Guthrie “Knot” Planning Study - KYTC Item No. 3-8630.00

Kentucky Transportation Cabinet

Final Report
March 2012

Stantec Inc.

One Team. Infinite Solutions.

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EXECUTIVE SUMMARY

Directly west of Guthrie, Kentucky is a triangular area known as Tiny Town where US 41, US 79, KY 181, KY 294, and KY 2128 come together. This junction of roadways results in a less than efficient "knot" of intersections with multiple safety concerns. The study area's location along two rail lines and two major US highways (US 41 and US 79), as well as its proximity to I-24, provides it with strong potential for growth. The major investment in the Hemlock Semiconductor Plant on US 79 (just to the south of the Tennessee state line) will have a potential employment of 5,000 employees and is anticipated to attract satellite industries which will utilize its products. Further residential and commercial development is likely to follow and the demand for travel through the Tiny Town junction is expected to increase.

The purpose of the Guthrie "Knot" Planning Study was to explore the scope of and justification for needed transportation improvements in the Tiny Town area. The study focused on investigating the current deficiencies in and around the junction and estimating the likely traffic impacts from future development.

Short term projects, focusing on existing safety and capacity issues, were investigated as well as longer term projects to meet the future transportation needs of the area. The purpose of these conceptual projects is to improve the safety and efficiency of travel through the intersections of KY 181 with US 79, KY 294, and US 41 and the intersections of US 79 with US 41 and with KY 2128 in the Guthrie area. Such projects will also provide better connections for travelers along this existing transportation network to the emerging industrial development.

The Guthrie "Knot" Planning Study resulted in the development of a number of conceptual improvements which were presented to stakeholders and the public. Ultimately, one short-term improvement and one long-term improvement were recommended. The study recommendations, shown in **Figure ES-1**, include access management changes at the US 41 intersection with US 79 and the realignment of KY 181. These improvements are summarized below.

- **Short-Term Improvement: Access management at US 79 and US 41 intersection**.
  This is a very large, skewed intersection with four-way stop control and the convenience store located on the south side of the intersection has uncontrolled access along the south and east roadway approaches. The potential short-term improvement includes maintaining the intersection in its current location but constructing a curbed island along most of the convenience store's frontage to define two access points – one on US 41 east of the intersection and one on US 79 south.

- **Long-Term Improvement: Realignment of KY 181.**
  This concept provides a western connector around Tiny Town by redirecting existing KY 181 from north of the US 41 intersection to the west along a semicircular route to US 79 west of the existing KY 181 intersection. The realignment of KY 181 should intersect US 79 at a location to eliminate or at least minimize any right-of-way acquisition or construction within the state of Tennessee. Existing KY 181 would be removed from the existing KY 294 intersection north to the proposed realignment north of US 41. A minor widening of KY 294 west of the realigned KY 181 could be included with this option.

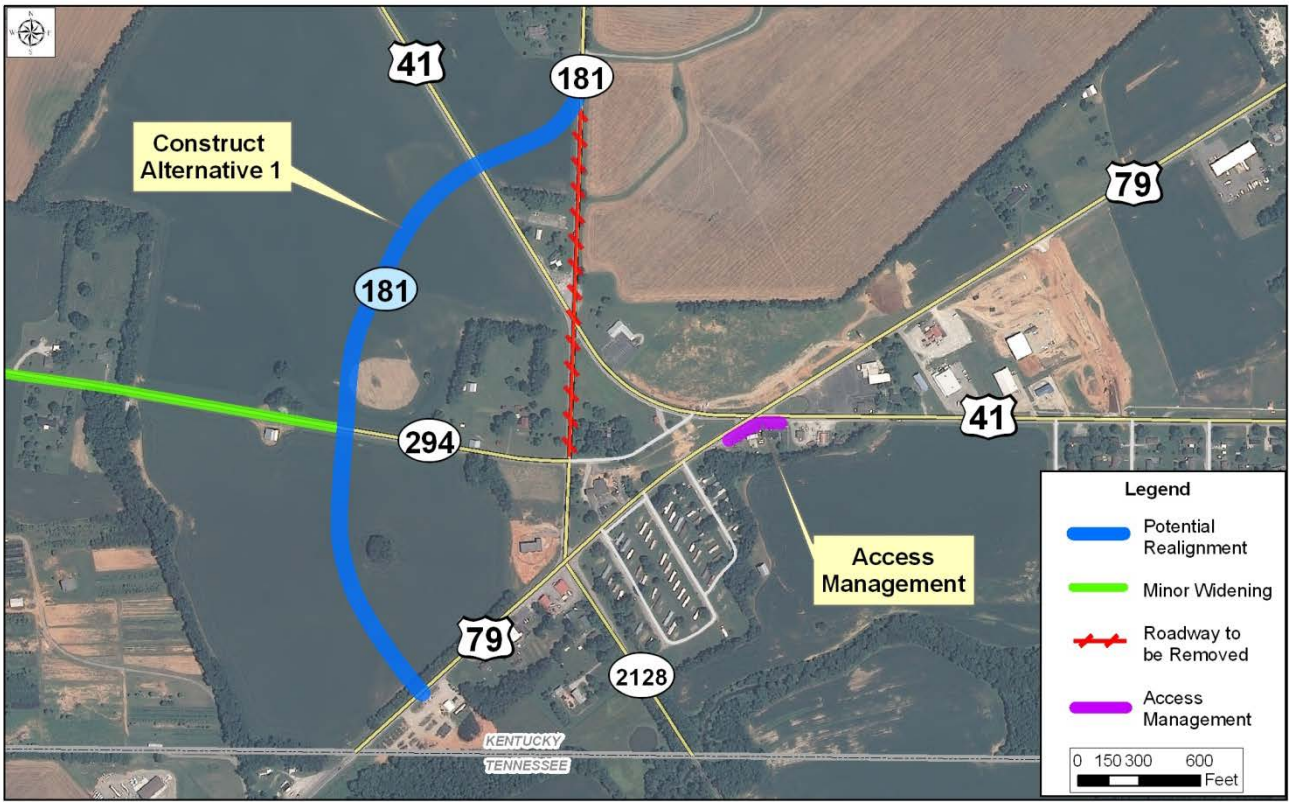


Figure ES-1: Recommended Short-Term and Long-Term Improvements

1 INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) initiated the Guthrie "Knot" Planning Study to seek improvement strategies for current and anticipated future transportation deficiencies within a portion of southern Todd County. The project study area, shown in **Figure 1**, is located west of the city of Guthrie and immediately north of the Tennessee state line. The area, commonly referred to as "Tiny Town", is located at the confluence of US 41, US 79, KY 181, KY 294, and KY 2128. These roads form a large triangle with skewed intersections located at each vertex of the triangle, creating a "knot" of intersecting roadways.

Figure 1: **Guthrie "Knot" Study Area**

Although there are some existing safety concerns with the skewed intersections within the study area, there has been no significant need for a comprehensive transportation study. A primary motivation for this planning study is the construction of the Hemlock Semiconductor facility, located just off US 79 less than four miles south of the study area in Tennessee. Hemlock produces polycrystalline silicon used in the electronics industry, particularly the production of solar power equipment, and other "satellite" industries are likely to locate nearby to take advantage of both the raw materials used by Hemlock and the products created by Hemlock. This has been the experience of the other Hemlock facility located in Michigan. The Tennessee plant is scheduled to be in operation in 2012 and once fully operational, it could employ as many as 4,000 to 5,000 employees.

With its proximity to the Hemlock facility and the City of Clarksville, Tennessee and I-24 to the south, and with its direct access to two US routes, the Guthrie area is likely to attract some of the satellite industries. The Todd County Industrial Foundation is marketing parcels located west of the study area (located on KY 294) for likely industrial development related to Hemlock. Tennessee already has improved the roadway which becomes KY 294 across the state line, and Kentucky will need to follow suit should development occur. Patriot Park, located on US 79 east of the study area, is another industrial site that is currently being marketed for development, and another large area of nearly 800 acres located off US 79 east of Guthrie is also available for industrial development.

Considering the potential economic development impacts combined with current concerns related to traffic operations and safety, the purpose of the Guthrie "Knot" Planning Study was to explore the scope and justification for needed transportation improvements in the Tiny Town area. The study has focused on investigating the current deficiencies in and around the junction and estimating the likely traffic impacts from future development. Short term improvements, focusing on existing safety and capacity issues, have been investigated as well as longer term improvements to meet the future transportation needs of the area.

1.1 Project Purpose and Need

The Purpose and Need Statement for the study, and for project recommendations which may result from the study, is as follows:

> *Directly west of Guthrie, Kentucky is a triangular area known as Tiny Town where US 41, US 79, KY 181, KY 294, and KY 2128 come together. This junction of roadways results in a less than efficient "knot" of intersections with multiple existing safety concerns. The study area's location along two rail lines and two major US highways (US 41 and US 79) and its proximity to I-24 provides it with strong potential for growth. The major investment in the Hemlock Semiconductor Plant on US 79 just to the south of the Tennessee state line will have a potential employment of 5,000 employees and is anticipated to attract satellite industries which will utilize its products. Further residential and commercial development is likely to follow and the demand for travel through the Tiny Town junction is expected to increase.*
>
> *The purpose of the potential project or multiple projects identified in this study is to improve the safety and efficiency of travel through the intersections of KY 181 with US 79, KY 294, and US 41 and the intersections of US 79 with US 41 and with KY 2128 in the Guthrie area and to provide better connections for travelers along this existing transportation network to the emerging industrial development.*

The primary goals for the study include the following:

- Discuss the project needs with public officials, resource agencies, the general public and other groups which have an interest in the project;
- Define project goals, needs, and issues;
- Identify any known environmental issues, including potential environmental justice issues; and
- Identify and evaluate short-and long-term projects, including access management, spot improvements, alternate corridors and design criteria.

1.2 Public Outreach

Public involvement plays a critical role in the success of any planning study. The KYTC seeks to build partnerships among stakeholders in order to better understand the relationships among problems and to bring more resources and expertise together to develop solutions. The purpose of the public outreach component of the Guthrie "Knot" Planning Study was to bring people together to express their ideas, to clarify areas of agreement and disagreement, and ideally to develop consensus on potential transportation improvement projects.

The public involvement component of this study was used to do the following:

- Gauge the interest of the affected community regarding the desire for transportation improvements;
- Inform and educate the public on the study;
- Identify the needs of the study area;
- Identify the project issues and goals; and
- Identify potential new or improved corridor locations.

Public involvement during the study included meetings with stakeholders and the general public. Invitations to serve on the stakeholders committee were sent to a diverse group of 69 individuals representing property owners, local officials, emergency responders, and other interested parties.

A stakeholders meeting was held early in the study process to introduce the study team members, begin to discuss study goals, and solicit input on transportation issues and needs. A group exercise was undertaken at the meeting to provide attendees an opportunity to work with each other to identify existing transportation issues and potential improvements. The committee was divided into small groups and provided maps on which they were asked to depict where improvements are needed within the study area. More discussion of this exercise and the results is found in the Development of Alternatives section of this report.

A Public Meeting for the Guthrie "Knot" planning study was held on Thursday, September 29, 2011 at the Guthrie Senior Citizens Center. (A second meeting with local officials was held the same day as the public information meeting and the purpose of the meeting was to discuss the information that would be presented at the public meeting later that evening). The purpose of the public meeting was to inform the public of the planning study, discuss various environmental and technical issues concerning the project area, and to solicit input on potential improvement projects. The meeting was held in an open house format with a brief overview presentation provided. KYTC and consultant staffs were available to answer questions and discuss issues. Seventy-five members of the public attended the meeting. A table was set up where attendees signed in and were given a meeting handout and questionnaire. The following project exhibits were on display:

- Study Area with Existing and Future Traffic Volumes
- Crash History
- Long-Term Improvements Options
- Short-Term Improvement Options

Meeting summaries for all meetings held throughout the Guthrie "Knot" Planning Study are found in **Appendix A**.

2 EXISTING CONDITIONS

Conditions of the study area's existing transportation network are examined in the following section. The information compiled includes traffic data, roadway geometrics, crash history, and environmental concerns within the study area. Data for this section were collected from the KYTC's Highway Information System (HIS) database, the Kentucky State Police Crash Database, and from field reviews.

2.1 Roadway Characteristics

Figure 2 shows the functional classification of the roadways within the study area.

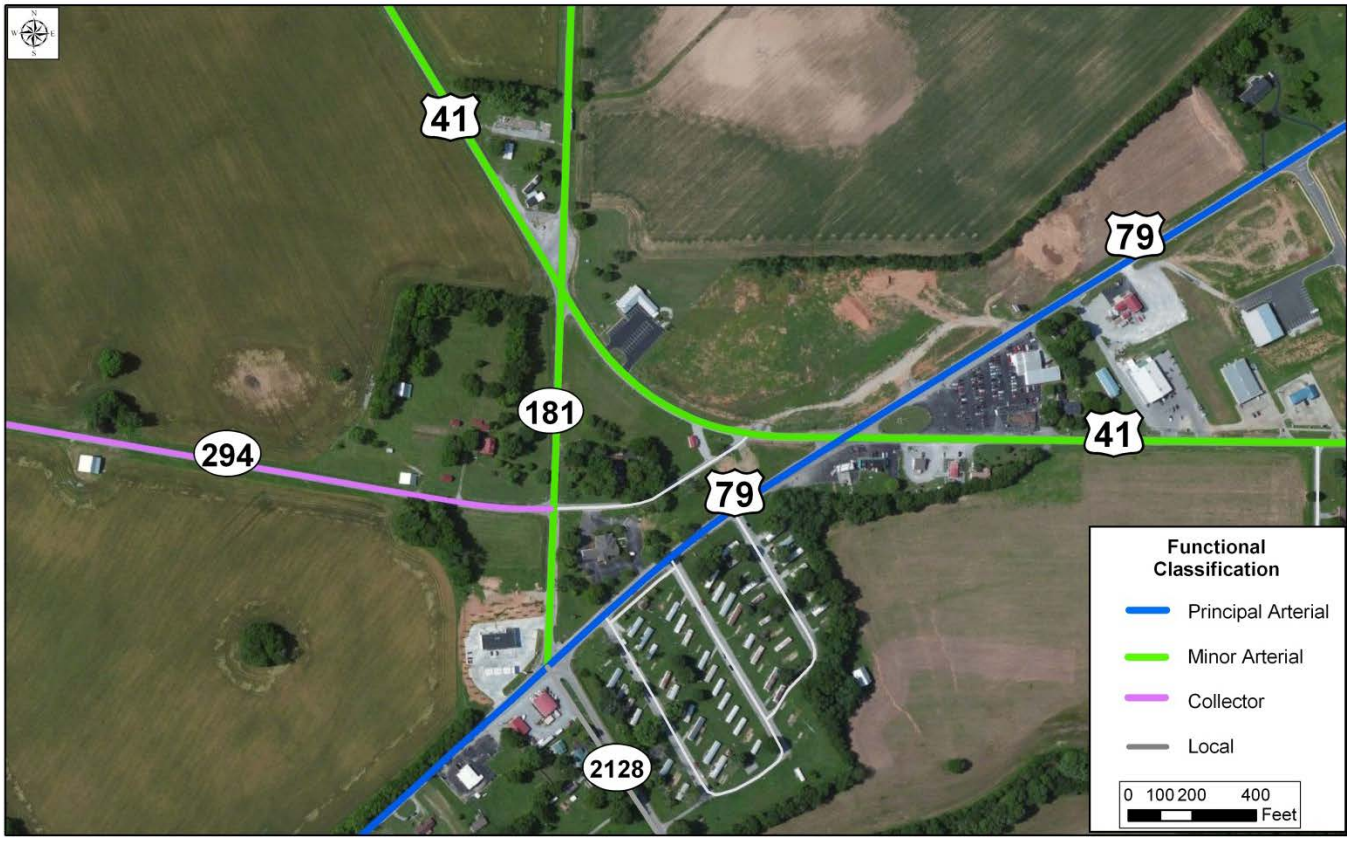


Figure 2: Functional Class for Study Area Roadways

Functional classification is the grouping of roads, streets and highways into integrated systems ranked by the level of mobility for through movements and access to adjoining land. This grouping acknowledges that roads serve multiple functions and it provides a basis for comparing roads fairly. Functional classification can be used for, but is not limited to, the following purposes:

- Provide a framework for highways serving mobility and connecting regions and cities within a state.
- Provide a basis for assigning jurisdictional responsibility according to the roadway's importance.
- Provide a basis for development of minimum design standards according to function.

- Provide a basis for evaluating present and future needs.
- Provide a basis for allocation of limited financial resources.

US 79 is functionally classified as a Rural Principal Arterial, US 41 and KY 181 are Rural Minor Arterials, and KY 294 is a Rural Minor Collector. KY 2128 is classified as a Local route.

Lane widths for the roadways within the study area are shown in **Figure 3**.

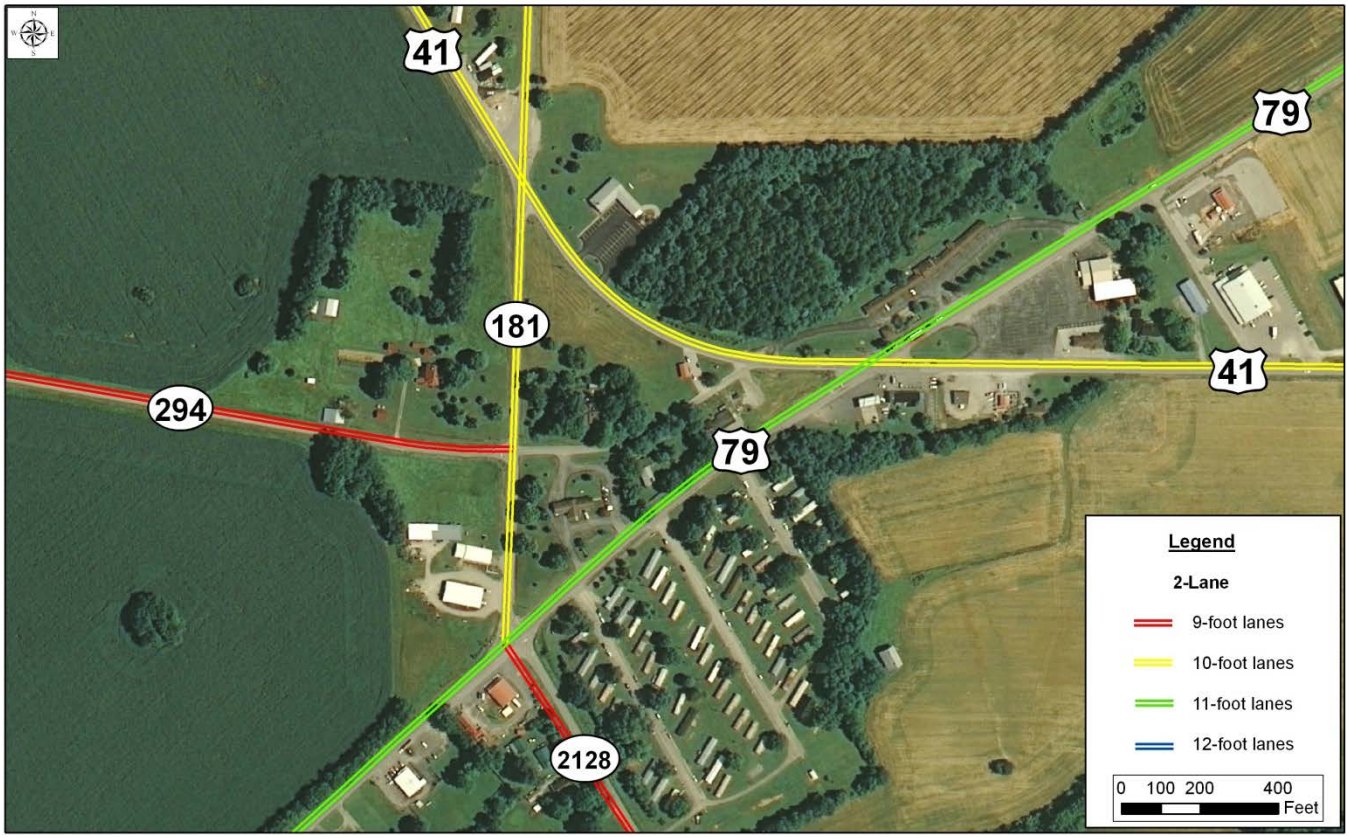


Figure 3: Lane Widths on Study Area Roadways

Current KYTC design guidelines call for a minimum of 11-foot wide lanes on arterials and collector roadways. US 79 has 11-foot wide lanes and both US 41 and KY 181 have 10-foot wide lanes. KY 294 and KY 2128 both have 9-foot wide lanes. Shoulder widths on all facilities range from one to four feet.

Figure 4 shows the speed limits in the study area, as well as the approximate location of the posted speed limit signs.

Figure 4: Speed Limits on Study Area Roadways

Within and approaching the triangle, both US 41 and US 79 are signed at 35 miles per hour (MPH). KY 181 is not posted within the study area (the nearest sign is located on northbound KY 181 north of US 41) and is therefore 55 MPH. There are no speed limit signs within the study area along either KY 294 or KY 2128. East of the study area, there is a 45 MPH zone on US 41 beginning near Patriot Park.

Existing average daily traffic (ADT) volumes were obtained for all State-maintained roadways within the study area using the KYTC HIS database. **Figure 5** shows the ADTs. US 79 carries the highest volume of traffic at 6,300 vehicles per day (VPD).

The volume-to-service flow (VSF) is a measure of congestion along a roadway, comparing the roadway's demand to its capability. Areas of concern are where the VSF values approach or exceed 1.0, in which limited capacity leads to congestion. As illustrated on **Figure 5**, all roadways are performing adequately, with a volume to capacity (V/C) ratio of 0.8 or below.

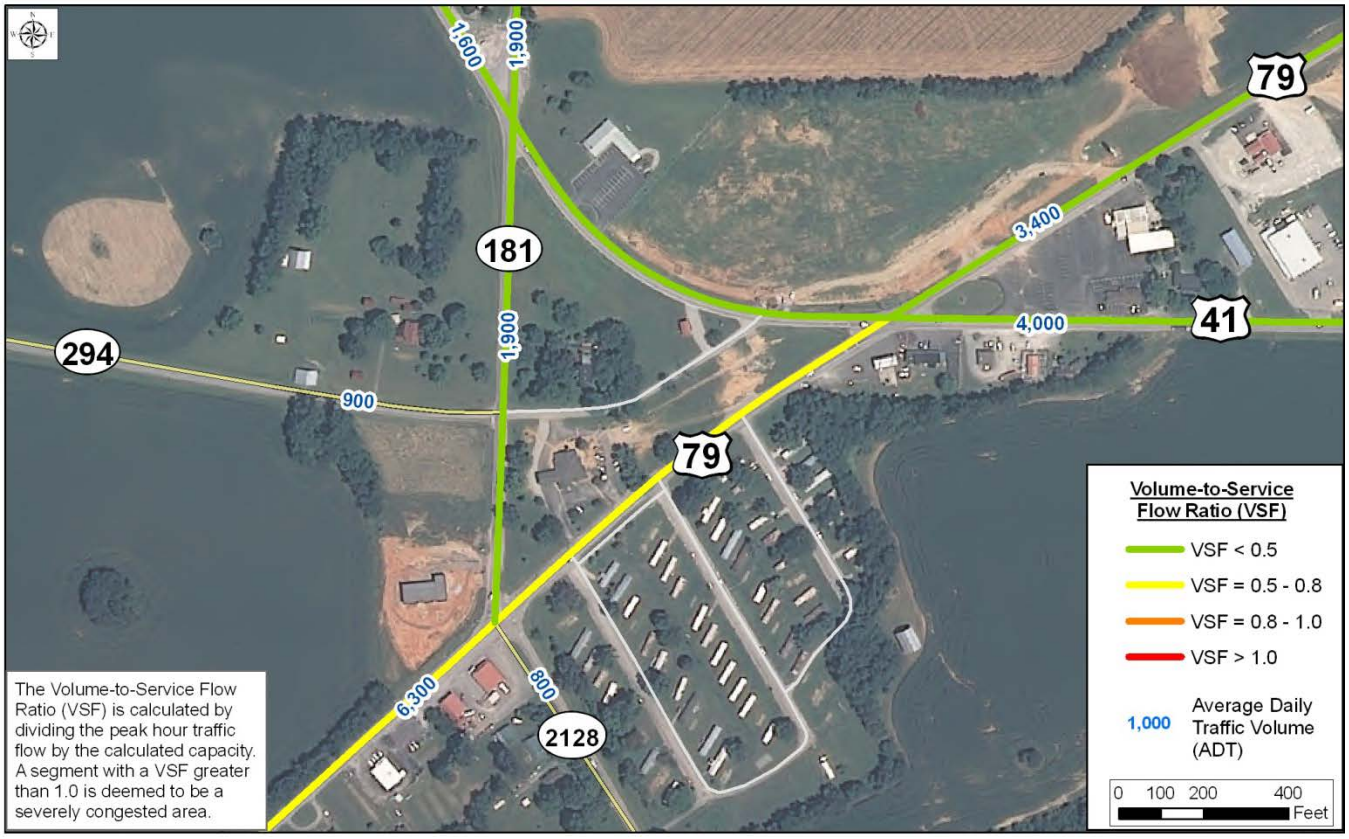


Figure 5: Average Daily Traffic (ADT) Volumes

2.2 Crash History

Crash data were collected along existing roadways within the study area for a five-year period (2006 – 2010). The locations of these crashes are shown on **Figure 6**. A total of 71 crashes were reported with 11 injury crashes (16 percent of total crashes) and no fatalities. The injury crashes were not concentrated at specific locations and were generally distributed throughout the study area. A closer review of the data found that most of the crashes were intersection crashes. Rear-end or angle crashes accounted for 39 percent of all crashes in the study area. There was also a significant percentage of backing crashes (19 crashes, 27 percent of total crashes), which would typically occur in parking lots.

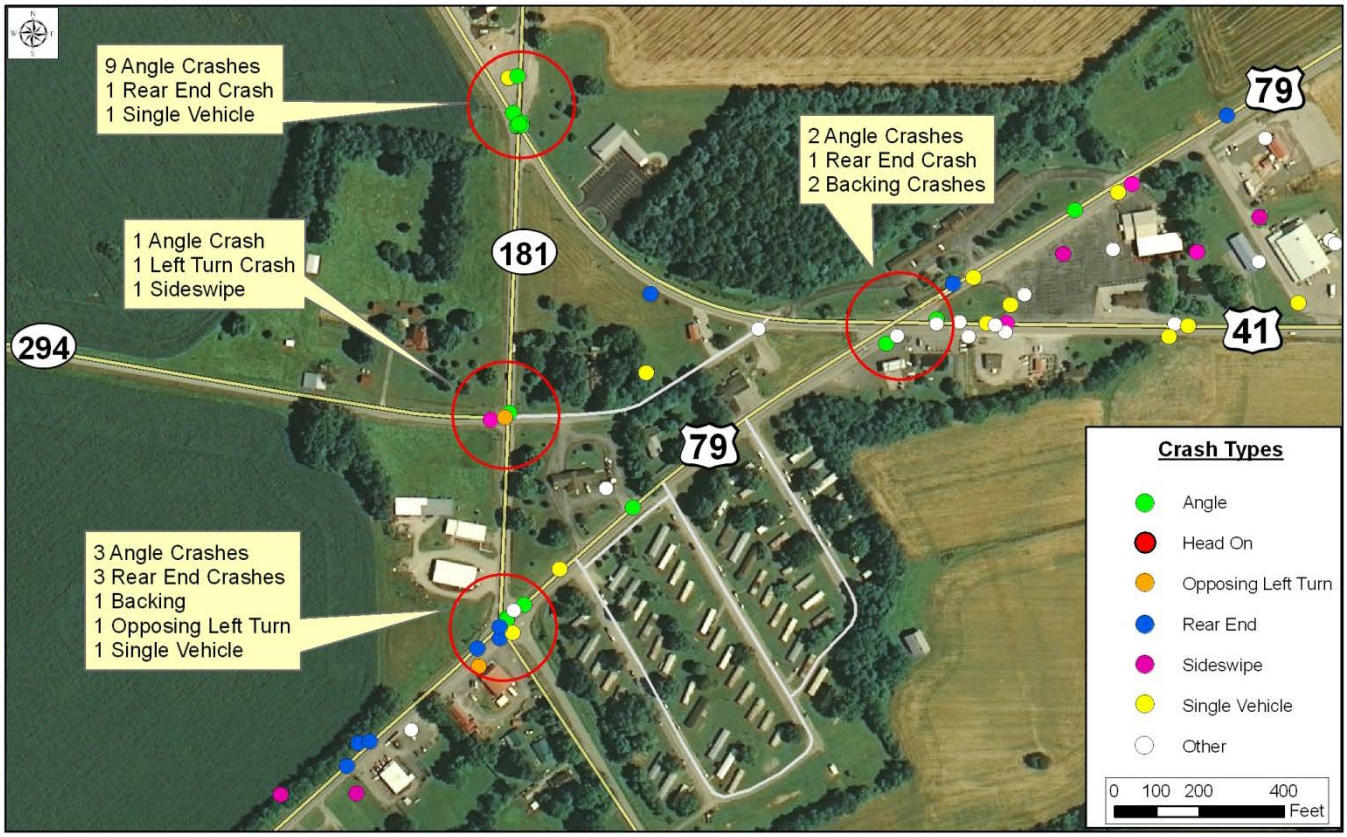


Figure 6: Crash History (2006 – 2010)

Critical Rate Factors (CRFs) were also determined as part of this analysis. The CRF value is calculated by dividing the actual crash rate along a particular roadway segment by the critical rate, which is the maximum accident rate for which it can be said that crashes are occurring randomly based on roadway characteristics and traffic. A CRF less than 1.0 indicates that crashes occur at random, and greater than 1.0 suggests that conditions may exist that contribute to non-random occurrences. **Figure 7** shows the CRF values for study area roadways between 2008 and 2010. Only KY 181 between US 41 and US 79 has a CRF greater than 1.0; the CRF on this segment is 1.9. More detailed crash analysis information is found in **Appendix B**.

Figure 7: Critical Crash Rate Factors (CRF), (2008 – 2010)

2.3 Environmental Resources and Issues

Environmental resources and issues of concern identified in the project study area include those related to both the natural and human environment, and included the following: streams, floodplains, wetlands, ponds, water supplies, threatened, endangered and special concern species and habitat, woodland and terrestrial areas, parks, social and economic resources, historic and archaeological resources, hazardous materials concerns, agriculture, mining, environmental justices, and additional concerns. A brief summary of the environmental resources and issues requiring additional consideration in the project study area is presented below, with additional resource and issue information provided in the project *Environmental Overview*, included in **Appendix C**.

Figure 8 presents a summary of the significant natural environment features located within the study area. Natural environment resources identified within the study area and issues that will require being addressed if impacts occur are discussed on the following pages.

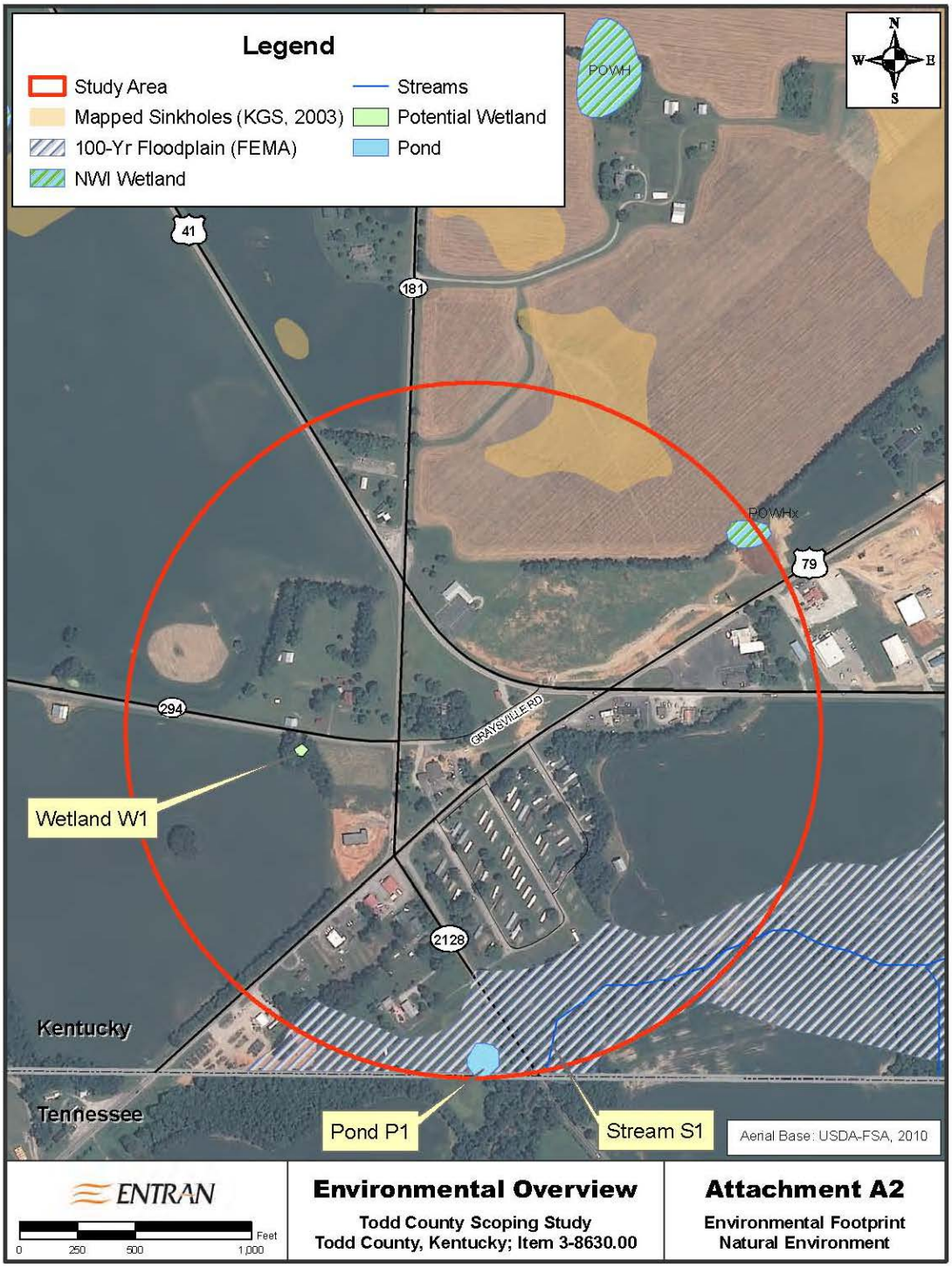


Figure 8: Significant Natural Environment Features

Surface Streams

One stream, one potential wetland and one pond are located in the study area. A comprehensive stream and wetland survey and impact assessment will be needed for the project. Unavoidable impacts to streams and/or wetlands will require coordination with the U.S. Army Corps of Engineers (USACE) and KDOW and a determination of Section 404/401 permitting and mitigation requirements.

100-Year Floodplain

Review and coordination with local floodplain coordinator for the City of Guthrie and the Kentucky Division of Water, Surface Water Permits Branch, Floodplain Management Section will be required.

Groundwater Resources

The study area is located within a karst landscape characterized by numerous sinkholes, underground conduits, or caves. Construction disturbance or release of pollutants within the study area could cause contamination of groundwater. Sinkholes are mapped and several low lying areas were observed within the study area into which surface drainage appeared to flow but having no discernible outflow, indicating potential locations of these underground conduits. Construction activities, especially in regards to vehicle fueling and maintenance and surface runoff from precipitation events, will be required to be directed away from all sinkhole and low lying areas, and steps should be taken to avoid introducing contaminants into the groundwater system.

Threatened, Endangered and Special Concern Species

There are no known records of any federal-listed species within the study area boundaries based on review of database records, although six species are known to have the potential to occur in Todd County. Indiana bat and littlewing pearlymussel potential habitat occurs in the study area, along with potential habitat for four state endangered and four state threatened species, and a nearby record of one state endangered species. Additional habitat assessment and coordination with the USFWS Ecological Services Kentucky Field Office, Kentucky Department of Fish and Wildlife Resources and the Kentucky State Nature Preserves Commission will be required.

Section 4(f) and Section 6(f) Facilities

Based on the June 2011 on-site reconnaissance and review of information from Kentucky State Nature Preserves (KSNPC), the National Park Service (NPS), and other available mapping, no state or federal managed areas, parks, forests or preserves (Section 4(f) resources) occur in the study area. No facilities in the study area were identified as having received a Land and Water Conservation Fund (LWCF) grant (Section 6(f) resources). Section 4(f) resources relative to archaeological sites and cultural and historic properties are discussed in the following section.

A summary of the significant human environment features in the study area is shown in **Figure 9**.

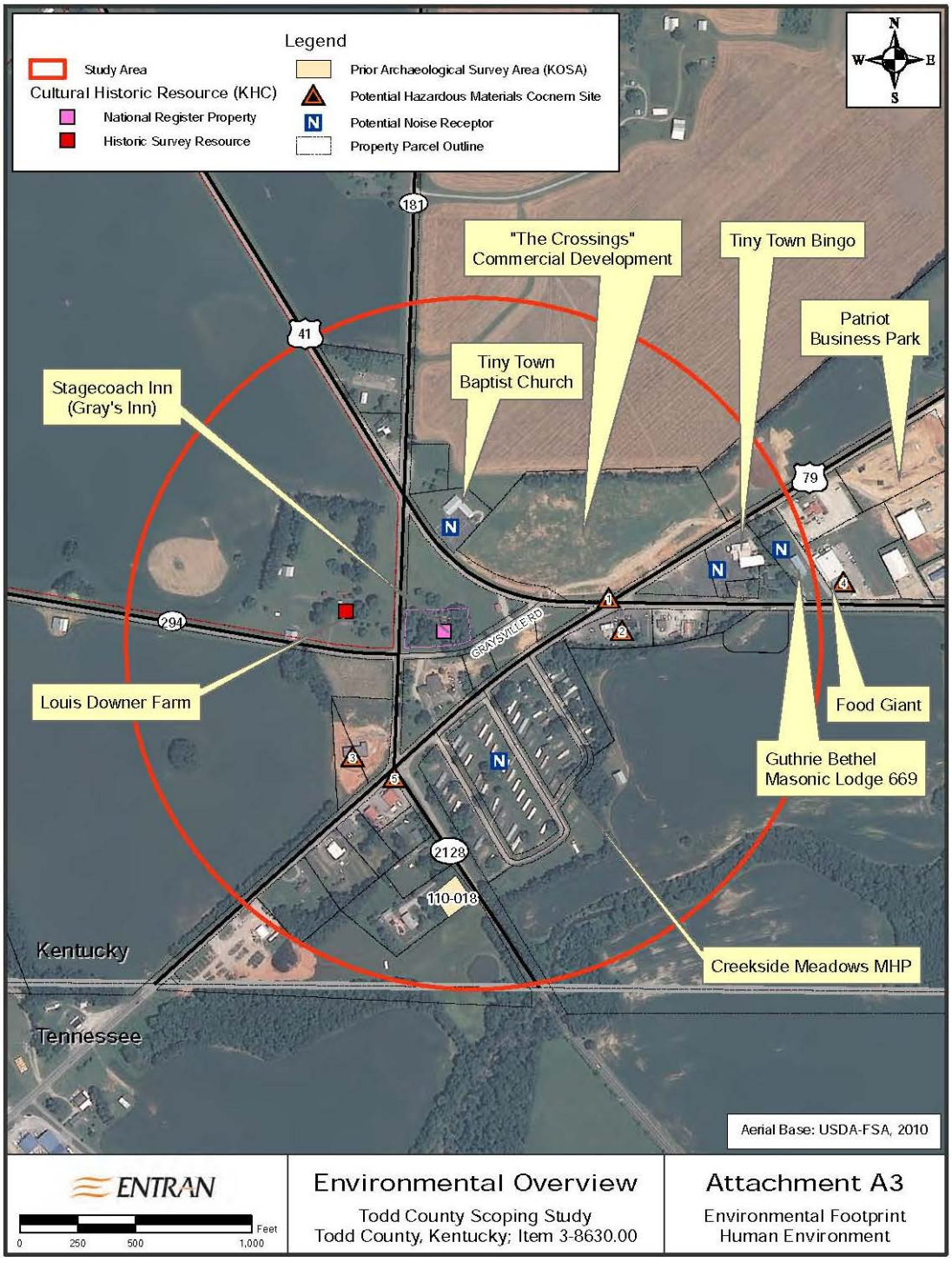


Figure 9: Significant Human Environment Features

Human environment resources identified within the study area and issues which will require being addressed are discussed below.

Historic and Archaeological Resources - Section 106 and Section 4(f) Resources

One National Register of Historic Places (NRHP) site and one Kentucky Historic Survey Resource site are located in the study area. **Figure 10** shows The Stagecoach Inn (also known as Gray's Inn), located in the center of the study area, at the northeast corner of Graysville Road and KY 181, facing Graysville Road. The building is on the NRHP, is currently a privately-owned residence, and the property includes a Kentucky Historical Society "Stage Coach Inn" marker and a National Park Service "Trail of Tears National Historic Trail" sign.

Figure 10: Stagecoach Inn

The Louis Downer Farm, shown in **Figure 11**, is a Historic Survey Resource, with NRHP status undetermined, and is located at the northwest corner of KY 181 and KY 294. The property includes a privately-owned residential structure and several small outbuildings in excellent condition. A cultural historic survey performed by a KYTC pre-qualified consultant will be required to determine the presence (and NRHP eligibility) or absence of additional cultural historic resources in the study area.

Figure 11: Louis Downer Farm

Review of information from the Kentucky Office of State Archaeology (KOSA) data request response indicates one prior archaeological survey has been performed which lies within the project study, which was provided the identification number 110-018. The prior archaeological survey was conducted for a cell tower site along KY 2128 south of the project center and did not identify any archaeological resources. The KOSA estimated that less than 10 percent of the project study area has been surveyed for archaeological resources. A Phase I archaeological site investigation will be required to determine the presence or absence of significant archaeological sites throughout the extent of the study area.

Hazardous Materials Concerns

There are two active underground storage tank (UST) facilities, one inactive UST facility, one inactive UST and Resource Conservation and Recovery Act (RCRA) facility, and one inactive USEPA Permit Compliance System (PCS) facility located within the study area. A Phase I survey for hazardous materials concerns including UST's and potentially contaminated soils will be required at four facilities.

Agriculture

Review of 2007 Agricultural Census data from the United States Department of Agriculture (USDA) indicates that Todd County is ranked 7th out of 120 Kentucky counties in agricultural production value, with the typical agricultural practices of corn (48,390 acres) and soybean (42,795 acres) (USDA, 2007), with poultry and eggs

having the largest value in sales. Review of soil data information of the project study area (Haagen, 1987) indicated that prime farmland soils cover 90% of the study area. Hay and row crop fields are present throughout the study area, and estimated to account for approximately 46% of the total land area. Coordination with the local NRCS office which is regulated by the Farmland Protection Policy Act (FPPA), will be necessary.

Noise-sensitive Receptors

Four locations within or adjacent to the study area include a mobile home park, a church and two community meeting facilities that may be sensitive to increased noise impacts. A project specific traffic noise impact analysis may need to be conducted to identify and mitigate traffic noise impacts.

2.4 Environmental Justice

Issues pertaining to minority, elderly, disability and low income (persons living in poverty) populations in the project study area were evaluated and documented in an April 2011 report entitled *KY 181/US 79/US 41/KY 294 Intersection Study - Environmental Justice Review*. The report concluded that Environmental Justice (EJ) populations above the state and county averages occur in several Census Block Groups in the study area, particularly within the Block Group that comprises the majority of the City of Guthrie. The study determined that there would be no impact to the EJ populations if project recommendations were confined to existing roadway rights-of-way. However, if proposed improvements take a new route off one of the existing right-of-ways in one or more areas, then additional examination of these areas proposed in the new route(s) should be explored further for EJ impacts as the project further develops. Additional information concerning Environmental Justice issues in the project study area is provided in the project *Environmental Justice Review* in **Appendix D**.

3 DEVELOPMENT OF ALTERNATIVES

In order to determine the need for and purpose of potential transportation improvement projects, it is necessary to estimate future conditions within the study area. This chapter summarizes the anticipated future conditions and how alternatives were developed to address anticipated needs.

3.1 Committed Projects

Only two transportation projects are programmed for implementation in Todd County within the coming years. These projects are summarized in **Figure 12**. KYTC Item #3-8401.00 is a current design project to provide spot improvements along KY 181 from the Todd County courthouse in Elkton north to US 68/80. Item #3-8630.00 is the Guthrie "Knot" Planning Study.

3.2 Population Projections

According to projections provided by the Kentucky State Data Center, Todd County's population is holding relatively steady. Recent population projections, released in September 2011, are shown in **Figure 13**.

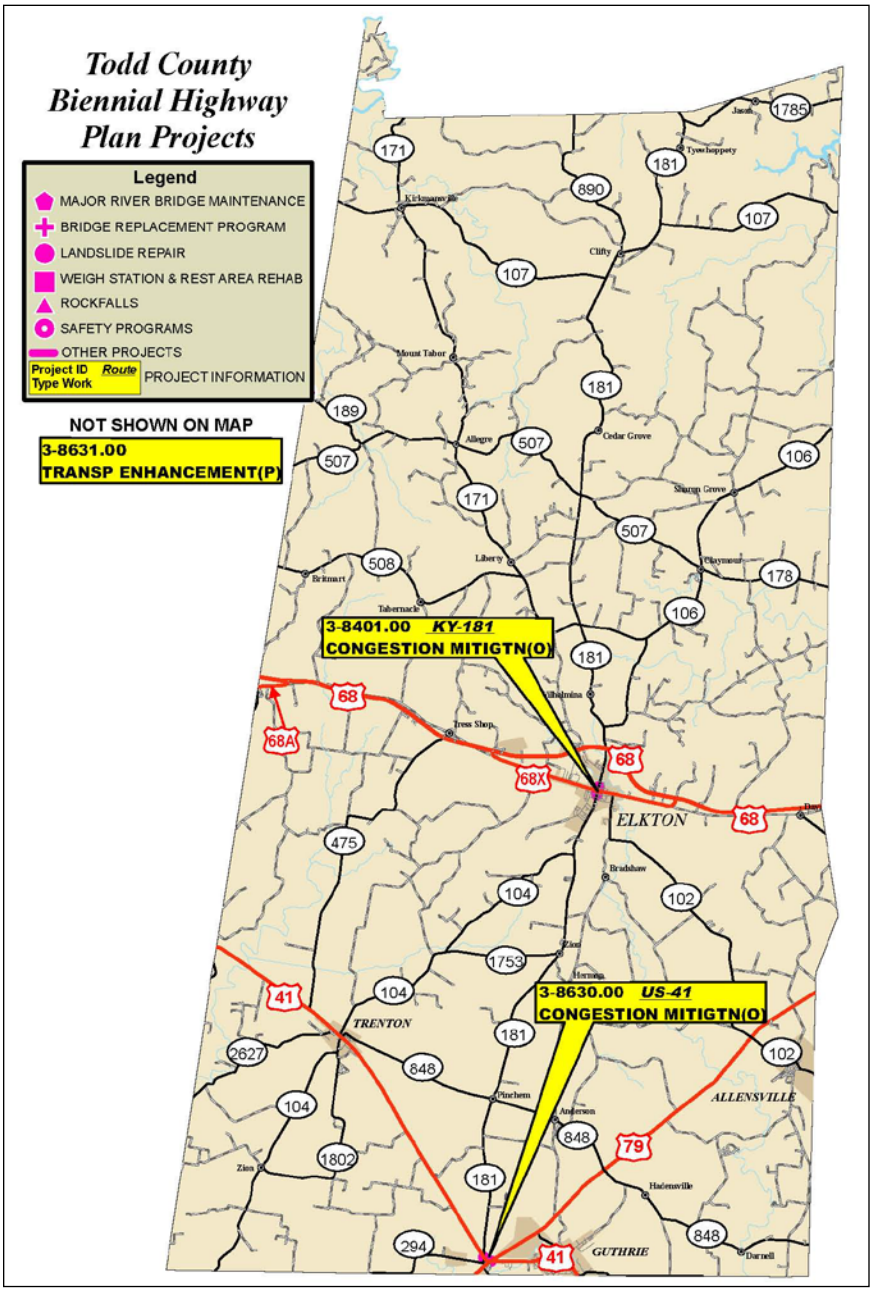


Figure 12: Committed Projects in Todd County
Source: KY Transportation Cabinet

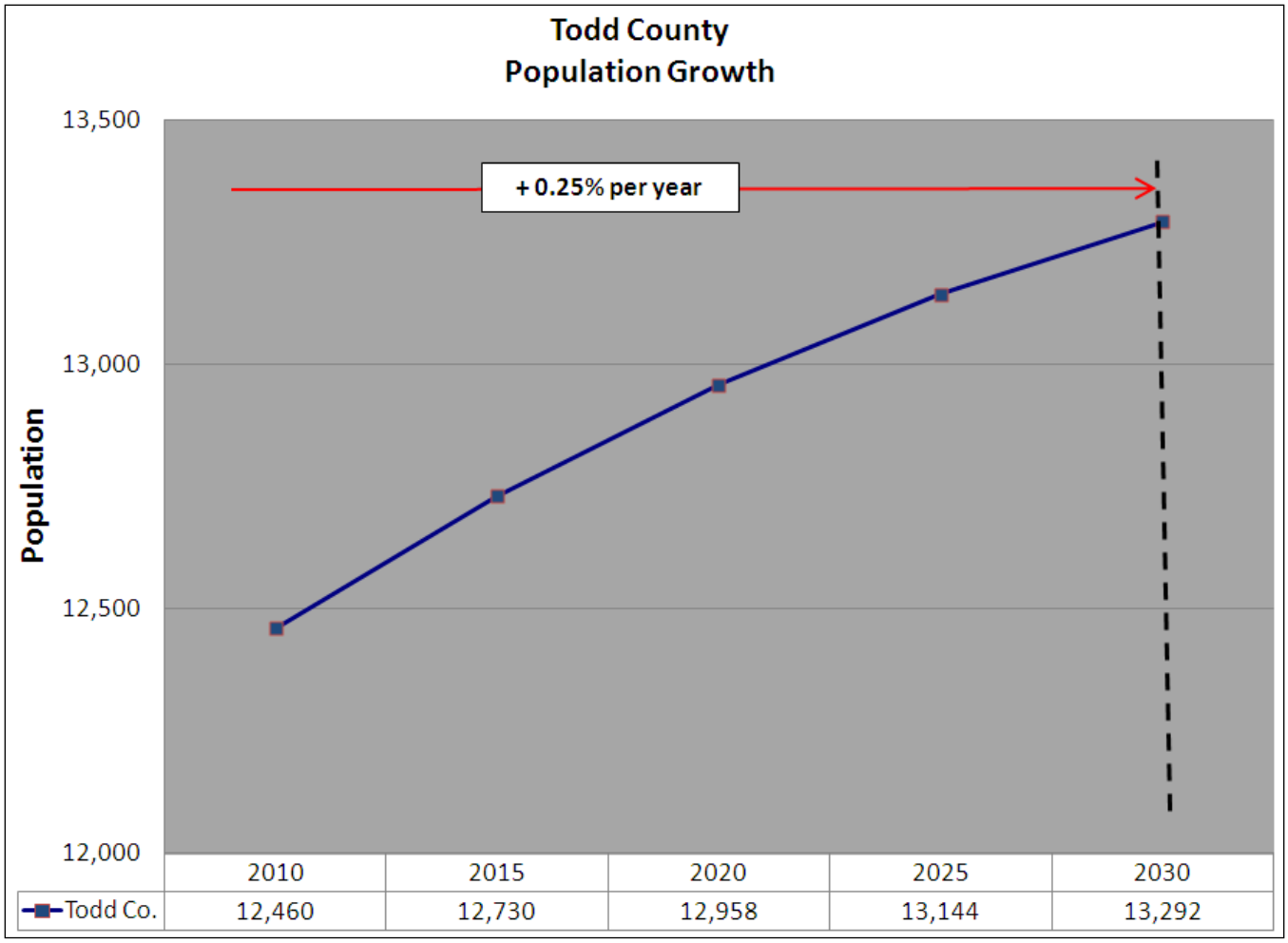


Figure 13: Todd County Population Projections
(Source: Kentucky State Data Center, September 2011)

Based on a comparison of the 2010 Census data, Todd County appears to be growing in population by about 0.25 percent per year. That is lower than the statewide average growth rate of 0.6 percent per year. The estimated population in Todd County in July 2010 was 12,460 and is expected to increase to 13,292 by the year 2030.

Table 1 includes a summary of the 2000 Census and subsequent population estimate for the incorporated cities in Todd County through 2009. Guthrie's population decreased by 0.1 percent per year over that time period while the remainder of the county grew by about 0.4 percent per year.

Table 1: Todd County and Incorporated Cities Population Estimates

County / Incorporated Place	2000 Census (April 1)	2009 Estimate (July 1)	Population Change	Annual Growth 2000 - 2009
Todd County	11,971	12,253	282	0.3%
Allensville	n/a	n/a		
Elkton	1,986	1,989	3	0.0%
Guthrie	1,469	1,457	-12	-0.1%
Trenton	419	430	11	0.3%
Balance of Todd County	8,097	8,377	291	0.4%

(Source: Kentucky State Data Center, June 2010)

3.3 Traffic Forecasts

Development of traffic forecasts is a necessary step in determining the need for transportation improvements. However, in the case of this study, traffic forecasts are difficult to estimate because no one knows the impact Hemlock will have on growth in the area. Therefore, it was decided that the study would consider a range of forecasts including low, medium, and high growth scenarios.

The low growth scenario is based on output from the Kentucky Statewide Travel Demand Model (KYSTM), the only travel demand model available for Todd County. The KYSTM is a conventional three-step daily travel demand model that is run in the TransCAD software package. The model contains all major state, federal, and county facilities in Kentucky and the adjacent areas of surrounding states. The model also has a truck component. The model is calibrated to a 2003 base year and has future year socioeconomic data to run a 2030 forecast. The KYSTM was run to establish a baseline traffic assignment, and was found to be relatively consistent with the population growth from the Census with traffic on most study area roadways growing by 0.4 to 0.5 percent per year.

The medium growth scenario is based on the lower of the historical growth rate for each roadway or the functional class average growth rate for Todd County based on KYTC's latest available data. The historical growth rate for a minor arterial in Todd County is 3.45 percent per year, and the average growth rates for each of the study area roadways is between 1.5 percent and 4.1 percent per year. High Growth is based on the higher of the historical growth rate or the functional class average growth rate for Todd County. The resulting traffic forecasts are summarized in **Table 2**.

Table 2: 2030 Traffic Forecasts

Route / Segment	Last Available Count			Assumed Annual Growth Rate			2030 Forecasts		
	2008	2009	2010	Low Growth	Med Growth	High Growth	Low Growth	Med Growth	High Growth
US 41 - East of US 79		4,030		0.4%	2.0%	3.45%	4,400	6,100	8,300
US 41 - West of US 79			1,610	0.4%	1.3%	3.45%	1,800	2,100	3,200
US 79 - South of US 41		6,290		0.5%	1.5%	3.45%	7,000	8,600	12,900
US 79 - North of US 41		3,420		0.5%	2.1%	3.45%	3,900	5,300	7,000
KY 181 - US 79 to US 41		1,860		0.3%	1.5%	3.45%	2,000	2,600	3,800
KY 181 - North of US 41	1,900			0.5%	1.5%	3.45%	2,200	2,700	4,100
KY 294		907		0.1%	0.6%	4.07%	1,000	1,100	2,100

The medium growth scenario includes annual growth rates ranging from 0.6 to 2.1 percent and the high growth scenario ranges from 3.45 to 4.1 percent per year. It was agreed that the high growth scenario should be used for purposes of this study. Even at the assumed high growth rates, no roadway segment within the study area would be anticipated to require widening to four lanes before 2030. The highest anticipated volume in 2030, 12,900 vehicles per day (VPD), is along US 79 south of US 41. **Appendix E** includes peak hour turning movement counts collected by the KYTC and 2030 forecasted design hour volumes (DHV's) developed based on the high growth rate scenario.

A number of transportation alternatives were developed and evaluated over the course of the study. These include both short-term projects that could potentially be implemented in the near term with minimal cost and long-range corridor alternatives that would require significant resources to implement. The following sections discuss how improvement concepts were developed and received by the public.

3.4 Stakeholder Input

One of the primary goals of the public involvement component of the study was to solicit input on the location of existing transportation deficiencies and needed improvements. To that end, the first meeting with local officials was used as an opportunity to ask focused questions. First, they were asked to point out specific trouble spots or issues that should be considered in the study. Second, they were asked to identify possible transportation improvements that should be considered. The attendees were divided into five groups, and their recommendations are summarized below.

Group 1

- Proposed improvements
  - Access control at convenience store near US 79 and US 41
  - Consider increasing turning radius from eastbound US 41 to southbound US 79 (investigate availability of using state property near the intersection)
  - Better "guide" signs at all intersections

- Widen KY 294 to Tennessee state line (minor widening discussed included two 11-foot wide lanes with 8-foot wide shoulder that is partially paved)
- Build loop away from knot to west to connect to KY 181 or US 79

Group 2

- Transportation issues
  - Drainage issues
- Proposed improvements
  - New connection from KY 294 to US 79; improve KY 294 to Hemlock
  - Consider a four-way stop at US 41 and KY 181 with a flashing beacon
  - Eliminate "through" traffic on Graysville Road
  - Increase turning radius at US 79 and US 41
  - Provide better access control at convenience store

Group 3

- Proposed improvements
  - Bypass to west (KY 294)
  - Additional signage at US 41 and KY 181
  - Consider making US 41 between KY 181 and US 79 a "local only" route
  - Left turn lane on northbound US 79 at KY 181
  - Sidewalk connection along US 41 to east

Group 4

- Transportation issues
  - Signs are too small at US 79 and KY 181; some advance warning signage is needed to direct traffic to turn onto KY 181
  - Congestion is an issue on Graysville Road
  - Crashes at Patriot Park entrance on US 41
  - Consider impact on downtown Guthrie, particularly associated with truck traffic toward Springfield
  - KY 346 (Ewing St.) serves as a cut-through
- Proposed improvements
  - Consider a traffic signal at US 41 and US 79
  - Western bypass with connection to Patriot Park to the east on US 79
  - Speed limit reduction on US 79 from Tennessee state line to north of Patriot Park
  - Speed limit reduction on US 41 north of the knot

Group 5

- Transportation issues
  - New school(s) proposed in north Montgomery County, TN
  - Huge subdivision planned off Port Royal Road (KY 2128)
  - 1,000 acre industrial park on KY 294
  - 800 acres of industrial property on US 79 north of KY 2128
  - TDOT has recently discussed widening US 79 to four lanes south of the Kentucky state line
  - Caution about constriction to any creeks as they currently control flooding in and around Guthrie
- Proposed Improvements
  - Bypass from KY 2128 to the west then north around to Patriot Park on US 41
  - Consider closing Graysville Road (minimize impacts to the Stagecoach Inn)

- Add directional signage to Hemlock and other industrial parks
- Add more pavement to the west at KY 181 and US 41 to help "square up" trucks

3.5 Short-Term Improvement Alternatives

A number of short-term improvements (also referred to as "spot improvements") were developed based on input from the combined local officials and stakeholders meeting, investigation of crash data, and site reconnaissance. These projects, most of which were developed to improve traffic safety, are shown in **Figure 14** with descriptions of each project to follow.

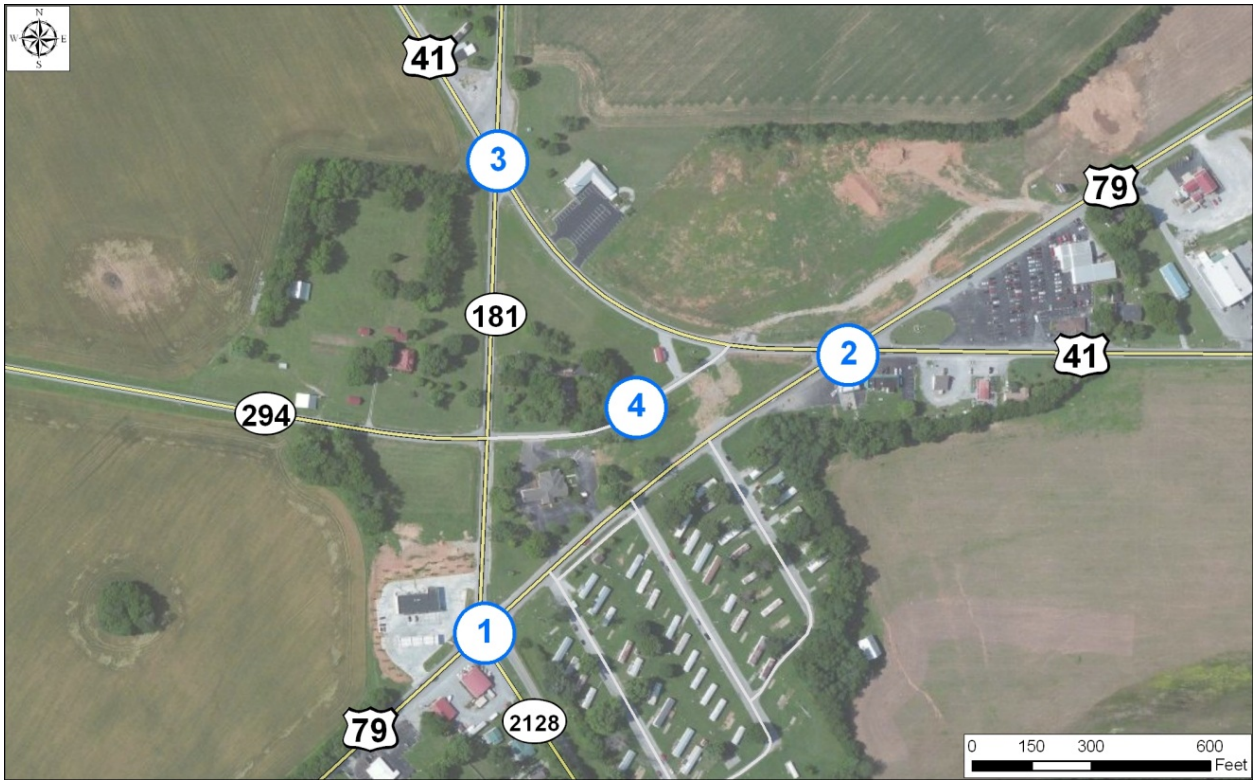


Figure 14: Preliminary Short-Term Improvement Alternatives

1. Construction of left-turn lanes on US 79 at the KY 181 intersection, shown in **Figure 15**. A number of rear end crashes have occurred at this intersection, and the addition of left-turn lanes on US 79 would be one way to minimize such crashes. This improvement would be difficult without significant right-of-way impacts and removal of parking for businesses south of US 79.

Figure 15: US 79 at KY 181

2. Access management at US 79 and US 41 intersection, shown in **Figure 16**. This is a very large, skewed intersection with four-way stop control and the convenience store located on the south side of the intersection has uncontrolled access along the south and east roadway approaches. The potential short-term improvement includes maintaining the intersection in its current location but constructing a curbed island along most of the convenience store's frontage to define two access points – one on US 41 east of the intersection and one on US 79 south.

Figure 16: US 79 at US 41

3. Minor reconfiguration of the US 41 and KY 181 intersection, shown in **Figure 17**. This is a very large, skewed intersection with two-way stop control on the KY 181 approaches. Vehicles, particularly trucks, on southbound KY 181 will often veer to the right (almost as if they were attempting to turn right onto westbound US 41) to maximize sight distance before crossing US 41 or turning left towards Guthrie. The preliminary proposed improvement was to construct a curbed island to define a right "turning roadway" onto westbound US 41 and to prevent through and left-turning vehicles from veering to the right.

Figure 17: US 41 at KY 181

During the second meeting with local officials, there was some discussion concerning the viability of this concept. The Study Team believed the issue was limited sight distance to the east (towards Guthrie). It was noted the issue really deals with the sight distance to the west along US 41 as the skew angle on the southbound approach makes it difficult for trucks to see oncoming vehicles to their right. Therefore, this concept could worsen that situation. Additional maintenance activities that could be considered include some shoulder stabilization on the northbound KY 181 approach for right-turning vehicles. There was also some discussion concerning converting this intersection to four-way stop control.

4. Traffic calming on Graysville Road, shown in **Figure 18**. Graysville Road experiences a significant volume of "cut-through" traffic as it provides a more direct east-west connection than either US 41 or US 79 to KY 181 and then KY 294. Three possible options discussed by the Study Team include: 1) do nothing, 2) traffic calming and speed reduction through speed humps, tables, or other such devices, and 3) permanent closure of Graysville Road.

Figure 18: Graysville Road (looking west)

These short-term improvements were presented at the public meeting in September, and a questionnaire was distributed to solicit input. Public meeting attendees were given the option to either fill out their questionnaire at the meeting or return it by mail after the meeting. A total of 21 questionnaires were returned. The results of the questionnaire are summarized in **Figure 19** and as follows:

1. Construction of left-turn lanes on US 79 at KY 181 (76% in favor)
2. Curb construction along US 41 and US 79 near the convenience store (81% in favor)
3. Traffic Calming on Graysville Road (76% in favor)
4. Reconfiguration of the US 41 and KY 181 intersection (67% in favor)

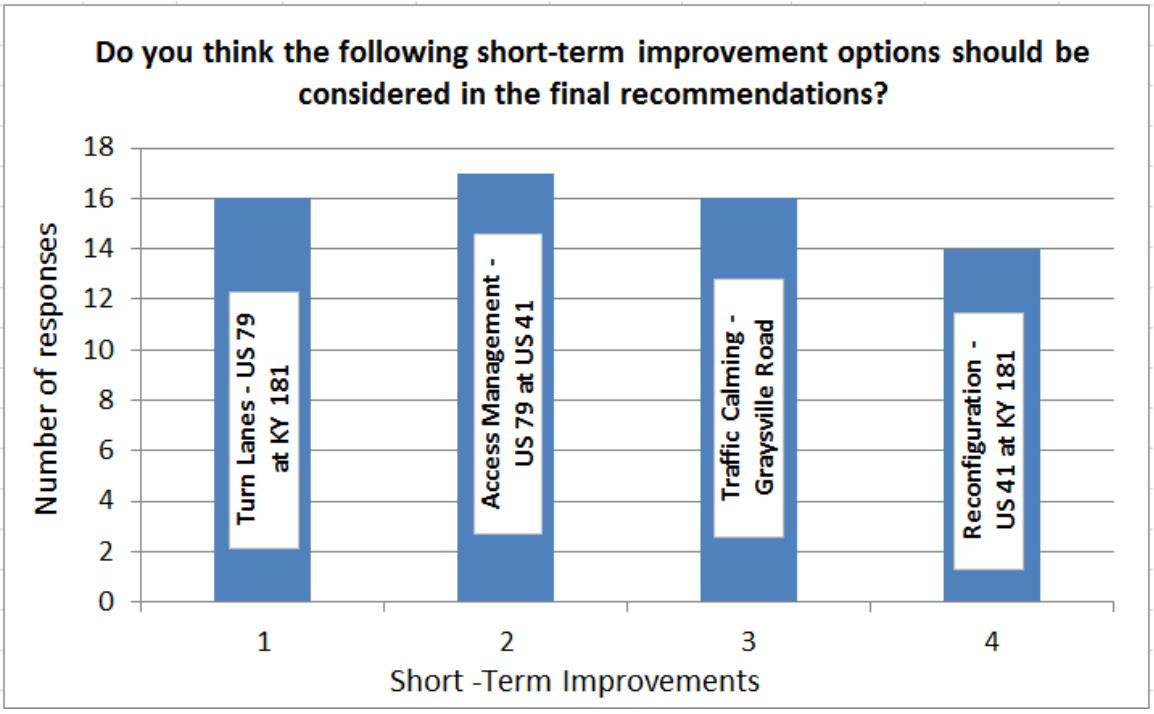


Figure 19: Public Comment Summary – Short-Term Improvements

All short-term improvement options were well received by those that returned questionnaires. Of the 21 responses received, the lowest approval was 67 percent in favor of the reconfiguration of the US 41 intersection with KY 181 with the greatest being 81 percent in favor of making the access management improvements near the US 79 intersection with US 41.

Several meeting attendees asked if four-way stop control or traffic signals could be considered at some of the intersections in the triangle. The Study Team evaluated each of these intersections and determined none would satisfy warrants for four-way stop control (other than the US 79 intersection with US 41 that is currently a four-way stop) or the installation of a traffic signal. These evaluations considered not only existing traffic, but also projected turning movements based on the 2030 traffic forecasts. These turning movements and forecasts are provided in **Appendix E**.

3.6 Long-Range Corridor Alternatives

The long-range corridor alternatives for the Guthrie "Knot" Planning Study were developed based on stakeholder outreach and a comprehensive investigation of existing conditions and future industrial development concerns. These alternatives, shown on **Figure 20**, involve realignments of existing routes in an effort to eliminate issues with the existing intersections. Descriptions of each of these concepts are provided below.

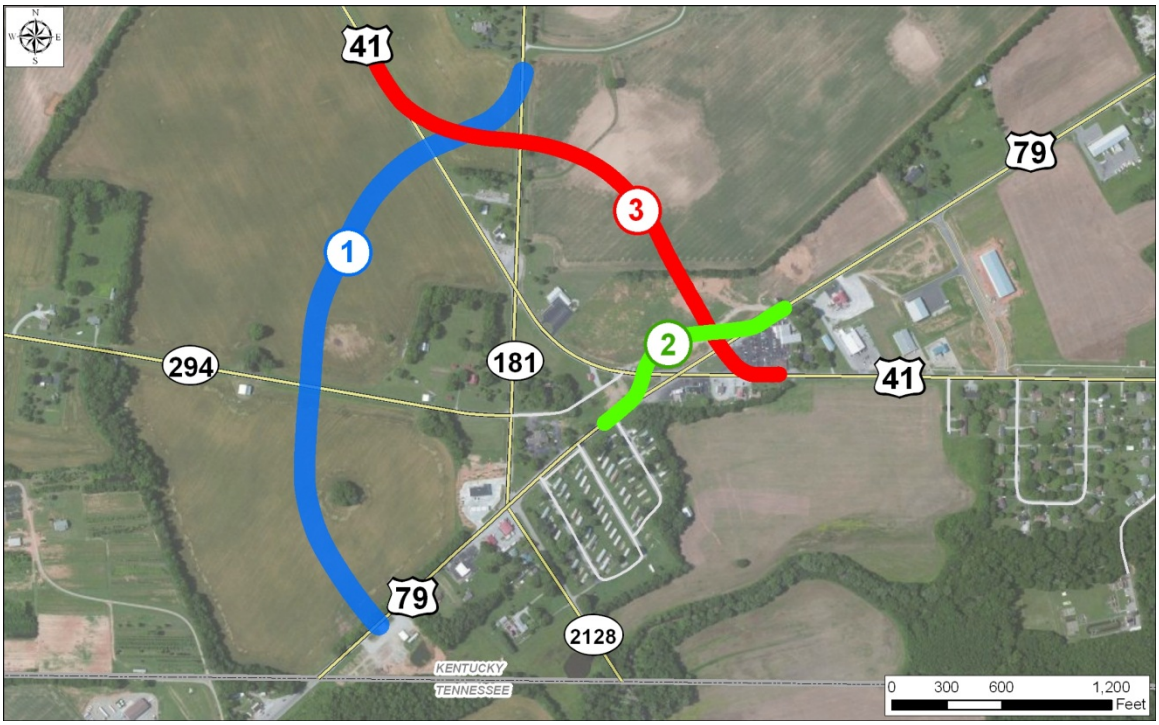


Figure 20: Preliminary Long-Range Improvement Alternatives

1. Realignment of KY 181, shown in **Figure 21**. This concept provides a western connector around Tiny Town by redirecting existing KY 181 from north of the US 41 intersection to the west along a semicircular route to US 79 west of the existing KY 181 intersection. The realignment of KY 181 should intersect US 79 at a location to eliminate or at least minimize any right-of-way acquisition or construction within the state of Tennessee. Existing KY 181 would be removed from the existing KY 294 intersection north to the proposed realignment north of US 41. A minor widening of KY 294 west of the realigned KY 181 could be included with this option.

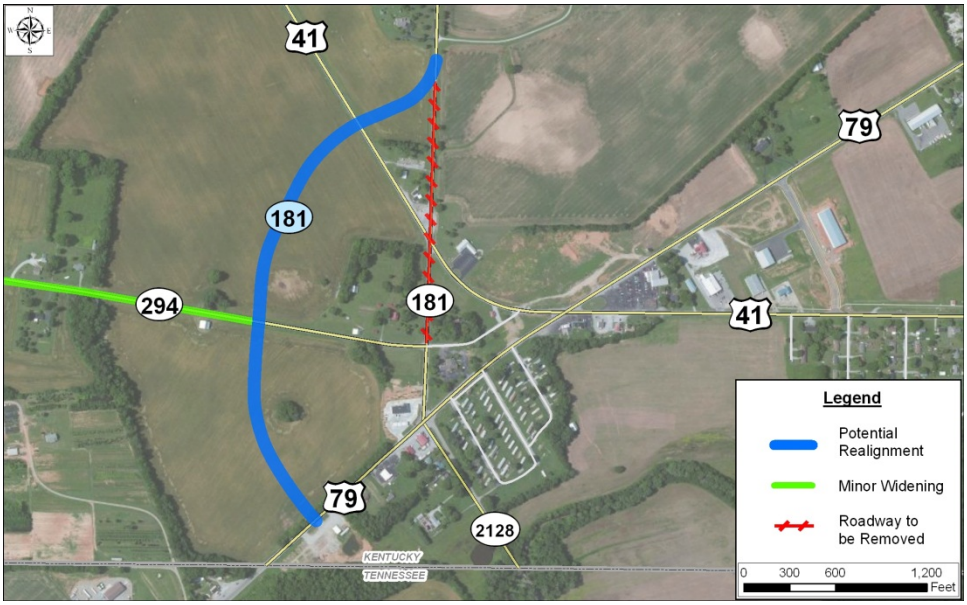


Figure 21: Conceptual Realignment of KY 181

2. Realignment of US 79, shown in **Figure 22**. This concept realigns US 79 to the west of the existing US 41 intersection to provide a more perpendicular intersection with US 41 and to eliminate the existing access issues with the Minit Mart. This concept would likely require the closure of Graysville Road near US 41 as it would be too close to the proposed US 79 intersection.

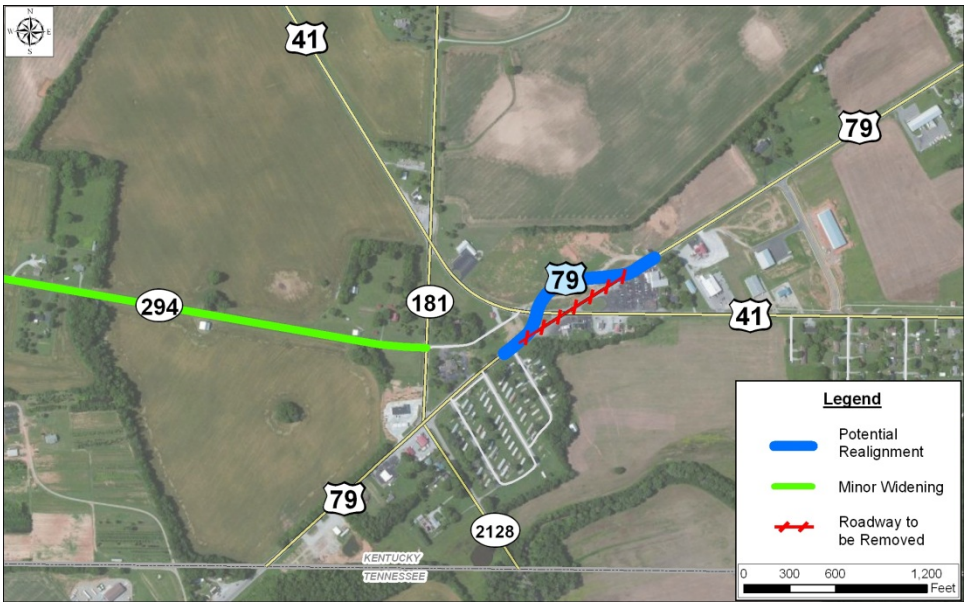


Figure 22: Conceptual Realignment of US 79

3. Realignment of US 41, shown in **Figure 23**. This concept realigns US 41 from west of existing KY 181 to east of US 79 through a proposed commercial development. This realignment would eliminate the adverse skew angles at the US 41 intersections with both KY 181 and US 79.

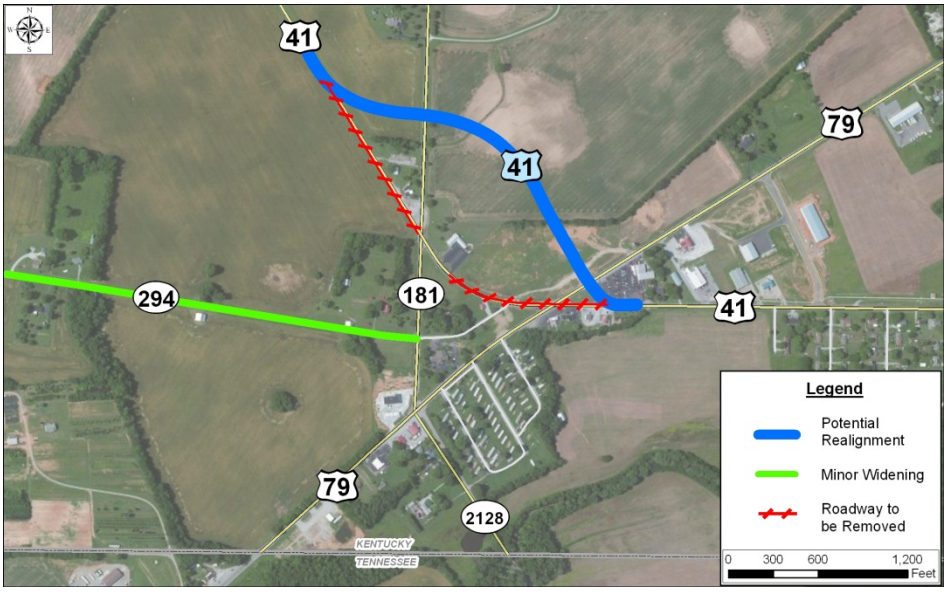


Figure 23: Conceptual Realignment of US 41

4. Realignment of KY 181 and Realignment of US 79, shown in **Figure 24**. This concept realigns both KY 181 (Alternative 1) and US 79 (Alternative 2). This combination would eliminate the adverse skew angles at the US 41 intersections with both KY 181 and US 79.

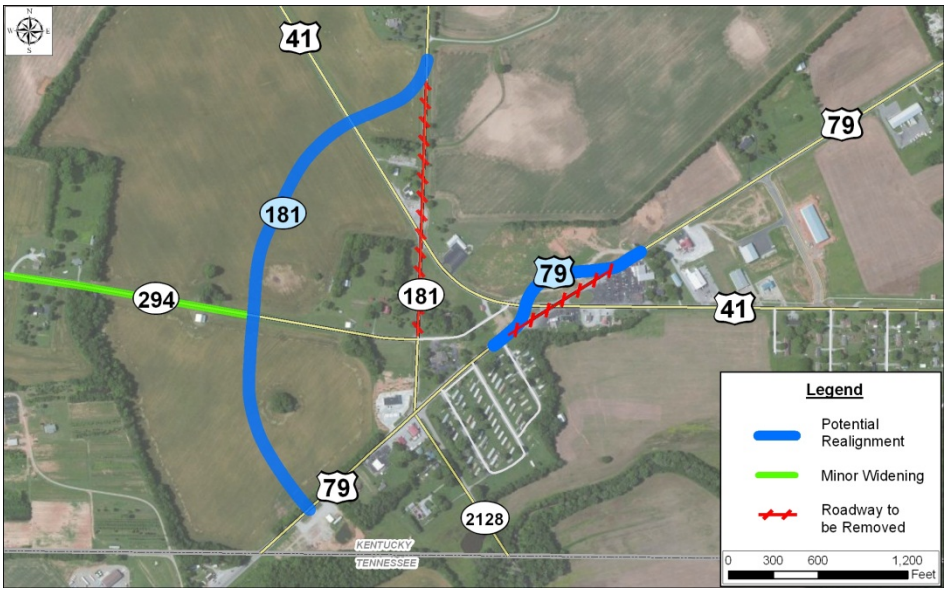


Figure 24: Combination of Realignment of KY 181 and of US 79

An additional alternative was discussed but not presented to the public. A new Northern Connector, shown in **Figure 25**, would have included a new connector route around the northern half of Tiny Town, from US 79 east of US 41 to US 79 west of KY 181. As shown, it would connect to US 79 east of Tiny Town at the existing entrance to Patriot Park, providing a connection to US 41. Existing KY 181 would be removed from the existing KY 294 intersection north to the proposed connector. One residence would be taken with this concept. The benefits a northern connector would provide are minimal as through traffic on US 79 would continue to travel through the existing skewed intersection at US 41. As the concept would not address many of the intersection issues in the triangle, it was not considered a reasonable alternative.

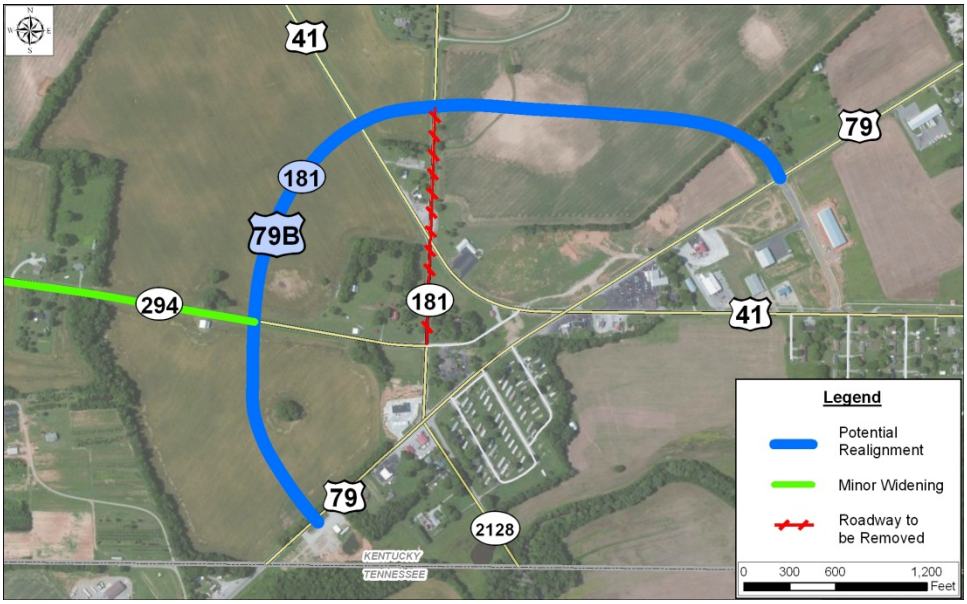


Figure 25: Conceptual Northern Connector

The results of the public meeting questionnaire are summarized in **Figure 26** and as follows:

1. Alternative 1 – Realignment of KY 181 (45% in favor)
2. Alternative 2 – Realignment of US 79 (25% in favor)
3. Alternative 3 – Realignment of US 41 (25% in favor)
4. Alternative 4 - Combination of Alternative 1 and Alternative 2 (50% in favor)

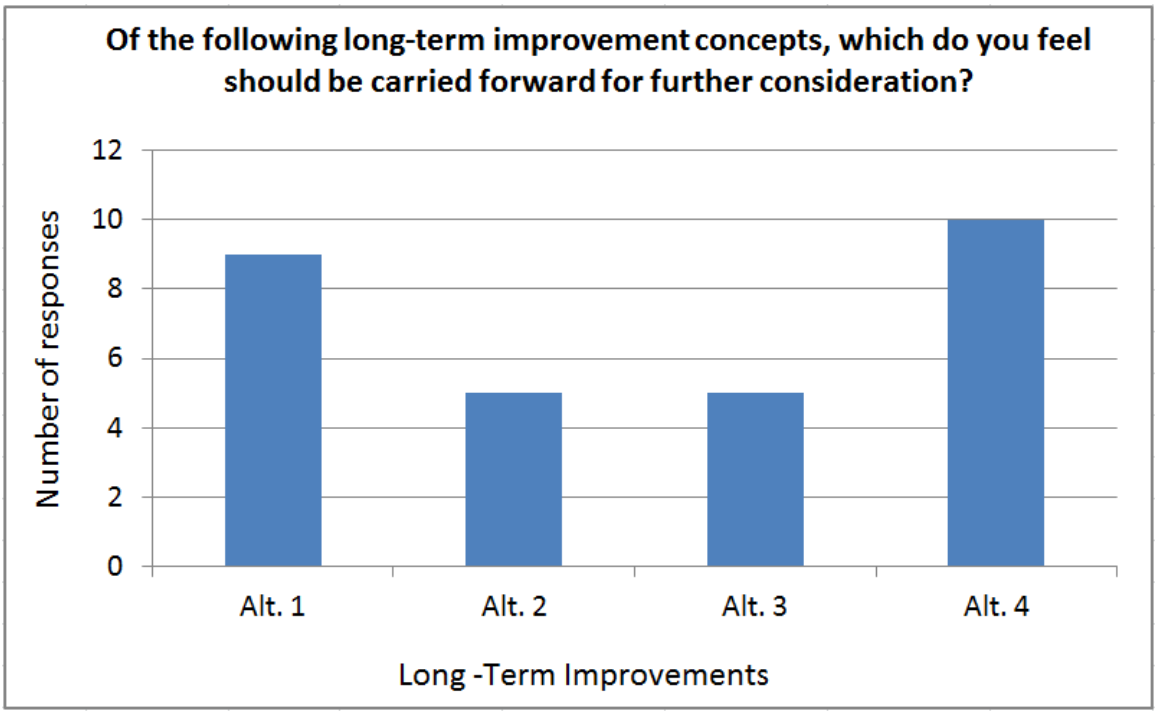


Figure 26: Public Comment Summary – Long-Term Improvements

Nine respondents indicated Alternative 1 should be considered further. This was second only to Alternative 4, a combination of Alternative 1 and Alternative 2, which received 10 responses. It should also be mentioned that all long-term options included provisions to widen KY 294 westward from the Tiny Town "Knot" area.

One additional long-term option was mentioned by several meeting attendees. This alternative would have realigned US 41 south of its current location to provide a more perpendicular intersection with US 79. This alternative was not considered reasonable by the Study Team because a residential development is planned for the area east of US 79 and south of US 41, which would be adversely affected by the alternative.

Table 3 presents a summary of all the alternatives as well as combinations of alternatives in the case of Alternative 4. Preliminary construction cost estimates for these long-term concepts were developed based on KYTC average unit bid prices from 2010 and the construction of a three-lane section (two travel lanes with a continuous center turn lane). Turn lanes were also included on approach roadways. A 20 percent contingency was included, as well as a cost associated with design (10 percent), and a cost of contractor mobilization and demobilization (4.5 percent). The widening of KY 294 includes reconstructing the existing route with an improved two lane section, including two 11-foot wide lanes and 4-foot wide paved shoulders. KYTC District 3 provided right-of-way and utility estimates.

Table 3: Summary of the Long-Range Corridor Alternatives

Project	Description	Length	Approximate cost ($Millions)	Design	Right-of-Way	Utilities	Construction
1. Realign KY 181	Realign KY 181 from north of US 41 to US 79 west	0.8 Miles	$3.8	$250,000	$250,000	$670,000	$2,610,000
2. Realign US 79	Realign US 79 west of the existing US 41 intersection	0.2 Miles	$2.3	$110,000	$300,000	$830,000	$1,090,000
3. Realign US 41	Realign US 41 from west of KY 181 to east of US 79 intersection	0.6 Miles	$2.8	$185,000	$225,000	$450,000	$1,900,000
4. Realign KY 181 & Realign US 79	Realignment of KY 181 and realignment of US 79	1.0 Miles	$6.1	$360,000	$550,000	$1,500,000	$3,700,000
5. Widen KY 294	Widen to two 11' lanes from KY 181 west to Tennessee state line	3.0 Miles	$9.2	$610,000	$550,000	$1,700,000	$6,370,000

4 RECOMMENDATIONS

The Guthrie "Knot" Planning Study resulted in the development of a number of short-term and long-term improvement concepts to improve travel efficiency and safety through the study area. The Study Team met in November 2011 to discuss the findings from the public information meeting and to make final study recommendations. Based on the input from the public meeting and discussions with stakeholders, it was decided that one short-term improvement and one long-term improvement would be recommended. **Figure 27** shows the study recommendations, which include the proposed access management changes at the US 41 intersection with US 79 and the realignment of KY 181.

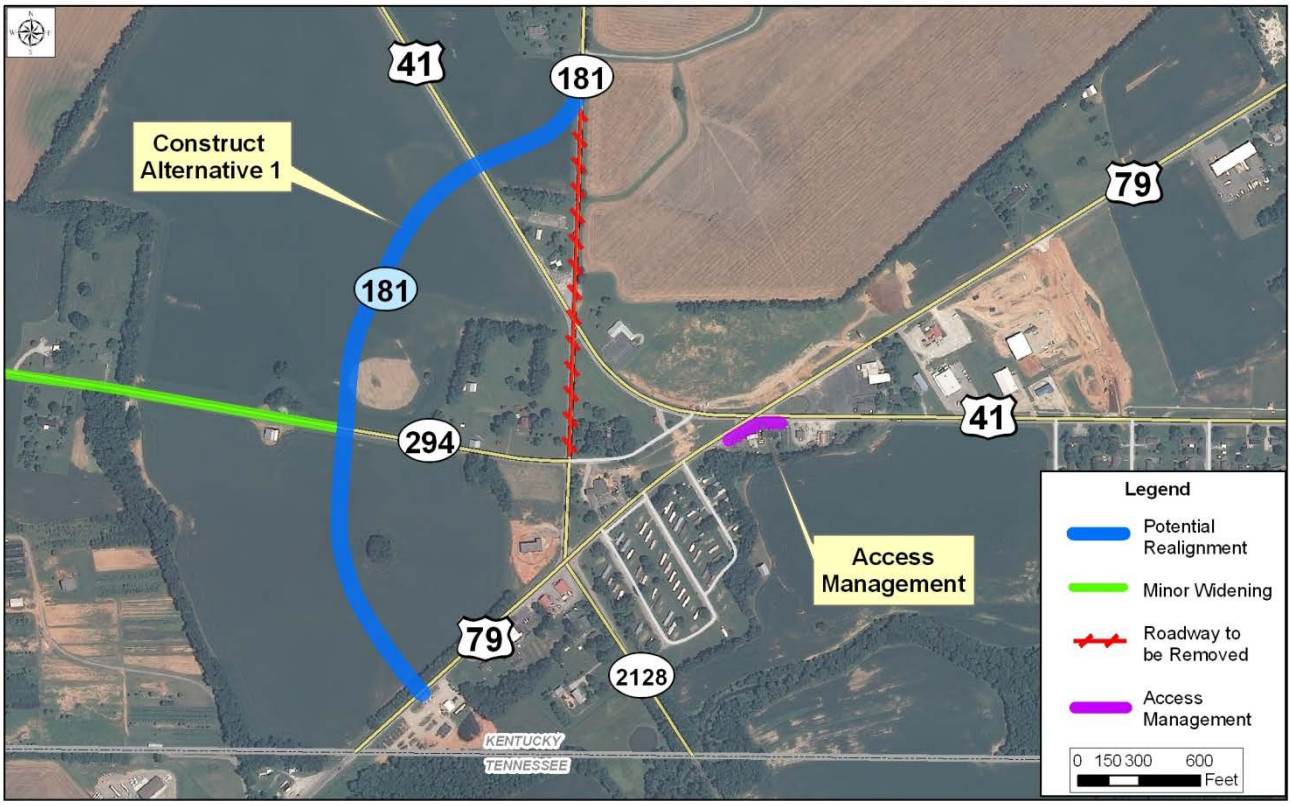


Figure 27: Recommended Short-Term and Long-Term Improvements

The Study Team also discussed the need for additional consideration of traffic calming concepts on Graysville Road. As Graysville Road is a county route (owned and maintained by Todd County), the team did not make any specific recommendations on what improvements should be considered. However, Todd County is strongly encouraged to work with KYTC District 3 to implement traffic calming to reduce traffic volumes and travel speeds on Graysville Road.

Appendix A – Meeting Summaries

ENTRAN
ENGINEERING INFRASTRUCTURE SOLUTIONS

Meeting Summary

TO: Jeff Moore
Project Manager, District 3 Planning
Kentucky Transportation Cabinet

FROM: Brian Aldridge, P.E.
Project Manager
ENTRAN, PLC

DATE: March 9, 2011

SUBJECT: KYTC Item #3-8630.00
Todd County Scoping Study
Kentucky Statewide Planning Contract

The kickoff meeting for the subject scoping study was held on February 22, 2011 at 9:00 a.m. CST in the KYTC District 3 conference room. The following individuals were in attendance:

Attendees:

Allen Cox	KYTC – District 3 Traffic/Permits
Kelly Divine	KYTC – District 3 Right-of-Way
Tonya Higdon	KYTC – Planning
Keirsten Jaggers	KYTC – District 3 PIO
Deneatra Henderson	KYTC – District 3
Jeff Moore	KYTC – District 3
Craig Morris	Pennyrile ADD
Mark Mudd	KYTC – District 3 Engineering Support
J.C. Puryear	KYTC – District 3 Utilities
Steve Ross	KYTC – Planning
Renee Slaughter	KYTC – District 3 Environmental
Scott Thomson	KYTC – Planning
Brian Aldridge	ENTRAN
Tom Creasey	ENTRAN
Glenn Hardin	ENTRAN

After introductions, Jeff Moore welcomed everyone to the kickoff meeting for the Guthrie "Knot" Scoping Study. Jeff described the "knot" as the area where US 41, US 79, KY 181, and KY 294 come together, forming a large triangle west of Guthrie in southern Todd County. This area is also known as Tiny Town. A draft Purpose and Need Statement was provided for discussion. The study will focus on investigating existing deficiencies in and around the junction and short term projects to address existing safety and capacity issues.

Longer term projects to meet the future transportation needs of the area will also be examined and evaluated. The study will follow a 12-month schedule.

Brian Aldridge discussed the focus area for the study, located just north of the Tennessee state line and approximately six miles north of Clarksville, TN. The study will be heavily influenced by the construction of the Hemlock Semiconductor facility, located just off US 79 south of the study area in Tennessee. Hemlock is to be in operation in 2012 and once fully implemented, it could employ as many as 4,000 to 5,000 employees. Hemlock produces polycrystalline silicon used in the electronics industry, particularly the production of solar power equipment, and other "satellite" industries are likely to locate nearby to take advantage of both the raw materials used by Hemlock as well as the products created by Hemlock. This has been the experience of their other facility located in Michigan.

With its proximity to the Hemlock facility and access to two US routes, Guthrie is likely to attract some of the satellite industries. Todd County has placed purchase options on some parcels located west of the study area (located on KY 294) for likely industrial development related to Hemlock. Brian mentioned that KY 294 would require upgrades should future traffic volumes (especially trucks) increase significantly. Tennessee has already improved SR 294, which turns into KY 294. Jeff added that Patriot Park is another industrial site located on US 79 east of the study area that is currently being marketed for development.

The scope of work was discussed and an outline of the scope was shown. Brian indicated ENTRAN was currently engaged on the first four tasks: Existing Conditions Inventory, Traffic Forecasting, Environmental Footprint, and Purpose and Need Development. He said the environmental fieldwork has been delayed due to the weather but that literature review and records searches are underway. Brian indicated there are no previous studies available for the study area. Jeff briefly discussed the history of the Tiny Town area and how land use and historical travel patterns changed with the construction of I-24 to the south.

Brian presented some of the existing conditions for the study area. US 79 is functionally classified as a rural principal arterial, US 41 and KY 181 are rural minor arterials, and KY 294 is a rural minor collector. US 79 has 11-foot wide lanes and both US 41 and KY 181 have 10-foot wide lanes; KY 294 has 9-foot wide lanes. Shoulder widths on all facilities range from one to four feet in width.

The crash history between January 1, 2006 and December 31, 2010 was presented. Brian noted that, on the surface, none of the study corridors appear to have a high crash rate. However, the four main intersections each have experienced a significant number of crashes over that five year period. A graphic was shown depicting the primary crash types that occurred at each intersection, and there was some discussion on each location. Rear-end and angle crashes appear to be an issue at the US 79/KY 181 intersection. Brian suggested turn lanes on US 79 may be a countermeasure worthy of consideration. Access management seems to be an issue at the US 41/US 79 intersection with the gas station located on the south side having uncontrolled access to both roads. However, the number of crashes at this intersection has likely been tempered as it is currently a four-way stop-controlled. The severe

skew angle at the US 41/KY 181 intersection may be a contributing factor to the large number of angle crashes that have occurred.

There was some discussion on the environmental footprint for the study. US 41 is part of the "Trail of Tears" auto route, something that the study must take into consideration should significant improvements be recommended for the route. The Stagecoach Inn (or Gray's Inn) is located in the triangle on the north side of Graysville Road, northeast of the KY 181/KY 2894 intersection. This property is located on National Register of Historic Places (NRHP). The Pennyrile ADD will be performing the Environmental Justice evaluation for the study. The trailer park located south of US 79 may be an issue.

Traffic forecasting for the study was discussed. There is no local travel demand model in place, and the Kentucky Statewide model will be used for input to the process. Brian indicated that low, medium, and high growth scenarios will be evaluated in terms of future traffic demand. Tom Creasey indicated that estimates of future employment within the area will be critical to developing these growth scenarios. It was mentioned that the Clarksville Metropolitan Planning Organization (MPO) may have some socioeconomic data estimates related to growth in the Clarksville area as a result of Hemlock. Craig Morris said he would contact the MPO.

Historical traffic trends for each route were discussed. Growth in daily traffic on each route has been relatively steady, but 2010 average daily traffic estimates (ADT) do not suggest a significant capacity concern. US 79 currently carries approximately 6,500 vehicles per day (VPD) near KY 181 and about 3,500 VPD east of the study area. East of the study area, US 41 carries approximately 4,000 VPD. All remaining study segments have less than 2,000 VPD. Jeff indicated that while the project's primary focus would be on safety and access, District 3 will provide peak hour turning movements to make sure the necessary data is available for the study to move forward.

It was previously discussed during the scoping meeting for the study that the southern portion of Todd County has a rather large Mennonite community, particularly along KY 181 north of the study area. Mennonites travel by both automobile and tractor, and by horse and buggy primarily on Sunday.

There was some discussion concerning the city limits for Guthrie and the location of the optioned parcels being marketed west of the study area on KY 294. Brian showed a map of the city limits with two large parcels (one north of KY 294 and the other south) included in the city limits about ½ mile west of KY 181. However, he showed a picture of a real estate sign for what was believed to be the proposed industrial site further west. It was confirmed that the real estate sign marked the correct location, and it was later confirmed that the latest version of the Guthrie city boundary has changed and no longer includes the two parcels closer to KY 181.

One of the next steps will be to hold a combined Local Officials and stakeholders meeting. Jeff asked how we might solicit input from the attendees. Brian mentioned the use of a workshop/brainstorming session where the attendees are divided into groups and asked to

point out trouble spots and needed improvements. It was agreed this approach would be preferable to a questionnaire. There will be a single public meeting during the study, which will be held after conceptual alternatives have been developed.

The meeting ended at approximately 10:00 a.m.

ENTRAN
ENGINEERING INFRASTRUCTURE SOLUTIONS

Meeting Summary

TO: Jeff Moore
Project Manager, District 3 Planning
Kentucky Transportation Cabinet

FROM: Brian Aldridge, P.E.
Project Manager
ENTRAN, PLC

DATE: April 11, 2011

SUBJECT: KYTC Item #3-8630.00
Todd County Scoping Study
Kentucky Statewide Planning Contract
Local Officials and Stakeholders Meeting

A combined Local Officials and Stakeholders meeting for the subject scoping study was held on April 6, 2011 at 9:30 a.m. CDT in the Elkton Bank and Trust conference room in Guthrie. The following individuals were in attendance:

Attendees:

Mike Baker	Todd County Industrial Foundation
Gary Braden	Pennyrile RECC
Nancy Camp	City of Elkton
Bert Covington, Jr.	Covington Farms, Inc.
Harry Greenmoo	Guthrie Water
Keith Dwyer	Guthrie Police Chief
Michael Forrest	AT&T
Darryl Greenfield	Todd County Judge Executive
Barry Groves	City of Trenton
John Haley	Todd County Water
Jen Harris	Todd County Health Department
Kyle Kenner	Logan-Todd County Water
Mary C. King	The Hairitage & Guthrie City Council
Scott Marshall	Guthrie Mayor
Steve Meriwether	Stage Coach Inn
Dean and Jean Moore	Robert Penn Warren House
Helen and Ray Morris	Landowners
Jimmy Scott	Elkton City Council
Kim Skippers	Dilling Group
Glenn Slack	Reburn-Julia Associates
Melba Smith	Guthrie City Council
Michael Smith	Creekside Meadows
Albert Thomas	Guthrie City Council

J. Walton	Logan-Todd County Water
George Winters	City of Guthrie
J.R. Ham	KYTC – Planning
Tonya Higdon	KYTC – Planning
Keirsten Jaggers	KYTC – District 3 PIO
Deneatra Henderson	KYTC – District 3
Jeff Moore	KYTC – District 3
Greg Meredith	KYTC – District 3
Brian Aldridge	ENTRAN

After introductions, Jeff Moore welcomed everyone to the first of two Local Officials and Stakeholders meetings for the Guthrie "Knot" Scoping Study. Jeff described the "knot" as the area where US 41, US 79, KY 181, and KY 294 come together, forming a large triangle west of Guthrie in southern Todd County. This area is also known as Tiny Town. He noted this is the first transportation planning study performed in the area, and the study will follow a 12-month schedule. There are no project phases funded beyond the current study.

Brian Aldridge delivered a brief presentation describing the purpose and scope of the study. Handouts were provided discussing planning studies. He indicated that studies such as these are necessary to not only examine existing issues and concerns, but also long-term needs. Transportation projects take a great deal of time to implement (often 10 years or more), and studies such as these are critical to identify and prioritize needed improvements so that funding can be sought. The ultimate goal is to provide to KYTC a list of short-term projects that can be implemented in the near term and a list of prioritized projects that can be considered for inclusion in the Six Year Highway Plan. The scope of work was discussed and an outline of the scope was shown.

A draft Purpose and Need Statement was provided for discussion. This Purpose and Need Statement was written to evaluate not only the study, but also the projects that may be considered over the course of the study. The purpose of the study is to explore the scope of and justification for needed transportation improvements in the Tiny Town area. Short-term and long-term projects will be evaluated to improve safety and efficiency of travel and to provide better connections for travelers along the existing transportation network.

The focus area for the study is located just north of the Tennessee state line and approximately six miles north of Clarksville, TN. The study will be heavily influenced by the construction of the Hemlock Semiconductor facility, located just off US 79 south of the study area in Tennessee. Hemlock is to be in operation in 2012 and once fully implemented, it could employ as many as 4,000 to 5,000 employees. Based on the experience at their other facility in Hemlock, Michigan, other "satellite" industries are likely to locate nearby to take advantage of both the raw materials used by Hemlock as well as the products it produces (Hemlock produces polycrystalline silicon used in the electronics and solar power industries.)

With its proximity to the Hemlock facility and access to two US routes, Guthrie is likely to attract some of the satellite industries. Todd County has placed purchase options on some

parcels located west of the study area (located on KY 294) for likely industrial development related to Hemlock. Brian mentioned that KY 294 would likely require upgrades should future traffic volumes (especially trucks) increase significantly. Tennessee has already improved Tylertown Road and Jim Johnson Road, which becomes KY 294 in Kentucky. Patriot Park is another industrial site located between US 41 and US 79 east of the study area that is currently being marketed for development.

Brian presented some of the existing conditions for the study area. US 79 is functionally classified as a rural principal arterial, US 41 and KY 181 are rural minor arterials, and KY 294 is a rural minor collector. US 79 has 11-foot wide lanes and both US 41 and KY 181 have 10-foot wide lanes; KY 294 has 9-foot wide lanes. Shoulder widths on all facilities range from one to four feet in width.

The crash history between January 1, 2006 and December 31, 2010 was presented. The four main intersections each have experienced a significant number of crashes over that five year period. A map depicting the primary crash types that occurred at each intersection was provided as a handout, and there was some discussion on each location. Rear-end and angle crashes appear to be an issue at the US 79/KY 181 intersection. Brian suggested turn lanes on US 79 may be considered in the study, but could result in the loss of parking for businesses on the south side of US 79. Access management seems to be an issue at the US 41/US 79 intersection with the gas station located on the south side having uncontrolled access to both roads. However, the number of crashes at this intersection has likely been tempered as it is currently four-way stop-controlled. The severe skew angle at the US 41/KY 181 intersection may be a contributing factor to the large number of angle crashes that have occurred. There was some discussion concerning the sight distance at the intersection, particularly for southbound drivers on KY 181 approaching the intersection. US 41 is curved through this intersection.

Brian discussed the environmental footprint under development for the study area and provided a brief summary of the National Environmental Policy Act of 1969 (NEPA) Process. US 41 is part of the "Trail of Tears" auto route and the study must take that into consideration. The Stagecoach Inn (or Gray's Inn) is located in the triangle on the north side of Graysville Road, northeast of the KY 181/KY 294 intersection. This property is located on National Register of Historic Places (NRHP). The property located northwest of the intersection may also be historic, but no formal determination has been performed. Brian said if it is found to eligible for the NRHP, the likely boundary may include the outline of trees around the home and surrounding outbuildings. Widening KY 181 would be difficult if that determination is made. The Pennyrile ADD will be performing the Environmental Justice evaluation for the study.

Traffic forecasting for the study was discussed. Brian indicated that low, medium, and high growth scenarios will be evaluated in terms of future traffic demand as there are many unknowns related to future development in and around the study area. KYTC District 3 has recently performed turning movement counts at the key intersections in the study area and those will be used in the process.

Brian mentioned that this meeting was the first step in the public involvement process. There will be a single public meeting during the study, which will be held after conceptual alternatives have been developed. A second Local Officials and Stakeholders meeting will be held prior to the public meeting to discuss the information that will be presented to the public.

At the conclusion of the presentation, a brainstorming session was conducted to allow the attendees to assist the project team in answering two critical questions. First, they were asked to point out specific trouble spots or issues that should be considered in the study. Second, they were asked to identify possible transportation improvements that should be considered. The attendees were divided into five groups, and their recommendations are summarized below.

Group 1

- Proposed improvements
  - Access control at Minit Mart near US 79 and US 41
  - Consider increasing turning radius from eastbound US 41 to southbound US 79 (investigate availability of using state property near the intersection)
  - Better "guide" signs at all intersections
  - Widen KY 294 to TN state line (minor widening discussed included two 11-foot wide lanes with 8-foot wide shoulder that is partially paved)
  - Build loop away from knot to west to connect to KY 181 or US 79

Group 2

- Transportation issues
  - Drainage issues
- Proposed improvements
  - New connection from KY 294 to US 79; improve KY 294 to Hemlock
  - Consider a four-way stop at US 41 and KY 181 with a flashing beacon
  - Eliminate "through" traffic on Graysville Road
  - Increase turning radius at US 79 and US 41
  - Provide better access control at Minit Mart

Group 3

- Proposed improvements
  - Bypass to west (KY 294)
  - Additional signage at US 41 and KY 181
  - Consider making US 41 between KY 181 and US 79 a "local only" route
  - Left turn lane on northbound US 79 at KY 181
  - Sidewalk connection along US 41 to east

Group 4

- Transportation issues
  - Signs are too small at US 79 and KY 181; some advance warning signage is needed to direct traffic to turn onto KY 181
  - Congestion is an issue on Graysville Road

- Crashes at Patriot Park entrance on US 41
- Consider impact on downtown Guthrie, particularly associated with truck traffic toward Springfield
- KY 346 (Ewing St.) serves as a cut-through

- Proposed improvements
  - Consider a traffic signal at US 41 & US 79
  - Western bypass with connection to Patriot Park to the east on US 79
  - Speed limit reduction on US 79 from Tennessee state line to north of Patriot Park
  - Speed limit reduction on US 41 north of the knot

Group 5

- Transportation issues
  - New school(s) proposed in north Montgomery county
  - Huge subdivision planned off Port Royal Road (KY 2128)
  - 1,000 acre industrial park on KY 294
  - 800 acres of industrial property on US 79 north of KY 2128
  - TDOT has recently discussed widening US 79 to four lanes south of the Kentucky state line
  - Caution about constriction to any creeks as they currently control flooding in and around Guthrie
- Proposed Improvements
  - Bypass from KY 2128 to the west then north around to Patriot Park on US 41
  - Consider closing Graysville Road (Stagecoach Inn)
  - Add directional signage to Hemlock & other industrial parks
  - Add more pavement to the west at KY 181 & US 41 to help "square up" trucks

The meeting ended at approximately 12:00 p.m.

Meeting Summary

TO: Jeff Moore
Project Manager, District 3 Planning
Kentucky Transportation Cabinet

FROM: Brian Aldridge, P.E.
Project Manager
ENTRAN, PLC

DATE: August 1, 2011

SUBJECT: KYTC Item #3-8630.00
Todd County Scoping Study
Kentucky Statewide Planning Contract

The second project team meeting for the subject scoping study was held on July 18, 2011 at 9:00 a.m. CST in the KYTC District 3 conference room. The following individuals were in attendance:

Attendees:

Rachel Fortson	KYTC - District 3
J.R. Ham	KYTC – Planning
Tonya Higdon	KYTC – Planning
Deneatra Henderson	KYTC – District 3
Daniel Hulker	KYTC – Planning
Jeff Moore	KYTC – District 3
Craig Morris	Pennyrile ADD
Mark Mudd	KYTC – District 3 Engineering Support
Renee Slaughter	KYTC – District 3 Environmental
Brian Aldridge	ENTRAN
Tom Creasey	ENTRAN

After introductions, Jeff Moore welcomed everyone to the second project team meeting for the Guthrie "Knot" Scoping Study and provided a brief summary of why the study is underway. The triangular knot of intersections is known as Tiny Town. Brian Aldridge recapped the draft Purpose and Need Statement that has been developed over the course of the study. He noted there is between 3,000 and 4,000 acres of potential industrial use land in the vicinity of the study area and development is anticipated in these areas as a direct result of the Hemlock Semiconductor facility, located north of US 79 south of the study area in Tennessee.

Brian discussed the combined Local Officials and Stakeholders meeting that was held in Guthrie on April 6. The meeting was very well attended and a group brainstorming exercise

was used to gather input from the attendees. It was noted that each of the five groups provided similar input in terms of projects that should be considered as part of the study.

A handout showing the traffic counts collected by KYTC District 3 was provided and discussed. Brian said that the traffic counts at the four intersections within the study area would not warrant the installation of a traffic signal, a potential improvement that was suggested at the Local Officials meeting. Jeff added some background information on how traffic passes through the "triangle" noting that KY 294 provides indirect access to Fort Campbell (as well as the Hemlock site). KY 294 becomes Graysville Road (a city street) east of KY 181, and its connection to US 41 contributes to significant traffic during the peak hours and relatively high speeds. The KY 294-to-Graysville Road crossing volume is high enough that through traffic on KY 181 will often slow down (or yield the right-of-way) approaching the intersection even though only the KY 294 and Graysville approaches are stop-controlled.

Brian briefly discussed the Environmental Overview and said it was nearly ready to submit. A graphic depicting the natural environment footprint was shown and Brian said only a limited number of resources were located within the study area. Another graphic was shown depicting the human environment and Brian specifically mentioned the known National Register of Historic Places (NRHP) site, the Stagecoach Inn or Gray's Inn, located in the triangle north of Graysville Road and east of KY 181 Another site that is potentially eligible for the NRHP is the Louis Downer Farm located northwest of the KY 181 intersection with KY 294. The "Crossings", a planned multi-use development north of the US 41 intersection with US 79 was also discussed.

The preliminary traffic forecasts for the project were discussed. Brian began by relating some Census data for Todd County. Todd County's population grew by about 0.3 percent per year between 2000 and 2009. Because it is difficult to predict the impact Hemlock will have on growth in the area, the study will consider a range of forecasts including low, medium, and high growth scenarios. The low growth scenario is based on output from the Kentucky Statewide Travel Demand Model which is relatively consistent with the population growth from the Census with traffic on most study area roadways growing by 0.4 to 0.5 percent per year. The medium growth scenario is based on the lower of the historical growth rate or the functional class average growth rate for Todd County based on KYTC's latest available data. High Growth is based on the higher of the historical growth rate or the functional class average growth rate for Todd County. The medium growth scenario includes annual growth rates ranging from 0.6 to 2.1 percent and the high growth scenario ranges from 3.45 to 4.07 percent per year. It was agreed that the high growth scenario should be used for purposes of this study. It was noted that even at the assumed high growth rates, no roadway segment within the study area would be anticipated to require widening to four lanes before 2030.

Rachel Fortson presented a draft of the proposed signage improvements proposed for the study area and said installation would begin very soon. Jeff added that most (if not all) of these improvements could be implemented before the public meeting, and would demonstrate progress to the attendees at the April Local Officials and Stakeholders meeting. Brian added some comments he had heard at that meeting regarding some potential safety

concerns at Patriot Drive, just east of the study area. Some photos were shown depicting the Patriot Drive approaches to US 41 (south) and US 79 (north). Someone at the meeting suggested that drivers traveling Patriot Drive do not always obey the stop signs (only Patriot Drive is stop-controlled at both intersections). Brian suggested that the existing stop signs, thought to be 30" or 36" signs, could be replaced with oversized 48" signs and double signs could be included (one each on the left and right side of the roadway).

Speed limits through the study area were discussed. ENTRAN prepared a graphic showing the locations of existing speed limit signs and zones based on comments from the Local Officials and Stakeholders meeting. There was some discussion concerning the lack of a transition from most of the 55 mile per hour (MPH) zones to the 35 MPH zones. Extending the 35 MPH zone on US 41 to downtown Guthrie was one option discussed, as was evaluating 45 MPH "buffer" zones outside the existing 35 MPH areas. This could help alleviate trucks using air brakes to rapidly decelerate as they exit the 55 MPH areas entering the Tiny Town area.

The following short-term / "Spot" improvements were discussed:

1. Construction of left-turn lanes on US 79 at the KY 181 intersection. A number of rear end crashes have occurred at this intersection, and the addition of left-turn lanes on US 79 would be one way to minimize such crashes. This improvement would be difficult without significant right-of-way impacts and removal of parking for businesses south of US 79.
2. Access management at US 79 and US 41 intersection. This is a very large, skewed intersection with four-way stop control and the Minit Mart has uncontrolled access along the southern and eastern approaches. The potential short-term improvement includes maintaining the intersection in its current location but constructing a curbed island along most of the Minit Mart's frontage to define two access points – one on US 41 east of the intersection and one on US 79 south.
3. Minor reconfiguration of the US 41 and KY 181 intersection. This is a very large, skewed intersection with two-way stop control on the KY 181 approaches. Vehicles, particularly trucks, on southbound KY 181 will often veer to the right (almost as if they were attempting to turn right onto westbound US 41) to maximize sight distance before crossing US 41 or turning left towards Guthrie. The proposed improvement is to construct a curbed island to define a right "turning roadway" onto westbound US 41 and to prevent through and left-turning vehicles from veering to the right. Additional maintenance activities that could be considered include some shoulder stabilization on the northbound KY 181 approach for right-turning vehicles. There was also some discussion concerning converting this intersection to four-way stop control.
4. Traffic calming on Graysville Road. Graysville Road experiences a significant volume of "cut-through" traffic as it provides a more direct east-west connection than either US 41 or US 79 to KY 181 and then KY 294. It was decided three options should be discussed with the Local Officials: 1) do nothing, 2) traffic

calming and speed reduction through speed humps or tables, and 3) permanent closure of Graysville.

The following long-term conceptual options were discussed:

1. Realignment of KY 181. This concept provides a western connector around Tiny Town by redirecting existing KY 181 from north of the US 41 intersection to the west along a semicircular route to US 79 west of the existing KY 181 intersection. Existing KY 181 would be removed from the existing KY 294 intersection north to the proposed realignment north of US 41. A minor widening of KY 294 west of the realigned KY 181 could be included with this option.
2. Realignment of US 79. This concept realigns US 79 to the west of the existing US 41 intersection to provide a more perpendicular intersection with US 41 and to eliminate the existing access issues with the Minit Mart. This concept would likely require the closure of Graysville Road near US 41 as it would be too close to the proposed US 79 intersection.
3. Realignment of US 41. This concept realigns US 41 from west of existing KY 181 to east of US 79 through the proposed "Crossings" development. This realignment would eliminate the adverse skew angles at the US 41 intersections with both KY 181 and US 79. The study team agreed to show a modified version of this concept to the public.
4. Northern Connector. This concepts includes a new connector route around the northern half of Tiny Town, from US 79 east of US 41 to US 79 west of KY 181. As shown, it would connect to US 79 east of Tiny Town at the existing entrance to Patriot Park, providing a connection to US 41. Existing KY 181 would be removed from the existing KY 294 intersection north to the proposed connector. One residence (the Morris residence) would be taken with this concept.

Brian noted some concerns relative to the benefits a northern connector would provide and suggested perhaps it should be shown to the Local Officials but not to the public. Jeff added the concept would not address many of the intersection issues in the triangle. Deneatra Henderson suggested showing a combination of the KY 181 and US 79 realignments. It was decided this option plus the four above would be shown at the next Local Officials meeting. Any recommended turn lanes should also be included in the cost estimates for these options.

Preliminary cost estimates for these long-term concepts were discussed. Brian mentioned the costs included some rough estimates for right-of-way and utilities and that input from the District would be sought before they were shown to the public.

There was some discussion concerning the priority of widening KY 294 west of the study area. Jeff said the widening should be the top priority of the study's recommendations to be consistent with the Unscheduled Projects List (UPL) prioritization. Todd County strongly supports this project to serve the anticipated industrial development to the west.

Next steps in the study will include a Local Officials meeting and a public meeting to be held the same day. The week of September 26-30 was discussed, and September 29 was chosen after the meeting. The Local Officials meeting will be held at 2 PM CST at the Guthrie Mayor's office. The public meeting will be from 5 to 7 PM CST at the Guthrie Senior Citizens Center. The meeting will follow an open house format with a brief presentation at around 5:15 (another presentation may be added at 6:15, if necessary). ENTRAN will develop a draft survey instrument to solicit public input at the meeting.

The meeting ended at approximately 10:30 a.m.

ENTRAN
ENGINEERING INFRASTRUCTURE SOLUTIONS

Meeting Summary

TO: Jeff Moore
Project Manager, District 3 Planning
Kentucky Transportation Cabinet

FROM: Brian Aldridge, P.E.
Project Manager
ENTRAN, PLC

DATE: November 11, 2011

SUBJECT: KYTC Item #3-8630.00
Todd County Scoping Study
Kentucky Statewide Planning Contract
Local Officials Meeting

A Local Officials meeting for the subject scoping study was held on September 29, 2011 at 2:00 p.m. CDT in the Guthrie City Hall. The following individuals were in attendance:

Attendees:

Bryan Blount	Todd County Industrial Foundation
Nancy Camp	City of Elkton
Darryl Greenfield	Todd County Judge Executive
Barry Groves	City of Trenton
Scott Marshall	Guthrie Mayor
Deneatra Henderson	KYTC - District 3
Tonya Higdon	KYTC – Central Office Planning
Keirsten Jaggers	KYTC - District 3
Greg Meredith	KYTC - District 3
Jeff Moore	KYTC - District 3
Mikael Pelfrey	KYTC – Central Office Planning
Joe Plunk	KYTC - District 3
Samantha K. Shirley	KYTC - District 3
Tom Creasey	ENTRAN, PLC
Brian Aldridge	ENTRAN, PLC

After introductions, Jeff Moore welcomed everyone to the second Local Officials meeting for the Guthrie "Knot" Scoping Study. Jeff described the "knot" as the area where US 41, US 79, KY 181, and KY 294 come together, forming a large triangle west of Guthrie in southern Todd County. He noted this is the first transportation planning study performed in the area, and the purpose of the meeting was to discuss the information that would be presented at the public meeting later that evening. He said the public meeting would be an open house format where the attendees could view the exhibits and ask questions of the

study team members. A formal presentation would be given at about 5:15 p.m. to familiarize everyone with the scope of the study and the alternatives that are under consideration. A questionnaire will be provided to collect input from the attendees. Copies of the exhibits were on display for the local officials to see.

Brian Aldridge provided a copy of the public meeting handout to everyone and provided some discussion on its contents. He said there are four short-term "spot" improvements under consideration and four long-term alternatives. The short-term improvements are as follows:

1. Construction of left-turn lanes on US 79 at KY 181
2. Reconfiguration of the US 41 and KY 181 intersection
3. Traffic Calming on Graysville Road
4. Curb construction along US 41 and US 79 near the convenience store

There was some discussion regarding the reconfiguration of the US 41 intersection with KY 181. This is a very large, skewed intersection with two-way stop control on the KY 181 approaches. Brian noted the proposed improvement, which includes separating the right turn from southbound KY 181 onto westbound US 41 from the southbound through and left turn, was an effort to prevent vehicles, particularly trucks, from veering to the right to maximize sight distance before crossing US 41 or turning left towards Guthrie. Brian said the project team believed the issue was limited sight distance to the east (towards Guthrie). It was noted the issue really deals with the sight distance to the west along US 41 as the skew angle on the southbound approach makes it difficult for trucks to see oncoming vehicles to their right. Therefore, the proposed concept should be revisited.

The four long-term improvements were developed based on input from the first local officials meeting in April. These concepts include the following:

1. Alternative 1 – Realignment of KY 181
2. Alternative 2 – Realignment of US 79
3. Alternative 2 – Realignment of US 41
4. Alternative 4 - Combination of Alternative 1 and Alternative 2

Each of the conceptual alternatives was developed in an effort to address the issues with the intersections within the triangle. Alternative 1 would alleviate concerns at both the KY 181 intersections with US 79 and US 41. Alternative 2 and Alternative 3 would address the skew angles at the US 79 intersection with US 41 and would also minimize the access issues with the convenience store on the south side of the intersection. Brian mentioned another alternative that had been discussed at the first local officials meeting in April that would have provided a semi-circular connection along US 41 around Tiny Town, effectively bypassing the area. He said the study team considered this option, but ultimately decided the utility of such a corridor would be minimal as through traffic on US 79 would continue to use the existing route.

The meeting ended at approximately 3:00 p.m.

PUBLIC MEETING SUMMARY

Guthrie "Knot" Planning Study
Todd County
Item No. 3-8630.00

Guthrie Senior Citizens Center
233 South Ewing Street
Guthrie, KY 42234
Thursday, September 29, 2011, 5:00 – 7:00 pm

A Public Meeting for the Guthrie "Knot" planning study was held on Thursday, September 29, 2011 at 5:00 pm at the Guthrie Senior Citizens Center in Guthrie. The purpose of the meeting was to provide information about the study, discuss potential alternative improvements to be considered, and solicit input from the public. The following individuals from the Kentucky Transportation Cabinet and the consultant staff were in attendance:

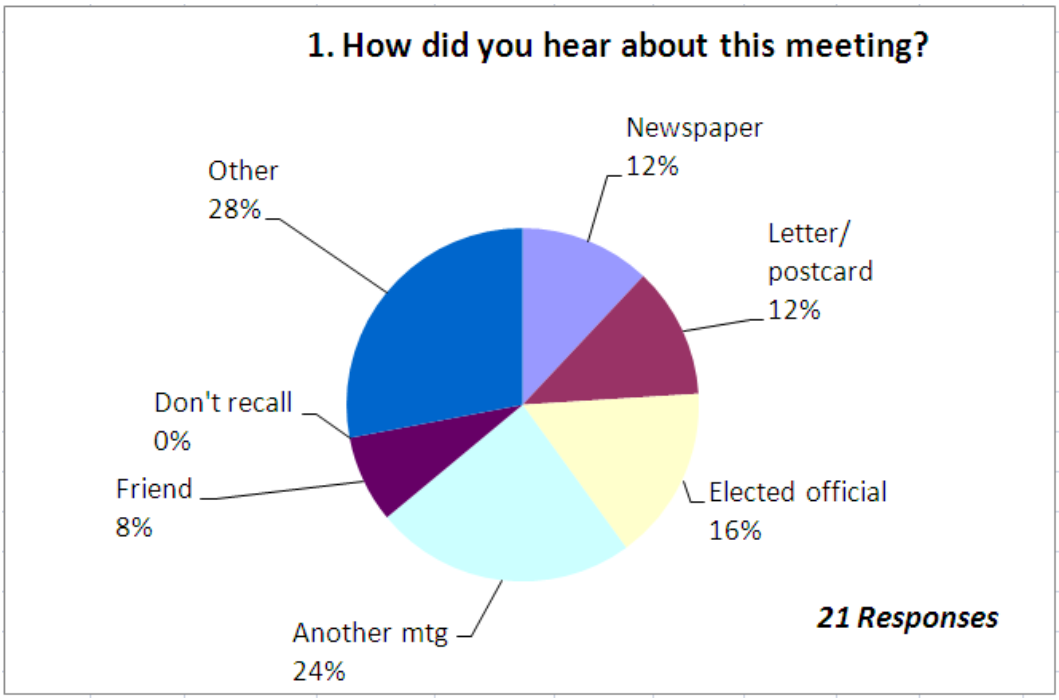
Tonya Higdon	KYTC – Central Office Planning
Mikael Pelfrey	KYTC – Central Office Planning
Jeff Moore	KYTC - District 3
Deneatra Henderson	KYTC - District 3
Keirsten Jaggers	KYTC - District 3
Greg Meredith	KYTC - District 3
Joe Plunk	KYTC - District 3
Samantha K. Shirley	KYTC - District 3
Tom Creasey	ENTRAN, PLC
Brian Aldridge	ENTRAN, PLC

The meeting was held in an open house format, with a formal presentation at 5:15 pm to explain the project and the considerations to provide comments on. Attendees were asked to sign in and were provided a project handout and questionnaire. KYTC and consultant staff were available to answer questions and discuss issues. Based on the sign-in sheets, 75 members of the public attended the meeting.

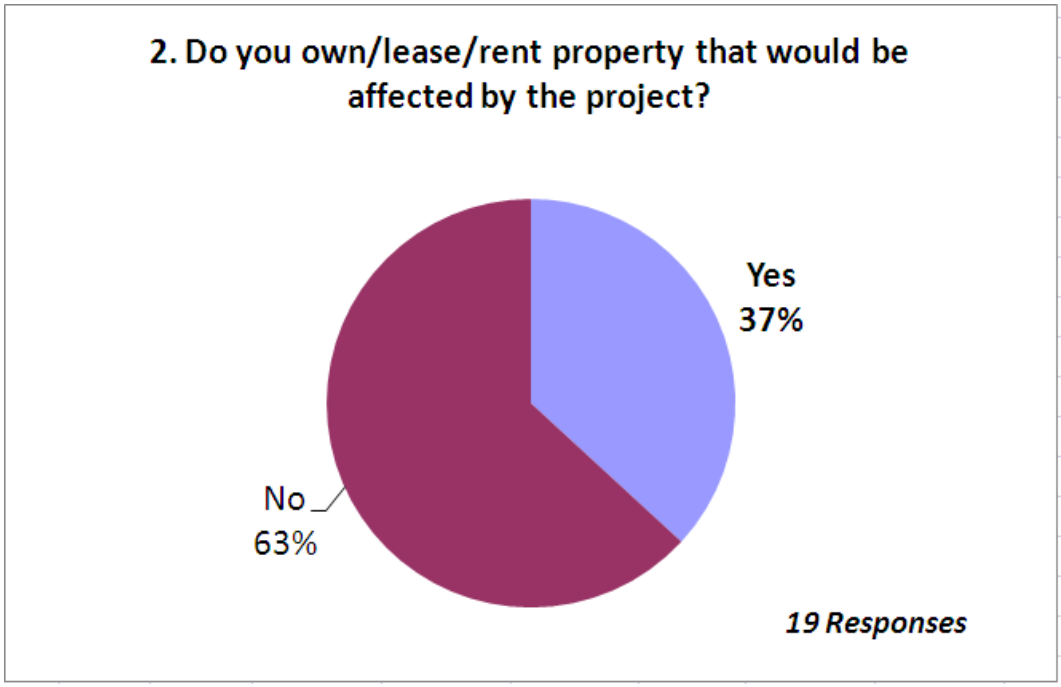
The following project exhibits were on display:

- Study Area with Existing and Future Traffic Volumes
- Crash History
- Long-Term Improvements Options
- Short-Term Improvement Options

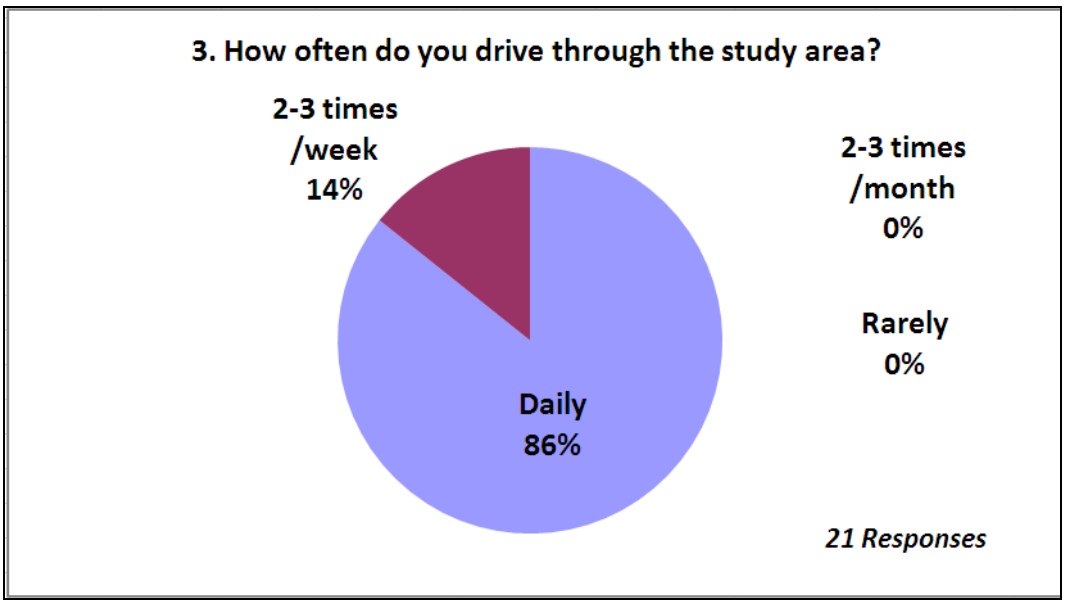
Public meeting attendees were given the option to either fill out their questionnaire at the meeting or return it by mail after the meeting. A total of 21 questionnaires were returned. The results of the questionnaire are summarized as follows:



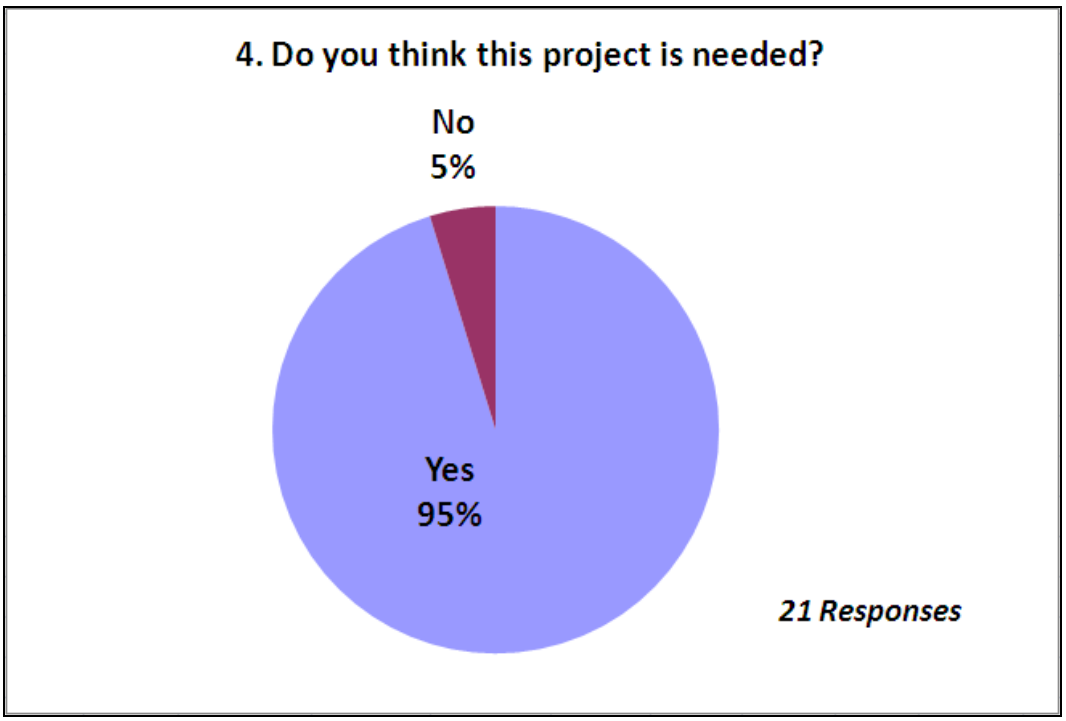
Some respondents indicated they heard about the meeting from more than one source. Most (7 responses, 28%) said they heard about the meeting from seeing the variable message sign KYTC District 3 posted the week of the meeting.



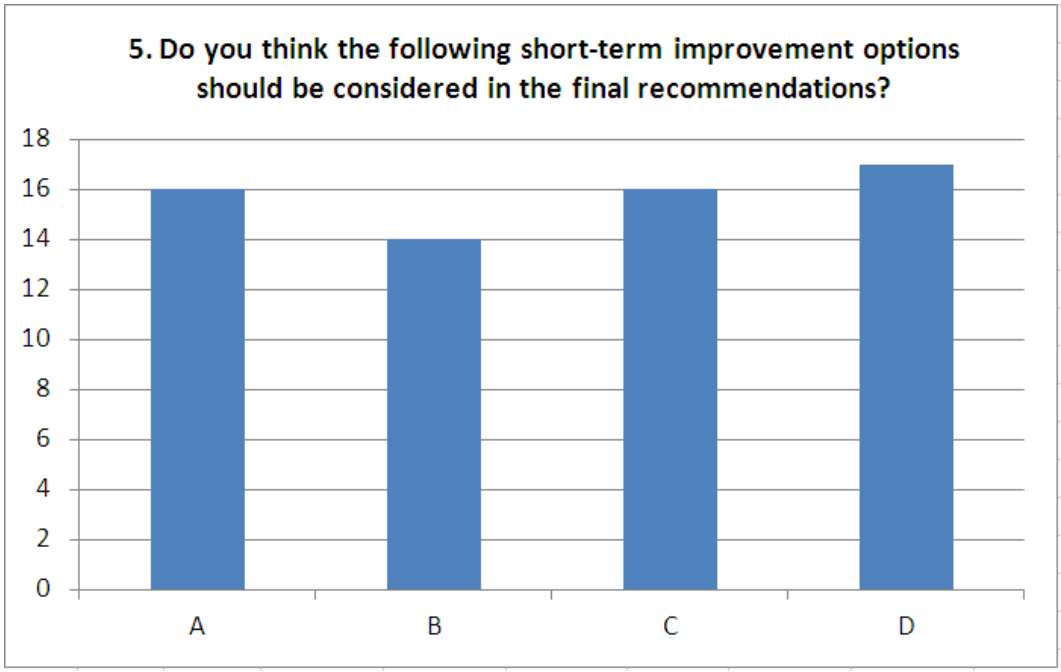
The majority of the survey respondents (12 responses, 63%) indicated they did not own property that may be affected by any of the potential improvements.



Most respondents (18 responses, 86%) said they drive through the study area daily. No respondents said they rarely drive through the study area.



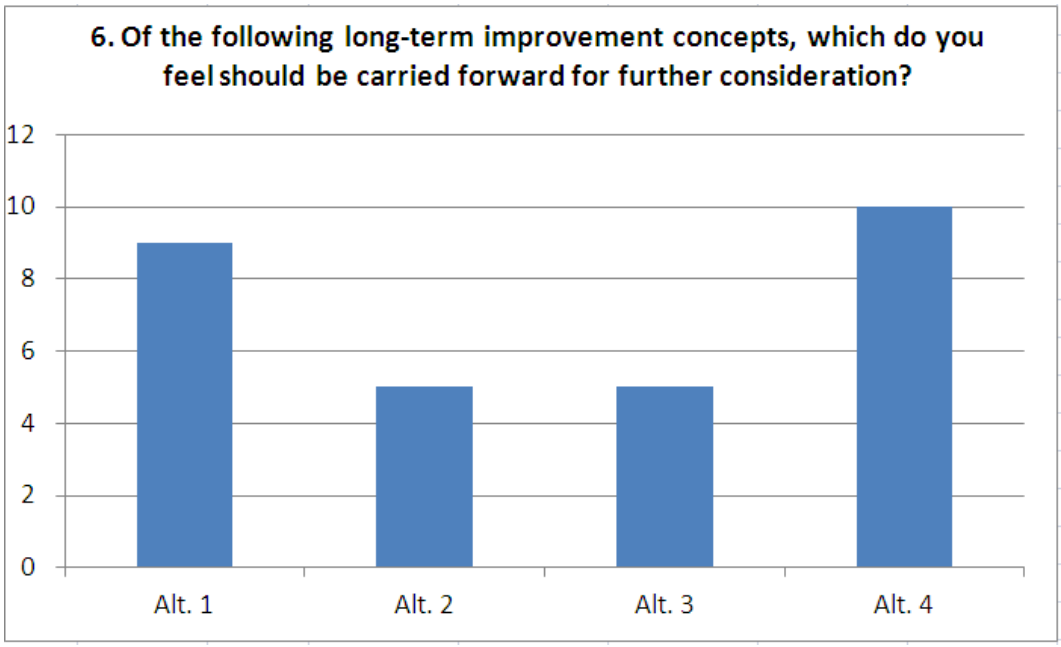
The overwhelming majority (20 responses, 95%) said transportation improvements are needed.



The study includes several potential short-term improvements that were presented for comments from the public. These include the following concepts:

1. Construction of left-turn lanes on US 79 at KY 181 (76% in favor)
2. Reconfiguration of the US 41 and KY 181 intersection (67% in favor)
3. Traffic Calming on Graysville Road (76% in favor)
4. Curb construction along US 41 and US 79 near the convenience store (81% in favor)

All short-term improvement options were well received by those that returned questionnaires. Of the 21 responses received, the lowest approval was 67% with the greatest being 81% in favor of making the improvements.



Several long-term improvements were also presented to further address the anticipated increase in traffic in the Tiny Town area. These alternatives are as follows:

1. Alternative 1 – Realignment of KY 181
2. Alternative 2 – Realignment of US 79
3. Alternative 3 – Realignment of US 41
4. Alternative 4 - Combination of Alternative 1 and Alternative 2

Nine respondents indicated Alternative 1 should be considered further. This was second only to Alternative 4, a combination of Alternative 1 and Alternative 2, which received 10 responses. It should also be mentioned that all long-term options included provisions to widen KY 294 westward from the Tiny Town "Knot" area.

One additional long-term option was mentioned by several meeting attendees. This alternative would have realigned US 41 south of its current location to provide a more perpendicular intersection with US 79. This alternative was not considered by the project team because a residential development is planned for the area east of US 79 and south of US 41 which would be affected by the alternative.

Meeting Summary

TO:	Jeff Moore Project Manager, District 3 Planning Kentucky Transportation Cabinet
FROM:	Brian Aldridge, P.E. Project Manager ENTRAN, PLC
DATE:	November 30, 2011
SUBJECT:	KYTC Item #3-8630.00 Todd County Scoping Study Kentucky Statewide Planning Contract

The third project team meeting for the subject scoping study was held on November 22, 2011 at 9:00 a.m. CST in the KYTC District 3 conference room. The following individuals were in attendance:

Attendees:

Rachel Fortson	KYTC - District 3
J.R. Ham	KYTC – Planning
Tonya Higdon	KYTC – Planning
Deneatra Henderson	KYTC – District 3 Planning
Jeff Moore	KYTC – District 3 Planning
Craig Morris	Pennyrile ADD
Greg Meredith	KYTC – District 3
Mark Mudd	KYTC – District 3 Engineering Support
Joe Plunk	KYTC – District 3 Project Development
Broc Porter	KYTC – District 3
Tim Sharp	KYTC – District 3
Renee Slaughter	KYTC – District 3 Environmental
Brian Aldridge	ENTRAN
Tom Creasey	ENTRAN

After introductions, Jeff Moore welcomed everyone to the third project team meeting for the Guthrie "Knot" Scoping Study. He then turned it over to Brian Aldridge who delivered a brief presentation, beginning with a recap of the study Purpose and Need and some discussion regarding current and projected 2030 traffic volumes and the crash history within the study area.

Brian provided a summary of the comments received at the public meeting in September. He said there were 75 attendees and 21 comment sheets submitted. The comment sheet responses were summarized.

Next there was some discussion regarding the potential short-term, "spot" improvements that were presented at the public meeting. Rachel Fortson indicated the signing improvements project was implemented over the summer and the improved signage was in place prior to the public meeting. Brian mentioned that he had received some positive feedback on the improved signage. He also said feedback was generally positive regarding all four of the short-term improvement concepts, which are described as follows:

1. Construction of left-turn lanes on US 79 at the KY 181 intersection. A number of rear end crashes have occurred at this intersection, and the addition of left-turn lanes on US 79 would be one way to minimize such crashes. This improvement would be difficult without significant right-of-way impacts and removal of parking for businesses south of US 79. There was at least one request from the public to consider a four-way stop at the intersection; however, the warrants for a four-way stop would not be satisfied with either the current or future traffic projections.
2. Minor reconfiguration of the US 41 and KY 181 intersection. This is a very large, skewed intersection with two-way stop control on the KY 181 approaches. Vehicles, particularly trucks, on southbound KY 181 will often veer to the right (almost as if they were attempting to turn right onto westbound US 41) to maximize sight distance before crossing US 41 or turning left towards Guthrie. The conceptual improvement was to construct a curbed island to define a right "turning roadway" onto westbound US 41 and to prevent through and left-turning vehicles from veering to the right.). It was noted the issue really deals with the sight distance to the west along US 41 as the skew angle on the southbound approach makes it difficult for trucks to see oncoming vehicles to their right. Therefore, the proposed concept would not address the issue and therefore was not considered feasible. There was also some discussion from the public meeting concerning possibly converting this intersection to four-way stop control. Similar to the US 79 intersection with KY 181, the warrants for a four-way stop would not be satisfied with either the current or future traffic projections.
3. Traffic calming on Graysville Road. Graysville Road experiences a significant volume of "cut-through" traffic as it provides a more direct east-west connection than either US 41 or US 79 to KY 181 and then KY 294. As Graysville is a city street, the study can only recommend that the city considers some of the possible traffic calming measures.
4. Access management at US 79 and US 41 intersection. This is a very large, skewed intersection with four-way stop control and the convenience store located on the south side of the intersection has uncontrolled access along the southern and eastern approaches. The potential short-term improvement includes maintaining the intersection in its current location but constructing a curbed island along most of the convenience store frontage to define two access points – one on US

41 east of the intersection and one on US 79 south. The intersection would not satisfy traffic signal warrants.

Brian then discussed each of the long-term conceptual options, summarized below. A minor widening of KY 294 study area could be included with each option.

1. Realignment of KY 181. This concept provides a western connector around Tiny Town by redirecting existing KY 181 from north of the US 41 intersection to the west along a semicircular route to US 79 west of the existing KY 181 intersection. Existing KY 181 would be removed from the existing KY 294 intersection north to the proposed realignment north of US 41.
2. Realignment of US 79. This concept realigns US 79 to the west of the existing US 41 intersection to provide a more perpendicular intersection with US 41 and to eliminate the existing access issues with the convenience store. This concept would likely require the closure of Graysville Road near US 41 as it would be too close to the proposed US 79 intersection. It would also split the property owned by the Morris family north of the US 41 where "The Crossings" commercial development is proposed.
3. Realignment of US 41. This concept realigns US 41 from west of existing KY 181 to east of US 79 through the proposed "Crossings" development. This realignment would eliminate the adverse skew angles at the US 41 intersections with both KY 181 and US 79. The study team agreed to show a modified version of this concept to the public.
4. Combination of Alternative 1 and Alternative 2. This concept includes the realignment of KY 181 proposed in Alternative 1 and the realignment of US 79 proposed in Alternative 2.

Public meeting feedback suggested Alternative 1 and Alternative 4 are most favored. Based on this information and the findings over the course of the study, Brian outlined Stantec's preliminary recommendations for the study. These recommendations include the short-term project to improve access management at the US 41 intersection with US 79 and to construct long-term Alternative 1, the realignment of KY 181. The combination of these two improvements will address all three of the badly skewed intersections forming the Tiny Town triangle. (Improvements to KY 294 are already considered a relatively high priority for District 3.) Jeff added that the recommendations meet all three objectives outlined in the Purpose and Need Statement, including improving safety, improving the efficiency of travel, and providing better connections between the study area roadways.

The meeting ended at approximately 10:00 a.m.

Appendix B – Crash Data

Critical Crash Rate Factor (CRF) Analysis (2008 - 2010)

Guthrie "Knot" Planning Study

KYTC Item #3-8630.00

County	District	Prefix	Route	Beginning Milepoint	Ending Milepoint	Number of Crashes	Number of Darkness Crashes	Number of Run-Off-Road Crashes	Number of Fatal Crashes	Number of Injury Crashes	Number Killed	Number Injured	ADT	Road Type	RSE_Unique	CRF
Todd	3	US	79	0.000	0.281	7	1	1	0	3	0	5	7101	Rural 2-lane	110 US-79	0.660
Todd	3	US	79	0.282	0.497	5	1	2	0	2	0	2	6574	Rural 2-lane	110 US-0079	0.596
Todd	3	US	79	0.498	1.864	7	1	3	0	1	0	1	3451	Rural 2-lane	110 US-0079	0.354
Todd	3	KY	181	0.000	0.214	9	0	2	0	1	0	2	2608	Rural 2-lane	110 KY-181	1.914
Todd	3	KY	181	0.215	1.432	6	2	4	0	2	0	3	2608	Rural 2-lane	110 KY-0181	0.408
Todd	3	US	41	2.019	2.300	3	0	2	0	0	0	0	1919	Rural 2-lane	110 US-0041	0.651
Todd	3	US	41	2.301	2.507	3	0	0	0	0	0	0	1978	Rural 2-lane	110 US-41	0.763
Todd	3	US	41	2.508	3.945	4	1	0	1	1	2	3	1919	Rural 2-lane	110 US-41	0.301
Todd	3	KY	294	1.946	2.909	1	0	0	0	0	0	0	714	Rural 2-lane	110 KY-294	0.188
Todd	3	KY	2128	0.000	0.201	0	0	0	0	0	0	0	700	Rural 2-lane	110 KY-2128	--

Source: Kentucky Transportation Center Buildup Crash Database

Crash Spot Analysis (2008-2010)
Guthrie "Knot" Planning Study
KYTC Item #3-8630.00
4/18/2011

STUDY PERIOD IN YEARS 3

Route	Spot	Description	Avg AADT	MP	Begin MP	End MP	Segment Length	Number of Crashes	Spot Crash Rate	Functional Class	M (MV)	Calculated Critical Crash Rate	CCRF
US 79	1	KY 181 intersection	6,500	0.281	0.181	0.381	0.200	9	1.26	Rural Two-Lane	11.86	1.44	0.88
US 79	2	US 41 intersection	3,500	0.497	0.397	0.597	0.200	3	0.78	Rural Two-Lane	6.39	1.71	0.46
US 41	3	KY 181 intersection	1,600	2.507	2.407	2.607	0.200	3	1.71	Rural Two-Lane	2.92	2.23	0.77
US 41	4	US 79 intersection	4,000	2.300	2.200	2.400	0.200	1	0.23	Rural Two-Lane	7.30	1.81	0.13
KY 181	5	US 41 intersection	2,100	0.214	0.114	0.314	0.200	5	2.17	Rural Two-Lane	3.83	2.21	0.98
KY 181	6	US 79 intersection	1,900	0.000	0.000	0.100	0.100	4	1.92	Rural Two-Lane	3.47	2.29	0.84

Appendix C – Environmental Overview

ENVIRONMENTAL OVERVIEW

Todd County Scoping Study
Todd County, Kentucky
Item 3-8630.00

Submitted to:
Kentucky Transportation Cabinet
District 3
900 Morgantown Road
Bowling Green, KY 42101

Submitted:
July 2011

Submitted by:

ENTRAN
ENGINEERING INFRASTRUCTURE SOLUTIONS

ENVIRONMENTAL OVERVIEW

TODD COUNTY SCOPING STUDY
TODD COUNTY, KENTUCKY
KYTC ITEM 3-8630.00

Prepared for

Kentucky Transportation Cabinet
District 3

Prepared by

ENTRAN, PLC
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JULY 2011

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EXECUTIVE SUMMARY

This Environmental Overview has been completed for the Todd County Scoping Study, to identify environmental resources and potential issues of concern, and establishes an environmental footprint for consideration in the development of project alternatives and avoidance and minimization of impacts. The study area assessed for this report is centered upon the area where US 41, US 79 and KY 181 come together to form a large triangle west of the town of Guthrie and known locally as Tiny Town. The study area is circular with a radius of 1,500 feet and encompasses approximately 162 acres (0.25 square mile).

Natural environment resources identified within the study area and issues which will require being addressed if impacts occur include:

- One stream, one potential wetland and one pond: A comprehensive stream and wetland survey and impact assessment will need to be conducted for the project. Unavoidable impacts to streams and/or wetlands will require coordination with the U.S. Army Corps of Engineers (USACE) and KDOW and a determination of Section 404/401 permitting and mitigation requirements.

- 100-Year floodplain: Review and coordination with local floodplain coordinator for the City of Guthrie and the Kentucky Division of Water, Surface Water Permits Branch, Floodplain Management Section will be required.

- Groundwater resources: The study area is located within a karst landscape characterized by numerous sinkholes, underground conduits, or caves. Construction disturbance or release of pollutants within the study area could cause contamination of groundwater. Sinkholes are mapped and several low lying areas were observed within the study area into which surface drainage appeared to flow but having no discernible outflow, indicating potential locations of these underground conduits. Construction activities, especially in regards to vehicle fueling and maintenance and surface runoff from precipitation events, will be required to be directed away from all sinkhole and low lying areas, and steps should be taken to avoid introducing contaminants into the groundwater system.

- Potential habitat for two federally endangered species: Indiana bat and littlewing pearlymussel potential habitat occurs in the study area, along with potential habitat for four state endangered and four state threatened species, and a nearby record of one state endangered species. Additional habitat assessment and coordination with the USFWS Ecological Services Kentucky Field Office, Kentucky Department of Fish and Wildlife Resources and the Kentucky State Nature Preserves Commission will be required.

Human environment resources identified within the study area and issues which will require being addressed include:

- Section 4(f) and Section 106 resources: One National Register of Historic Places (NRHP) site, The Stagecoach Inn (Gray's Inn), and one Kentucky Historic Survey Resource site are located in the study area. A Phase I archaeological site investigation will be required to determine the presence or absence of significant archaeological sites throughout the extent of the study area. A cultural historic survey performed by a KYTC pre-qualified consultant will be required to determine the presence (and NRHP eligibility) or absence of additional cultural historic resources in the study area.

- Hazardous materials concern sites: two active UST facilities, one inactive UST facility, one inactive UST and RCRA facility, and one inactive USEPA PCS facility occur within the study area. A Phase I survey for hazardous materials concerns including UST's and potentially contaminated soils will be required at four facilities.

- Agricultural lands: Hay and row crop fields are present throughout the study area, estimated to account for approximately 46% of the total land area. Coordination with the local NRCS office, regulated by the Farmland Protection Policy Act (FPPA), will be necessary.

- Noise-sensitive receptors: Four locations within or adjacent to the study area include a mobile home park, a church and two community meeting facilities that may be sensitive to increased noise impacts. A project specific traffic noise impact analysis may need to be conducted to identify and mitigate traffic noise impacts.

I. PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING

A. Project Description, History and Status

The Todd County Scoping Study project area is located just west of the City of Guthrie and bordering the Kentucky/Tennessee state line, at a triangular-shaped junction of four major roads, US 41, US 79, KY 181 and KY 294, in an area known locally as Tiny Town. The project will consider the current deficiencies in and around the junction of the four major routes, existing safety and capacity issues, and likely traffic impacts from future development patterns.

The Guthrie area is located on two US routes and in close proximity to Interstate 24 which runs through Clarksville, Tennessee approximately six miles to the southwest. A large industrial complex is currently being constructed across the state line in Tennessee between Guthrie and Clarksville, and additional industrial development will likely be stimulated and is being planned nearby. Residential and commercial development is anticipated to follow in Guthrie and the area around Tiny Town due to their proximity.

These conditions lead to an increase in anticipated travel demand through the junction, and necessitate a holistic examination to evaluate the transportation needs through the area. Existing concerns include the widening of US 79 through the area, considered a high priority project for both Todd County and Logan County to the east. In addition, the existing junction of US 41, US 79 and KY 181 has safety concerns such as the sight distance at US 41 and KY 181. This scoping study, being conducted under the Statewide Corridor Planning Contract, is intended to identify minor improvements along with short term and long term projects which may be suitable to meet these future development patterns.

The study area assessed for this report is centered upon the triangular-shaped junction formed by the intersections of US 41, US 79 and KY 181, having a radius of 1,500 feet, and encompassing approximately 162 acres (Attachment A1). This study area includes approximately 0.5 mile of US 41 (about MP 2.1 to 2.6), 0.6 mile of US 79 (about MP 0.1 to 0.7), 0.4 mile of KY 181 (MP 0.0 to 0.4), 0.2 mile of KY 294 (MP 2.7 to 2.9) and 0.2 mile of KY 2128 (MP 0.0 to 0.2). Approximately one-half of the study area lies within the city limits of Guthrie. This *Environmental Overview,* a component of the Scoping Study work in progress, identifies environmental resources and potential issues of concern, and establishes an environmental footprint for consideration in the development of project alternatives and avoidance and minimization of impacts.

Information for this overview was obtained from literature review, resource agency coordination, and an on-site reconnaissance (field) survey of the study area conducted on 30 June 2011 by ENTRAN personnel. Information obtained from secondary sources and the on-site survey was mapped on aerial photograph base maps provided in Attachments A2 and A3 and a USGS Topographic map provided in Attachment A4.

Resources and issues of concern identified in the study area include those related to both the natural and human environment. Natural environment resources are presented in Section II, which includes streams, floodplains, wetlands, ponds, water supplies, threatened, endangered and special concern species and habitat, woodland and terrestrial areas, and parks (Attachment A2). Human environment

resources are presented in Section III, which includes social and economic resources, historic and archaeological resources, hazardous materials concerns, agriculture, mining, air quality and noise, and additional concerns (Attachment A3).

B. Land Cover

Land cover in the project area was determined through a combination of aerial photograph review and on-site survey. General land cover in the study area includes a mix of agricultural, residential and commercial lands surrounding existing roadway right-of-way (Attachment A2; aerial base USDA-FSA, 2010). The central portion of the study area occurs within the Guthrie corporate limits, with land use in this area being commercial, residential and institutional. A mobile home residential village occurs in the south center of the study area, and extensive agricultural fields surround the area. Overall throughout the study area, agriculture covers an estimated 46% of land area, residential 17%, commercial 12%, institutional 3% and undeveloped land 10%.

C. Physiography and Topography

The project is located in the Mississippian Plateaus (also known as Western Pennyroyal) physiographic region (KGS, 2001a; Attachment B1), and the Western Pennyroyal Karst Plain subarea of the Interior Plateau Ecoregion (Woods et al, 2002; Attachment B2). These regions are described as gently sloping to rolling karst plain with underground drainage containing sinkholes and ponds with few surface streams. Historic and potential natural vegetation includes bluestem prairie and oak-hickory or mixed deciduous forests dominated by beech and oak, though much is replaced by extensive cropland and pastureland, with forests limited in extent.

The study area vicinity has gently rolling terrain with low relief. Review of the United States Geologic Survey Guthrie 7.5' topographic quadrangle (USGS, 1950; Attachment A1) indicates elevations range from about 520 feet above mean sea level to 550 feet above mean sea level, sloping towards the south, with small to moderate size mapped sinkholes present.

D. Geology and Soils

In general, soils are comprised of thin loess and alluvium over middle Mississippian age St. Genevieve Limestone bedrock of the Meramec Formation (Haagen, 1987; Klemic, 1966; Attachment B3). The southern portion of Todd County is considered to be in an intense karst potential area (KGS, 2001b; KGS, 2010a; Attachment B4). Intense karst indicates an area "underlain by bedrock with high potential for karst development. May exhibit mature karst, including caves, sinkholes and springs where they crop out" (KGS, 2010b). Several sinkholes are mapped within the vicinity of the study area (KGS, 2003), though none were definitively observed during field survey activities (Attachment A2).

Soils in the study area occur primarily in the Pembroke-Nicholson-Crider soil association with minor Robertsville-Lawrence soil association coverage (Attachment B5). These soil associations include nearly level to sloping, deep, well drained and moderately well drained to poorly drained soils that are loamy, formed in loess and residuum from limestone or in alluvium or colluvium, on broad upland plains or

concave upland basins and stream terraces. The Robertsville silt loam and Newark silt loam soil units along the south edge of the study area are mapped as hydric soils (Haagen, 1987 and USDA, 2011a).

E. Drainage

The study area is located within the Spring Creek watershed (HUC-11: 05130206250) of the Lower Cumberland, Red River Cataloging Unit (HUC-8: 05130206; Carey, 2003; KDOW, 2011a). The Spring Creek watershed has a drainage area of 34.2 square miles and flows south into Tennessee to join the Red River. Local surface drainage in the study area is to the south to an Unnamed Tributary to Spring Creek which then flows southwest across the state line. Subsurface drainage is likely due to the presence of mapped sinkholes in the study area vicinity.

II. NATURAL ENVIRONMENT

A. Surface Streams

Information from the Kentucky Energy and Environment Cabinet, Department for Environmental Protection, Division of Water (KDOW) indicates that no Special Use Waters (cold water aquatic habitat, exceptional waters, reference reach waters, outstanding state resource waters, outstanding national resource waters, state wild rivers or federal wild and scenic rivers) occur in the study area (KDOW, 2011b). No high quality stream corridors were observed in the study area during the on-site survey conducted in June 2011.

One stream was identified in the study area during the June 2011 field survey, an unnamed tributary to Spring Creek designated as Stream S1 (Attachment A2). Based on review of USGS 7.5' topographic mapping (USGS, 1950), this stream corresponds to an unnamed USGS mapped perennial feature.

Stream S1 is not listed in the 2010 KDOW 305(b) and 303(d) water quality reports (KDOW, 2010a and 2010b), and does not have an assigned Designated Use. The nearest feature with a Designated Use evaluation is Spring Creek (River Miles 14.4 to 16.3), which is located approximately 1.25 mile downstream of the study area. Spring Creek is listed as "Fully Supporting" its Warm Water Aquatic Habitat Use designation. Additional Designated Use categories for Spring Creek have not been assessed due to insufficient or no data available. No Total Maximum Daily Load (TMDL) is in effect for the Spring Creek watershed.

A comprehensive stream survey and impact assessment, including evaluation of avoidance and minimization measures, will need to be conducted as this project further develops. Unavoidable impacts to streams will require coordination with the U.S. Army Corps of Engineers (USACE) and KDOW to determine Section 404/401 permitting and mitigation requirements.

B. Floodplains

Based on review of Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FEMA, 2010) and floodplain data from the Kentucky Office of Technology-Division of Geographic Information (KOT-DGI, 2010a), 100-Year floodplain exists within the study area (Attachments A2 and

B6). This floodplain is associated with FEMA identified Spring Creek Tributary 6, which was designated as Stream S1 during the June 2011 field survey. The floodplain is located at the southern extent of the study area and is designated as Zone A ("1-percent-annual-chance flood event") with no base flood elevation determined. Within the study area this floodplain includes the riparian corridor and bottomland woodlands around Stream S1, a field identified pond, and agricultural fields.

C. Wetlands

One National Wetland Inventory (NWI) wetland is mapped within the study area, identified as palustrine open water permanently flooded excavated feature, i.e. dug-out pond (USFWS, 2011a; Attachment A2). Based on review of soils information (Haagen, 1987; USDA, 2011b), approximately 8.6% (14 acres) of the study area includes Robertsville and Newark silt loam soil units, which have 93 and 6% (respectively) hydric soil components (Attachment B5) and a greater potential of containing un-mapped wetlands than non-hydric soils.

The June 2011 on-site reconnaissance included a field check of NWI mapped features, as well as a reconnaissance of the study area to determine the occurrence of other potential wetlands. The one NWI feature was observed to occur within a plowed agricultural field. Wetland characteristics were not evident and further assessment will be needed to determine the jurisdictional status of this feature as a farmed wetland.

One potential wetland was observed (Attachment A2), designated as Wetland W1 and identified as a palustrine forested wetland (PFO) having an approximate size of 0.048 acre. This potential wetland was located within a wooded low lying area on the south side of KY 294, and exhibited standing water along with hydrophytic vegetation (herbaceous and woody.) This potential wetland corresponds in location to a USGS mapped pond though is smaller in size.

No extensive or high quality wetlands were noted to occur in the study area from secondary source review, aerial mapping or field observation. Additional potential wetlands may occur within the floodplain of Stream S1, which was not intensively investigated during on-site reconnaissance, as this floodplain is comprised of wooded riparian corridor on hydric soils.

Potential wetlands identified during field survey were not verified through wetland determination or wetland delineation procedures. A comprehensive wetland survey and impact assessment, including evaluation of avoidance and minimization measures, will need to be conducted as this project further develops. Unavoidable wetland impacts will require coordination with the USACE and KDOW to determine Section 404/401 permitting and mitigation requirements.

D. Ponds

One pond was identified within the study area during the June 2011 on-site reconnaissance (Attachment A2), designated as Pond P1. This pond appeared to have a current use as a recreational pond, with a surface area of 0.36 acre, and located in a grass field within the floodplain of Stream S1.

E. Groundwater Resources and Public Water Supplies

Groundwater - Groundwater, spring, and water well information from the Kentucky Geologic Survey (KGS) and KDOW was reviewed for the study area. In general, groundwater resources in southern Todd County are greater and more readily accessed than those in the northern half. Springs having low to moderate flow rates are present, and most wells drilled in upland areas are adequate for domestic supply as they penetrate solution openings in the karst bedrock (Brown and Lambert, 1963; Carey and Stickney, 2004; Attachment B7). The Kentucky State Nature Preserves Commission indicated the study area is "located within a karst landscape characterized by numerous sinkholes, underground conduits, or caves. Construction disturbance or release of pollutants within the specified area could easily cause contamination of groundwater" (Attachment B10). Several low lying areas were observed within the study area into which surface drainage appeared to flow but having no discernible outflow, indicating potential locations of these underground conduits.

Water wells in the general project vicinity (Guthrie USGS quad) are primarily utilized for monitoring (unspecified activities, 67%), with domestic (21%) and livestock (7%) uses secondary (KGS, 2011a), with average total depth about 75 to 125 feet and depth to bedrock about 20 to 50 feet. Information from KGS indicated that no water wells are located within the study area or vicinity (Attachment A2), with the nearest water wells being domestic use wells approximately 0.6 to 0.8 mile north and northwest of the study area.

Springs in the general project vicinity are common and primarily used for livestock. No springs are mapped within the study area (KGS, 2011a), with the nearest mapped spring (Merriweather Spring, perennial) located approximately 0.5 mile west of the study area.

No water wells or springs were observed in the study area during the June 2011 on-site reconnaissance.

Public Water Supplies - The majority of county residents (94%) are on public water utility services supplied through the Logan-Todd Regional Water District, which draws from the Cumberland River. Water supplies in the project vicinity are provided by the Guthrie Water Works and the Todd County Water District (Pennyrile Area Development District, 1999 and 2009). Based on information from the Kentucky Geologic Survey (KGS), the Kentucky Division of Water (KDOW), and the Pennyrile Area Development District (PADD), the study area and vicinity is not within a Source Water Assessment and Protection (SWAP) area, nor are any Wellhead Protection Areas established (KDOW, 2010a; KOT-DGI, 2010b; PADD, 2009). The spring located just west of the project area is the Merriweather Spring, a perennial spring previously utilized as the water supply source for the local Guthrie Water Works prior to their interconnection with the Logan-Todd Regional Water District.

F. Threatened, Endangered and Special Concern Species

Secondary Source Information – Information concerning federal and state endangered, threatened and special concern species and unique habitats in the project vicinity was obtained from the United States Fish and Wildlife Service (USFWS, 2011b and 2011c), the USFWS Ecological Services Kentucky Field Office (USFWS, 2008a), the Kentucky Department of Fish and Wildlife Resources (KDFWR, 2011), and the Kentucky State Nature Preserves Commission (KSNPC). The USFWS national office reports

three federal-endangered species from Todd County, including the clams Littlewing pearlymussel (*Pegias fabula*), Ring pink (*Obovaria retusa*) and Fanshell (*Cyprogenia stegaria*). The USFWS Ecological Services Kentucky Field Office indicates one additional federal-endangered species, the Indiana bat (*Myotis sodalis*), as having the potential to occur within Todd County. Other USFWS listed species known or having the potential to occur within Todd County include two federal-candidate species: Fluted kidneyshell mussel (*Ptychobranchus subtentum*) and Slabside pearlymussel (*Lexingtonia dolabelloides*). There were no USFWS managed Endangered Species conservation measures found in effect in the study area vicinity (Attachment B8).

The KDFWR indicates an additional 18 state-listed species observations in Todd County, including four state-endangered, eight state-threatened and six state-special concern species (Attachment B9).

Based on data received from KSNPC, there are no reported occurrences of any state or federal listed species within the study area boundaries. However, KSNPC records indicate one listed species within 1-mile of the study area (Buffalo clover, *Trifolium reflexum*), and three records within 10-miles (Attachment B10). Two of the four records indicate species not on the KDFWR list (Buffalo clover and Bewick's Wren) that are known to occur in Todd County. Due to the sensitive nature of listed-species information, mapped locations of these records are not included in this environmental overview.

1. Federal-Listed Species

There are no known records of any federal-listed species within the study area boundaries based on review of database records, although six species are known from or have the potential to occur in Todd County, including:

- **Fanshell mussel** (*Cyprogenia stegaria*), federal and state endangered species known from Todd County. Prefers medium to large rivers, primarily in relatively deep water in gravel substrate with moderate current (USFWS).

- **Indiana bat** (*Myotis sodalis*), federal and state endangered species having the potential to occur within Todd County. In summer, found under exfoliating bark and in cavities of dead and live trees in upland and riparian forests, and wooded fencerows. In winter, found hibernating in caves and old mine portals (KDFWR).

- **Ring pink mussel** (*Obovaria retusa*), federal and state endangered species known from Todd County. Characterized as a large-river species inhabiting relatively shallow waters within gravel and sandy substrates (USFWS).

- **Littlewing pearlymussel** (*Pegias fabula*), federal and state endangered species known from Todd County. Inhabits small to medium, low turbidity, cool-water, high to moderate gradient streams, partially within or on top of gravel substrates in riffles, or beneath boulders and slabrock (USFWS).

- **Slabside pearlymussel** (*Lexingtonia dolabelloides*), federal candidate species having the potential to occur within Todd County (synonymous with *Pleuronaia dolabelloides*). Primarily inhabits large

creeks to moderately-sized rivers within sand, fine gravel and cobble in relatively shallow riffles and shoals with moderate to swift current (NatureServe).

- **Fluted kidneyshell mussel** (*Ptychobranchus subtentum*), federal candidate and state endangered species known from Todd County. Inhabits small to medium rivers embedded in sand, gravel, and cobble substrates with swift current or riffles (NatureServe).

Review of information provided in the Indiana Bat Mitigation Guidance for the Commonwealth of Kentucky (USFWS, 2008b) indicates that the study area occurs outside of the mapped USFWS Indiana Bat Recovery and Mitigation Focus Areas (RMFA's). The nearest specified RMFA's are mapped approximately 14 miles northeast, 18 miles west, and 20 miles north of the study area. These mapped locations contain "Sensitive" and "Maternity" habitat, "Sensitive", Priority 3 and Priority 4 hibernacula, and Priority 3 and Priority 4 hibernacula, respectively (Attachment B11). None of these mapped locations are connected to the project study area by contiguous forested habitat. The Kentucky Speleological Society (KSS; Attachment B12) indicated that there are no known caves within the study area, and no caves were observed during the June 2011 on-site reconnaissance.

During the June 2011 on-site reconnaissance, potential habitat was identified in the study area for the following species:

- Indiana bas summer habitat (federal-endangered) as the riparian corridor of Stream S1 (see representative photographs in Attachment C). This riparian corridor consisted of bottomland woodland along both banks of the stream, connecting two larger woodlots to the east (upstream) and south (downstream) of the study area.

- Littlewing pearlymussel (federal and state-endangered) as Stream S1. This stream is a USGS perennial stream, and was observed to be a small stream of relatively low to possibly mild gradient. Turbidity levels, temperature and substrate were not evaluated during the course of field survey.

No suitable habitat for the federal-endangered fanshell mussel or ring pink mussel, or the federal-candidate slabside pearlymussel or fluted kidneyshell mussel was observed in the study area.

Due to the occurrence of potential habitat for federal-listed Indiana bat and littlewing pearlymussel within the study area, additional habitat assessment and coordination with resource agencies may be required as the project further develops.

2. State-Listed Species

There are no known records of any state-listed species within the project study area boundaries based on review of KSNPC database records, though 20 species are known from or have the potential to occur in Todd County (KDFWR and KSNPC), as summarized below.

State-Endangered

- **Great egret** (*Ardea alba*), state endangered species with range in Todd County. Primarily uses forested floodplain and bottomland hardwood forests and reservoir habitat, emergent and shrub-dominated wetlands, and forested wetlands (KDFWR).

- **Pocketbook mussel** (*Lampsilis ovata*), state endangered species with range in Todd County. Found in medium-sized to large rivers in sand and gravel (KDFWR).

- **Double-crested cormorant** (*Phalacrocorax auritus*), state endangered species with range in Todd County. Preferred habitat includes lakes, ponds, rivers, lagoons, swamps, usually within sight of land. Nests on the ground or in trees in freshwater situations (NatureServe, 2010).

- **Purple lilliput mussel** (*Toxolasma lividus*), state endangered species with range in Todd County. Inhabits fine-particle substrates and also sand, gravel, or cobbles and boulders in riffles or flats immediately above riffles. Often the first species encountered in headwater areas, generally occurring at depths less than 1 meter (KDFWR).

- **Buffalo clover** (*Trifolium reflexum*), state endangered species historically known from Todd County. Found in prairies and disturbed openings either associated with forests or opportunistically in fields or well-drained sites (KSNPC). Note: this species not listed for Todd County by KDFWR, but did produce a historical database record from KSNPC located within Todd County.

State-threatened

- **Blue-winged teal** (*Anas discors*), state threatened species historically known from Todd County. Prefers marshes, ponds, sloughs, lakes, and sluggish streams (river pools) (NatureServe, 2010).

- **Northern harrier** (*Circus cyaneus*), state threatened species with range in Todd County. Prefers reclaimed mine lands and emergent and shrub-dominated wetlands, with adjacent grassland/agricultural (KDFWR).

- **Bald Eagle** (*Haliaeetus leucocephalus*), state threatened species (federal delisted) with range in Todd County. Inhabits forested floodplains, bottomland hardwood forests, bald cypress wetlands, and riparian forests along large rivers and reservoirs (KDFWR and KSNPC).

- **Redspotted sunfish** (*Lepomis miniatus*), state threatened species with range in Todd County. Inhabits lowland streams, oxbow lakes, and wetlands typically over substrates of sand and mud overlain with organic debris. In streams occurs in backwater and pool habitats and in wetlands and oxbow lakes along vegetated shorelines (KDFWR).

- **Eastern slender glass lizard** (*Ophisaurus attenuates longicaudus*), state threatened species with range in Todd County. Occurs in fairly dry rocky open woodlands, remnant glades and prairies, rocky fields, and utility line areas with some bare ground (KDFWR).

- **Whitewashed rabdotus** (*Rabdotus dealbatus*), state threatened species with range in Todd County. Terrestrial snail species found crawling on the ground or on low vegetation in wet weather, associated with glades (KSNPC).

- **Kentucky creekshell mussel** (*Villosa ortmanni*), state threatened species with range in Todd County. Prefers small streams to medium-sized rivers in sand, mud, and gravel (KDFWR).

- **Mountain creekshell mussel** (*Villosa vanuxemensis vanuxemensis*), state threatened species with range in Todd County. Prefers small streams and small rivers in silt, sand, or gravel (KDFWR).

State special concern

- **Henslow's sparrow** (*Ammodramus henslowii*), federal species of management concern and state special concern species with range in Todd County. Prefers open fields and meadows with interspersed grass, weeds or shrubby vegetation, especially in damp or low-lying area. Migration and winter habitat includes grassy areas adjacent to pine or second-growth woods (KSNPC).

- **Great blue heron** (*Ardea herodias*), state special concern species with range in Todd County. Found in freshwater habitats, lakes, ponds and marshes with adjacent woodlands (NatureServe, 2010).

- **Eastern hellbender** (*Cryptobranchus alleganiensis alleganiensis*), state special concern species with range in Todd County. Occurs in rivers and large streams; known from the major river systems in Kentucky including the Ohio, Licking, Kentucky, Green, Barren, Cumberland. Apparently requires reasonably good water quality (KDFWR).

- **Barking treefrog** (*Hyla gratiosa*), state special concern species with range in Todd County. Generally found only in agricultural areas; breed sporadically in seasonal and permanent ponds that are located primarily in open agricultural habitats (KDFWR).

- **Dark-eyed junco** (*Junco hyemalis*), state special concern species with range in Todd County. Prefers various sorts of coniferous, mixed, and deciduous forest; forest edge; forest clearings; bogs; open woodland; brushy areas adjacent to forest; and burned-over lands (NatureServe, 2010).

- **Onyx rocksnail** (*Leptoxis praerosa*), state special concern species with range in Todd County. Aquatic snail found on algae-covered rocks in strong current (NatureServe, 2010); no habitat assessment, habitat guild or key habitat identified by KDFWR.

- **Bewick's wren** (*Thryomanes bewickii*), federal species of management concern and state special concern species historically known from Todd County. Prefers brushy areas, thickets and scrub in open country, open and riparian woodland. Found in country towns and farms (KSNPC). Note: this species not listed for Todd County by KDFWR, but did produce a historical database record from KSNPC located within Todd County.

During the June 2011 on-site reconnaissance, potential habitat was identified in the study area for the following species:

- Great egret and bald eagle in the form of floodplain woodlands along Stream S1;
- Double-crested cormorant, buffalo clover, blue-winged teal, Henslow's sparrow and great blue heron in the form of a pond and open field adjacent to Stream S1;
- Purple lilliput mussel, Kentucky creekshell mussel and mountain creekshell mussel in the form of the small to medium sized Stream S1;
- Barking treefrog in the form of Wetland W1 and various additional low spots adjacent to or within agricultural fields throughout the study area;
- Bewick's wren in the form of wooded fence rows and tree lines along agricultural fields and Stream S1, throughout the study area.

Due to the occurrence of potential habitat for multiple state-listed species within the study area, additional habitat assessment and coordination with resource agencies may be required as the project further develops.

G. Woodland Habitats

Woodland habitat within the project study area is generally linear in presence (fence rows, riparian corridors, agricultural field boundaries, etc.), and accounted for about 7 percent (12 acres) of the study area (Attachment A2; see representative photographs in Attachment C). A majority of the woodland within the study area occurred as bottomland woodland within the floodplain of Stream S1 dominated by sycamore, ash and box-elder. Wooded areas in low lying locations such as around Wetland W1 or agricultural drainage swales were similarly dominated by ash and box-elder. The remaining wooded areas were upland woodlots or fence rows typically dominated by oaks, maple, black cherry or locust. Wooded habitats had a relatively open understory with limited scrub or shrub undergrowth. None of the wooded areas observed were considered to be unique or of high quality.

H. Public Parks – Section 4(f) and Section 6(f) Facilities

Based on the June 2011 on-site reconnaissance and review of information from KSNPC, the National Park Service (NPS, 2011a), and other available mapping, no state or federal managed areas, parks, forests or preserves (Section 4(f) resources) occur in the study area. No facilities in the study area were identified as having received a Land and Water Conservation Fund (LWCF) grant (Section 6(f) resources; Attachment B13). Section 4(f) resources relative to archaeological sites and cultural and historic properties are discussed in Section III.B of this document.

III. HUMAN ENVIRONMENT

A. Social and Economic Resources

Through a combination of review of secondary source information, aerial photography and on-site field survey, the following social and economic resources were identified in the study area (Attachment A3):

Cemeteries - No cemeteries were identified.

Churches - One church was identified:

- *Tiny Town Baptist Church,* Hwy 41 at Hwy 181

Federal Facilities - No federal facilities were identified.

Fire Departments and Hospitals - No fire departments or hospitals were identified.

Golf Courses - No public golf courses occur in the study area.

Industrial and Business Parks - No industrial or business parks occur in the study area. The Patriot Business Park occurs just east (approximately 250 feet) of the study area, between US 79 and US 41. The current vacant lot on the north side of US 41 and US 79 was indicated by signage as the site of the future "The Crossings" commercial development location. Businesses in the study area were concentrated along US 41 and US 79.

Table 1. Businesses in Study Area (Tiny Town, Guthrie).

Name	Address
Beach Oil, dba Exxon	11945 Hwy 181
Creekside Meadows MHP	10270 Russellville Road (Hwy 79)
Elkton Bank & Trust	10275 Russellville Road (Hwy 79)
Favourite Lotto	10125 Dixie Beeline Highway (Hwy 41)
Flea Market	Hwy 41 & Hwy 181 NW
Food Giant Food Store	10300 Dixie Beeline Highway (Hwy 41)
Guthrie Bethel Masonic Lodge 669	Hwy 41, Tiny Town
Kidron Brook Nursery	10480 Russellville Road (Hwy 79)
Lotto Express	10410 Russellville Road (Hwy 79)
Mike's Bar-B-Cue	9926 Russellville Road (Hwy 79)
The Hairitage Salon	10210 Graysville Road
Thoroughbred Realty	10220 Dixie Beeline Highway (Hwy 41)
Tiny Town Auto Sales	10360 Russellville Road (Hwy 79)
Tiny Town Bingo	10020 Russellville Road (Hwy 79)
Tiny Town Pizza & Subs	10155 Dixie Beeline Highway (Hwy 41)
Tiny Town Produce	10155 Dixie Beeline Highway (Hwy 41)
Tiny Town Red Top Bar-B-Q	10388 Russellville Road (Hwy 79)

Schools, Institutions and Learning Centers - No schools or learning centers were identified, and two locations were identified as Institutions for community resources:

- *Guthrie Bethel Masonic Lodge 669,* Hwy 41
- *Tiny Town Bingo*, 10020 Russellville Road

Shopping Centers - No shopping centers were identified.

B. Archaeological and Cultural Historic Resources – Section 106 and Section 4(f) Resources

Information concerning archaeological and cultural historic resources in the vicinity of the project study area was obtained from the Kentucky Office of State Archaeology (KOSA) and the Kentucky Heritage Council (KHC) through data requests in March 2011. A summary of key findings is provided below. Section 106 review under the Historic Preservation Act and evaluation and coordination with the Federal Highway Administration under Section 4(f) of the Department of Transportation Act of 1966 will be required if any archaeological or cultural historic resources are identified and impacted by the project.

1. Archaeological Resources

Review of information from the Kentucky Office of State Archaeology data request response indicates one prior archaeological survey has been performed which lies within the project study (KOSA, 2011; Attachment A3), which was provided the identification number 110-018. The prior archaeological survey was conducted for a cell tower site along KY 2128 south of the project center and did not identify any archaeological resources. KOSA estimated that less than 10% of the project study area has been surveyed for archaeological resources.

The prior archaeological survey location was observed during the June 2011 field survey to exist as a residential lot consisting of mowed/maintained grass with residential structures to the north and west, an open field, pond, stream and wooded riparian corridor to the south, and a mobile home park and agricultural field to the east.

As most of the project area has not been previously surveyed for archaeological resources, a Phase I archaeological site investigation will be required to determine the presence or absence of archaeological resources throughout the extent of the study area.

2. Cultural Historic Resources

Review of information from the Kentucky Heritage Council data request response indicated two previously recorded historic resources occur within the project study area (KHC, 2011; Attachment A3).

- The Stagecoach Inn (Gray's Inn) is located in the center of the study area, at the northeast corner of Graysville Road and KY 181, facing Graysville Road. The building is on the National Register of Historic Places, is currently a privately-owned residence, and the property includes a

Kentucky Historical Society "Stage Coach Inn" marker and a National Park Service "Trail of Tears National Historic Trail" sign (NPS, 2011b).

- The Louis Downer Farm is a Historic Survey Resource, with NRHP status undetermined, and is located at the northwest corner of KY 181 and KY 294. The property includes a privately-owned residential structure and several small outbuildings in excellent condition.

An on-site reconnaissance of the study area performed June 2011 by ENTRAN personnel identified the two listed historical resources as present, each centered on a residential structure (Attachment C). Several additional structures that appeared to be more than 50 years in age were observed scattered throughout the study area. A cultural historic survey performed by a KYTC pre-qualified consultant will be required as this project further develops to determine the presence (and NRHP eligibility) or absence of cultural historic resources in the study area.

C. Hazardous Materials Concerns

Properties with hazardous material concerns were identified through review of state and federal database records and an on-site reconnaissance of the study area. Federal and state regulatory database records research was provided by FirstSearch Technology Corporation (2011), in addition to a review of the Statewide UST Database Report (KDWM, 2011) and Kentucky Solid Waste Facilities GIS information (KDWM, 2010).

Overall, five sites within the project study area were identified as having potential hazardous material concerns as described below and shown on Attachment A3, labeled by the indicated Property ID.

1. Underground Storage Tanks

The occurrence of Underground Storage Tanks (UST's) in the vicinity of the study area was determined through a review of state UST/AST (Underground Storage Tank/Aboveground Storage Tank), LUST (Leaking Underground Storage Tank) and State Petroleum Cleanup databases.

A combination of the database search report review and field survey of the study area conducted by ENTRAN personnel on 30 June 2011 identified the following UST concern facilities:

Property ID 1 *Tiny Town Coffee Cup*, Hwy 41 and Hwy 79. The location has a database record of UST indicating six UST's which were removed 5/1/1989. The location of this site could not be identified, though it may have been located at the current Tiny Town Bingo or commercial development area listed as "The Crossings".

Property ID 2 *Favourite Lotto*, 10125 Dixie Beeline Hwy (US 41). This property has database records of UST and LUST, and was identified as the current Favourite Lotto gas station and convenience store at the southeast corner of US 41 and US 79. Database records indicate three active and two removed (removal date 6/22/99) UST's on the property. Two LUST records for the property have no recorded remediation activities.

Property ID 3 *Beach Oil, dba Exxon #25*, 11945 Guthrie Highway (Highway 181). This property has a database record of UST indicating three active UST's, and was identified during on-site reconnaissance as a recently opened Exxon gas station and convenience store.

Property ID 4 *Piggly Wiggly 79*, 10300 Dixie Beeline Hwy (Highway 41). This property has a database record of UST indicating three UST's removed 11/9/1998. The location address corresponds to the current Food Giant Food Store at the east edge of the study area along US 41 (see Table 1, page 11).

A Phase I survey for UST's and potentially contaminated soils will need to be conducted as the project further develops should either of these properties be impacted by construction or excavation activities.

2. USEPA Regulated Sites

The occurrence of USEPA regulated sites and incident reports in the vicinity of the study area was determined through review of the USEPA Envirofacts Data Warehouse (USEPA, 2011) and the FirstSearch Technology Corporation (2011) regulatory database search of the following databases:

USEPA NPL (National Priority List-Active and Delisted); CERCLIS (Comprehensive Environmental Response Compensation and Liability Information System –Superfund); NFRAP (CERCLIS Archived Sites); RCRA (Resource Conservation and Recovery Information System, RCRIS, RCRA Corrective Action, Treatment Storage and Disposal Facilities, and Generators); ERNS (Emergency Response Notification System); and Brownfields;

STATE Sites (State LEADS List); SWL (Permitted Operating Landfills); LUST (Senate Bill 193); UST/AST; and Brownfields.

A USEPA Envirofacts Data Warehouse Locational Reference Tables data query for all USEPA registered facilities reported two facilities (Attachment B14) within the study area under the following regulatory programs:

Resource Conservation and Recovery Act Information System (RCRAINFO)

Property ID 4 *Keystop Food Mart-Piggly Wiggly #79*, 10300 Dixie Bee Line Drive. This property report indicates NAICS codes listed as Gasoline Station and Supermarkets and Other Grocery (Except Convenience) Stores. The property is listed under "Inactive" status with the last update registered 09/02/2000. The property was identified in the UST database record review as the site of the current Food Giant Food Store.

Permit Compliance System (PCS)

Property ID 5 *South Todd Turning Lanes*, Guthrie Road. This property has an "Inactive" status with no data records available regarding inspection and enforcement, compliance monitoring or alleged violations. May be related to an NPDES permit or a 404/401 permit (Clean Water Act Statute indicated), as the company SIC code indicates "Highway and Street Construction" (U.S. Department of Labor, 2011). Location data indicates this

property is at the current location of the Tiny Town Auto Sales at the southwest corner of Hwy 79, Hwy 181 and Hwy 2128.

3. Oil and Gas Wells

Oil and gas well locations in the vicinity of the study area were identified through review of information from the Kentucky Geological Survey, Geologic Information Service (KGS, 2011b) and on-site survey. No oil or gas wells are located within the study area. The nearest active oil or gas well is located approximately 4.5 miles northeast of the study area, with several dry and abandoned wells somewhat closer. No oil or gas fields are mapped in or near the study area.

4. Landfills

Review of information from Kentucky Environmental and Public Protection Cabinet, Division of Waste Management (KDWM), Solid Waste Branch indicated there are no active Contained or CDD solid waste facilities in Todd County (KDWM, 2010). No specific information could be determined regarding solid waste disposal activities in the project vicinity.

The federal and state regulatory database search report acquired for the project (FirstSearch Technology Corporation, 2011) reported one record for permitted landfills (SWL) in the vicinity of the study area, an active record for Stateline Transfer Station on KY 79 South which could not be geographically located.

During the on-site reconnaissance of the study area, no evidence of active or closed landfills was observed in or adjacent to the study area. The reported Stateline Transfer Station on KY 79 was not identified or observed as present in the vicinity of the study area.

D. Agriculture

Review of 2007 Agricultural Census data from the United States Department of Agriculture (USDA) indicates that Todd County is ranked 7th out of 120 Kentucky counties in agricultural production value, with the typical agricultural practices of corn (48,390 acres) and soybean (42,795 acres) (USDA, 2007), with poultry and eggs having the largest value in sales. Review of soil data information of the project study area (Haagen, 1987) indicated that prime farmland soils cover 90% of the study area (Attachment B5).

On-site reconnaissance in June 2011 indicated that agricultural lands in the study area consisted of expansive hay and corn fields. One fallow row-crop field was observed to the south of US 41 at the east side of the study area. Land dedicated to agriculture was estimated to account for approximately 46% of the total study area.

Impacts to farmland are regulated by the Farmland Protection Policy Act (FPPA). Coordination with the local NRCS office will be necessary as the project develops, to determine if there will be adverse impacts to farmland associated with the proposed project.

E. Mining

The presence of mines or quarries in the study area was investigated through review of information from the Kentucky Department for Natural Resources (Division of Mine Permits, Division of Mine Reclamation and Enforcement, and Division of Abandoned Mine Lands; KDNR, 2010), Kentucky Mine Mapping Information (2011), and field survey of the study area. Review of secondary source information indicated two active and one closed mines and/or quarries occur in Todd County. The nearest operating mine or quarry and is located approximately 13 miles north of the study area. There are no mined out areas mapped within the county, and the county is covered by the Division of Abandoned Mine Lands' Madisonville field office.

No active or inactive mining operations were observed within or adjacent to the study area during the on-site field reconnaissance. No additional work regarding mines or mining operations is recommended for the proposed project.

F. Air Quality and Noise

1. Air Quality

Review of available USEPA Envirofacts data for Todd and adjoining counties (USEPA, 2011) did not indicate any air quality issues for the reporting year through March 2011. Review of available USEPA Green Book data (USEPA, 2010) indicates Todd County and the surrounding counties are not listed for any criteria pollutants. The Kentucky Transportation Cabinet (KYTC), Division of Planning's Air Quality Modal Program does not list Todd County as an Air Quality Non-Attainment Area (*8-Hour Ozone* or *PM2.5*) as of July 2007 (KYTC, 2011a).

2. Noise

Noise-sensitive receptors observed during the June 2011 on-site reconnaissance as being within or adjacent to the study area included the following:

- Creekside Meadows Mobile Home Park, 10270 Russellville Road (Hwy 79);
- Tiny Town Baptist Church, Hwy 41 at Hwy 181;
- Tiny Town Bingo, 10020 Russellville Road (Hwy 79);
- Guthrie Bethel Masonic Lodge 669, Hwy 41, Tiny Town.

Aside from these specific locations, the majority of the study area resembled rural residential and rural agricultural development patterns with widely separated single family residential structures scattered throughout the study area.

The locations of these identified receptors in the study area are provided on Attachment A3. A project specific traffic noise impact analysis may need to be conducted to identify and mitigate traffic noise impacts as this project further develops.

G. Additional Items of Concern

MS4 - The study area, the City of Guthrie and Todd County are not within any regulated Small Municipal Separate Storm Sewer System (MS4) (KYTC, 2010b).

Utility Corridors - No specific utility corridors were identified during June 2011 on-site reconnaissance.

Socioeconomic and Environmental Justice - Information regarding socioeconomic data and the presence or absence of environmental justice populations is being provided by the Pennyrile Area Development District for inclusion in the project scoping study. Aerial and USGS mapping indicates a mobile home neighborhood is located along the south side of US 79, south of US 41, which was identified during on-site reconnaissance of the study area as the Creekside Meadows MHP, and is considered a noise-sensitive receptor (see Attachment A3).

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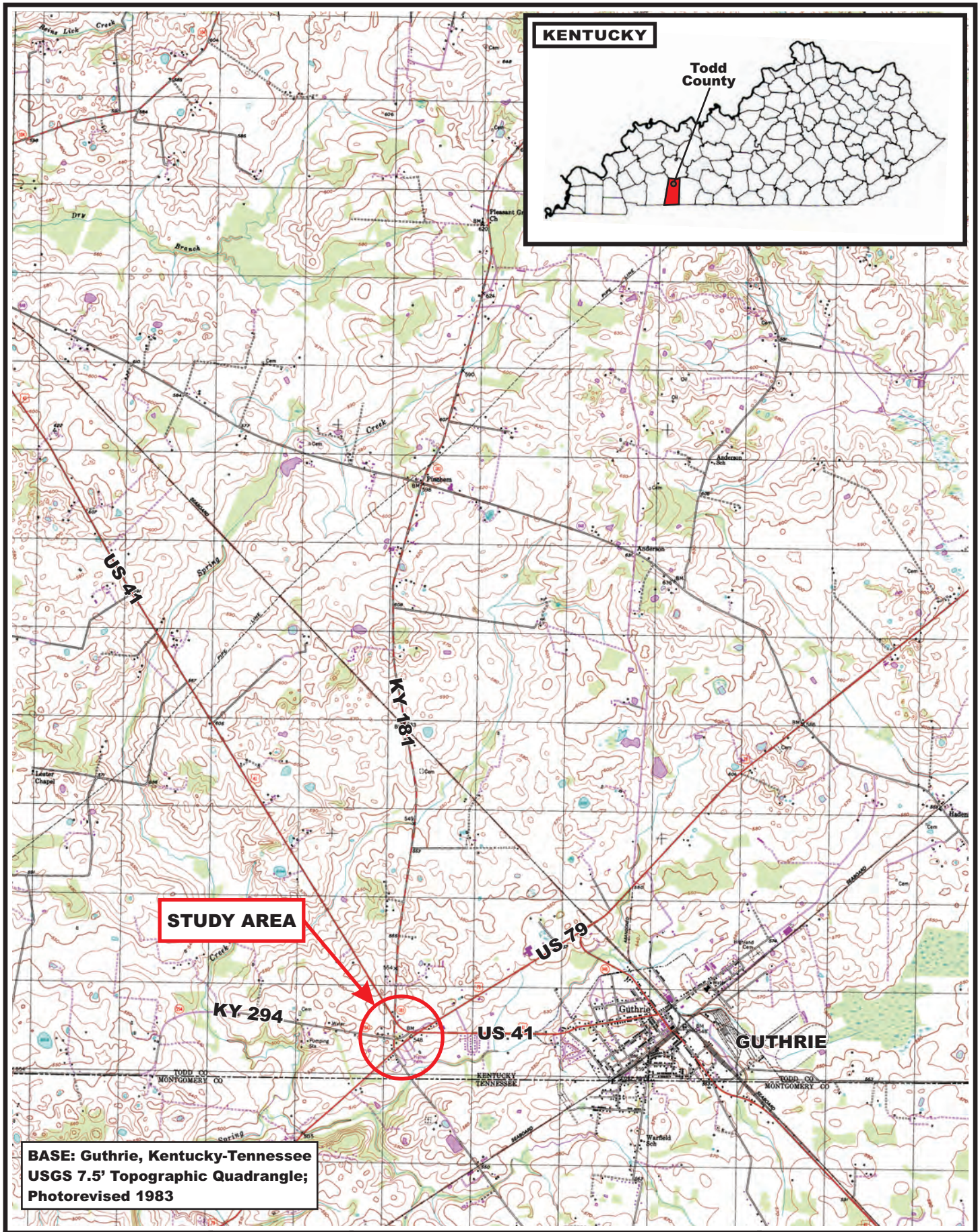
ATTACHMENT A

A1. Project Location Map
A2. Environmental Footprint, Natural Environment
A3. Environmental Footprint, Human Environment
A4. Project Area Map on USGS Base



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July 2011

NORTH

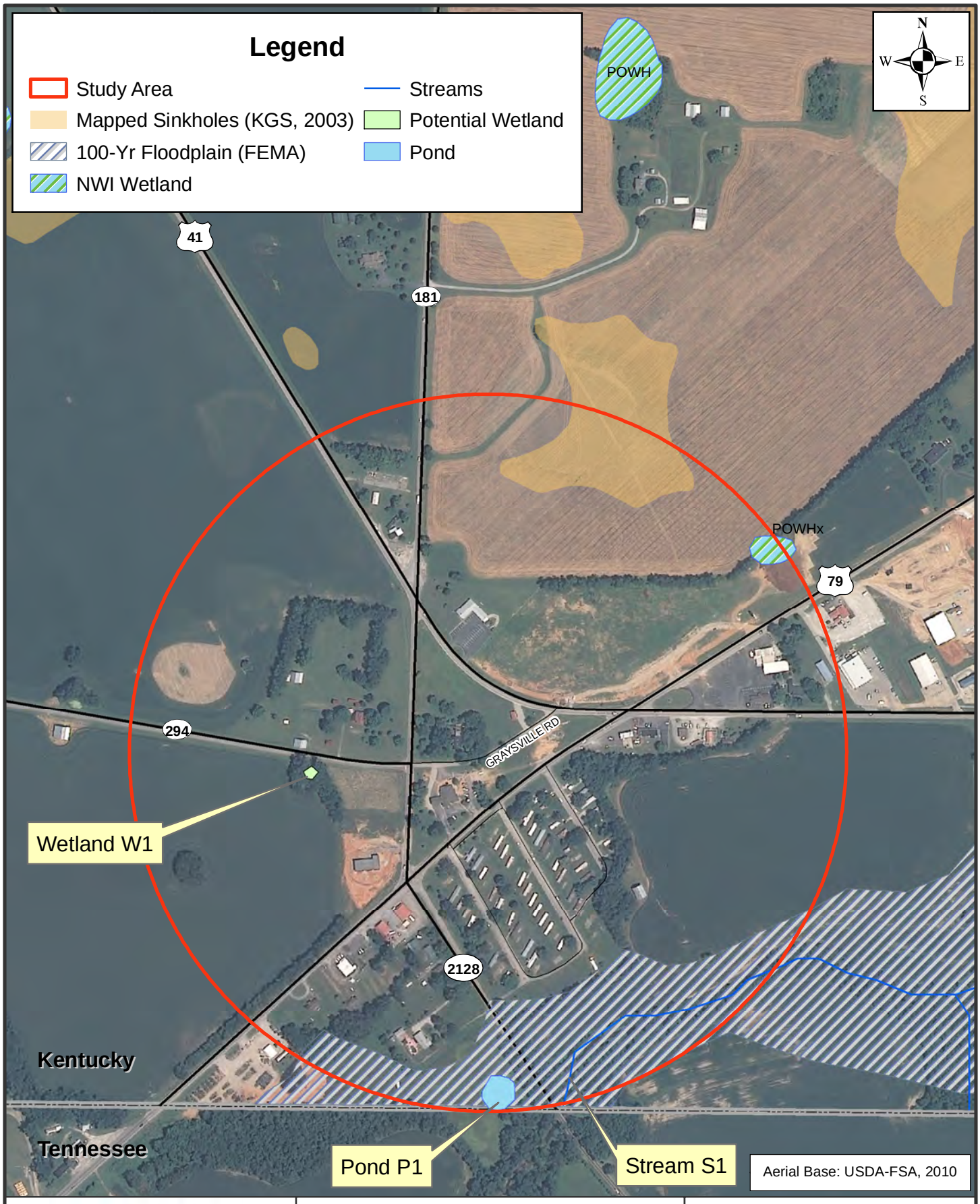
ENTRAN

Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment A1

Project Location Map



ENTRAN

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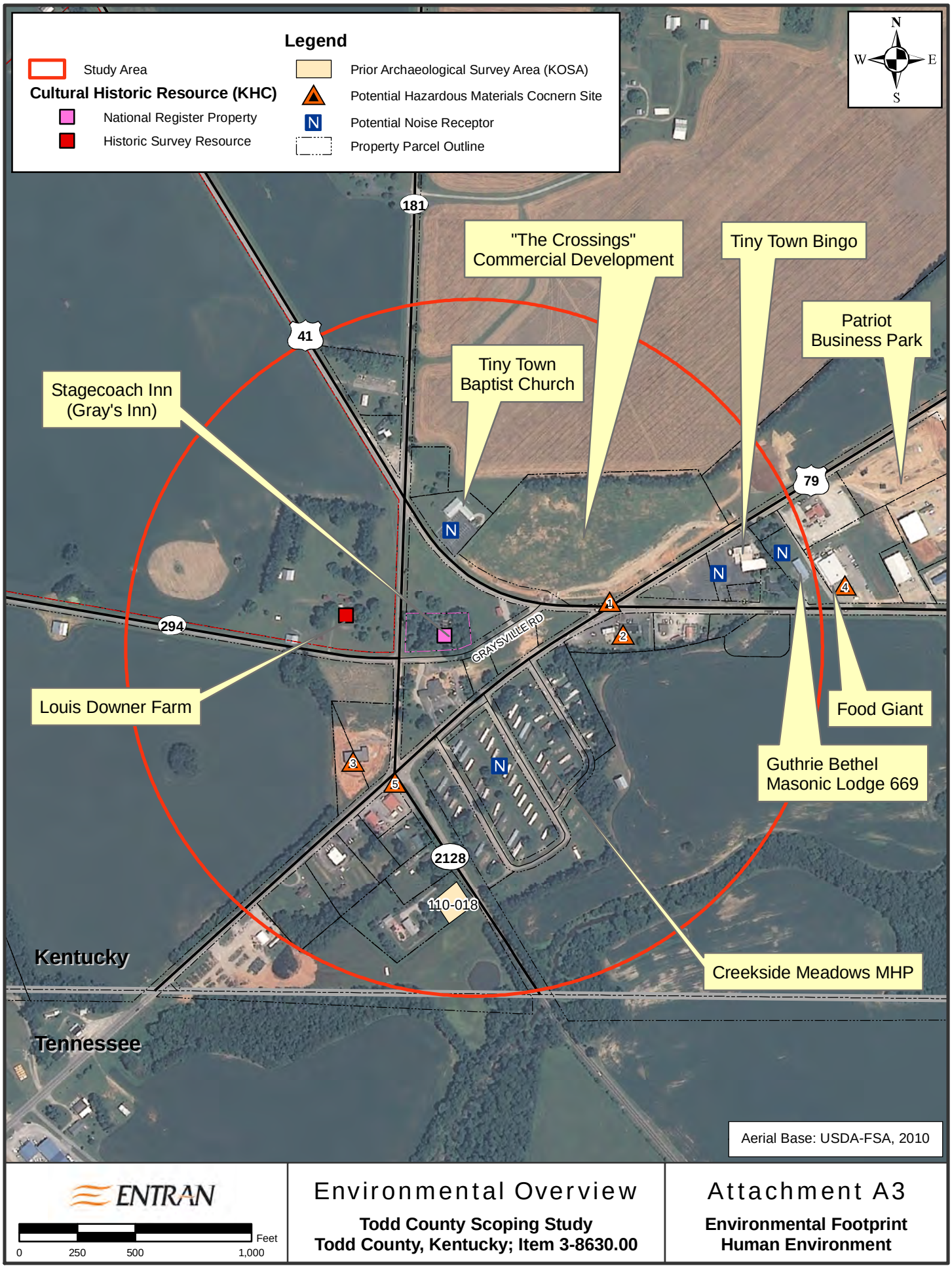
Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment A2

Environmental Footprint
Natural Environment



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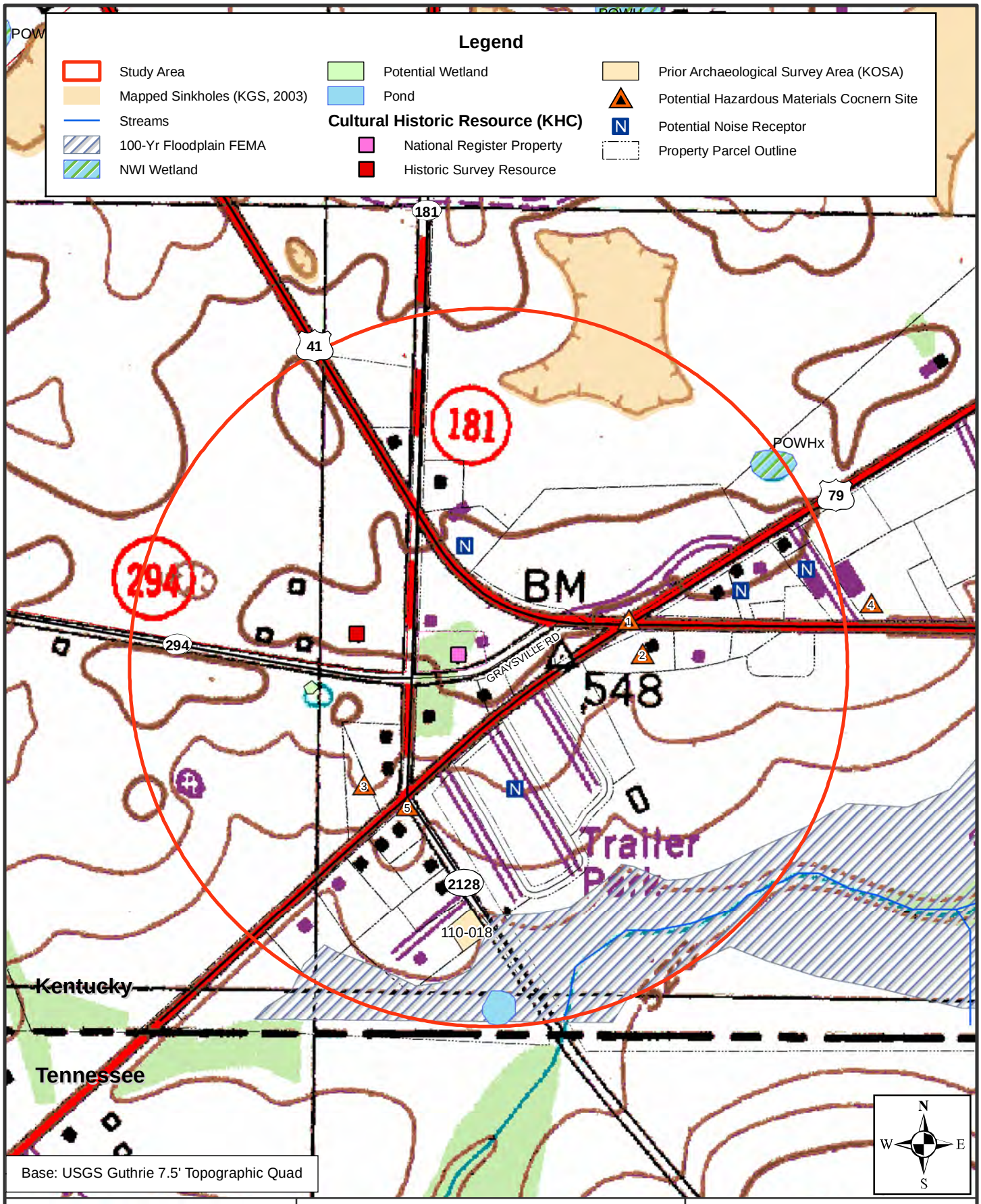
Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment A3

Environmental Footprint
Human Environment



ENTRAN

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Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment A4

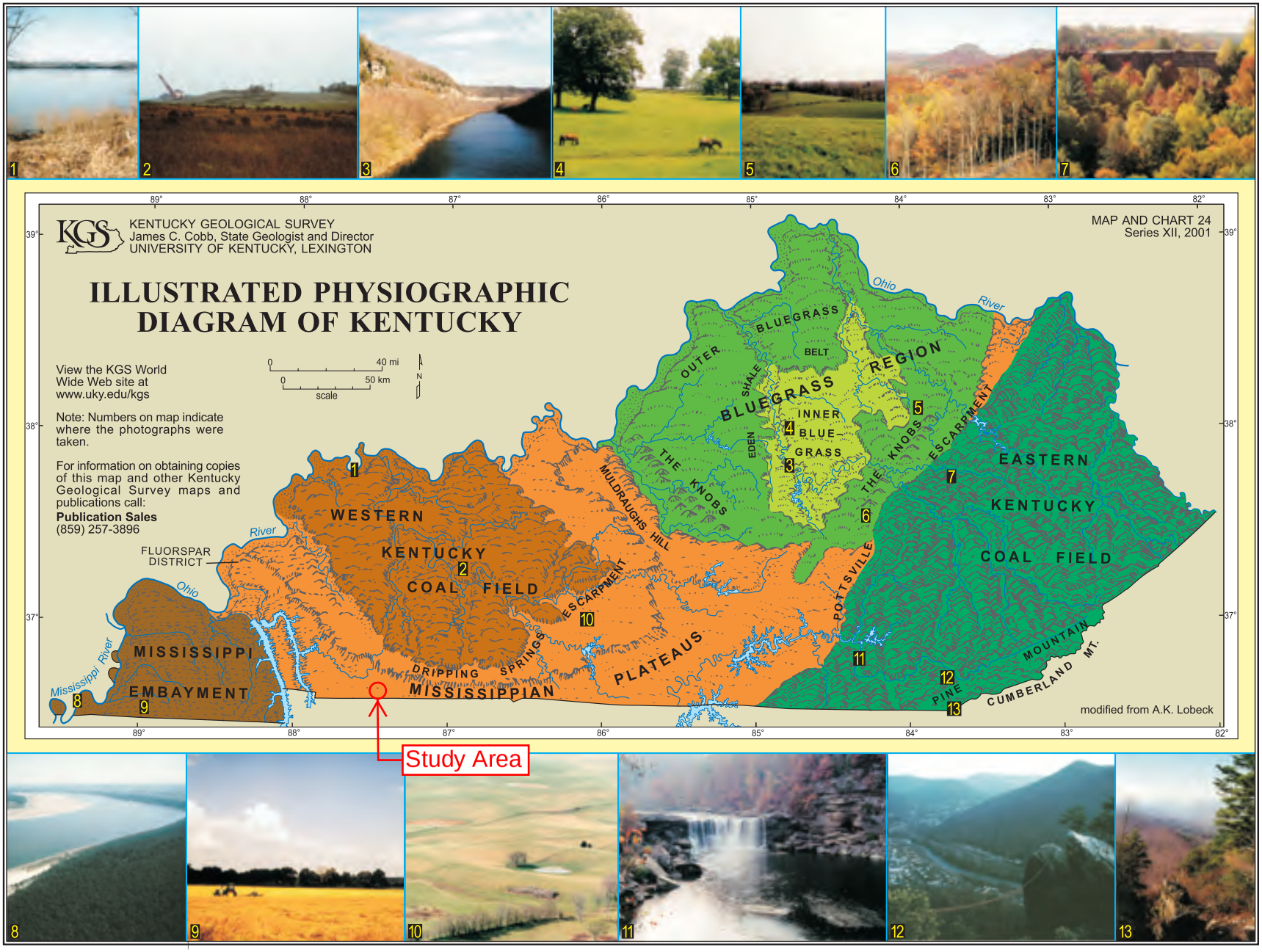
Project Area Map
USGS Base

ATTACHMENT B
Supplemental Information

B1. **Physiographic Regions of Kentucky**
B2. **Ecoregions of Kentucky**
B3. **Geologic Quadrangle Map, Guthrie Quadrangle**
B4. **Todd County Karst Areas (2 Maps and Legend)**
B5. **Project Area and Vicinity Soils Map**
Hydric Soils Map
Prime Farmland Soils Map
B6. **FEMA FIRMette of Project Area Vicinity**
B7. **Availability of Ground Water in Caldwell, Christian, Crittenden, Livingston, Lyon, Todd and Trigg Counties, Kentucky (HA-34)**
B8. **USFWS ECOS List of Federal-Listed Species in Todd County, Kentucky**
Kentucky Ecological Services Field Office List of Endangered, Threatened, & Candidate Species in Todd County, Kentucky
IPCS Conservation Measures Report
B9. **KDFWR List of State-Listed Species in Todd County, Kentucky**
B10. **KSNPC Response 3/22, 2011**
B11. **USFWS Known Myotis sodalis Habitat-Project Vicinity Map**
B12. **KSS Response 4/19/2011**
B13. **NPS Land & Water Conservation Fund Detailed Listing of Grants, Todd County 12/10/2010**
B14. **USEPA Envirofacts Warehouse Reports**

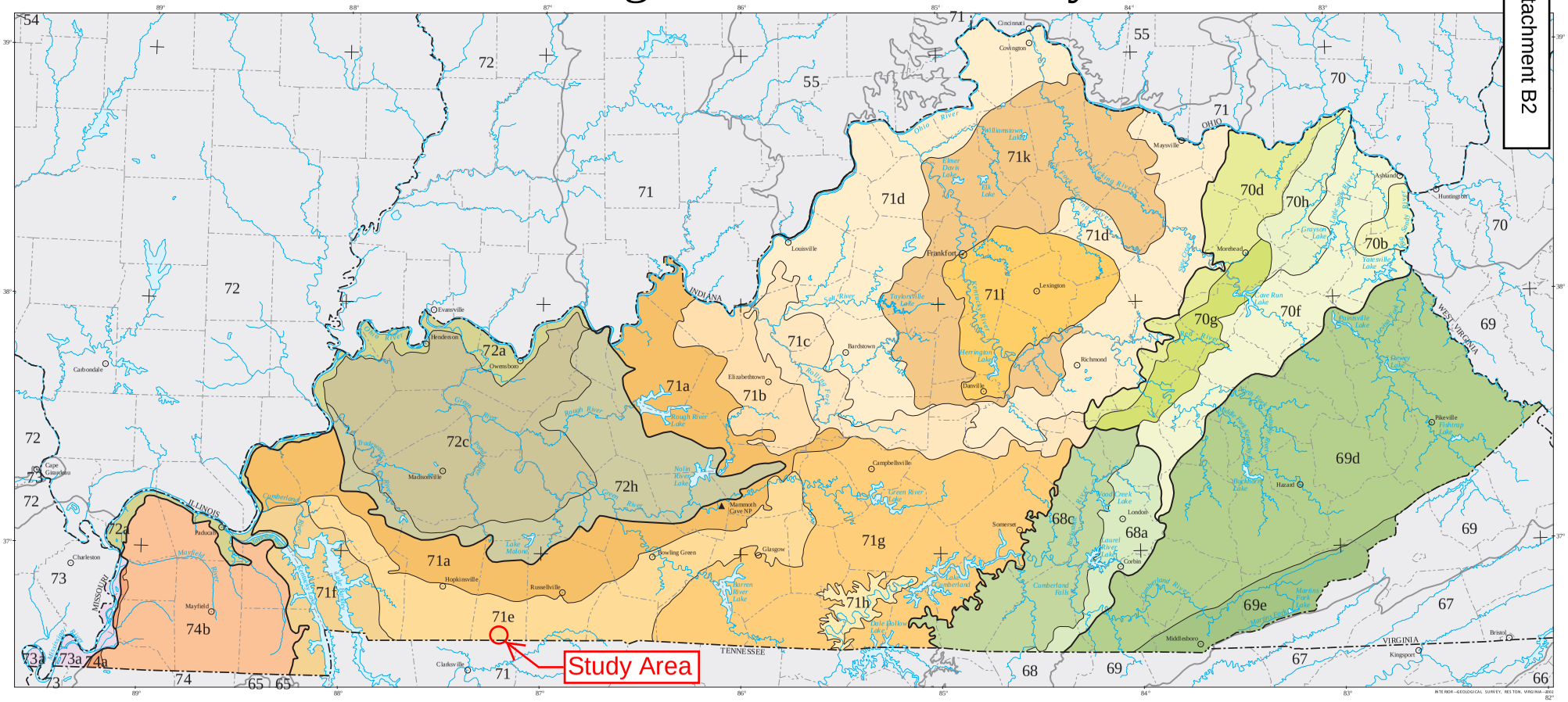
Appendix 1.6
Physiographic Regions of Kentucky

Attachment B1



Ecoregions of Kentucky

Attachment B2



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CITING THIS POSTER: Woods, A.J., Omernik, J.M., Martin, W.H., Pond, G.J., Andrews, W.M., Call, S.M, Comstock, J.A., and Taylor, D.D., 2002, Ecoregions of Kentucky (color poster with map, descriptive text, summary tables, and photographs): Reston, VA., U.S. Geological Survey (map scale 1:1,000,000).

This project was partially supported by funds from the USEPA's Office of Research and Development through USEPA Region IV's Regional Ecological Assessment Program (REAP) via contract 68-D-01-0005 to Dynamac Corporation.

Level III ecoregion
Level IV ecoregion
County boundary
State boundary
International boundary

15 10 5 0 30 60 mi
30 20 10 0 60 120 km

Albers Equal Area Projection
Standard parrallels 37° N and 39° N

68 Southwestern Appalachians
- 68a Cumberland Plateau
- 68c Plateau Escarpment

69 Central Appalachians
- 69d Dissected Appalachian Plateau
- 69e Cumberland Mountain Thrust Block

70 Western Allegheny Plateau
- 70b Monongahela Transition Zone
- 70d Knobs–Lower Scioto Dissected Plateau
- 70f Ohio/Kentucky Carboniferous Plateau
- 70g Northern Forested Plateau Escarpment
- 70h Carter Hills

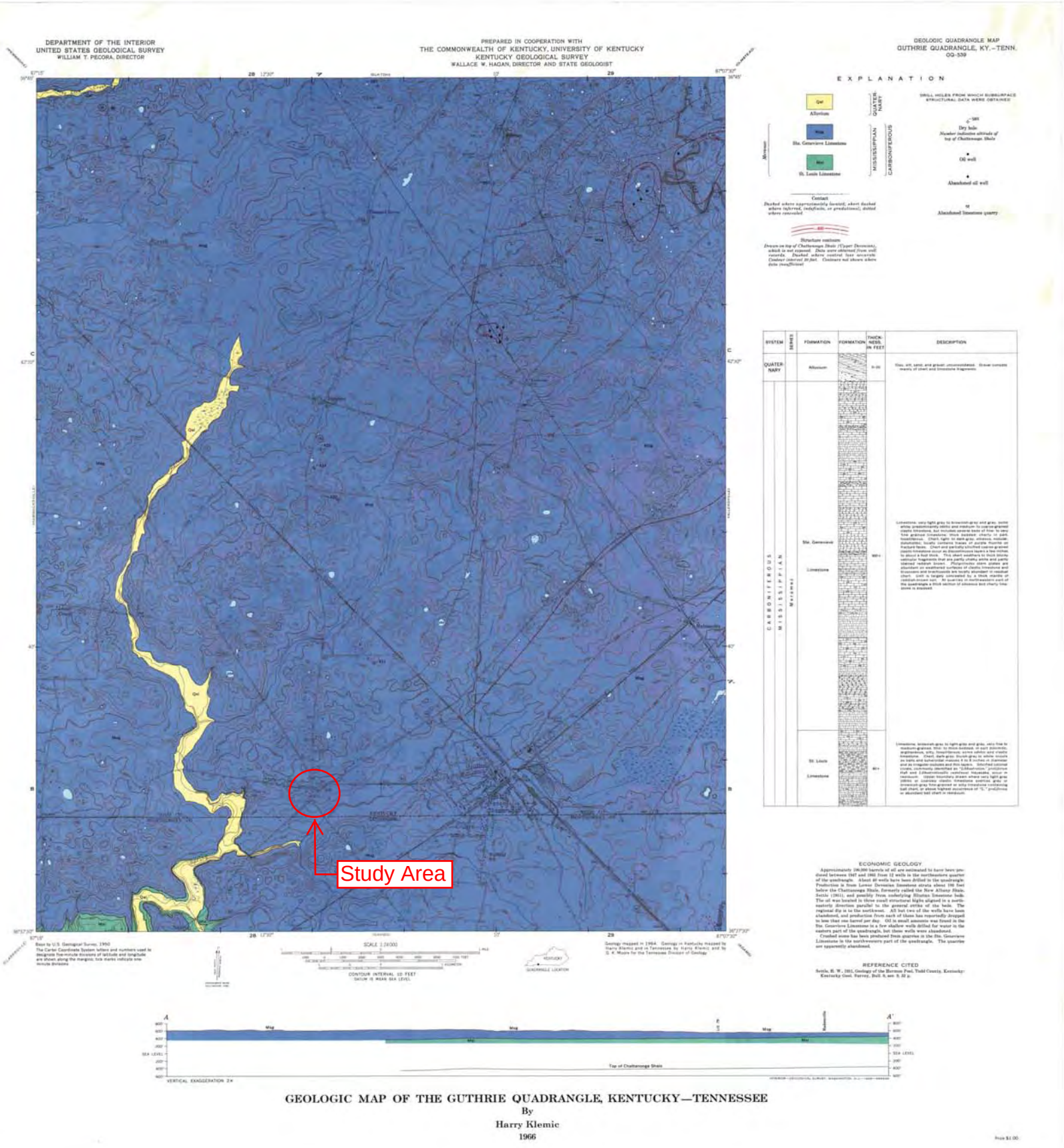
71 Interior Plateau
- 71a Crawford–Mammoth Cave Uplands
- 71b Mitchell Plain
- 71c Knobs–Norman Upland
- 71d Outer Bluegrass
- 71e Western Pennyroyal Karst Plain
- 71f Western Highland Rim
- 71g Eastern Highland Rim
- 71h Outer Nashville Basin
- 71k Hills of the Bluegrass
- 71l Inner Bluegrass

72 Interior River Valleys and Hills
- 72a Wabash–Ohio Bottomlands
- 72c Green River–Southern Wabash Lowlands
- 72h Caseyville Hills

73 Mississippi Alluvial Plain
- 73a Holocene Meander Belts

74 Mississippi Valley Loess Plains
- 74a Bluff Hills
- 74b Loess Plains

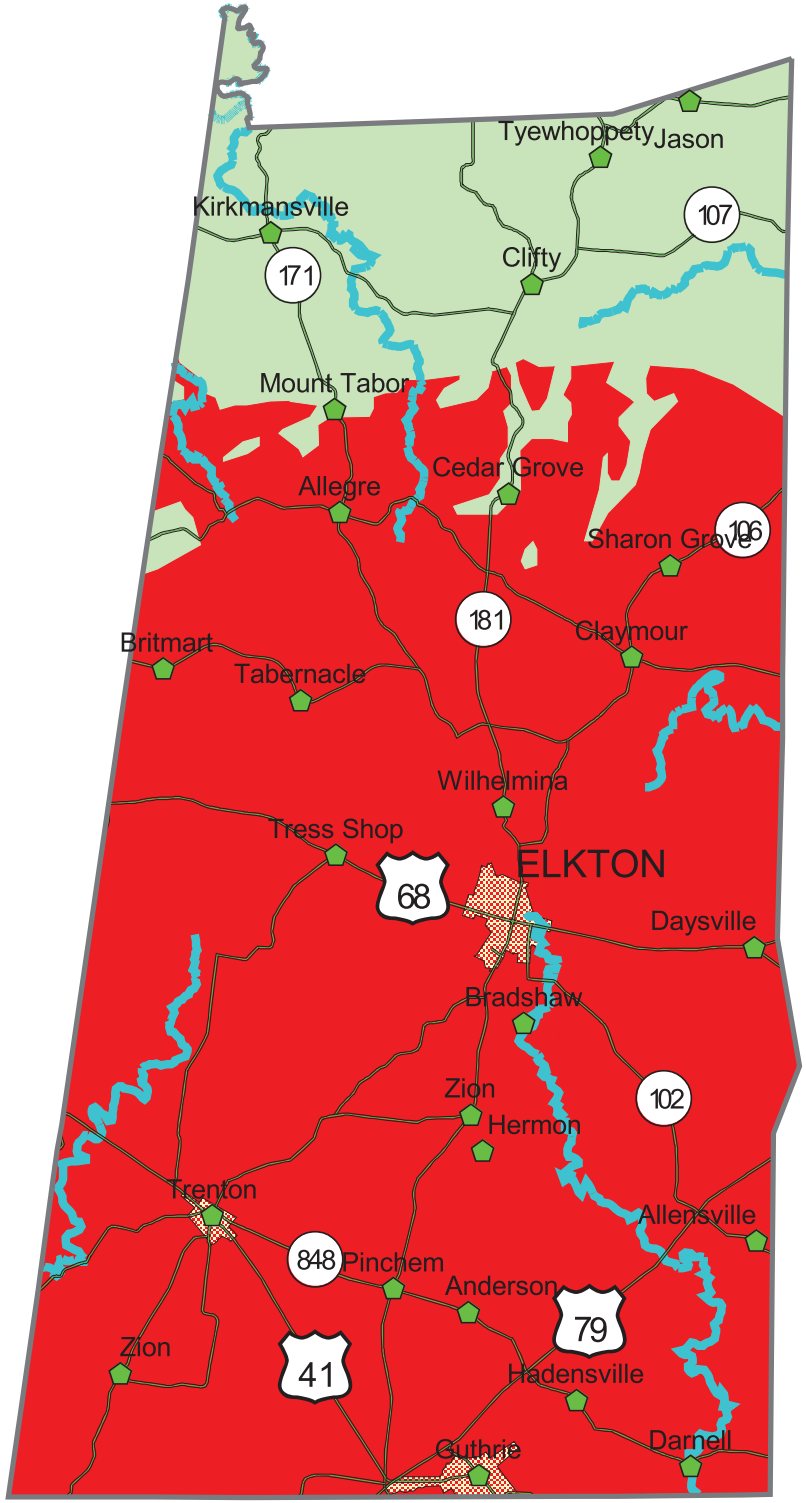
Attachment B3



Note: Reduced from original size, not intended for fine scale viewing; see original source document for details

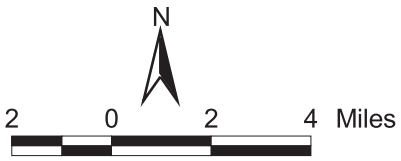
Todd County Karst Areas

(Source: Geologic Map of Kentucky, Scale, 1:500,000)

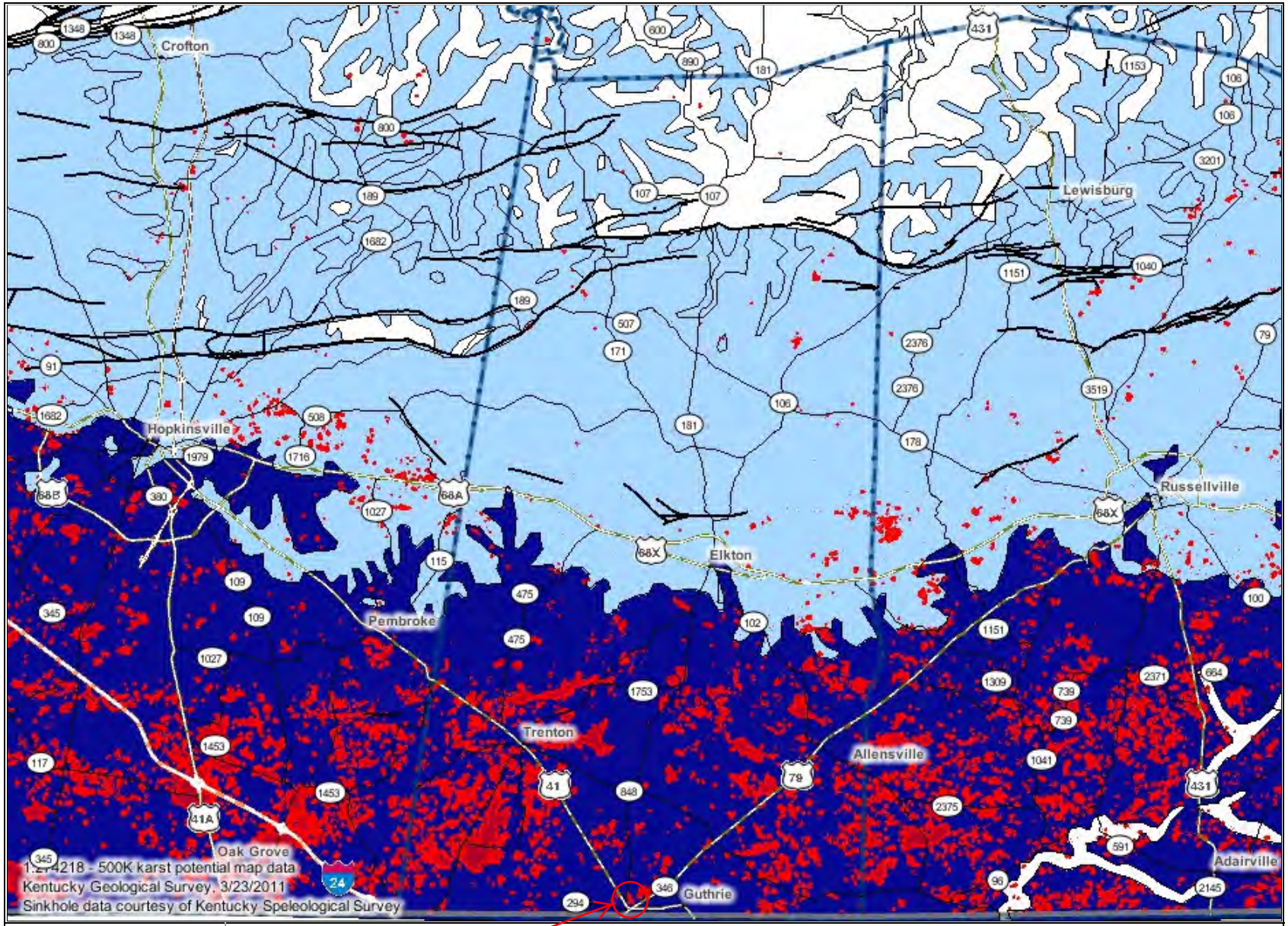


Intense Karst

Non-karst



Attachment B4-2



Current Scale = 1:274,218

- Display Legend For Printing

PRINT THIS PAGE

Attachment B4-3

Kentucky Geological Survey
Geologic Information Service
Map Legend

Karst Potential Index:

- **intense**
- **prone**
- **non-karst**

Symbols:

- contacts / structural features:

- fault
- fault - concealed
- fault - secondary
- fault - projected

- sinkhole location

PRINT THIS PAGE

NOTE: in order to print colors, make sure your browser is enabled to print background colors.
Internet Explorer Instructions: Go to Tools --> Internet Options --> Advanced --> Under the "Printing" header, click the "Print background colors and images" box.
Firefox Instructions: Go to File --> Page Setup --> Click the "Print Background (colors & images)" box.

Attachment B4-4

Karst Potential Classification

The karst potential map shows the tendency for geologic units to develop or have karst features such as sinkholes, springs, caves, or other solution features. The classification is based on lithology. The lithologic characteristics used are percentage of $CaCO_3$ in the carbonate portion of the unit, grain size, bedding thickness, and insoluble components. Insoluble components may occur as a mineral grains within the limestone lithology or as interbeds of noncarbonate rock. These criteria were evaluated for all rock units and combined rock units that appear on the map, and resulted in about 50 distinct rankings. These rankings were reduced to three to five simplified classes by analysis of their frequency of distribution and the scale of the map data.

1:500,000 (small scale) map data (viewed at scales 1:150,001 and smaller) displays three classes:

INTENSE
Areas underlain by bedrock with high potential for karst development. May exhibit mature karst, including caves, sinkholes, and springs where they crop out.

PRONE
Areas underlain by bedrock with moderate potential for karst development. Development of karst features in this category is variable and dependent on site-specific conditions. Occurrence of caves may be influenced by physiographic setting, unit thickness, and lithology.

NONKARST
Areas underlain by bedrock with limited or no potential for karst development. Karst features rare or absent.

1:24,000 (large scale) map data (viewed at scales 1:150,000 and greater) displays five classes:

VERY HIGH
Thick-bedded, typically fine-grained and pure limestone units with little or no insoluble content. Will exhibit mature karst, including caves, sinkholes, and springs where they crop out.

HIGH
Limestone units with low insoluble content, but varied grain size and bedding characteristics. Likely to contain karst features. Occurrence of caves may be influenced by physiographic setting, unit thickness, and lithology.

MEDIUM
Limestone units and coarse-grained, or siliciclastic units with limestone interbeds. Limestone units may contain a high percentage of insoluble minerals. Siliciclastic units will only be karst-prone where limestone beds occur in the near surface. Development of karst features in this category is variable and dependent on site-specific conditions.

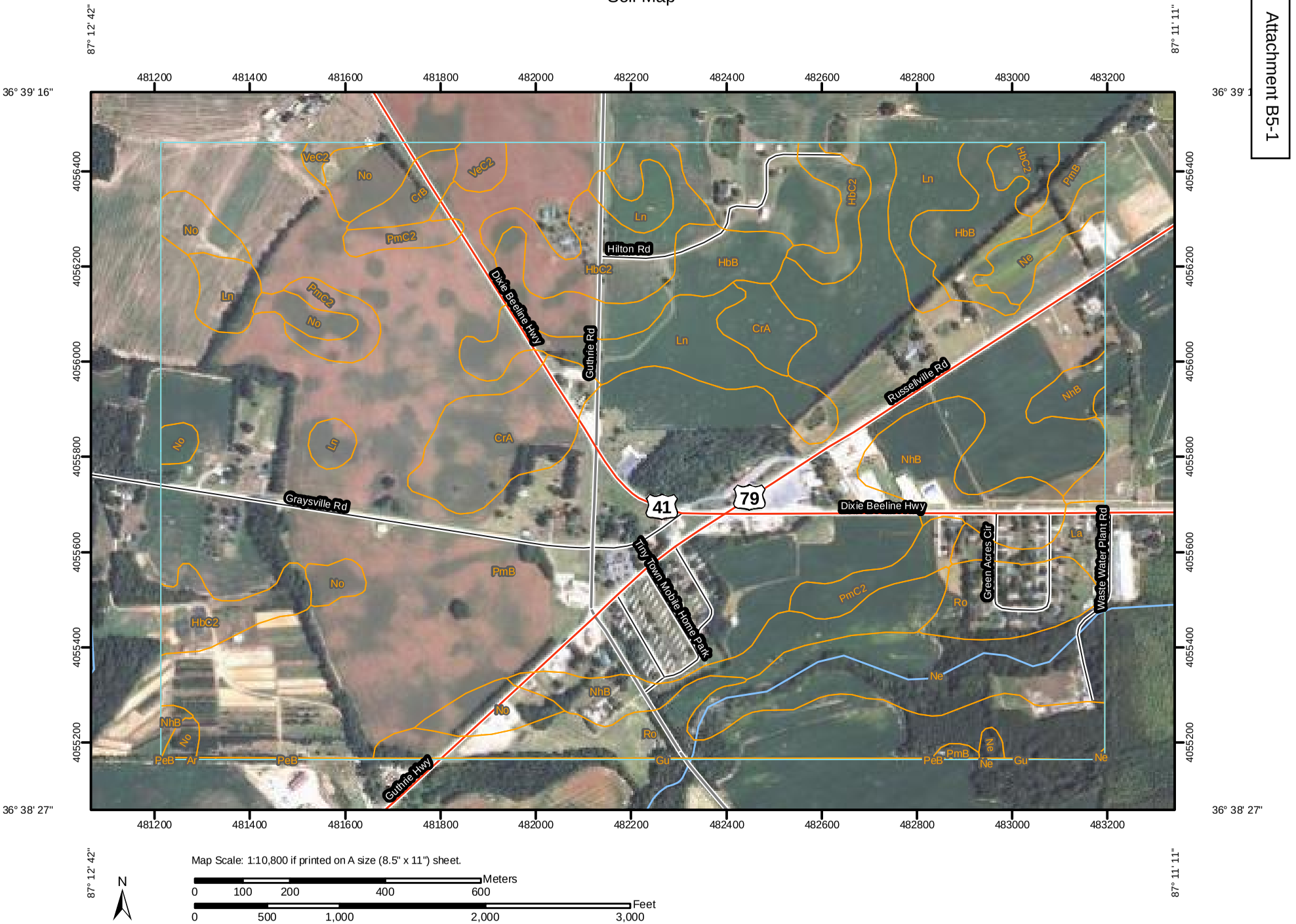
LOW
Siliciclastic units with minor limestone beds or units primarily composed of dolomite. Karst features are poorly developed or absent.

NONKARST
Consolidated or unconsolidated siliciclastic units. Karst features rare or absent.

*Note: A more detailed and precise karst classification method is in development. When the testing and evaluations are complete, the method will be used to add enhanced categories in the karst classification.

Custom Soil Resource Report
Soil Map

Attachment B5-1



Map Scale: 1:10,800 if printed on A size (8.5" x 11") sheet.

N

Meters
0 100 200 400 600

Feet
0 500 1,000 2,000 3,000

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Units

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other

Special Line Features
- Gully
- Short Steep Slope
- Other

Political Features
- Cities

Water Features
- Oceans
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

MAP INFORMATION

Map Scale: 1:10,800 if printed on A size (8.5" × 11") sheet.

The soil surveys that comprise your AOI were mapped at scales ranging from 1:15,840 to 1:20,000.

Please rely on the bar scale on each map sheet for accurate map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: UTM Zone 16N NAD83

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Montgomery County, Tennessee
Survey Area Data: Version 6, Jan 5, 2007

Soil Survey Area: Todd County, Kentucky
Survey Area Data: Version 9, Oct 16, 2009

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Date(s) aerial images were photographed: 8/9/2006

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

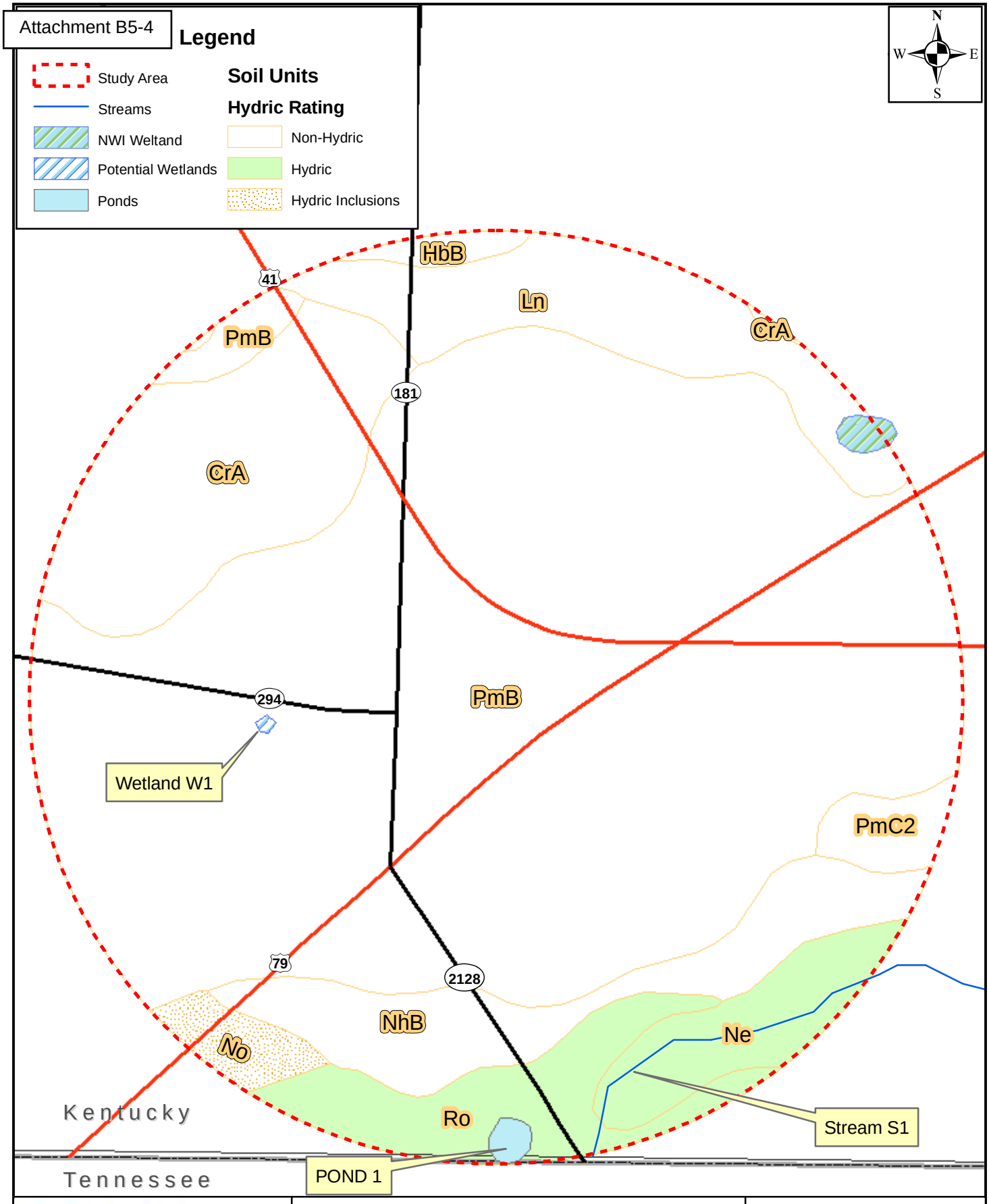
Montgomery County, Tennessee (TN125)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
Ar	ARRINGTON SILT LOAM	0.1	0.0%
Gu	GUTHRIE SILT LOAM	0.8	0.1%
Ne	NEWARK SILT LOAM	0.0	0.0%
PeB	PEMBROKE SILT LOAM, 2 TO 5 PERCENT SLOPES	0.3	0.0%
Subtotals for Soil Survey Area		**1.2**	**0.2%**
Totals for Area of Interest		**635.1**	**100.0%**

Todd County, Kentucky (KY219)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
CrA	Crider silt loam, 0 to 2 percent slopes	23.1	3.6%
CrB	Crider silt loam, 2 to 6 percent slopes	4.4	0.7%
HbB	Hammack-Baxter complex, 2 to 6 percent slopes	25.5	4.0%
HbC2	Hammack-Baxter complex, 6 to 12 percent slopes, eroded	34.9	5.5%
La	Lawrence silt loam, occasionally flooded	5.7	0.9%
Ln	Lindside silt loam, occasionally flooded	38.0	6.0%
Ne	Newark silt loam, occasionally flooded	34.4	5.4%
NhB	Nicholson silt loam, 2 to 6 percent slopes	36.0	5.7%
No	Nolin silt loam, occasionally flooded	22.8	3.6%
PmB	Pembroke silt loam, 2 to 6 percent slopes	343.4	54.1%
PmC2	Pembroke silt loam, 6 to 12 percent slopes, eroded	13.8	2.2%
Ro	Robertsville silt loam, occasionally flooded	48.2	7.6%
VeC2	Vertrees silty clay loam, 6 to 12 percent slopes, eroded	3.6	0.6%
Subtotals for Soil Survey Area		**633.9**	**99.8%**
Totals for Area of Interest		**635.1**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape,



ENTRAN

0 150 300 600 Feet

Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment B5

Hydric Soils

Attachment B5-5

ENTRAN

0 170 340 680 Feet

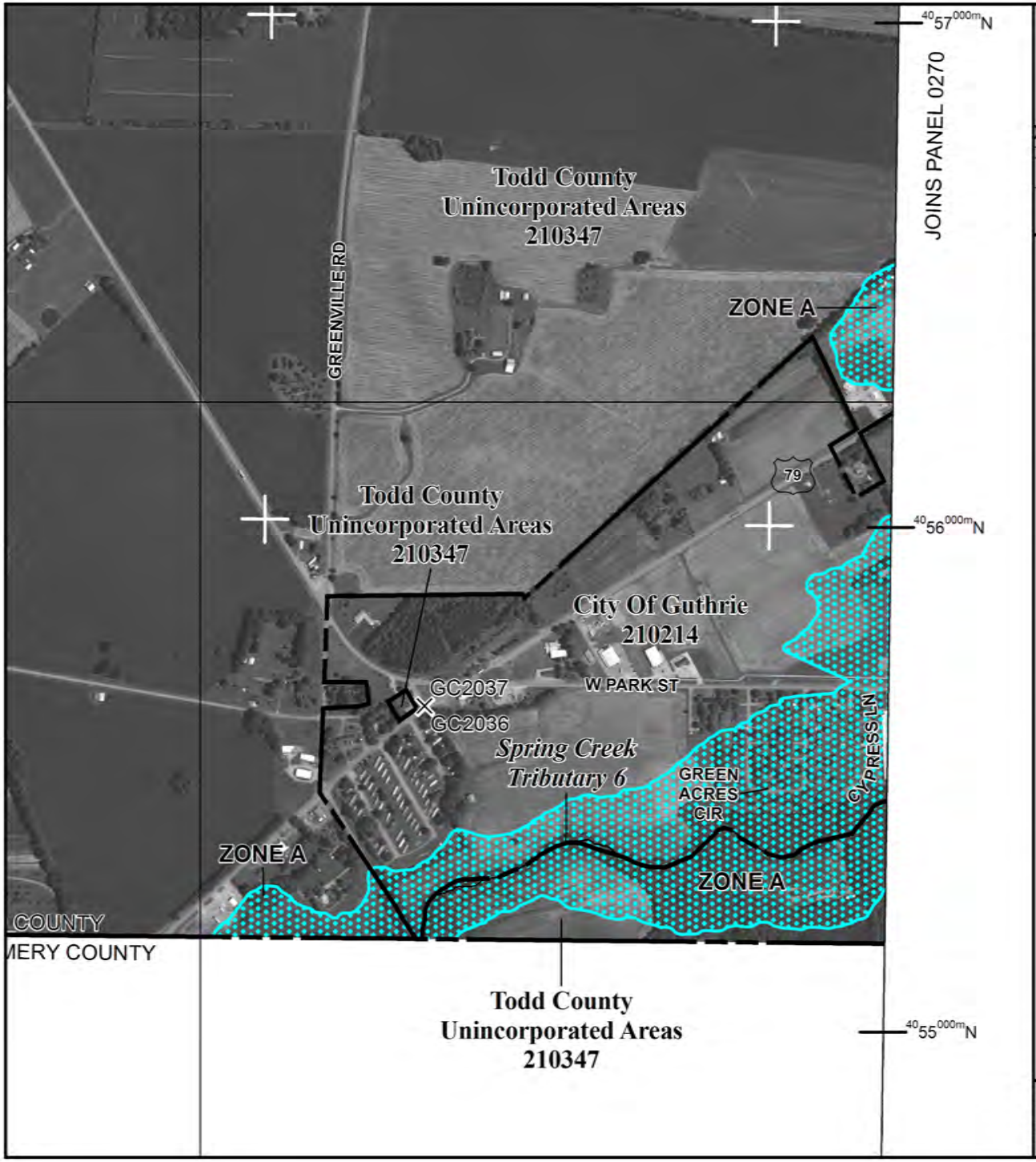
Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment B5

Prime Farmland Soils

Attachment B6



MAP SCALE 1" = 1000'

0 1000 2000 FEET

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0265C

FIRM

FLOOD INSURANCE RATE MAP

TODD COUNTY, KENTUCKY AND INCORPORATED AREAS

PANEL 265 OF 300

(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
GUTHRIE, CITY OF	210214	0265	C
TODD COUNTY	210347	0265	C

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

EFFECTIVE DATE
JULY 22, 2010

MAP NUMBER
21219C0265C

Kentucky

State of Kentucky
Federal Emergency Management Agency

Attachment B7-1

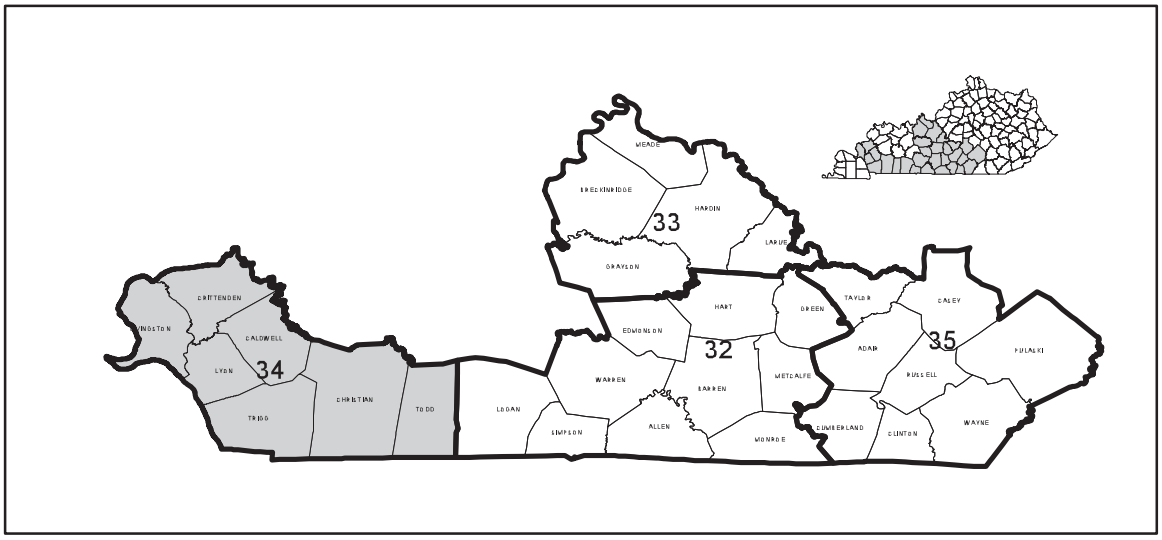
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH
THE COMMONWEALTH OF KENTUCKY
AND THE KENTUCKY GEOLOGICAL SURVEY
UNIVERSITY OF KENTUCKY

AVAILABILITY OF GROUND WATER IN CALDWELL, CHRISTIAN, CRITTENDEN, LIVINGSTON, LYON, TODD, AND TRIGG COUNTIES, KENTUCKY

By
T.W. Lambert and R.F. Brown

HYDROLOGIC INVESTIGATIONS
ATLAS HA-34



INDEX MAP OF THE MISSISSIPPIAN PLATEAU REGION, KENTUCKY, SHOWING COUNTY GROUPS AND AREA OF THIS ATLAS

This is 1 of 4 atlases (HA-32 to HA-35) showing geology and availability of ground water in the Mississippian Plateau region, Kentucky U.S. Geological Survey Water-Supply Paper 1603 contains a text description and illustrations providing further information on the occurrence and quality of ground water in the Mississippian Plateau region.

PUBLISHED BY THE U.S. GEOLOGICAL SURVEY

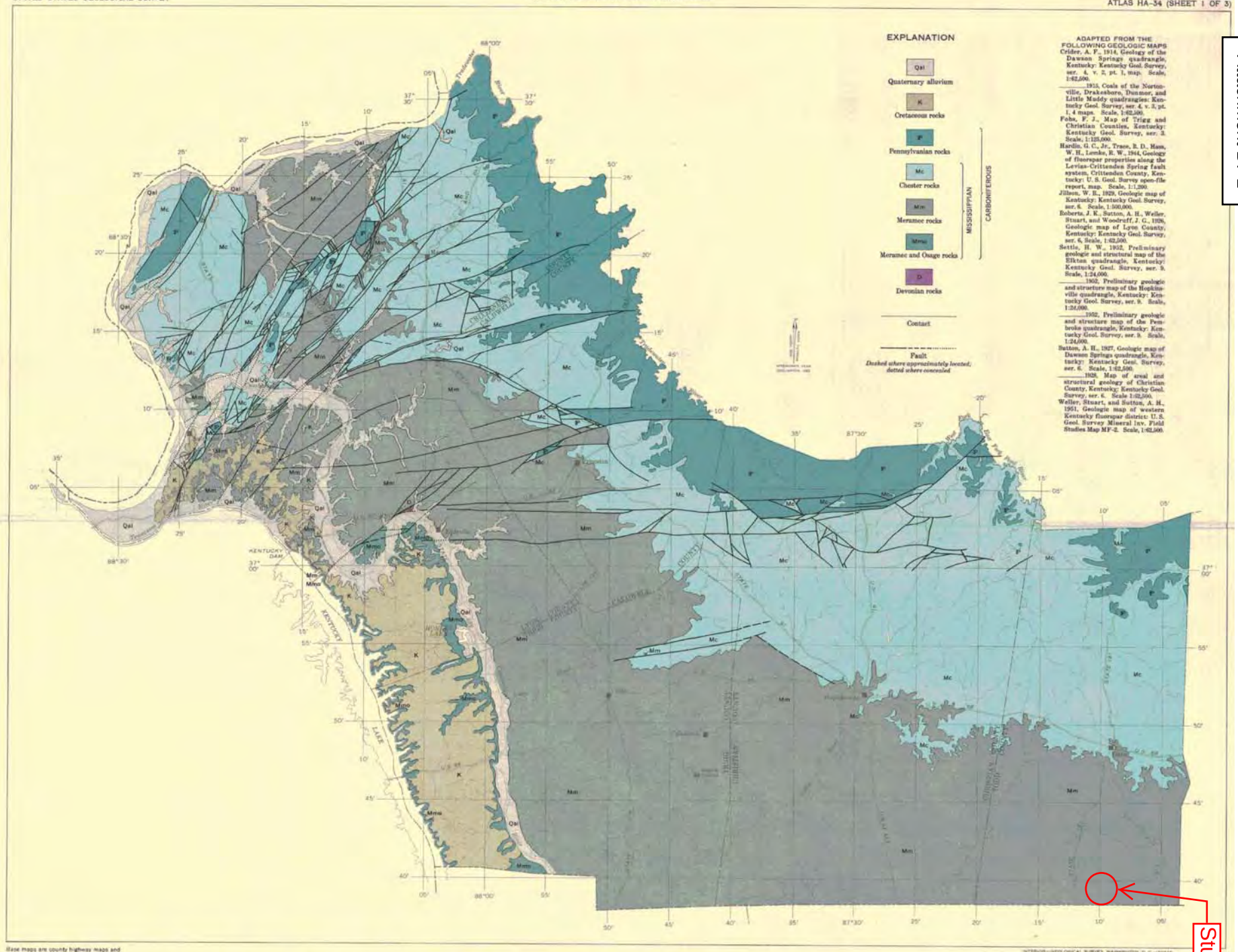
WASHINGTON, D.C.

1963

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE COMMONWEALTH OF KENTUCKY
UNIVERSITY OF KENTUCKY, KENTUCKY GEOLOGICAL SURVEY
AND THE DEPARTMENT OF ECONOMIC DEVELOPMENT

HYDROLOGIC INVESTIGATIONS
ATLAS HA-34 (SHEET 1 OF 3)



Base maps are county highway maps and adjacent county groups may not match

GEOLOGIC MAP OF CALDWELL, CHRISTIAN, CRITTENDEN, LIVINGSTON, LYON, TODD, AND TRIGG COUNTIES, KENTUCKY

By
T. W. Lambert and R. F. Brown

SCALE 1:250 000

4 0 4 8 12 MILES
4 0 4 8 12 KILOMETERS

HYDROLOGIC INVESTIGATIONS
ATLAS HA-34 (SHEET 1 OF 3)

1963

Price $1.25 per set

Attachment B7-2

Note: Reduced from original size, not intended for fine scale viewing; see original source document for details

Attachment B7-3

Note: Reduced from original size, not intended for fine scale viewing; see original source document for details

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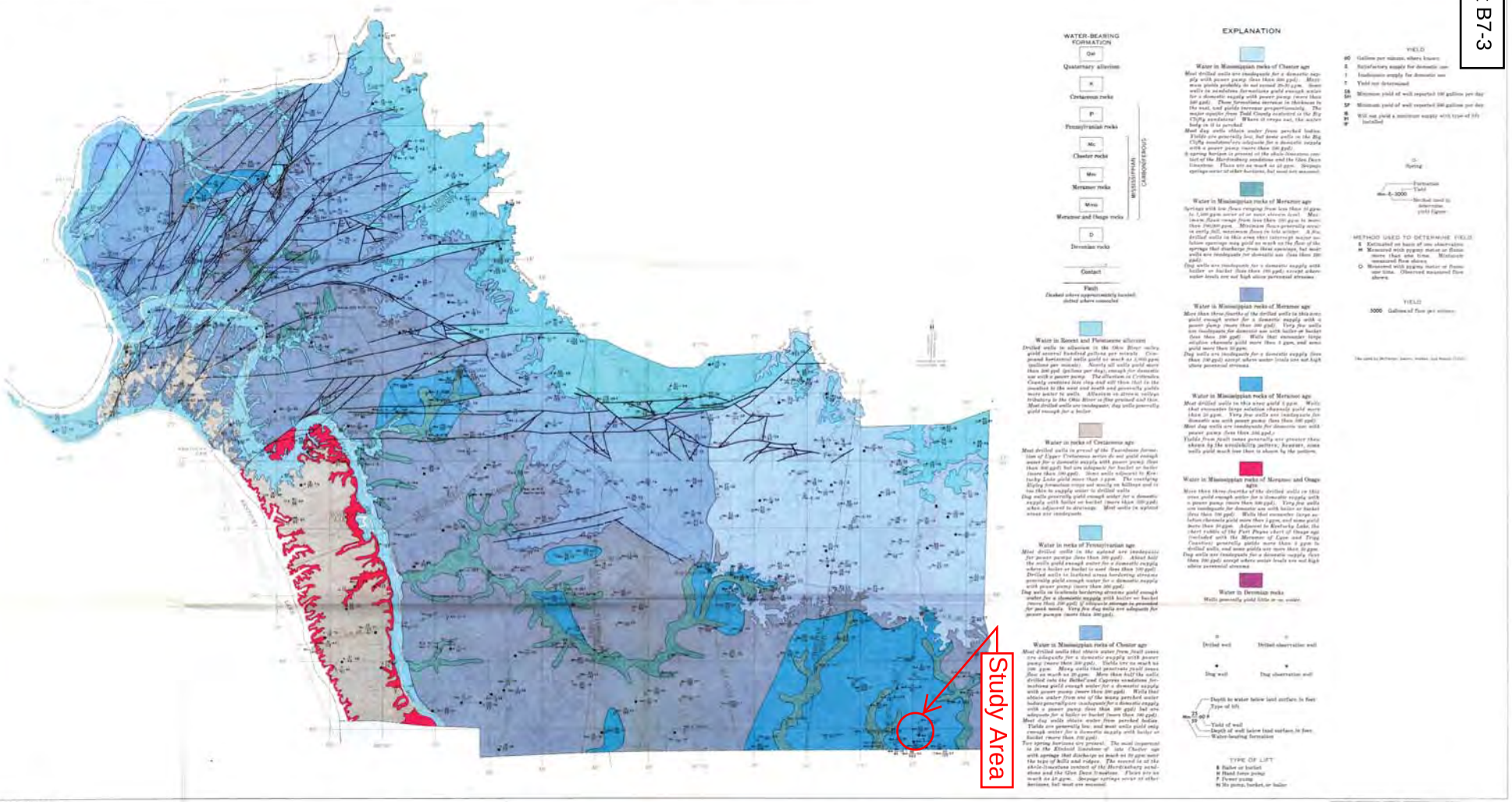
UNIVERSITY OF KENTUCKY, KENTUCKY GEOLOGICAL SURVEY
AND THE DEPARTMENT OF ECONOMIC DEVELOPMENT

HYDROLOGIC INVESTIGATIONS
ATLAS HA-34 (SHEET 2 OF 3)



AVAILABILITY OF GROUND WATER IN CALDWELL, CHRISTIAN, CRITTENDEN, LIVINGSTON, LYON, TODD, AND TRIGG COUNTIES, KENTUCKY

By

T. W. Lambert and R. F. Brown

SCALE 1:250 000

1963

Attachment B7-4

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE COMMONWEALTH OF KENTUCKY
UNIVERSITY OF KENTUCKY, KENTUCKY GEOLOGICAL SURVEY
AND THE DEPARTMENT OF ECONOMIC DEVELOPMENT

HYDROLOGIC INVESTIGATIONS
ATLAS HA-34 (SHEET 3 OF 3)

SYSTEM	SERIES	FORMATION	THICKNESS (IN FEET)	SECTION	LITHOLOGY	TOPOGRAPHY	WATER-BEARING CHARACTER
QUATERNARY	Recent and Pleistocene	Alluvium	0–120		Silt, clay, and some sand and gravel in tributary valleys. Sand, gravel, and clay in major stream valleys.	Terraces and flood plains of Cumberland, Tennessee, and Ohio Rivers and tributaries.	Yields several hundred gallons a minute to drilled wells in the alluvium of the Ohio River valley and its two main tributaries, Cumberland and Tennessee River valleys. Nearly all wells produce more than 500 gpm (gallons per minute), enough water for domestic use with a power pump. Locally, north of Smithland, Livingston County, wells must penetrate the underlying bedrock to obtain an adequate supply. Alluvium in stream valleys tributary to the three major rivers is fine-grained and thin; most wells in these areas furnish less than 100 gpd (gallons per day), not enough for a bailer or bucket.
TERTIARY		Sand and gravel	0–40		Gravel, iron-stained, mainly chert, and small amounts of quartzite. Pebbles subangular to rounded, average diameter ½ to 1 in. Medium to coarse, orange or brick-red sand. Mostly chert and quartzite but contains some feldspar, hornblende, kyanite, and zircon. Sand and pebbles in places cemented by iron oxide into a hard conglomeratic sandstone.	Underlies dissected uplands between Cumberland and Tennessee Rivers above altitude of approximately 380 feet.	
CRETACEOUS	Upper Cretaceous	Ripley	0–50		Sand and interbedded clay; thin, indurated beds at sand-clay contacts. Sand may be white, buff, yellow, or red. Clay ranges from white to dark gray. Formation mostly silt and clay in some areas.	Underlies dissected uplands and ridges between Cumberland and Tennessee Rivers; truncated and covered by the alluvium of the Ohio and Tennessee Valleys.	Yields enough water for a domestic supply (more than 100 gpd) to dug wells of large storage capacity. Only locally is there a sufficient thickness to obtain a domestic supply.
		Tuscaloosa	0–200		Rounded chert gravel in matrix of angular chert sand and tripolitic clay. Average diameter of gravel about 1½ in.		Yields almost no water to wells owing to its small thickness and its topographic situation, except south of Smithland, Livingston County, where it underlies the alluvium.
PENNSYLVANIAN		Caseyville sandstone	30–400		Sandstone containing interbedded sandy shale and coal. Quartzose conglomerate present at base in some places.	Underlies dissected ridges between Cumberland and Tennessee Rivers. Underlies dissected uplands adjacent to Tradewater and Pond Rivers. Forms major escarpment. Occurs in faulted zone of the fluorspar area	Most drilled wells in the gravel of the Tuscaloosa formation are adequate for a bailer (more than 100 gpd.) Yields adjacent to Kentucky Lake may exceed 5 gpm. Tripolitic clay is present locally and wells penetrating it are inadequate (less than 100 gpd). Yields enough water for a domestic supply with a power pump (more than 500 gpd) to drilled wells in lowland areas bordering streams and locally in broad upland areas. Wells in small areas upland generally are inadequate (less than 100 gpd).
MISSISSIPPIAN	Chester	Kinkaid limestone	0–200		Limestone, light- to medium-gray, dense, thin-bedded, alternating with light-gray chert, and gray to black shale; unit red and olive green in places. Sandstone in lower part of formation.	Underlie gently rolling upland having some sinkholes. Form moderate to steep slopes.	Most drilled wells that obtain water from fault zones are adequate for a domestic supply with a power pump (more than 500 gpd). Yields are as much as 100 gpm. Flows of as much as 20 gpm are obtained from fractures along fault zones and adjacent beds. Most flowing wells are in sandstone. Water is usually obtained from the hanging walls or gouge zones of faults. Sandstone formations yield enough water for a domestic supply with a bailer or bucket (more than 100 gpd) where there is an adequate saturated thickness in perched water zones. Most shallow wells in broad uplands are dug and usually yield more than 100 gpd, but yields are not dependable in dry years. Drilled wells produce enough water for a bailer (more than 100 gpd) and most of these wells produce enough water for a power pump (more than 500 gpd). Minor spring horizons occur near the base of the sandstone on discontinuous shale beds. Very few of the springs are adequate for a domestic supply, and many go dry in late fall or winter. Limestone formations yield small to adequate supplies from solution openings. In lowland areas bordering streams, some wells furnish enough for a domestic supply with a power pump (more than 500 gpd). Most wells in upland areas are inadequate for a domestic supply with bailer or bucket (less than 100 gpd). On uplands deep wells that penetrate solution openings in limestone may produce more than 5 gpm, but most deep wells on uplands are inadequate for a domestic supply with bailer or bucket (less than 100 gpd). Close to outcrop areas, particularly near major escarpments, yields from perched water bodies generally are inadequate during dry periods. Springs occur at the base of many limestone formations where they crop out on escarpments and hillsides. Adjacent to large upland areas, springs yield as much as 100 gpm and low flows are more than 5 gpm from some springs.
		Degonia sandstone	10–30		Sandstone, yellow to brown, thin-bedded, flaggy, crossbedded, ripple-marked; calcareous in places.		
		Clore limestone	30–60		Limestone, gray, shaly, thin-bedded; interbedded with argillaceous and calcareous shale.		
		Palestine sandstone	40–80		Sandstone, light-gray, medium-grained, thin-bedded to massive.	Forms minor bench on hillsides. Underlies gently rolling upland.	
		Menard limestone	80–140		Limestone, dark-gray, dark olive-tan, and black, fine-grained to sublithographic, commonly argillaceous; interbedded with dark-gray fissile shale.	Underlie flat uplands. Form gentle slopes on hillsides.	
		Waltersburg sandstone	20–60		Sandstone, medium-gray, fine-grained, shaly; massive in places. In lower part consists chiefly of very dark gray shale.		
		Vienna limestone	20–40		Shale, dark-gray, fissile; also dark-gray, clayey, calcareous in upper part, alternated with medium- to dark-gray fine-grained to crystalline limestone and dark bluish-gray chert.		
		Tar Springs sandstone	100–200		Sandstone, light- to medium-gray, fine-grained; shaly limestone containing interbedded dark-gray shale and thin sandstone lenses and thin coal beds.	Underlies gently rolling upland. Forms minor bench on hillsides.	
		Glen Dean limestone	40–90		Limestone, light- to medium-gray, fine-grained to coarsely crystalline, crinoidal; contains medium-gray shale beds. Limestone coarsely oolitic in places. Sandy shale and sandstone near middle of formation.	Underlies gently rolling upland. Forms a gradual slope above Hardinsburg bench.	
		Hardinsburg sandstone	20–140		Sandstone, light-gray, fine- to medium-grained, massive; dark shale horizon in middle. Thin, basal conglomerate present in places.	Forms minor escarpment, modified in many places by faults. Underlies broad rolling uplands.	
	Golconda	Haney limestone[1]	30–170		Limestone, light-gray, coarsely crystalline, argillaceous in places. Chert and gray shale interbedded with limestone.	Underlie gently rolling upland. Form steep slope below minor Hardinsburg sandstone escarpment. Fraley shale grades into Big Clifty sandstone[2] eastward from Christian County to form a major escarpment.	
		Fraley shale[1]			Shale, light- to dark-gray, slightly calcareous. Gray limestone interbedded with shale. Grades into Big Clifty sandstone[2] eastward from Todd County.		
		Beech Creek limestone[1]			Limestone, dark-gray, very hard, slightly argillaceous.		
		Cypress sandstone	25–125		Sandstone, light- to greenish-gray, fine- to medium-grained. Thin, basal conglomerate, and thin coal present in places. Dark shale in middle or lower part.	Forms a major escarpment, but broken by faults in fluorspar area. Eastward from Christian County the escarpment wedges out against the overlying Big Clifty[2]. Underlies broad flat uplands.	
		Rideshower shale[1]	1–100		Shale, dark-gray, slightly sandy, and sandstone. Nodular impure limestone predominant to east.	Forms moderate to rolling slope below Cypress sandstone escarpment; modified by faults in fluorspar area.	
		Bethel sandstone[1]	25–125		Sandstone, light-gray, medium-grained, massive. In places a conglomerate is present at the base.	Forms lowest major escarpment from fluorspar area to Todd County; escarpment broken by faults in fluorspar area. Underlies broad rolling upland.	
		Paoli limestone[1]	20–100		Limestone, medium- to dark-gray, medium- to coarse-grained, crystalline, oölitic in places, and interbedded dark greenish-gray shale, commonly calcareous in places.	Forms a moderate slope under Bethel sandstone[1] escarpment except where modified by faults or a higher sandstone escarpment.	Yields little or no water to wells. Small springs with low flows of about 5 gpm occur near the top of the formation.
	Meramec	Ste. Genevieve limestone	180–270		Limestone, white to medium-gray, fine-grained to oölitic, crossbedded; contains chert nodules. Calcareous or shaly, slabby or massive lenticular sandstone may be present in the upper one-third of the formation.	Underlies rolling karst uplands[1]. Forms moderate slope under Bethel sandstone escarpment except where modified by faults. Exposed as large fault blocks in much of the fluorspar area.	Yields more than 50 gpm to wells from large solution openings in karst areas. Most wells penetrate solution openings, but in areas high above perennial streams, solution openings are dry in late summer and fall and many wells are inadequate. Springs having low flows ranging from less than 10 to about 1,500 gpm occur at or near stream level. Smaller springs discharge from perched water bodies in upland areas, but many go dry during late summer and fall.
		St. Louis limestone	350–400		Limestone, medium-gray to black, fine-grained to lithographic; contains abundant bluish-gray chert nodules.	Underlies dissected uplands and ridges. Underlies rolling karst uplands in faulted parts of the fluorspar area and uplands of Christian, Trigg, and Todd Counties. Forms steep valley walls along Cumberland River.	Low flows of numerous springs that discharge from near the top of the formation and near stream level range from less than 10 gpm to about 1,500 gpm. Maximum flows range from less than 100 gpm to more than 100,000 gpm. Most large springs are situated near minor rivers. In karst areas, drilled wells generally produce enough water for domestic use with a power pump (more than 500 gpd). Some produce more than 50 gpm from large solution openings. Most wells high above perennial streams are adequate. In nonkarst areas, yields generally are lower than in karst. The number of solution openings is fewer and their size smaller. Many wells are insufficient for bailer or bucket (less than 100 gpd). Most springs are small and many go dry during late summer and fall. Most wells high above perennial streams are inadequate (less than 100 gpd).
		Spergen limestone[1]	50		Limestone, light- to medium-gray, fine-grained to oölitic.	Underlies dissected uplands and ridges adjacent to Ohio River in Livingston and Crittenden Counties and adjacent to Cumberland River in Trigg County.	Wells that encounter large solution openings near stream level or near sinkholes yield sufficient water for a power pump (more than 500 gpd). In most other areas, the rock is fine-grained and yields generally are insufficient for a bailer or bucket (less than 100 gpd).
		Warsaw limestone	50±		Limestone, medium- to dark-gray, coarsely granular, crinoidal, fossiliferous. The basal part of the formation consists of medium- to dark-gray fine-grained shaly limestone containing nodules and stringers of gray chert.	Underlies dissected uplands and ridges adjacent to Cumberland and Tennessee Rivers and tributaries in Trigg, Lyon, and Livingston Counties. Exposed in faulted zone at Kuttawa.	
	Osage	Fort Payne chert	515		Limestone, dark bluish-gray, and interlayered chert. Chert is dark-gray to black and has fine laminations paralleling the bedding or is concentric in nodules. Along Kentucky Lake leached section consists of residual bleached chert and interbedded tripolitic clay.	Underlies dissected ridges between Tennessee and Cumberland Rivers. Exposed in fault scarp at Kuttawa.	Yields almost no water to wells where unweathered. Where the limestone has been leached away and chert rubble is left, yields may exceed 50 gpm. Yields of most wells of moderate depths range from 2 to 10 gpm. Tripolitic clay may be present in some areas and here the formation yields little or no water to wells.
		New Providence shale	30		Shale, green, clayey.	Exposed in faulted scarp at Kuttawa.	Yields little or no water to wells.
DEVONIAN		Chattanooga shale	200±		Shale, black, massive.	Exposed in faulted scarp at Kuttawa.	Yields little or no water to wells.

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D. C.—10419

See list of references in Water-Supply Paper 1603.
[1] As used by McFarlan, Swann, Walker, and Rowan (1956).
[2] As used by Stockdale (1939) = Salem limestone of Cumings (1901) = Somerset shale member of Warsaw limestone.

Note: Reduced from original size, not intended for fine scale viewing; see original source document for details

GENERALIZED COLUMNAR SECTION OF CALDWELL, CHRISTIAN, CRITTENDEN LIVINGSTON, LYON, TODD, AND TRIGG COUNTIES, KENTUCKY

By
T. W. Lambert and R. F. Brown

1963

HYDROLOGIC INVESTIGATIONS
ATLAS HA-34 (SHEET 3 OF 3)

Price $1.25 per set

Attachment B8-1

U.S. Fish & Wildlife Service

Species Reports

Environmental Conservation Online System

Search



Species By County Report

The following report contains Species that are known to or are believed to occur in this county. Species with range unrefined past the state level are now excluded from this report. If you are looking for the Section 7 range (for Section 7 Consultations), please visit the IPaC application.

County: Todd, KY

Group	Name	Population	Status	Lead Office	Recovery Plan Name	Recovery Plan Action Status	Recovery Plan Stage
Clams	Littlewing pearlymussel (*Pegias fabula*)		Endangered	Kentucky Ecological Services Field Office	Little Wing Pearly Mussel	View Implementation Progress	Final
	Ring pink (mussel) (*Obovaria retusa*)		Endangered	Kentucky Ecological Services Field Office	Ring Pink (Mussel)	View Implementation Progress	Final
	Fanshell (*Cyprogenia stegaria*)		Endangered	Kentucky Ecological Services Field Office	Fanshell (Mussel)	View Implementation Progress	Final
	Fluted kidneyshell (*Ptychobranchus subtentum*)		Candidate	Asheville Ecological Services Field Office	-	-	-

Export options: CSV | EXCEL | XML | PDF

Last updated: March 7, 2011

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

U.S. Fish & Wildlife Service
330 West Broadway, Rm 265
Frankfort, KY 40601
Phone: 502-695-0468
Fax: 502-695-1024

Endangered, Threatened, & Candidate Species in _____TODD_____ County, KY

Group	Species	Common name	Legal* Status	Known** Potential	Special Comments
Mammals	*Myotis sodalis*	Indiana bat	E	P	
Mussels	*Cyprogenia stegaria*	fanshell	E	K	
	Ptychobranchus subtentum	fluted kidneyshell	C	K	
	Pegias fabula	littlewing pearlymussel	E	K	
	Obovaria retusa	ring pink	E	K	
	Lexingtonia dolabelloides	slabside pearlymussel	C	P	

NOTES:

* Key to notations: E = Endangered, T = Threatened, C = Candidate, CH = Critical Habitat

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

Attachment B8-3

U.S. Fish & Wildlife Service

Information, Planning, and Conservation System

Environmental Conservation Online System

Search

IPaC Home Page | Initial Project Scoping | Project Builder | FAQs

Step 1
Location

Step 2
Activities

Step 3
Trust resources list

Step 4
Conservation measures

Conservation Measures (CM) Report

Caution!
This portion of the IPaC system is still under development and testing by the U.S. Fish & Wildlife Service. Conservation Measures obtained at this time should not be used as authoritative recommendations for your project.

Project Counties:
Todd, KY

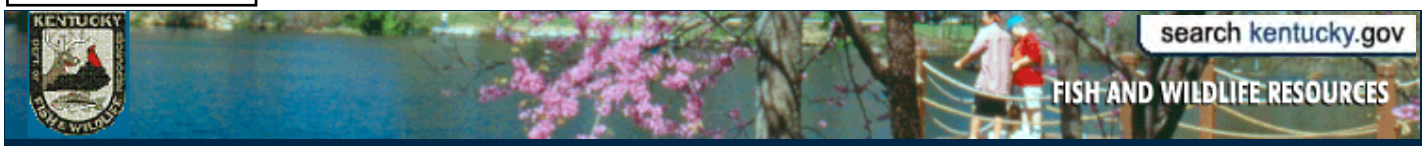
Project type: Transportation

Conservation Measures (Grouped by Category)

No FWS Endangered Species conservation measures were found for your project.

Last updated: March 7, 2011

Attachment B9



Species Information

State Threatened, Endangered, and Special Concern Species observations for selected counties

Linked life history provided courtesy of NatureServe Explorer.

Records may include both recent and historical observations.

US Status Definitions Kentucky Status Definitions

List State Threatened, Endangered, and Special Concern Species observations in 1 selected county.
Selected county is: Todd.

Scientific Name and Life History	Common Name and Pictures	Class	County	US Status	KY Status	WAP	Reference
Ammodramus henslowii	Henslow's Sparrow	Aves	Todd	N	S	Yes	Reference
Anas discors	Blue-winged Teal	Aves	Todd	N	T		Reference
Ardea alba	Great Egret	Aves	Todd	N	E	Yes	Reference
Ardea herodias	Great Blue Heron	Aves	Todd	N	S		Reference
Circus cyaneus	Northern Harrier	Aves	Todd	N	T	Yes	Reference
Cryptobranchus alleganiensis alleganiensis	Eastern Hellbender	Amphibia	Todd	N	S	Yes	Reference
Cyprogenia stegaria	Fanshell	Bivalvia	Todd	LE	E	Yes	Reference
Haliaeetus leucocephalus	Bald Eagle	Aves	Todd	N	T	Yes	Reference
Hyla gratiosa	Barking Treefrog	Amphibia	Todd	N	S	Yes	Reference
Junco hyemalis	Dark-eyed Junco	Aves	Todd	N	S		Reference
Lampsilis ovata	Pocketbook	Bivalvia	Todd	N	E	Yes	Reference
Lepomis miniatus	Redspotted Sunfish	Actinopterygii	Todd	N	T	Yes	Reference
Leptoxis praerosa	Onyx Rocksnail	Gastropoda	Todd	N	S		Reference
Obovaria retusa	Ring Pink	Bivalvia	Todd	LE	E	Yes	Reference
Ophisaurus attenuatus longicaudus	Eastern Slender Glass Lizard	Reptilia	Todd	N	T	Yes	Reference
Pegias fabula	Littlewing Pearlymussel	Bivalvia	Todd	LE	E	Yes	Reference
Phalacrocorax auritus	Double-crested Cormorant	Aves	Todd	N	E		Reference
Ptychobranchus subtentum	Fluted Kidneyshell	Bivalvia	Todd	C	E	Yes	Reference
Rabdotus dealbatus	Whitewashed Rabdotus	Gastropoda	Todd	N	T		Reference
Toxolasma lividus	Purple Lilliput	Bivalvia	Todd	N	E	Yes	Reference
Villosa ortmanni	Kentucky Creekshell	Bivalvia	Todd	N	T	Yes	Reference
Villosa vanuxemensis vanuxemensis	Mountain Creekshell	Bivalvia	Todd	N	T	Yes	Reference

22 species are listed

Attachment B10-1

Steven L. Beshear
Governor

Leonard K. Peters
Secretary
Energy and Environment Cabinet

Donald S. Dott, Jr.
Director

Commonwealth of Kentucky
Kentucky State Nature Preserves Commission
801 Schenkel Lane
Frankfort, Kentucky 40601-1403
502-573-2886 Voice
502-573-2355 Fax

March 22, 2011

William Leopold
ENTRAN, PLC
1848 Summit Road
Cincinnati, OH 45237

Data Request 11-108

Dear Mr. Leopold:

This letter is in response to your data request of March 8, 2011 for the Todd County-Guthrie Scoping Study project. We have reviewed our Natural Heritage Program Database to determine if any of the endangered, threatened, or special concern plants and animals or exemplary natural communities monitored by the Kentucky State Nature Preserves Commission occur near the project area on the Guthrie USGS Quadrangle, as shown on the map provided. Please see the attached reports for more information, which reflect analysis of the project area with three buffers applied:

1-mile for all records – 1 record
5-mile for aquatic records – no records
5-mile for federally listed species – no records
10-mile for mammals and birds – 3 records

The site is located within a karst landscape characterized by numerous sinkholes, underground conduits, or caves. Construction disturbance or release of pollutants within the specified area could easily cause contamination of groundwater. Caves are often associated with sensitive ecosystems and may provide habitat for a number of rare or endangered species. Cave organisms are heavily dependent on water quality, and steps should be taken to avoid introducing contaminants into the water system.

Haliaeetus leucocephalus (Bald eagle, federally delisted, KSNPC threatened) can be found near seacoasts, rivers and large lakes. Preferentially roosts in conifers in winter in some areas. In winter, may associate with waterfowl concentrations or congregate in areas with abundant dead fish.

Thyromanes bewickii (Bewick's Wren, KSNPC special concern, federal species of management concern) can be found in brushy areas, thickets, scrub in open country, open and riparian woodlands, and in country towns and farms.

I would like to take this opportunity to remind you of the terms of the data request license, which you agreed upon in order to submit your request. The license agreement states "Data and data products received from the Kentucky State Nature Preserves Commission, including any portion thereof, may not be reproduced in any form or by any means without the express written authorization of the Kentucky State Nature Preserves Commission." The exact location of plants, animals, and natural communities, if released by the Kentucky State Nature Preserves Commission, may not be released in any document or correspondence. These products are provided on a temporary basis for the express project (described above) of the requester, and may not be redistributed, resold or copied without the written permission of the Kentucky State Nature Preserves Commission's Data Manager (801 Schenkel Lane, Frankfort, KY, 40601. Phone: (502) 573-2886).

Please note that the quantity and quality of data collected by the Kentucky Natural Heritage Program are dependent on the research and observations of many individuals and organizations. In most cases, this information is not the result of comprehensive or site-specific field surveys; many natural areas in Kentucky have never been thoroughly surveyed, and new plants and animals are still being discovered. For these reasons, the Kentucky Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of Kentucky. Heritage reports summarize the existing information known to the Kentucky Natural Heritage Program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. We would greatly appreciate receiving any pertinent information obtained as a result of on-site surveys.

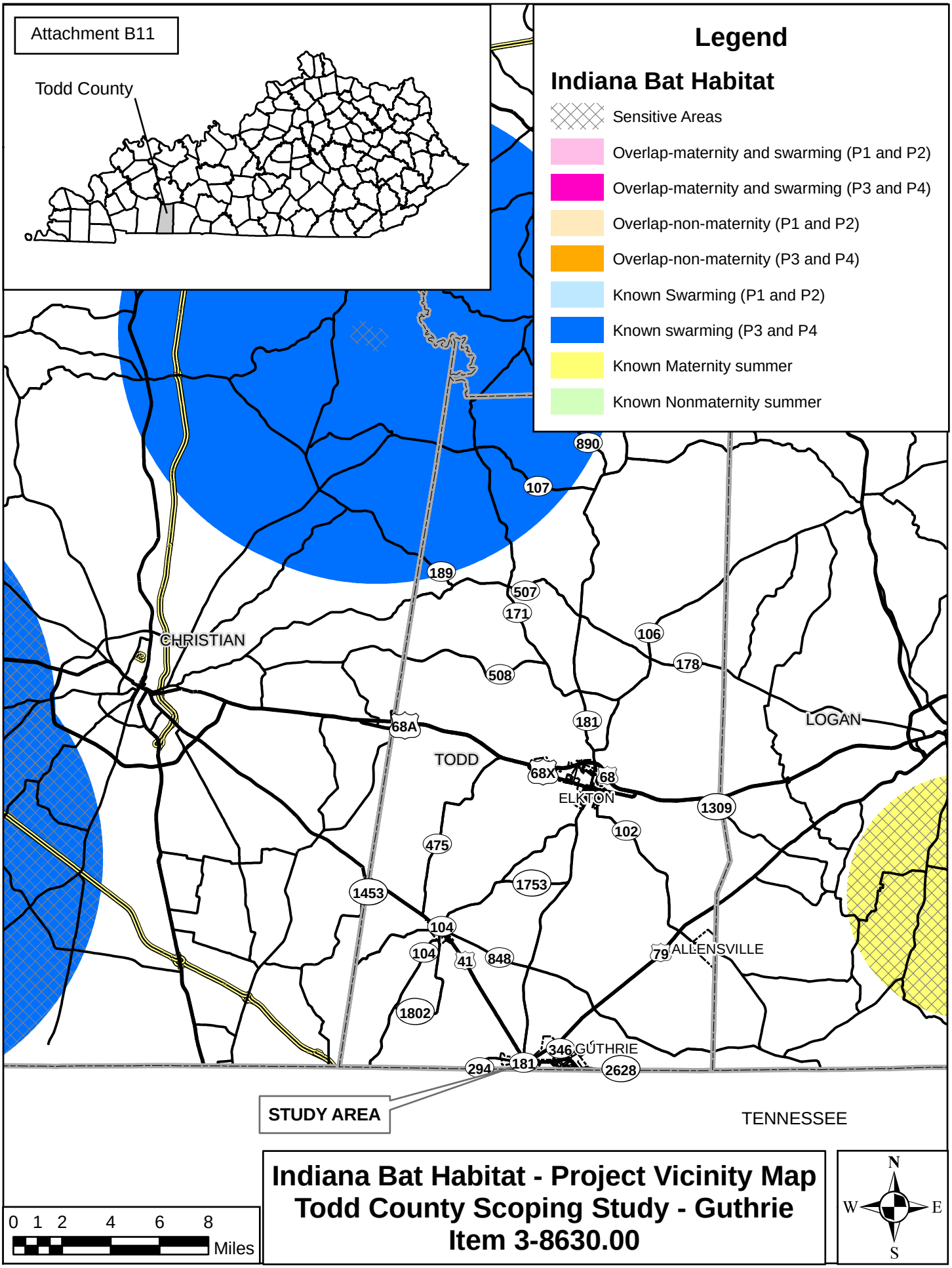
If you have any questions or if I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Sara Hines
Data Manager

SLD/SGH

Enclosures: Data Report and Interpretation Key


Attachment B11
Todd County
Legend
Indiana Bat Habitat
Sensitive Areas
Overlap-maternity and swarming (P1 and P2)
Overlap-maternity and swarming (P3 and P4)
Overlap-non-maternity (P1 and P2)
Overlap-non-maternity (P3 and P4)
Known Swarming (P1 and P2)
Known swarming (P3 and P4
Known Maternity summer
Known Nonmaternity summer
890
107
189
507
171
106
178
508
181
68A
LOGAN
TODD
68X
68
ELKTON
1309
102
475
1753
1453
104
104
41
848
79
ALLENSVILLE
1802
346
GUTHRIE
294
181
2628
CHRISTIAN
STUDY AREA
TENNESSEE
Indiana Bat Habitat - Project Vicinity Map
Todd County Scoping Study - Guthrie
Item 3-8630.00
0 1 2 4 6 8
Miles
N
W
E
S

Attachment B12

Leopold, William

From: Thomas, Randall
Sent: Thursday, April 21, 2011 7:47 AM
To: Currens, James C
Cc: Osborne, Deborah; deVilliers, Mike; Leopold, William; Aldridge, Brian; Creasey, Tom
Subject: Re: Highway improvement near Guthrie, Todd County

Thank you, Jim, and best wishes.

Randall J. Thomas, P.G.
Senior Environmental Planner
ENTRAN
400 East Vine Street, Suite 300
Lexington, KY 40507
(859) 285-7691
rthomas@entran.us
www.entran.us

On Apr 19, 2011, at 5:12 PM, "Currens, James C" <currens@email.uky.edu> wrote:

> Hello Randall,
>
> We've searched what records KSS has and have asked a couple of knowledgeable cavers. KSS has no caves on record. The 4 or 5 cavers I've talked to do not know of any caves in the vicinity of the junction of US79, US41 and Ky 181 (Tiny Town). The geology suggests, however, that caves are present and potentially would be both a hazard for construction and an environmental issue. There is a major cave about 3 or 4 miles further west, however.
>
> Cordially,
>
> Jim Currens

United States Department of the Interior
National Park Service
Land & Water Conservation Fund

Detailed Listing of Grants Grouped by County

Today's Date: 3/28/2011

KENTUCKY - 21

Grant ID & Element	Type	Grant Element Title	Grant Sponsor	Amount	Status	Date Approved	Exp. Date	Cong. District
TAYLOR								
11 - XXX	D	R. L. MILLER PARK	CITY OF CAMPBELLSVILLE	$39,875.06	C	7/24/1968	6/30/1972	2
29 - XXX	D	TAYLOR COUNTY PARK	TAYLOR COUNTY	$28,708.34	C	1/23/1969	12/31/1973	2
123 - XXX	D	GREEN RIVER LAKE PARK DEVELOPMENT	DEPT. OF PARKS	$128,605.95	C	8/25/1971	12/31/1973	2
348 - XXX	D	CAMPBELLSVILLE-TAYLOR COUNTY BALL PA	CITY OF CAMPBELLSVILLE & TAYLOR CO.	$56,068.75	C	3/2/1976	6/30/1979	2
569 - XXX	D	GREEN RIVER LAKE STATE PARK	DEPT. OF PARKS	$32,689.85	C	2/16/1979	1/31/1984	2
578 - XXX	D	ROBERT L. MILLER TENNIS COURT	CITY OF CAMPBELLSVILLE	$362,209.74	C	2/16/1979	2/29/1984	2
777 - XXX	D	CAMPBELLSVILLE/TAYLOR COUNTY PARK	TAYLOR COUNTY	$17,940.45	C	7/27/1983	9/15/1984	2
930 - XXX	D	GREEN RIVER LAKE STATE PARK	DEPT. OF PARKS	$123,327.80	C	6/10/1985	5/31/1987	2
1289 - XXX	R	TAYLOR COUNTY PARK	TAYLOR COUNTY	$29,513.11	C	8/20/2003	7/31/2008	2
			TAYLOR County Total:	**$818,939.05**		**County Count:**		**9**
TODD								
174 - XXX	C	SHARON GROVE PARK	TODD COUNTY	$16,194.38	C	7/11/1972	12/31/1975	1
492 - XXX	C	TODD COUNTY RECREATION COMPLEX	TODD COUNTY	$81,405.70	C	12/6/1977	12/31/1981	1
728 - XXX	D	SHARON GROVE PARK	TODD COUNTY	$4,776.38	C	2/6/1981	1/31/1986	1
900 - XXX	D	TODD COUNTY PARK	TODD COUNTY	$6,471.90	C	10/18/1984	10/31/1986	1
1212 - XXX	D	ELKTON PARK PLAYGROUND	City of Elkton	$6,036.42	C	7/21/2000	7/31/2005	1
1245 - XXX	C	OLD CLIFTY SCHOOL PARK	TODD COUNTY	$36,050.00	C	1/23/2002	9/30/2006	1
1292 - XXX	R	ELKTON PARK	CITY OF ELKTON	$19,040.20	C	8/20/2003	7/31/2008	1
1321 - XXX	D	VETERANS MEMORIAL PARK	CITY OF GUTHRIE	$13,850.00	C	7/19/2004	7/31/2009	1
			TODD County Total:	**$183,824.98**		**County Count:**		**8**

Attachment B14-1

Search Results

Search Results for:
Map Recentered

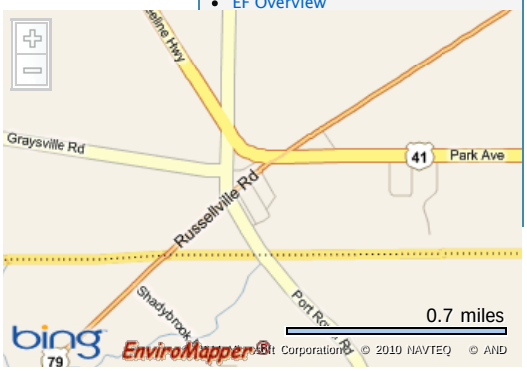
API Link for Report Data:
http://iaspub.epa.gov/enviro/efservice/multisystem/minLatitude/36.636812/maxLatitude/36.653340/minLongitude/-87.2129

Copy and paste the link above to view the data from this report

Info | AIR | TOXICS | WASTE | RADIATION | WATER

Click on a tab to see a summary view of data for a media type.

Envirofacts Links
- EF Overview



LIST OF EPA-REGULATED FACILITIES IN ENVIROFACTS

The facility list below is based upon the facilities that are visible with the map above. To refine your search to a more targeted area of interest, please visit the Envirofacts Multisystem Search Form. To search Envirofacts via an interactive map, please view your results in EnviroMapper for Envirofacts

FACILITY INFORMATION	AFS	ACRES	BR	CERCLIS	PCS	RADInfo	RCRAInfo	TRI	TSCA
GUTHRIE STP 251 CYPRESS LINE GUTHRIE, KY 42234 Summary Report Facility Report Compliance Report					View Report				
KEYSTOP FOOD MART-PIGGLY WIGGLY #79 10300 DIXIE BEE LINE DR GUTHRIE, KY 42234 Summary Report Facility Report Compliance Report							View Report		
SOUTH TODD TURNING LANES GUTHRIE RD GUTHRIE, KY 42234 Summary Report Facility Report Compliance Report					View Report				

Total Number of Facilities Displayed: 3

Return to more topical information

Attachment B14-2

U.S. ENVIRONMENTAL PROTECTION AGENCY

Facility Registry System (FRS)

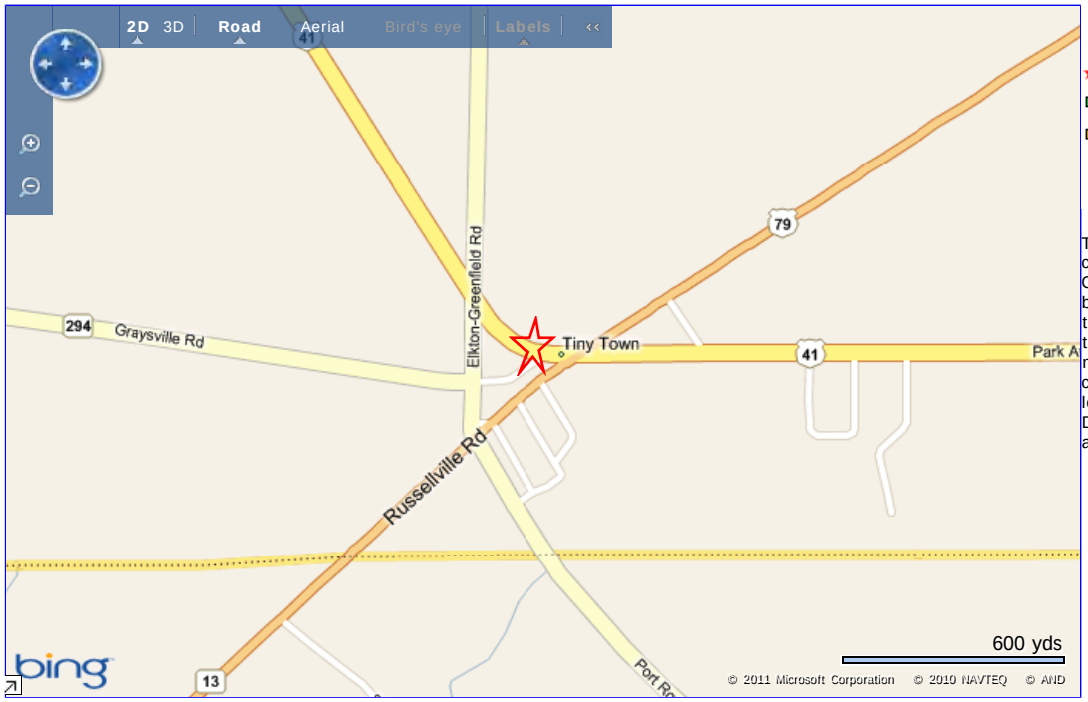
Facility Detail Report

Report an Error

FRS

KEYSTOP FOOD MART-PIGGLY WIGGLY #79

10300 DIXIE BEE LINE DR
GUTHRIE, KY 42234
EPA Registry Id: 110003254816



Legend

- Selected Facility
- EPA Facility of Interest
- State/Tribe Facility of Interest

The facility locations displayed come from the FRS Spatial Coordinates tables. They are the best representative locations for the displayed facilities based on the accuracy of the collection method and quality assurance checks performed against each location. The North American Datum of 1983 is used to display all coordinates.

Environmental Interests

Information System	Information System ID	Environmental Interest Type	Data Source	Last Updated Date	Supplemental Environmental Interests:
RESOURCE CONSERVATION AND RECOVERY ACT INFORMATION SYSTEM	KYR000020016	UNSPECIFIED UNIVERSE (INACTIVE)	RCRAINFO	09/02/2000	

Additional EPA Reports: No Additional EPA Reports returned.

Standard Industrial Classification Codes (SIC)

No SIC Codes returned.

National Industry Classification System Codes (NAICS)

Data Source	NAICS Code	Description	Primary
RCRAINFO	4471	GASOLINE STATIONS	
RCRAINFO	44511	SUPERMARKETS AND OTHER GROCERY (EXCEPT CONVENIENCE) STORES	

Facility Codes and Flags

EPA Region:	04
Duns Number:	
Congressional District Number:	07
Legislative District Number:	01
HUC Code/Watershed:	05130206 / RED
US Mexico Border Indicator:	NO
Federal Facility:	NO
Tribal Land:	NO

Facility Mailing Addresses

Affiliation Type	Delivery Point	City Name	State	Postal Code	Information System
REGULATORY CONTACT	7520 DISTRIBUTION DRIVE	LOUISVILLE	KY	40258	RCRAINFO
FACILITY MAILING ADDRESS	7520 DISTRIBUTION DRIVE	LOUISVILLE	KY	40258	RCRAINFO
OWNER	P.O. BOX 2809	FRANKLIN	KY	42135	RCRAINFO

Alternative Names

No Alternative Names returned.

Contacts

Affiliation Type	Full Name	Office Phone	Information System	Mailing Address

Organizations

Affiliation Type	Name	DUNS Number	Information System	Mailing Address
OWNER	KEYSTOPS INC		RCRAINFO	View

REGULATORY CONTACT	PETE DEBEER	5029334943	RCRAINFO	View

Attachment B14-3

Query executed on: MAR-28-2011

Attachment B14-4

U.S. ENVIRONMENTAL PROTECTION AGENCY

Enforcement & Compliance History Online (ECHO)

Detailed Facility Report

Map | Report Error | Data Dictionary

For Public Release - Unrestricted Dissemination Report Generated on 03/28/2011
US Environmental Protection Agency - Office of Enforcement and Compliance Assurance

Facility Permits and Identifiers

Data Dictionary

Statute	System	Source ID	Facility Name	Street Address	City	State	Zip
	FRS	110041945802	SOUTH TODD TURNING LANES	GUTHRIE RD	GUTHRIE	KY	42234
CWA	PCS	KYR10E896	SOUTH TODD TURNING LANES	GUTHRIE RD	GUTHRIE	KY	42234

Facility Characteristics

Data Dictionary

Statute	Source ID	Universe	Status	Areas	Permit Expiration Date	Latitude/ Longitude	Indian Country?	SIC Codes	NAICS Codes
	110041945802					LRT: 36.644610 , -87.199970	No		
CWA	KYR10E896	Minor	Inactive		07/31/2014		No	1611	

If the CWA permit is past its expiration date, this normally means that the permitting authority has not yet issued a new permit. In these situations, the expired permit is normally administratively extended and kept in effect until the new permit is issued.

For the RCRA program, activities that contribute to an overall facility status of Active are displayed in parentheses using the acronym HPACS, where H indicates handler activities, P - permitting, A - corrective action, C - converter, and S - state-specific. More information is available in the Data Dictionary.

Inspection and Enforcement Summary Data

Data Dictionary

Statute	Source ID	Insp. Last 05Yrs	Date of Last Inspection	Formal Enf Act Last 05 Yrs	Penalties Last 05 Yrs
CWA	KYR10E896	0	Never	0	$00

Compliance Monitoring History (05 years)

Data Dictionary

Statute	Source ID	System	Inspection Type	Lead Agency	Date	Finding
- No data records returned.						

Entries in *italics* are not considered inspections in official counts.

Compliance Summary Data

Data Dictionary

Information on the nature of alleged violations is available on the FAQ page.

Statute	Source ID	Current SNC/HPV?	Description	Current As Of	Qtrs in NC (of 12)
CWA	KYR10E896	N/A		Jul-Sep10	

Three Year Compliance Status by Quarter

Data Dictionary

Violations shown in a given quarter do not necessarily span the entire 3 months. Information on the nature of alleged violations is available on the FAQ page, and information on the duration of non-compliance is available at the end of this report.

Statute:Source ID	QTR1	QTR2	QTR3	QTR4	QTR5	QTR6	QTR7	QTR8	QTR9	QTR10	QTR11	QTR12
- No data records returned.												

Attachment B14-5

Notices of Violation or Informal Enforcement - AFS, PCS, ICIS-NPDES, RCRAInfo (05 year history)

Data Dictionary

Statute	Source ID	Type of Action	Lead Agency	Date	
- No data records returned.					

Formal Enforcement Actions - (05 year history)

AFS, PCS, RCRAInfo, NCDB

Data Dictionary

Statute	Source ID	Type of Action	Lead Agency	Date	Penalty	Penalty Description	
- No data records returned.							

In some cases, formal enforcement actions may be entered both at the initiation and final stages of the action. These may appear more than once above. Entries in *italics* are not "formal" actions under the PCS definitions but are either the initiation of an action or penalties assessed as a result of a previous action. This section includes US EPA and State formal enforcement actions under CAA, CWA and RCRA.

ICIS

Data Dictionary

Primary Law/Section	Case Number	Case Type	Lead Agency	Case Name	Issued/Filed Date	Settlement Date	Federal Penalty	State/Local Penalty	SEP Cost	Comp Action Cost	
- No data records returned.											

Federal enforcement actions and penalties shown in this section are from the Integrated Compliance Information System (ICIS-FE&C). These actions may duplicate records in the Formal Enforcement Actions section.

TRI History of Reported Chemicals Released in Pounds per Year at Site:

Data Dictionary

Year /	Total Air Emissions	Surface Water Discharges	Underground Injections	Releases to Land	Total On-site Releases	Total Off-site Transfers	Total Releases and Transfers	
- No data records returned.								

TRI Total Releases and Transfers by Chemical and Year

Chemical Name	-8	-7	-6	-5	-4	-3	-2	-1	0	
- No data records returned.										

Demographic Profile of Surrounding Area (3 Miles)

Data Dictionary

Radius of Area:	N/A	Land Area:	N/A	Households in area:	N/A
- No data records returned.					

Please note: Entries in gray denote records that are not federally required to be reported to EPA. These data may not be reliable.

Notice About Duration of Violations -- The duration of violations shown on this report is an estimate of the actual duration of the violations that might be alleged or later determined in a legal proceeding. For example, the start date of the violation as shown in the ECHO database is normally when the government first became aware of the violation, not the first date that the violation occurred, and the facility may have corrected the violation before the end date shown. In some situations, violations may have been corrected by the facility, but EPA or the State has not verified the correction of these violations. In other situations, EPA does not remove the violation flag until an enforcement action has been resolved.

Attachment B14-6

This report was generated by the Integrated Data for Enforcement Analysis (IDEA) system, which updates its information from program databases monthly. The data were last updated: PCS: 02/19/2011. FRS: 02/17/2011.

Some regulated facilities have expressed an interest in explaining data shown in the Detailed Facility Reports in ECHO. Please check company web sites for such explanations.

Attachment B14-7

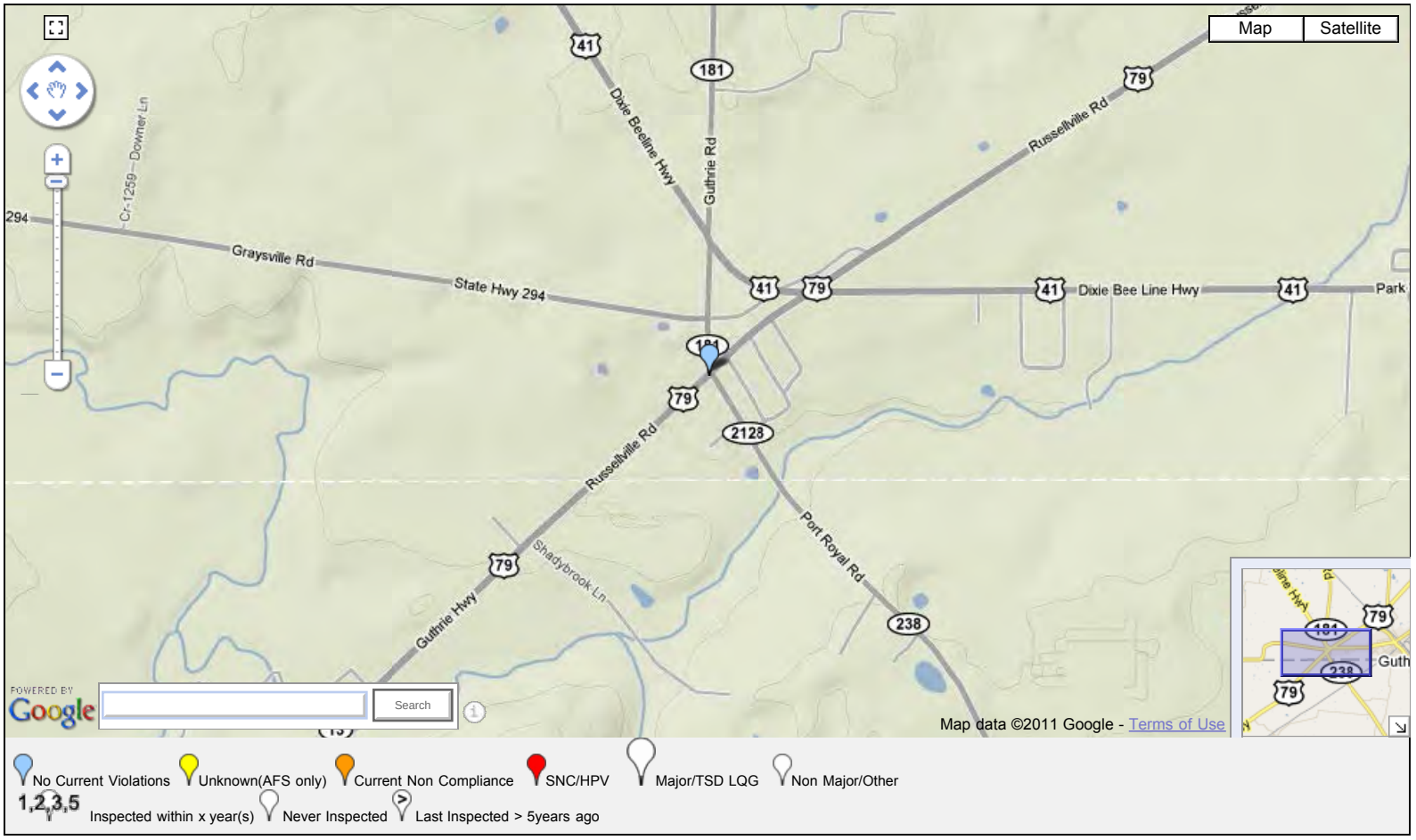
U.S. ENVIRONMENTAL PROTECTION AGENCY

Enforcement & Compliance History Online (ECHO)

Share

Search Results (Multimedia)

Help



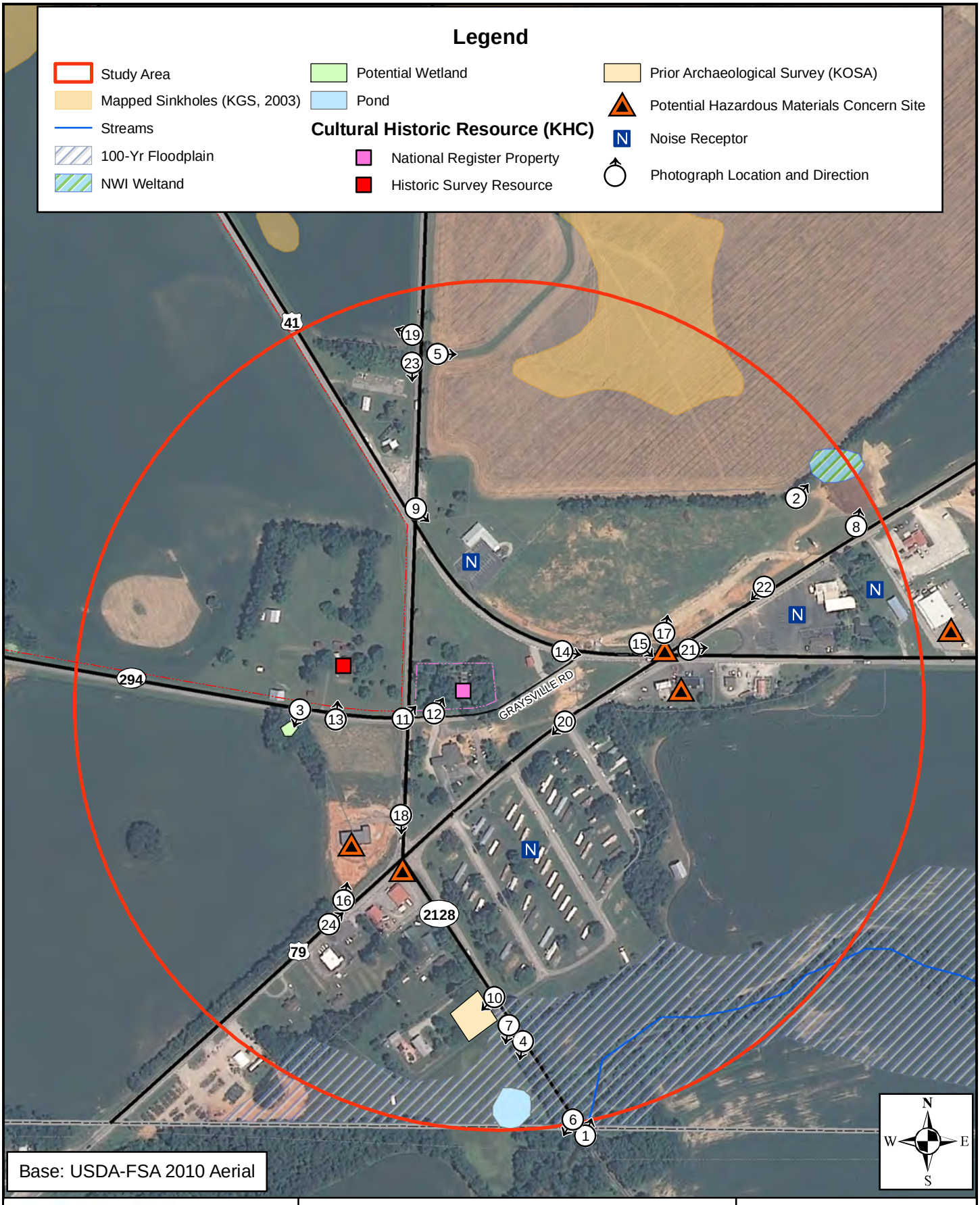
Download KML

http://www.epa-echo.gov/cgi-bin/ideaotis.cgi?idea_database=MAPECHO&ids=110041945802
Print As-Is

Last updated on Monday, March 28, 2011

Last updated on March 28th, 2011

ATTACHMENT C
Photograph Index Map and Study Area Representative Photographs



ENTRAN

0 200 400 800 Feet

Environmental Overview

Todd County Scoping Study
Todd County, Kentucky; Item 3-8630.00

Attachment C

Photolog Index Map

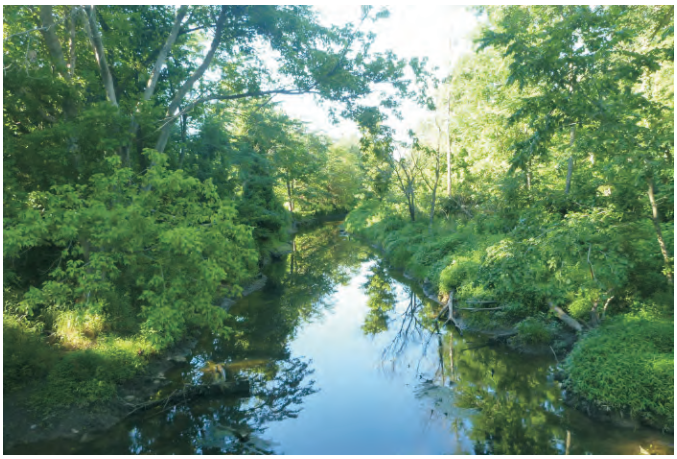


Photo 1: Stream S1, an un-named USGS-Perennial stream, and its associated 100-Year floodplain, looking upstream into study area, facing northeast.

Photo 2: Location of mapped NWI wetland (POWHx) feature, currently a row-crop agricultural field displaying no wetland characteristics, facing northeast.

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Photo 5: View towards sinkhole mapped within study area, in center of corn field, facing east.

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Photo 7: Representative photograph of potential habitat for several state-listed species (floodplain woodlands along Stream S1, pond and open field) present within study area, facing south

Photo 8: Representative photograph of woodland habitat (fence row) scattered throughout study area, facing northeast.

Photo 9: Representative photograph of social resource and noise-sensitive receptor present in study area, Tiny Town Baptist Church, facing southeast.

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Photo 11: NRHP registered site, The Stagecoach Inn (Gray's Inn), including National Park Service "Trail of Tears National Historic Trail" sign, located at KY 181 and Graysville Road, facing northeast.

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Photo 14: Potential location of hazardous materials concern site Property ID 1, Tiny Town Coffee Cup at Hwy 41 and Hwy 79 with inactive UST record, facing intersection from Hwy 41, southwest.

Photo 15: Hazardous materials concern site Property ID 2, Favourite Lotto at 10125 Dixie Beeline Hwy (US 41) with UST (active) and LUST (status undetermined) records, facing southeast.

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Photo 17: Potential location of hazardous materials concern site Property ID 4, Piggly Wiggly 79 at 10300 Dixie Beeline Hwy (US 41) with inactive RCRA and UST records, currently the location of the future "The Crossings" commercial development, facing north.

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Photo 19: Representative photograph of agricultural land use (hay field) and prime farmland soil units, facing northwest.

Photo 20: Creekside Meadows Mobile Home Park, a potential noise-sensitive receptor within the study area, facing southwest.

Photo 21: Representative photograph of commercial land use, entering the City of Guthrie at US 41 and US 79, facing east.

Photo 22: Representative photograph of existing roadway configuration, US 79 at US 41, facing southwest.

Photo 23: Representative photograph of existing roadway configuration, KY 181 at US 41, facing south.

Photo 24: Representative photograph of existing roadway configuration, US 79 at KY 181, facing northeast.

Appendix D – Environmental Justice Review

KY 181/US 79/US 41/KY 294 Intersection Study
Guthrie, Kentucky

ENVIRONMENTAL JUSTICE REVIEW
May 2011

Prepared for

Kentucky Transportation Cabinet (KYTC) – Division of Planning

Prepared by

Pennyrile Area Development District

This document was prepared in cooperation with the Kentucky Transportation Cabinet.

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APPENDICES

1.0 INTRODUCTION

This report presents a review of the socioeconomic characteristics in the study area for the proposed KY 181/US 79/US 41 /KY 294 intersection in the City of Guthrie, Kentucky located in Todd County, which is also located within the Pennyrile Area Development District. This area is depicted in *Exhibit 1, Proposed KY 181/US 79/US 41/KY 294 Intersection Reconstruction Project Area*. Data from the U.S. Census Bureau Census 2000 has been utilized for the analysis of the project area. It is intended to be used as a "first look study" into the socioeconomic characteristics that exist in the project area. If, at a later time, the Kentucky Transportation Cabinet determines specific project locations, a more in-depth analysis of the socioeconomic characteristics may be warranted. The information and results are intended to assist the Kentucky Transportation Cabinet in making informed and prudent transportation decisions in the project area, especially with regard to the requirements of *Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (signed February 11, 1994). Executive Order 12898 states:

> …each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations…"

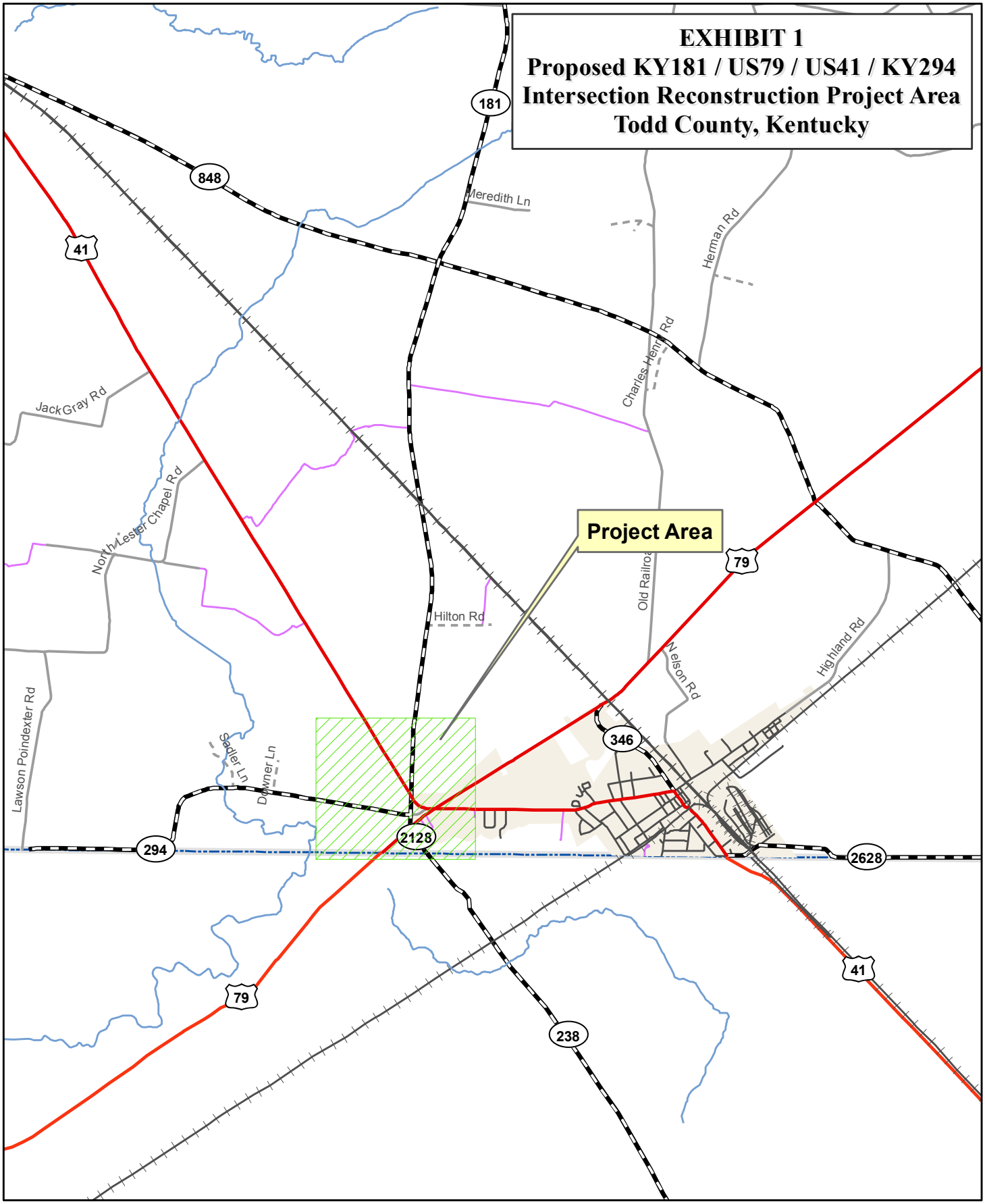
This report outlines Census 2000 statistics for the project area using tables and maps. Statistics are provided on minority, low-income, elderly, and disabled populations for the block groups and census tracts within the project area, Todd County, Kentucky and the United States.

2.0 WHAT IS ENVIRONMENTAL JUSTICE?

The U.S. Department of Transportation (DOT) outlines the three primary Environmental Justice Concepts as:

1. To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic effects, on minority populations and low-income populations.
2. To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
3. To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority populations and low-income populations.

Low-income is defined in U.S. DOT Order (5610.2) as "a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines." A low-income population is "any readily identifiable group of low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons…"



Prepared by: Pat Lee, GIS Manager
Pennyrile Area Development District
Print Date: April, 2011
File: Todd - Guthrie - EJ Study - Location Map.mxd

The U.S. DOT order defines minority as:

1. Black (a person having origins in any of the black racial groups of Africa);
2. Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
3. Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
4. American Indian and Alaskan Native (a person having origins in any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition).

A minority population is "any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons…"

A disproportionately high and adverse effect on a minority or low-income population means an adverse effect that:

1. is predominately borne by a minority population and/or low-income population, or
2. will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population.

Elderly and disabled populations (also used in this analysis) are not specifically recognized under the definition of an Environmental Justice community. However, the U.S. DOT specifically encourages the early examination of potential populations of the elderly, children, disabled, and other populations protected by Title VI of the Civil Rights Act of 1964 and related nondiscrimination statutes.

3.0 METHODOLOGY

Data for this study was collected by using the method outlined by the KYTC document, "Methodology for Assessing Potential Environmental Justice Concerns for KYTC Planning Studies" that is located in *Appendix A, Methodology*. The U.S. Census Data used in the report is taken from American Fact Finder Summary File 3 including tables:

- P7. Hispanic or Latino By Race
- P8. Sex by Age
- P 41. Age by Types of Disability for the Civilian Non-institutionalized Population 5 Years and Over with Disabilities
- P 87. Poverty Status in 1999 by Age

The data was compiled with maps and tables to present a detailed description of the community conditions in and around the study area.

4.0 CENSUS DATA ANALYSIS

U.S. Census data is arranged according to geographic unit. The U.S. Census Bureau defines geographical units as:

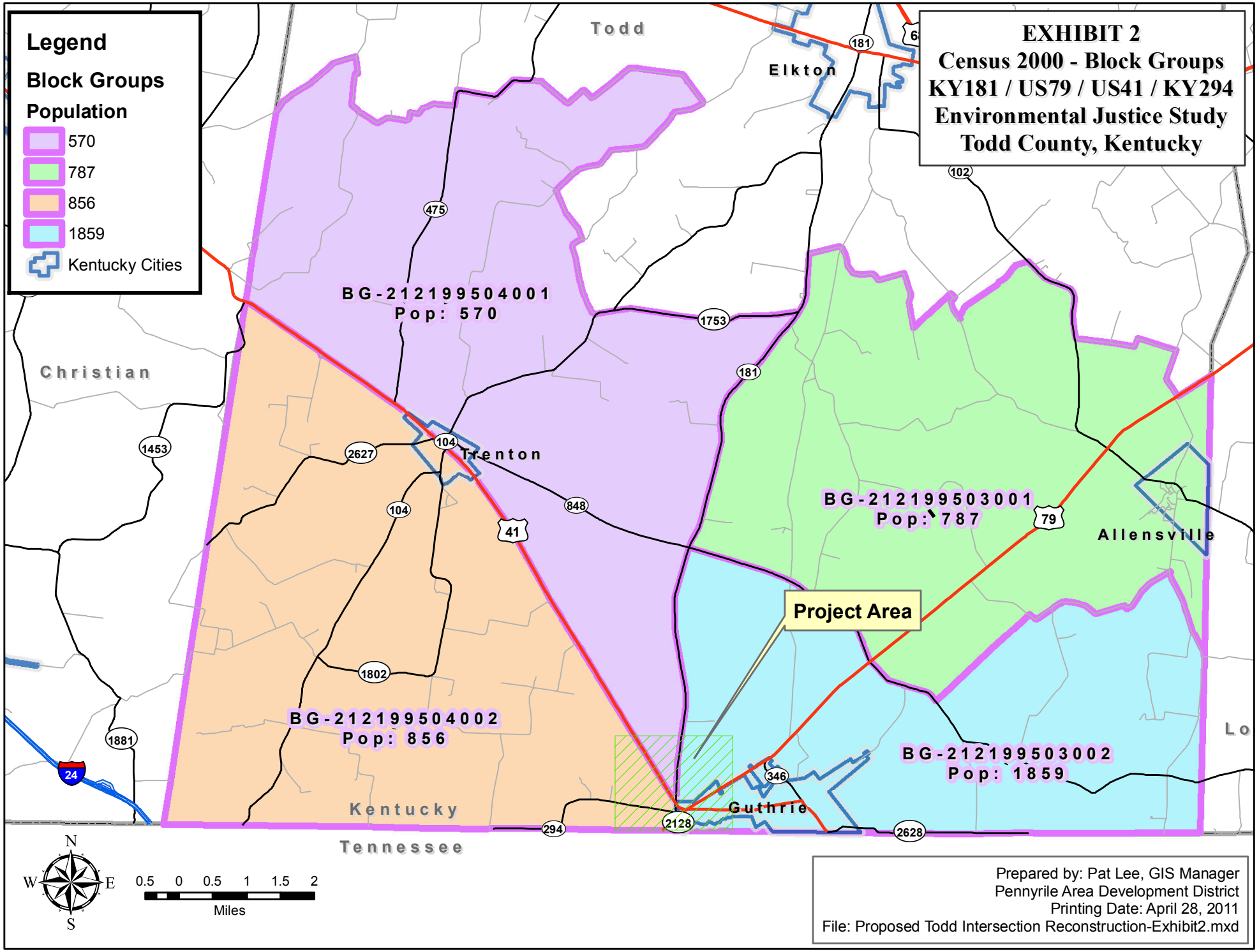
- **Census Tract (CT)** – "A small, relatively permanent statistical subdivision of a county or statistically equivalent entity delineated for data presentation purposes by a local group of census data users or the geographic staff of a regional census center in accordance with Census Bureau guidelines. CTs generally contain between 1,000 and 8,000 people. CT boundaries are delineated with the intention of being stable over many decades, so they generally follow relatively permanent visible features. They may also follow governmental unit boundaries and other invisible features in some instances; the boundary of a state or county is always a census tract boundary."
- **Block Group (BG)** - "A statistical subdivision of a CT. A BG consists of all tabulation blocks whose numbers begin with the same digit in a CT. BGs generally contain between 300 and 3,000 people, with an optimum size of 1,500 people."
- **Census Block (CB)** – "An area bounded on all sides by visible and/or invisible features shown on a map prepared by the Census Bureau. A CB is the smallest geographic entity for which the Census Bureau tabulates decennial census data."

The US Census tables in this report include the total number and percentages for minorities, elderly population, disabled population and low-income population levels for the block groups, census tracts, Todd County, State of Kentucky and the United States. There are two (2) census tracts and four (4) block groups that are relevant to this study area. The Census Data Tables used in this report are located in *Appendix B, Data Tables*. Total population numbers are included in the census tract data even though all block groups within a census tract may not be included in the study area.

A method developed by the Ohio Department of Transportation (ODOT)[1] to identify target populations is applied in this study. This study will use the population percentages for Todd County as the reference threshold for identifying target populations. The County numbers most likely provide a better snapshot of the overall population characteristics of the region in the project area as opposed to the national percentages.

In reviewing each block group for target populations, an analysis range was used based on the reference threshold in each of the four census categories utilized in this study. This range was set at 25 percent above the threshold to 25 percent below the threshold. The full explanation on how this reference threshold is applied is explained in *Appendix C, Analysis Ranges*.

The 2000 Census Block Groups that comprised the southern half of Todd County and the project area are shown in *Exhibit 2, Block Group Boundaries, Todd County, KY*. The southern boundary of this project area boarders the Kentucky/Tennessee State line.


Legend
Block Groups
Population
570
787
856
1859
Kentucky Cities
EXHIBIT 2
Census 2000 - Block Groups
KY181 / US79 / US41 / KY294
Environmental Justice Study
Todd County, Kentucky
Todd
Elkton
Christian
Trenton
Allensville
Kentucky
Tennessee
Guthrie
Project Area
BG-212199504001
Pop: 570
BG-212199503001
Pop: 787
BG-212199504002
Pop: 856
BG-212199503002
Pop: 1859
475
181
102
1753
1453
2627
104
848
41
79
1802
1881
24
346
294
2128
2628
N
S
E
W
0.5 0 0.5 1 1.5 2
Miles
Prepared by: Pat Lee, GIS Manager
Pennyrile Area Development District
Printing Date: April 28, 2011
File: Proposed Todd Intersection Reconstruction-Exhibit2.mxd

5.0 STUDY FINDINGS: POPULATION BY PERSONS OF MINORITY ORIGIN

As described in the Census Data tables in Appendix B, the minority population percentages for the United States is 30.88 percent, which is significantly higher than Kentucky at 10.68 percent. The Todd County minority population is 10.43 percent, which is very similar to the State percentage.

Three (3) of the four (4) Block Groups (BG's) in the project area had a higher percentage of minority population than the state percentage or reference county threshold of 10.43 percent. The BG with the highest percentage is CT 9503 BG 2 (26.36%). The remaining 2 BGs that were higher than the Todd County threshold (10.43%) are listed in order from highest to lowest as follows: CT 9503 BG 1 (20.36%), CT 9504 BG 1 (12.59%). These BG's can be seen in Appendix D, *Map A, Percent Minority, KY 181/US 70/US 41/KY 294 Study Area, Todd County, KY*.

6.0 STUDY FINDINGS: POPULATION BY PERSONS BELOW POVERTY LEVEL

As described in the Census Data tables in Appendix B, the percentage of persons below the poverty level in the United States is 12.05 percent, which is just below Kentucky's 15.37 percent. The Todd County poverty percentage is 16.94 percent, which is slightly higher than the national percentage.

One (1) of the four (4) Block Groups (BG's) in the project area had a higher percentage of persons below poverty than the state percentage or reference county threshold of 16.94 percent. This BG with the highest percentage is CT 9503 BG 2 (24.49%). The remaining three (3) BG's that are below the reference threshold are listed in order from highest to lowest: CT 9504 BG 1 (13.62%), CT 9504 BG 2 (12.53%), and CT 9503 BG 2 (10.70%). These BG's can be seen in Appendix D, *Map D, Persons Below Poverty Level, KY 181/US 70/US 41/KY 294 Study Area, Todd County, KY*.

7.0 STUDY FINDING: POPULATION BY PERSONS AGE 65 YEARS AND OLDER

As described in the Census Data tables in Appendix B, the *Persons 65 and Over Percentages* for the United States was 12.43 percent, which was about equal to the State of Kentucky with 12.46 percent. The Todd County percentage is 13.97 percent, which is slightly higher than the State percentage.

Of the four (4) BG's in the study area, only one had a higher percentage of persons age 65 and older than the Todd County percentage. This BG with the higher percentage is CT 9504 BG 2 (17.26%). The remaining three (3) BG's that are below the reference Todd County threshold are

listed in order from highest to lowest: CT 9503 BG 2 (13.48%), CT 9503 BG 1 (11.60%), and CT 9504 BG 1 (9.83%). These BG's can be seen in Appendix D, *Map B, Percent 65 and Older, KY 181/US 70/US 41/KY 294 Study Area, Todd County, KY*.

8.0 STUDY FINDING: POPULATION BY DISABILITIES AGE 5 AND OVER

As described in the Census Data tables in Appendix B, the *Population By Disabilities Age 5 and Over* for the United States was 31.68 percent, which was lower than the State of Kentucky with 41.73 percent. The Todd County percentage is 43.16 percent, which is slightly higher than the State percentage.

Of the four (4) BG's in the study area, only one had a higher percentage of persons with disabilities age 5 and older than the Todd County percentage. This BG with the higher percentage is CT 9503 BG 2 (46.68%). The remaining three (3) BG's that are below the reference Todd County threshold are listed in order from highest to lowest: CT 9504 BG 1 (41.03%), CT 9504 BG 2 (39.13%), and CT 9503 BG 1 (26.80%). These BG's can be seen in Appendix D, *Map C, Population By Disabilities Age 5 and Over, KY 181/US 70/US 41/KY 294 Study Area, Todd County, KY*.

9.0 CONCLUSION

After the analysis of the study area, it became apparent that there are several Block Groups that may require further evaluation depending on the scope of the improvements planned for the intersection. All of the BG's with higher percentages of populations compared to the Todd County thresholds that were analyzed in the *Study Findings* section of this report will not be re-addressed in this Conclusion Section. However, one of the Block Groups that are identified in this section has two (2) or more significantly higher percentages of the target populations and is addressed in this section to highlight these areas of concern.

The Block Group that comprises the majority of the City of Guthrie, Kentucky (Tract 9503 BG 2), which includes the eastern portion of the project area, has the highest percentage of minorities (26.31%) and persons below the poverty level (24.49%). There is a total population of 1,870 persons in this BG. The total number of minority population in this BG is 492 persons, and the total population below poverty is 458 persons. This BG also has a slightly higher percentage of its population disabled (46.68%) above the Todd County Threshold disabled population (43.16%)

In closing, if the highway improvements are confined to the existing right-of-ways of the proposed intersection, this study has determined that there would be no impact to the EJ populations that were studied as part of this report. However, if the improvements involved in

this project are proposed to take a new route off one of the existing right-of-ways in one or more areas, then additional examination of these areas proposed in the new route(s) should be explored further for EJ impacts.

Appendix A

Study Methodology

Methodology for Assessing Potential Environmental Justice Concerns for KYTC Planning Studies

Updated: February 1, 2002

The demographics of the affected area should be defined using U.S. Census data (Census tracts and block groups) and the percentages for minorities, low-income, elderly, or disabled populations should be compared to those for the following:

- Other nearby Census tracts and block groups,
- The county as a whole,
- The entire state, and
- The United States.

Information from PVA offices, social service agencies, local health organizations, local public agencies, and community action agencies can be used to supplement the Census data. Specifically, we are interested in obtaining the following information:

- Identification of community leaders or other contacts who may be able to represent these population groups and through which coordination efforts can be made.
- Comparison of the Census tracts and block groups encompassing the project area to other nearby Census tracts and block groups, county, state, and United States percentages.
- Locations of specific or identified minority, low-income, elderly, or disabled population groups within or near the project area. This may require some field reviews and/or discussions with knowledgeable persons to identify locations of public housing, minority communities, ethnic communities, etc., to verify Census data or identify changes that may have occurred since the last Census. Examples would be changes due to new residential developments in the area or increases in Asian and/or Hispanic populations.
- Concentrations or communities that share a common religious, cultural, ethnic, or other background, e.g., Amish communities.
- Communities or neighborhoods that exhibit a high degree of community cohesion or interaction and the ability to mobilize community actions at the start of community involvement.
- Concentrations of common employment, religious centers, and/or educational institutions with members within walking distance of facilities.
- Potential effects, both positive and negative, of the project on the affected groups as compared to the non-target groups. This may include, but are not limited to:
  1. Access to services, employment or transportation.
  2. Displacement of persons, businesses, farms, or non-profit organizations.
  3. Disruption of community cohesion or vitality.
  4. Effects to human health and/or safety.
- Possible methods to minimize or avoid impacts on the target population groups.

If percentages of these populations are elevated within the project area, it should be brought to the attention of the Division of Planning immediately so that coordination with affected populations may be conducted to determine the affected population's concerns and comments on the project. Also, with this effort, representatives of minority, elderly, low-income, or disabled populations should be identified so that, together, we can build a partnership for the region that may be incorporated into other projects. Also, we hope to build a Commonwealth-wide database of contacts. We are available to participate in any meetings with these affected populations or with their community leaders or representatives.

In identifying communities, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. The selection of the appropriate unit of analysis may be a governing body's jurisdiction, a neighborhood, census tract, or other similar unit that is to be chosen so as not to artificially dilute or inflate the affected population. A target population also exists if there is (1) more than one minority or other group present and (2) the percentages, as calculated by aggregating all minority persons, exceed that of the general population or other appropriate unit of geographic analysis.

Maps should be included that show the Census tracts and block groups included in the analysis as well as the relation of the project area to those Census tracts and block groups.

Appendix B

US Census Data Tables for Study Area

Table 1
KY181 / US79 / US41 / KY294
Intersection Project Area

	Total	White Alone	White Alone (%)	Black or African American alone	Black or African American alone (%)	Hispanic or Latino Origin	Hispanic or Latino Origin (%)	American Indian and Alaska Native alone	American Indian and Alaska Native alone (%)	Asian alone	Asian alone (%)	Native Hawaiian and other Pacific Islander alone	Native Hawaiian and other Pacific Islander alone (%)
United States	281,421,906	194,514,140	69.12%	33,707,230	11.98%	35,238,481	12.52%	2,091,206	0.74%	10,067,813	3.58%	342,743	0.12%
Kentucky	4,041,769	3,610,112	89.32%	291,735	7.22%	56,414	1.40%	8,424	0.21%	28,697	0.71%	947	0.02%
Todd Co.	11,971	10,723	89.57%	1,019	8.51%	228	1.90%	26	0.22%	5	0.04%	0	0.00%
Tract 9503	2,646	1,996	75.43%	578	21.84%	62	2.34%	7	0.26%	5	0.19%	0	0.00%
Block Group 1	776	618	79.64%	153	19.72%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	1,870	1,378	73.69%	425	22.73%	62	3.32%	7	0.37%	5	0.27%	0	0.00%
Tract 9504	1,426	1,316	92.29%	90	6.31%	26	1.82%	0	0.00%	0	0.00%	0	0.00%
Block Group 1	580	507	87.41%	56	9.66%	18	3.10%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	846	809	95.63%	34	4.02%	8	0.95%	0	0.00%	0	0.00%	0	0.00%
Source: US Census Bureau, 2000 Census													
Summary File 3 (SF3)													
Detailed Tables: P7-Hispanic or Latino by Race, P8-Sex by Age, P41 Age by Types of Disability, P87-Poverty Status in 1999 by Age													

Table 2
KY181 / US79 / US41 / KY294
Intersection Project Area

	Total	Some other race alone	Some other race alone (%)	Two or more races	Two or more races (%)	Total Minority	Minority %	Persons 65 and Over	Persons 65 and Over (%)	Population by Disabilities Age 5 and Over	Population by Disabilities Age 5 and Over (%)	Persons Below Poverty Level	Persons Below Poverty Level (%)
United States	281,421,906	447,552	0.16%	5,012,741	1.78%	86,907,766	30.88%	34,978,972	12.43%	89,142,962	31.68%	33,899,812	12.05%
Kentucky	4,041,769	3,303	0.08%	42,137	1.04%	431,657	10.68%	503,668	12.46%	1,686,789	41.73%	621,096	15.37%
Todd Co.	11,971	96	0.80%	102	0.85%	1,248	10.43%	1,672	13.97%	5,167	43.16%	2,028	16.94%
Tract 9503	2,646	33	1.25%	27	1.02%	650	24.57%	342	12.93%	1,081	40.85%	541	20.45%
Block Group 1	776	0	0.00%	5	0.64%	158	20.36%	90	11.60%	208	26.80%	83	10.70%
Block Group 2	1,870	33	1.76%	22	1.18%	492	26.31%	252	13.48%	873	46.68%	458	24.49%
Tract 9504	1,426	14	0.98%	6	0.42%	110	7.71%	203	14.24%	569	39.90%	185	12.97%
Block Group 1	580	14	2.41%	3	0.52%	73	12.59%	57	9.83%	238	41.03%	79	13.62%
Block Group 2	846	0	0.00%	3	0.35%	37	4.37%	146	17.26%	331	39.13%	106	12.53%
Source: US Census Bureau, 2000 Census													
Summary File 3 (SF3)													
Detailed Tables: P7-Hispanic or Latino by Race, P8-Sex by Age, P41 Age by Types of Disability, P87-Poverty Status in 1999 by Age													

Appendix C

Analysis Range Explanation and Methodology for Population Percentages Above or Below the Todd County Threshold

Analysis Ranges
Explanation and Methodology

The Todd County percentages are used as a reference threshold in each of the census data categories utilized for this report. Areas that are up to 25% higher than the reference threshold are considered just above the threshold, and areas that are 25% or higher are considered significantly above the threshold.

PERCENT MINORITY

Analysis Range	Percent Minority
Significantly Above Threshold	> 13.04%
Just Above Threshold	10.43% - 13.04%
REFERENCE THRESHOLD (Todd Co. Percentage)	**10.43%**
Just Below Threshold	7.82% - 10.43%
Significantly Below Threshold	< 7.82%

PERCENT 65 AND OLDER

Analysis Range	Percent 65 and Older
Significantly Above Threshold	> 17.46%
Just Above Threshold	13.97% - 17.46%
REFERENCE THRESHOLD (Todd Co. Percentage)	**13.97%**
Just Below Threshold	10.48% - 13.97%
Significantly Below Threshold	< 10.48%

PERCENT DISABLED

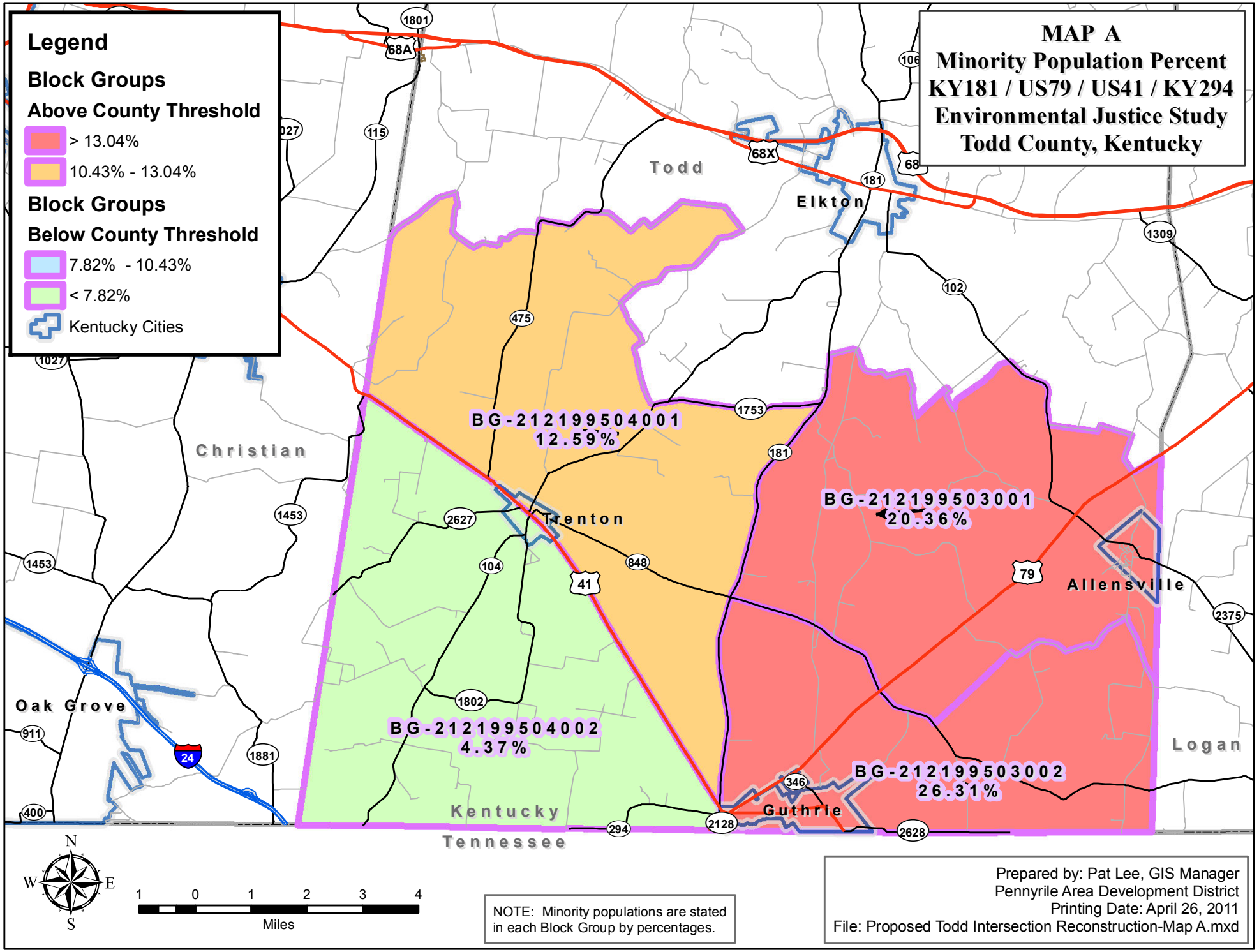
Analysis Range	Percent Disabled
Significantly Above Threshold	> 53.95%
Just Above Threshold	43.16% - 53.95%
REFERENCE THRESHOLD (Todd Co. Percentage)	**43.16%**
Just Below Threshold	32.37% - 43.16%
Significantly Below Threshold	< 32.37%

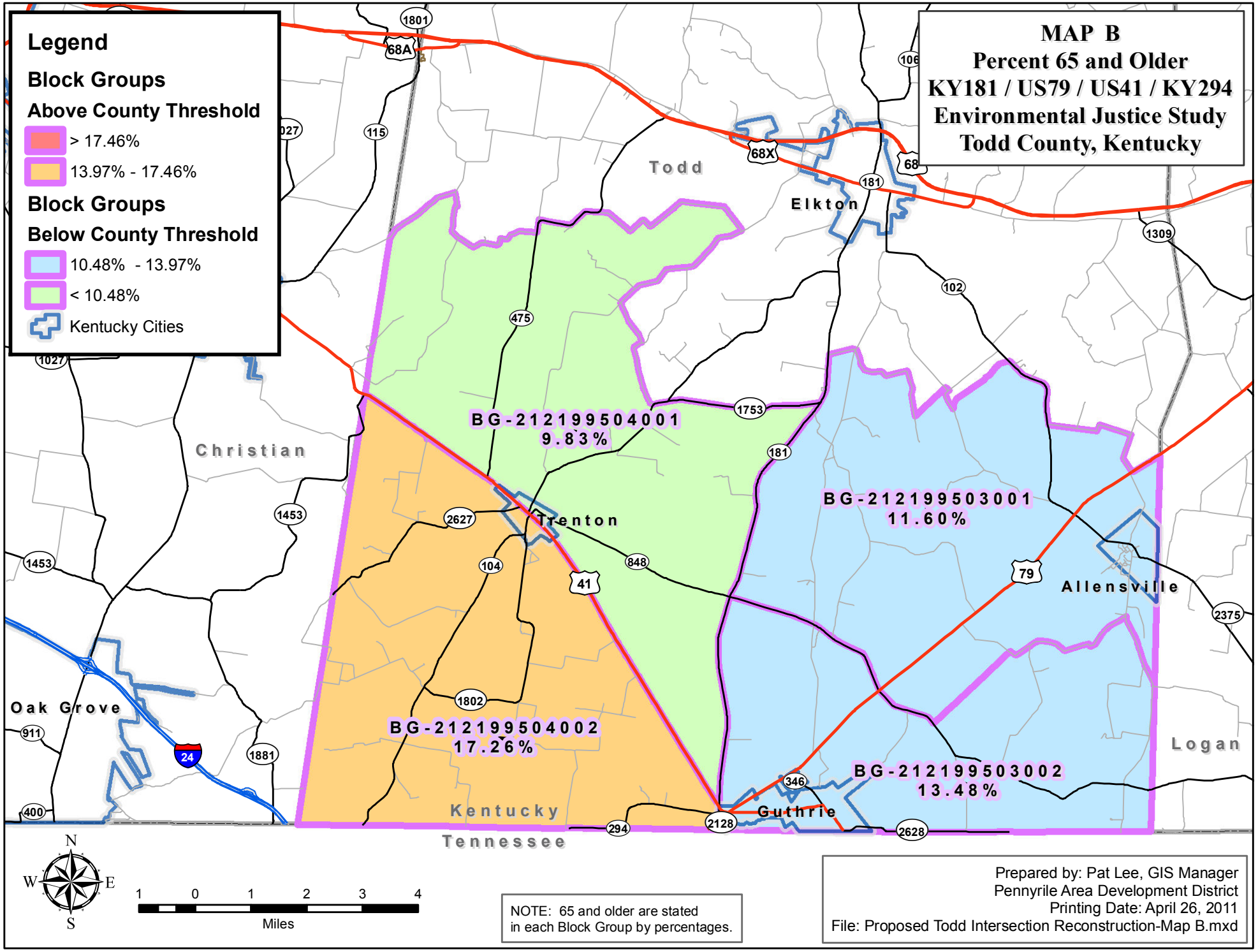
PERCENT BELOW POVERTY

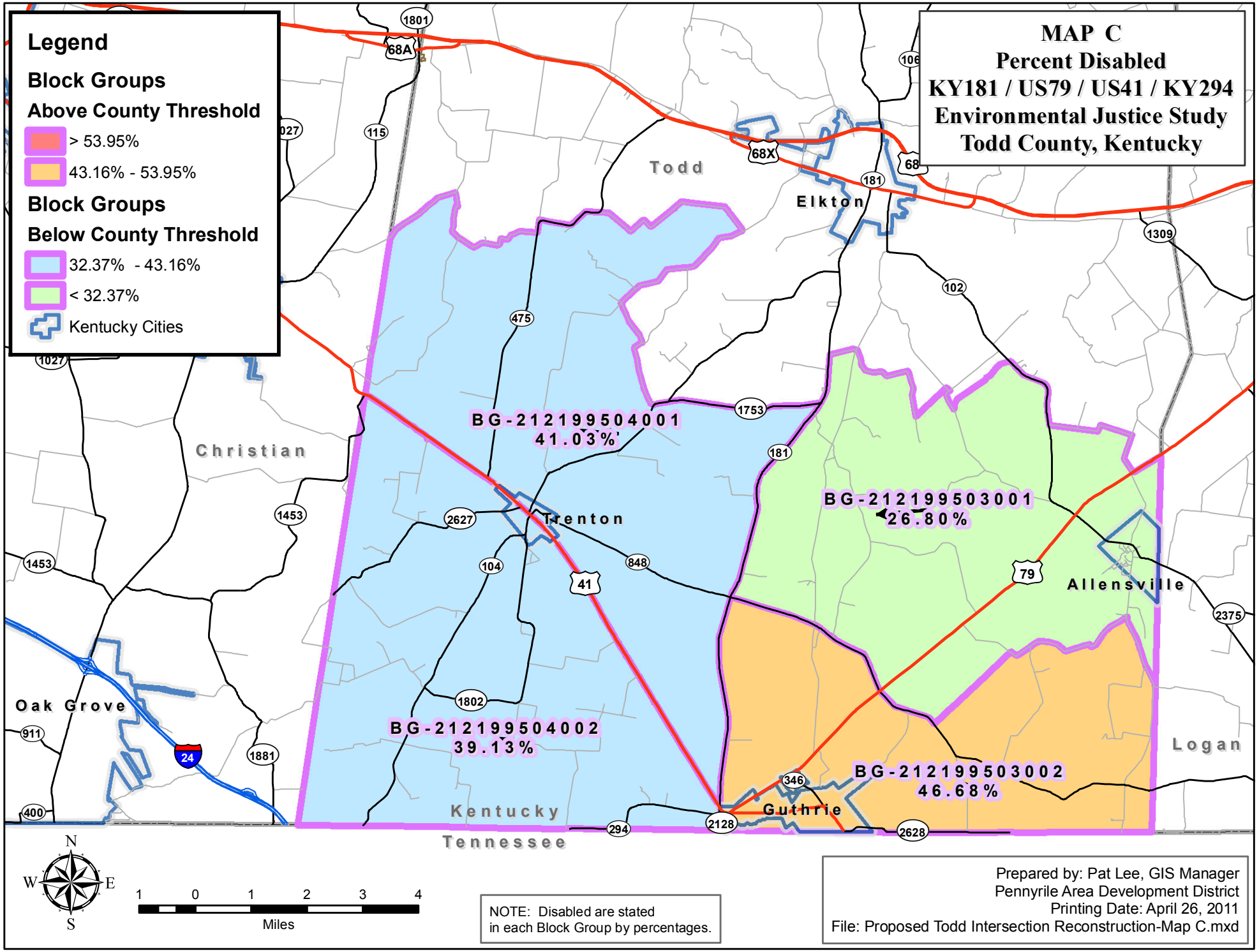
Analysis Range	Percent Below Poverty
Significantly Above Threshold	> 21.17%
Just Above Threshold	16.94% - 21.17%
REFERENCE THRESHOLD (Todd Co Percentage)	**16.94%**
Just Below Threshold	12.70% - 16.94%
Significantly Below Threshold	< 12.70%

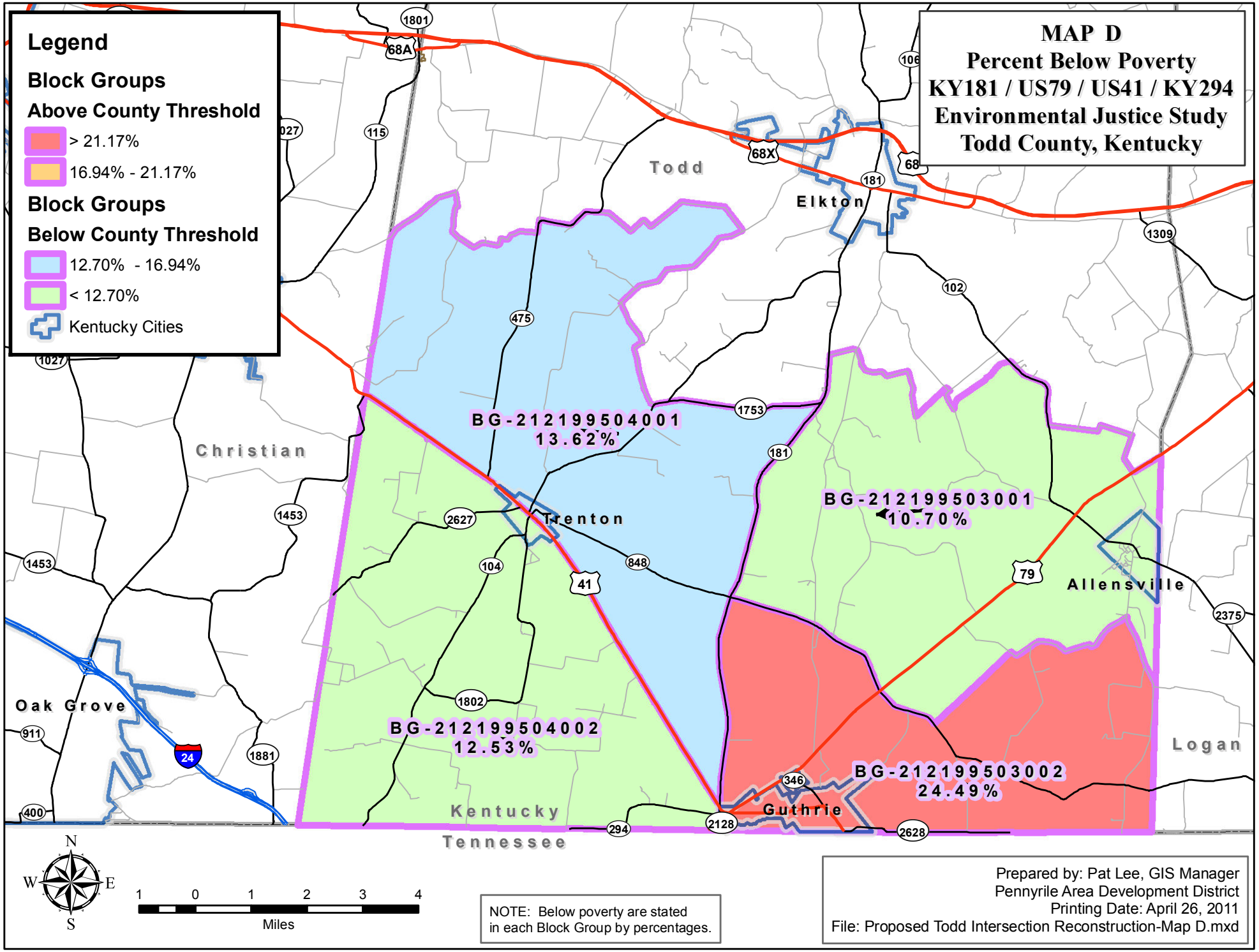
Appendix D

Block Groups Above or Below Todd County Population Threshold Maps


Legend
Block Groups
Above County Threshold
> 13.04%
10.43% - 13.04%
Block Groups
Below County Threshold
7.82% - 10.43%
< 7.82%
Kentucky Cities
MAP A
Minority Population Percent
KY181 / US79 / US41 / KY294
Environmental Justice Study
Todd County, Kentucky
BG-212199504001
12.59%
BG-212199503001
20.36%
BG-212199504002
4.37%
BG-212199503002
26.31%
Todd
Elkton
Christian
Trenton
Allensville
Oak Grove
Kentucky
Tennessee
Guthrie
Logan
1801
68A
68X
181
1309
102
475
1753
1027
1453
2627
104
848
41
79
2375
1802
911
24
1881
400
294
2128
346
2628
N
W
E
S
1 0 1 2 3 4
Miles
NOTE: Minority populations are stated in each Block Group by percentages.
Prepared by: Pat Lee, GIS Manager
Pennyrile Area Development District
Printing Date: April 26, 2011
File: Proposed Todd Intersection Reconstruction-Map A.mxd


Legend
Block Groups
Above County Threshold
> 17.46%
13.97% - 17.46%
Block Groups
Below County Threshold
10.48% - 13.97%
< 10.48%
Kentucky Cities
MAP B
Percent 65 and Older
KY181 / US79 / US41 / KY294
Environmental Justice Study
Todd County, Kentucky
BG-212199504001
9.83%
BG-212199503001
11.60%
BG-212199504002
17.26%
BG-212199503002
13.48%
Todd
Elkton
Christian
Trenton
Allensville
Oak Grove
Kentucky
Tennessee
Logan
Guthrie
N
S
E
W
1 0 1 2 3 4
Miles
NOTE: 65 and older are stated in each Block Group by percentages.
Prepared by: Pat Lee, GIS Manager
Pennyrile Area Development District
Printing Date: April 26, 2011
File: Proposed Todd Intersection Reconstruction-Map B.mxd


Legend
Block Groups
Above County Threshold
> 53.95%
43.16% - 53.95%
Block Groups
Below County Threshold
32.37% - 43.16%
< 32.37%
Kentucky Cities
MAP C
Percent Disabled
KY181 / US79 / US41 / KY294
Environmental Justice Study
Todd County, Kentucky
BG-212199504001
41.03%
BG-212199503001
26.80%
BG-212199504002
39.13%
BG-212199503002
46.68%
Todd
Elkton
Christian
Trenton
Allensville
Oak Grove
Logan
Guthrie
Kentucky
Tennessee
1801
68A
68X
181
1309
102
475
1753
1027
1453
2627
104
848
41
79
2375
1802
911
24
1881
400
346
2128
294
2628
N
S
E
W
1 0 1 2 3 4
Miles
NOTE: Disabled are stated
in each Block Group by percentages.
Prepared by: Pat Lee, GIS Manager
Pennyrile Area Development District
Printing Date: April 26, 2011
File: Proposed Todd Intersection Reconstruction-Map C.mxd


Legend
Block Groups
Above County Threshold
> 21.17%
16.94% - 21.17%
Block Groups
Below County Threshold
12.70% - 16.94%
< 12.70%
Kentucky Cities
MAP D
Percent Below Poverty
KY181 / US79 / US41 / KY294
Environmental Justice Study
Todd County, Kentucky
BG-212199504001
13.62%
BG-212199503001
10.70%
BG-212199504002
12.53%
BG-212199503002
24.49%
Todd
Elkton
Christian
Trenton
Allensville
Oak Grove
Logan
Guthrie
Kentucky
Tennessee
1801
68A
115
68X
181
1309
102
475
1753
1027
1453
2627
104
848
41
79
2375
1802
911
24
1881
400
346
2128
294
2628
N
S
E
W
1 0 1 2 3 4
Miles
NOTE: Below poverty are stated in each Block Group by percentages.
Prepared by: Pat Lee, GIS Manager
Pennyrile Area Development District
Printing Date: April 26, 2011
File: Proposed Todd Intersection Reconstruction-Map D.mxd

Appendix E – Turning Movement Counts and Forecasts

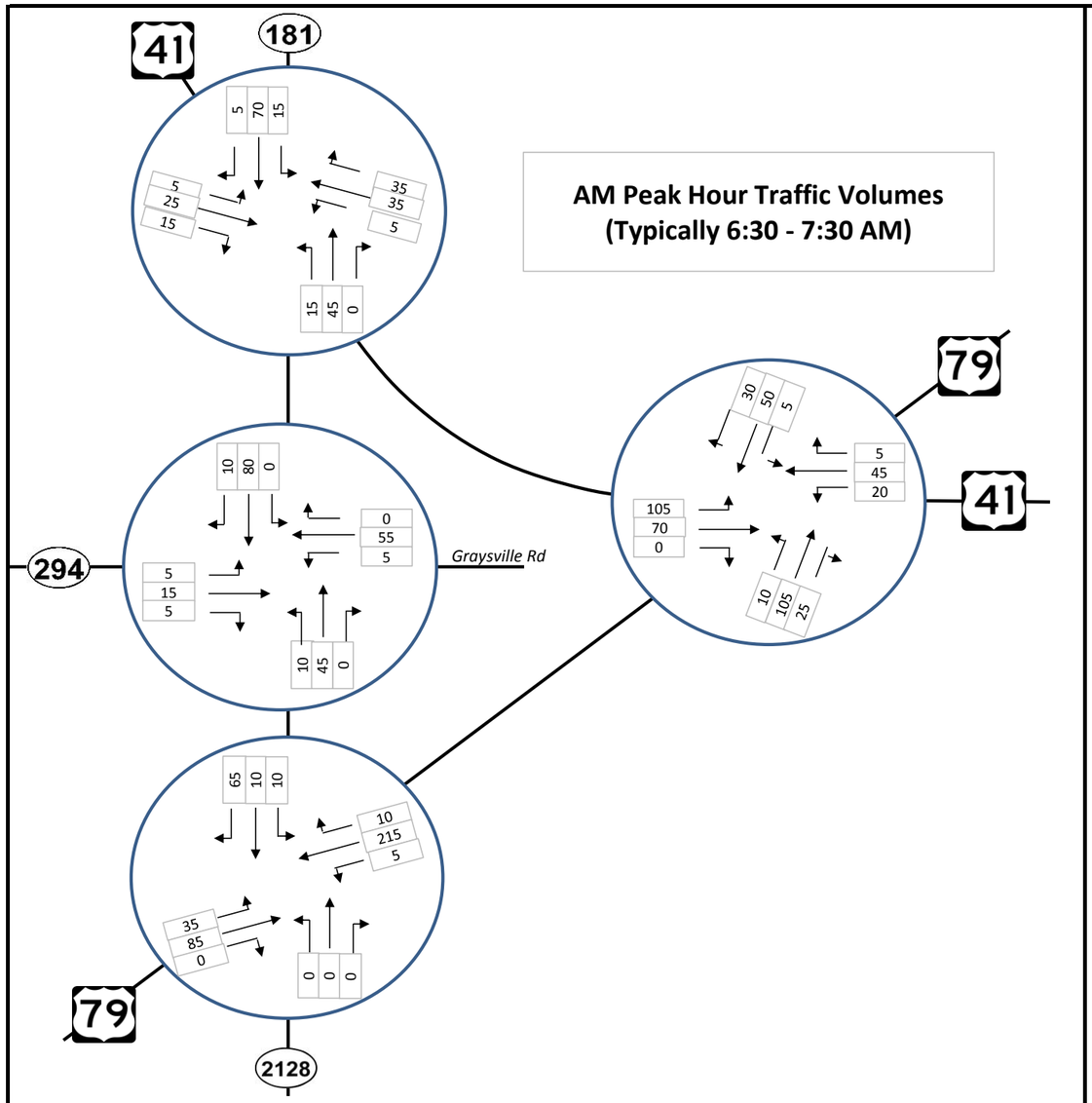
Guthrie "Knot" Planning Study

Todd County

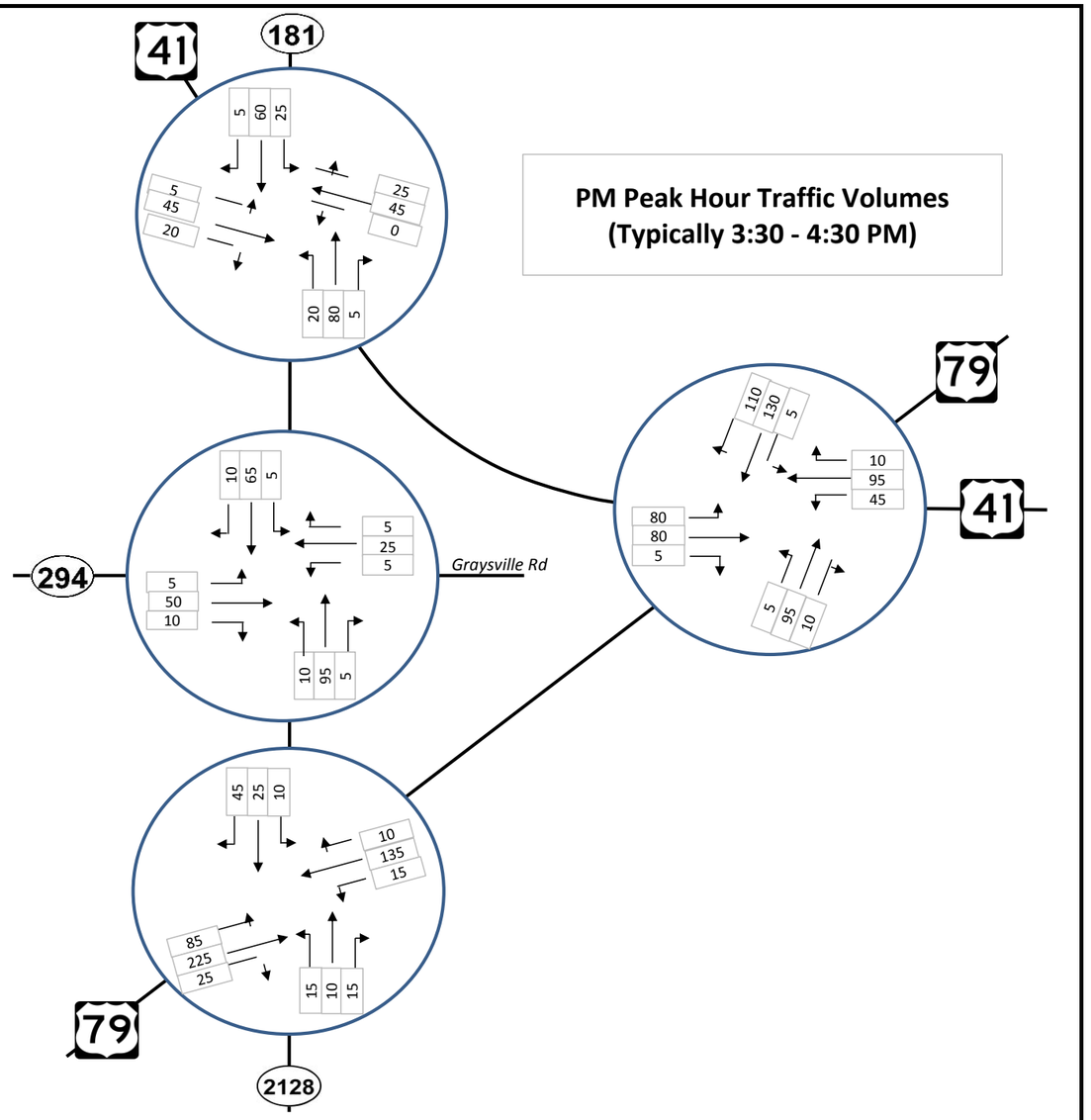
KYTC Item No. 3-8630.00

July 18, 2011

2011 Peak Hour Traffic Volumes



AM Peak Hour Traffic Volumes
(Typically 6:30 - 7:30 AM)



PM Peak Hour Traffic Volumes
(Typically 3:30 - 4:30 PM)

Traffic Counts collected by KYTC District 3 between March 17 and March 30, 2011.

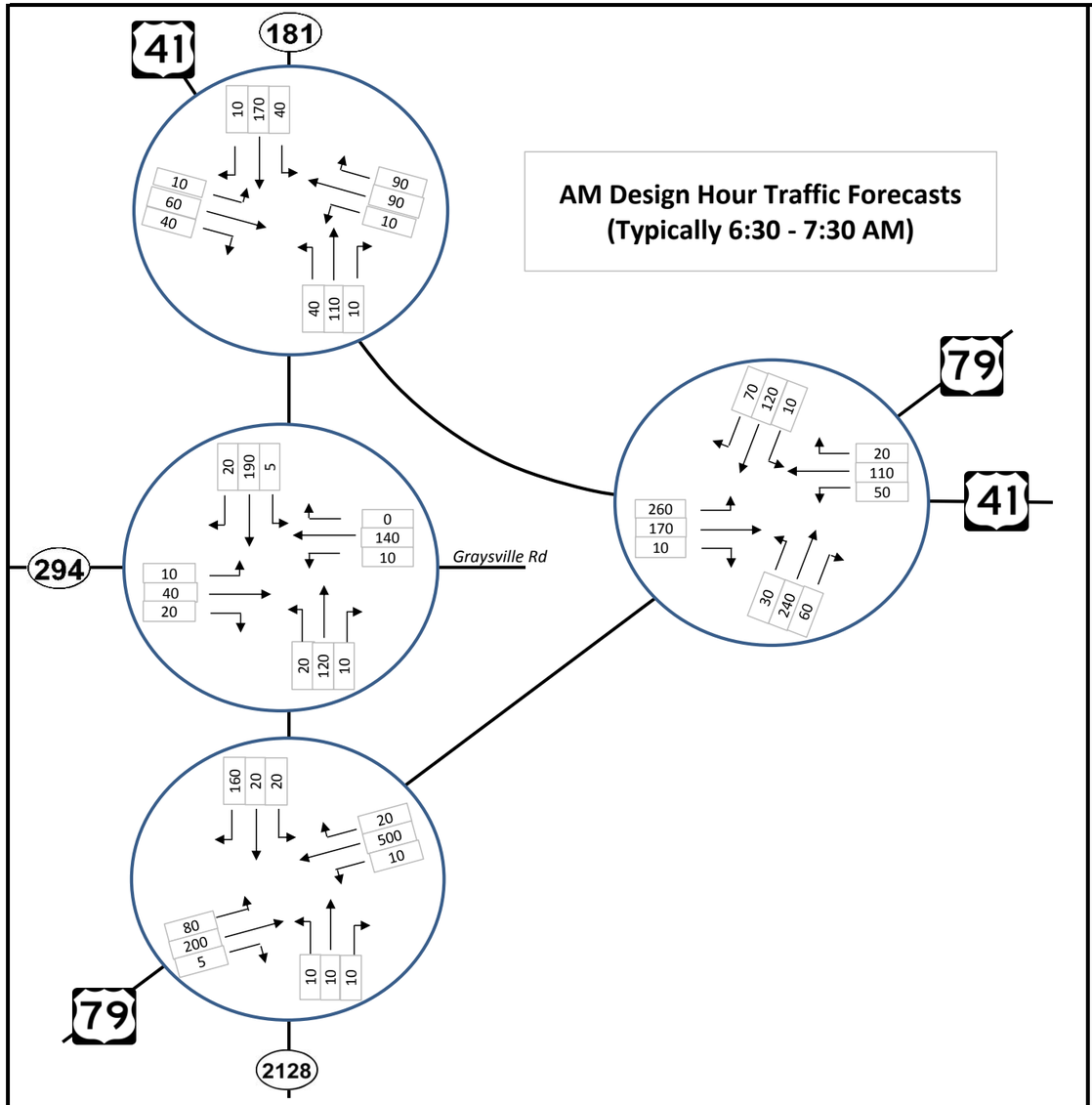
Guthrie "Knot" Planning Study

Todd County

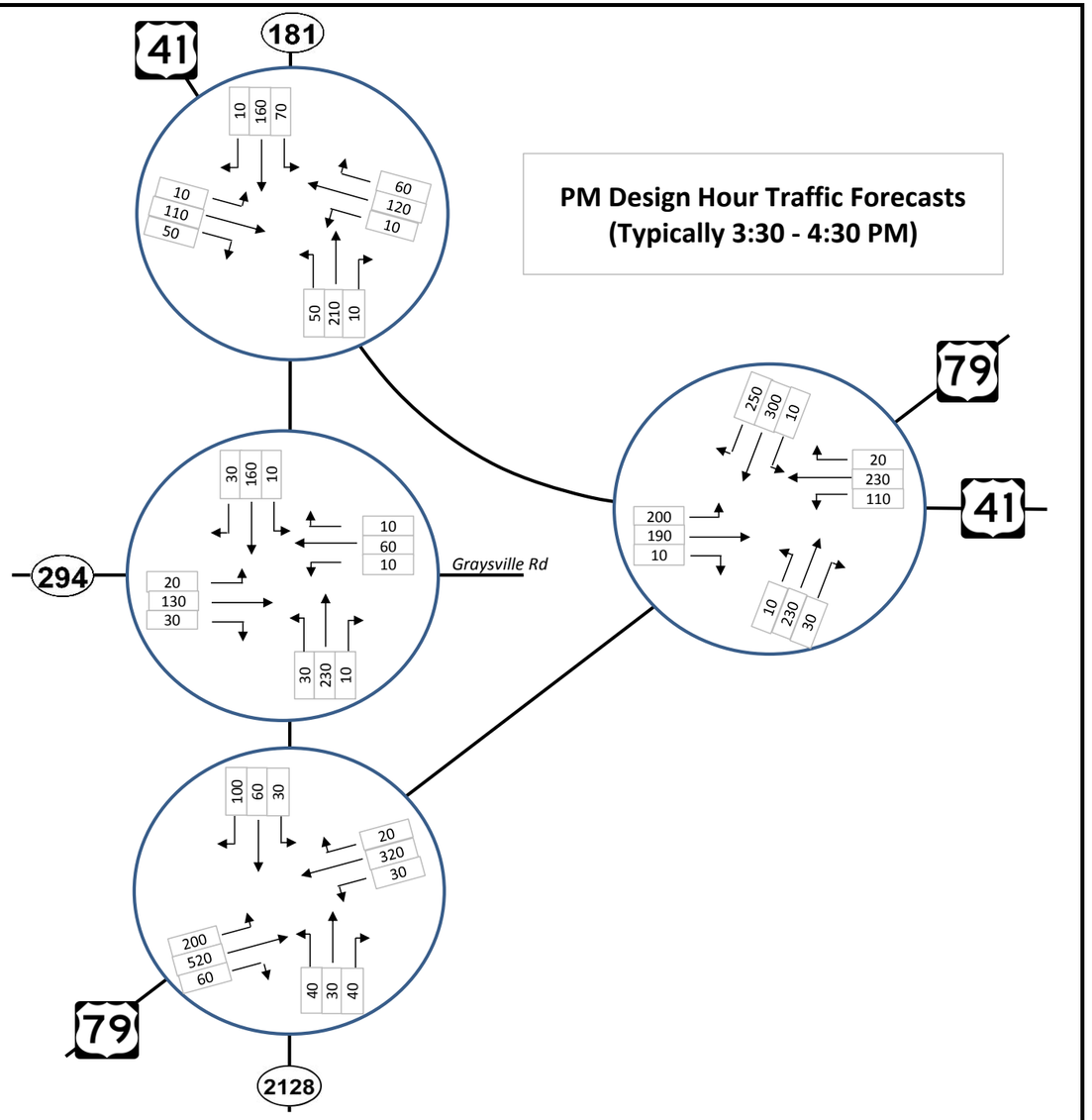
KYTC Item No. 3-8630.00

September 15, 2011

2030 No-Build Design Hour Traffic Forecasts



AM Design Hour Traffic Forecasts
(Typically 6:30 - 7:30 AM)



PM Design Hour Traffic Forecasts
(Typically 3:30 - 4:30 PM)

Forecasts based on assumed "high" growth rate.