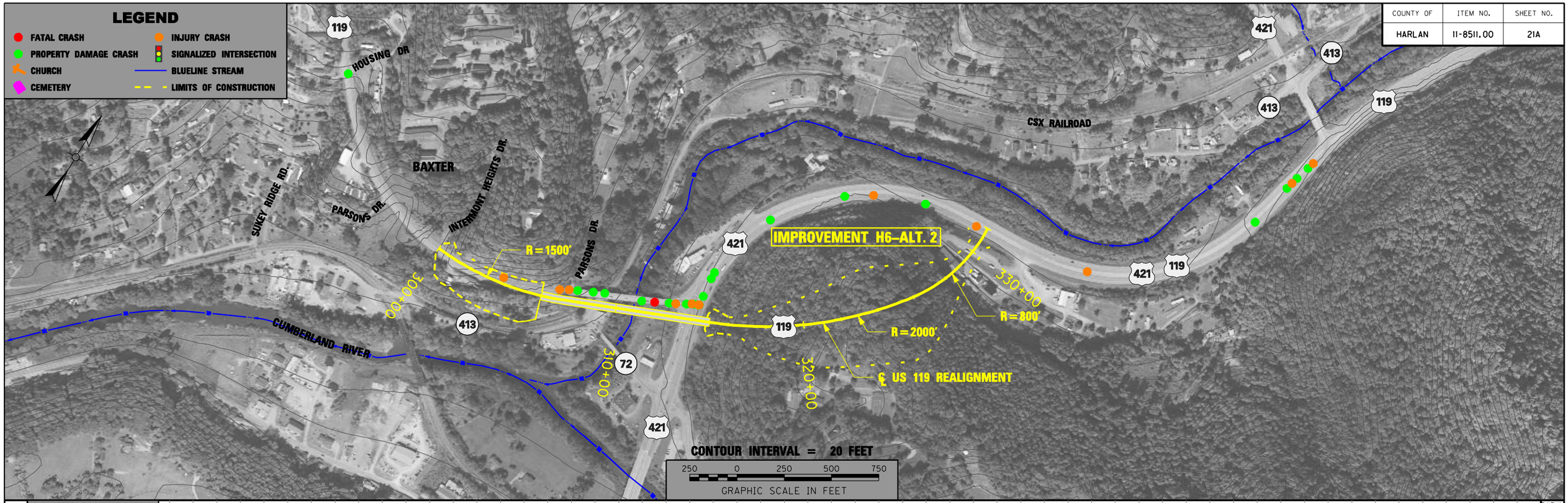
1520+00 15+00 20+00 25+00 30+00 35+00 40+00 45+00 50+00

HARLAN COUNTY US 119 - MP 12.5 TO MP 13.8
STA. 1490+00 TP STA. 50+00

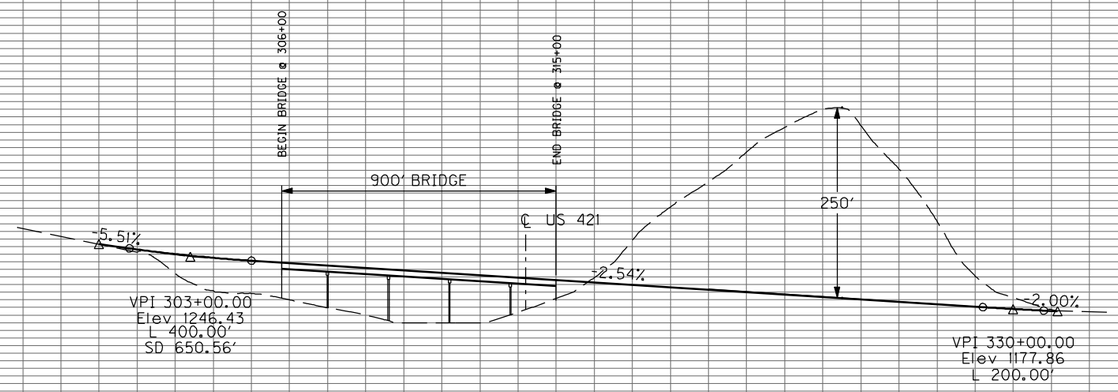
COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	21A

LEGEND

- FATAL CRASH
- PROPERTY DAMAGE CRASH
- CHURCH
- CEMETERY
- INJURY CRASH
- SIGNALIZED INTERSECTION
- BLUELINE STREAM
- LIMITS OF CONSTRUCTION



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



1500 1350 1200 1050 900 750

300+00	305+00	310+00	315+00	320+00	325+00	330+00
1200.0 / 1262.96	1198.5 / 1241.35	1160.0 / 1228.65	1191.7 / 1215.96	1344.8 / 1203.26	1418.9 / 1190.56	1192.7 / 1177.99

EARTHWORK ESTIMATE:

EXCAVATION = 1,750,000 C.Y.
EMBANKMENT = 120,000 C.Y.

GRAPHIC SCALES IN FEET
100
0
0 250 500

IMPROVEMENT H6 - ALT. 2

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	22

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED CONSTRUCTION

MURPHY LN.
70+00
KELLY LN.
60+00
421
413
CUMBERLAND RIVER
R = 1910'
119
MILE 14
80+00
SERGENT DR.
GATUN
90+00
CSX RAILROAD
413
100+00
110+00
120+00
119
MILE 15
MATCHLINE STA. 50+00
MATCHLINE STA. 130+00
IMPROVEMENT H7
Provide lighting at intersection.
R = 2292'

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750
GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

EB TURN LANE
3600'
BEGIN WB PASSING LANE
L 1400.00'
SD 1779.15'
-0.50%
0.50%
-0.50%
0.50%
-0.50%
0.50%
L 500.00'
END EB PASSING LANE
3000'
L 500.00'
L 1400.00'
SD 1779.69'
L 500.00'

GRAPHIC SCALES IN FEET
50
0
0 250 500

1300
1250
1200
1150
1100

1187.5 1185.0 1184.5 1187.0 1189.5 1192.0 1193.2 1192.7 1190.5 1188.6 1190.5 1193.0 1195.3 1196.2 1195.3 1193.2 1194.5

50+00 55+00 60+00 65+00 70+00 75+00 80+00 85+00 90+00 95+00 100+00 105+00 110+00 115+00 120+00 125+00 130+00

HARLAN COUNTY US 119 - MP 13.8 TO MP 15.2
STA. 50+00 TO STA. 130+00

COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	23

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED CONSTRUCTION

CUMBERLAND RIVER
MATCHLINE STA. 130+00
MATCHLINE STA. 210+00
413
119
522
ROSSPOINT
POINT LN.
TYREE LN.
MAPLE ST.
HULAN LN.
GUY LN.
MOSELY LN.
HOWARD'S ROAD
160+00
170+00
180+00
190+00
200+00
R = 1432'
R = 5729'
R = 2864'
R = 1637'
MILE 16
HARLAN COUNTY HIGH SCHOOL
Widening to extend left turn lane for Harlan County High School.
IMPROVEMENT H8

CONTOUR INTERVAL = 20 FEET

250 0 250 500 750
GRAPHIC SCALE IN FEET

DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'

EB TURN LANE
L 500.00'
SD 529.39'
0.50%
4.53%
BEGIN EB PASSING LANE
END WB PASSING LANE
L 1200.00'
SD 586.41'
1525'
BEGIN WB PASSING LANE
-3.00%
END EB PASSING LANE
2950'

L 600.00'
SD 710.11'
GRAPHIC SCALES IN FEET
50
0
0 250 500

1300
1250
1200
1150
1100

1194.5 1197.0 1199.5 1202.0 1204.6 1219.1 1241.7 1264.4 1286.7 1298.4 1294.4 1279.7 1264.7 1249.7 1234.7 1220.0 1215.3

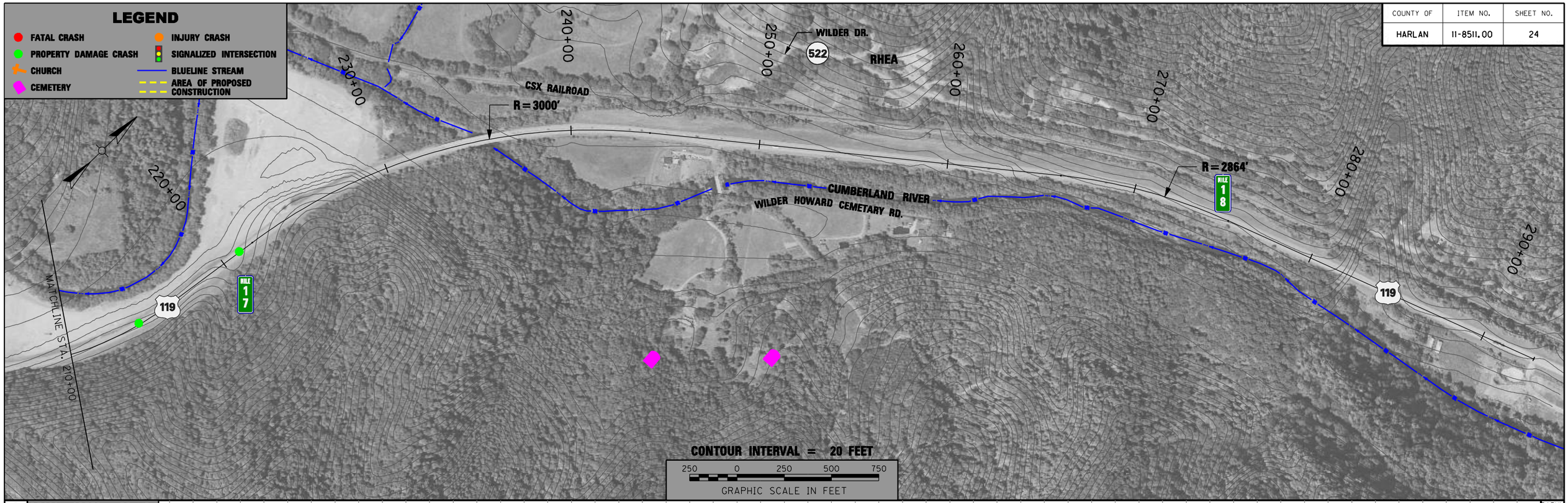
130+00 135+00 140+00 145+00 150+00 155+00 160+00 165+00 170+00 175+00 180+00 185+00 190+00 195+00 200+00 205+00 210+00

HARLAN COUNTY US 119 - MP 15.2 TO MP 16.8
STA. 130+00 TO STA. 210+00

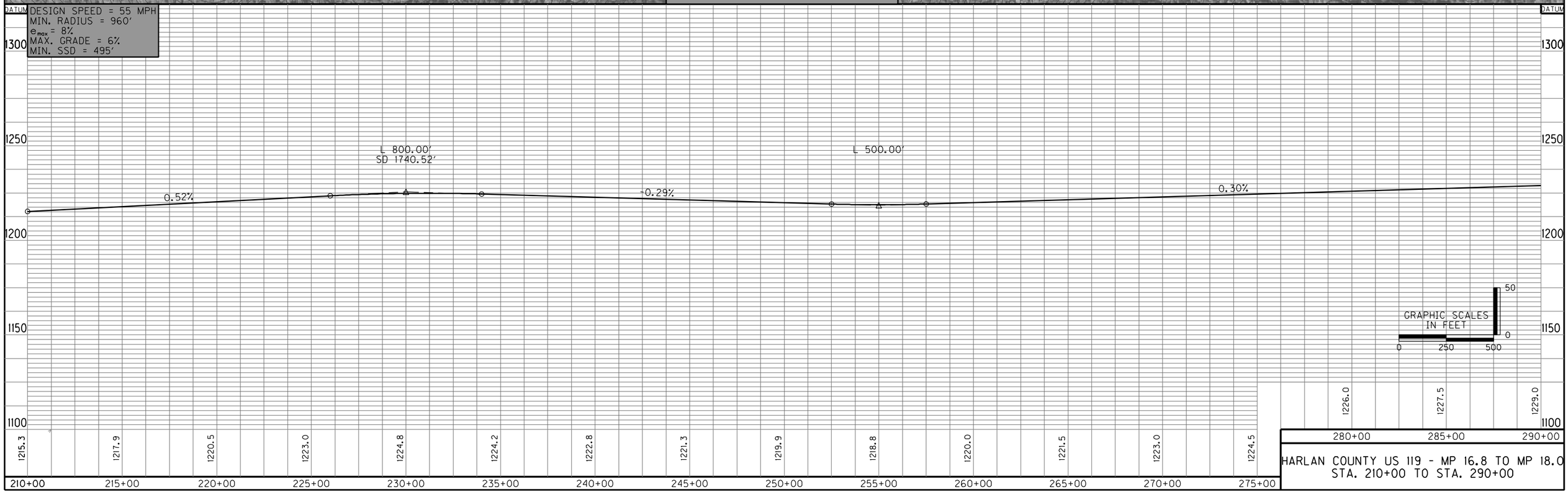
COUNTY OF	ITEM NO.	SHEET NO.
HARLAN	11-8511.00	24

LEGEND

- FATAL CRASH
- INJURY CRASH
- PROPERTY DAMAGE CRASH
- SIGNALIZED INTERSECTION
- CHURCH
- BLUELINE STREAM
- CEMETERY
- AREA OF PROPOSED CONSTRUCTION



DESIGN SPEED = 55 MPH
MIN. RADIUS = 960'
e_{max} = 8%
MAX. GRADE = 6%
MIN. SSD = 495'



HARLAN COUNTY US 119 - MP 16.8 TO MP 18.0
STA. 210+00 TO STA. 290+00

Item Number: 11-8511.00

US 119 Corridor Study

Summary of Findings and Recommendations

PARSONS BRINCKERHOFF