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US 431 Programming Study for Safety Improvements

Item No. 02-8106.00

Logan, Muhlenberg, McLean, and Daviess Counties

Final Report
September 2008



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I. INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) has undertaken this Programming Study to recommend safety improvements along the US 431 corridor from the Tennessee state line to the US 60 Owensboro Bypass. The study area, shown in **Exhibit 1.1**, passes through the Kentucky counties of Logan, Muhlenberg, McLean, and Daviess. The purpose of this study is to identify, develop, and prioritize solutions for safety problems existing along the route.

A Programming Study for Safety Improvements to US 431 in Logan, Muhlenberg, McLean, and Daviess Counties

A. Background

The US 431 Programming Study was initiated by the KYTC in 2003. The study was originally identified in the KYTC's *Approved 2002 Biennial Highway Construction Program and Identified Preconstruction Program Plan for FY 2003 Through FY 2008* (generally referred to as the Six Year Plan) as Item 2-8106.00. The project was described as a "scoping study for safety improvements to US 431 from the McLean/Muhlenberg County line to the Tennessee border (Phase I) and a scoping study for safety improvements to US 431 from the McLean/Muhlenberg County line to the Indiana border (Phase II)."

Following the study commencement, the boundary between phases was redefined to divide the project at the Wendell H. Ford Western Kentucky Parkway (Ford Parkway) in Muhlenberg County. Phase I continues to reference the southern portion and Phase II references the northern. A portion of the roadway in Logan County was omitted from further study as it was recently improved to a four-lane cross section. A second portion in Daviess County between the US 60 Bypass and the Indiana border was also omitted.

B. Project Location

The study area, shown in **Exhibit 1.1**, runs north-south along the existing US 431 corridor through Logan, Muhlenberg, McLean, and Daviess Counties. The route is primarily a two-lane rural facility passing through a number of small communities. Larger towns include Russellville, Central City, and Owensboro. Communities throughout the region rely on the US 431 corridor as an economic link to cities such as Owensboro to the north and Nashville to the south.

The segment of the corridor in Muhlenberg County was included in the Kentucky 2006 Five Percent report. It is identified as one of the top 5% of state-maintained roadways with the most fatalities and severe injuries.

C. Programming and Schedule

This study was funded in the FY 2002 (2003-2008) Six Year Highway Plan, with committed planning funds of \$300,000. Subsequent phases of project development, including Design, Right-of-Way Acquisition, Utility Relocation, and Construction, are not scheduled in the most recent legislatively approved Six Year Highway Plan.

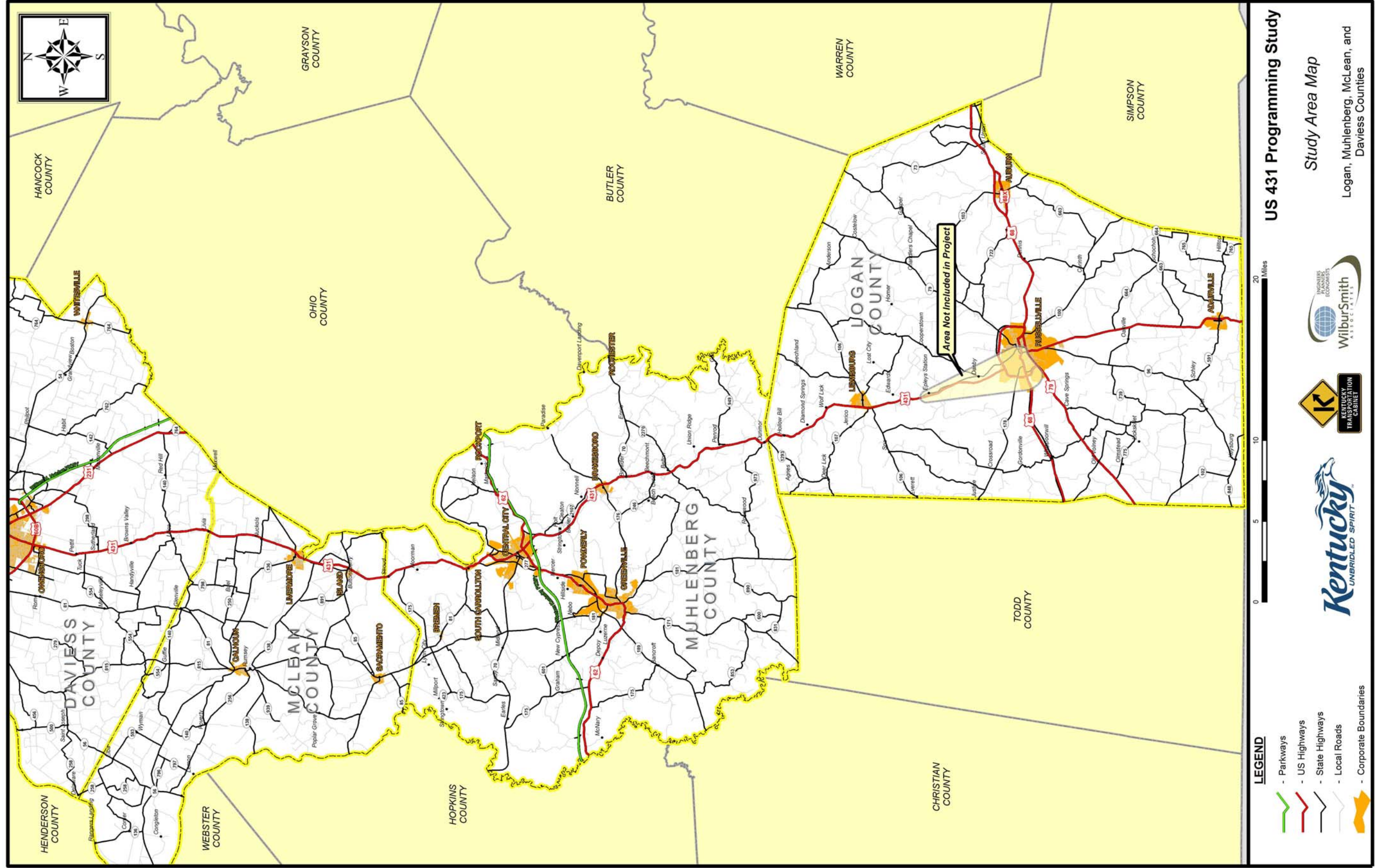


Exhibit 1.1

II. EXISTING CONDITIONS

Characteristics of US 431 are identified in the following sections. Information is included about highway systems, geometric characteristics, bridges, traffic conditions, vehicle crashes, adequacy ratings, and planned highway improvements. Roadway information was summarized from the KYTC Highway Information System (HIS) database in July 2007. Photographs taken throughout the study area can be found in **Appendix A**. Additional information on the existing conditions is presented in **Appendix B**, as discussed below. **Exhibit 2.1** shows the location of the study area with breaks at county lines and between phases. A section of the route in Logan County (milepoints 13.896 – 20.590) was recently improved to a four-lane section and has been omitted from further study. Copies of the route logs for Phases I and II are included as **Exhibits B.1** and **B.2** in **Appendix B**.

Exhibit 2.1 – Study Area Mileage

County	Begin MP	End MP
Logan	0.000	13.896
	20.590	31.050
Muhlenberg-Phase 1	0.000	17.484
Muhlenberg-Phase 2	17.484	27.779
McLean	0.000	11.573
Daviess	0.000	11.367

A. Highway Systems

Major highway systems information is shown in **Exhibit B.3** in **Appendix B**, including the State Primary Road System, Functional Classification System, National Highway System (NHS), National Truck Network (NN), Designated Truck Weight Class, and Defense Highway Network. Major highway systems summarized for the study area are as follows:

- State-maintained roads in Kentucky are categorized under the State System, ranging from the highest order classification to the lowest as follows: State Primary roads, State Secondary roads, Rural Secondary roads, and Supplemental roads. State Primary routes are those routes which are considered to be long-distance, high-volume intrastate routes that are of statewide significance. Mobility is the prime function of the routes which can be distinguished by high traffic-carrying capacity. These routes link major urban centers within the state and/or serve as major regional corridors. US 431 is categorized as a state primary route throughout the study area.

- One of 13 functional classification categories is assigned to each state-maintained road in Kentucky, based on the function the road provides and whether the road is in an urban or rural setting. These are classified from highest to lowest and by geographic designation as: Rural Interstate, Urban Interstate, Other Rural Freeways and Expressways (Principal Arterial), Other Urban Freeways and Expressways (Principal Arterial), Other Rural Principal Arterial, Other Urban Principal Arterial, Rural Minor Arterial, Urban Minor Arterial, Rural Major Collector, Urban Collector, Rural Minor Collector, Rural Local, and Urban Local. In the study area, US 431 is an arterial, varying by location between Urban and Rural, Principal and Minor.
- The NHS, first established in 1991 by the Intermodal Surface Transportation Efficiency Act (ISTEA), includes Interstate Highways and other significant Principal Arterials important to the nation's economy, defense, and mobility. US 431 is not a component member of the NHS.
- The NN includes roads designated for use by commercial trucks with increased dimensions (102 inches wide; 13 feet, 6 inches high; semi-trailers up to 53 feet long; and trailers up to 28 feet long – not to exceed two trailers per truck). The 102-inch wide trucks may also travel within 5 miles of a NN highway to pick up or deliver goods or commodities or to access essential services, such as fuel, lodging, or food. Portions of the route in the study area have been state or federally designated to the NN.
- Kentucky Revised Statutes impose weight limits on the state-maintained highway system. There are three weight classification limits: (1) AAA – 80,000 lbs. maximum gross vehicle weight; (2) AA – 62,000 lbs. maximum gross vehicle weight; and (3) A – 44,000 lbs. maximum gross vehicle weight. For special circumstances, occasional exceptions are granted for over-dimensional or overweight vehicles by permits issued by the KYTC, Division of Motor Carriers. In the study area, US 431 has a weight classification limit of AAA.

Portions of the route have also been included on the Bike Route System and the Scenic Byway System, as summarized in **Exhibit B.4**. Three bike trails intersect US 431 while traveling on other routes. One trail, the Midland Kentucky Trail, follows US 431 for approximately 0.3 miles in Muhlenberg County. US 431 is also part of the Blues to Bluegrass Scenic Byway in Muhlenberg County.

B. Geometric Characteristics

Geometric characteristics for major routes in the study area are listed in **Exhibits B.5** and **B.6** for Phases I and II, respectively, including the number of lanes, lane widths, shoulder widths, roadway type, local terrain, speed limits, percent passing sight distance, and pavement type.

In the study area, US 431 lies on flat to rolling terrain with a primarily undivided, two lane cross-section and with driving lanes ranging from 9 to 12 feet in width. 80% of the corridor length in Phase I and 23% of the length in Phase II has driving lanes less than 12 feet wide. Sidewalk facilities are provided alongside US 431 in some of the developed areas, including portions of Central City, Russellville, and Livermore.

C. Bridges

Bridge data for the structures along US 431 are presented in **Exhibits B.7** and **B.8** for Phases I and II. A bridge with a sufficiency rating less than fifty (50.0) is considered to be eligible for replacement with federal funds under the Federal-Aid Highway Bridge Replacement and Rehabilitation Program. Bridges can be rated either structurally deficient or functionally obsolete. Within the project area, only the structure at Muhlenberg County milepoint 27.7 (497-foot long Overflow Structure) is structurally deficient and falls below a 50.0 sufficiency rating. It was noted in a previous report that this structure should be replaced if the route is widened in this area. Phase I contains seven bridges listed as functionally obsolete; Phase II also contains seven functionally obsolete structures.

With the designation of the southern portion of US 431 as a part of the NN, narrow bridges south of Russellville will likely serve higher volumes of wide vehicles. There are two narrow structures within this section of roadway:

- Bridge over South Fork of Red River, Logan County MP 0.987, 318 feet long; and
- Bridge over North Fork of Red River, Logan County MP 4.025, 318 feet long.

D. Traffic and Operational Measures

Existing (Year 2007) and estimated future (Year 2030) traffic and operational conditions are discussed in the following subsections for each major route in the study area. **Exhibits B.9** through **B.14** depict key traffic information along the route for both analysis years.

1. Existing Traffic Volumes (Year 2007)

Traffic volumes on US 431 range from 2,580 vehicles per day (vpd) near the Logan/Muhlenberg County line to 29,900 vpd in Owensboro. The roadway, like many in this portion of Kentucky, follows the rolling terrain, resulting in numerous curves and grades and the associated sight distance limitations. The speed limit is 55 mph, dropping as low as 35 mph passing through various communities. **Exhibits B.9** and **B.10** tabulate traffic characteristics for Phases I and II, respectively.

A large number of heavy trucks were observed in Muhlenberg County due to coal mining operations. According to 2005 data from the KYTC Coal Haul Highway System, as much as 3 million tons of coal is hauled by truck along segments of US 431 south of the Ford Parkway in Muhlenberg County. North of the parkway, as much as 2 million tons are hauled annually through segments concentrated in Muhlenberg County, but routes extend as far north as southern Owensboro. Reported haul weights are shown in **Exhibits B.11** and **B.12**. Plans for a new \$3.3 billion power plant north of Central City may further increase hauled tonnages and, therefore, increase the number of heavy trucks.

2. Level of Service (Year 2007)

The Level of Service (LOS) is a qualitative measure of highway traffic conditions, as defined in the *2000 Highway Capacity Manual (HCM)*, published by the Transportation Research Board (TRB). Individual levels of service characterize these conditions in terms of speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined and given letter designations from A to F, with LOS A as the best condition, representing free flow conditions, and ranging to LOS F, representing severe congestion and/or time delays. Typically, a minimum of LOS D is considered acceptable in urban areas and LOS C is considered acceptable in rural areas.

On US 431, LOS throughout rural portions of the corridor is restricted by limited passing opportunities and the frequency of access points. Generally, LOS drops to lower levels within the towns and small developed areas along the roadway. Most undeveloped sections function at a LOS D or better. **Exhibit B.13** displays maps of the 2007 LOS.

3. Estimated No-Build Future Traffic (Year 2030)

No-Build future traffic was estimated using historic growth rates and assuming no significant changes to the roadway. The growth rates were based on KYTC's historic traffic counts for each study area route. The annual growth rate used for projecting future traffic was 1.45%, resulting in 2030 traffic volumes ranging from 3,600 vpd in undeveloped rural areas to 41,600 vpd in Owensboro.

4. Estimated No-Build Future Level of Service (Year 2030)

Significant increases in traffic volumes further deteriorate level of service. For future year 2030 traffic projections, most of the route is anticipated to function at a LOS D or E. Details are presented graphically in **Exhibit B.14**.

E. Crash Analysis

The safety analysis was based on a methodology developed by the Kentucky Transportation Center (KTC) to locate roadway "segments" based upon traffic volumes and geometric characteristics which correspond to high crash concentrations. The procedure was also used to identify the location of 0.10-mile "spots" which demonstrate high crash frequencies. Each segment or spot is assigned a critical rate factor (CRF) based on formulas published by the KTC. The CRF is one measure of the safety of a road, expressed as a ratio of the crash rate at the study location to the average crash rate for roadways of the same functional classification throughout the state.

If the Critical Rate Factor is 1.00 or greater, it is assumed that crashes are happening due to circumstances that cannot be attributed to random occurrence. Therefore, it should be studied in more detail to ascertain if there are remedial actions that could be taken to improve the overall safety of the facility.

A crash analysis was completed based on 2003-2006 data available from the KYTC's CRASH database. Calculations for the segments and spots along US 431 are summarized by county and phase in **Exhibits B.15** and **B.16**. Segments and spots with a CRF greater than 1.00 are shaded to add emphasis. A total of 40 high CRF spots were identified during this crash analysis, with CRF as high as 4.85.

F. Adequacy Ratings

The KYTC HIS database provides an adequacy rating percentile for state-maintained arterials and most major collectors. The composite rating is based on the condition, safety, and service component scores of the route, as described below:

- The Condition Index considers only the condition of the road's pavement.
- The Safety Index is evaluated based on lane width, shoulder width, median widths, alignment, and critical crash rate factors.
- The Service Index rates the route's volume-to-capacity ratio and access control.

Exhibit B.17 depicts the adequacy ratings assigned to the entire length of US 431.

Almost one-third of the segments fall into the lowest quartile of the composite adequacy rating scheme. A concentration of poorly rated segments lie in southern Muhlenberg County, primarily because of low Safety Index values.

G. Programmed Highway Improvements

Since this programming study began in 2003, a number of highway improvement projects have been programmed for US 431. A synopsis of these is shown in **Exhibit 2.2**. The "Final Phase" column represents the last phase scheduled as of the 2006-2012 Highway Plan.

Exhibit 2.2 – Programmed Highway Improvements

Item No.	County	BMP	EMP	Project Description	Final Phase	Year
02-5006.00	Mlbg	13.200	13.300	Rockfall Correction	C	2003
02-9.00	McLean	5.988	6.088	Reconstruct KY 136 Intersection	C	2003
02-972.00	McLean	8.265	8.365	Realignment at KY 1080	C	2004
02-900.00	Mlbg	6.200	6.400	Improving Dead Man's Curve	C	2006
02-977.00	Mlbg	23.900	24.100	Realignment north of S Carrollton	C	2006
03-994.00	Logan	4.145	4.245	Realignment at KY 663	C	2007
03-8309.00	Logan/Mlbg	25.718	17.250	Reconstruct to 4-lane	D	2008
03-273.01	Logan	21.311	25.718	Reconstruct to 4-lane	U	2008
02-160.00	Mlbg	15.524	15.824	Improving RR Crossing	C	2009
02-976.00	Mlbg	22.400	22.700	South Carrollton Realignment	C	2009
03-311.10	Logan	---	---	Russellville Southern Bypass	U	2010

Additional projects completed along the study corridor include adding turning lanes in Beechmont (Muhlenberg County) for a new school and widening in Owensboro (Daviness County) from Home Depot to Martin Luther King loop.

III. ENVIRONMENTAL OVERVIEW

An Environmental Overview Report was developed in 2004 for the US 431 project area. A preliminary environmental analysis was completed to identify potential issues and concerns within the defined US 431 study area, extending 2,000 feet on either side of the existing alignment. This chapter presents a summary of the Environmental Overview.

Relevant environmental data for the four-county area was collected and then mapped using GIS applications. Additional “windshield surveys” were conducted within the project area. From these venues, an overview of environmental concerns within the project area was assembled, and issues have been identified that will require consideration for any likely transportation improvements.

An electronic copy of the full text of the Environmental Overview Report is available in **Appendix C**, including maps depicting the location of the discussed features. For each county, information is presented on Natural and Manmade Water Features; Biotic Communities; Social, Economic, and Environmental Justice Concerns; Historic and Archaeological Sites; Prime and Unique Farmland Concerns; UST, HAZMATs, Oil, and Gas Concerns; and Additional Issues. The following sections summarize the findings of this Overview Report.

A. Logan County Environmental Issues

Water Features – A number of manmade water resources are located within the study area, including multiple water tanks, public supply facilities, water lines, wells, and gauges. There are also a number of natural water resources: the Mud and Red Rivers divide the county into two main watersheds. The proximity of the rivers creates floodplain concerns: Adairville and portions of Russellville lie in FEMA’s 100 year flood zones. A total of 65 individual streams are concentrated in the northern half of the county; karst topography south of Russellville limits the number of aboveground streams occurring here. Over 182 acres of wetlands have been identified, similarly concentrated in the northern half of the county around stream corridors and floodplains. The Natural Resources and Environmental Protection Cabinet (NREPC) has not identified any Outstanding Resource waters or Wild Rivers. Though there are no lakes in this portion of the study area, small farm ponds are common.

Biotic Communities – Records from the Kentucky State Nature Preserves Commission (KSNPC) and the US Fish and Wildlife Service (USFWS) identify a number of endangered, threatened, and special concern species in the project area, including as many as six plant

species and five animal species. The Indiana Bat is the only species that appears in the databases of both agencies.

Social, Economic, & Environmental Justice – A number of community sensitive locations lie within the study area. Within the 4,000 foot wide corridor, there are four churches, five cemeteries, an elementary school, and various businesses and industries concentrated around Russellville. There are fifteen major manufacturing sites in the city; Logan Aluminum is the largest, employing 1,100 persons.

An environmental justice profile was developed for the study area based on 2000 Census data. Minority population concentrations above the state and county averages exist in Tracts 9603, 9605 (north and south of Russellville, respectively) and 9606 (southern portion of the county). Concentrations of persons living in poverty are greater in Tracts 9602 (northwestern Logan County), 9603, and 9604 (west of Russellville) than statewide and countywide averages. Additional environmental justice information is presented in **Chapter 4** and in the Environmental Justice Overview prepared by the Green River, Barren River, and Pennyriple Area Development Districts.

Historic Sites – Numerous historical points of interest exist in Logan County dating back to the American Civil War. Among these sites are a 2,100 acre historic district in Russellville and other historic structures, two of which are listed on the National Register of Historic Places. There are also 23 officially registered archaeological sites.



Sexton House at US 431 intersection with US 79

Farmlands – An estimated 79% of land area in the county is harvested cropland; over 44% is designated as prime farmland. Karst features in the southern portion of the county may allow agricultural chemicals an opportunity to infiltrate underground water systems. Relocating portions of the US 431 corridor could increase this concern.

Monitored Sites and Wells – Monitored sites, HAZMAT disposal sites, permitted discharge locations, and wells are common in the area. The most significant issue in this category is a CERCLIS/Superfund site west of Lewisburg which should be avoided unless further investigation finds no environmental hazards. Information about the other sites is presented in the complete Environmental Overview and its appendices.

Additional Concerns – Six fault lines run predominantly east-west between Lewisburg and Logan Aluminum. There is also a sewage treatment plant on the edge of the 4,000 foot wide corridor just north of the Russellville corporate limits.

B. Muhlenberg County Environmental Issues

Water Features – Numerous manmade water resources are located within the study area, including multiple water tanks, water lines, and abandoned wells. The Green River runs along the eastern boundary of the county. Its watershed covers the entire area. There are also 101 individual streams in the study area. The NREPC has not identified any Outstanding Resource waters or Wild Rivers. Though there are no lakes, the gently rolling terrain facilitates the pooling of small ponds throughout the county. Additionally, there are approximately 900 acres of wetlands. Portions of the study area north of KY 949, near Drakesboro, and at the northern end of the county have been classified as FEMA Zone A (100 year floodplain).

Biotic Communities – The KSNPC and USFWS list as many as two plant species as threatened. The *Pyramid Pigtoe* bivalve is listed as an endangered animal species by both agencies. The habitat of the *Copperbelly Water Snake* is subject to conditions outlined in the Kentucky Department of Fish and Wildlife Resources (KDFWR) Conservation Agreement. The Peabody Wildlife Management Area provides a 264 acre refuge within the study area.

Social, Economic, & Environmental Justice – Seventeen community sensitive locations were identified within the 4,000 foot wide study area. This includes 11 churches, 2 elementary schools, and 4 historic cemeteries.

Central City provides the industrial base for the county, with 11 major manufacturing sites. Retail trade and services compose the largest employment sector percentages, followed by manufacturing. The 2001 unemployment rate is over 10% and puts Muhlenberg County at nearly double the state and national unemployment rates.



Church along US 431 in South Carrollton

Four census tracts cover the study area. Concentrations of minority populations below state averages in each of these should be considered in future phases. Each tract also shows a higher concentration of persons living in poverty than state and county averages.

Field review confirms that the project area contains evidence of low-income housing developments.

Historic Sites – The study area within Muhlenberg County is home to one historic structure and one historic land marker. There are also 18 known archaeological sites, predominantly located north of Drakesboro.

Farmlands – An estimated 35% of the county is harvested cropland, supporting a \$47 million agriculture economy. Though most farmland areas would not be affected by construction, irregular runoff and poor drainage caused by new development could impact farming.

Monitored Sites and Wells – Monitored sites, HAZMAT disposal sites, permitted discharge locations, and wells are common in the area. The most significant issue in this category is a CERCLIS/Superfund site south of Central City, a quarter-mile west of US 431. There are also a number of UST and well sites identified; information about the other sites is presented in the complete Environmental Overview and its appendices. Because this area is located within the Western Kentucky Coal Field, it has seen a high amount of geotechnical activity which increases the potential for environmental hazards and contaminations.

Additional Concerns – There are nine fault lines crossing the study area. There are also three sewage treatment plants and a tire dump along the corridor.

C. McLean County Environmental Issues

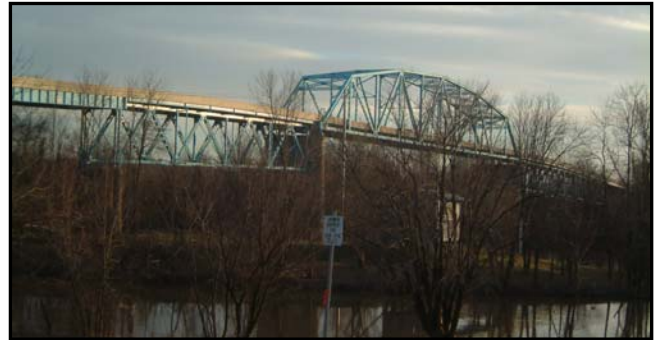
Water Features – Similar to the other counties in the study area, McLean County contains various water resources. Water tanks, wells, and lines are located throughout the corridor; there is also a water gauge on the Green River in Livermore. The Green River is the major waterway in the county, merging with the Rough River near Livermore. Forty-five individual streams throughout the county drain through this watershed. No Outstanding Resource waters or Wild Rivers occur within the study area. Farm ponds exist along the US 431 corridor although there are no natural or manmade lakes. Approximately 328 acres of wetlands line the stream and river channels and floodplains. Floodplains in the area vary from FEMA Zone A (inundated by a 100 year flood) to Zone X (beyond the range of a 500 year flood).

Biotic Communities – USFWS and KSNPC records report up to two threatened plant species and one possible threatened animal species. The habitat of the *Copperbelly Water Snake* is subject to conditions outlined in the KDFWR Conservation Agreement.

Social, Economic, & Environmental Justice – McLean County has relatively few community sensitive locations within the study area: three churches, one school, and two cemeteries. Industry, retail, and services comprise the largest sectors of the economy. County unemployment rates are higher than both state and national levels.

Environmental justice data for McLean County was taken from 2000 US Census data for two tracts. Both have minority populations less than one percent, well below state and county averages. Poverty rates are comparable to state and county averages. More environmental justice data is presented in **Chapter 4**.

Historic Sites – There are several historic points of interest in the study area. There are 21 historic sites within the study area; 16 of these fall within a one-block area of Livermore although it is not officially designated as a Historic District. The Livermore Bridge is the only river bridge in the world which begins and ends in the same county, spans two rivers, and crosses another county. There are three additional National Register approved/eligible sites near Livermore and ten known archaeological sites.



Livermore Green River Bridge

Farmlands – Harvested cropland makes up an estimated 65% of the land area in McLean County. The potential for crop damage due to flooding in the fertile floodplains around the Green and Rough Rivers is an ever-present reality. Any corridor relocations may result in land use changes which could impact farmlands.

Monitored Sites and Wells – UST sites, oil and gas wells, and permitted disposal locations are common along the study route which may impact roadway improvements. As part of the Western Kentucky Coal Fields, this county has experienced a large amount of geotechnical activity which may increase the potential for environmental hazards and contaminations.

Additional Concerns – In addition to the previously discussed features, there are eight fault lines crossing the study area between the Green River and the Daviess County line. A

sewage treatment plant lies at the northern end of the corridor east of the existing alignment. A riverport and intermodal terminal within the 4,000 foot wide corridor at Livermore provide transport/shipping services for grains.

D. Daviess County Environmental Issues

Water Features – This county has a number of water facilities falling within 2,000 feet of either side of the existing US 431 alignment: two public water supply facilities, two water treatment plants, and a water tank, in addition to wells and water lines. The Ohio River forms the northern border for both the county and the state, but Daviess County is part of the Green River watershed to the south. Streams and wetlands are common in the study area although there are no lakes and few ponds. No Outstanding Resource waters or Wild Rivers have been identified in the area. Most of the area is within 500 year floodplain elevations; an area around Panther Creek is within 100 year floodplain levels.

Biotic Communities – According to KSNPC and USFWS records, no threatened or endangered plant species are found within the study corridor. There is one possible animal species listed as endangered. The habitat of the *Copperbelly Water Snake* is subject to conditions outlined in the KDFWR Conservation Agreement.

Social, Economic, & Environmental Justice – Community sensitive locations within the project area include four churches, Brescia and Kentucky Wesleyan Colleges, seven other schools, and a cemetery. Services, government, and retail trade are the largest industries based on 2000 data. Income levels and unemployment rates are comparable to state averages.

Based on 2000 Census rates, minority populations exist in Tracts 2, 3, and 5 (south central Daviess County and central Owensboro west of US 431). These tracts also have a higher percentage of persons living in poverty than state and county averages. Residential dwellings exhibiting low-income housing characteristics were encountered during a field review.

Historic Sites – Four historic districts are located within Owensboro. There are 121 identified historic structures, 22 of which are listed on the National Register of Historic Places. There are also a number of historic markers and monuments. No separate archaeological sites have been identified in the study area, but they are likely to exist around any historic structures.

Farmlands – Daviess County is the state’s highest producer of soybeans. It is estimated that 64% of the area is harvested cropland. Any relocations of the US 431 alignment may lead to land use changes and impacts to farmlands.

Monitored Sites and Wells – There are a number of monitored sites, HAZMAT disposal sites, UST locations, and oil/gas wells in the study area. The primary issue in this category is a CERCLIS/Superfund location along US 431 in Livia. High amounts of geotechnical activity increase the potential for hazards and contaminations.

Additional Concerns – Seven fault lines cross the study area, concentrated in the southern portion of the county. There are two sewage treatment plants in the area. In addition, the Division of Environmental Analysis cautions that noise factors could be a concern in Daviess County.

IV. ENVIRONMENTAL JUSTICE OVERVIEW

The US 431 project area covers portions of four Kentucky counties and has the potential to impact the diverse populations living there. An Environmental Justice overview was prepared jointly by the Barren River, Green River, and Pennyriple Area Development Districts (ADD) in 2004 to provide information about these populations in order to assist the KYTC in making informed and prudent transportation decisions in the project area. Data on race, poverty levels, age groups, and disability status were compiled from the US Census Bureau, the KYTC Division of Planning, conversations with local officials in the study area, and field reviews. The following sections outline the findings of this investigation. A full text version of the Environmental Justice Report is located in **Appendix D**.

Environmental Justice

“Fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.”

--US EPA

A. Phase I Environmental Justice

Phase I of the US 431 Programming Study extends from the Tennessee state line at Logan County to the Ford Parkway in Muhlenberg County. The study corridor is defined along the existing US 431 alignment, 2,000 feet on either side.

Logan County contains small concentrations of minority and low-income groups located within Russellville from Rhea Boulevard to Ninth Street. There is also an identified concentration of low-income persons in Lewisburg, just east of US 431. In Adairville, two elderly/low-income housing complexes (the Adairville Arms and Robert L. Staggers Manor) and a mobile home community are located just east of US 431. No clusters of disabled persons were identified although one Tract exhibited a higher population percentage of disabled persons than national, state, or county rates.

Muhlenberg County south of the parkway contains minority population levels below national, state, and county levels. Minority population clusters were identified in small neighborhoods in Drakesboro west of US 431 and in Cleaton just beyond the study corridor to the east. Low income population concentrations are elevated for all Tracts within this county but no specific concentrations were identified; this reflects the high poverty rate of the county overall, which has one of the highest unemployment rates in the state. Likewise, no concentrations of elderly or disabled persons were identified.

B. Phase II Environmental Justice

Phase II of the US 431 Programming Study extends from the Ford Parkway in Muhlenberg County to the US 60 Bypass in Owensboro, Daviess County, approaching the Indiana state line. The study area is again defined as a 4,000 foot wide corridor centered on the existing US 431 alignment.

Muhlenberg County north of the parkway contains the Green River Correctional Complex, contributing to elevated minority population levels. Additionally, a predominantly African American neighborhood was identified in Central City west of the existing US 431 alignment. No low income concentrations were determined, but both a nursing home and an apartment complex in Central City do contain concentrations of elderly persons. Block Group 4 in Tract 9602 (southwestern Central City) exhibits an elevated percentage of disabled persons, but no concentrations were identified; further study is recommended for this particular Block Group.

McLean County contains multiple low-income housing units in Livermore near Prells Lane, Sixth Street, and Ridge Court. The Sixth Street area also hosts concentrations of elderly and disabled persons. Two nursing homes lie within the town of Livermore. There is an increased percentage of disabled persons in both Tracts in McLean County; further study is recommended to identify likely concentrations.

Daviess County contains higher percentages of multiple minority groups – Asian, Hispanic, African American, and ‘Other’ – with a concentration appearing in an apartment complex on the edge of the study corridor. A senior citizen’s personal care home and some low-income housing developments were identified as concentrations of elderly, disabled, and/or low-income populations, but are located far enough from US 431 that it is unlikely they will be impacted. Due to high concentrations of minority, elderly, disabled, and low-income populations, Block Group 4 of Tract 17.01 is recommended for additional study.

V. PURPOSE AND NEED STATEMENT

The general purpose of this study is to improve highway safety along US 431 in Kentucky. As a secondary goal, increasing access and connectivity for this regional corridor is also desirable. Projects identified as part of this study should address these needs.

Purpose and Need
- Improve Safety
- Increase Access & Connectivity

A. Improve Safety

The existing US 431 corridor winds from the Tennessee state line in Logan County to the Owensboro Bypass in Daviess County. Sections of the route take on urban and rural characteristics, depending on their setting.

For the most part, US 431 is a two-lane undivided highway with 9 to 12 foot lanes and narrow shoulders. Especially in rural areas, numerous horizontal and vertical curves restrict sight distances and create potential safety problems along the existing alignment. Single vehicle collisions with objects are common in rural portions of the route; limited sight distance and driveways without turn lanes also lead to rear end and angle type collisions. In urban areas like Central City and Owensboro, the cross-section expands to 3 or 4 lanes with turning bays, curb-and-gutter, and sidewalks in select areas. Concentrations of access points increase conflict opportunities in the developed portions of the corridor, reflected in an increased number of rear end and angle type crashes as driveway densities and traffic volumes increase.

In the four year analysis period from 2003 to 2006, there were 583 reported crashes in the Phase I portion of the route, including 11 fatalities and 165 injuries. For Phase II, there were 611 reported crashes during the same period, including 9 fatalities and 191 injury crashes. A total of 4 segment and 26 spots with a CRF above 1.00 were identified in Phase

I; 4 segments and 14 spots with a CRF above 1.00 were identified in Phase II.

Crash Rates by Vehicle Miles Travelled (VMT)
Crash rates by county along US 431, based on 2007 ADT for crashes occurring 2003-2006:

- Logan: 2.4 crashes / 1,000,000 VMT
- Muhlenberg (Ph I): 1.6 crashes / 1,000,000 VMT
- Muhlenberg (Ph II): 3.3 crashes / 1,000,000 VMT
- McLean: 1.4 crashes / 1,000,000 VMT
- Daviess: 0.8 crashes / 1,000,000 VMT

Compared to a statewide rate on all state roads of approximately 1.9 crashes / 1,000,000 VMT

The portion of US 431 in Muhlenberg County was identified in the KYTC 2006 "Five Percent Report," a federally-mandated list describing the top 5% of locations along state highways exhibiting the most severe highway safety needs. This 28-mile length of roadway

had 13 fatalities and 31 incapacitating injuries in the period 2003-2005.

In addition, the high percentage of heavy coal trucks utilizing the existing route further exasperates safety and operational conditions.

B. Improve Access and Connectivity

Improvements to the roadway should also improve access and connectivity between highways and communities located within and around the project corridor. US 431 is strategically located between the William H. Natcher Green River Parkway and the Edward T. Breathitt Pennyrile Parkway to provide regional north-south connectivity between Tennessee and Indiana, with access to several cities and numerous small communities between.

Level of Service (LOS), used to describe traffic flow along the route, degrades to E or F in many of the small developed areas along the two-lane portions of the route. Frequent stops and limited passing opportunities increase travel times between destinations. On this regionally significant route, individual bottlenecks create a negative perception of the route overall and deter long distance trips. Addressing existing geometric deficiencies will have a positive impact on access at both local and regional levels. It may also improve the economic development potential throughout this corridor.

VI. INITIAL PROJECT INPUT

Throughout the course of the study, opportunities were given to local officials and government agencies to provide input to the study process through a correspondence letter. Because no future phases have been scheduled for this project, it is difficult to anticipate what future projects may result; therefore, no formal meetings were held with elected officials or the public. Before any spot improvements were identified, the project team requested input from a variety of public agencies. This chapter describes the input received through the first project team meeting, resource agency coordination, and additional correspondences. Additional team meetings are discussed as part of the alternatives development and refinement processes in later chapters.

A. Project Team Meeting I

A project team meeting was conducted October 23, 2003, in Central City, Kentucky. Attendees included representatives from KYTC Districts 2, 3, and Central Office; FHWA; the Green River, Pennyrile, and Barren River ADDs; and the study consultant, Wilbur Smith Associates (WSA). Muhlenberg County Judge Executive Rodney Kirtley also joined the meeting. The project team convened to discuss the purpose, goals, and objectives of the proposed project and to review preliminary existing conditions data for the study corridor. The meeting minutes are included in **Appendix E**.

This programming study is intended to recommend safety improvements on US 431, divided between two phases. Two prior study reports were noted. Discussion focused on the following items.

- US 431 provides an economic link to Owensboro for communities to the south.
- The primary goal of the study is to improve safety, considering both short term and long term projects. Auxiliary goals include improving access and regional connectivity.
- Public input will be sought through resource agency coordination. Since no future phases of the study are approved, it is difficult to anticipate what future actions may result from the study's recommendations.

B. Resource Agency Coordination

Many local, state and federal resource agencies, with diverse areas of public responsibility, were included in this planning process. Input was solicited through written

requests from the Division of Planning in September 2004. Each agency was sent a copy of the study area map, maps showing traffic volumes and Level of Service (LOS) for 2003 and 2030, crash information maps, and environmental footprint maps by county. A copy of the letter submitted to the agencies, a list of addressees, and copies of the response letters from the various resource agencies are located in **Appendix F**. This section describes the input received from these organizations. The remainder of recipients did not provide a response.

The following 28 agencies and individuals responded by offering comments or concerns regarding the project.

- *Barren River ADD* – This study seems to identify the locations presenting safety concerns, but it would be helpful if additional crash information were given.
- *Delta Regional Authority* – The project would be beneficial to the DRA counties, but no additional comments are offered at this time.
- *Eldon Eaton, Mayor of Livermore* – The city supports widening US 431 to improve safety and increase business prospects. The segment of roadway at the foot of the Green River Bridge is cited as a dangerous intersection; widening could alleviate this problem spot.
- *Federal Aviation Administration* – As long as construction activities do not exceed 200 feet in height, no impacts to FAA are anticipated.
- *Greater Owensboro Chamber of Commerce* – Improving US 431 from Muhlenberg County north to Owensboro is vital for much of the retail community, especially the portion of US 431 which has seen tremendous growth in recent years. US 431 has developed a reputation for being narrow and dangerous. It is widely believed that consumers in McLean and Muhlenberg Counties avoid US 431 and travel south to Bowling Green instead of taking the shorter trip to Owensboro. Spot safety improvements are long overdue and a vital concern to the business community. The Chamber of Commerce would like to request (1) Phase II of this project be given top priority; (2) Phase II improvements would be incorporated into the Six Year Plan; and (3) the KYTC would initiate a plan to 4-lane the existing route.
- *Kentucky Cabinet for Economic Development* – Logan County has five industrial sites; two of these, Lewisburg and Adairville, may be impacted due to any road widening. Muhlenberg County has no direct impacts anticipated for existing industrial sites or

available buildings. The closest site is 5 to 6 miles west of the project corridor although some access improvement and regional connectivity may result. No buildings or industrial sites in McLean County are expected to be impacted. In Daviess County, direct impacts are anticipated as several buildings are either located on US 431 or are one block removed. This project would improve traffic ingress and egress for Owensboro, thus addressing the transportation needs of the community.

- *Kentucky Commerce Cabinet* – There are several areas of interest relating to cultural activities and a developing tourism industry which could be impacted by roadway improvements. Phase I has sensitive areas due to the large number of historical sites, wildlife management areas, and national wetlands. Environmental impacts upon these areas should be a particular concern. Improvements in Phase II may impact national wetlands and river ways. There are several historic structures in Livia and a cemetery in McLean County which may be impacted.
- *Kentucky Department of Agriculture* – No specific concerns are noted.
- *Kentucky Department of Aviation* – There are no impacts anticipated to airports or air traffic. If construction equipment exceeds 200 feet above ground level, a permit is required.
- *Kentucky Department of Fish and Wildlife Resources* – Based on current information, 15 federally-listed threatened or endangered species occur within 10 miles of the project area and 68 state-listed threatened or endangered species have been identified within two miles of the corridor. Habitats likely to contain these species should be surveyed. Impacted wetlands should be delineated. Key forestry, water resources, and erosion control measures are suggested to minimize lasting impacts.
- *Kentucky Department for Natural Resources* – One active rock quarry lies in the project area, south of Lewisburg in Logan County. Additionally, the project lies in an area of known oil and gas exploration activity which may require coordination with owners.
- *Kentucky Department of Parks* – The study will not directly impact any Department of Parks facilities; however, the route is in the vicinity of Lake Malone and Ben Hawes State Parks. Sediment control to prevent runoff to the lake is a concern.
- *Kentucky Division for Air Quality* – Precautions should be taken to prevent particulate matter from becoming airborne, including covering open bodied trucks and avoiding

depositing earth onto paved roadways. Open burning is prohibited for all but the express purposes detailed in the Open Burning Fact Sheet. The project must meet the conformity requirements of the Clean Air Act and the transportation planning provisions of Titles 23 and 49 of the US Code. The division suggests investigating local government requirements as well.

- *Kentucky Division of Conservation* – There are three agricultural districts in Logan County which may be impacted by the project. State agencies are required to mitigate any impact their programs may have on these districts. Additionally, prime farmlands and farmlands of statewide importance could be impacted by the project. Best management practices are also recommended to control erosion and sedimentation.
- *Kentucky Division of Forestry* – No specific problems with individual trees or forestland were identified along this route. Native tree planting is encouraged to replace trees cleared for highway construction or agricultural uses.
- *Kentucky Division of Mine Reclamation and Enforcement* – This project would not impact any active mining operations and there are no proposed new operations in the area. It is likely to encounter oil and gas wells; owners may need to be contacted if these are impacted.
- *Kentucky Education Cabinet* – This agency has no comments at this time.
- *Kentucky Geological Survey* – Phase I lies in the Mississippian Plateau and Western Kentucky Coal Field physiographic regions. Karst features, such as caves and sinkholes, unconsolidated sediments along streams, and pre- or post-landslide hazards are likely to be encountered. It is likely to encounter ownership issues for oil and gas wells, as well as coal and limestone deposits. The corridor crosses several natural gas pipelines, compressor stations, and other related service facilities within Phase I. Numerous faulted areas occur in the Coal Field region. Some limestones, excepting St Louis Limestones, may be usable for construction activities. Peak ground acceleration due to earthquake ground motion is 0.09 to 0.15g, with a low potential for slope liquefaction or failure.

Phase II lies in the Western Kentucky Coal Field physiographic region as well. Unconsolidated sediments are likely and may result in pre- or post-landslide hazards. Oil and gas wells, coal, and limestone in the area may lead to ownership issues. There are several natural gas pipelines crossing in the current corridor, and it is possible to

encounter compressor stations and other related service facilities. It is likely Phase II may cross over abandoned underground mines. Limestone beds may be useful as construction stone. Faulted areas may be encountered. Peak ground acceleration due to earthquake ground motion is 0.15g, with a low potential for slope liquefaction or failure in unconsolidated sediments.

- *Kentucky Justice and Public Safety Cabinet, Vehicle Enforcement* – Any widening should accommodate large trucks, especially since US 431 was added to the designated highway list to improve truck access to Russellville. No other problems with roadway widening are foreseen.
- *Kentucky State Nature Preserves Commission* – Rare plant species may occur along the roadside, especially in the Russellville area. Mitigations and native species restoration may be necessary if these are impacted.
- *Kentucky State Police, Henderson* – Specific improvements are suggested, including widening (Muhlenberg Co MP 0.00-1.50), shoulder upgrades (Muhlenberg Co MP 0.00-2.50, 5.00-11.60), turning lanes (Main St intersection at Island, KY 140 intersection at Utica), and straightening (Davies Co MP 2.50-5.00) the existing alignment.
- *Kentucky State Police, Madisonville* – Traffic and LOS are greater in the Phase II portions of the study area than Phase I, both for the current year and future. More injury and fatality crashes in Muhlenberg County occur along US 431 south of the parkway than north. Widening (entire route), truck/passing lanes (near KU plant at Central City), warning signage for high crash sites, and improved clear zones are recommended. Additionally, high crash zones in need of special consideration were identified at MP 5.000-6.000, MP 8.000-9.900, MP 11.000-12.100, MP 18.240-19.117, and MP 22.000-24.347 in Muhlenberg County.

[Note: Comments from the State Police Madisonville branch were reviewed during the second project team meeting. It was decided during this discussion that the suggested warning signage in high crash zones will not address safety issues along the alignment and may create a false sense of security in unmarked zones. This creates a liability issue therefore the signage recommendation will not be pursued further.]

- *KYTC Geotechnical Branch* – From Tennessee to Russellville, US 431 is underlain by various limestones and sandstone. Sinkholes are likely to be encountered and should be avoided if possible. Few or no streams should be encountered due to subsurface

drainage. From Russellville to Central City, the route is underlain by various limestones and sandstones and the Lisman, Carbondale, Tradewater, Caseyville, Waltersburg, Golconda, and Cypress Formations. Limestone from some formations may be suitable for construction applications. Limestones, sandstones, and shales encountered in this section may be susceptible to weathering. Numerous faults cross east-west through the area and should be crossed in fill sections when possible; cut slopes may need to be flatter than normal. Oil and gas wells should be avoided. Underground coal and strip mines exist; precautions should be taken to avoid cut slopes and surface runoff. From Central City to Owensboro, underlying bedrock is from Sturgis, Lisman, Carbondale, Tradewater, and Casey Formations with Alluvium, Outwash, Lacustrine, and Loss deposits. Deposits are highly susceptible to weathering. Flatter cut slopes and soil stabilization may be required. East-west faults are common and should be intersected perpendicular to strike in cut sections.

The Branch has no specific concerns at this time, but more detailed study should be made as corridors are determined. Mine subsidence may be a concern. Corridors may need to be refined to avoid mines and wells, but it is unlikely fault zones can be avoided.

- *KYTC Permits Branch* – This Branch recommends classifying the project as partially controlled access, with possible access points identified on plans and adjoining right-of-way deeds specifying such. Access control fencing is also recommended. The route should be designed to match the posted speed limit. If US 431 is to be included on the NHS, additional coordination with this office is required.
- *Rodney Kirtley, Muhlenberg County Judge Executive* – Most of the entire Phase I stretch of US 431 is thought to be extremely dangerous. Dead Man’s Curve near Belton, even though it has been widened recently, still desperately needs straightening. There are two very narrow bridges near the community of Penrod that are very dangerous. An extremely high number of large trucks travel US 431, serving the Paradise Steam Plant, Logan Aluminum, and the Owensboro Riverport. The trucks increase the danger on this stretch of US 431.

Within Phase II, the curve near the Kentucky Utilities plant is difficult to negotiate and has been the site of numerous fatalities over the past few years. There are few passing opportunities and a high number of trucks traveling this portion of the route. With future development of the Thoroughbred Energy Plant in Muhlenberg County, truck traffic is likely to increase.

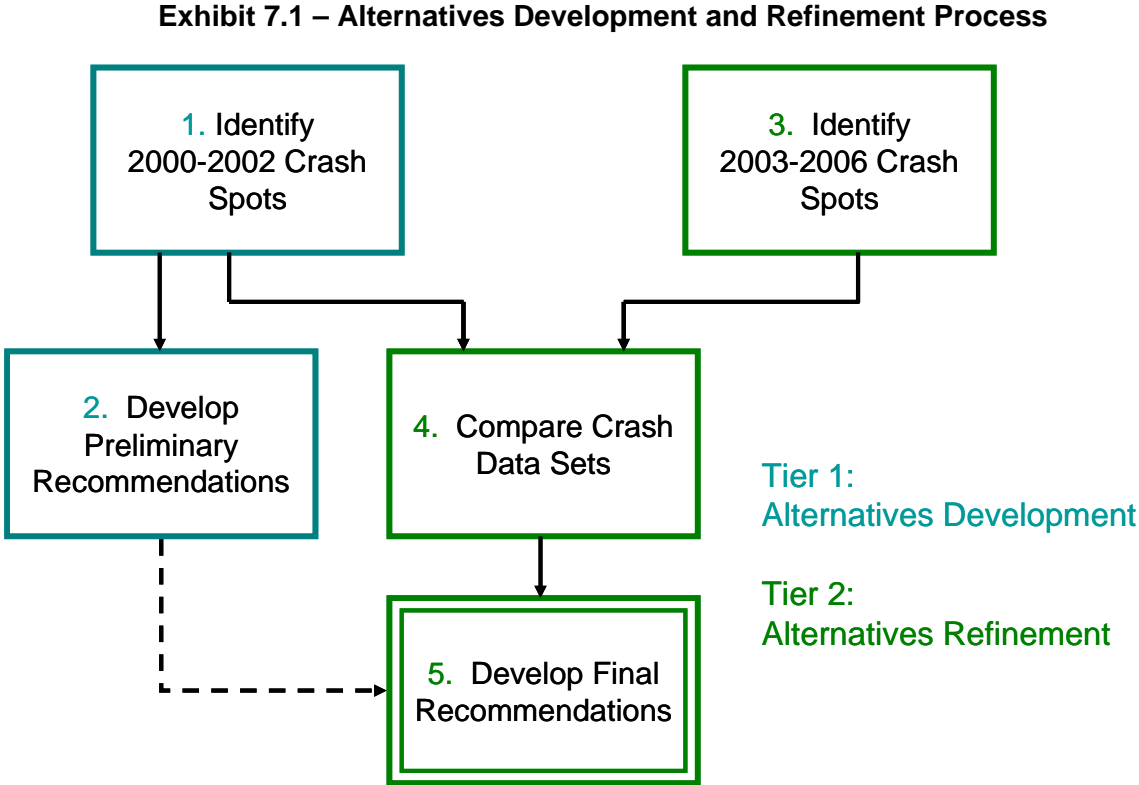
- *Owensboro MPO Transportation Advisory Committee* – Segments of US 431 in Daviess County have been identified in the long range plan and unscheduled projects list for widening to a four lane facility. With 30,000 vehicles per day, US 431 is a busy route serving the commercial portion of south Owensboro. The KYTC is encouraged to rate improvements to Phase II of this project ahead of Phase I.
- *US Coast Guard* – Livermore Highway Bridge, Mile 71.3, Green River is located in the area identified in Phase II of this project. Because this structure lies over a navigable waterway, extensive coordination with this office is required if bridge location or bridge plans are changed.
- *Brent Yonts, State Representative for 15th Legislative District in the Kentucky House of Representatives* – US 431 carries a lot of traffic and trade as a connection from Tennessee to Indiana. Despite short term repairs, four-laning this corridor (similar to US 68 from Bowling Green to Murray) would be a major improvement, stimulating economic development and improving safety. Utility, right-of-way, and relocation may be costly, but federal funding should be obtained to widen this route.

C. Additional Input

Following the aforementioned resource agency coordination effort, additional feedback was received from various elected officials. A newspaper article describing Congressman Yonts' support to widen US 431 to four lanes and letters of support from Mayor Boarman of Whitesville and Mayor Yassney of Russellville are included in **Appendix E** following the resource agency responses.

VII. ALTERNATIVES DEVELOPMENT

Safety improvement recommendations evolved over a two-tiered process. Initially, 2000-2002 crash data was analyzed and coupled with resource agency input to develop a preliminary set of prioritized recommendations. This “Alternatives Development” stage included the second and third project team meetings and is covered in this chapter. The second, or “Alternatives Refinement,” tier of the process is presented in **Chapter 8**. In the second stage, crash data for 2003-2006 was collected, then compared to the 2000-2002 data. A set of final recommendations were developed, based on the reported crashes in both data sets and incorporating elements from the preliminary recommendations. **Exhibit 7.1** illustrates the two-tier process.



A. Identification of Potential Spot Improvements

To identify candidate locations for spot improvement projects, analysts began by listing each 0.10-mile crash spot with a CRF greater than 0.90 based on 2000-2002 crash data. Each of these locations was given a name composed of the phase number, a hyphen, and a

sequential number (beginning with “1”) for the southernmost end of the project corridor. Additional improvement locations of varying lengths were included in the list of potential spot improvements based on resource agency recommendations.

Members of the project team completed a field visit in November 2003 to observe the existing conditions along the route and at each of the identified spots.

B. Project Team Meeting II

A second project team meeting was conducted February 17, 2005, in Central City, Kentucky. Attendees included representatives from KYTC Districts 2 and 3, KYTC Central Office, and the Green River, Pennyrile, and Barren River ADDs. The project team met to review the environmental justice information and resource agency responses, and to discuss the identified spot improvements sites. The meeting minutes are included in **Appendix E**.

Potential concerns from an Environmental Justice perspective include two low-income/elderly apartment complexes in Adairville; a low-income area in Lewisburg; minority neighborhoods in Drakesboro and Cleaton; concentrations of minority and elderly populations in Central City; and a Tract in Daviess County containing elevated numbers of minority, low-income, elderly, and disabled persons. Resource agency responses received to date were summarized. The team requested that the Education Cabinet and area school districts be contacted to determine if any new school projects are planned; one new school development (Muhlenberg South Elementary School in Beechmont) is already known.

The remainder of the meeting was spent discussing potential spot improvement locations. A complete copy of this discussion material is included with the meeting minutes in **Appendix E**.

Overall, Phase I included 19 spots, two of which were added to the initial list of potential spots based on project team discussions. Eight Phase I spots were not recommended for further consideration. There was one segment identified by the Kentucky State Police which was not recommended for improvement unless follow-up crash data identifies an obvious problem. Phase II included 24 spots, 5 of which were not recommended for additional consideration. Four additional segments were identified based on input by the Kentucky State Police.

C. Additional Spot Safety Research

Following the second project team meeting, spots which had not been eliminated were subjected to a more detailed crash investigation. In some cases, detailed police reports were examined and reported crashes during 2003-2004 were accessed from the CRASH database to provide further insight into crash patterns. Maintenance personnel from each District were also given an opportunity to review and comment on the identified high crash spots.

Remaining spots were ranked as a High, Medium, or Low priority based on crash characteristics.

D. Project Team Meeting III

A third project team meeting was conducted November 1, 2005, in Central City. Attendees included representatives from KYTC Districts 2 and 3, KYTC Central Office, and the Green River, Pennyriple, and Barren River ADDs. The project team met to review the detailed police reports for spots that required follow up. Projects were also re-prioritized following a numeric ranking scheme, with the highest CRF spot in each Phase becoming Priority 1. The meeting minutes are included in **Appendix E**.

A total of 15 recommended spot improvements in Phase I and 16 in Phase II resulted from team discussions, including a number of realignments around small developed areas along the route. A set of tables displaying the preliminary recommended build projects are also included in **Appendix E** following the third project team meeting minutes.

E. Preliminary Costs and Recommendations

KYTC District 2 personnel conducted an additional field inspection following the third project team meeting. As a result of this effort, project recommendations at each of the remaining spots were developed. Cost estimates were established and are discussed further in **Chapter 9**. A copy of the field notes for each spot can be found in **Appendix E**.

VIII. ALTERNATIVES REFINEMENT

After the development of the recommended spot improvements described in the previous chapter, a period of time elapsed in which the study lay dormant. In 2007, select components of the existing conditions overview were updated (including the crash analysis) to ensure that recommendations and priorities reflect the current conditions.

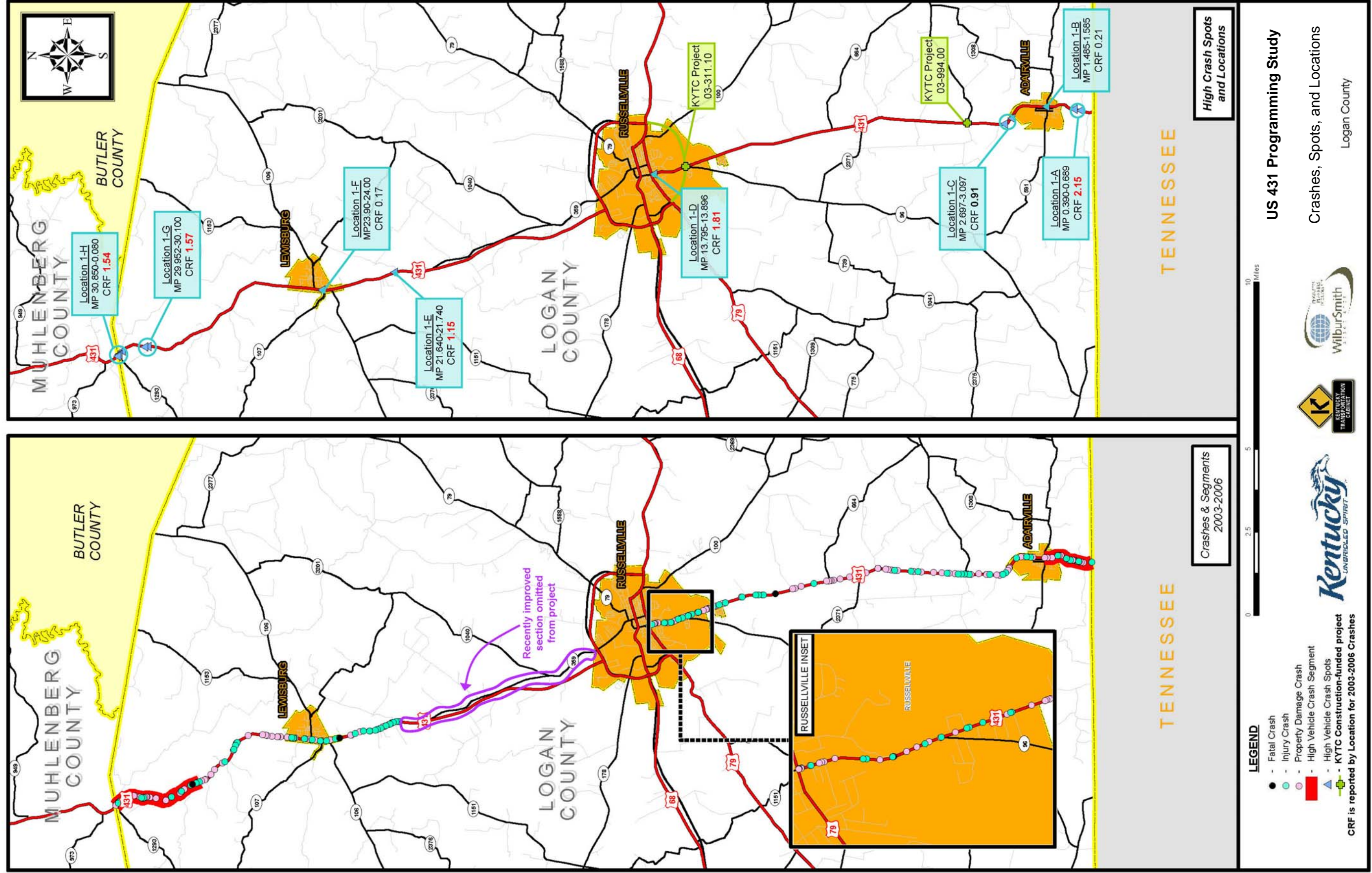
A. Identification of Spots and Locations

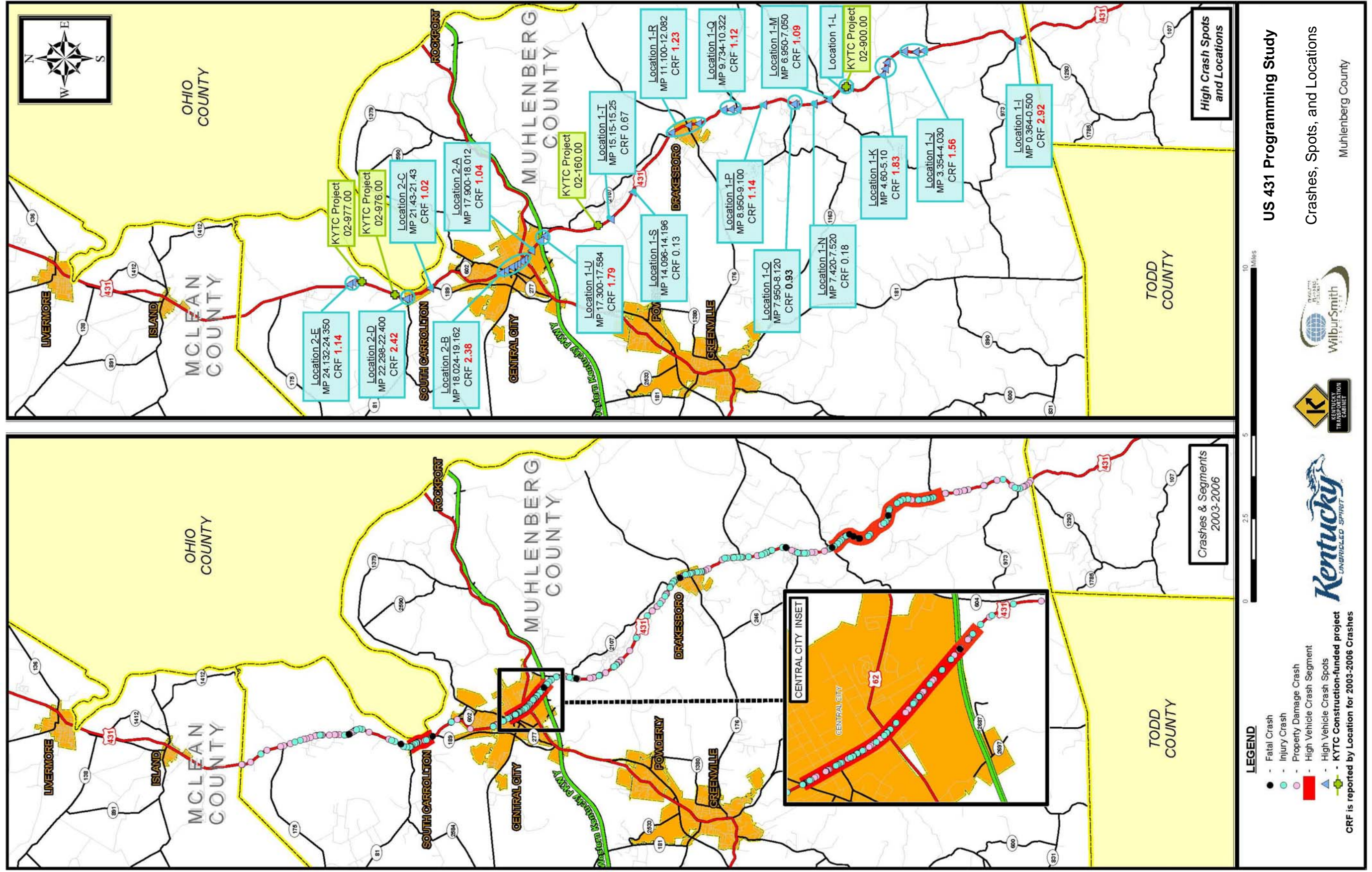
To build upon the preliminary recommended spot improvements identified, analysts began by conducting an independent crash analysis for vehicle crashes occurring along the route during 2003-2006. This analysis is discussed in **Chapter 2** of this report. Using the same KTC methodology originally employed to identify crash clusters, a list of spots with a CRF greater than 0.90 over the four year period was developed.

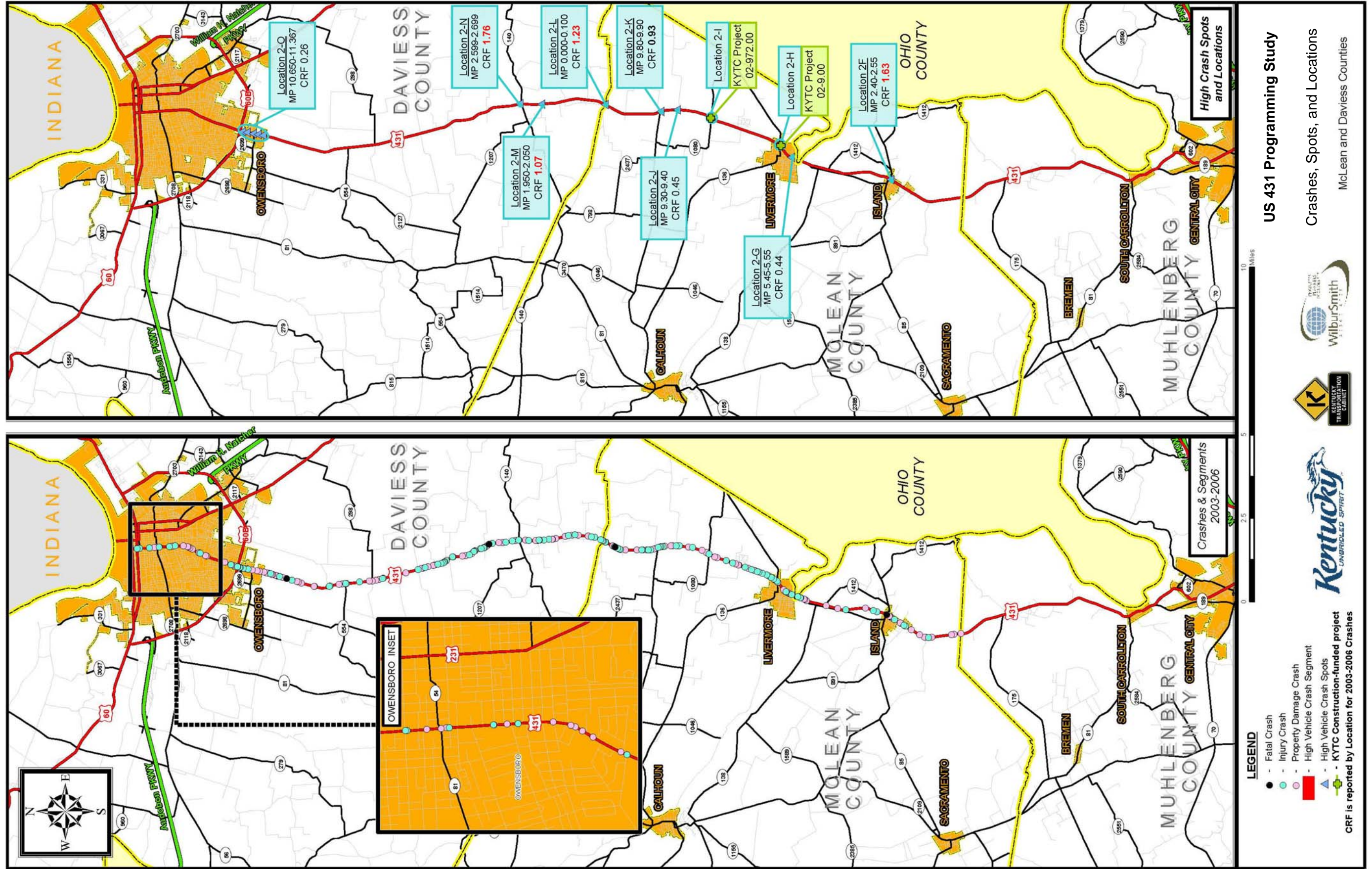
Considering only milepoint boundaries of each 0.10-mile spot, analysts compiled a list of all spots occurring in either the 2000-2002 or 2003-2006 data set. Spots which had overlapping milepoints were combined with the overlapping areas noted. Combining the data sets yielded 36 spots in Phase I and 29 spots in Phase II.

To create a more practical approach for project identification, analysts developed the concept of crash “Locations.” A Location is defined as one or more 0.10-mile spots occurring in a concentrated area. It is likely that related factors are causing increased crash rates over a short length of roadway; for example, a series of adjacent urban intersections with high CRF may all be attributable to poor access control applications along the corridor. Consolidating adjacent spots into Locations allowed analysts to look at a larger picture, rather than repeatedly addressing related 0.10-mile problems.

Each Location was named with a number representing the phase, a hyphen, and a sequential letter, with “A” being the southernmost location in each Phase. A total of 21 Locations were identified in Phase I and 15 Locations were identified in Phase II. Crash number, severity, and trend information was assembled for each location. Critical Rate Factors were calculated both for each spot (or spots) composing a Location, and for the Location itself, calculated as a segment if it encompassed more than 0.10 mile. **Exhibits 8.1 to 8.3** show the geospatial placement of all reported crashes in the 2003-2006 data set, coded by severity; any segments identified in the second crash analysis with a CRF greater than 1.00; all spots with a CRF greater than 0.90 in either data set; and the defined Locations.







B. Comparison with Prior Spot Data

Analysts then undertook a comparison of the 2000-2002 and 2003-2006 crash data characteristics at the spot level. Looking at identified high crash spots and CRF data, each Location fell into one of four categories:

- Milepoints which did not appear in either data set were quickly dismissed from consideration for improvements.
- Spots which appeared in the initial data set but were not repeated in later years were investigated to determine if any site conditions may have changed crash propensities.
- Locations appearing in the 2003-2006 crash data set but not the 2000-2002 were given similar consideration to determine if conditions had changed to increase the likelihood of crashes occurring.
- Last, sites with a high CRF in both data sets were assessed to identify effective remedies to repeating crash trends.

Group	High CRF?		Next Steps
	00-02	03-06	
1	N	N	Dismiss Spot
2	Y	N	Examine Existing Conditions
3	N	Y	
4	Y	Y	Seek Mitigation

A table presenting the side-by-side comparison of the 2000-2002 and 2003-2006 data sets is included in **Appendix G**.

A field visit of the project area was completed in July 2007. Potential mitigations were developed for each identified spot within the context of its surroundings.

C. Project Team Meeting IV

The second tier of suggested improvements, based on statistical crash analysis and field observation, was presented to the project team during the fourth and final project team meeting. This meeting was conducted on August 15, 2007, at the KYTC District 4 Office in Elizabethtown. Representatives from KYTC Districts 2, 3, and Central Office and WSA met to review the updated crash data and discuss the final team recommendations. A copy of the meeting minutes is included in **Appendix E**.

The outcome of this discussion was a set of recommendations for each of the identified Locations. Locations were recommended to be dropped from additional consideration or to be pursued for future actions.

Also resulting from this meeting, KYTC District 2 decided to pursue rerouting US 431 around Central City. US 431 will be signed along KY 189 and US 62 west of the city, removing a large portion of long distance trips (including large trucks) from key intersections with high CRF values. As a result, Location 2-B will no longer lie along US 431 and is therefore not considered a part of this study.

1. Locations not recommended for additional consideration

A total of 13 Locations were not recommended for specific safety improvements, typically due to a low CRF. Sites in this grouping include the following Locations.

- *Location 1-A* is just north of the Tennessee state line. A number of crashes coded in this area were inaccurately located and actually occurred on US 431X.
- *Location 1-B* contains the intersection with KY 591 in Adairville. For both the 2000-2002 and 2003-2006 crash data sets, the CRF is less than 1.00.
- *Location 1-C* lies just north of Adairville in a tangent section which terminates in a horizontal curve to the north. Entrances to untenanted commercial properties gain access to US 431 from the east; crash reports do not suggest causal trends although eleven crashes occur within this 0.4-mile long stretch during 2003-2006.
- *Location 1-E* is the intersection of US 431 with Lewisburg-Edwards Road, a few miles south of Lewisburg. A bypass of the city of Lewisburg is in the design phase and is expected to remove a significant portion of traffic at this location.
- *Location 1-F*, between the intersections with KY 106 and KY 107 in Lewisburg, exhibits a significant decline in the number of crashes occurring between the 2000-2002 and 2003-2006 data sets. Only one crash occurred during the second analysis period. Additionally, a bypass of Lewisburg is currently in the design phase and should remove a part of the traffic from this segment.
- *Location 1-N* lies between the US 431 intersections with KY 2270 and KY 246 in southern Muhlenberg County. The CRF decreased to 0.18 during 2003-2006, from a 1.13 CRF during 2000-2002. The reason for this improvement was not determined but recommended projects were identified on either side of this Location.

- *Location 1-S* is just south of Old Sawmill Road in Bevier in Muhlenberg County. The CRF is less than 1.00 for both crash data sets analyzed.
- *Location 2-C* contains the intersection with KY 189 north of Central City. A detailed investigation of police crash reports indicates only one incident actually occurred at this intersection during 2003-2006.
- *Location 2-E* falls within a recently improved section at Power Plant Drive. Construction to realign this segment, widen shoulders, and add guardrail began in 2006.
- *Location 2-H* includes the KY 136 intersection in Livermore. This project was addressed under KYTC Item 2-9.00 with 2005 construction funding. Only one crash has been reported at this Location since that time.
- *Location 2-I* is the KY 1080 intersection at Nuckols. In 2004, construction funding was allotted under Item 2-972.00 to complete improvements at this intersection.
- *Location 2-J* contains the Barrett Hill Road intersection in northeastern McLean County. Despite a number of driveways on US 431, no geometric deficiencies are apparent. The CRF for 2003-2006 is 0.45, a significant reduction from a 1.21 based on 2000-2002 data, although the reason for this improvement in CRF is not evident from statistical analysis or field observation.
- *Location 2-O* is along a recently improved commercial strip in southern Owensboro. In this Location, US 431 has been improved to a divided 4-lane arterial with turn lanes, coordinated signals, and frontage roads. The CRF dropped significantly below 1.00 following these improvements.

2. Locations recommended for future action

The remaining sites were recommended for some type of action as a result of this study. Recommendations include further study, conventional safety improvement projects, and a variety of other build projects. These are discussed in the following chapter.

IX. RECOMMENDATIONS

This chapter presents the recommended safety improvement projects developed by the project team over the course of the study.

A. Purpose and Need

As discussed in **Chapter V**, the defined purpose and need for the projects proposed in this Programming Study for Safety Improvements along US 431 is to improve safety, with an auxiliary goal to improve access and mobility.

B. Recommendations

The following sections discuss the recommendations.

1. Specific Recommendations and Priorities

A total of 20 specific spot improvements are recommended to address safety issues identified as a result of this study. Recommendations include widening segments, realigning curves, improving roadside features, and improving intersections. Individual project descriptions are shown on the detailed project cut sheets presented in **Appendix H**. Each sheet presents a narrative description of the site, the crash information for both 2000-2002 and 2003-2006 data sets, the priority level, the recommendation, and estimated costs. An explanatory guide to the tables presenting the crash data can be found in **Appendix G**. The following Locations are recommended for safety improvement projects:

Recommended Build Projects	
1-D: Intersection Improvements at US 79	1-R: Intersection Improvements at KY 176
1-G: Realign Segment at Hollow Bill	1-R: Intersection Improvements at KY 2107
1-H: Intersection Improvements at KY 1293	1-T: Intersection Improvements at Cleaton Rd
1-I: Intersection Improvements at KY 973	1-U: Extend 4-lane section at Parkway
1-J: Widen narrow Bridges at Penrod	2-A: Widen to 3 lanes at Central City
1-J: Realign Segment north of Penrod	2-D: Realign Segment at KY 81
1-K: Realign Segment at Union Ridge Road and Belcher Lane	2-K: Intersection Improvements at KY 250
1-M: Intersection Improvements at KY 2270	2-L: Intersection Improvements at Harmons Ferry Road
1-O: Intersection Improvements at KY 246	2-M: Cut embankment at Mill Street
1-Q: Intersection Improvements at KY 70	2-N: Intersection Improvements at KY 140

Each proposed project was ranked as High, Medium, or Low priority, as shown in the project descriptions in **Appendix H**. This decision was weighted by CRF, crash severity, and estimated cost to fix. **Exhibit 9.1** at the end of the chapter shows a map of the prioritized recommended projects.

Projects were ranked by CRF, severity, and cost as High, Medium, or Low Priorities.

In addition, a number of projects were identified and are recommended which do not fall into the established prioritization criteria. In these cases, no defined crash problems fell within the site boundaries. However, the projects do align with the stated project purpose and are considered worthwhile improvements to the corridor.

One of these Locations is a widening project within Livermore at Location 2-G that is a county and local priority. The community would like to incorporate access management principles and continue the existing three-lane section for about a half-mile south to the foot of the Green River Bridge. This project is in line with the secondary goal of this study to improve access and connectivity through the US 431 corridor although it is not merited solely on safety performance.



Area in Livermore to be widened

Likewise, a number of long term improvement projects are recommended to enhance the corridor, summarized in **Exhibit 9.2**. These projects fall beyond the scope of this programming study, but are recommended for more detailed planning efforts on an individual level.

Exhibit 9.2 – Long Term Improvements

Location	Description	Cost Estimate	
1-H/1-I	Dunmor Bypass: Construct 1.2-mile long new alignment east of Dunmor	D	\$850,000
		R	\$1,100,000
		U	\$600,000
		C	\$8,500,000
		T	\$11,050,000
1-O	Beechmont Bypass: Construct 1.6-mile long new alignment east of Beechmont	D	\$1,120,000
		R	\$1,650,000
		U	\$800,000
		C	\$11,200,000
		T	\$14,770,000
1-U	Parkway Interchange: Reconstruct toll-booth interchange to typical diamond configuration for interstate compliance	D	\$850,000
		R	\$250,000
		U	\$100,000
		C	\$8,500,000
		T	\$9,700,000
2-B	Central City Bypass: Construct 2.25-mile new alignment around southwest quadrant of Central City	D	\$850,000
		R	\$2,000,000
		U	\$1,000,000
		C	\$8,500,000
		T	\$12,350,000
2-D	South Carrollton Bypass: Construct 2.0-mile new alignment west of South Carrollton	D	\$1,400,000
		R	\$1,800,000
		U	\$800,000
		C	\$14,000,000
		T	\$18,000,000
2-N	Bypass near Utica: Construct 1.5-mile new alignment north of KY 140 incorporating drainage improvements	D	\$970,000
		R	\$1,700,000
		U	\$750,000
		C	\$9,700,000
		T	\$13,120,000
Total - Long Term Improvements			\$78,990,000

NOTE: Cost Estimates provided by KYTC Districts 2 and 3

2. General Recommendations

A number of trends appeared along the corridor length that impact overall safety along the study corridor. These factors include:

- *Interim Low Cost Improvements* – If more immediate lower-cost improvements are desired for any particular location or locations along the US 431 Corridor which have experienced a significant crash history, a Roadway Safety Audit for those locations can be an option. A Roadway Safety Audit utilizes an interdisciplinary team to identify possible low-cost improvements including more or modified signing, shoulder work, clearing right-of-way, rumble strips, etc. Such low-cost improvements could possibly be implemented in the

interim with dedicated federal funding prior to execution of the "recommended build" projects. These low-cost improvements should not be considered as replacements for those "recommended build" projects.

- *Access Control* – Limiting the frequency and size of private driveways accessing US 431 will reduce the number of conflict points and positively impact both safety and capacity;
- *Roadside Features* – Guardrails, vegetation, embankments, and other obstacles have the potential to impact operations in crash events; improvements to roadside features should be incorporated into any mainline projects; and
- *Heavy Truck Volumes* – Performance characteristics of large vehicles increase the need for key safety upgrades like turning lanes, adequate clearances, and large turning radii at intersections. This is especially relevant south of Russellville where US 431 is designated on the National Truck Network. South of Russellville, there are three structures, two of which are functionally obsolete, with widths of 25 feet each.

These factors should be taken into consideration during development phases for recommended projects.

3. Recommended for Continued Monitoring

Following the steps outlined in the previous chapters, analysts identified sites along the route which appeared as high crash areas. Statistical crash investigations and field observations suggested potential mitigations at most sites; however, three Locations did not satisfactorily reveal causal features which a project should address. These Locations are recommended for continued monitoring by transportation officials:

- *Location 1-L* consists of a curve immediately south of the recently



improved segment known as “Dead Man’s Curve” in southern Muhlenberg County. Seven crashes occurred in the period 2003-2005. It is too soon to determine whether the recent safety improvement project at Dead Man’s Curve (constructed in 2006) will improve safety on this adjoining segment.

- *Location 1-P* contains the intersection with Sylvania Street in Beechmont. This location has a CRF greater than 1.00 for both data sets but site geometrics do not indicate a likely cause. Crash trend analyses are also inconclusive. This location is just south of the recently constructed Muhlenberg South Elementary School.

Views north
(left) and
south (right)
at Sylvania Street



- *Location 2-F* lies at the KY 85 intersection in Island. This intersection has wide lanes with full shoulders, turn lanes, and warning signage. There is a steep vertical grade and reduced speed zone to the south. A number of injury crashes and a fatality occurred at this location during 2003-2006 for a 1.63 CRF. The Kentucky State Police continue to monitor this site.



KY 85 intersection north of Island

C. Project Costs

Cost estimates were developed for each recommended spot improvement by KYTC District personnel. Costs are divided by phase for design, right-of-way acquisition, utilities relocations, and construction. **Exhibit 9.3** presents these costs for each of the recommended spot improvements.

Exhibit 9.3 – Cost Estimates by Phase and Priority

Location	Project Description	Design Cost	ROW Cost	Utility Cost	Const Cost	Total Cost
Phase I						
High Priority						
1-I	Intersection Improvements at KY 973	\$20,000	\$0	\$0	\$50,000	\$70,000
1-J	Widen Bridges at Penrod	\$120,000	\$150,000	\$130,000	\$1,200,000	\$1,600,000
1-K	Realign segment near Union Ridge	\$560,000	\$1,000,000	\$900,000	\$5,600,000	\$8,060,000
1-Q	Intersection Improvements at KY 70	\$25,000	\$0	\$0	\$100,000	\$125,000
1-R	Intersection Improvements at KY 176	\$100,000	\$390,000	\$350,000	\$820,000	\$1,660,000
1-U	Widen Segment at Parkway Interchange	\$50,000	\$50,000	\$25,000	\$275,000	\$400,000
High Priority Totals		\$875,000	\$1,590,000	\$1,405,000	\$8,045,000	\$11,915,000
Medium Priority						
1-G	Realign Segment at Hollow Bill, north Logan County	\$400,000	\$600,000	\$360,000	\$4,040,000	\$5,400,000
1-M	Intersection Improvements at KY 2270	\$20,000	\$0	\$0	\$50,000	\$70,000
1-O	Intersection Improvements at KY 246	\$50,000	\$50,000	\$0	\$250,000	\$350,000
Medium Priority Totals		\$470,000	\$650,000	\$360,000	\$4,340,000	\$5,820,000
Low Priority						
1-D	Intersection Improvements at US 79	\$100,000	\$500,000	\$200,000	\$500,000	\$1,300,000
1-H	Intersection Improvements at KY 1293	\$225,000	\$570,000	\$160,000	\$2,270,000	\$3,225,000
1-J	Realign segment at Penrod	\$100,000	\$220,000	\$180,000	\$750,000	\$1,250,000
1-R	Intersection Improvements at KY 2107	\$100,000	\$180,000	\$100,000	\$350,000	\$730,000
1-T	Intersection Improvements at Cleaton Road	\$100,000	\$140,000	\$145,000	\$520,000	\$905,000
Low Priority Totals		\$625,000	\$1,610,000	\$785,000	\$4,390,000	\$7,410,000
Phase I Totals		\$1,970,000	\$3,850,000	\$2,550,000	\$16,775,000	\$25,145,000
Phase II						
High Priority						
2-D	Realign Segment at KY 81	\$75,000	\$200,000	\$125,000	\$300,000	\$700,000
High Priority Totals		\$75,000	\$200,000	\$125,000	\$300,000	\$700,000
Medium Priority						
2-A	Widen Segment at Parkway Interchange	\$115,000	\$200,000	\$460,000	\$950,000	\$1,725,000
2-L	Intersection Improvements at Harmons Ferry Road	\$100,000	\$150,000	\$200,000	\$500,000	\$950,000
2-M	Improve Roadside Geometry at Mill Street	\$20,000	\$0	\$0	\$75,000	\$95,000
2-N	Intersection Improvements at KY 140	\$100,000	\$200,000	\$200,000	\$750,000	\$1,250,000
Medium Priority Totals		\$335,000	\$550,000	\$660,000	\$2,275,000	\$4,020,000
Low Priority						
2-K	Intersection Improvements at KY 250	\$100,000	\$200,000	\$180,000	\$500,000	\$980,000
Low Priority Totals		\$100,000	\$200,000	\$180,000	\$500,000	\$980,000
Phase II Totals		\$510,000	\$950,000	\$1,165,000	\$3,075,000	\$5,700,000
Total for Phase I & Phase II		\$2,480,000	\$4,800,000	\$3,715,000	\$19,850,000	\$30,845,000

D. Design Criteria

Potential design criteria are included in this section for planning purposes only. These criteria are general recommendations based on information gathered as part of the planning phase and recent improvements completed within the area. Specific geometric parameters should be defined on a case by case basis during future design phases of the project, as more detailed information is available.

The recommended cross section for improvements to two-lane sections of the route consists of two 12-foot wide lanes with an 8-foot wide paved shoulder. In sections where a turn lane is recommended, a third 12-foot wide turn lane should be added to accommodate vehicles. **Exhibit 9.4** presents an artistic rendering of the recommended typical cross section. Because of variations along the route, this template may not be applicable in all circumstances but should serve as a guide.

Exhibit 9.4 – Typical Cross Section



E. Environmental Considerations

A number of issues related to environmental factors and sensitive land uses identified throughout this study should be considered as this project moves into future phases. These issues have been discussed in greater detail in previous chapters. Important issues include:

- *Farmlands* – Impacts to prime farmlands and farmlands of statewide significance are likely to accompany any improvements along this predominantly rural route. Three Agricultural Districts exist in Logan County, although impacts from the recommended spot improvements are unlikely.
- *Threatened and Endangered Species* – A variety of protected plant and animal species are likely to inhabit the study area. Habitats should be surveyed and construction impacts limited through restricted tree cutting and planned erosion

control measures. Impacted wetlands should be delineated and mitigated at a 2:1 or better ratio. Peabody Wildlife Management Area lies near US 431 north of Drakesboro, protecting a unique environmental area.

- *Historic Properties* – A number of historic districts, National Register properties, archaeological sites, and other historic places occur near the existing alignment.
- *Community Resources* – Consideration should be given to existing community resources throughout the study area. Churches, cemeteries, parks, and schools may be found near the existing route.
- *Environmental Justice* – Environmental Justice issues relating to low-income, elderly, disabled, and/or minority populations should be monitored during future phases due to concentrations of these populations in the study area.
- *Floodplains* – Portions of the project area fall into FEMA Zones A/AE (inundated by 100 year floods), X500 (inundated by 500 year floods), and X (beyond 100 year and 500 year floodplains). Crash records indicate a number of crash events were related to water pooling in the roadway. Improvements should provide adequate drainage facilities to address this issue.
- *Water Quality* – Consideration should be given to potential water quality issues in nearby rivers, streams, ponds, and wetlands. Erosion control measures should be implemented during construction activities.
- *Fault Lines* – A number of geologic faults stretch east-west through portions of the study area. Though most recommendations lie along the existing alignment, improvements off the existing alignment should plan for these features.

F. Construction Considerations

Construction-related issues were also identified throughout this study. Discussed in more detail in previous chapters, potential issues related to construction of any recommended spot improvements include:

- *Erosion and Sediment Control* – Measures should be utilized to control erosion and sedimentation during and after commencement of earth-disturbing activities.
- *Air Quality* – Precautions should be taken to prevent particulate matter from becoming airborne. Open burning is prohibited. Requirements outlined in the Clean

Air Act and Titles 23 and 49 of the US Code should be met, in addition to any local government regulations.

- *Geotechnical and Subsurface Issues* – UST sites, gas and oil wells, abandoned underground mines, and/or faulted areas may be encountered during construction activities and require additional coordination. Additionally, ownership issues may arise for any coal and limestone deposits; some excavated stone may be suitable for construction purposes.



US 431 Programming Study
 Roadway Spot and Segment Improvements

Logan, Muhlenberg, McLean, and Daviess Counties

LEGEND

Roadway Improvements Priorities:

- High (Red circle)
- Medium (Green circle)
- Low (Grey circle)

Project Type Codes:

- Red line: Realignment
- Green line: Intersection Improvements
- Blue line: Improve Roadside Geometry
- Black line: Widen

Exhibit 9.1

Appendix A

Study Area Photos

Appendix A – Study Area Photographs



View north towards bridges at Location 1-A



View southwest of US 431 intersection with KY 591 at Location 1-B in Adairville



View south at Location 1-C along US 431



US 79 approach to intersection with US 431, facing west to Location 1-D



Location 1-E: Intersection with Lewisburg-Edwards Road in Logan County, looking south



View north at Location 1-G towards a series of reverse curves north of Hollow Bill, seen from intersection with H. W. McPherson Road in Logan County



Intersection with local roads in Dunmor, looking north at Location 1-H



View south from KY 973 intersection at Location 1-I



Narrow bridge near Penrod in Muhlenberg County, facing north at Location 1-J



US 431 intersection with Hudson Lane in Muhlenberg County (Location 1-K)



KY 2270 Intersection looking north at Location 1-M



Intersection with KY 246 in Beechmont, looking north, at Location 1-O



US 431 at Location 1-P, just south of Muhlenberg South Elementary School



View of KY 70 intersection in Muhlenberg County (Location 1-Q)



US 431 intersection with KY 2107 (old US 431) north of Drakesboro, looking north (Location 1-R)



Looking north at US 431 from Cleaton Road, east approach (Location 1-T)



View north towards Western Kentucky Parkway, with transition from two-lane to four-lane section at Location 1-U



Approaching parkway from north near transition from 2-lane to 4-lane section at Location 2-A



Low railroad overpass in Central City within Location 2-B



US 431 in Central City, approaching intersection with KY 70 at Location 2-B



Intersection of US 431 with KY 277 in Central City within Location 2-B



View north at Location 2-C along US 431 to KY 189 intersection north of Central City



View northward of US 431 intersection with KY 81 and local roads in South Carrollton at Location 2-D



US 431 intersection with KY 85, facing north, seen from crest at Main Street intersection in Island (Location 2-F)



View south towards Green River Bridge and intersection with Third Street in Livermore (Location 2-G)



US 431 intersection with KY 136 looking north at Location 2-H



View north from Barrett Hill Road intersection with US 431 in McLean County at Location 2-J



View north along US 431 at Location 2-K at KY 250 intersection



View south at Location 2-L along McLean/Daviess County Line



View north along US 431 at Mill Street intersection (Location 2-M) in Daviess County



Location 2-N: KY 140 intersection with US 431, looking south, in Utica



Recently improved four-lane commercial strip in south Owensboro approaching US 60 Bypass at Location 2-O.

Appendix B

Existing Conditions Tables

Exhibit B.1 Route Log

COUNTY NAME	DIST	ADD	MP	DESCRIPTION	Intersection Type	Intersection Control
Muhlenberg	2	Pennyrile	17.484	WEST KY PKWY OVERPASS - B00008	Interchange, 4 Quad. Cloverleaf	-
Muhlenberg	2	Pennyrile	17.450	W KY PARKWAY EASTBOUND ONRAMP	T	Unsignalized
Muhlenberg	2	Pennyrile	17.360	W KY PARKWAY EASTBOUND OFFRAMP	Y	Unsignalized
Muhlenberg	2	Pennyrile	17.250	KY 604 (YOUNGSTOWN ROAD)	T	Unsignalized
Muhlenberg	2	Pennyrile	16.538	KY 2107 (CLEATON - DRAKESBORO ROAD)	T	Unsignalized
Muhlenberg	2	Pennyrile	16.409	HOLT ROAD	Y	Unsignalized
Muhlenberg	2	Pennyrile	15.674	RAILROAD CROSSING	-	-
Muhlenberg	2	Pennyrile	15.184	CLEATON ROAD	-	-
Muhlenberg	2	Pennyrile	13.307	P. & M. HAUL ROAD OVERPASS - B00009	-	-
Muhlenberg	2	Pennyrile	12.448	POND CREEK BRIDGE - B00018	-	-
Muhlenberg	2	Pennyrile	11.982	KY 2107	Y	Unsignalized
Muhlenberg	2	Pennyrile	11.467	KY 176 (IN DRAKESBORO)	4 leg	Signalized
Muhlenberg	2	Pennyrile	10.991	PLUM CREEK CULVERT - B00099	-	-
Muhlenberg	2	Pennyrile	9.834	KY 70 (AT BROWDER)	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	9.091	SYLVANIA STREET	T	Unsignalized
Muhlenberg	2	Pennyrile	8.020	KY 246 AT BEECHMONT	Y	Unsignalized
Muhlenberg	2	Pennyrile	7.020	HAZEL CREEK BRANCH CULVERT - B00013	-	-
Muhlenberg	2	Pennyrile	6.964	KY 2270	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	6.412	HAZEL CREEK BRANCH CULVERT - B00014	-	-
Muhlenberg	2	Pennyrile	5.922	HAZEL CREEK BRANCH CULVERT - B00015	-	-
Muhlenberg	2	Pennyrile	5.072	UNION RIDGE ROAD	T	Unsignalized
Muhlenberg	2	Pennyrile	3.634	BRANCH OF ROCKY CREEK BRIDGE - B00016	-	-
Muhlenberg	2	Pennyrile	3.454	ROCKY CREEK BRIDGE - B00017	-	-
Muhlenberg	2	Pennyrile	2.873	KY 949	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	1.615	MASON POYNER ROAD/SKIPWORTH LANE	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	0.487	KY 973	T	Unsignalized
Muhlenberg	2	Pennyrile	0.464	OAK STREET	T	Unsignalized
Muhlenberg	2	Pennyrile	0.000	LOGAN - MUHLENBERG COUNTY LINE	-	-
Logan	3	Barren River	31.050	LOGAN - MUHLENBERG COUNTY LINE (KY 1293)	T	Unsignalized
Logan	3	Barren River	29.906	H. W. MCPHERSON ROAD	Y	Unsignalized
Logan	3	Barren River	28.847	PITMANS CREEK CULVERT - B00074	-	-
Logan	3	Barren River	28.207	PEACH ORCHARD ROAD	T	Unsignalized
Logan	3	Barren River	28.057	RAWHIDE CREEK BRIDGE - B00005	-	-
Logan	3	Barren River	27.798	CEDAR DALE SWAMP CULVERT - B00004	-	-
Logan	3	Barren River	27.202	RED HILL ROAD	T	Unsignalized
Logan	3	Barren River	26.877	WOLF LICK SWAMP BRIDGE - B00003	-	-

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.1 Route Log

COUNTY NAME	DIST	ADD	MP	DESCRIPTION	Intersection Type	Intersection Control
Logan	3	Barren River	26.564	WOLF LICK CREEK BRIDGE - B00002	-	-
Logan	3	Barren River	24.531	OLD JERICO-LEWISBURG ROAD	T	Unsignalized
Logan	3	Barren River	24.172	KY 106 (IN LEWISBURG)	T	Unsignalized
Logan	3	Barren River	23.863	CHURCH STREET	T	Unsignalized
Logan	3	Barren River	23.859	KY 107	T	Unsignalized
Logan	3	Barren River	23.646	KY 106 (IN LEWISBURG)	T	Unsignalized
Logan	3	Barren River	22.071	CENTER ROAD	-	-
Logan	3	Barren River	21.636	LEWISBURG-EDWARDS ROAD	T	Unsignalized
Logan	3	Barren River	20.590 13.896	Improved Section: Omitted from Study	-	-
Logan	3	Barren River	13.896	US 79	T	Signalized
Logan	3	Barren River	13.811	GUION COURT	-	-
Logan	3	Barren River	13.797	PERRY STREET	T	Unsignalized
Logan	3	Barren River	13.710	RUSSELL STREET	T	Unsignalized
Logan	3	Barren River	13.168	ARMSTRONG STREET	Y	Unsignalized
Logan	3	Barren River	12.774	KY 96	Y	Unsignalized
Logan	3	Barren River	11.922	COUNTRY CLUB DRIVE	T	Unsignalized
Logan	3	Barren River	9.407	EVERETT - ELLIS ROAD	Y	Unsignalized
Logan	3	Barren River	8.252	KY 664 (HALLS STORE - SCHOCHOH ROAD)	T	Unsignalized
Logan	3	Barren River	7.375	KY 2731 (RED OAK CHURCH-OAKVILLE ROAD)	T	Unsignalized
Logan	3	Barren River	6.783	BEREA CHURCH ROAD	T	Unsignalized
Logan	3	Barren River	5.569	KIRBY ROAD	T	Unsignalized
Logan	3	Barren River	4.145	KY 663	T	Unsignalized
Logan	3	Barren River	4.025	N.FORK OF RED RIVER BRIDGE - B00020	-	-
Logan	3	Barren River	3.197	MASON TYLER ROAD	T	Unsignalized
Logan	3	Barren River	1.800	KY 2135 (SCHOOL AVENUE)	T	Unsignalized
Logan	3	Barren River	1.485	KY 591 IN ADAIRVILLE	4 leg	Unsignalized
Logan	3	Barren River	1.450	KY 3053	T	Unsignalized
Logan	3	Barren River	1.312	STRAWBERRY ALLEY	4 leg	Unsignalized
Logan	3	Barren River	0.987	SOUTH FORK RED RIVER BRIDGE - B00021	-	-
Logan	3	Barren River	0.000	TENNESSEE - KENTUCKY STATE LINE	-	-

Exhibit B.2 Route Log

COUNTY NAME	DIST	ADD	MP	DESCRIPTION	Intersection Type	Intersection Control
Daviess	2	Green River	14.670	US 60 WESTBOUND (2ND STREET)	4 leg	Signalized
Daviess	2	Green River	14.595	3RD STREET	4 leg	Signalized
Daviess	2	Green River	14.519	US 60 E.B. (4TH STREET)	4 leg	Signalized
Daviess	2	Green River	14.445	KY 2245 (5TH STREET)	4 leg	Signalized
Daviess	2	Green River	14.161	9TH STREET	4 leg	Signalized
Daviess	2	Green River	14.047	RAILROAD CROSSING	-	-
Daviess	2	Green River	13.900	KY 54 (13TH STREET)-KY 81 (PARRISH AVENUE)	4 leg	Signalized
Daviess	2	Green River	13.845	14TH STREET	4 leg	Unsignalized
Daviess	2	Green River	13.689	PHILLIPS COURT/GRIFFITH AVENUE	4 leg	Signalized
Daviess	2	Green River	13.536	18TH STREET	T	Signalized
Daviess	2	Green River	13.439	22ND STREET	T	Signalized
Daviess	2	Green River	13.402	23RD STREET	4 leg	Unsignalized
Daviess	2	Green River	13.125	24TH STREET (BOOTH AVENUE)	4 leg	Signalized
Daviess	2	Green River	13.072	WASHINGTON AVENUE	T	Signalized
Daviess	2	Green River	13.030	WEST 25TH STREET	T	Signalized
Daviess	2	Green River	12.968	PARK PLAZA STREET	T	Unsignalized
Daviess	2	Green River	12.828	WESELEYN PLAZA ENTRANCE	T	Signalized
Daviess	2	Green River	12.565	SCHERM ROAD	T	Signalized
Daviess	2	Green River	12.357	BYERS AVENUE	T	Signalized
Daviess	2	Green River	12.298	COLLEGE DRIVE	T	Unsignalized
Daviess	2	Green River	12.283	SHOPPING CENTER ENTRANCE	T	Signalized
Daviess	2	Green River	12.245	HERMITAGE DRIVE	T	Unsignalized
Daviess	2	Green River	12.166	WEST WARWICK DRIVE/STANDISH PLACE NORTH	4 leg	Unsignalized
Daviess	2	Green River	12.090	STANDISH PLACE SOUTH	T	Unsignalized
Daviess	2	Green River	12.045	LAFAYETTE DRIVE	T	Unsignalized
Daviess	2	Green River	12.011	HALIFAX DRIVE	T	Unsignalized
Daviess	2	Green River	11.923	TAMARACK ROAD	4 leg	Signalized
Daviess	2	Green River	11.785	FAIRFAX DRIVE	T	Unsignalized
Daviess	2	Green River	11.773	FACTORY ROAD	T	Unsignalized
Daviess	2	Green River	11.581	TIME DRIVE/SHOPPING CENTER ENTRANCE	4 leg	Signalized
Daviess	2	Green River	11.515	US 60 BYPASS WESTBOUND OFFRAMP	Y	Unsignalized
Daviess	2	Green River	11.507	US 60 BYPASS WESTBOUND ONRAMP	Y	Unsignalized
Daviess	2	Green River	11.471	US 60 BP WB OFFRAMP/US 60 BP WB ONRAMP	4 leg	Signalized
Daviess	2	Green River	11.367	US 60 BY-PASS	Interchange, Diamond	-
Daviess	2	Green River	11.322	US 60 BP EB ONRAMP/US 60 BP EB OFFRAMP	4 leg	Signalized
Daviess	2	Green River	11.284	US 60 BYPASS EASTBOUND ONRAMP	Y	Unsignalized
Daviess	2	Green River	11.216	SALEM DRIVE/KY 2699 (GOETZ ROAD)	4 leg	Signalized
Daviess	2	Green River	11.155	CARLTON DRIVE	T	Unsignalized

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.2 Route Log

COUNTY NAME	DIST	ADD	MP	DESCRIPTION	Intersection Type	Intersection Control
Daviess	2	Green River	11.066	FULTON DRIVE/SHOPPING CENTER ENTRANCE	4 leg	Signalized
Daviess	2	Green River	10.952	SOUTHTOWN BLVD/KY 2121 (SOUTHTOWN BLVD)	4 leg	Signalized
Daviess	2	Green River	10.719	MALL ENTRANCE	4 leg	Signalized
Daviess	2	Green River	10.185	BRIDGE OVER DRAINAGE DITCH - B00040	-	-
Daviess	2	Green River	10.146	BRIDGE OVER DRAINAGE DITCH - B00041	-	-
Daviess	2	Green River	10.131	BRIDGE OVER DRAINAGE DITCH - B00042	-	-
Daviess	2	Green River	10.115	BRIDGE OVER DRAINAGE DITCH - B00043	-	-
Daviess	2	Green River	10.049	BRIDGE OVER DRAINAGE DITCH - B00044	-	-
Daviess	2	Green River	9.858	BRIDGE OVER DRAINAGE DITCH - B00045	-	-
Daviess	2	Green River	9.829	BRIDGE OVER DRAINAGE DITCH - B00046	-	-
Daviess	2	Green River	9.333	PANTHER CREEK BRANCH CULVERT - B00047	-	-
Daviess	2	Green River	9.034	PANTHER CREEK BRANCH BRIDGE - B00048	-	-
Daviess	2	Green River	8.543	PANTHER CREEK BRIDGE - B00049	-	-
Daviess	2	Green River	8.037	PANTHER CREEK BRANCH CULVERT - B00050	-	-
Daviess	2	Green River	8.027	KY 554	T	Unsignalized
Daviess	2	Green River	7.215	KY 298 (SHARP ROAD)	4 leg	Unsignalized
Daviess	2	Green River	6.385	BURNS ROAD NO. 2	T	Unsignalized
Daviess	2	Green River	5.798	MARKSBURY ROAD	4 leg	Unsignalized
Daviess	2	Green River	4.968	BROWNS VALLEY - RED HILL ROAD	Y	Unsignalized
Daviess	2	Green River	3.680	MCFARLAND ROAD	4 leg	Unsignalized
Daviess	2	Green River	2.599	KY 140	4 leg	Unsignalized
Daviess	2	Green River	1.985	MILL STREET	T	Unsignalized
Daviess	2	Green River	1.287	LOCUST GROVE ROAD	4 leg	Unsignalized
Daviess	2	Green River	0.581	MOHON ROAD	T	Unsignalized
Daviess	2	Green River	0.000	MCLEAN - DAVIESS COUNTY LINE	-	-
McLean	2	Green River	11.573	MCLEAN - DAVIS COUNTY LINE	-	-
McLean	2	Green River	9.852	KY 250	Y	Unsignalized
McLean	2	Green River	9.625	BUCK CREEK BRANCH CULVERT - B00013	-	-
McLean	2	Green River	9.262	BARRETT HILL ROAD	T	Unsignalized
McLean	2	Green River	9.128	BUCK CREEK BRIDGE - B00015	-	-
McLean	2	Green River	8.265	KY 1080	4 leg	Unsignalized
McLean	2	Green River	7.313	ATHERTON ROAD	T	Unsignalized
McLean	2	Green River	7.116	BUCK CREEK BRANCH CULVERT - B00014	-	-
McLean	2	Green River	6.038	KY 136	4 leg	Unsignalized
McLean	2	Green River	5.100	GREEN RIVER & ROUGH RIVER BRIDGE	-	-
McLean	2	Green River	4.954	KY 138	T	Unsignalized
McLean	2	Green River	4.632	BRIDGE OVER UNNAMED STREAM - B00021	-	-
McLean	2	Green River	4.354	KY 1412 (DOUGH HILL ROAD)	T	Unsignalized

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.2 Route Log

COUNTY NAME	DIST	ADD	MP	DESCRIPTION	Intersection Type	Intersection Control
McLean	2	Green River	3.493	CULV OVER SWAMP OPPOSITE L&N RR	-	-
McLean	2	Green River	2.485	KY 85	4 leg	Unsignalized
McLean	2	Green River	1.881	CRABTREE ROAD	T	Unsignalized
McLean	2	Green River	1.677	W. CALVERT ROAD	4 leg	Unsignalized
McLean	2	Green River	1.045	DOCTOR BROWN LANE	T	Unsignalized
McLean	2	Green River	0.797	DRAIN TO CYPRESS CREEK BRIDGE - B00019	-	-
McLean	2	Green River	0.646	RAILROAD CROSSING	-	-
McLean	2	Green River	0.000	MUHLENBERG - MCLEAN COUNTY LINE	-	-
Muhlenberg	2	Pennyryle	27.779	MUHLENBERG - MCLEAN COUNTY LINE	-	-
Muhlenberg	2	Pennyryle	27.713	OVERFLOW BRIDGE - B00056	-	-
Muhlenberg	2	Pennyryle	27.608	COUNTY LINE RD	T	Unsignalized
Muhlenberg	2	Pennyryle	27.370	SPRING HILL LN	T	Unsignalized
Muhlenberg	2	Pennyryle	26.678	NEW HOPE LN	T	Unsignalized
Muhlenberg	2	Pennyryle	26.411	KY 175	T	Unsignalized
Muhlenberg	2	Pennyryle	26.248	THOROFARE RD	T	Unsignalized
Muhlenberg	2	Pennyryle	25.744	CYPRESS CREEK BRANCH CULVERT - B00057	-	-
Muhlenberg	2	Pennyryle	25.600	MOORMAN CEMETERY RD	T	Unsignalized
Muhlenberg	2	Pennyryle	25.575	FLOYD AVE	T	Unsignalized
Muhlenberg	2	Pennyryle	25.574	RAILROAD CROSSING	-	-
Muhlenberg	2	Pennyryle	25.552	BALLPARK ST	T	Unsignalized
Muhlenberg	2	Pennyryle	25.321	GEARY LN	T	Unsignalized
Muhlenberg	2	Pennyryle	25.275	HIGHLAND AVE	T	Unsignalized
Muhlenberg	2	Pennyryle	24.833	LADSHAW RD	T	Unsignalized
Muhlenberg	2	Pennyryle	24.232	POWER PLANT DR	T	Unsignalized
Muhlenberg	2	Pennyryle	23.190	RAILROAD LN	T	Unsignalized
Muhlenberg	2	Pennyryle	22.398	KY 81	T	Unsignalized
Muhlenberg	2	Pennyryle	22.366	EAST CHURCH ST	T	Unsignalized
Muhlenberg	2	Pennyryle	22.305	SINKING ST	4 leg	Unsignalized
Muhlenberg	2	Pennyryle	22.240	CLARK ST	T	Unsignalized
Muhlenberg	2	Pennyryle	22.173	SPRING ST	T	Unsignalized
Muhlenberg	2	Pennyryle	22.143	CROSS ST	4 leg	Unsignalized
Muhlenberg	2	Pennyryle	22.119	MAIN ST	T	Unsignalized
Muhlenberg	2	Pennyryle	22.021	CARROLL ST	T	Unsignalized
Muhlenberg	2	Pennyryle	22.006	MAIN ST/WALNUT ST	4 leg	Unsignalized
Muhlenberg	2	Pennyryle	21.937	LIMESTONE ST	T	Unsignalized
Muhlenberg	2	Pennyryle	21.888	DAVIS CIR	T	Unsignalized
Muhlenberg	2	Pennyryle	21.850	DAVIS CIR	T	Unsignalized
Muhlenberg	2	Pennyryle	21.663	PREMIUM DR	T	Unsignalized

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.2 Route Log

COUNTY NAME	DIST	ADD	MP	DESCRIPTION	Intersection Type	Intersection Control
Muhlenberg	2	Pennyrile	21.590	STILLHOUSE BEND LN	T	Unsignalized
Muhlenberg	2	Pennyrile	21.481	KY 189	T	Unsignalized
Muhlenberg	2	Pennyrile	21.293	FERGUSON LN	T	Unsignalized
Muhlenberg	2	Pennyrile	21.155	RIVERVIEW DR	T	Unsignalized
Muhlenberg	2	Pennyrile	21.083	ALLEN LN	T	Unsignalized
Muhlenberg	2	Pennyrile	21.066	GREENFIELD LN	T	Unsignalized
Muhlenberg	2	Pennyrile	20.860	RAILROAD UNDERPASS	-	-
Muhlenberg	2	Pennyrile	20.661	KY 602	T	Unsignalized
Muhlenberg	2	Pennyrile	20.626	BALLPARK LN	T	Unsignalized
Muhlenberg	2	Pennyrile	20.134	DUNCAN LN	T	Unsignalized
Muhlenberg	2	Pennyrile	20.118	TEMPLE ST	T	Unsignalized
Muhlenberg	2	Pennyrile	20.064	NEAL ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.991	FEDERAL ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.843	PERKINS ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.695	NORTH 5TH ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.608	NORTH 4TH ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.537	SHOWN LN	T	Unsignalized
Muhlenberg	2	Pennyrile	19.519	LOIS LN	T	Unsignalized
Muhlenberg	2	Pennyrile	19.462	PARK ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.354	EAST WHITMER ST	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	19.258	DIVINE ST	T	Unsignalized
Muhlenberg	2	Pennyrile	19.182	NEWMAN ST	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	19.103	PENDLETON ST	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	19.028	SHORT ST	T	Unsignalized
Muhlenberg	2	Pennyrile	18.962	KY 277	4 leg	Signalized
Muhlenberg	2	Pennyrile	18.822	REYNOLDS ST	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	18.754	MOREHEAD ST	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	18.679	EAST BROAD ST/KY 70	4 leg	Signalized
Muhlenberg	2	Pennyrile	18.525	RAILROAD CROSSING	-	-
Muhlenberg	2	Pennyrile	18.392	HARRISON AVE	T	Unsignalized
Muhlenberg	2	Pennyrile	18.330	WEST STROUDE LN	4 leg	Unsignalized
Muhlenberg	2	Pennyrile	18.278	US 62	4 leg	Signalized
Muhlenberg	2	Pennyrile	17.705	WELBORN ST	T	Unsignalized
Muhlenberg	2	Pennyrile	17.605	WESTERN KENTUCKY PARKWAY WESTBOUND	-	-
Muhlenberg	2	Pennyrile	17.521	WEST KY PKWY OVERPASS - B00008	Interchange	-
Muhlenberg	2	Pennyrile	17.450	WESTERN KENTUCKY PARKWAY EASTBOUND	-	-
Muhlenberg	2	Pennyrile	17.360	WESTERN KENTUCKY PARKWAY EASTBOUND	-	-
Muhlenberg	2	Pennyrile	17.250	KY 604	T	Unsignalized

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.3 Major Systems

County	Begin MP	End MP	Functional Classification	National Truck Network (NN)	State System	National Highway System (NHS)	Truck Weight Class
Logan	0.000	11.922	Rural Minor Arterial	State Designated	State Primary	No	AAA
Logan	11.922	13.896	Urban Principal Arterial	State Designated	State Primary	No	AAA
Logan	20.590	31.050	Rural Principal Arterial	No	State Primary	No	AAA
Muhlenberg	0.000	17.484	Rural Principal Arterial	No	State Primary	No	AAA
Muhlenberg	17.484	21.481	Urban Principal Arterial	No	State Primary	No	AAA
Muhlenberg	21.481	27.779	Rural Principal Arterial	No	State Primary	No	AAA
McLean	0.000	11.573	Rural Principal Arterial	No	State Primary	No	AAA
Daviess	0.000	10.371	Rural Principal Arterial	No	State Primary	No	AAA
Daviess	10.371	11.367	Urban Principal Arterial	No	State Primary	No	AAA
Daviess	11.367	14.450	Urban Principal Arterial	Federal Designated	State Primary	No	AAA
Daviess	14.450	14.670	Urban Principal Arterial	Federal Designated	State Primary	No	AAA

Note: Logan MP 13.896-20.590 removed from study area due to recent improvements

Exhibit B.4 Other Systems

County	Appalachian Development Highway System	Bike Route System	Forest Highway System	Scenic Byway System
Daviess	No	Ramblin' River Tour [1], KY's Trans America Trail [2]	No	No
McLean	No	No	No	No
Muhlenberg	No	Midland Kentucky Tour [3]	No	Blues To BG-Everyly Bros. Rock & Roll Tr. [5]
Logan	No	Southern Lakes Tour [4]	No	No

US 431 intersects with four designated bike routes:

[1] Ramblin' River Tour follows US 60, intersects US 431 at Owensboro

[2] Kentucky's Trans America Trail follows KY 140, intersects US 431 at Utica

[3] Midland Kentucky Tour follows KY 973, intersects US 431 at Dunmor, and follows US 431 from MP 0.487 to 0.808

[4] Southern Lakes Tour follows KY 591, intersects US 431 at Adairville

Roadway cross sections at these intersections should not obstruct or deter bicycle transportation.

[5] The Blues to Bluegrass-Everyly Brothers Rock & Roll Trail follows US 431 in Muhlenberg County from MP 11.467 at KY 176 in Drakesboro to MP 22.398 at KY 81 in South Carrollton.

Exhibit B.5 Geometric Characteristics

County	Beg. MP	End MP	Segment Length (mi.)	No. of Lanes	Divided/ Undivided	Lane Width (ft.)	Shoulder Width (ft.)	Terrain	Pavement Type		
Muhlenberg	17.290	17.484	0.194	4	D	12	10	Rolling	High Flexible		
Muhlenberg	17.252	17.290	0.038	3	D	12	10	Rolling	High Flexible		
Muhlenberg	16.538	17.252	0.714	2	U	12	2	Rolling	High Flexible		
Muhlenberg	11.982	16.538	4.556	2	U	12	1	Rolling	High Flexible		
Muhlenberg	6.850	11.982	5.132	2	U	10	1	Rolling	High Flexible		
Muhlenberg	0.000	6.850	6.850	2	U	10	2	Rolling	High Flexible		
Logan	25.032	31.050	6.018	2	U	9	4	Rolling	High Flexible		
Logan	21.932	25.032	3.100	2	U	11	4	Rolling	High Flexible		
Logan	21.636	21.932	0.296	2	U	12	4	Rolling	High Flexible		
Logan	20.900	21.636	0.736	2	U	12	4	Flat	High Flexible		
Logan	20.800	20.900	0.100	2	D	12	10	Rolling	High Flexible		
Logan	20.590	20.800	0.210	3	D	12	10	Rolling	High Flexible		
Logan	13.896	20.590	6.694	OMITTED FROM STUDY AREA							
Logan	13.237	13.896	0.659	2	U	10	2	Rolling	High Flexible		
Logan	12.331	13.237	0.906	2	U	11	2	Rolling	High Flexible		
Logan	11.776	12.331	0.555	2	U	11	2	Flat	High Flexible		
Logan	2.300	11.776	9.476	2	U	11	2	Flat	High Flexible		
Logan	1.970	2.300	0.330	2	U	11	2	Rolling	High Flexible		
Logan	1.809	1.970	0.161	2	U	11	curbed	Rolling	High Flexible		
Logan	1.325	1.809	0.484	2	U	12	curbed	Rolling	High Flexible		
Logan	1.150	1.325	0.175	2	U	11	curbed	Rolling	High Flexible		
Logan	0.992	1.150	0.158	2	U	11	2	Flat	High Flexible		
Logan	0.980	0.992	0.012	2	U	12	2	Flat	High Flexible		
Logan	0.400	0.980	0.580	2	U	12	10	Flat	High Flexible		
Logan	0.013	0.400	0.387	2	U	12	10	Flat	High Flexible		
Logan	0.000	0.013	0.013	2	U	12	10	Flat	High Flexible		

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.6 Geometric Characteristics

County	Beg. MP	End MP	Segment Length (mi.)	No. of Lanes	Divided/ Undivided	Lane Width (ft.)	Shoulder Width (ft.)	Terrain	Pavement Type
Daviess	11.923	14.670	2.747	4	U	12	curbed	Flat	High Flexible
Daviess	11.471	11.923	0.452	4	D	12	curbed	Flat	High Flexible
Daviess	10.719	11.471	0.752	4	U	12	curbed	Flat	High Flexible
Daviess	10.621	10.719	0.098	4	D	12	10	Flat	High Flexible
Daviess	10.507	10.621	0.114	4	U	12	10	Flat	High Flexible
Daviess	10.367	10.507	0.140	3	U	12	10	Flat	High Rigid (Reinforce Jointed)
Daviess	9.120	10.367	1.247	2	U	12	10	Flat	High Rigid (Reinforce Jointed)
Daviess	7.215	9.120	1.905	2	U	12	10	Flat	High Flexible
Daviess	4.968	7.215	2.247	2	U	12	2	Rolling	High Flexible
Daviess	0.000	4.968	4.968	2	U	12	2	Rolling	High Flexible
McLean	8.250	11.573	3.323	2	U	12	3	Rolling	High Flexible
McLean	3.045	8.250	5.205	2	U	12	2	Rolling	High Flexible
McLean	2.585	3.045	0.460	2	U	12	10	Rolling	High Flexible
McLean	1.045	2.585	1.540	2	U	12	2	Rolling	High Flexible
McLean	0.000	1.045	1.045	2	U	12	2	Flat	High Flexible
Muhlenberg	21.630	27.779	6.149	2	U	11	2	Rolling	High Flexible
Muhlenberg	21.481	21.630	0.149	2	D	11	10	Rolling	High Flexible
Muhlenberg	21.320	21.481	0.161	2	U	11	10	Rolling	High Flexible
Muhlenberg	21.293	21.320	0.027	2	U	11	7	Rolling	High Flexible
Muhlenberg	19.389	21.293	1.904	2	U	11	2	Rolling	High Flexible
Muhlenberg	18.879	19.389	0.51	2	U	12	curbed	Rolling	High Flexible
Muhlenberg	18.825	18.879	0.054	2	U	10	curbed	Rolling	High Flexible
Muhlenberg	18.679	18.825	0.146	2	U	12	curbed	Rolling	High Flexible
Muhlenberg	18.278	18.679	0.401	2	U	12	curbed	Flat	High Flexible
Muhlenberg	17.955	18.278	0.323	2	U	12	2	Rolling	High Flexible
Muhlenberg	17.81	17.955	0.145	2	U	12	10	Rolling	High Flexible
Muhlenberg	17.484	17.81	0.326	2	D	12	10	Rolling	High Flexible

Shaded Rows: Urban

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.7 Bridges

County Name:	Bridge No:	Milepoint:	Bridge Description:	Features Intersected:	Structure Length:	Bridge Width:	Posting Rate:	Structural Function:	Superstructure:	Substructure:	Sufficiency Rating ¹ :
Muhlenberg	B00009	13.307	1-92.25 FT PRESTRESSED RCDG	MINE HAUL ROAD	98	44	No Post		Very Good (No Defects)	Very Good (No Defects)	86.4
Muhlenberg	B00135	12.448	3 SPAN CONC	POND CREEK	290	24	No Post		Very Good (No Defects)	Good (Minor Defects)	91.8
Muhlenberg	B00099	10.991	TRI 10X6X30 RC CULV-30 DEG SK	PLUM CRK	39	N/A	No Post		N/A	N/A	85.7
Muhlenberg	B00013	7.020	DBL 10X6X30 RC CULV-30 DEG SK	BRANCH OF HAZEL CREEK	26	N/A	No Post		N/A	N/A	58.2
Muhlenberg	B00014	6.412	TRI 8X5X26 RC CULVERT	BRANCH OF HAZEL CREEK	27	N/A	No Post		N/A	N/A	62.3
Muhlenberg	B00015	5.922	DBL 10X3X30 RC CULV-30 DEG SK	BR HAZEL CRK	26	N/A	No Post		N/A	N/A	62.3
Muhlenberg	B00016	3.634	1-45 FT R.C.D.G. SPAN	BRANCH OF ROCKY CREEK	48	21.5	No Post	Functionally Obsolete	Satisfactory (Minor Deterioration)	Good (Minor Defects)	60.6
Muhlenberg	B00017	3.454	7-30 FT R.C.D.G. SPANS	ROCKY CREEK	227	21	No Post	Functionally Obsolete	Satisfactory (Minor Deterioration)	Satisfactory (Minor Deterioration)	65.9
Logan	B00074	29.649	DBL. 14 X 10 FT R.C. BOX CULVERT	PITMANS CREEK	30	N/A	No Post		N/A	N/A	91.9
Logan	B00005	28.859	2-40 FT RCDG SPANS	RAWHIDE CREEK	85	24	No Post	Functionally Obsolete	Good (Minor Defects)	Good (Minor Defects)	62.8
Logan	B00004	28.600	DBL 10X5X32 RC CLVT -2 FT FILL L	CEDAR DALE SWAMP	24	N/A	No Post		N/A	N/A	75.3
Logan	B00003	27.679	3-45 FT RCDG SPANS	WOLF LICK SWAMP	144	24	No Post	Functionally Obsolete	Good (Minor Defects)	Good (Minor Defects)	64.8

Exhibit B.7 Bridges

County Name:	Bridge No:	Milepoint:	Bridge Description:	Features Intersected:	Structure Length:	Bridge Width:	Posting Rate:	Structural Function:	Superstructure:	Substructure:	Sufficiency Rating ¹ :
Logan	B00002	27.366	5-50 FT RCDG SPANS	WOLF LICK CREEK	264	25.5	No Post	Functionally Obsolete	Good (Minor Defects)	Good (Minor Defects)	64.8
Logan	B00045	14.583	DBL 12X7X38 CLVT	TOWN BRANCH	38	N/A	No Post		N/A	N/A	89.2
Logan	B00020	4.025	6-50 FT RCDG SPANS	NORTH FORK OF RED RIVER	318	25	No Post	Functionally Obsolete	Good (Minor Defects)	Good (Minor Defects)	67.3
Logan	B00021	0.987	6-50 FT RCDG SPANS	SOUTH FORK OF RED RIVER	318	25	No Post	Functionally Obsolete	Good (Minor Defects)	Good (Minor Defects)	63.9

¹ Based on March 2006 State Bridge Inventory

Exhibit B.8 Bridges

County Name:	Bridge No:	Milepoint:	Bridge Description:	Features Intersected:	Structure Length:	Bridge Width:	Posting Rate:	Structural Function:	Superstructure:	Substructure:	Sufficiency Rating ¹ :
Daviess	B00075P	11.370	TWIN(35.42-94-35.42 FT SIMPLE WF STEEL BEAM SPANS- 0 DE	US431	172	40.8	No Post		Good (Minor Defects)	Good (Minor Defects)	93.8
Daviess	B00075	11.370	TWIN(35.42-94-35.42 FT SIMPLE WF STEEL BEAM SPANS- 0 DE	US431	172	40.8	No Post		Good (Minor Defects)	Good (Minor Defects)	93.8
Daviess	B00040	10.185	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	14.8	No Post		Satisfactory (Minor Deterioration)	Satisfactory (Minor Deterioration)	60.7
Daviess	B00041	10.146	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	14.8	No Post		Good (Minor Defects)	Good (Minor Defects)	59.2
Daviess	B00042	10.131	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	14.8	No Post		Good (Minor Defects)	Good (Minor Defects)	59.2
Daviess	B00043	10.115	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	14.8	No Post		Good (Minor Defects)	Good (Minor Defects)	59.2
Daviess	B00044	10.049	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	13.4	No Post		Satisfactory (Minor Deterioration)	Good (Minor Defects)	59.2
Daviess	B00045	9.858	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	14.8	No Post		Good (Minor Defects)	Good (Minor Defects)	59.2
Daviess	B00046	9.829	1-30 FT RC PRECAST(ONLY) SPAN - 0 DEG SKEW	DRAINAGE DITCH	32	13.4	No Post		Good (Minor Defects)	Good (Minor Defects)	59.2
Daviess	B00047	9.333	DBL 10X7X71 RC BOX CULV-0 DEG SK FILL= 5 FT BRL= GOOD	BRANCH OF PANTHER CREEK	23	0	No Post		N/A	N/A	63.4
Daviess	B00048	9.034	3-30 FT SIMPLE RCDG SPANS 0 DEG SKEW	BRANCH OF PANTHER CREEK	99	45	No Post		Very Good (No Defects)	Very Good (No Defects)	90.2
Daviess	B00049	8.543	1-32.94 2-33.25 1-33.75 2-70.67 1-100 1-33.44 FT STEEL	PANTHER CREEK	412	31.7	Post Req'd		Satisfactory (Minor Deterioration)	Good (Minor Defects)	61.0
Daviess	B00050	8.037	20X6X68 RC BOX CULV-0 DEG SK FILL= 2 FT BRL= GOOD	BRANCH OF PANTHER CREEK	22	0	No Post		N/A	N/A	80.9
McLean	B00013	9.625	SNGL 10X6X79 RC CLVT - 1FT FILL OD	BRANCH BUCK CREEK	79	0	No Post	Functionally Obsolete	N/A	N/A	51.6
McLean	B00015	9.128	30 FT- 35 FT- 30 FT R.C.D.G. SPANS - 30 DEG SKEW	BUCK CREEK	104	33	No Post	Functionally Obsolete	Good (Minor Defects)	Good (Minor Defects)	64

Exhibit B.8 Bridges

County Name:	Bridge No:	Milepoint:	Bridge Description:	Features Intersected:	Structure Length:	Bridge Width:	Posting Rate:	Structural Function:	Superstructure:	Substructure:	Sufficiency Rating ¹ :
McLean	B00014	7.116	DBL 10X8X38 RC CULVERT FILL= 2 FT BRL= GOOD	BRANCH BUCK CREEK	23	0	No Post		N/A	N/A	78.9
McLean	B00018	5.100	3-150'DECK TRUS,1- 320'THRY TRUSS,10-56'I- BMS K	GREEN RIVER & ROUGH RIVE	1644	27	No Post	Functionally Obsolete	Satisfactory (Minor Deterioration)	Good (Minor Defects)	56.4
McLean	B00021	4.632	10-30 FT R.C.D.G. SPANS	UNNAMED STREAM TO GREEN	330	28	No Post	Functionally Obsolete	Good (Minor Defects)	Satisfactory (Minor Deterioration)	74.1
McLean	B00020	3.493	DBL 10X4X41 RC CULV-0 DEG SK FILL= 3 FT BRL= GOOD	SWAMP OPPOSITE L & N.R.R	23	39.5	No Post		N/A	N/A	77.5
McLean	B00019	0.800	15-30 FT R.C.D.G. SPANS	DRAIN TO CYPRESS CREEK	497	25.5	No Post	Functionally Obsolete	Good (Minor Defects)	Satisfactory (Minor Deterioration)	64.5
Muhlenberg	B00056	27.713	15-30 FT R.C.D.G. SPANS	OVERFLOW STRUCTURE	497	25	No Post	Structurally Deficient	Fair (Minor Section Loss)	Poor (Advanced Section Loss)	39.0
Muhlenberg	B00057	25.744	DBL 8X3X45 RC CULV-45 DEG SK	BR CYPRESS CREEK	26	0	No Post		N/A	N/A	93.4
Muhlenberg	RR0601	20.860	1-16'X24'X58' RIGID FRAME	PEABODY RAILROAD	21	39	No Post	Functionally Obsolete	N/A	N/A	76.7
Muhlenberg	RR0603	20.860	1-27' & 2-8' RC SLAB SPAN	P&L RAILWAY	50	25	No Post		Satisfactory (Minor Deterioration)	Good (Minor Defects)	N/A
Muhlenberg	B00132	20.860	1-27' & 2-8' RC SLAB SPAN	P&L RAILWAY	50	25	No Post		Satisfactory (Minor Deterioration)	Good (Minor Defects)	N/A

¹ Based on March 2006 State Bridge Inventory

Exhibit B.9 Traffic Characteristics

County	Beg. MP	End MP	Segment Length	2007 ADT	Percent Trucks (HIS)*	Posted Speed Limit	% Passing Sight Distance	2007 LOS	Projected 2030 ADT	Projected 2030 LOS
Muhlenberg	17.290	17.484	0.194	7,270	18%	55	100%	A	10,100	A
Muhlenberg	17.250	17.290	0.040	7,270	18%	55	30%	D	10,100	D
Muhlenberg	16.538	17.250	0.712	7,270	18%	55	30%	D	10,100	D
Muhlenberg	15.184	16.538	1.354	6,610	18%	55	70%	C	9,200	D
Muhlenberg	11.982	15.184	3.202	8,180	18%	55	50%	D	11,400	D
Muhlenberg	11.782	11.982	0.200	8,180	18%	55	70%	D	11,400	D
Muhlenberg	11.427	11.782	0.355	8,180	18%	45	50%	E	11,400	E
Muhlenberg	11.000	11.427	0.427	5,930	18%	35	40%	E	8,300	E
Muhlenberg	9.970	11.000	1.030	5,930	18%	55	40%	C	8,300	D
Muhlenberg	9.834	9.970	0.136	5,930	18%	45	40%	E	8,300	E
Muhlenberg	9.669	9.834	0.165	4,610	18%	45	40%	E	6,400	E
Muhlenberg	8.530	9.669	1.139	4,610	18%	55	40%	C	6,400	D
Muhlenberg	8.020	8.530	0.510	4,610	18%	35	40%	E	6,400	E
Muhlenberg	7.520	8.020	0.500	4,960	18%	45	40%	E	6,900	E
Muhlenberg	6.964	7.520	0.556	4,960	18%	55	40%	D	6,900	D
Muhlenberg	0.540	6.964	6.424	2,590	18%	55	2%	C	3,600	C
Muhlenberg	0.000	0.540	0.540	2,580	18%	45	2%	E	3,600	E
Logan	28.207	31.050	2.843	2,810	18%	55	28%	C	3,900	C
Logan	24.728	28.207	3.479	5,320	18%	55	55%	C	7,400	D
Logan	24.454	24.728	0.274	5,320	18%	45	35%	E	7,400	E
Logan	23.873	24.454	0.581	5,320	18%	35	35%	E	7,400	E
Logan	23.240	23.873	0.633	5,320	18%	45	35%	E	7,400	E
Logan	21.636	23.240	1.604	5,850	18%	55	35%	C	8,100	D
Logan	20.900	21.636	0.736	6,180	18%	55	47%	C	8,600	D
Logan	20.590	20.900	0.310	6,180	18%	55	100%	C	8,600	C
Logan	13.896	20.590	6.694	Omitted From Planning Study						
Logan	13.593	13.896	0.303	10,400	7%	35	not avail	E	14,500	E
Logan	12.774	13.593	0.819	10,400	7%	45	not avail	E	14,500	E
Logan	12.331	12.774	0.443	5,900	7%	45	not avail	E	8,200	E

* 2003 KY Average Truck %'s were used to calculate LOS:

Rural Minor Arterial- 14.0%

Urban Minor Arterial- 8.7%

Urban Prin. Arterial- 6.9%

Exhibit B.9 Traffic Characteristics

County	Beg. MP	End MP	Segment Length	2007 ADT	Percent Trucks (HIS)*	Posted Speed Limit	% Passing Sight Distance	2007 LOS	Projected 2030 ADT	Projected 2030 LOS
Logan	8.252	12.331	4.079	5,900	14%	45	85%	E	8,300	E
Logan	4.145	8.252	4.107	3,210	14%	55	68%	C	4,500	C
Logan	2.359	4.145	1.786	4,000	14%	55	51%	C	5,600	C
Logan	2.300	2.359	0.059	4,000	14%	45	51%	D	5,600	E
Logan	1.974	2.300	0.326	4,000	14%	45	28%	E	5,600	E
Logan	1.485	1.974	0.489	4,000	14%	35	28%	E	5,600	E
Logan	1.323	1.485	0.162	3,940	14%	35	30%	E	5,500	E
Logan	1.150	1.323	0.173	3,940	14%	35	40%	E	5,500	E
Logan	1.050	1.150	0.100	3,940	14%	45	63%	D	5,500	E
Logan	0.992	1.050	0.058	3,940	14%	55	63%	B	5,500	C
Logan	0.400	0.992	0.592	3,940	14%	55	63%	B	5,500	C
Logan	0.000	0.400	0.400	3,940	14%	55	100%	A	5,500	B

* 2003 KY Average Truck %'s were used to calculate LOS:

Rural Minor Arterial- 14.0%

Urban Minor Arterial- 8.7%

Urban Prin. Arterial- 6.9%

Exhibit B.10 Traffic Characteristics

County	Beg. MP	End MP	Segment Length	2007 ADT	Percent Trucks (HIS)*	Posted Speed Limit	% Passing Sight Distance	2007 LOS	Projected 2030 ADT	Projected 2030 LOS
Daviess	14.519	14.670	0.151	8,140	7%	35	100%	D	11,300	D
Daviess	13.900	14.519	0.619	18,700	7%	35	100%	C	26,000	C
Daviess	11.367	13.900	2.533	27,400	7%	35	100%	C	38,200	C
Daviess	10.952	11.367	0.415	29,900	7%	35	100%	D	41,600	D
Daviess	10.910	10.952	0.042	10,400	7%	35	100%	C	14,500	C
Daviess	10.632	10.910	0.278	10,400	7%	45	100%	C	14,500	C
Daviess	10.246	10.632	0.386	10,400	7%	45	100%	A	14,500	A
Daviess	7.215	10.246	3.031	10,300	18%	55	100%	C	14,300	D
Daviess	2.599	7.215	4.616	8,960	18%	55	0%	D	12,500	D
Daviess	0.000	2.599	2.599	6,550	18%	55	25%	D	9,100	D
McLean	10.507	11.573	1.066	6,180	18%	55	60%	C	8,600	D
McLean	9.852	10.507	0.655	6,180	18%	55	0%	C	8,600	D
McLean	8.300	9.852	1.552	6,910	18%	55	60%	C	9,600	D
McLean	8.265	8.300	0.035	6,910	18%	55	80%	C	9,600	D
McLean	6.770	8.265	1.495	6,910	18%	55	80%	C	9,600	D
McLean	6.650	6.770	0.120	6,910	18%	45	80%	E	9,600	E
McLean	6.038	6.650	0.612	6,910	18%	45	0%	E	9,600	E
McLean	4.954	6.038	1.084	7,110	18%	45	0%	E	9,900	E
McLean	4.354	4.954	0.600	6,800	18%	55	100%	C	9,500	C
McLean	3.045	4.354	1.309	6,120	18%	55	50%	C	8,500	D
McLean	2.766	3.045	0.279	6,120	18%	55	50%	C	8,500	D
McLean	2.590	2.766	0.176	5,030	18%	55	50%	C	7,000	D
McLean	2.500	2.590	0.090	5,030	18%	45	50%	E	7,000	E
McLean	1.980	2.500	0.520	5,030	18%	45	75%	E	7,000	E
McLean	1.045	1.980	0.935	5,030	18%	55	75%	C	7,000	C
McLean	0.000	1.045	1.045	5,030	18%	55	100%	B	7,000	C
Muhlenberg	26.411	27.779	1.368	5,030	18%	55	20%	C	7,000	D
Muhlenberg	24.232	26.411	2.179	4,390	18%	55	20%	C	6,100	C
Muhlenberg	22.398	24.232	1.834	4,970	18%	45	20%	E	6,900	E
Muhlenberg	21.630	22.398	0.768	2,770	18%	45	30%	E	3,900	E

*2003 KY Average Truck %'s were use to calculate LOS:

Rural Minor Arterial - 14.0%

Urban Minor Arterial - 8.7%

Urban Prin. Arterial - 6.9%

Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.10 Traffic Characteristics

County	Beg. MP	End MP	Segment Length	2007 ADT	Percent Trucks (HIS)*	Posted Speed Limit	% Passing Sight Distance	2007 LOS	Projected 2030 ADT	Projected 2030 LOS
Muhlenberg	21.481	21.630	0.149	2,770	18%	55	30%	C	3,900	C
Muhlenberg	21.320	21.481	0.161	2,770	7%	55	50%	B	3,900	C
Muhlenberg	21.293	21.320	0.027	2,770	7%	55	50%	B	3,900	C
Muhlenberg	20.661	21.293	0.632	2,770	7%	55	50%	C	3,900	C
Muhlenberg	19.389	20.661	1.272	3,430	7%	45	50%	E	4,800	E
Muhlenberg	18.879	19.389	0.51	5,270	7%	35	50%	E	7,300	E
Muhlenberg	18.679	18.879	0.2	7,840	7%	35	50%	E	10,900	E
Muhlenberg	18.278	18.679	0.401	12,100	7%	35	50%	E	16,800	E
Muhlenberg	17.955	18.278	0.323	9,280	7%	35	50%	E	12,900	E
Muhlenberg	17.81	17.955	0.145	9,280	7%	45	50%	E	12,900	E
Muhlenberg	17.484	17.81	0.326	9,280	7%	55	50%	D	12,900	D

*2003 KY Average Truck %'s were use to calculate LOS:

Rural Minor Arterial - 14.0%

Urban Minor Arterial - 8.7%

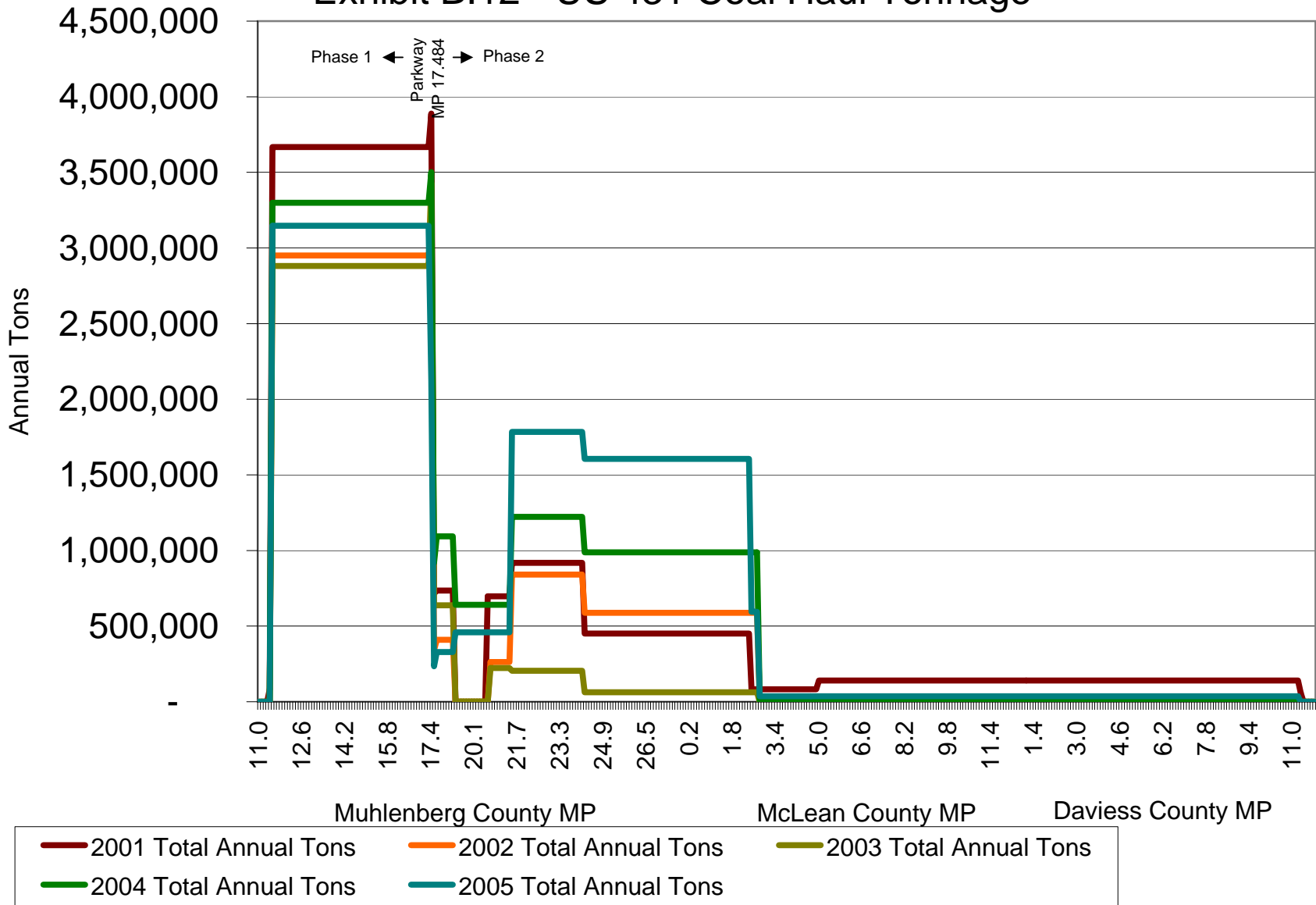
Urban Prin. Arterial - 6.9%

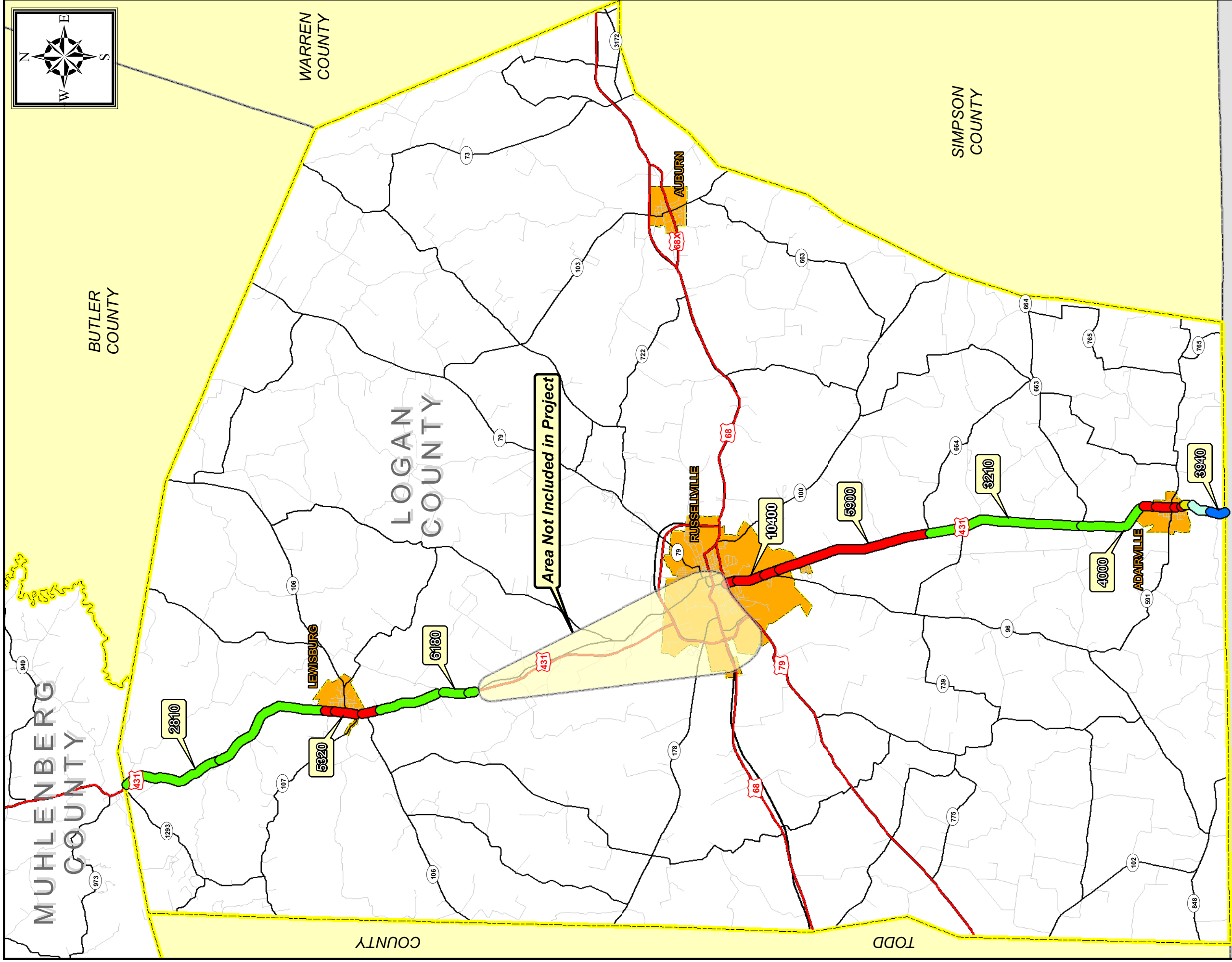
Source: KYTC Highway Information System (HIS), June 2007

Exhibit B.11 Coal Haul Tonnage

County	Begin MP	End MP	2001 Cardinal Direction	2001 Non-Cardinal Direction	2001 Total Annual Tons	2002 Cardinal Direction	2002 Non-Cardinal Direction	2002 Total Annual Tons	2003 Cardinal Direction	2003 Non-Cardinal Direction	2003 Total Annual Tons	2004 Cardinal Direction	2004 Non-Cardinal Direction	2004 Total Annual Tons	2005 Cardinal Direction	2005 Non-Cardinal Direction	2005 Total Annual Tons
Daviess	11.400	14.670			-			-			-			-			-
Daviess	11.300	11.400	58,540		58,540			-			-			-			-
Daviess	10.371	11.300	58,540	82,000	140,540			-			-			-			-
Daviess	0.000	10.371	58,540	82,000	140,540			-			-	9,600	-	9,600	35,531	0	35,531
McLean	5.000	11.573	58,540	82,000	140,540			-			-	9,600	-	9,600	35,531	0	35,531
McLean	2.800	5.000		82,000	82,000			-			-	9,600	-	9,600	35,531	0	35,531
McLean	2.500	2.800		82,000	82,000	587,582		587,582	62,519	0	62,519	377,019	611,088	988,107	595,045	0	595,045
McLean	0.000	2.500	451,000		451,000	587,582		587,582	62,519	0	62,519	377,019	611,088	988,107	1,605,561	0	1,605,561
Muhlenberg	24.200	27.779	451,000		451,000	587,582		587,582	62,519	0	62,519	377,019	611,088	988,107	1,605,561	0	1,605,561
Muhlenberg	21.500	24.200	918,021		918,021	840,659		840,659	204,944	0	204,944	611,348	611,088	1,222,436	1,784,694	0	1,784,694
Muhlenberg	21.400	21.500	704,083		704,083	262,878		262,878	1,033	222,612	223,645	29,336	611,088	640,424	459,471	0	459,471
Muhlenberg	20.700	21.400	697,507		697,507	262,878		262,878	1,033	222,612	223,645	29,336	611,088	640,424	459,471	0	459,471
Muhlenberg	20.600	20.700	697,507		697,507			-	1,033	0	1,033	29,336	611,088	640,424	459,471	0	459,471
Muhlenberg	18.300	20.600			-			-	1,033	0	1,033	29,336	611,088	640,424	459,471	0	459,471
Muhlenberg	17.600	18.300	489,488	244,971	734,459	142,267	266,614	408,881	618,721	19,552	638,273	315,848	777,189	1,093,037	234,516	93,667	328,183
Muhlenberg	17.500	17.600	489,488	225,384	714,872	142,267	197,710	339,977	617,688	19,552	637,240	315,848	602,377	918,225	234,516	0	234,516
Muhlenberg	17.400	17.500	383,937	3,505,125	3,889,062	142,267	2,919,678	3,061,945	617,688	2,812,753	3,430,441	315,848	3,187,056	3,502,904	234,516	1,891,681	2,126,197
Muhlenberg	11.500	17.400		3,667,437	3,667,437		2,949,797	2,949,797	0	2,880,354	2,880,354	29,336	3,269,505	3,298,841	29,336	3,117,590	3,146,926
Muhlenberg	11.400	11.500		83,099	83,099		5,149	5,149			-			-			-
Muhlenberg	0.000	11.400			-			-			-			-			-
Logan	14.962	31.050			-			-			-			-			-
Logan	11.776	14.962			-			-			-			-			-
Logan	0.000	11.776			-			-			-			-			-

Exhibit B.12 - US 431 Coal Haul Tonnage

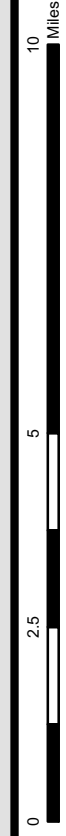




TENNESSEE

LEGEND

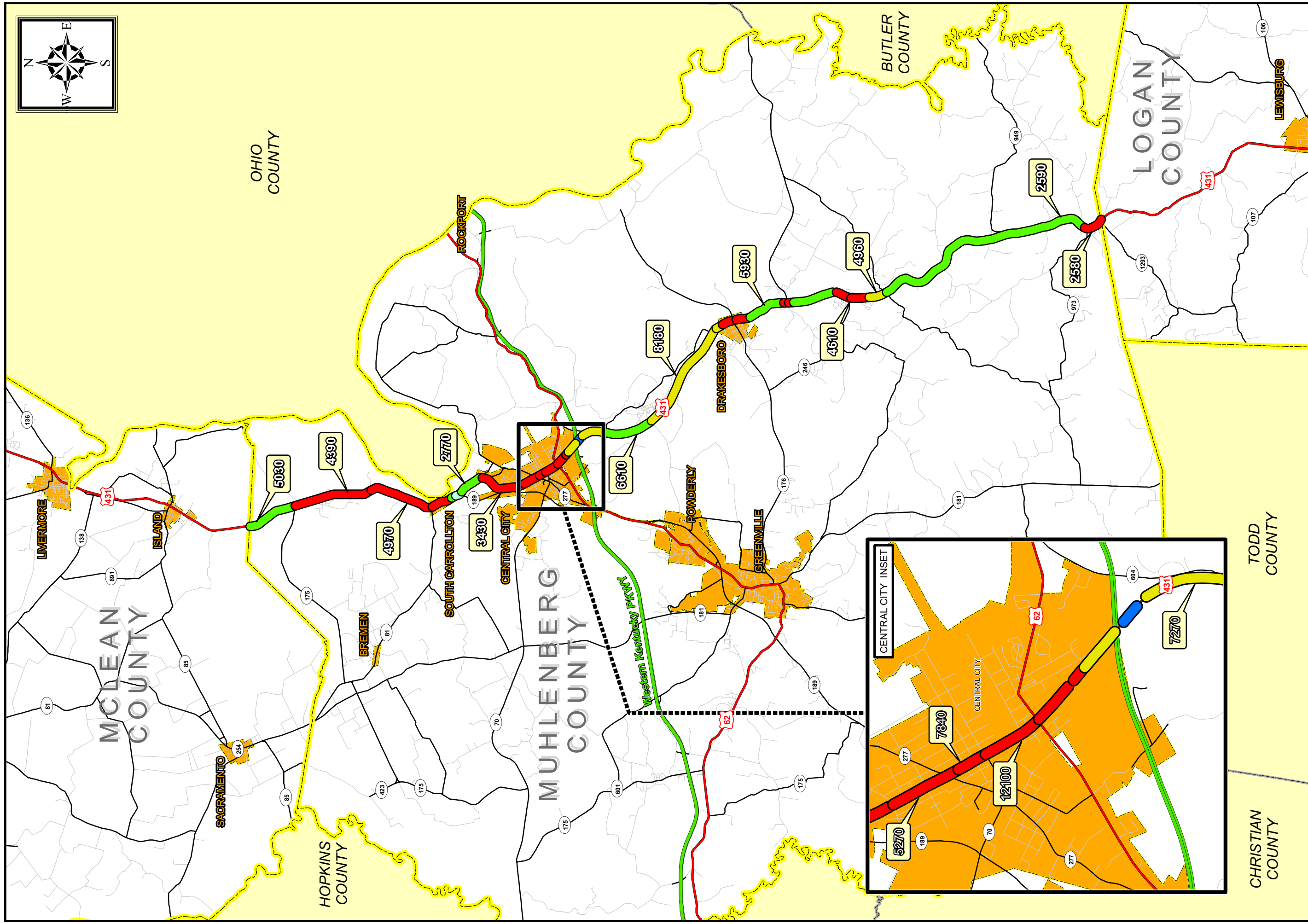
- 2340** - Average Daily Traffic (ADT)
- Level of Service "A"
- Level of Service "B"
- Level of Service "C"
- Level of Service "D"
- Level of Service "E" or "F"



US 431 Programming Study

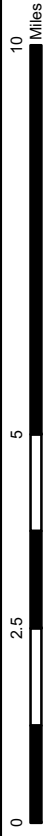
Exhibit B.13A
 2007 Level of Service
 and Average Daily Traffic (ADT)





LEGEND

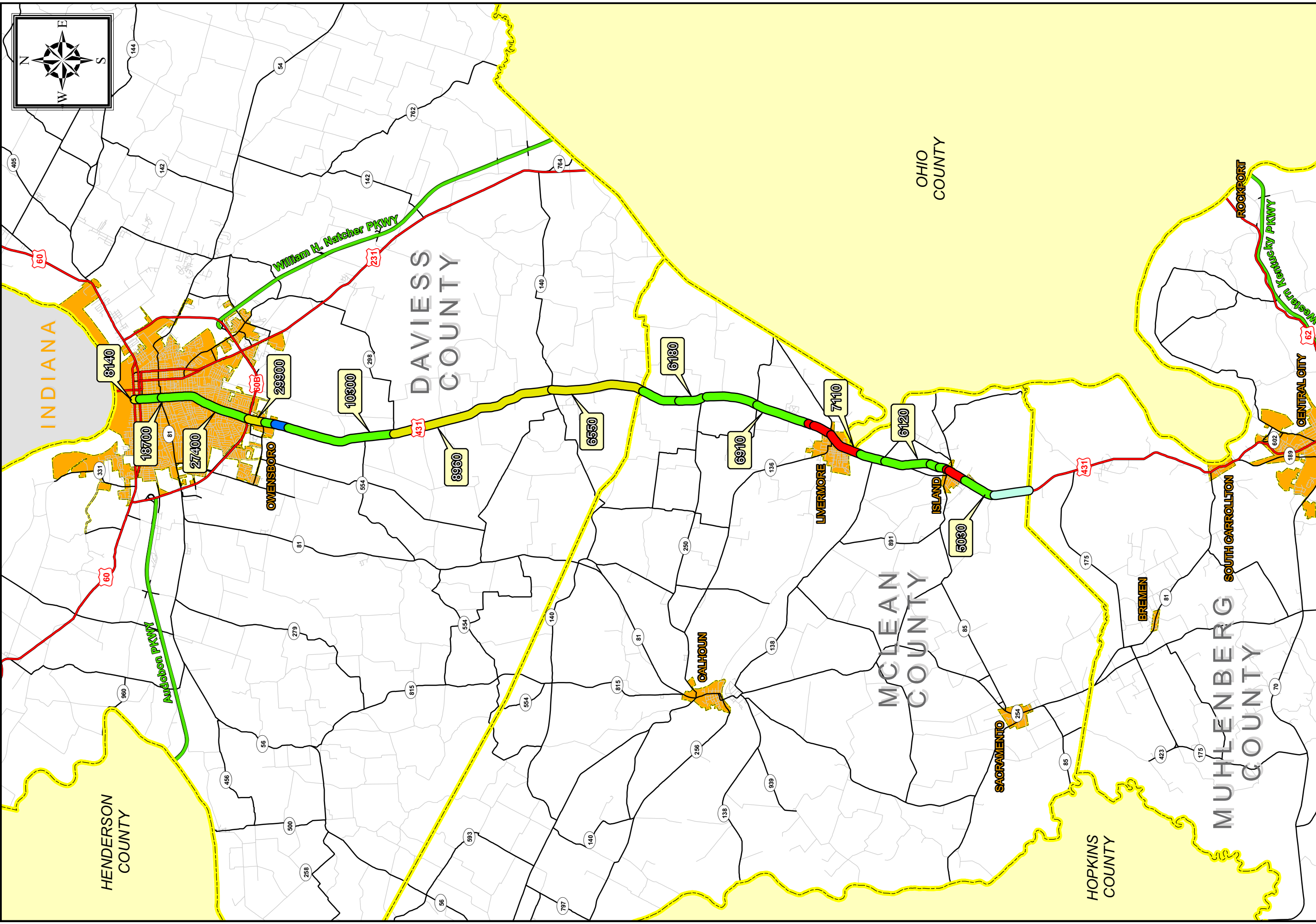
- 2640 - Average Daily Traffic (ADT)
- Level of Service "A"
- Level of Service "B"
- Level of Service "C"
- Level of Service "D"
- Level of Service "E" or "F"



US 431 Programming Study

Exhibit B.13B
 2007 Level of Service
 and Average Daily Traffic (ADT)

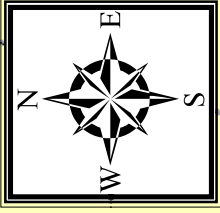
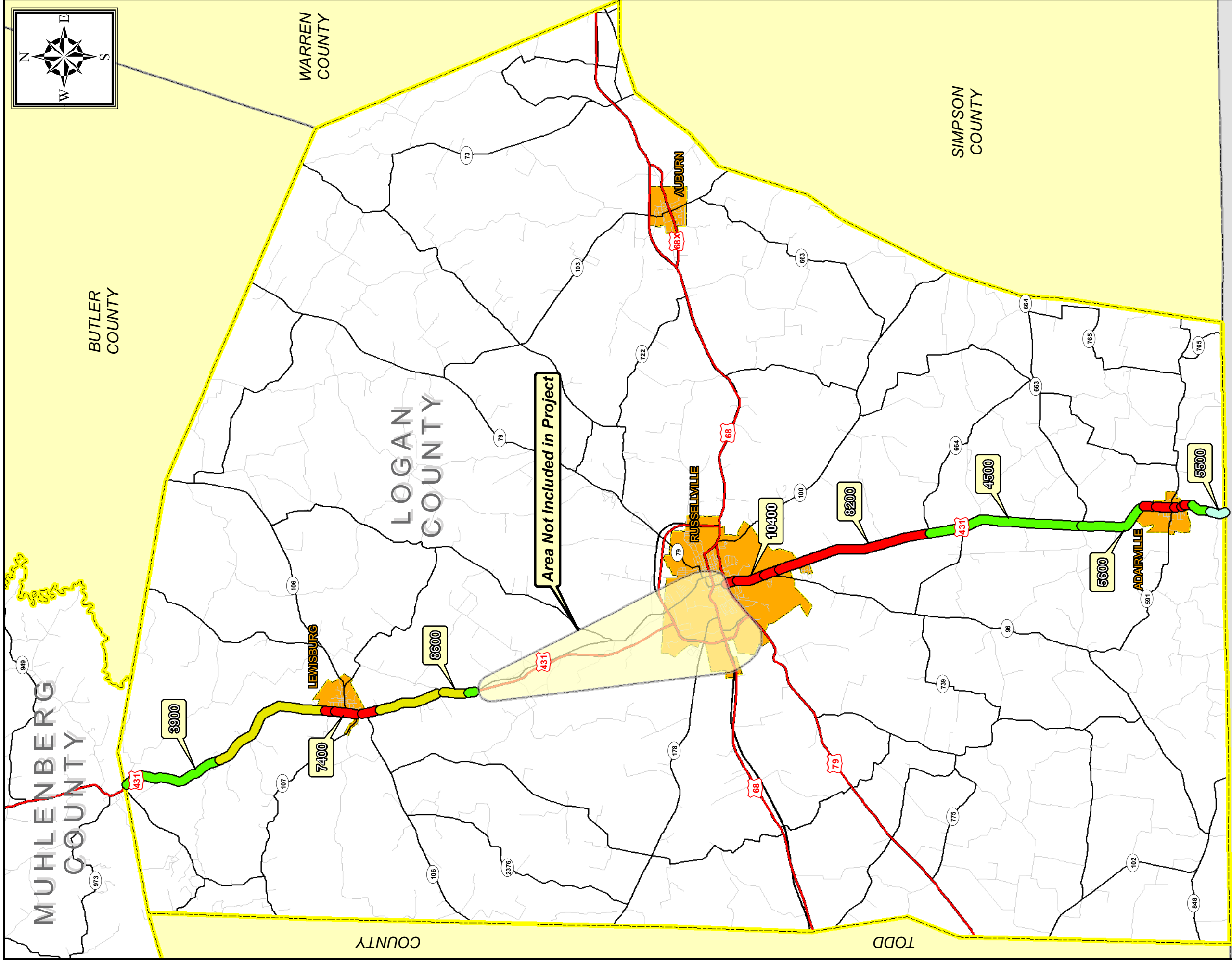




US 431 Programming Study

Exhibit B.13C
**2007 Level of Service
 and Average Daily Traffic (ADT)**
 McLean and Daviess Counties





TENNESSEE

LEGEND

2840 - Average Daily Traffic (2030 ADT)

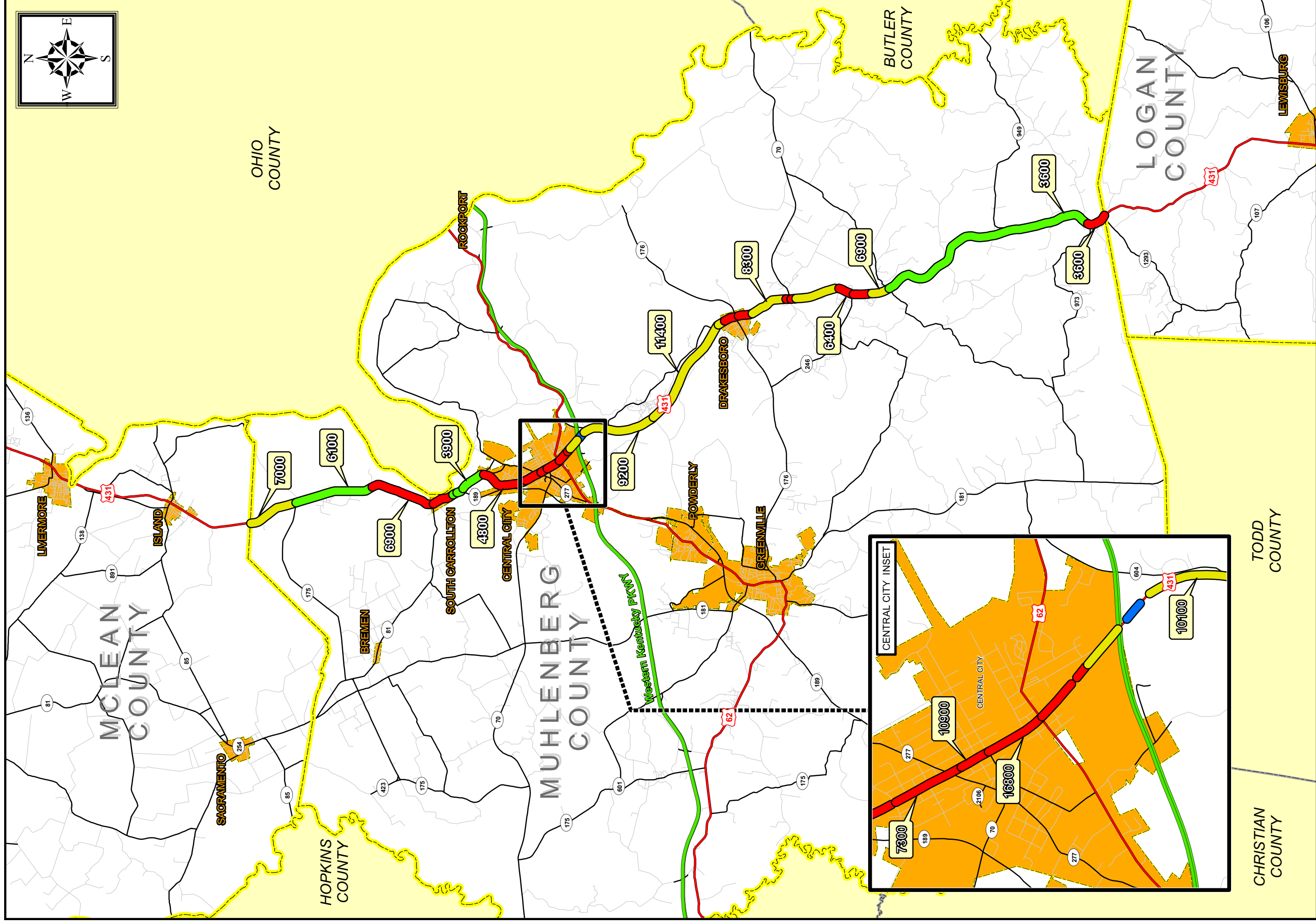
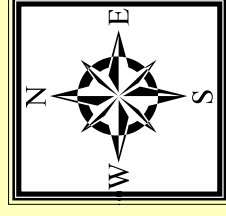
- █ - Level of Service "A"
- █ - Level of Service "B"
- █ - Level of Service "C"
- █ - Level of Service "D"
- █ - Level of Service "E" or "F"



US 431 Programming Study

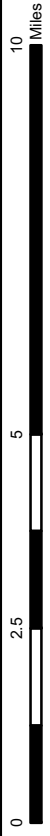
Exhibit B.14A
2030 Level of Service
and Average Daily Traffic (ADT)







LEGEND

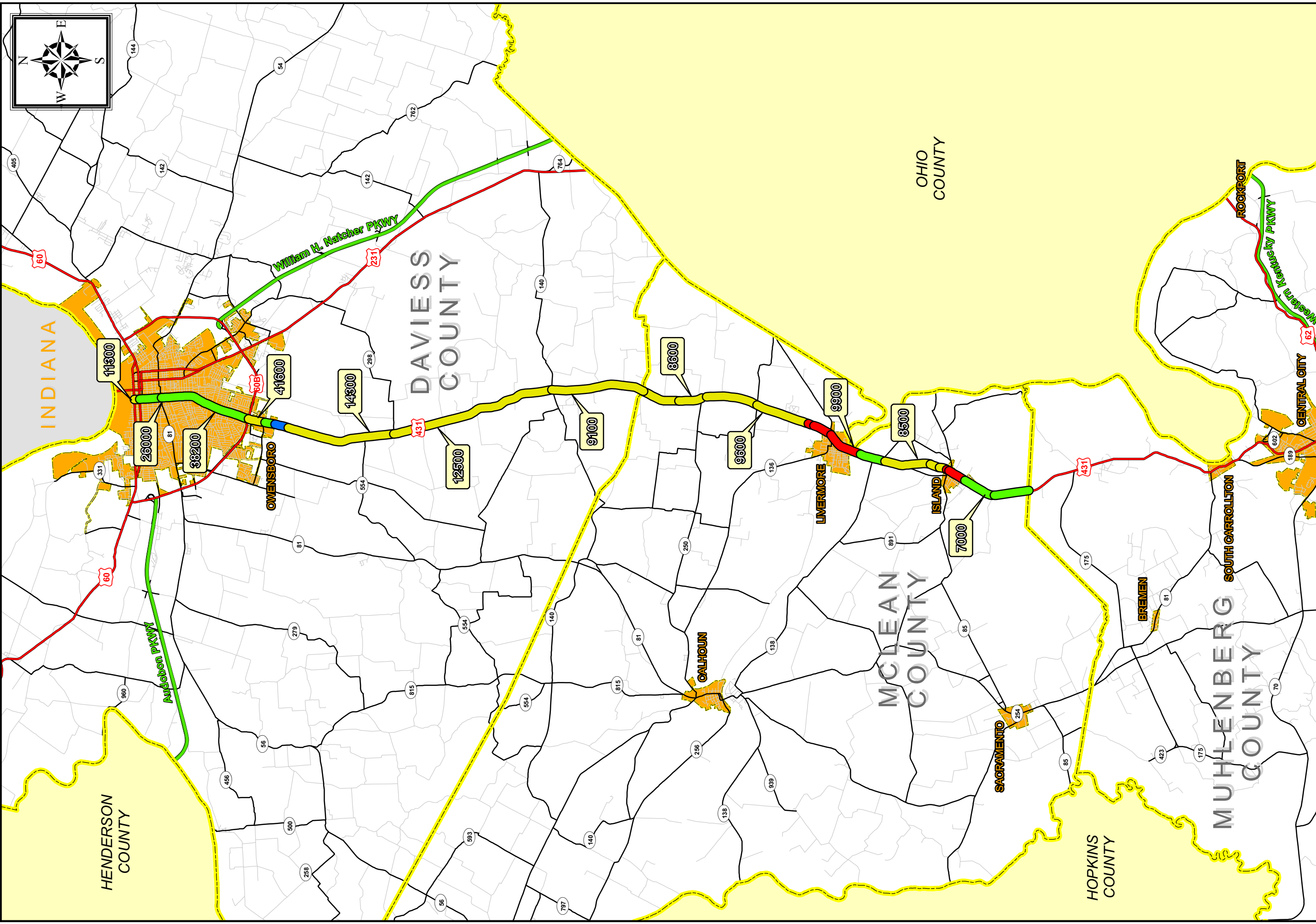
- 2640 - Average Daily Traffic (2030 ADT)
- █ - Level of Service "A"
- █ - Level of Service "B"
- █ - Level of Service "C"
- █ - Level of Service "D"
- █ - Level of Service "E" or "F"



US 431 Programming Study

Exhibit B.14B
2030 Level of Service
and Average Daily Traffic (ADT)

LEGEND

- 2040 - Average Daily Traffic (2030 ADT)
- █ - Level of Service "A"
- █ - Level of Service "B"
- █ - Level of Service "C"
- █ - Level of Service "D"
- █ - Level of Service "E" or "F"



US 431 Programming Study

Exhibit B.14C
 2030 Level of Service
 and Average Daily Traffic (ADT)



McLean and Daviess Counties

**Exhibit B.15
High Crash Spots & Segments
2003-2006 Data**

Spot or Segment	Location			Length	ADT	Lanes	Rural or Urban	Class Rate	Critical Crash Rate	Crashes				Critical Rate Factor (CRF)
	County	BMP	EMP							Fatal	Injury	PDO	Total	
Segment	Logan	0.000	1.485	1.485	3,940	2	Rural	236	377.25	0	6	30	36	1.12
Segment	Logan	1.485	4.145	2.660	4,000	2	Rural	236	339.62	0	7	27	34	0.64
Segment	Logan	4.145	8.252	4.107	3,210	2	Rural	236	328.80	0	7	21	28	0.44
Segment	Logan	8.252	11.922	3.670	5,900	2	Rural	236	307.96	1	8	22	31	0.32
Segment	Logan	11.922	12.774	0.852	5,900	2	Urban	256	414.95	0	5	10	15	0.49
Segment	Logan	12.774	13.896	1.122	10,400	2	Urban	256	358.79	0	7	32	39	0.64
Segment	Logan	20.590	21.636	1.046	6,180	2	Rural	236	370.11	0	4	3	7	0.20
Segment	Logan	21.636	23.859	2.223	5,850	2	Rural	236	329.45	1	10	22	33	0.53
Segment	Logan	23.859	28.207	4.348	5,320	2	Rural	236	305.58	0	9	30	39	0.38
Segment	Logan	28.207	31.050	2.843	2,810	2	Rural	236	356.16	1	12	30	43	1.04
Spot	Logan	0.000	0.100	0.100	3,940	2	Rural	0.23	0.83	0	2	2	4	0.84
Spot	Logan	0.390	0.490	0.100	3,940	2	Rural	0.23	0.83	0	1	6	7	1.46
Spot	Logan	0.589	0.689	0.100	3,940	2	Rural	0.23	0.83	0	1	11	12	2.51
Spot	Logan	2.697	2.797	0.100	4,000	2	Rural	0.23	0.83	0	0	5	5	1.04
Spot	Logan	2.997	3.097	0.100	4,000	2	Rural	0.23	0.83	0	1	4	5	1.04
Spot	Logan	10.400	10.500	0.100	5,900	2	Rural	0.23	0.71	0	2	3	5	0.82
Spot	Logan	13.100	13.200	0.100	10,400	2	Urban	0.25	0.61	0	2	5	7	0.75
Spot	Logan	13.610	13.710	0.100	10,400	2	Urban	0.25	0.61	0	0	8	8	0.86
Spot	Logan	13.795	13.895	0.100	10,400	2	Urban	0.25	0.61	0	1	10	11	1.18
Spot	Logan	21.436	21.536	0.100	6,180	2	Rural	0.23	0.70	0	2	3	5	0.80
Spot	Logan	21.640	21.740	0.100	5,850	2	Rural	0.23	0.71	0	1	6	7	1.15
Spot	Logan	24.700	24.800	0.100	5,320	2	Rural	0.23	0.74	0	2	2	4	0.70
Spot	Logan	30.000	30.100	0.100	2,810	2	Rural	0.23	0.96	0	1	4	5	1.27
Spot	Logan	30.106	30.206	0.100	2,810	2	Rural	0.23	0.96	0	1	4	5	1.27
Spot	Logan	30.850	30.950	0.100	2,810	2	Rural	0.23	0.96	0	2	3	5	1.27
Segment	Muhlenberg	0.000	2.873	2.873	2,580	2	Rural	236	360.92	0	5	27	32	0.82
Segment	Muhlenberg	2.873	6.964	4.091	2,590	2	Rural	236	339.85	4	28	37	69	1.31
Segment	Muhlenberg	6.964	8.020	1.056	4,960	2	Rural	236	385.64	1	4	11	16	0.54
Segment	Muhlenberg	8.020	9.834	1.814	4,610	2	Rural	236	353.35	1	9	16	26	0.60
Segment	Muhlenberg	9.834	11.467	1.633	5,930	2	Rural	236	344.78	0	16	22	38	0.78
Segment	Muhlenberg	11.467	15.184	3.717	8,180	2	Rural	236	296.52	1	18	40	59	0.45
Segment	Muhlenberg	15.184	16.538	1.354	6,610	2	Rural	236	349.30	1	4	14	19	0.42
Segment	Muhlenberg	16.538	17.290	0.752	7,270	2	Rural	236	382.34	0	4	6	10	0.33
Segment	Muhlenberg	17.290	17.484	0.194	7,270	4 Div	Rural	118	337.29	0	2	5	7	1.01

Exhibit B.15
High Crash Spots & Segments
 2003-2006 Data

Spot or Segment	Location			Length	ADT	Lanes	Rural or Urban	Class Rate	Critical Crash Rate	Crashes				Critical Rate Factor (CRF)
	County	BMP	EMP							Fatal	Injury	PDO	Total	
Spot	Logan/Muhlenberg	31.030	0.080	0.100	2,600	2	Rural	0.23	1.00	0	1	3	4	1.06
Spot	Muhlenberg	0.400	0.500	0.100	2,580	2	Rural	0.23	1.00	0	3	8	11	2.92
Spot	Muhlenberg	3.354	3.454	0.100	2,590	2	Rural	0.23	1.00	0	2	7	9	2.39
Spot	Muhlenberg	3.600	3.700	0.100	2,590	2	Rural	0.23	1.00	0	3	6	9	2.39
Spot	Muhlenberg	4.600	4.700	0.100	2,590	2	Rural	0.23	1.00	0	2	3	5	1.33
Spot	Muhlenberg	4.800	4.900	0.100	2,590	2	Rural	0.23	1.00	1	2	1	4	1.06
Spot	Muhlenberg	5.000	5.100	0.100	2,590	2	Rural	0.23	1.00	0	4	6	10	2.65
Spot	Muhlenberg	6.400	6.500	0.100	2,590	2	Rural	0.23	1.00	0	1	6	7	1.86
Spot	Muhlenberg	6.950	7.050	0.100	4,960	2	Rural	0.23	0.76	1	2	3	6	1.09
Spot	Muhlenberg	7.950	8.050	0.100	4,960	2	Rural	0.23	0.76	0	1	5	6	1.09
Spot	Muhlenberg	9.000	9.100	0.100	4,610	2	Rural	0.23	0.78	0	2	4	6	1.14
Spot	Muhlenberg	9.800	9.900	0.100	5,100	2	Rural	0.23	0.75	0	6	7	13	2.33
Spot	Muhlenberg	10.000	10.100	0.100	5,930	2	Rural	0.23	0.71	0	1	6	7	1.14
Spot	Muhlenberg	11.100	11.200	0.100	5,930	2	Rural	0.23	0.71	0	4	3	7	1.14
Spot	Muhlenberg	11.400	11.500	0.100	8,180	2	Rural	0.23	0.63	0	4	16	20	2.66
Spot	Muhlenberg	11.700	11.800	0.100	8,180	2	Rural	0.23	0.63	1	1	3	5	0.67
Spot	Muhlenberg	11.920	12.020	0.100	8,180	2	Rural	0.23	0.63	0	4	4	8	1.06
Spot	Muhlenberg	15.100	15.200	0.100	8,180	2	Rural	0.23	0.63	0	2	4	6	0.80
Spot	Muhlenberg	16.500	16.600	0.100	7,270	2	Rural	0.23	0.66	0	2	3	5	0.72
Spot	Muhlenberg	17.300	17.400	0.100	7,270	4 Div	Rural	0.11	0.42	0	2	4	6	1.35

Exhibit B.16
High Crash Spots & Segments
2003-2006 Data

Spot or Segment	Location			Length	ADT	Lanes	Rural or Urban	Class Rate	Critical Crash Rate	Crashes				Critical Rate Factor (CRF)
	County	BMP	EMP							Fatal	Injury	PDO	Total	
Segment	Muhlenberg	17.484	18.278	0.794	9,280	2	Urban	256	386.31	2	14	30	46	1.11
Segment	Muhlenberg	18.278	18.679	0.401	12,100	2	Urban	256	417.91	0	10	48	58	1.96
Segment	Muhlenberg	18.679	18.962	0.283	7,840	2	Urban	256	500.44	0	6	29	35	2.16
Segment	Muhlenberg	18.962	19.462	0.500	5,270	2	Urban	256	479.13	0	5	6	11	0.60
Segment	Muhlenberg	19.462	20.661	1.199	3,430	2	Urban	256	432.53	0	1	3	4	0.15
Segment	Muhlenberg	20.661	21.481	0.820	2,770	2	Urban	256	497.41	0	1	2	3	0.18
Segment	Muhlenberg	21.481	22.398	0.917	2,770	2	Rural	236	454.98	1	11	12	24	1.42
Segment	Muhlenberg	22.398	24.232	1.834	4,970	2	Rural	236	348.24	1	15	14	30	0.65
Segment	Muhlenberg	24.232	26.411	2.179	4,390	2	Rural	236	345.47	1	5	20	26	0.54
Segment	Muhlenberg	26.411	27.779	1.368	5,030	2	Rural	236	365.83	0	1	11	12	0.33
Spot	Muhlenberg	17.484	17.584	0.100	9,280	2	Urban	0.25	0.64	2	2	5	9	1.04
Spot	Muhlenberg	17.670	17.770	0.100	9,280	2	Urban	0.25	0.64	0	2	4	6	0.70
Spot	Muhlenberg	17.800	17.900	0.100	9,280	2	Urban	0.25	0.64	0	2	3	5	0.58
Spot	Muhlenberg	17.900	18.000	0.100	9,280	2	Urban	0.25	0.64	0	4	5	9	1.04
Spot	Muhlenberg	18.240	18.340	0.100	12,100	2	Urban	0.25	0.58	0	4	25	29	2.81
Spot	Muhlenberg	18.350	18.450	0.100	12,100	2	Urban	0.25	0.58	0	3	7	10	0.97
Spot	Muhlenberg	18.490	18.590	0.100	12,100	2	Urban	0.25	0.58	0	4	18	22	2.13
Spot	Muhlenberg	18.600	18.700	0.100	10,000	2	Urban	0.25	0.62	0	4	13	17	1.87
Spot	Muhlenberg	18.700	18.800	0.100	7,840	2	Urban	0.25	0.67	0	1	8	9	1.17
Spot	Muhlenberg	18.900	19.000	0.100	6,000	2	Urban	0.25	0.74	0	5	12	17	2.61
Spot	Muhlenberg	22.300	22.400	0.100	2,770	2	Rural	0.23	0.97	0	9	10	19	4.85
Spot	Muhlenberg	24.132	24.232	0.100	4,970	2	Rural	0.23	0.76	0	4	4	8	1.46
Segment	McLean	0.000	2.766	2.766	5,030	2	Rural	236	326.27	1	8	21	30	0.45
Segment	McLean	2.766	4.354	1.588	6,120	2	Rural	236	344.58	0	3	4	7	0.14
Segment	McLean	4.354	4.954	0.600	6,800	2	Rural	236	406.54	0	0	2	2	0.08
Segment	McLean	4.954	6.038	1.084	7,110	2	Rural	236	358.41	0	8	16	24	0.60
Segment	McLean	6.038	9.852	3.814	6,910	2	Rural	236	301.10	0	19	41	60	0.52
Segment	McLean	9.852	11.573	1.721	6,180	2	Rural	236	339.64	1	10	15	26	0.49
Spot	McLean	2.400	2.500	0.100	5,030	2	Rural	0.23	0.75	1	4	4	9	1.63
Spot	McLean	5.500	5.600	0.100	7,110	2	Rural	0.23	0.66	0	2	4	6	0.87
Spot	McLean	6.000	6.100	0.100	7,000	2	Rural	0.23	0.67	0	3	8	11	1.62
Spot	McLean	6.258	6.358	0.100	6,910	2	Rural	0.23	0.67	0	1	5	6	0.89
Spot	McLean	8.000	8.100	0.100	6,910	2	Rural	0.23	0.67	0	0	5	5	0.74
Spot	McLean	8.265	8.365	0.100	6,910	2	Rural	0.23	0.67	0	1	4	5	0.74
Spot	McLean	9.800	9.900	0.100	6,500	2	Rural	0.23	0.68	0	3	3	6	0.92

Based on: KTY Analysis of Traffic Crash Data in KY (2001-2005)
Geometric info from KYTC HIS Program, June 2007

Exhibit B.16
High Crash Spots & Segments
2003-2006 Data

Spot or Segment	Location			Length	ADT	Lanes	Rural or Urban	Class Rate	Critical Crash Rate	Crashes				Critical Rate Factor (CRF)
	County	BMP	EMP							Fatal	Injury	PDO	Total	
Segment	Daviess	0.000	2.599	2.599	6,550	2	Rural	236	317.39	0	13	25	38	0.48
Segment	Daviess	2.599	7.215	4.616	8,960	2	Rural	236	287.75	1	29	47	77	0.44
Segment	Daviess	7.215	8.027	0.812	8,700	2	Rural	236	364.07	0	2	3	5	0.13
Segment	Daviess	8.027	9.120	1.093	10,300	2	Rural	236	336.65	0	3	9	12	0.22
Segment	Daviess	9.120	10.246	1.126	10,300	2	Urban	256	359.11	1	2	10	13	0.21
Segment	Daviess	10.246	10.367	0.121	10,400	2	Urban	256	587.29	0	0	2	2	0.19
Segment	Daviess	10.367	10.507	0.140	10,400	3	Urban	478	887.80	0	1	2	3	0.16
Segment	Daviess	10.507	10.621	0.114	10,400	4 Undiv	Urban	429	863.42	0	0	1	1	0.07
Segment	Daviess	10.621	10.952	0.331	10,400	4 Div	Urban	265	462.00	0	0	2	2	0.09
Segment	Daviess	10.952	11.322	0.370	29,900	4 Div	Urban	265	372.44	0	3	5	8	0.13
Segment	Daviess	11.322	11.367	0.045	29,900	4 Undiv	Urban	429	835.13	0	1	1	2	0.12
Segment	Daviess	11.367	11.923	0.556	27,400	4 Div	Urban	265	356.16	0	9	8	17	0.21
Segment	Daviess	11.923	13.900	1.977	27,400	4 Undiv	Urban	429	489.63	0	6	19	25	0.06
Segment	Daviess	13.900	14.519	0.619	18,700	4 Undiv	Urban	429	561.75	0	4	3	7	0.07
Segment	Daviess	14.519	14.670	0.151	8,140	4 Undiv	Urban	429	855.15	0	1	0	1	0.07
Spot	Daviess	0.000	0.100	0.100	6,550	2	Rural	0.23	0.68	0	3	5	8	1.23
Spot	Daviess	1.950	2.050	0.100	6,550	2	Rural	0.23	0.68	0	2	5	7	1.07
Spot	Daviess	2.599	2.699	0.100	8,960	2	Rural	0.23	0.61	0	5	9	14	1.76
Spot	Daviess	3.400	3.500	0.100	8,960	2	Rural	0.23	0.61	1	4	2	7	0.88
Spot	Daviess	3.680	3.780	0.100	8,960	2	Rural	0.23	0.61	0	2	3	5	0.63
Spot	Daviess	4.000	4.100	0.100	8,960	2	Rural	0.23	0.61	0	3	3	6	0.75
Spot	Daviess	4.905	5.005	0.100	8,960	2	Rural	0.23	0.61	0	3	3	6	0.75
Spot	Daviess	8.027	8.127	0.100	10,300	2	Rural	0.23	0.58	0	1	5	6	0.69
Spot	Daviess	10.085	10.185	0.100	10,300	2	Urban	0.25	0.62	0	1	4	5	0.54
Spot	Daviess	11.300	11.400	0.100	29,900	4	Urban	0.41	0.67	0	9	6	15	0.51
Spot	Daviess	12.550	12.650	0.100	27,400	4	Urban	0.41	0.68	0	1	6	7	0.26
Spot	Daviess	13.440	13.540	0.100	27,400	4	Urban	0.41	0.68	0	3	2	5	0.18

**Exhibit B.17
Adequacy Ratings**

County	BMP	EMP	Condition Index	Max Possible Condition Index	Safety Index	Max Possible Safety Index	Service Index	Max Possible Service Index	Composite Adequacy Rating	Percentile
Logan	0.000	0.400	30.00	30.00	45.00	45.00	20.00	25.00	95.00	100.00
Logan	0.400	1.150	30.00	30.00	22.00	45.00	20.00	25.00	72.00	27.68
Logan	1.150	1.323	30.00	30.00	39.00	45.00	20.00	25.00	89.00	75.93
Logan	1.323	1.809	30.00	30.00	41.00	45.00	20.00	25.00	91.00	80.64
Logan	1.809	2.300	30.00	30.00	41.80	45.00	20.00	25.00	91.80	83.15
Logan	2.300	4.145	30.00	30.00	39.80	45.00	20.00	25.00	89.80	78.57
Logan	4.145	8.252	30.00	30.00	41.80	45.00	20.00	25.00	91.80	83.15
Logan	8.252	11.922	30.00	30.00	41.80	45.00	20.00	25.00	91.80	83.15
Logan	11.922	12.391	30.00	30.00	30.00	35.00	27.00	35.00	87.00	87.39
Logan	12.391	12.520	30.00	30.00	30.00	35.00	27.00	35.00	87.00	87.39
Logan	12.520	13.237	30.00	30.00	30.00	35.00	27.00	35.00	87.00	87.39
Logan	13.237	13.896	30.00	30.00	18.00	35.00	9.45	35.00	57.45	29.07
Logan	20.900	21.478	35.00	35.00	33.20	35.00	25.00	30.00	93.20	56.69
Logan	21.478	21.636	35.00	35.00	33.20	35.00	25.00	30.00	93.20	56.69
Logan	21.636	22.630	35.00	35.00	33.20	35.00	25.00	30.00	93.20	56.69
Logan	22.630	23.859	35.00	35.00	33.20	35.00	25.00	30.00	93.20	56.69
Logan	23.859	25.400	35.00	35.00	33.20	35.00	25.00	30.00	93.20	56.69
Logan	25.400	28.207	35.00	35.00	24.50	35.00	25.00	30.00	84.50	28.78
Logan	28.207	31.050	35.00	35.00	13.30	35.00	25.00	30.00	73.30	9.77
Muhlenberg	0.000	1.700	35.00	35.00	12.40	35.00	25.00	30.00	72.40	7.67
Muhlenberg	1.700	2.873	35.00	35.00	23.60	35.00	25.00	30.00	83.60	26.29
Muhlenberg	2.873	6.700	35.00	35.00	3.90	35.00	25.00	30.00	63.90	2.27
Muhlenberg	6.700	7.100	26.25	35.00	9.00	35.00	25.00	30.00	60.25	1.14
Muhlenberg	7.100	7.400	26.25	35.00	26.00	35.00	25.00	30.00	77.25	12.56
Muhlenberg	7.400	8.400	26.25	35.00	23.30	35.00	25.00	30.00	74.55	10.07
Muhlenberg	8.400	8.550	26.25	35.00	23.30	35.00	25.00	30.00	74.55	10.07
Muhlenberg	8.550	9.300	26.25	35.00	20.60	35.00	25.00	30.00	71.85	6.97
Muhlenberg	9.300	9.700	26.25	35.00	26.00	35.00	25.00	30.00	77.25	12.56
Muhlenberg	9.700	10.000	26.25	35.00	9.00	35.00	25.00	30.00	60.25	1.14
Muhlenberg	10.000	11.300	26.25	35.00	23.30	35.00	25.00	30.00	74.55	10.07
Muhlenberg	11.300	11.550	26.25	35.00	6.30	35.00	25.00	30.00	57.55	0.81
Muhlenberg	11.550	11.982	26.25	35.00	23.30	35.00	25.00	30.00	74.55	10.07
Muhlenberg	11.982	15.184	26.25	35.00	32.00	35.00	25.00	30.00	83.25	24.29
Muhlenberg	15.184	16.538	26.25	35.00	32.00	35.00	25.00	30.00	83.25	24.29
Muhlenberg	16.538	16.605	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
Muhlenberg	16.605	17.250	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
Muhlenberg	17.250	17.705	26.25	30.00	9.00	35.00	25.00	35.00	60.25	1.14
Muhlenberg	17.705	18.241	26.25	30.00	29.60	35.00	25.00	35.00	80.85	16.98

**Exhibit B.17
Adequacy Ratings**

County	BMP	EMP	Condition Index	Max Possible Condition Index	Safety Index	Max Possible Safety Index	Service Index	Max Possible Service Index	Composite Adequacy Rating	Percentile
Muhlenberg	18.241	18.278	26.25	30.00	15.30	35.00	5.00	35.00	46.55	0.14
Muhlenberg	18.278	18.391	22.50	30.00	12.00	35.00	27.00	35.00	61.50	38.39
Muhlenberg	18.391	18.679	22.50	30.00	12.00	35.00	17.55	35.00	52.05	21.50
Muhlenberg	18.679	18.879	22.50	30.00	12.00	35.00	27.00	35.00	61.50	38.39
Muhlenberg	18.879	19.389	22.50	30.00	21.00	35.00	25.65	35.00	69.15	51.76
Muhlenberg	19.389	19.462	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Muhlenberg	19.462	20.600	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Muhlenberg	20.600	20.661	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Muhlenberg	20.661	20.693	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Muhlenberg	20.693	21.293	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Muhlenberg	21.293	21.481	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Muhlenberg	21.481	22.450	35.00	35.00	12.60	35.00	25.00	30.00	72.60	8.37
Muhlenberg	22.450	24.232	35.00	35.00	26.90	35.00	25.00	30.00	86.90	34.23
Muhlenberg	24.232	27.779	35.00	35.00	29.60	35.00	25.00	30.00	89.60	39.24
McLean	0.000	1.045	14.00	35.00	32.30	35.00	25.00	30.00	71.30	6.93
McLean	1.045	1.800	14.00	35.00	32.30	35.00	25.00	30.00	71.30	6.93
McLean	1.800	2.500	14.00	35.00	32.30	35.00	25.00	30.00	71.30	6.93
McLean	2.500	4.354	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
McLean	4.354	4.954	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
McLean	4.954	5.400	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
McLean	5.400	6.650	35.00	35.00	29.60	35.00	25.00	30.00	89.60	39.24
McLean	6.650	8.265	35.00	35.00	32.30	35.00	25.00	30.00	92.30	55.81
McLean	8.265	8.300	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
McLean	8.300	9.852	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
McLean	9.852	10.507	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
McLean	10.507	11.573	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
Daviess	0.000	2.599	26.25	35.00	32.30	35.00	25.00	30.00	83.55	25.74
Daviess	2.599	7.215	35.00	35.00	29.60	35.00	25.00	30.00	89.60	39.24
Daviess	7.215	8.027	35.00	35.00	35.00	35.00	25.00	30.00	95.00	85.33
Daviess	8.027	10.246	35.00	35.00	32.30	35.00	25.00	30.00	92.30	55.81
Daviess	10.246	10.952	30.00	30.00	30.00	35.00	27.00	35.00	87.00	87.39
Daviess	10.952	11.923	22.50	30.00	30.60	35.00	25.65	35.00	78.75	66.64
Daviess	11.923	13.900	22.50	30.00	30.00	35.00	22.95	35.00	75.45	62.67
Daviess	13.900	14.519	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55
Daviess	14.519	14.670	22.50	30.00	30.00	35.00	27.00	35.00	79.50	70.55

Appendices C-F on CD

C – Environmental Overview Report

D – Environmental Justice Report

E – Minutes from Project Team Meetings

F – Resource Agency Coordination Letters

Environmental Overview Final



US 431 Logan, Muhlenberg, McLean and Daviess Counties Item No. 2-8106.00

April 2004



Prepared for:
Kentucky Transportation
Cabinet



Prepared by:
Wilbur Smith Associates



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APPENDICES

- Appendix A. Environmental Resource Information
- Appendix B. Project Area Photographs
- Appendix C. Listing of Additional Community Sensitive Locations
- Appendix D. Listing of Sites and Wells

I. Introduction

An environmental footprint was developed for the US 431 project area. Beginning at the Tennessee / Kentucky state line in Logan County, US 431 completely traverses the western part of Kentucky. From Logan County, US 431 extends north through the Kentucky counties of Muhlenberg and McLean. Finally, the route terminates in Daviess County at the Kentucky / Indiana state line. In total, US 431 has approximately 85.9 miles of roadway within Kentucky. A preliminary environmental analysis was completed to identify potential issues and concerns within the defined US 431 study area.

Issues Considered

- ✓ Natural and Manmade Features
- ✓ Biotic Communities
- ✓ Social, Economic and Environmental Justice Concerns
- ✓ Historic and Archaeological Sites
- ✓ Prime and Unique Farmland
- ✓ UST/HazMat, Oil and Gas Sites

A four-county Geographic Information System (GIS) was assembled for the defined study area using relevant environmental data collected from numerous sources that include: federal, state, and local databases; agency contacts; field investigations; and existing in-house data. Resource information, including contacts and web site locations for each source (as available), is included in **Appendix A**. The compiled data was geo-referenced as needed using the GIS developed for the project.

Windshield surveys were conducted which included consideration of known and unknown environmental issues within the project area. Photo documentation of identified sites was undertaken where possible. Project area photographs for each county are included throughout this report and are located within **Appendix B**. In some instances, the development of graphics was assisted by the use of a global positioning system (GPS) unit for field data collection and application in the GIS database.

This study identified environmental issues that are likely to require consideration during any environmental assessment for the proposed transportation improvements. The environmental issues considered as part of the overview analysis include: Natural and Manmade Features; Biotic Communities; Social, Economic, and Environmental Justice Concerns; Historic and Archaeological Sites; UST/HazMat, Oil and Gas Concerns; and other additional issues. These items are summarized within a 4,000-foot buffer zone centered on the existing US 431 alignment on a county by county basis.

II. Logan County Environmental Overview

Figure 1 displays the environmental features identified within Logan County along US 431 in the study area. The study area refers to anything inside of the 4000' buffer zone in Logan County.

It should be noted that features displayed on the map may be deceiving as one graphic feature symbol can often represent more than one of that particular feature. For instance, a graphic symbol indicating one water well may actually represent multiple water wells. The following text addresses such occurrences where possible.

A. Natural and Manmade Water Features

Natural and manmade features considered as part of this analysis are divided into five (5) categories: water resources, surface water, lakes/ponds, wetlands, and floodplains.

1. Water Resources

A number of manmade water resources are located within the Logan County section of the study area. A summary is provided below:

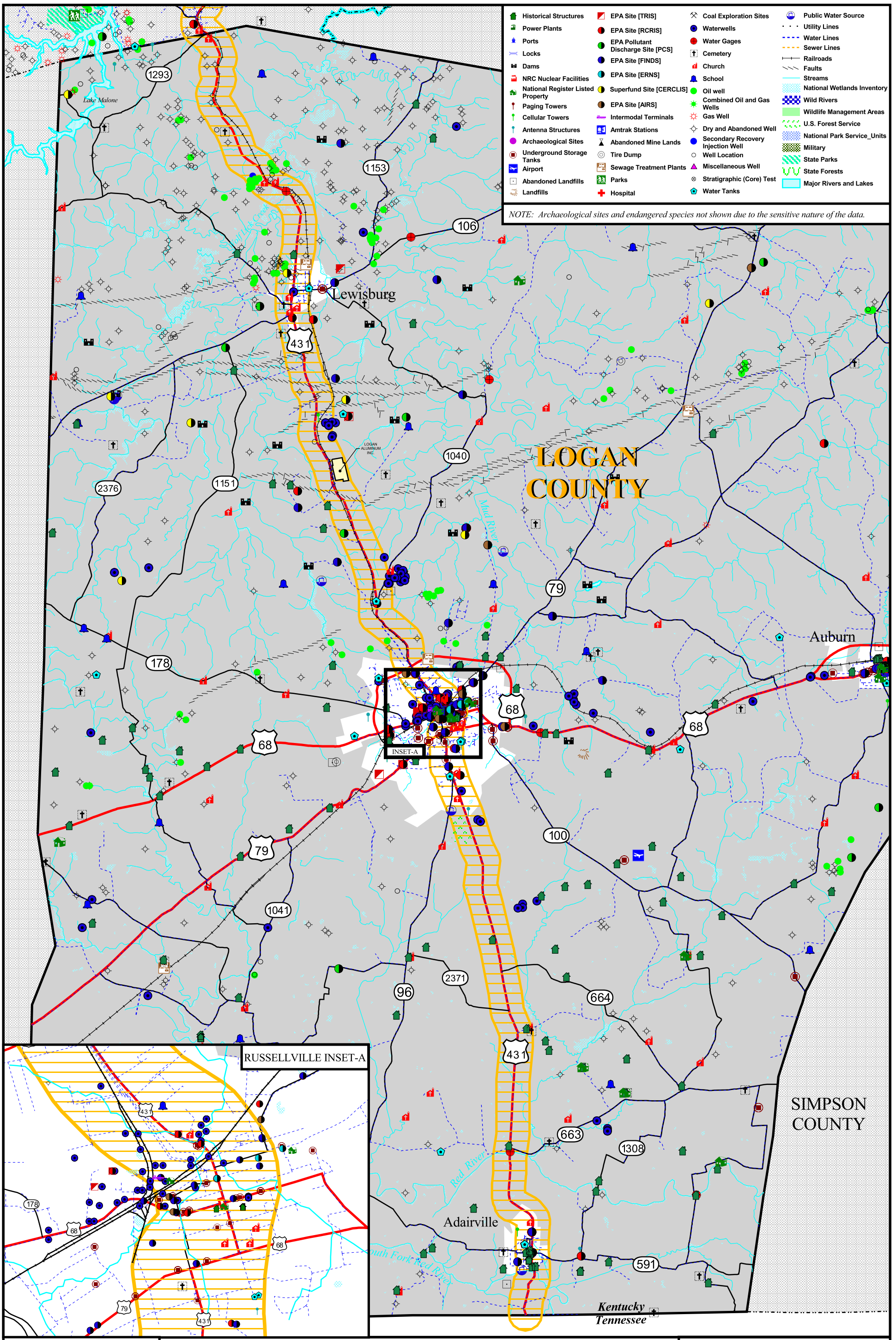
- There are 67.0 miles of water lines in the study area;
- There are eight (8) water tanks in the study area. Four (4) of these are located within the study area within the Russellville corporate limits. These are represented by two (2) separate water tank symbols, each representing two (2) individual tanks;
- Two (2) public water facilities are found within the study area. These include the Adairville Water Works, located next to the South Fork of the Red River, and Russellville Municipal Water, located adjacent to the Russellville Country Club on the southern edge of town;
- There are 227 water wells located inside the study area. The highest concentrations of water wells can be found in Russellville. In addition, clusters of water wells can be found along US 431 between Russellville and Lewisburg. The primary use of these sites differs mostly between well monitoring locations and domestic usage; and,
- Two (2) water gauges are located within the study area. The first is located on the Red River north of Adairville while the other is found on Wolf Lick Creek north of Lewisburg.

2. Surface Water

The US 431 study area in Logan County is divided into two major watersheds: the Green River watershed and the Cumberland River watershed. The city of Russellville is the geographic dividing line between the two watersheds.

- Streams north of Russellville tend to flow into the Mud River, which in turn, empties into the Green River; and,
- Streams south of Russellville tend to flow into the Red River and South Fork Red River. These two rivers merge and continue south to the Cumberland River in Tennessee.

The Mud River, the Red River and the South Fork of the Red River are the only river systems found within the study area. The Mud River forms just east of Russellville near the intersection of KY 2369 and US 68. The Red River crosses the US 431 corridor just north of Adairville at the junction of US 431 and KY 663. The South Fork Red River flows along the



- | | | | |
|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------|
| Historical Structures | EPA Site [TRIS] | Coal Exploration Sites | Public Water Source |
| Power Plants | EPA Site [RCRIS] | Waterwells | Utility Lines |
| Ports | EPA Pollutant Discharge Site [PCS] | Water Gages | Water Lines |
| Locks | EPA Site [FINDS] | Cemetery | Sewer Lines |
| Dams | EPA Site [ERNS] | Church | Railroads |
| NRC Nuclear Facilities | Superfund Site [CERCLIS] | School | Faults |
| National Register Listed Property | EPA Site [AIRS] | Oil well | Streams |
| Paging Towers | Intermodal Terminals | Combined Oil and Gas Wells | National Wetlands Inventory |
| Antenna Structures | Amtrak Stations | Gas Well | Wild Rivers |
| Archaeological Sites | Abandoned Mine Lands | Dry and Abandoned Well | Wildlife Management Areas |
| Underground Storage Tanks | Tire Dump | Secondary Recovery Injection Well | U.S. Forest Service |
| Airport | Sewage Treatment Plants | Miscellaneous Well | National Park Service Units |
| Abandoned Landfills | Hospital | Stratigraphic (Core) Test | Military |
| Landfills | | Water Tanks | State Parks |
| | | | State Forests |
| | | | Major Rivers and Lakes |

NOTE: Archaeological sites and endangered species not shown due to the sensitive nature of the data.

Legend

- 4000' Corridor
- U.S. Highways
- State Roads

Scale: 0 to 4 Miles

KENTUCKY

Environmental Footprint
 FIGURE 1
 Logan County
 Item No. 2-8106.00
 Phase 1 - Scoping Study for Safety Improvements on US 431 from the McLean/Muhlenberg Co. Line to the Tennessee Border

southern edge of Adairville, crossing the study area near the intersection of US 431 and KY 591.

A total of sixty-five (65) individual streams compose a total of 27.2 miles of streams in the project area. A concentration of stream tributaries can be found within the study area north of Russellville. Tributaries flowing south of Russellville are more limited in number with very few crossing the study area. The southern half of Logan County is located within a *karst* landscape, which is characterized by sinkholes, underground conduits, and caves. Stream patterns are sometimes affected by the *karst* landscape. In some instances, streams are formed underground which could explain a decrease in tributaries in southern Logan County.

Natural and Manmade Features

- ✓ Water lines, tanks, and wells
- ✓ Two major watersheds
- ✓ Major River systems
- ✓ 57 wetland areas totaling 182 acres
- ✓ Zone A floodplains

Streams are classified by a hierarchy system called *stream order*. In this system, the smallest stream is designated an Order 1 stream and the largest is designated an Order 8 stream. The Ohio River is an example of an Order 8 stream. As stream segments continue to merge, the Order number increases. Order designations in the study area include:

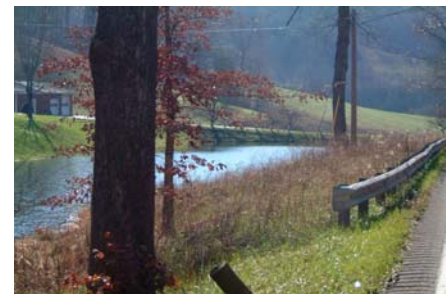
- There are no Order 6, 7, or 8 streams crossing the study area;
- There is one (1) Order 5 stream within the study area, Wolf Lick Creek, which totals 1.0 mile in length. The *Mud River* is an Order 5 stream located just outside of the 4000' buffer zone;
- There are five (5) Order 4 streams within the study area. These streams have a combined total length of 2.5 miles and include the *Red River* and *South Fork of the Red River*;
- There are six (6) Order 3 streams located in the study area. These streams have a combined total length of 3.8 miles;
- There are sixteen (16) Order 2 streams located in the study area. These streams have a combined total length of 4.8 miles; and,
- There are thirty-seven (37) Order 1 streams within the study area. These streams have a combined total length of 15.1 miles.

Information obtained from the Water Quality Branch of the Natural Resources and Environmental Protection Cabinet (NREPC) indicates there are no Outstanding Resource Waters or Wild Rivers within the proposed corridor.

As recommended by the Division of Environmental Analysis, all channel changes should be avoided as part of this project to reduce mitigation needs and permitting requirements.

3. Lakes/Ponds

There are no natural or man-made lakes within the US 431 study area in Logan County. However, field review in the northernmost section of the study area indicates that private ponds are found scattered along US 431. In southern Logan County, ponds and sinkholes are found, likely due to increased karst topography in the area.



Pond located beside US 431

4. Wetlands

Fifty-seven (57) wetlands are recorded within the study area totaling over 182 acres. Compared to other western Kentucky counties, Logan County does not contain as many wetlands. Similar to the stream data, wetlands are more frequent in the northern half of the county. Stretches of wetlands can be found following linear tracts along stream corridors and floodplains. Smaller, more secluded wetland areas populate the more southern portions of the study area. From Russellville to the Kentucky/Tennessee state line, wetland areas within the study area become increasingly sparse or absent.

A field inspection of each of these areas will be necessary to determine their jurisdictional status (i.e., they may or may not require a nationwide or individual permit from the US Army Corps of Engineers). Furthermore, a more in depth inspection would be beneficial for mitigation assessment purposes, if needed.

5. Floodplains

The available Q-3 digital Federal Emergency Management Agency (FEMA) data for Kentucky floodplains are digital datasets that are available on a county-by-county basis. Based on this data source, the Logan County floodplain data includes the following:

- The city of Adairville is surrounded by the Red River to the north and South Fork Red River to the south. Adairville is within FEMA designated “Zone A” for which Base Flood Elevations (BFEs) have not been determined. Zone A indicates that an area is inundated by 100-year flooding;
- Near Russellville, tributaries of the Mud River cross the study area with 90% of the area designated “Zone AE.” FEMA considers “Zone AE” locations to be inundated by 100-year flooding for which BFEs have been determined. The remaining 10% of the area is categorized “Zone X500,” an area inundated by 500-year flooding. This also includes areas inundated by 100-year flooding with average depths of less than one foot or with drainage areas less than one square mile. In addition, “Zone X500” includes any areas protected from 100-year flooding by levees; and,
- One other area for flood potential within the study area is located along the tributaries of Wolf Lick Creek, which is approximately 2.5 miles north of Lewisburg. This area contains “Zone A” 100-year flood inundation potential, within an area over 533 acres in size.

B. Biotic Communities

Biotic communities considered as part of this analysis are divided into floral and faunal categories as discussed in the following sections. The Kentucky State Nature Preserves Commission (KSNPC) monitors a number of endangered, threatened, or special concern plants or animals within the US 431 study area. The KSNPC data is updated on a regular basis and may be verified as needed in future phases of this project. To further ensure the accuracy of this analysis, a cross-check was completed with data collected from the United States Fish and Wildlife Service (USFWS).

1. Floral Communities

The KSNPC has determined that six (6) occurrences of monitored vascular plants are recorded within the study area in Logan County. These include:

- Two (2) species have been determined to be **endangered**: *Soft False Gromwell* and the *Rough Rattlesnake-Root*;

- Two (2) species have been given a **threatened** status: *White Heath Aster* and the *Carolina Larkspur*; and,
- Two (2) species are considered to be **special concern** flora: *Blue Wild Indigo* and the *Purple Prairie-Clover*.

The USFWS does not list *Soft False Gromwell* or *Rough Rattlesnake-Root* as **endangered** floral species; nor does it list *White Heath Aster* or *Carolina Larkspur* as **threatened** floral species within the study area.

2. Faunal Communities

Based upon the KSNPC's most current information, five (5) occurrences of monitored species are found within the study area including one (1) of each: mammal, fish, amphibian, crustacean, and reptile.

- One (1) species has been determined to be **endangered**: the *Indiana Bat* (mammal);
- No **threatened** species were found within the study area; and,
- Four (4) species are considered to be **special concern** fauna: *Pallid Shiner* (fish), *Barking Treefrog* (amphibian), *Crayfish* (crustacean), and *Copperbelly Water Snake* (reptile).



Barking Treefrog
<http://www.uga/srel>

The *Indiana Bat* is also listed within the USFWS's database as an **endangered** faunal species, while there where no **threatened** faunal species listed by the USFWS within the study area. Also, it should be recognized that **special concern** listings are not displayed within the USFWS database.

It should be noted that the *Copperbelly Water Snake* in this region is subject to the conditions outlined in the Copperbelly Water Snake Conservation Agreement, overseen by the Kentucky Department of Fish and Wildlife Resources.

Another species, the basic *Crayfish* (*Orconectes Pellucidus*) is listed by KSNPC as a "**Sensitive Element.**" This species is located in areas of subterranean waters within the city of Adairville.

C. Social, Economic, and Environmental Justice Concerns

Socioeconomic concerns considered as part of this analysis include social and economic locations, and environmental justice. These items are discussed in the following sections.

1. Social and Economic Locations

Twenty (20) community sensitive locations were identified in the study area. These locations include:

- There are fourteen (14) churches in the study area. Four (4) can be found adjacent to US 431 while the remaining ten (10) are located in and around cites or towns. **Appendix C** provides a listing of the churches;
- One (1) school facility is located within the study area. Stevenson Elementary School is located inside the city limits of Russellville; and,
- Five (5) cemeteries are found in the study area, none of which are identified as historic. Two (2) of the cemeteries were located from a field survey and were not

queried from our database. The remaining three (3) sites were identified as the following: the Fitzhugh Cemetery (near the Muhlenberg County line), the Kinnley Chapel Cemetery (in Lewisburg), and the Lewisburg Cemetery (in Lewisburg).

In addition to the potential community concern areas described above, the study area is composed of various businesses and industry. The major manufacturing area within Logan County is Russellville.

- There are over fifteen (15) major manufacturing sites near Russellville. The largest is Logan Aluminum, Inc., which employs over 1,100 local residents;
- In all, over 4,000 of the 10,000 jobs in Logan County are in manufacturing;
- Retail and local services provide the greater remaining portion of employment in the study area;
- Agriculture is not a major player in regards to area economics;
- Logan County has a per capita personal income (PCPI) of \$20,696. This PCPI ranks 51st in the State and is lower than the state average (\$24,085) and the national average (\$29,469); and,
- The unemployment rate in Logan County as of 2001 is listed at 8.7 percent, which is higher than the State average of 5.5 percent and the U.S. average of 4.8 percent.

2. Environmental Justice

An important consideration for highway reconstruction or new development is environmental justice. For this study, environmental justice was addressed by calculating the percentage of minorities and low-income persons in the project area. Information was gathered from 2000 U.S. Census tract population counts. The study area is located in Census Tracts 9602, 9603, 9604, 9605, and 9606 in Logan County.

Environmental justice concerns related to minority populations may exist based on Census 2000 data for the project area census tracts:

- Census Tracts 9603, 9605, and 9606 have minority populations of 17.9, 12.5, and 13.2 percent, respectively.
- These percentages are higher than average percentages for Kentucky and Logan County (10.0 and 9.7 percent, respectively).

Similarly, field review activities indicate that residential dwellings currently reflect evidence of potential environmental justice issues with respect to low-income housing. Low-income data from the 2000 U.S. Census has not yet been released for the census tracts; however, census bureau information for the year 1999 indicates that three census tracts have a higher percentage of persons living in poverty than Kentucky and Logan County:

- Census Tracts 9602, 9603, and 9604 have poverty rates of 19.5, 17.1 and 16.8 percent, respectively.
- The statewide and countywide rates were 15.8 percent and 15.5 percent, respectively, in 1999.

It should be noted that 2000 minority population and 1999 low-income data sets were the latest available information at the time of this report.

The Green River Area Development District is compiling an Environmental Justice document to be included in the project study report. This document should be referenced for a more in-depth analysis of the environmental justice issues in the study area.

D. Historic and Archaeological Sites

A number of historic and archaeological sites are located within the study area. A full historic baseline study is recommended early in project development to review cultural landscapes and other historic sites in the study area.

1. Historic Sites

There are numerous historical points of interest throughout the US 431 study area in Logan County. Russellville and Adairville each have history dating back to the American Civil War.

- The Russellville Historic District is listed on the National Register of Historic Places and was added in 1976. This district covers 2100 acres in size and includes sixty-one (61) buildings and three (3) structures;
- Russellville has several Confederate Civil War historic markers documenting its extensive and important role in history;
- Russellville was the site of the **Confederate State Convention** on November 20th, 1861 in which sixty-four (64) Kentucky counties seceded from the Union; and,
- A small Civil War skirmish was fought in Adairville and headed by Confederate General J.K. Jackson on May 17th, 1862.



Civil War cannon in Russellville

Other historic sites include:

- Seventy-eight (78) historic structures are recorded within the study area;
- Two (2) **National Register List** structures are found in the study area. Both are located in Russellville:
 - The first structure is a Confederate monument, which is located at the intersection of US 431 and US 68; and,
 - The second structure is the Long-Briggs House, which is located on Cornelius Avenue.

2. Archaeological Sites

There are twenty-three (23) archaeological sites officially recorded within the project area in Logan County. Twenty (20) of these sites are located between the cities of Lewisburg and Russellville.

Within the Russellville city limits, seven (7) archaeological sites are located and include:

- Sites 15Lo73, 15Lo91, and 15Lo102 have no components to determine a cultural period of origin;
- Sites 15Lo68, 15Lo70, and 15Lo71 are determined to belong in an undefined *Woodland* cultural period. Site 15Lo71 is the only site in which a family still inhabits the site area. This site is also known as the *Nolan Still Site* (a farm site); and
- 15Lo184 is the only known site to be dated from the *Late Archaic* period.

Historic/Archaeological Features

- ✓ Historic District in Russellville
- ✓ Confederate State Convention
- ✓ 78 Historic Structures
- ✓ 2 National Register Listings
- ✓ 23 Archaeological Sites

The fourteen (14) archaeological sites located along US 431 between Russellville and Lewisburg include:

- Sites 15Lo168 (1801-1900), 15Lo167 (1950-2000), 15Lo170 (1801-1850), 15Lo171 (1901-1950), and 15Lo162 (1851-1950) are all *Historic Farm* locations. These sites have been disturbed to an unknown extent.
- Archaeological sites 15Lo159, 15Lo160, 15Lo161, 15Lo164, 15Lo165, 15Lo166, and 15Lo169 are collectively classified as “*open habitation without mounds*.” These sites are also disturbed to an unknown extent;
- 15Lo173 is a late prehistoric site of the Mississippian period that is described as a “*rock shelter*.” This site has also been disturbed to unknown extent; and
- Site 15Lo134 has very limited information regarding its significance. This may be due in part to its unknown extent of disturbance.

The remaining two (2) archaeological sites within the study corridor in Logan County are located just north and south of the city of Adairville. These sites include:

- Site 15Lo74 is located along the Red river, just north of Adairville. This site is classified as an “*open habitation without mounds*” site that is non-historic; and
- Site 15Lo51 is located south of Adairville, just north of the Kentucky/Tennessee state line. This site is also classified as an “*open habitation without mounds*” site and described as non-historic.

E. Prime and Unique Farmland Concerns

An estimated 79% of Logan County is harvested cropland. Soybeans, corn, oats, wheat, and barley are the staple crops in this area. According to the Soil Survey Geographic (SSURGO) database, over 44% of Logan County is covered by prime farmland. The SSURGO database is updated and maintained by the United States Department of Agriculture (USDA). The attribute database contains physical and chemical soil properties for approximately 18,000 soil series recognized in the United States. SSURGO data provides the most detailed level of information and was designed primarily for farm and ranch, landowner/user, township, county, or natural resource planning and management. Using the soil attributes, this data serves as an excellent source for determining soil assessment and development.

One concern relative to farming in southern Logan County involves drainage within the *karst* landscape of this area. As farmers utilize herbicides and pesticides to maintain crops, these chemicals are capable of draining into underground water systems, potentially affecting plant and animal life. Further alteration of the landscape could promote new or additional groundwater and drainage concerns within the study area.

Relocation of the US 431 corridor could result in land use changes and subsequent impacts to prime farmland, including chemical runoff into sinkholes and other drainage concerns.

F. Monitored Sites and Wells

A review of the databases and data source information covering the project area revealed a number of monitored sites, hazardous materials sites, locations with discharge permits, as well as oil and gas wells. A listing of these sites as well as a corresponding address of the sites can be found in **Appendix D**. The most significant issue along the corridor appears to be a site designated within the “Superfund” database, a number of underground storage tank locations, and oil and gas wells. A summary of these issues is presented as follows:

- One (1) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or “Superfund” site. In 1980, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund. The intent of this legislation was to regulate the cleanup of disposal sites where hazardous waste was leaking into the environment. The subject site is described as the TVA/Homer L. Owens substation capacitors site, and can be found west of the Lewisburg city limits, approximately 500 feet downstream of Rockwell Branch. Currently, this federal facility, discovered in 1987, is not listed on the National Priority List (NPL) meaning that immediate action for this site is not anticipated under the Superfund Program. However, this site may represent a significant concern for project development considerations and should be avoided unless further investigation reveals this site to be free from environmental hazards;
- A total of 108 underground storage tank (UST) sites are found within the Logan County study corridor. Approximately ninety-two (92) tanks are located within the corporate limits in Russellville, including thirty (30) tanks which are currently in use, seventeen (17) tanks which are not in use and forty-five (45) tanks which have been permanently removed. Adairville accounts for the remaining sixteen (16) underground storage tanks. Of these, five (5) tanks are currently active, while the remaining eleven (11) have been permanently removed. In the development of corridor alignments, consideration should be given to opportunities to avoid the locations where underground storage tanks currently exist or did exist to avoid the need to remove existing tanks or assume liability for right-of-way that may be contaminated;
- Seventeen (17) Resource Conservation and Recovery Information System (RCRIS) sites. These sites are required to provide information about their activities to state environmental agencies. RCRIS is a national information system which supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities which generate, transport, treat, store or dispose of hazardous waste. RCRIS allows the RCRA program staff to track the notification, permit, compliance and corrective action activities required under the RCRA. Thirteen (13) of these sites are found within the corporate limits of Russellville. The remaining four (4) sites are split between Adairville and Lewisburg. Seven (7) of the RCRIS sites were also found in the FINDS database discussed later in this section. Of these seven (7), six (6) are located in Russellville (BTR Precision Die Casting, Inc., Bethel Cleaners, KO Kleeners, Minit Mart #41, Penske Truck Leasing and a private residence) while one (1) can be found in Adairville (Adairville Auto Care). In the development of corridor alignments, further investigation of these locations is warranted in order to better understand their environmental significance and liability risk that they may pose to the Cabinet;
- Five (5) Aerometric Information Retrieval System (AIRS) sites. AIRS sites are used to track emissions and compliance data from industrial plants. AIRS data are utilized by states to prepare State Implementation Plans (SIP) to comply with regulatory programs and by the Environmental Protection Agency (EPA) as an input for the estimation of the total national emissions. All five (5) AIRS sites found in the study corridor are located within the corporate limits of Russellville. Of the five (5):
 - Two (2) are associated with the Carpenter, Co.
 - Two (2) are associated with the Adairville Feed Mill No. 2; and,
 - One (1) is associated with BTR Precision Die Casting.

- One (1) Emergency Response Notification System (ERNS) site, located within the corporate limits of Russellville on 302 N. Main Street at the UNOCAL station. The ERNS is an extensive database revealing notifications of oil and hazardous substance releases that have occurred throughout the United States. This data base is a listing of locations where a release or spill of hazardous material has previously occurred at a federally-determined level and the responsible operator has notified the federal government of the spill. Further investigations of these locations, including soil tests or other appropriate investigations should be undertaken if these locations are going to be potentially impacted during the project development phase;
- Four (4) Permit Compliance System (PCS) sites. The PCS represents companies which have been issued permits to discharge waste water into rivers. PCS is a computerized management information system which contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks permit, compliance, and enforcement states of NPDES facilities. The first PCS site is located north of the corporate limits of Russellville on 106 SW Park Square. The other three (3) sites are also listed in the FINDS database. Two (2) of these are located in Russellville (Encon KY Inc at 300 Nashville Road, and Marathon Fuels, Inc on West 2nd Street) while the final site is located in Adairville (Adairville STP on Cemetery Street). Sites categorized as PCS sites do not necessarily represent a particular environmental hazard for highway project development considerations, but further investigation of any potentially impacted sites is recommended during the project development process;
- Seventeen (17) Facility Identification Initiative System (FINDS) sites, all of which are located within the corporate limits of Central City. The goal of this system, which was developed in the mid-1990's, was to simplify the reporting of all government sites by using an extensive database relative to all environmental sites monitored by the EPA which are subject to environmental regulation or of environmental interest. The sites contained in this database are facilities that are subject to federal environmental reporting and permitting requirements. Since this database is a compilation of multiple types of sites, there is some overlap between the FINDS sites and those described in the previous bullets. Of the seventeen (17) sites, fourteen (14) are found within the corporate limits of Russellville. The remaining three (3) sites are found in Adairville. Seven (7) of the sites are identified as RCRIS sites, three (3) are identified as PCS sites, while the remaining seven (7) sites do not have a specific designation; and,
- 47 oil and gas wells, mostly near the northern portion of the study area. While these wells do not represent insurmountable obstacles for project development purposes, several issues should be considered if these sites are to be impacted by future construction. First, the KYTC must compensate the owner/operator of the well for its loss. Also, the KYTC must take responsibility for operating issues with the well and eventual closing and plugging. Plugging costs range from \$1,500 for a shallow well to \$6,000 or more for deeper wells or wells with problems. Finally, many oil and gas wells produce a brine wastewater and potentially other contaminants that should be investigated on the sites.

It should be noted that within Figure 1, the mapping legend may contain additional environmental graphic symbols that do not appear on this map.

G. Additional Concerns

Other items identified within the US 431 study area include:

- Areas south of Russellville towards the Tennessee/Kentucky state line become increasingly susceptible to runoff pollution associated with *karst* topography;
- Additional UST/HazMat concerns are likely to be associated with farming operations in the study area;
- Six (6) fault lines cross the study area between Lewisburg and areas north of Logan Aluminum, Inc.; and,
- A Sewage Treatment Plant is located along the outer edge of the 4000' study corridor, just north of Russellville's corporate limits.

H. Summary of Environmental Issues

The potential environmental concerns identified for the study area in Logan County have been identified through this preliminary analysis. Environmental issues that are likely to require consideration during future phases of this project include:

- Potential water quality, wetland, and floodplain issues related to the Mud River, Red River, and the South Fork of the Red River and their tributaries;
- Public and private water sources, such as water lines, wells, tanks, and facilities;
- Churches, schools, and cemeteries;
- Potential habitat for threatened, endangered, or special concern species;
- Potential environmental justice issues related to high percentages of minority and low-income populations in the project area census tracts;
- Two National Register Listed structures located along US 431;
- Prime farmland throughout the study route;
- Underground storage tanks, sewage treatment plants, and gas/oil wells; and,
- Fault lines located between the community of Lewisburg and Logan Aluminum, Inc.

III. Muhlenberg County Environmental Overview

Figure 2 displays the environmental features identified within Muhlenberg County along US 431 in the study area. The study area refers to anything inside of the 4000' buffer zone in Muhlenberg County.

It should be noted that the features displayed on the map may be deceiving in that one symbol representing a feature can often represent more than one of that particular feature. For instance, a symbol indicating one water well may actually represent more than one water well. The following text addresses such occurrences where possible.

A. Natural and Manmade Water Features

Natural and manmade features considered as part of this analysis are divided into five (5) categories: water resources, surface water, lakes/ponds, wetlands, and floodplains.

1. Water Resources

A number of manmade water resources are located within the Muhlenberg County section of the study area. A summary is provided below:

- There are 77.1 miles of water lines in the study area;
- There are four (4) water tanks in the study area. Two (2) are located in Central City, one (1) is located in Drakesboro, and the final one (1) is located between the two cities;
- There are no public water facilities found within the study area;
- There are eleven (11) water wells located in the study area. Many of these are located in the northern portion of Muhlenberg County. In addition, a high concentration of water wells is found in Central City. The water wells within the study area are listed as abandoned and therefore, have no general usage; and,
- No water gauges are located within the study area.

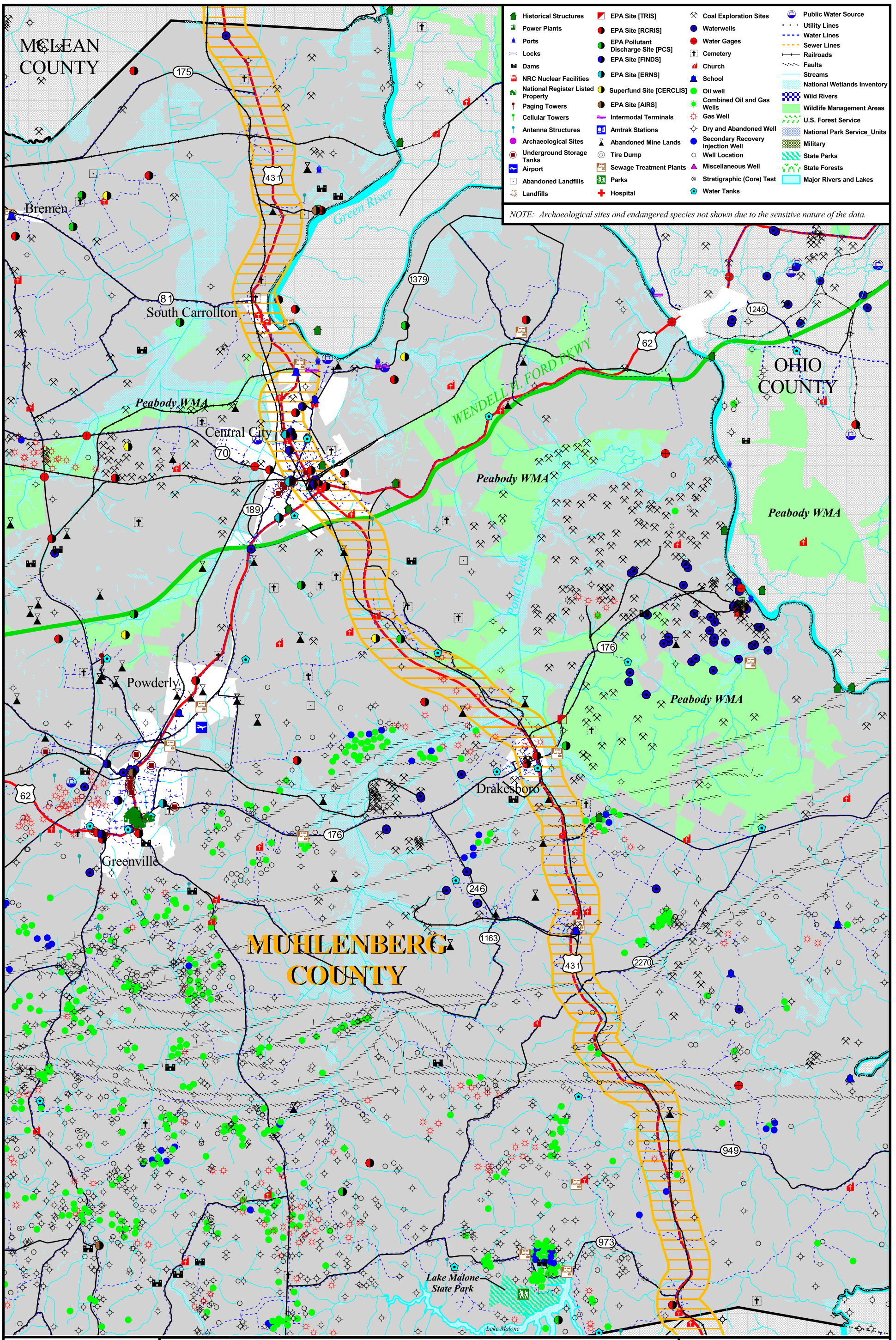
2. Surface Water

The US 431 study area in Muhlenberg County is contained within the Green River watershed. This watershed encompasses the entire county and topographically directs all stream flows into the Green River. The Green River is the only river system found within the study area. This river is located along the eastern border of Muhlenberg County and western border of Ohio County.

A total of 101 individual streams compose 35.3 miles of streams in the project area.

Streams are classified by a hierarchy system called *stream order*. In this system, the smallest stream is designated an Order 1 stream and the largest is designated an Order 8 stream. The Ohio River is an example of an Order 8 stream. As stream segments continue to merge, the Order number increases. Order designations in the study area include:

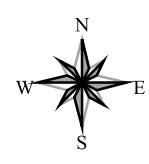
- There is one (1) Order 8 stream in the study area, the Green River. It has a length of 0.5 miles in the study area;
- There are no Order 6 or 7 streams crossing the study area;



- | | | | |
|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------|
| Historical Structures | EPA Site [TRIS] | Coal Exploration Sites | Public Water Source |
| Power Plants | EPA Site [RCRIS] | Waterwells | Utility Lines |
| Ports | EPA Pollutant Discharge Site [PCS] | Water Gages | Water Lines |
| Locks | EPA Site [FINDS] | Cemetery | Sewer Lines |
| Dams | EPA Site [ERNS] | Church | Railroads |
| NRC Nuclear Facilities | Superfund Site [CERCLIS] | School | Faults |
| National Register Listed Property | EPA Site [AIRS] | Oil well | Streams |
| Paging Towers | Intermodal Terminals | Combined Oil and Gas Wells | National Wetlands Inventory |
| Cellular Towers | Amtrak Stations | Gas Well | Wild Rivers |
| Antenna Structures | Abandoned Mine Lands | Dry and Abandoned Well | Wildlife Management Areas |
| Archaeological Sites | Tire Dump | Secondary Recovery Injection Well | U.S. Forest Service |
| Underground Storage Tanks | Sewage Treatment Plants | Miscellaneous Well | National Park Service Units |
| Airport | Parks | Stratigraphic (Core) Test | Military |
| Abandoned Landfills | Hospital | Water Tanks | State Parks |
| Landfills | | | State Forests |
| | | | Major Rivers and Lakes |

NOTE: Archaeological sites and endangered species not shown due to the sensitive nature of the data.

- Legend**
- 4000' Corridor
 - Parkways
 - U.S. Highways
 - State Roads



2 0 2 4 Miles



Environmental Footprint

FIGURE 2
 Muhlenberg County
 Item No. 2-8106.00
 Phase 1 - Scoping Study for Safety
 Improvements on US 431 from the
 McLean/Muhlenberg Co. Line to the
 Tennessee Border

- One (1) Order 5 stream can be found inside the study area. *Pond Creek* has a total length of 1.1 miles;
- There are eleven (11) Order 4 streams located in the study area. These streams have a combined total length of 2.4 miles, with the largest of these tributaries being *Little Cypress Creek*;
- Six (6) Order 3 streams are located within the study area. These streams have a combined total length of 1.2 miles;
- There are 24 Order 2 streams located in the study area. These streams have a combined total length of 9.8 miles; and,
- Order 1 streams make up the largest number with a count of 55 streams within the study area. These streams have a combined total length of 20.3 miles.

As is common to this area, dendritic stream patterns are found throughout the study area. Dendritic streams have a varying tributary order, as tributaries join the “trunk,” or stream channel at oblique angles. An example of this pattern would be the appearance of veins in tree leaves.

Information obtained from the Water Quality Branch of the Natural Resources and Environmental Protection Cabinet (NREPC) does not indicate any Outstanding Resource Waters or Wild Rivers within the proposed corridor.

As recommended by the Division of Environmental Analysis, all channel changes should be avoided as part of this project to reduce mitigation needs and permitting requirements.

3. Lakes/Ponds

There are no natural or man-made lakes within the study area portion of Muhlenberg County. However, the regional landscape of gentle to rolling topography promotes ponds of many sizes. These ponds are scattered along the study area.

4. Wetlands

Ninety (90) wetlands are recorded within the study area, totaling 906 acres. The primary wetlands within the study corridor are located north and south of Drakesboro. Larger stretches of wetlands can be found following linear tracts along stream corridors and floodplains. Some areas exhibit a more level landscape and feature wetland areas that stretch out away from stream beds and cover a more extensive area.

A field inspection of each of these areas would be necessary to determine their jurisdictional status (i.e., they may or may not require a nationwide or individual permit from the US Army Corps of Engineers). Furthermore, a more in depth inspection would be beneficial for mitigation assessment purposes, if needed.

5. Floodplains

The Q-3 digital Federal Emergency Management Agency (FEMA) data for Kentucky floodplains are digital datasets that are available on a county-by-county basis. Based on this data source, the Muhlenberg County floodplain data includes the following:

Natural and Manmade Features	
✓	Water lines, tanks and wells
✓	One major watershed
✓	90 wetland areas totaling 906 acres
✓	Zone A floodplains

- Just north of KY 949, 174 acres of potential floodplain cross the US 431 buffer zone. FEMA has classified this area a “Zone A” area, in which Base Flood Elevations

(BFEs) have not been determined. “Zone A” indicates that this is an area inundated by 100-year flooding;

- Near Drakesboro, 335 acres of floodplains not only cross the study area, but parallel it as well. FEMA has classified this area as “Zone A;”
- Floodplain tributaries can also be found throughout the Central City area as well as north of Central City. This large area has been given a “Zone X” rating, which describes areas that are determined to be outside the 100 and 500 year floodplains; and,
- Near South Carrollton, “Zone X” areas continue across the study area until the study area shifts to the Green River, and changes classification to “Zone A” and then “Zone AE” to the north.

B. Biotic Communities

Biotic communities considered as part of this analysis are divided into floral and faunal categories as discussed in the following sections. The Kentucky State Nature Preserves Commission (KSNPC) monitors a number of endangered, threatened, or special concern plants or animals within the US 431 study area. The KSNPC data is updated on a regular basis and may be verified as needed in future phases of this project. To further ensure the accuracy of this analysis, a cross-check was completed with data collected from the United States Fish and Wildlife Service (USFWS).

1. Floral Communities

The KSNPC has determined that three (3) occurrences of monitored vascular plants are recorded within the study area in Muhlenberg County. These include:

- No **endangered** species were found within the study area;
- Two (2) species have been given a **threatened** status: *Least Bittern* and *Water Hickory*. *Least Bittern* is a unit of vegetation found only within the Peabody Wildlife Management Area in and around marsh or mangrove swamp areas in the study area. *Water Hickory* is found inside two different areas in Central City, and usually located within bottomlands and floodplain swamps; and,
- One (1) **special concern** species, *Water-Purslane*, is located near Rosewood. This species is usually found within shallow waters and around margins of sloughs, ponds, and slow streams.

The USFWS does not list *Least Bittern* or *Water Hickory* as **threatened** floral species; nor does it list any potential **endangered** floral species within the study area.

2. Faunal Communities

Based upon the KSNPC’s most current information, five (5) occurrences of monitored species are found within the study area including one (1) bivalve, one (1) amphibian, and three (3) birds.

- One (1) species has been determined to be **endangered**: the *Pyramid Pigtoe*, a bivalve found along parts of the Green River;
- No **threatened** species were found within the study area;



Adult Male Henslow's Sparrow
<http://www.wbu.com>

- One (1) species is considered to be a **special concern** fauna: the *Eastern Hellbender* (amphibian); and,
- Three (3) birds are **monitored** within the study area: the *Henslow's Sparrow*, the *Great Blue Heron*, and the *Lark Sparrow*.

The *Pyramid Pigtoe* is also listed within the USFWS's database as an **endangered** faunal species. No **threatened** species were listed in the USFWS database within the study area. Also, it should be recognized that **special concern** listings are not displayed within the USFWS database.

It should also be noted that portions of the US 431 corridor are located within the **Peabody Wildlife Management Area**. Over 264 acres are found within the study area and should be considered in future phases of this project.

C. Social, Economic, and Environmental Justice Concerns

Socioeconomic concerns considered as part of this analysis include social and economic locations, and environmental justice. These items are discussed in the following sections.

1. Social and Economic Locations

Seventeen (17) community sensitive locations were identified in the study area.

- There are eleven (11) churches in the study area, each adjacent to US 431. **Appendix C** provides a listing of the churches;
- Two (2) school facilities are found within the study area; the *Central City Elementary School* in north Central City and the *Hughes-Kirk Elementary School* located south of Drakesboro. Both schools are adjacent to US 431; and,
- Four (4) cemeteries are located within the study area, none of which are identified as historic.

In addition to these potential community concern areas, the study area is comprised of various businesses and industry.

- The major industrial area within Muhlenberg County is Central City;
- There are over 11 major manufacturing sites near Central City;
- Of the 9,500 jobs in Muhlenberg County, retail trade (19.5%) and services (19.0%) make up the largest majority of employment within the study area;
- Manufacturing employment ranks third, with a 15.0% employment share;
- Muhlenberg County has a per capita personal income (PCPI) of \$19,480. This PCPI ranks 59th in the State and is lower than the state average (\$24,085) and the national average (\$29,469); and,
- The unemployment rate in Muhlenberg County as of 2001 is listed at 10.3 percent, which is nearly double the State average of 5.5 percent and the U.S. average of 4.8 percent.

2. Environmental Justice

An important consideration for highway reconstruction or new development is environmental justice. For this study, environmental justice was addressed by calculating the percentage of minorities and low-income persons in the project area. Information was

gathered from 2000 U.S. Census tract population counts in Muhlenberg County. The study area is located in Census Tracts 9601, 9602, 9607, and 9608.

Environmental justice concerns related to minority populations should be considered in future phases of this project based on Census 2000 data for the project area census tracts:

- Census Tracts 9601, 9602, 9607, and 9608 have minority populations of 8.3, 8.9, 6.0, and 0.8 percent, respectively.
- All four percentages are lower than the average percentage for Kentucky (10.0%), but three of the four are higher than the average percentage for Muhlenberg County (5.8%).

Field review of the project area indicates that residential dwellings currently reflect evidence of low-income housing. Low-income data from the 2000 U.S. Census has not yet been released for the census tracts; however, census bureau information for the year 1999 indicates that the four census tracts have a higher percentage of persons living in poverty than Kentucky and Muhlenberg County:

- Census Tracts 9601, 9602, 9607, and 9608 have poverty rates of 30.2, 20.5, 22.2, and 24.1 percent, respectively; and,
- The statewide and countywide rates were 15.8 percent and 19.7 percent, respectively, in 1999.

It should be noted that 2000 minority population and 1999 low-income data sets were the latest available information at the time of this report.

The Green River Area Development District is compiling an Environmental Justice document to be included in the project study report. This document should be referenced for a more in-depth analysis of the environmental justice issues in the study area.

Historic/Archaeological Features	
✓	One (1) Historic Structure
✓	One (1) Historic Land marker
✓	Twenty-three (23) archaeological sites

D. Historic and Archaeological Sites

A number of historic and archaeological sites are located within the study area. A full historic baseline study is recommended early in project development to review cultural landscapes and other historic sites in the study area.

1. Historic Sites

There is one (1) historic structure and one (1) land marker within the US 431 study area in Muhlenberg County. These include:

- The Robert Thomas House, located at 516 Broad Street in Central City, is the only historic structure found in the study area. This historic structure is not recognized as a National Register Listing; and,
- An historic land marker recognizing John W. I. Godman, Muhlenberg County's first elected judge, is found along US 431 near his original farm.

There are no other historic sites or Historic Districts identified within the study area at this time.

2. Archaeological Sites

There are eighteen (18) archaeological sites listed within the project area in Muhlenberg County. All but five (5) of these sites are located north of Drakesboro. Most locations are

generally found north of South Carrollton extending northward, reaching the county boundary of McLean/Muhlenberg. None of the eighteen (18) sites in this project area are eligible for listing on the National Register of Historic Places; however, further baseline studies of the corridor are likely to identify sites that may be considered to be eligible or potentially eligible.

Sites 15MU9, 15MU216, 15MU223, and 15MU235 are located closest to US 431 in the project area in Muhlenberg County.

- Site 15MU9 lists no specific cultural period, but is unique as this site is classified as a “special activity area”. This site has seen vandalism and is considered disturbed to an unknown percentage;
- Site 15MU216 is located within a Phase 1 Archaeological Survey for a proposed telecommunications tower. This area is located south of Drakesboro and west of the town of Browder. Situated on the west side of US 431, this study did not provide any other recordable sites.
- Site 15MU223 is classified from an historic non-Indian cultural period (1901-1950), which is determined to be over 75% disturbed; and,
- Site 15MU235 has been linked to the late archaic cultural period, with over thirty (30) different items collected at this location. A physical description of this site is classified as an “open habitation without mounds.” A historic date range was not determined for this site.



*Historic Land Marker in
Muhlenberg County*

Sites 15MU67, 15MU183, 15MU184, and 15MU133 are collectively located near Drakesboro.

- Site 15MU67 is located within the town of Drakesboro. This site is listed as archaic, but indeterminate in regard to its age or time period. The site type is described as “open habitation without mounds” and has also been disturbed to an unknown percentage;
- Site 15MU183 is located south of Drakesboro. This site is considered prehistoric indeterminate, as no definite cultural time period was assessed. The site type is described as “open habitation without mounds” and has also been disturbed to an unknown percentage;
- Site 15MU184 is located just east of Site 15MU183. This site is also considered prehistoric indeterminate, with no definite cultural time period. Similar to Site 15MU183, this site is described as “open habitation without mounds” and has also been disturbed to an unknown percentage; and,
- Site 15MU133 is the southernmost site in McLean County. This particular site is described as late archaic indeterminate from the early woodland period. This site is considered historic, with Euro-American influence and occupied the time period from 1851-1950. The site type is listed as a “rock shelter” that is determined disturbed between 76-99%.

The remaining sites are located north of Central City. They include Sites 15MU17, 15MU220, 15MU234, 15MU233, 15MU232, 15MU91, 15MU225, 15MU237, 15MU224, and 15MU236.

- Site 15MU17 is located south of South Carrollton and described as an “open habitation without mounds” site type. This site has also been vandalized and has been disturbed to a unknown percentage;
- Site 15MU220 is located west of South Carrollton. Site survey data was not cataloged at time of visit.
- Site 15MU234 is located north of South Carrollton. This site is represented by a late Woodland/Mississippian cultural period within an “open habitation without mounds” site type. This site has also been vandalized and disturbed to an unknown percentage;
- 15MU233 is located north of South Carrollton and is closely adjacent to sites 15MU232 and 15MU235. This site is represented by a late Woodland/Mississippian cultural period. The historic date range is listed as 1851-1959. The site type is similar to other sites in the study area described as an “open habitation without mounds.” Disturbance has been determined somewhere between 76-99%;
- 15MU232 is located north of South Carrollton and closely adjacent to sites 15MU233 and 15MU235. This site is described as having an historic non-Indian cultural period and a historic date range listed as 1851-1900. The site type is a cemetery which has been undisturbed;
- 15MU91 is located north of South Carrollton and only has a small portion within the study area. One particular section (Area “B”), yielded primary artifacts inside the site belonging to late archaic/early woodland, late woodland/mississippian, and prehistoric late woodland/early mississippian cultural periods;
- 15MU225 is located south of the Muhlenberg/McLean County line. This site is described as an early archaic cultural period and is found within an “open habitation without mounds.” Disturbance has been estimated between 76-99%;
- 15MU237 is located north of site 15MU225 along the 4000’ buffer edge. This site is represented by an historic non-Indian cultural period and lists an historic date range from 1801-1950. The site type is considered to be an “open habitation without mounds” and has been disturbed by an unknown percentage;
- 15MU224 is located south of the Muhlenberg/McLean County line. This site is represented by a late archaic cultural period. The site type is considered to be an “open habitation without mounds” and has been disturbed by 76-99%.
- 15MU236 is located south of the Muhlenberg/McLean County line. This site is described having an historic non-Indian cultural period that is unassigned and has an historic date range from 1801-1950. This site type is listed as an “open habitation without mounds” that has been disturbed by an unknown percentage.

E. Prime and Unique Farmland Concerns

An estimated 35% of Muhlenberg County is harvested cropland. With respect to crops, Muhlenberg County is similar to other Western Kentucky counties. Corn, soybeans, wheat, and barley are the staple crops in this area. Once considered a major player in the coal industry, Muhlenberg County now boasts a \$47,000,000 dollar agriculture economy. In a recent survey, only 221 farm operators reported farming as their principal occupation. An additional 300 people consider farming to be a part-time occupation. Most farmland areas would not be affected by construction, but irregular runoff and poor drainage caused by new development could affect farming areas bordering US 431.

According to the most recently updated Soil Survey Geographic (SSURGO) database, Muhlenberg County digital soil data sets are **not** completed for downloading. The soil data obtained from SSURGO is the most detailed and accurate soil information available. The SSURGO database is updated and maintained by the United States Department of Agriculture (USDA).

Relocation of the US 431 corridor could result in land use changes and subsequent impacts to prime farmland, including chemical runoff into sinkholes and other drainage concerns.

F. Monitored Sites and Wells

A review of the databases and data source information covering the project area revealed a number of monitored sites, hazardous materials sites, locations with discharge permits, as well as oil and gas wells. A listing of these sites as well as a corresponding address of the sites can be found in **Appendix D**. The most significant issue along the corridor appears to be a site designated within the “Superfund” database, a number of underground storage tank locations, and oil and gas wells. A summary of these issues is presented as follows:

- One (1) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) or “Superfund” site. In 1980, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund. The intent of this legislation was to regulate the clean up of disposal sites where hazardous waste was leaking into the environment. The subject site is described as the AMAX, Inc. Ayrgem Mine. The site is located south of Central City, just one quarter mile west of US 431. It is classified as an “Archived Site” under the Superfund program meaning that no further remedial action is planned for this site under the Superfund Program. However, the status of cleanup at the site is uncertain and it is likely to represent a significant concern for project development considerations and should be avoided unless further investigation reveals this site to be free from environmental hazards;
- Twenty-one (21) underground storage tank (UST) sites are found within the Muhlenberg County study corridor. All twenty-one (21) sites are located within the corporate limits of Central City. Six (6) underground storage tanks are currently active, while the remaining fifteen (15) have been removed. In the development of corridor alignments, consideration should be given to opportunities to avoid the locations where underground storage tanks currently exist or did exist to avoid the need to remove existing tanks or assume liability for right-of-way that may be contaminated;
- Nine (9) Resource Conservation and Recovery Information System (RCRIS) sites. They are required to provide information about their activities to state environmental agencies. RCRIS is a national information system which supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities which generate, transport, treat, store or dispose of hazardous waste. RCRIS allows the RCRA program staff to track the notification, permit, compliance and corrective action activities required under the RCRA. Five (5) of these sites are located within Central City, two (2) in Drakesboro, one (1) located in Dunmor, and one (1) found between Central City and Drakesboro. Two (2) of the sites located in Central City are also noted in the FINDS database, discussed later in this section. One (1) additional RCRIS site (Central City Auto Parts) was noted in the FINDS database but not in the RCRIS database. In the development of corridor alignments, further investigation of all RCRIS sites is warranted in order to better understand their environmental significance and liability risk that they may pose to the Cabinet;

- Two (2) Emergency Response Notification System (ERNS) sites. Both sites are located within the corporate limits of Central City. The first site is found adjacent to 818 N 2nd Street, within an open drainage ditch, while the second is located at 131 Reservoir Avenue at Carl Mitchell and Son. The ERNS is an extensive database revealing notifications of oil and hazardous substance releases that have occurred throughout the United States. The database includes a listing of locations where a release or spill of a hazardous material has previously occurred at a federally-determined level and the responsible operator has notified the federal government of the spill. Further investigations of these locations, including soil tests or other appropriate investigations should be undertaken if these locations are going to be potentially impacted during the project development phase;
- Five (5) Permit Compliance System (PCS) sites. This first site facility, Drakesboro STP, is located between Central City and Drakesboro, adjacent to US 431 and is found in the PCS database. However, four (4) additional PCS sites in Central City were identified using the FINDS database. These include Central City Municipal Water & Sewer, Central City STP, Conrad & Smith, Inc, and Quality Oil Company. The PCS represents companies which have been issued permits to discharge waste water into rivers. PCS is a computerized management information system which contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks permit, compliance, and enforcement states of NPDES facilities. Sites categorized as PCS sites do not necessarily represent a particular environmental hazard for highway project development considerations, but further investigation of any potentially impacted sites is recommended during the project development process;
- Eight (8) Facility Identification Initiative System (FINDS) sites, all which are located within the corporate limits of Central City. The goal of this system, which was developed in the mid-1990's, was to simplify the reporting of all government sites by using an extensive database relative to all environmental sites monitored by the EPA which are subject to environmental regulation or of environmental interest. The sites contained in this database are facilities that are subject to federal environmental reporting and permitting requirements. Since this database is a compilation of multiple types of sites, there is some overlap between the FINDS sites and those described in the previous bullets. Of the eight (8) sites, three (3) are RCRIS sites, four (4) are PCS sites, and the remaining site is only identified as Stewarts IGA Foodliner on South 2nd Street in Central City; and,
- Forty-four (44) oil and gas wells, mostly located south of Central City. While these wells do not represent insurmountable obstacles for project development purposes, several issues should be considered if these sites are to be impacted by future construction. First, the KYTC must compensate the owner/operator of the well for its loss. Also, the KYTC must take responsibility for operating issues with the well and eventual closing and plugging. Plugging costs range from \$1,500 for a shallow well to \$6,000 or more for deeper wells or wells with problems. Finally, many oil and gas wells produce a brine wastewater and potentially other contaminants that should be investigated on the sites.

It should be noted that within **Figure 2**, the mapping legend may contain additional environmental graphic symbols that do not appear within the project corridor.

Muhlenberg County has seen a high amount of geotechnical activity through the years, due to its location within the **Western Kentucky Coal Field**. It should be noted that the potential for environmental hazard/contamination is increased within the study area due to higher amounts of

geotechnical activity. These hazards apply to a majority of Muhlenberg County where oil and gas drilling is more prominent.

G. Additional Concerns

Other items identified within the US 431 study area include:

- Additional UST/HazMat concerns are likely to be associated with farming operations in the study area;
- Nine (9) fault lines crossing the study area were also located. Four (4) of these are located near Drakesboro and most are in the southern half of the county;
- Three (3) Sewage Treatment Plants located north of Central City, east of Drakesboro, and near the KY 246/US 431 intersection in southern Muhlenberg County respectively; and,
- A tire dump located north of the KY 949/US 431 intersection in southern Muhlenberg County.

H. Summary of Environmental Issues

The potential environmental concerns identified for the study corridor have been identified through this preliminary analysis. Environmental issues that are likely to require consideration during future phases of this project include:

- Potential water quality and floodplain issues related to the Green River, its tributaries, and wetland areas;
- Public and private water sources, such as water lines, wells, tanks, and facilities;
- Churches, schools, and cemeteries;
- Potential habitat for threatened, endangered, or special concern species;
- Potential environmental justice issues related to high percentages of low-income and minority populations in the project area census tracts;
- Historic structures and archaeological sites, but none listed on the National Register of Historic Places;
- The **Peabody Wildlife Management Area** should be considered in future project phases;
- Prime farmland along the US 431 corridor and chemical runoff considerations; and,
- Underground storage tanks, sewage treatment plants, and gas/oil wells.

IV. McLean County Environmental Overview

Figure 3 displays the environmental features identified within McLean County along US 431 in the study area. The study area refers to anything inside of the 4000' buffer zone in McLean County.

It should be noted that features displayed on the map may be deceiving as one graphic feature symbol can often represent more than one of that particular feature. For instance, a graphic symbol indicating one water well may actually represent multiple water wells. The following text addresses such occurrences where possible.

A. Natural and Manmade Water Features

Natural and manmade features considered as part of this analysis are divided into five (5) categories: water resources, surface water, lakes/ponds, wetlands, and floodplains.

1. Water Resources

A number of manmade water resources are located within the McLean County section of the study area. A summary is provided below:

- There are 38.0 miles of water lines in the study area;
- There are three (3) water tanks in the study area. Two of the three are located in Livermore while the third can be found north of the intersection of US 431 and KY 250;
- There are no public water facilities found within the study area;
- There are thirty (30) water wells located inside the study area. All of these wells are located near the McLean/Daviess county line. The primary use of these wells is for monitoring purposes; and,
- One (1) water gauge is located within the study area. This gauge, located in the city of Livermore, is used to obtain readings from the Green River.

2. Surface Water

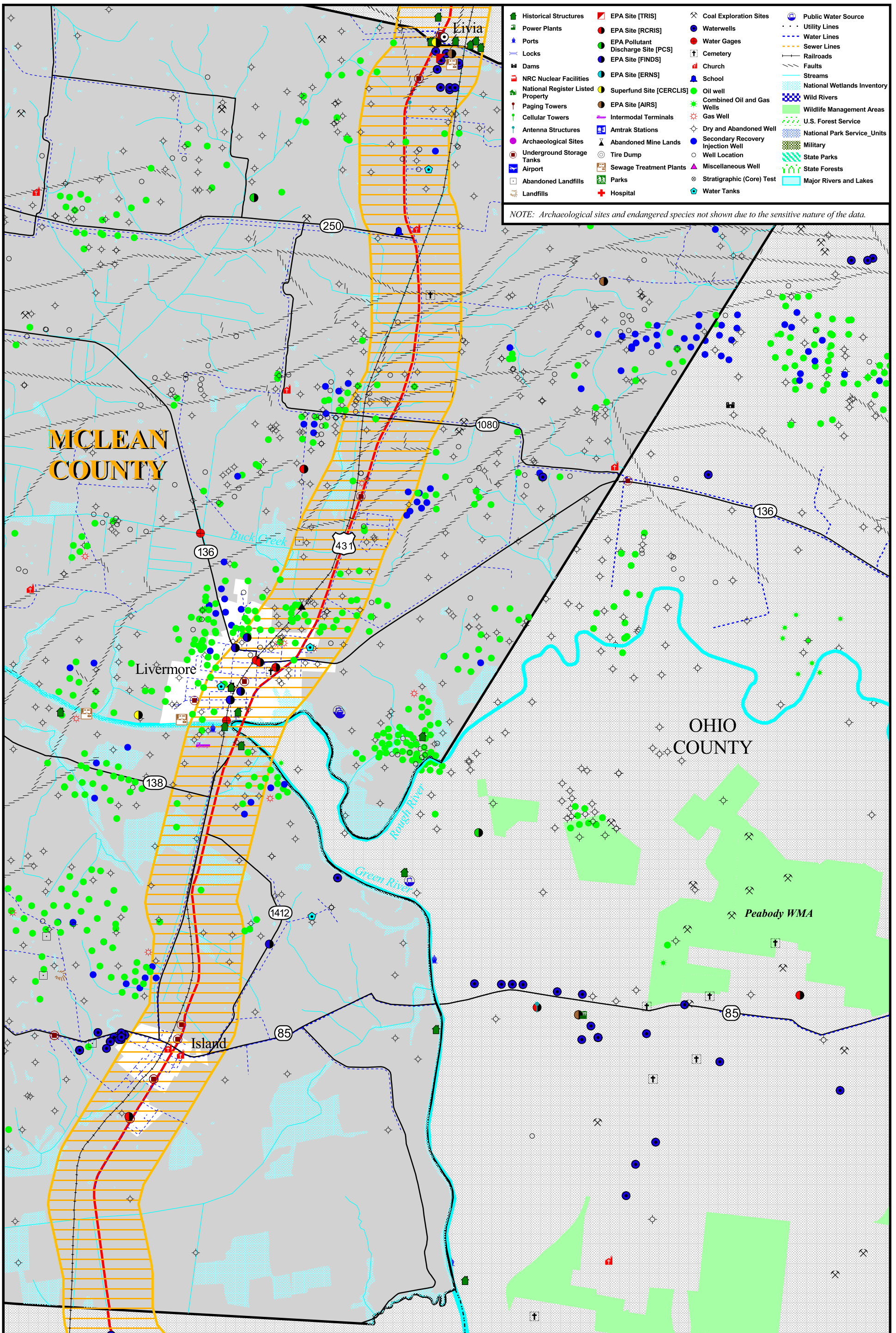
The US 431 study area in McLean County is included in one major watershed, the Green River watershed. This watershed encompasses the entire county and topographically directs all stream flows into the Green River.

This Green River system nearly splits McLean County in half as it traverses the study area. Certain area tributaries merge into the Green River Basin at different locations.



Green River along US 431

- Streams south of the Green River tend to flow in a north/northwest direction and merge with the Green River as it meanders westward through McLean County; and,
- Streams north of the Green River tend to flow south/southwest into the Rough River, which in turn, merges into the Green River in the town of Livermore. The famous Livermore Bridge crosses both of these river systems. This bridge will be discussed more in depth in the historical section of this report.



- | | | | |
|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------|
| Historical Structures | EPA Site [TRIS] | Coal Exploration Sites | Public Water Source |
| Power Plants | EPA Site [RCRIS] | Waterwells | Utility Lines |
| Ports | EPA Pollutant Discharge Site [PCS] | Water Gages | Water Lines |
| Locks | EPA Site [FINDS] | Cemetery | Sewer Lines |
| Dams | EPA Site [ERNS] | Church | Railroads |
| NRC Nuclear Facilities | Superfund Site [CERCLIS] | School | Faults |
| National Register Listed Property | EPA Site [AIRS] | Oil well | Streams |
| Paging Towers | Intermodal Terminals | Combined Oil and Gas Wells | National Wetlands Inventory |
| Antenna Structures | Amtrak Stations | Gas Well | Wild Rivers |
| Archaeological Sites | Abandoned Mine Lands | Dry and Abandoned Well | Wildlife Management Areas |
| Underground Storage Tanks | Tire Dump | Secondary Recovery Injection Well | U.S. Forest Service |
| Airport | Sewage Treatment Plants | Miscellaneous Well | National Park Service Units |
| Abandoned Landfills | Hospital | Water Tanks | Military |
| Landfills | | | State Parks |
| | | | State Forests |
| | | | Major Rivers and Lakes |

NOTE: Archaeological sites and endangered species not shown due to the sensitive nature of the data.

MCLEAN COUNTY

OHIO COUNTY

Livermore

136

431

1080

136

138

1412

85

Island

85

Peabody WMA

- Legend**
- 4000' Corridor
 - U.S. Highways
 - State Roads

1 0 1 2 Miles

KENTUCKY

Environmental Footprint
 FIGURE 3
 McLean County
 Item No. 2-8106.00
 Phase 2 - Scoping Study for Safety Improvements on US 431 from the McLean/ Muhlenberg Co. Line to the Indiana Border

The Green River and the Rough River are the only river systems within the study area. The Green River is the larger of the two and forms McLean County's eastern border. It is one of Kentucky's largest, longest, and most navigable rivers. The Rough River, on the other hand, is smaller in size and enters from Ohio County to the east. The Green River merges with the Rough River at a point south of Livermore.

Natural and Manmade Features

- ✓ Water lines, tanks and wells
- ✓ One major watershed
- ✓ 65 wetland areas / over 328 acres
- ✓ Zone A floodplains

A total of forty-five (45) individual streams compose a total of 22.7 miles of streams in the project area.

Streams are classified by a hierarchy system called *stream order*. In this system, the smallest stream is designated an Order 1 stream and the largest is designated an Order 8 stream. The Ohio River is an example of an Order 8 stream. As stream segments continue to merge, the Order number increases. Order designations in the study area include:

- One (1) Order 8 stream is located within the study area. The Green River has a total length of 0.8 miles in the study area and is considered the major river system in McLean County;
- There are no Order 7 streams within the study area;
- There is one (1) Order 6 stream in the study area. The Rough River has a total length of 0.7 miles in the study area and merges with the Green River at Livermore;
- There are no Order 5 streams within the study area;
- Six (6) separate tributaries of one (1) Order 4 stream are found within the study area. Buck Creek has a total length of 1.7 miles;
- Six (6) Order 3 streams are located within the study area. These streams have a total combined length of 3.0 miles;
- There are twelve (12) Order 2 streams in the study area. These streams have a total combined length of 4.7 miles; and,
- There are twenty-four (24) Order 1 streams in the study area. These streams have a total combined length of 11.8 miles.

As is common to this area, dendritic stream patterns are found throughout the study area. Dendritic streams have a varying tributary order, as tributaries join the "trunk" or stream channel at oblique angles. An example of this pattern would be the appearance of veins in tree leaves.

Information obtained from the Water Quality Branch of the Natural Resources and Environmental Protection Cabinet (NREPC) indicates there are no Outstanding Resource Waters or Wild Rivers within the proposed corridor.

As recommended by the Division of Environmental Analysis, all channel changes should be avoided as part of this project to reduce mitigation needs and permitting requirements.

3. Lakes/Ponds

There are no natural or man-made lakes within the study area of McLean County. However, private ponds exist in limited numbers along the US 431 corridor.

4. Wetlands

McLean County contains sixty-five (65) separate wetland areas, covering an estimated 328 acres within the study area. Sizeable stretches of wetlands can be found following tributaries of smaller order streams which merge into the Green River Basin. The occurrence of wetland areas is greater in the study area due to the confluence of the Green and Rough Rivers. The major wetland areas are located north and south of Livermore. Locations in and around the Green and Rough River floodplain tend to promote an increasing number of wetland areas.

A field inspection of each of these areas will be necessary to determine their jurisdictional status (i.e., they may or may not require a nationwide or individual permit from the US Army Corps of Engineers). Furthermore, a more in depth inspection would be beneficial for mitigation assessment purposes, if needed.

5. Floodplains

The Q-3 digital Federal Emergency Management Agency (FEMA) data for Kentucky floodplains are digital datasets that are available on a county-by-county basis. Based on this data source, the McLean County floodplain data includes the following:

- Between the Muhlenberg/McLean County line and just south of the town of Island, FEMA has designated areas east of the study corridor “Zone AE” and sections to the west as “Zone A.” FEMA considers “Zone AE” locations inundated by 100-year flooding for which Base Flood Elevations (BFEs) have been determined. “Zone A” areas indicate that this is an area inundated by 100-year flooding for which BFEs have not been determined;
- FEMA has established a “Zone X” classification for land areas encircling the small town of Island. “Zone X” standards determine areas outside the 100 and 500-year floodplains. The town of Island is completely within a “Zone ANI” (Area Not Included) classification. This classification is given to an area which is located within a community or county that is not mapped on any published Flood Insurance Rate Map (FIRM);
- Near the town of Livermore, floodplains alter significantly due to the convergence of the Green and Rough River systems. FEMA has given areas in and around the Green River Basin a “Zone AE” classification. On the other hand, the town of Livermore, which is located at the confluence of both river systems, has been designated “Zone X”; and,
- The remaining portions of the study area vary between “Zone A” and “Zone X” classifications. This is due in part to Buck Creek and its tributary flow across the study corridor. After crossing this section, “Zone X” designations continue to the McLean/Daviess county line.

B. Biotic Communities

Biotic communities considered as part of this analysis are divided into floral and faunal categories as discussed in the following sections. The Kentucky State Nature Preserves Commission (KSNPC) monitors a number of endangered, threatened, or special concern plants or animals within the US 431 study area. The KSNPC data is updated on a regular basis and may be verified as needed in future phases of this project. To further ensure the accuracy of this analysis, a cross-check was completed with data collected from the United States Fish and Wildlife Service (USFWS).

1. Floral Communities

The KSNPC has determined that two (2) occurrences of monitored vascular plants are recorded within the study area in McLean County.

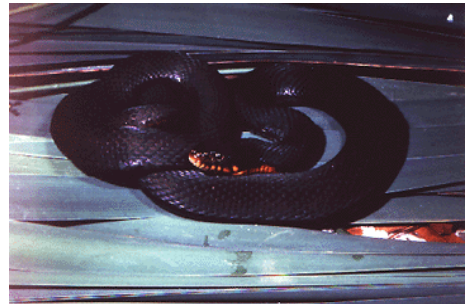
- No **endangered** species were found within the study area;
- Two (2) species have been given a **threatened** status: *Eastern Blue-Star* and *American Frog's-Bit*; and,
- No **special concern** species were found within the study area.

The USFWS does not list the *Eastern Blue-Star* or the *American Frog's-Bit* as a **threatened** floral species, nor does it list any potential **endangered** floral species within the study area.

2. Faunal Communities

Based upon the KSNPC's most current information, four (4) occurrences of monitored species are found within the study area including one (1) of each: bird, bi-valve, fish, and reptile.

- No **endangered** species were found within the study area;
- One (1) species has been given a **threatened** status: *Northern Harrier* (bird); and,
- Three (3) species are considered to be **special concern** fauna: *Little Spectaclecase* (bi-valve), *Pallid Shiner* (fish), and *Copperbelly Water Snake* (reptile).



Copperbelly Water Snake
<http://www.fws.gov>

The USFWS does not list the *Northern Harrier* as a **threatened** species in Kentucky, nor does it list any potential **endangered** faunal species within the study area. Also, it should be recognized that **special concern** listings are not displayed within the USFWS database.

It should be noted that the *Copperbelly Water Snake's* habitat in the study area is subject to the conditions outlined in the Copperbelly Water Snake Conservation Agreement, which is overseen by the Kentucky Department of Fish and Wildlife Resources.

C. Social, Economic, and Environmental Justice Concerns

Socioeconomic concerns considered as part of this analysis include social, economic, and environmental justice related issues. These items are discussed in the following sections.

1. Social and Economic Locations

In comparison to other counties within the study area, McLean County has very few community sensitive locations. Six (6) community sensitive locations were identified in the study area.

- There are three (3) churches in the study area. **Appendix C** provides a listing of the churches;
- Only one (1) school facility is located within the study area. Liberty School is located at the intersection of KY 250 and US 431 in the northern section of the study area; and,



Buck Creek Church in McLean County

- Two (2) cemeteries are found within the study area, neither of which are identified as historic. The first is located within the town of Livermore and the second is located near the KY 250 / US 431 intersection in northern McLean County.

Other than these potential community concern areas, the study area is composed of a small amount of business and industry.

- There are 1,800 county-wide jobs in industry-related fields;
- The major industrial area within McLean County is Livermore, where five (5) major industrial sites are found;
- The largest industrial site is Advanced Drainage Systems, Inc., which employs 59 people;
- Excluding industry, retail and local services combine for the greatest remaining portion of employment in the study area;
- Agriculture is not a major contributor to area economics;
- McLean County has a per capita personal income (PCPI) of \$25,158. This PCPI ranks 18th in the State and is higher than the state average (\$24,085), but less than the national average (\$29,469); and,
- The unemployment rate in McLean County as of 2001 is listed at 7.1 percent which is higher than the State average of 5.5 percent, and the U.S. average of 4.8 percent.

2. Environmental Justice

An important consideration for highway reconstruction or new development is environmental justice. For this study, environmental justice was addressed by calculating the percentage of minorities and low-income persons in the project area. Information was gathered from 2000 U.S. Census tract population counts in McLean County. The study area is located in Census Tracts 9701 and 9704.

Environmental justice concerns related to minority populations are not likely, based on Census 2000 data for the project area census tracts:

- Census Tracts 9701 and 9704 have minority populations of 0.7 and 0.0 percent, respectively.
- These percentages are lower than average percentages for Kentucky and McLean County (10.0 and 1.7 percent, respectively).

Environmental justice concerns related to low-income populations should be monitored throughout future phases of this project. Low-income data from the 2000 U.S. Census has not yet been released for the census tracts; however, census bureau information for the year 1999 indicates that one (1) census tract has a higher percentage of persons living in poverty than Kentucky and McLean County.

- Census Tracts 9701 and 9704 have poverty rates of 16.9 and 15.4 percent, respectively.
- The rates for Kentucky and McLean County were 15.8 percent and 16.0 percent, respectively, in 1999.

It should be noted that 2000 minority population and 1999 low-income data sets were the latest available information at the time of this report.

The Green River Area Development District is compiling an Environmental Justice document to be included in the project study report. This document should be referenced for a more in-depth analysis of the environmental justice issues in the study area.

Historic/Archaeological Features	
✓	Historic Livermore Bridge
✓	Historic Neighborhood in Livermore
✓	21 Historic sites
✓	10 Archaeological sites

D. Historic and Archaeological Sites

A number of historic and archaeological sites are located within the study area. A full historic baseline study is recommended early in project development to review cultural landscapes and other historic sites in the study area.

1. Historic Sites

There are several historic points of interest throughout the US 431 study area in McLean County. Overall, there are twenty-one (21) historic sites found within the study area in McLean County.

- The most prominent historical area is within the town of Livermore. According to the National Register of Historic Places, Livermore does not list a “Historical District.” However, within the heart of the town, sixteen (16) individual historic sites are located within a street block. It should be noted that one historic graphic symbol may represent multiple historic sites on the associated digital mapping. These historical sites include the following:
 - Two (2) historical sites are eligible for National Register Status: the *Livermore Hotel* and *Victorian Manor*;
 - Six (6) historical sites have been given an Inventory Site status;
 - Five (5) historical sites have been given a Survey Site status; and
 - The other three (3) structures have not been given a status at this time.
- Another site with historic value is the *Livermore Bridge*. When this bridge structure was built, it was claimed to be the only river bridge in the world that begins and ends in the same county (McLean), spans two rivers (Green and Rough), and crosses another county (Ohio). The Livermore Bridge is 1,350 feet long, and was dedicated on November 13, 1940;
- This area also contains three (3) historic sites within or just beyond the city of Livermore:
 - Archaeological site 15McL26 is also a historic site located in southern Livermore and has a current *pending* National Register status. The site type is open habitation without earth mounds and has been disturbed to an unknown percentage;



Livermore Bridge Marker



Historic Livermore Bridge

- The Seaboard Railroad Bridge (#13.5-14) is located in Livermore, spanning the Green River. This site has been determined eligible for National Register status by agreement; and,
- The Butterfield Site (15McL7) is another historic archaeological site located just south of Livermore, adjacent to US 431. The site type is described as a pre-historic shell mound (levee), with scattered shell fragments found within the area. This site is on the National Register of Historic Places.
- A 20th century historic house is located near the Daviess County/McLean County line. This historical structure holds no National Register status at this time.

2. Archaeological Sites

There are ten (10) archaeological sites officially recorded within the project area in McLean County. Eight (8) of these sites are located in close proximity to the existing route between the towns of Island and Livermore. The remaining two (2) sites can be found near US 431 in the southernmost portion of the study area in McLean County.

- Archaeological sites 15McL26, 15McL7, 15McL116 and 15McL117 are located near Livermore:
 - The Butterfield Site (15McL7) is an historic archaeological site located just south of Livermore, adjacent to US 431. This site is a prehistoric shell mound (levee) and has an *archaic/woodland* cultural affiliation, dating within the 1801-1900 range. This site is also important due to its potential to contain prehistoric native North American human remains. Site 15McL7 is listed on the National Register of Historic Places;
 - Site 15McL26 is an historic archaeological site located in southern Livermore. This particular site has an *archaic/late woodland-mississippian* cultural affiliation within the 1801-1900 date range. Site 15McL26 is listed on the National Register of Historic Places; and,
 - Sites 15McL116 and 15McL117 are archaeological sites located south of Livermore. Both sites have an *historic non-Indian* cultural affiliation and are dated within the 1801-1900 range. These sites have no National Register affiliation.
- Sites 15McL129, 15McL184, 15McL185, and 15McL140 are located north of the community, Island:
 - Sites 15McL184 and 15McL185 have a *late woodland/historic non-Indian* cultural affiliation. Both sites have a date range within 1801-1900 and have no National Register affiliation;
 - Site 15McL129 has an *historic non-Indian* cultural affiliation and a date range from 1801-1900; and,
 - Site 15McL140 has an *unassigned* cultural affiliation and a date range from 1801-1900.
- Sites 15McL6 and 15McL8 are located in the southernmost portion of the study area, near the McLean/Muhlenberg border:
 - Site 15McL6 is considered a late prehistoric site with *late woodland-mississippian* cultural affiliation without a date range given. The site type is an earth mound which has been disturbed to an unknown percentage; and,

- Site 15McL8 does not list any cultural affiliation or site date, but states that this site is an open habitation without mounds which has been disturbed to an unknown percentage.

E. Prime and Unique Farmland Concerns

An estimated 65% of McLean County is harvested cropland. Soybeans, corn, wheat, and barley are the staple crops in this area. The confluence of the Green and Rough Rivers also yield excellent floodplain farming within areas on both sides of these river systems.

One concern relative to farming in McLean County is the potential for crop damage from flooding. As the floodplains of the Green and Rough Rivers are extremely fertile, the possibility of actual flood damage is ever-present. One single flood could potentially ruin an entire crop base if planted within these flood prone areas.

According to the most recently updated Soil Survey Geographic (SSURGO) database, Muhlenberg County digital soil data sets are **not** completed for downloading. The soil data obtained from SSURGO is the most detailed and accurate soil information available. The SSURGO database is updated and maintained by the United States Department of Agriculture (USDA).

Relocation of the US 431 corridor could result in land use changes and subsequent impacts to prime farmland, including chemical runoff into sinkholes and other drainage concerns.

F. Monitored Sites and Wells

A review of the databases and data source information covering the project has revealed the monitored sites and wells described in the following paragraphs. A listing of these sites as well as a corresponding address of the sites can be found in **Appendix D**.

- Twenty-eight (28) underground storage tank (UST) sites are located within the McLean County study corridor. Fourteen (14) of these tanks are located in or around the town of Island. Of these fourteen (14), seven (7) tanks are currently active, six (6) have been permanently removed, and one (1) is not in use. The remaining fourteen (14) underground storage tank sites are located in and around the communities of Livermore (3) and Livia (11), which is found along the McLean/Daviess county line. Within Livermore, all three (3) tanks have been permanently removed. In Livia, eight (8) tanks are determined to have been permanently removed, while the remaining three (3) are temporarily closed. In the development of corridor alignments, consideration should be given to opportunities to avoid the locations where underground storage tanks currently exist or did exist to avoid the need to remove existing tanks or assume liability for right-of-way that may be contaminated;
- Five (5) Resource Conservation and Recovery Information System (RCRIS) sites. These sites are required to provide information about their activities to state environmental agencies. RCRIS is a national information system which supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities which generate, transport, treat, store or dispose of hazardous waste. RCRIS allows the RCRA program staff to track the notification, permit, compliance and



Oil well in McLean County

corrective action activities required under the RCRA. Three (3) of these sites are located within Livermore while the remaining two (2) sites are split between Island and Livia. One (1) of the sites located in Livermore, the Livermore Gulf & Body Shop on US 431, is also noted in the FINDS database, which is discussed later in this section. In the development of corridor alignments, further investigation of all RCRIS sites is warranted in order to better understand their environmental significance and liability risk that they may pose to the Cabinet;

- Four (4) Aerometric Information Retrieval System (AIRS) sites. AIRS sites are used to track emissions and compliance data from industrial plants. AIRS data are utilized by states to prepare State Implementation Plans (SIP) to comply with regulatory programs and by the Environmental Protection Agency (EPA) as an input for the estimation of the total national emissions. All four (4) AIRS sites found in the study corridor are located near the community of Livia (McLean/Daviess county line) and are associated with Barmet of Kentucky;
- One (1) Toxic Release Inventory (TRIS) site. TRIS sites contain information about the release of toxic chemicals by manufacturers. The data reported from these sites are important for both the government and public so that potential chemical risks can be assessed. This site, Barmet Aluminum Company, is located along US 431 near the community of Livia, along the McLean/Daviess county line;
- One (1) Permit Compliance System (PCS) site. This facility was identified in the FINDS database as Livermore STP on 3rd Street. PCS sites represent companies which have been issued permits to discharge waste water into rivers. PCS is a computerized management information system which contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks permit, compliance, and enforcement states of NPDES facilities. Sites categorized as PCS sites do not necessarily represent a particular environmental hazard for highway project development considerations, but further investigation of any potentially impacted sites is recommended during the project development process;
- Five (5) Facility Identification Initiative System (FINDS) sites. Three (3) of the sites are located within the town of Livermore, while the remaining sites are found near the community of Livia, near the McLean/Daviess county line. The goal of this system, which was developed in the mid-1990's, was to simplify the reporting of all government sites by using an extensive database relative to all environmental sites monitored by the EPA which are subject to environmental regulation or of environmental interest. The sites contained in this database are facilities that are subject to federal environmental reporting and permitting requirements. Since this database is a compilation of multiple types of sites, there is some overlap between the FINDS sites and those described in the previous bullets. Of the five (5) sites, one (1) is an RCRIS site (Livermore Gulf & Body Shop), one (1) is a PCS site (Livermore STP), and the remaining three (3) sites include Livermore IGA on US 431, U.S. Army Livermore Armory at 3rd and Main Street, and Wonderest Chair Co, Inc on 4th Street; and,
- Forty-seven (47) oil and gas wells, with the majority of these sites located in and around the community of Livermore. While these wells do not represent insurmountable obstacles for project development purposes, several issues should be considered if these sites are to be impacted by future construction. First, the KYTC must compensate the owner/operator of the well for its loss. Also, the KYTC must take responsibility for operating issues with the well and eventual closing and plugging. Plugging costs range from \$1,500 for a shallow well to \$6,000 or more for deeper wells or wells with problems.

Finally, many oil and gas wells produce a brine wastewater and potentially other contaminants that should be investigated on the sites.

It should be noted that within **Figure 3**, the mapping legend may contain additional environmental graphic symbols that do not appear on this map.

McLean County has seen a high amount of geotechnical activity through the years, due to its location within the **Western Kentucky Coal Field** belt. It should be noted that the potential for environmental hazard/contamination is increased within the study area due to higher amounts of geotechnical activity. These hazards apply throughout the entire study area where oil and gas drilling is more prominent.

G. Additional Concerns

Other items identified within the US 431 study area include:

- Eight (8) fault lines crossing the study area between the Green river and the McLean/Daviess County line to the north;
- One (1) Sewage Treatment Plant located in northern McLean County near the Daviess County line;
- The Livermore Wharf (river port) located on the Green River at Livermore is used primarily for loading/unloading of grain. This port, owned by the Bunge Corporation, is connected to the CSX Railroad and has a storage capacity of 2,296,000 bushels; and,
- The Perdue Farms Elevator located just outside Livermore adjacent to US 431. This intermodal terminal site is used for grain retrieval and storage.

H. Summary of Environmental Issues

The potential environmental concerns identified for the study corridor have been identified through this preliminary analysis. Environmental issues that are likely to require consideration during future phases of this project include:

- Potential water quality and floodplain issues related to the Green River, its tributaries, and wetland areas;
- Public and private water sources, such as water lines, wells, tanks, and facilities;
- Churches, schools, and cemeteries;
- Historic structures such as the Livermore Bridge and historic archaeological sites in and around the town of Livermore;
- Potential habitat for threatened, endangered, or special concern species;
- Prime farmland along the US 431 corridor and chemical runoff concerns;
- Underground storage tanks, sewage treatment plant, and gas/oil wells; and,
- Fault lines located between the Green River and the McLean/Daviess County line.

V. Daviess County Environmental Overview

Figure 4 displays the environmental features identified within Daviess County along US 431 in the study area. The study area refers to anything inside of the 4000' buffer zone in Daviess County.

It should be noted that the features displayed on the map may be deceiving as one graphic feature symbol can often represent more than one of that particular feature. For instance, a graphic symbol indicating one water well may actually represent multiple water wells. The following text addresses such occurrences where possible.

A. Natural and Manmade Water Features

Natural and manmade features considered as part of this analysis are divided into five (5) categories: water resources, surface water, lakes/ponds, wetlands, and floodplains.

1. Water Resources

A number of manmade water resources are located within the Daviess County section of the study area. A summary is provided below:

- There are 38.0 miles of water lines in the study area;
- There is one (1) water tank in the study area. It is located within the Owensboro city limits;
- Two (2) public water facilities are found within the study area. The facilities are found at two separate locations but generally located along US 431 between US 60 and the Ohio River. Both facilities are operated by Owensboro Municipal Utilities. These facilities depend on an underground aquifer to supply the city with water. As a result, the Ohio River is not used for public water in Owensboro;
- Two (2) water treatment plants are located within the study area in Daviess County;
- There are 41 water wells located within the study area. There is a high concentration of these water wells at the McLean/Daviess County Line. In addition, many water wells are located in the Owensboro city limits. The primary use of these well sites is for well monitoring purposes; and,
- No water gauges are located within the study area.

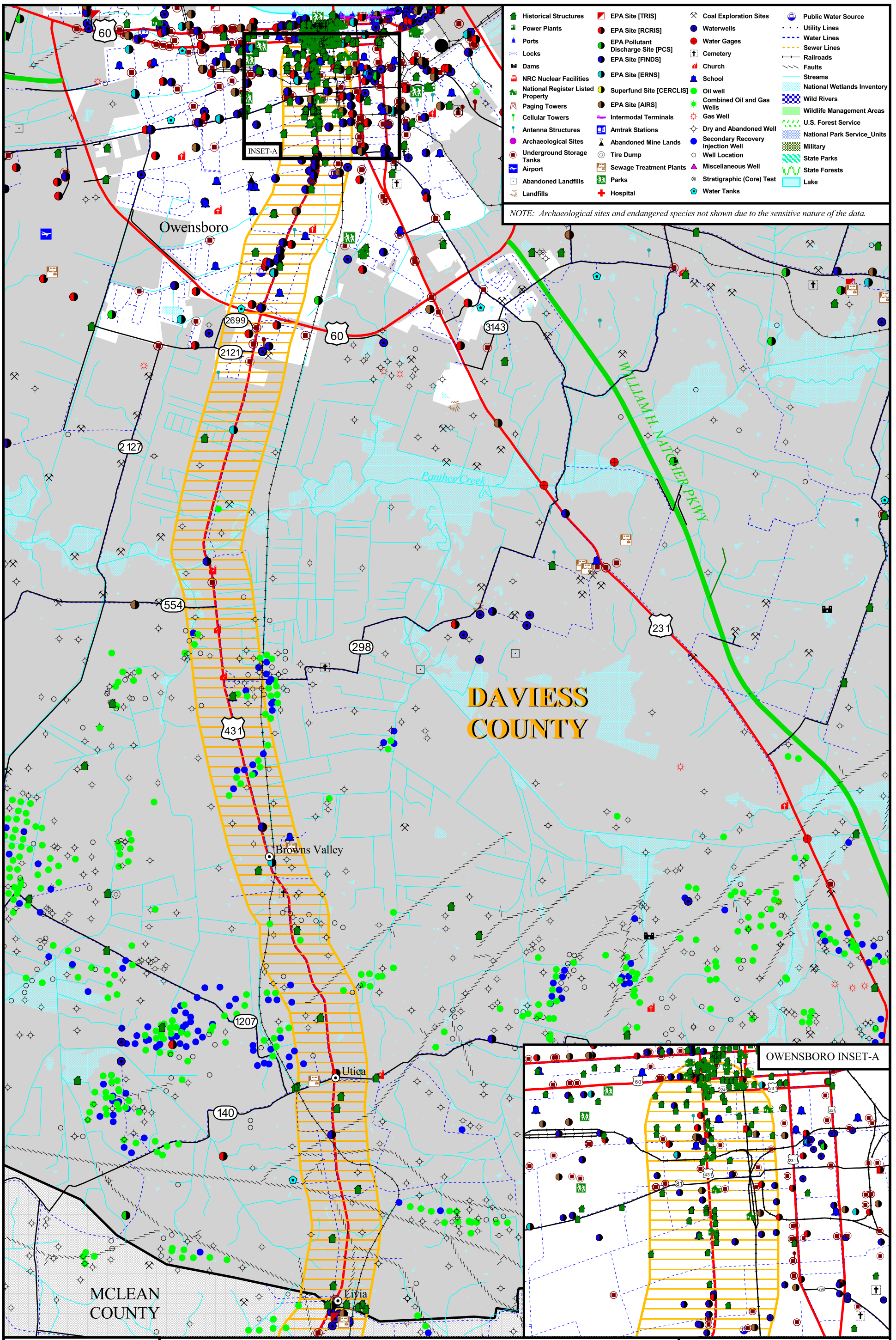
2. Surface Water

The US 431 study area in Daviess County is contained in one major watershed, the Green River watershed.

All streams south of Owensboro flow in a southwest manner, collectively emptying into the Green River in McLean County. In addition, a large number of streams merge into the Panther Creek. This creek is located near the intersection of KY 554 and US 431.



Ohio River at Owensboro



- | | | | |
|-----------------------------------|------------------------------------|----------------------------|-----------------------------|
| Historical Structures | EPA Site [TRIS] | Coal Exploration Sites | Public Water Source |
| Power Plants | EPA Site [RCRIS] | Waterwells | Utility Lines |
| Ports | EPA Pollutant Discharge Site [PCS] | Water Gages | Water Lines |
| Locks | EPA Site [FINDS] | Cemetery | Sewer Lines |
| Dams | EPA Site [ERNS] | Church | Railroads |
| NRC Nuclear Facilities | Superfund Site [CERCLIS] | School | Faults |
| National Register Listed Property | EPA Site [AIRS] | Oil well | Streams |
| Paging Towers | Intermodal Terminals | Combined Oil and Gas Wells | National Wetlands Inventory |
| Antenna Structures | Amtrak Stations | Gas Well | Wild Rivers |
| Archaeological Sites | Abandoned Mine Lands | Dry and Abandoned Well | Wildlife Management Areas |
| Underground Storage Tanks | Tire Dump | Injection Well | U.S. Forest Service |
| Airport | Sewage Treatment Plants | Miscellaneous Well | National Park Service Units |
| Abandoned Landfills | Parks | Stratigraphic (Core) Test | Military |
| Landfills | Hospital | Water Tanks | State Parks |
| | | | State Forests |
| | | | Lake |

NOTE: Archaeological sites and endangered species not shown due to the sensitive nature of the data.

DAVIESS COUNTY

- Legend**
- 4000' Corridor
 - Parkways
 - U.S. Highways
 - State Roads



Environmental Footprint
 FIGURE 4
 Daviess County
 Item No. 2-8106.00
 Phase 2 - Scoping Study for Safety Improvements on US 431 from the McLean / Muhlenberg Co. Line to the Indiana Border

Despite not being part of the watershed in the study area, the Ohio River is a major river system found within the study area. The Ohio River is located along Owensboro's northern boundary and is considered the third largest river system in North America. The Ohio River is also Kentucky's northern boundary, separating the state from Ohio, Indiana, and Illinois.

Daviess County has numerous man-made ditches in and around Owensboro and has experienced significant flooding in areas. In addition, there are a large number of stream tributaries spanning the study area. A total of 83 individual streams compose a total of 20.2 miles of streams in the project area. As previously mentioned, Panther Creek is the major creek system that crosses the study area.

Streams are classified by a hierarchy system called *stream order*. In this system, the smallest stream is designated an Order 1 stream and the largest is designated an Order 8 stream. The Ohio River is an example of an Order 8 stream. As stream segments continue to merge, the Order number increases. Order designations in the study area include:

- There are no Order 6, 7, or 8 streams crossing the study area, although the Ohio River is just north of the study area;
- One (1) Order 5 stream is located within the study area. Panther Creek has a total length of approximately 1.0 mile;
- One (1) Order 4 stream is located within the study area. Rhodes Creek is located in the middle of the study area near the intersection of US 431 and KY 554. This stream has a total length of 1.2 miles;
- There are no Order 3 streams in the study area;
- One (1) Order 2 stream is located within the study area. This stream has a total length of 0.2 miles; and,
- There are 80 Order 1 streams in the study area. These streams have a combined total length of 17.8 miles, with most tributaries belonging to Panther Creek.

As is common to this area, dendritic stream patterns are found throughout the study area. Dendritic streams have a varying tributary order, as tributaries join the "trunk" or stream channel at oblique angles. An example of this pattern would be the appearance of veins in tree leaves.

Information obtained from the Water Quality Branch of the Natural Resources and Environmental Protection Cabinet (NREPC) indicates there are no Outstanding Resource Waters or Wild Rivers within the proposed corridor.

As recommended by the Division of Environmental Analysis, all channel changes should be avoided as part of this project to reduce mitigation needs and permitting requirements.

3. Lakes/Ponds

There are no natural or man-made lakes within the study area portion of Daviess County. Though private ponds were located from previous base mapping, they were nearly non-existent during field review of the study area.

4. Wetlands

Seventy-six (76) wetlands were recorded within the study area totaling over 163 acres. The primary wetland areas are associated with Panther Creek and Rhodes Creek, located just north of the KY 554 / US 431 intersection.

A field inspection of each of these areas will be necessary to determine their jurisdictional status (i.e., they may or may not require a nationwide or individual permit from the US Army Corps of Engineers). Furthermore, a more in depth inspection would be beneficial for mitigation assessment purposes, if needed.

5. Floodplains

The Q-3 digital Federal Emergency Management Agency (FEMA) data for Kentucky floodplains are digital datasets that are available on a county-by-county basis. Based on this data source, the Daviess County floodplain data includes the following:

Natural and Manmade Features	
✓	Water lines, tanks, and wells
✓	One major watershed
✓	76 wetland areas totaling 163 acres
✓	“Zone X” floodplains

- South of the intersection of US 431 and KY 554, FEMA has designated floodplain areas “Zone X.” This zone designates areas that are outside of 100 to 500-year floodplains;
- A section of “Zone X500” floodplain can be found near the KY 298/US 431 intersection. An area with a “Zone X500” classification, describes floodplains which are inundated by 500-year flooding. This classification also includes areas inundated by 100-year flooding with average depths of less than one foot or with drainage areas less than one square mile and any areas protected by levees from 100-year flooding;
- Tributaries north of Panther Creek on either side of US 431 possess “Zone AE” classifications. “Zone AE” status is described as having locations inundated by 100-year flooding for which Base Flood Elevations (BFEs) have been determined;
- Near the intersection of US 431 and US 60, another flood potential site within the study area exists. This area contains different segments of “Zone X,” with one small section containing “Zone X500”; and,
- The remaining floodplain data indicates “Zone X” classifications extending the length of the study area north toward the Ohio River.

B. Biotic Communities

Biotic communities considered as part of this analysis are divided into floral and faunal categories as discussed in the following sections. The Kentucky State Nature Preserves Commission (KSNPC) monitors a number of endangered, threatened, or special concern plants or animals within the US 431 study area. The KSNPC data is updated on a regular basis and may be verified as needed in future phases of this project. To further ensure the accuracy of this analysis, a cross-check was completed with data collected from the United States Fish and Wildlife Service (USFWS).

1. Floral Communities

The KSNPC and USFWS have determined that no occurrences of monitored vascular plants are found within the study area in Daviess County.

2. Faunal Communities

Based upon the KSNPC’s most current information, five (5) occurrences of monitored species are found within



Northern Crawfish Frog
<http://www.herpnet.net>

the study area including two (2) bi-valves, one (1) amphibian, one (1) bird, and one (1) reptile.

- One (1) species has been determined to be **endangered**: *Rabbitsfoot* (bi-valve); and,
- Four (4) species are considered to be **special concern** fauna: *Sheepnose* (bi-valve), *Barn Owl* (bird), *Northern Crawfish Frog* (amphibian), and *Copperbelly Water Snake* (reptile).

The USFWS does not list *Rabbitsfoot* (bi-valve) as an **endangered** species in Kentucky, nor does it match any potential **threatened** faunal species from the KSNPC's listings. Also, it should be recognized that **special concern** listings are not displayed within the USFWS database.

It should be noted that the *Copperbelly Water Snake* is subject to the conditions outlined in the Copperbelly Water Snake Conservation Agreement, which is overseen by the Kentucky Department of Fish and Wildlife Resources.

C. Social, Economic, and Environmental Justice Concerns

Socioeconomic concerns considered as part of this analysis include social and economic locations and environmental justice. These items are discussed in the following sections.

1. Social and Economic Locations

Fourteen (14) community sensitive locations were identified in the study area.

- There are four (4) churches in the study area. Of the churches, three (3) are located south of Panther Creek and the other one (1) within the Owensboro City limits. These are listed in **Appendix C**;
- Nine (9) school facilities are located within the study area. Of the school facilities, two (2) are colleges, including:
 - Brescia College; and
 - Kentucky Wesleyan College. These colleges are located on either side of US 431 in Owensboro;
 - Seven (7) other schools were identified and are listed in Appendix C; and
- One (1) cemetery located within the study area has not been identified as historic.



Brescia College

In addition to these potential community concern areas, the study area is composed of various businesses and industry. The major industrial area within Daviess County is Owensboro.

- There are over twenty (20) major industrial sites within Owensboro;
- The largest industries according to Year 2000 economic data include:
 - Services, 23.6 percent of earnings;
 - State and local government, 16.4 percent; and
 - Retail trade, 11.0 percent.

- Agriculture is not a major player in regards to area economics;
- Daviess County has a per capita personal income (PCPI) of \$24,238. This PCPI ranks 22nd in the State and is greater than the state average (\$24,085), but less than the national average (\$29,469);
- Also, Owensboro has a total personal income (TPI) of \$2,220,460, which ranks 6th in the State, and accounts for 2.3 percent of the state total; and,
- The unemployment rate in Daviess County as of 2001 is listed at 5.4 percent, which is lower than the State average of 5.5 percent but higher than the U.S. average of 4.8 percent.

2. Environmental Justice

An important consideration for highway reconstruction or new development is environmental justice. For this study, environmental justice was addressed by calculating the percentage of minorities and low-income persons in the project area. Information was gathered from 2000 U.S. Census tract population counts. The study area is located in Census Tracts 2, 3, 5, 7, 8, 10, 11, and 12 in Daviess County.

Environmental justice concerns related to minority populations may exist based on Census 2000 data for the project area census tracts:

- Census Tracts 2, 3, and 5 have minority populations of 28.8, 12.2, and 10.3 percent, respectively.
- These percentages are higher than average percentages for Kentucky and Daviess County (10.0 and 6.1 percent, respectively).

Field review of the study area indicates that, residential dwellings currently reflect evidence of potential environmental justice issues with respect to low-income housing. Low-income data from the 2000 U.S. Census has not yet been released for the census tracts; however, census bureau information for the year 1999 indicates that three census tracts have a higher percentage of persons living in poverty than Kentucky and Daviess County:

- Census Tracts 2, 3, and 5 have poverty rates of 35.0, 37.4, and 17.6 percent, respectively.
- The statewide and countywide rates were 15.8 percent and 12.3 percent, respectively, in 1999.

It should be noted that 2000 minority population and 1999 low-income data sets were the latest available information at the time of this report.

The Green River Area Development District is compiling an Environmental Justice document to be included in the project study report. This document should be referenced for a more in-depth analysis of the environmental justice issues in the study area.

D. Historic and Archaeological Sites

A number of historic and archaeological sites are located within the study area. A full historic baseline study is recommended early in project development to review cultural landscapes and other historic sites in the study area.

1. Historic Sites

There are numerous historical points of interest throughout the US 431 study area in Daviess County, including markers, structures and districts. Historic markers and monuments in the study area include the following:

- North of the intersection of US 431 and KY 140 in Daviess County, a Civil War Historical Marker was established identifying a Civil War skirmish, dated September 19, 1862. The marker details how Confederate forces had occupied the area and refused to surrender as Union soldiers moved into the area. A skirmish followed as Union forces obtained reinforcements from the Indiana Legion. Outnumbered, the Confederates retreated with 36 killed and over 70 wounded. Union forces losses were minimal with 3 killed and 35 wounded. This site has not been assessed for potential listing on the National Register of Historic Places.
- The town of Owensboro has several War Memorial monuments on the banks of the Ohio River. The most prominent is the Ernest E. Shelton monument for Prisoners of War (POW) and those Missing In Action (MIA). A U.S. Air Force POW, Ernest E. Shelton was never found and eventually was documented as killed in action. This monument honors these soldiers who gave their lives for their country.
- A Confederate Congressional Medal of Honor state marker is located on the Ohio River in Owensboro. Though this historic marker falls just outside the study corridor, its significance should be recognized. It was erected in 1997 and has been given a National Register Listing.

Historic structures within the study area include:

- 121 historic structures have been located within the study area;
- Twenty-two (22) of these historic structures are listed on the National Register of Historic Places. All of these are located within Owensboro.

Four (4) Historic Districts are located within the Owensboro corporate limits:

- The Phillips Court District centers on a three block area of Frederica St. and includes approximately 118 acres, with twenty-six (26) contributing buildings. Two (2) outstanding structures within this district are the Italianate Triplett House and the Second Empire Building;
- The J.Z. Moore District consists of a 130 acre, twelve (12) block area of late Victorian and Classical Revival style homes and buildings. Forty-nine (49) building lots comprise the entire district;
- Doctor's Row is a five (5) acre Historic District of late 19th century commercial architecture. This District was significant in establishing Owensboro as a regional medical center; and,



Historical Marker in Daviess County, along US 431



POW/MIA War Memorial in Owensboro

- Owensboro Historic Commercial District is located between Lewis Street, the Ohio River in the north, and St. Ann Street to the south. This district includes forty-three (43) separate buildings and 80 acres.

2. Archaeological Sites

According to the Office of State Archaeology, there are no archaeological sites officially recorded within the project area in Daviess County. However, according to the Division of Environmental Analysis (DEA), it should be noted that the 121 historic structures listed in the previous section have a likely potential of being archaeological sites. Due to the lack of previous archaeological research in this area, documentation of known sites is nonexistent. It should also be noted that numerous archaeological sites do exist outside the study area with many located in and around the city of Owensboro.

E. Prime and Unique Farmland Concerns

An estimated 64% of Daviess County is harvested cropland. Soybeans, corn, oats, wheat, and hay are the staple crops in this area, along with some tobacco. Daviess County carries the distinction of the state's top producer of soybeans with over 82,639 acres of beans harvested. In addition, it ranks second in corn production in the state, with over 76,500 acres harvested.

According to the most recently updated Soil Survey Geographic (SSURGO) database, Daviess County digital soil data sets are **not** completed for downloading. The soil data obtained from SSURGO is the most detailed and accurate soil information available. The SSURGO database is updated and maintained by the United States Department of Agriculture (USDA).

Relocation of the US 431 corridor could result in land use changes and subsequent impacts to prime farmland, including chemical runoff into sinkholes and other drainage concerns.

F. Monitored Sites and Wells

A review of the databases and data source information covering the project area revealed a number of monitored sites, hazardous materials sites, locations with discharge permits, as well as oil and gas wells. A listing of these sites as well as a corresponding address of the sites can be found in **Appendix D**. The most significant issue along the corridor appears to be a site designated within the "Superfund" database, a number of underground storage tank locations, and oil and gas wells. A summary of these issues is presented as follows:

- One (1) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) site. In 1980, the U.S. Congress passed the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), commonly known as Superfund. The intent of this legislation was to regulate the cleanup of disposal sites where hazardous waste was leaking into the environment. The subject site is located along US 431 in Livia, just north of the Daviess/McLean County line and is known as Barnet of Kentucky. The current status of this site indicates that it is not on the National Priority List (NPL) and that no further remedial action is planned for this site under the Superfund Program. However, this site may present a significant concern for project development considerations and should be avoided unless further investigation reveals this site to be free from environmental hazards;



Oil well in Daviess County

- 197 underground storage tank (UST) sites within the Daviess County study corridor. Of these 197 tank sites, 180 tanks are found inside Owensboro's corporate limits. Of these, there are thirty-four (34) tanks which are currently active, five (5) tanks that have been closed, nine (9) tanks that have been temporarily closed, and 132 tanks which have been permanently removed. The remaining seventeen (17) underground storage tanks can be found in Browns Valley (9) and Livia (8). Four (4) tanks within Browns Valley are currently active, while four (4) more have been removed, and one (1) has been temporarily closed. Within the community of Livia, all eight (8) underground storage tanks have been permanently removed. In the development of corridor alignments, consideration should be given to opportunities to avoid the locations where underground storage tanks currently exist or did exist to avoid the need to remove existing tanks or assume liability for right-of-way that may be contaminated;
- Forty-five (45) Resource Conservation and Recovery Information System (RCRIS) sites. They are required to provide information about their activities to state environmental agencies. RCRIS is a national information system which supports the Resource Conservation and Recovery Act (RCRA) program through the tracking of events and activities related to facilities which generate, transport, treat, store or dispose of hazardous waste. RCRIS allows the RCRA program staff to track the notification, permit, compliance and corrective action activities required under the RCRA. Of these sites, forty-four (44) are located within the corporate limits of Owensboro. The remaining site is found in Utica (1). Twenty-four (24) of the sites located in Owensboro are also noted in the FINDS database, discussed later in this section. In addition, seven (7) RCRIS sites were noted in the FINDS database but not the RCRIS database. In the development of corridor alignments, further investigation of all RCRIS sites is warranted in order to better understand their environmental significance and liability risk that they may pose to the Cabinet;
- Eighteen (18) Aerometric Information Retrieval System (AIRS) sites. Seventeen (17) sites are currently located within the corporate limits in Owensboro. The remaining site is located near Browns Valley. AIRS sites are used to track emissions and compliance data from industrial plants. AIRS data are utilized by states to prepare State Implementation Plans (SIP) to comply with regulatory programs and by the Environmental Protection Agency (EPA) as an input for the estimation of the total national emissions. It should be noted that nine (9) of the eighteen sites were identified in the FINDS database, described later in this section;
- One (1) Toxic Release Inventory (TRIS) site. TRIS sites contain information about the release of toxic chemicals by manufacturers. The data reported from these sites are important for both the government and public so that potential chemical risks can be assessed. This site, MPD Inc., is located along on East 9th Street in Owensboro;
- Five (5) Emergency Response Notification System (ERNS) sites. Four (4) sites are located within the corporate limit of Owensboro, while the remaining site is found within the community of Browns Valley. The ERNS is an extensive database revealing notifications of oil and hazardous substance releases that have occurred throughout the United States. This data base is a listing of locations where a release or spill of hazardous material has previously occurred at a federally-determined level and the responsible operator has notified the federal government of the spill. It should be noted that these sites are also affiliated with the aforementioned FINDS sites. Further investigations of these locations, including soil tests or other appropriate investigations

should be undertaken if these locations are going to be potentially impacted during the project development phase;

- Three (3) Permit Compliance System (PCS) sites. The PCS represents companies which have been issued permits to discharge waste water into rivers. PCS is a computerized management information system which contains data on National Pollutant Discharge Elimination System (NPDES) permit holding facilities. PCS tracks permit, compliance, and enforcement states of NPDES facilities. The three (3) sites were identified from the FINDS database. Two (2) of these are located in Owensboro (Daviness County Detention Center on St. Elizabeth Street and Owensboro Grain Company on East Second Street) while the final site is located in Utica (Browns Valley MHP on US 431). Sites categorized as PCS sites do not necessarily represent a particular environmental hazard for highway project development considerations, but further investigation of any potentially impacted sites is recommended during the project development process;
- Fifty-one (51) Facility Identification Initiative System (FINDS) sites, all but two (2) of which are located within the corporate limits of Owensboro. The goal of this system, which was developed in the mid-1990's, is to simplify the reporting of all government sites by using an extensive database relative to all environmental sites monitored by the EPA which are subject to environmental regulation or of environmental interest. The sites contained in this database are facilities that are subject to federal environmental reporting and permitting requirements. Since this database is a compilation of multiple types of sites, there is some overlap between the FINDS sites and those described in the previous bullets. Of the fifty-one (51) sites, thirty (30) are RCRIS sites, three (3) are PCS sites, nine (9) are AIRS sites, and the remaining nine (9) sites do not include any other specific site type; and,
- Eighty-eight (88) oil and gas wells primarily concentrated in the southern half of the county. While these wells do not represent insurmountable obstacles for project development purposes, several issues should be considered if these sites are to be impacted by future construction. First, the KYTC must compensate the owner/operator of the well for its loss. Also, the KYTC must take responsibility for operating issues with the well and eventual closing and plugging. Plugging costs range from \$1,500 for a shallow well to \$6,000 or more for deeper wells or wells with problems. Finally, many oil and gas wells produce a brine wastewater and potentially other contaminants that should be investigated on the sites.

It should be noted that within **Figure 4**, the mapping legend may contain additional environmental graphic symbols that do not appear on this map.

Also, the potential for environmental hazard/contamination is increased within the study area due to higher amounts of geotechnical activity. These hazards apply to the southern section of Daviness County where oil and gas drilling is more prominent.

G. Additional Concerns

Other items identified within the US 431 study area include:

- Additional UST/HazMat concerns are likely to be associated with farming operations in the study area;
- Seven (7) fault lines cross the study area, primarily in the southern portion of Daviness County;

- Two (2) sewage treatment plants located near the KY 140/US 431 intersection and south of KY 298, adjacent to St. Anthony's School along US 431; and,
- According to the Division of Environmental Analysis, noise could be a concern in Daviess County.

H. Summary of Environmental Issues

The potential environmental concerns identified for the study corridor have been identified through this preliminary analysis. Environmental issues that are likely to require consideration during future phases of this project include:

- Potential water quality and floodplain issues related to the streams such as Panther Creek, their tributaries and wetland areas;
- Public and private water sources, such as water lines, wells, tanks, and facilities;
- Churches, schools, and cemeteries;
- Potential environmental justice issues related to high percentages of minority and low-income populations in the project area census tracts;
- Prime farmland along the US 431 corridor;
- Historic structures and Historic Districts, including those listed on the National Register of Historic Places;
- Underground storage tanks and gas/oil wells;
- Fault lines located in the southern portion of Daviess County; and,
- Potential habitat for threatened, endangered, or special concern species.

APPENDIX A

Environmental Resource Information

Appendix A

Granting Agency		
Contact Information		Data Obtained
<i>Department of Fish & wildlife Resources</i>		
<i>Web Address</i>	<i>http://www.fws.gov/data/stata/kydata.html</i>	<i>Wetlands Information - U.S. Department of Fish and Wildlife Quad Maps, 1983-1987</i>
<i>Mailing Address</i>	<i>#1 Game Farm Road Frankfort, KY 40601</i>	
<i>Phone Number</i>	<i>(800) 858-1549</i>	
<i>Kentucky Division of Waste Management / Underground Storage Tank Division</i>		
<i>Web Address</i>	<i>www.waste.ky.gov/programs/ust/</i>	<i>Underground Storage Tank Data</i>
<i>Mailing Address</i>	<i>14 Reilly Road Frankfort, KY 40601</i>	
<i>Phone Number</i>	<i>(502) 564-6717</i>	
<i>Kentucky Natural Resources and Environmental Protection Cabinet</i>		
<i>Web Address</i>	<i>www.nr.state.ky.us</i>	<i>Tire Dump Locations Sewage Treatment Plants Public Water Supply Lakes - based on National Wetlands Inventory, 1981 Permitted Landfills, recorded 1965-1985 Wildlife Management Areas State Parks - Kentucky Department of Parks, 1991 Facilities Guide State Forests</i>
<i>Mailing Address</i>	<i>Capital Plaza Tower</i>	
<i>Phone Number</i>	<i>(502) 564-3350</i>	
<i>Kentucky Heritage Council</i>		
<i>Web Address</i>	<i>www.state.ky.us/agencies/khc/khchome.htm</i>	<i>Archaeological Sites Historic Structures</i>
<i>Mailing Address</i>	<i>300 Washington Street Frankfort, KY 40601</i>	
<i>Phone Number</i>	<i>(502) 564-7005</i>	

Appendix A (continued)

Granting Agency		
Contact Information		Data Obtained
<i>Kentucky Geological Survey</i>		
<i>Web Address</i>	<i>www.uky.edu/KGS/home.htm</i>	<i>Faults Blueline Streams Oil and Gas Wells Coal Exploration USGS Water Monitoring Sites Water Wells</i>
<i>Mailing Address</i>	<i>228 Mining and Mineral Resources Building University of Kentucky Lexington, KY 40506-0107</i>	
<i>Phone Number</i>	<i>(859) 257-5500</i>	
<i>Kentucky State Nature Preserves Commission</i>		
<i>Web Address</i>	<i>www.naturepreserves.ky.gov/dataservices/download_reports.htm</i>	<i>Threatened and Endangered Species</i>
<i>Mailing Address</i>	<i>801 Schenkel Lane Frankfort, KY 40601</i>	
<i>Phone Number</i>	<i>(502) 573-2886</i>	
<i>Kentucky Department for Surface Mining Reclamation and Enforcement</i>		
<i>Web Address</i>	<i>www.surfacemining.ky.gov/data/gis/spatial/</i>	<i>Graphic database for all mining activities since 1961</i>
<i>Mailing Address</i>	<i>2 Hudson Hollow Frankfort, KY 40601</i>	
<i>Phone Number</i>	<i>(502) 564-6940</i>	
<i>U.S. Army Corps of Engineers</i>		
<i>Web Address</i>	<i>www.usace.army.mil</i>	<i>Dams (National Inventory of Dams, 1998-1991) Locks Ports</i>
<i>Mailing Address</i>	<i>20 Massachusetts Ave, NW Washington, DC 20314</i>	
<i>Phone Number</i>	<i>(202) 761-0001</i>	

Appendix A (continued)

Granting Agency		
Contact Information		Data Obtained
<i>Abandoned Mine Land Program</i>		
<i>Web Address</i>	<i>www.surfacemining.ky.gov/data/gis/spatial/</i>	<i>Abandoned Mine Lands Data</i>
<i>Mailing Address</i>	<i>2521 Lawrenceburg Road Frankfort, KY 40601</i>	
<i>Phone Number</i>	<i>(502) 564-2141</i>	
<i>U.S. Geological Survey</i>		
<i>Web Address</i>	<i>www.usgs.gov</i>	<i>GNIS (Geographical Name Information Server) for Schools, Cemeteries, Churches, and Hospitals</i>
<i>Mailing Address</i>	<i>12201 Sunrise Valley Drive Reston, VA 20192</i>	
<i>Phone Number</i>	<i>(703) 648-7411</i>	<i>DRG (Digital Raster Graphic)</i>
<i>National Park Service</i>		
<i>Web Address</i>	<i>www.nps.gov</i>	<i>Dataset for 340 National Park System Unit Boundaries</i>
<i>Mailing Address</i>	<i>1848 C Street, NW Washington, DC 20240</i>	
<i>Phone Number</i>	<i>(202) 208-4621</i>	
<i>National Forest Service</i>		
<i>Web Address</i>	<i>www.nfs.fed.us</i>	<i>Polygon Coverage Showing Surface Ownership / Jurisdictions of Lands</i>
<i>Mailing Address</i>	<i>1400 Independence Ave, SW Washington, DC 20250</i>	
<i>Phone Number</i>	<i>(202) 205-1760</i>	
<i>Bureau of Transportation Statistics</i>		
<i>Web Address</i>	<i>www.bts.gov</i>	<i>United States Military Installations Database (BTS) Railroad Linear Data</i>
<i>Mailing Address</i>	<i>400 7th Street, SW Washington, DC 20590</i>	
<i>Phone Number</i>	<i>(202) 366-1111</i>	

Appendix A (continued)

Granting Agency		
Contact Information		Data Obtained
<i>Federal Communications Commission</i>		
<i>Web Address</i>	<i>www.fcc.gov</i>	<i>Paging, Cellular, and Antenna Spatial Data</i>
<i>Mailing Address</i>	<i>445 12th Street SW Washington, DC 20554</i>	
<i>Phone Number</i>	<i>(202) 418-0615</i>	
<i>U.S. Department of Transportation</i>		
<i>Web Address</i>	<i>www.dot.gov</i>	<i>Highway and Road Networks Utility Line Linear Data</i>
<i>Mailing Address</i>	<i>400 7th Street, SW Washington, DC 20590</i>	
<i>Phone Number</i>	<i>(202) 366-4000</i>	
<i>Environmental Protection Agency</i>		
<i>Web Address</i>	<i>www.epa.gov</i>	<i>AFS (AIRS Facility Subsystem) CERCL (Comprehensive Environmental Response, Compensation and Liability) ERNS (Emergency Response Notification System) FINDS (Facility Identification Initiative) PCS (Permit Compliance System) RCRIS (Resource Conservation and Recovery Information System) TRIS (Toxics Release Inventory System)</i>
<i>Mailing Address</i>	<i>W1200 W. Tower of Waterside Mall 401 M Street, SW Washington, DC 20460</i>	
<i>Phone Number</i>	<i>(202) 260-4700</i>	
<i>Natural Resource Conservation Service (NRCS)</i>		
<i>Web Address</i>	<i>www.nrcs.usda.gov</i>	<i>Prime & Unique Farmland Concerns</i>
<i>Mailing Address</i>	<i>U.S. Department of Agriculture 1400 Independence Avenue Washington, DC 20250</i>	
<i>Phone Number</i>	<i>(202) 720-2600</i>	

APPENDIX B
Project Area Photographs



Logan Memorial Hospital
(Logan Co.)



Civil War Monument
(Russellville-Logan Co.)



Four-lane section of US 431
(Russellville-Logan Co.)



Logan Aluminum, Inc.
(Logan Co.)



Lewisburg Water Treatment Plant
(Lewisburg-Logan Co.)



Hillcrest Church of Christ
(Logan Co.)



Hughes-Kirk Elementary School
(Muhlenberg Co.)



Potential Historic General Store
(Drakesboro-Muhlenberg Co.)



Bevier Presbyterian Church
(Muhlenberg Co.)



First Methodist Church
(Central City-Muhlenberg Co.)



US 431 / US 62 intersection
(Central City-Muhlenberg Co.)



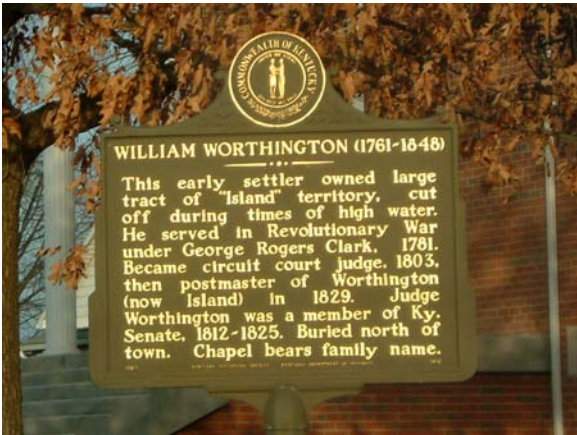
New Hope Cemetery
(Muhlenberg Co.)



Prime Farmland along US 431
(McLean County)



Grain Elevators along Green River
(McLean Co.)



Historic Marker (William Worthington)
(McLean Co.)



Historic Livermore Bridge
(Green and Rough Rivers-McLean Co.)



Gas Station w/ UST's
(Island-McLean Co.)



Poultry Barns (chicken)
(McLean Co.)



Civil War Historic Marker
(Davies Co.)



Oil well along US 431
(Davies Co.)



Historic House along US 431
(Owensboro-Davies Co.)



US 431 North in Owensboro
(Owensboro-Davies Co.)



Owensboro High School
(Owensboro-Davies Co.)



War Memorial with Owensboro Bridge
(Owensboro-Davies Co.)

APPENDIX C

Listing of Additional Community Sensitive Locations

Appendix C

Churches in Logan County:

1. Hillcrest Church of Christ
2. Baptist Church
3. Oak Forest Missionary Baptist Church
4. Cumberland Presbyterian Church
5. Church of Christ
6. The Temple Pentecostal Church
7. Northside Congregation Church of Christ
8. Russellville United Methodist Temple
9. First Baptist Church
10. Trinity Episcopal Church
11. Grace Baptist Church
12. Southern Heights Baptist Church
13. Church of Christ of Adairville
14. Berea Church

Churches in Muhlenberg County:

1. Church of Jesus Christ
2. Beechmont Church of Christ
3. Belton Beechmont Baptist Church
4. South Carrollton Missionary Baptist Church
5. Maple Grove General Baptist Church
6. Temple Missionary Baptist Church
7. First Church of the Nazarene
8. First United Methodist Church
9. Church of God of Prophecy
10. Bevier Presbyterian Church
11. Dunmor Missionary Baptist Church

Churches in McLean County:

1. Voice of the Lord Tabernacle
2. Island Baptist Church
3. Buck Creek Church

Churches in Daviess County:

1. Bellevue Church
2. New Hope Church
3. Panther Creek Church
4. Rushing Church

Schools in Daviess County

1. Longfellow School
2. Newton Parrish School
3. Our Lady of Lourdes School
4. St. Anthony School
5. Sutherland Consolidated School
6. Western School
7. Owensboro High School

APPENDIX D
Listing of Sites and Wells

Site Name	Street Address	City	State	Zip	Tank Status	Substance	Date Installed	Date Removed	Date Closed
QUINNS SHELL	622 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/1956	2/12/1990	
QUINNS SHELL	622 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/1956	2/12/1990	
QUINNS SHELL	622 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/1956	2/12/1990	
QUINNS SHELL	622 E 4TH ST	OWENSBORO	KY	42301	TRM	OIL	1/1/1956	2/12/1990	
QUINNS SHELL	622 E 4TH ST	OWENSBORO	KY	42301	TRM	OIL	1/1/1956	2/12/1990	
QUALITY QUICK 3	501 W 2ND ST	OWENSBORO	KY	42303	TR8	GAS	1/1/1966	1/1/1986	
QUALITY QUICK 3	501 W 2ND ST	OWENSBORO	KY	42303	TR8	GAS	1/1/1966	1/1/1986	
QUALITY QUICK 3	501 W 2ND ST	OWENSBORO	KY	42303	TR8	GAS	1/1/1966	1/1/1986	
QUALITY QUICK 3	501 W 2ND ST	OWENSBORO	KY	42303	TAC	GAS	1/1/1986	00000000	
QUALITY QUICK 3	501 W 2ND ST	OWENSBORO	KY	42303	TAC	GAS	1/1/1986	00000000	
QUALITY QUICK 3	501 W 2ND ST	OWENSBORO	KY	42303	TAC	GAS	1/1/1986	00000000	
RE 269	304 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/1971	1/10/1990	
RE 269	304 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/1971	1/10/1990	
RE 269	304 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/1971	1/10/1990	
RE 269	304 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	1/10/1990	
RE 269	304 E 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	1/10/1990	
RE 269	304 E 4TH ST	OWENSBORO	KY	42301	TRM	OIL	1/1/2001	1/10/1990	
PETROLEUM LOCATION BP	E 14TH ST	OWENSBORO	KY	42301	TUR	GAS	1/1/1975	2/22/1989	
PETROLEUM LOCATION BP	E 14TH ST	OWENSBORO	KY	42301	TUR	GAS	1/1/1975	2/22/1989	
ROBERTS MOTOR SALES INC	200 E 18TH ST	OWENSBORO	KY	42301	TR8	UNK	1/1/1960	1/1/1988	
ROBERTS MOTOR SALES INC	200 E 18TH ST	OWENSBORO	KY	42301	TR8	OIL	1/1/1960	1/1/1988	
ATHERTONS GROCERY	HWY 431	UTICA	KY	42376	TRM	GAS	1/1/1974	10/13/1992	
ATHERTONS GROCERY	HWY 431	UTICA	KY	42376	TRM	DSL	1/1/1974	10/13/1992	
ATHERTONS GROCERY	HWY 431	UTICA	KY	42376	TRM	GAS	1/1/1974	10/13/1992	
BOWEN TIRE	711 PARRISH	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	3/26/1990	
BOWEN TIRE	711 PARRISH	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	3/26/1990	
BOWEN TIRE	711 PARRISH	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	3/26/1990	
BOWEN TIRE	711 PARRISH	OWENSBORO	KY	42301	TRM	OIL	1/1/2001	3/26/1990	
RABEN TIRE COMPANY	824 FREDERICA ST	OWENSBORO	KY	42301	TRM	UOL	1/1/1974	10/27/1993	
J BACON & SONS	5000 FREDERICA ST	OWENSBORO	KY	42301	TEX	DSL	1/1/1978	00000000	
J & L AUTOMOTIVE	600 W 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	10/21/1998	
J & L AUTOMOTIVE	600 W 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	10/21/1998	
J & L AUTOMOTIVE	600 W 4TH ST	OWENSBORO	KY	42301	TRM	GAS	1/1/2001	10/21/1998	
J & L AUTOMOTIVE	600 W 4TH ST	OWENSBORO	KY	42301	TRA	UOL	1/1/2001	10/21/1998	
SUBURBAN PROPANE	308 E 25TH ST	OWENSBORO	KY	42302	TRM	UOL	1/1/2001	12/2/1998	

RCRIS Sites

Facility ID	Facility Name	Street Address	City	State	Zip Code	Contact Name	Contact Phone
LOGAN COUNTY							
KYD985112317	ACTION AUTOMOTIVE GROUP INC.	620 NORTH MAIN STREET	RUSSELLVILLE	KY	42276	SHOOK TIM	5027263694
KYR000010249	ADAIRVILLE AUTO CARE	N MAIN ST	ADAIRVILLE	KY	42202	BLAKE THURMAN	5025394341
KYD049937832	CARPENTER COMPANY	200 FORREST PARK DRIVE	RUSSELLVILLE	KY	42276	BAKER WADE	5027269513
KYR000004952	CLAYS AUTO BODY	591 WEST 2ND STREET	RUSSELLVILLE	KY	42276	BILYEU CLAY	5027268092
KYR000012377	HALLIGAN FOOD MART	3203 LEWISBURG RD	LEWISBURG	KY	42256	HALLIGAN WILLIAM	5739982836
KYD990876252	ILLINOIS TOOL WORKS INC	CLARKSVILLE ROAD	RUSSELLVILLE	KY	42276	ARNOLD LARRY	5027269531
KYD985094143	J. S. TECHNOS CORP.	188 EARL DAVIS DRIVE	RUSSELLVILLE	KY	42276	WILLIAMS JERRY	5027266122
KYR000003723	KENTUCKY DEPT OF HIGHWAYS	US 431	RUSSELLVILLE	KY	42276	SMITH BOBBY G.	5025647111
KY0001019264	PRIVATE RESIDENCE	214 EAST 1ST STREET	RUSSELLVILLE	KY	42276	MATHIS GARY	5027810577
KYR000009639	STOP & SHOP MARKET	HWY 106 & 8TH ST	LEWISBURG	KY	42256	LOGSDON DOROTHY	5027554556
KYR000019042	TRIMBLE'S SERVICE CENTER	100 N MAIN ST	ADAIRVILLE	KY	42202	TRIMBLE JIM	5025396741
KYR000000851	4TH ST UNOCAL	4TH ST	RUSSELLVILLE	KY	42276	CHESTNUT JAMES MICHAEL	5027265848
KYD981804925	BETHEL CLEANERS	212 BETHEL SHOPPING CENTE	RUSSELLVILLE	KY	42276	HARDIN GARY	5027262115
KYD006379945	BTR PRECISION DIE CASTING, INC.	232 HOPKINSVILLE ROAD	RUSSELLVILLE	KY	42276	INMAN THOMAS H.	2707260268
KYD135322030	KO KLEENERS	520 WEST NINTH ST.	RUSSELLVILLE	KY	42276	GOWER J. L.	5027262501
MUHLENBERG COUNTY							
KYD000773382	AMAX INC AYRGEM MINE	1/4 MI OFF KY HWY 431 SOUTH	CENTRAL CITY	KY	42330	HUGHES MICHAEL,R	5023386240
KYR000019331	DRAKESBORO CITY BUILDING	HWY 176 MAIN ST.	DRAKESBORO	KY	42337	BRAKE EDDIE	5024768986
KYR000008581	FASTWAY #5	HWY 62 & RESERVOIR ST	CENTRAL CITY	KY	42330	BALL DAVID C	5022987401
KYR000012229	PRYOR'S GULF SERVICE	HWY 431	DRAKESBORO	KY	42337	RICHARDSON DONNA B	5027541525
KYD981807472	SHAVER'S BODY SHOP	ROUTE 4, PARK STREET	CENTRAL CITY	KY	42330	SHAVER BARRY	5027541484
KY0000851923	SHAVER'S BODY SHOP LLC	HWY 62 EAST EVERLY BROTH	CENTRAL CITY	KY	42330	SHAVER BARRY	5027541484
KYD985086925	VERBLE CHEVROLET, INC.	HWY. 62 & SOUTH 4TH STREET	CENTRAL CITY	KY	42330	ROEDER FRED	5027542600
KYR000019638	WAYNE'S PLACE	11061 HWY 431 SOUTH	DUNMOR	KY	42339	JOHNSON HARRY	5026572636
MCLEAN COUNTY							
KYD082391012	BARMET ALUMINUM CORP.	HIGHWAY 431 SOUTH	LIVIA	KY	42376	TUTTLE DAVID G.	5027334381
KYR000017723	CASTEEL'S ISLAND SERVICE	165 ADAMS ST	ISLAND	KY	42350	JOHNSON JERRY W	5024863292
KYD985115252	HELMERICH & PAYNE INT'L DRILLING CO	4407 HIGHWAY 1080, RIG 79	LIVERMORE	KY	42352	WILLIAMS JR. D. KENYON	9187425531
KYD980847198	LIVERMORE BRASS & SILVER SHOP	HIGHWAY 136	LIVERMORE	KY	42352	RANBURGER JR SHELLY	5022782181
KYR000009167	LIVERMORE GULF & BODY SHOP	HWY 431	LIVERMORE	KY	42352	RATLIFF DAVID	5022782196
DAVISS COUNTY							
KYD985083591	ACE LUBE INC.	3425 FREDERICA STREET	OWENSBORO	KY	42301	ALEXANDER JOE S.	5026842270
KYD985080688	BASKIN ROBBINS USA CO. (MIDWEST DIV.)	1017 LOCUST STREET	OWENSBORO	KY	42301	SANDIFER SCOTT D.	5026832466
KYD980563639	BELL SOUTH TELECOMMUNICATIONS 53334	720 FREDERICA STREET	OWENSBORO	KY	42302	GABHART RICK	5025828604
KYD985087352	BELL SOUTH TELECOMMUNICATIONS 53338	605 FULTON DRIVE	OWENSBORO	KY	42301	GABHART RICK	5025828604
KYD981855273	CHAMPION FORD LINCOLN MERCURY MAZDA	322 WEST FOURTH STREET	OWENSBORO	KY	42301	TABER RON	5026841441
KY0000134593	CHEVRON USA PRODUCTS CO 42765	902 FREDERICA & 9TH STREET	OWENSBORO	KY	42301	JOHNSON JENNIFER L	7709844135
KY0000065680	DAIRY MART #203	817 LAFAYETTE DRIVE	OWENSBORO	KY	42303	WILLIAMS C. KEITH	5025845765
KYD024140410	DON MOORE CHEVROLET	600 WEST SECOND STREET	OWENSBORO	KY	42301	LOGSDON DON	5026855551
KYD985085760	FELDHaus-SCHWARTZ COMPANY	410 E. 14TH STREET	OWENSBORO	KY	42301	BURNS JOE	5026838934
KYR000020537	MARVIN'S MARKET #3 DBA UTICA FOOD MART	10615 US 431	UTICA	KY	42301	JENNINGS L.D.	5029263124
KYD006394423	MPD INC	316 E. 9TH STREET	OWENSBORO	KY	42303	WESSEL ROBERT A.	5026856303
KY0000065789	OWENSBORO BOARD OF EDUCATION	1335 WEST 11TH STREET	OWENSBORO	KY	42302	HOWARD ALLEN	5026861076
KYD985080621	OWENSBORO MUNICIPAL UTILITIES/FREDERICA	4230 FREDERICA STREET	OWENSBORO	KY	42301	FRIZZELL KEVIN	5029263200

Facility ID	Facility Name	Street Address	City	State	Zip Code	Contact Name	Contact Phone
KY0000851949	SEARS, ROEBUCK AND COM. -2950	35 TOWNE SQUARE MALL	OWENSBORO	KY	42301	WHITNEY MARGE	7082868616
KYR000021089	SOUTHTOWN BP	2402 FREDERICA ST	OWENSBORO	KY	42301	BALL DAVID	2702987401
KYR000007187	SUPERAMERICA #5568	2224 FREDERICA ST	OWENSBORO	KY	42303	BLANTON RUSS	6063572522
KYR000002808	SUPERAMERICA #9269	304 EAST 4TH STREET	OWENSBORO	KY	42303	HISER SCOTT	6063572522
KYD985097104	TEXAS GAS TRANSMISSION	3800 FREDERICA STREET	OWENSBORO	KY	42301	ADAMS SHEILA R	5026886958
KYD981854409	BILL'S QUALITY CLEANERS	341 WASHINGTON AVE.	OWENSBORO	KY	42301	WAHL BILLY G.	5026852507
KYD981805872	CONVENIENT FOOD MART #202	353 WASHINGTON STREET	OWENSBORO	KY	42301	WINNER MARC	5024513800
KYD980843361	DOVE TRANSPORTATION CO INC	1301 DAVIESS STREET	OWENSBORO	KY	42301	BURTON THOMAS M.	5026844294
KYD981754534	E.A. CARTER SUPPLY	508 W. SECOND STREET	OWENSBORO	KY	42301	CHAPMAN LARRY	5026849292
KYD981805112	GIPE AUTOMOTIVE	425 WEST FOURTH STREET	OWENSBORO	KY	42301	GIPE FRED	5026852901
KYD981014897	GIPE AUTOMOTIVE INC	510 W 4TH ST	OWENSBORO	KY	42301	GIPE FRED N.	5026852901
KYD024136822	GIPE AUTOMOTIVE INC MFG'S AUTO WHSE	510 WEST 4TH ST	OWENSBORO	KY	42301	GIPE FRED	5026852901
KYD981854847	GOODYEAR AUTO SERVICE CENTER	824 FREDERICA STREET	OWENSBORO	KY	42301	SCHHELP D. L.	5026843241
KY0000032383	MASSEY CLARK DEVELOPMENT	3633 FREDERICA STREET	OWENSBORO	KY	42301	APPLEBY DAVID	5026848771
KYD024138935	MOTOR & ELECTRIC INC	425 WEST 4TH ST	OWENSBORO	KY	42301	THOMPSON DON	5026849483
KY0000229815	NU-LOOK CLEANERS	1070 TAMARACK ROAD	OWENSBORO	KY	42301	MILLS ROBERT M.	5028266834
KYD981803638	OWENSBORO PUBLISHING COMPANY	1401 FREDERICA STREET	OWENSBORO	KY	42301	MARTIN PHILLIP C.	5029260123
KYD115960866	OWENSBORO VOCATIONAL TECHNICAL SCHOOL	1501 FREDERICA STREET	OWENSBORO	KY	42301	PARKER TARA	5026849871
KYD024140196	ROBERTS MOTOR SALES INC.	200 E. 18TH STREET	OWENSBORO	KY	42301	ROBERTS BILL	5026836282
KYD985087501	RYDER TRUCK RENTAL	515 SALEM DRIVE, BLDG. 7	OWENSBORO	KY	42303	STANLEY TOM	3178447783
KYD985112143	SOUTHTOWN BP	2400 FREDERICA STREET	OWENSBORO	KY	42301	BARTLETT JEFF	5026846247
KYD024140543	SWAN CLEANERS & SHIRT LAUNDRY, INC.	1228 WALNUT STREET	OWENSBORO	KY	42301	HICKS RONALD L.	5026840268
KYD024141426	VOGUE CLEANERS	2318 FREDERICA STREET	OWENSBORO	KY	42301	GOYAL DINESH	5026847506
KYD981473887	VOGUE CLEANERS, INC.	3600 FREDERICA STREET	OWENSBORO	KY	42301	GOYAL DINESH	5026847506
KYD024141699	WESTERN PLATING CO., INC.	1728 MOSELEY STREET	OWENSBORO	KY	42302	TOOMEY MARK	5026843882

AIRS Sites

Plant Name	Plant ID	Street Address	City	State	Zip	Air Program Code
LOGAN COUNTY						
CARPENTER CO	12	PO BOX 190	RUSSELLVILLE	KY	42276	0
CARPENTER CO	12	PO BOX 190	RUSSELLVILLE	KY	42276	7
ADAIRVILLE FEED MILL #2	59	342 W SECOND ST	RUSSELLVILLE	KY	42202	0
ADAIRVILLE FEED MILL #2	59	342 W SECOND ST	RUSSELLVILLE	KY	42202	9
BTR PRECISION DIE CASTING INC	22	232 HOPKINSVILLE RD	RUSSELLVILLE	KY	42276	0
MCLEAN COUNTY						
BARMET OF KY INC	1	HIGHWAY 431,SOUTH	UTICA	KY	42376	0
BARMET OF KY INC	1	HIGHWAY 431,SOUTH	UTICA	KY	42376	6
BARMET OF KY INC	1	HIGHWAY 431,SOUTH	UTICA	KY	42376	7
BARMET OF KY INC	1	HIGHWAY 431,SOUTH	UTICA	KY	42376	9
DAVISS COUNTY						
COTTRELL,J S & CO	67	21 MOSELEY STREET	OWENSBORO	KY	42301	0
DAVIS FUNERAL HOME	69	3000 FREDERICA ST.	OWENSBORO	KY	42301	0
LEE CONCRETE PRODUCTS	19	301 E 14TH ST	OWENSBORO	KY	42301	0
MPD, INC.	16	316 EAST NINTH STRT	OWENSBORO	KY	42301	0
MPD, INC.	16	316 EAST NINTH STRT	OWENSBORO	KY	42301	7
OWENSBORO GRAIN CO.	83	108 CRITTENDON	OWENSBORO	KY	42301	0
OWENSBORO GRAIN CO.	83	108 CRITTENDON	OWENSBORO	KY	42301	7
READY MIX CONCRETE	24	304 EAST 25TH STREET	OWENSBORO	KY	42301	0
TRANSIT MIX CONCRETE	21	1533 MOSELEY STREET	OWENSBORO	KY	42301	0

ERNS Sites

Facility Name	Street Address	Regional Code	Incident State	Incident County	Spill Date	Material Spilled	Action Taken
LOGAN COUNTY							
	302 N MAIN ST	94-1995	KY	RUSSELLVILLE	3/22/1994	ETHYLENE GLYCOL	NONE
MUHLENBERG COUNTY							
	DRAINAGE DITCH BEHIND 818 N 2ND STREET	92-8127	KY	CENTRAL CITY	6/6/1992	UNKNOWN MATERIAL	NONE
CARL MITCHELL AND SON	131 RESERVOIR AVE	96-0275	KY	CENTRAL CITY	11/11/1995	ETHYLENE GLYCOL	NONE
DAVISS COUNTY							
	9048 HIGHWAY 431	89-492	KY	UTICA	4/20/1989	ALUMINUM DROSS	TRUCKING COMPANY WITH CLEANUP.
BASKINS ROBBINS	1017 LOCUST ST	96-1627	KY	OWENSBORO	4/30/1996	AMMONIA, ANHYDROUS	RELEASE SECURED
HENRY'S HEATING & COOLING	518 E 5TH ST	94-3549	KY	OWENSBORO	8/5/1994	FREON	NONE
KINGS TRANSFER	US HWY 431	94-1975	KY	OWENSBORO	3/18/1994	DIMETHENAMID	UPPER LIMIT OF EGY WAS 66.7 LBS, ATZ 300 LBS, DIMET
TEXAS GAS TRANSMISSION CO	3800 FREDERICA STREET	94-4088	KY	OWENSBORO	9/26/1994	SULFURIC ACID	ACID AND WATER MIXTURE//25 GALLONS WAS ACID//CONTAI

PCS Sites

EPA ID	Site ID	County Name	Facility Name	Street Address	Street Address (Continued)	City	State	Zip Code
LOGAN COUNTY								
KYD000875625	KY0020877	LOGAN	RUSSELLVILLE STP	KEN SMITH, MAYOR	106 SW PARK SQUARE	RUSSELLVILLE	KY	42276
MUHLENBERG COUNTY								
	KY0066575	MUHLENBERG	DRAKESBORO STP	CITY HALL	PO BOX 129	DRAKESBORO	KY	42337

CERLIS Sites

EPA ID	County Name	Site Name	Street Address	City	State	Zip	Date of Site
LOGAN COUNTY							
KY8890090006	LOGAN	TVA/HOMER L OWENS SUBSTATION CAPACITORS	ROCKWELL BRANCH, 500 FT DWNSTRM OF	RUSSELLVILLE	KY	42276	11/4/1987
MUHLENBERG COUNTY							
KYD000773382	MUHLENBERG	AMAX INC AYRGEM MINE	1/4 MI OFF KY HWY 431 S	CENTRAL CITY	KY	42330	8/1/1980
DAVISS COUNTY							
KYD082391012	DAVISS	BARMET OF KENTUCKY	ROUTE 431 S	UTICA	KY	42376	11/1/1980

TRIS Sites

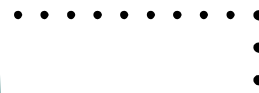
Site ID	EPA ID	County	Company Name	Street Address	City	State	Zip Code	Contact Person	Contact Number
<i>MCLEAN COUNTY</i>									
42376BRMTLHWY43	KYD082239101	MC LEAN	BARMET ALUMINUM CORP.	HWY. 431 S.	LIVIA	KY	42376	KEVIN MORRIS	5027334381
<i>DAVIESS COUNTY</i>									
42303MPDNC316E9	KYD006394423	DAVIESS	MPD INC.	316 E. 9TH ST.	OWENSBORO	KY	423033511	C. W. MATTINGLY	5026856200

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Environmental Justice and Community Impact Report



**US 43 I Safety Improvements
Tennessee State Line to the
Owensboro Bypass**

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1.0 INTRODUCTION

This document is an assessment of the community characteristics for the proposed improvements to US 431 from the Tennessee state line to the Owensboro Bypass. The data used in this report has been compiled from a number of sources including the U.S. Census Bureau Census 2000, Kentucky Transportation Cabinet Division of Planning, local officials, and field observations of the project area. Appendix 1, *Identification of Community Leaders and Other Contacts*, contains contact information for individuals who were identified as having an interest or stake in the US 431 Improvements Project. 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 12898¹, to ensure equal environmental protection to all groups potentially impacted by this project.

The US 431 study area in western Kentucky crosses two KYTC Districts (2 and 3), three Area Development Districts (Barren River, Green River, and Pennyrite), and four counties (Logan, Muhlenberg, McLean, and Daviess). The study consists of two phases and the boundaries of the study area are generally as follows:

- Phase I begins at the Tennessee state line and extends northward to the Western Kentucky Parkway.
- Phase II begins at the Western Kentucky Parkway and extends northward to the Owensboro Bypass.

The information in this document is arranged into two parts – Phase I and Phase II.

This report outlines Census 2000 statistics for the US 431 Project Area using tables and maps. Statistics are provided on minority, low-income, elderly, and disabled populations for the project area, nation, state, region, tracts, and block groups.

2.0 WHAT IS ENVIRONMENTAL JUSTICE?

The U.S. EPA Office of Environmental Justice (EJ) defines EJ as:

“The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local and tribal programs and policies. Meaningful involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision making process; and (4) the decision makers seek out and facilitate the involvement of those potentially affected.”

¹ Executive Order 12898 signed on February 11, 1994 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...”

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.

2.1.1 Definitions

USDOT Order 5610.2 on EJ, issued in the April 15, 1997 Federal Register defines what constitutes low income and minority populations.

- Low-Income is defined as a person whose median household income is at or below the U.S. Department of Health and Human Services poverty guidelines.
- Minority is defined as a person who is: (1) Black (a person having origins in any 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).
- Low-Income Population is defined as any readily identifiable group of low-income persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons who will be similarly affected by a proposed DOT program, policy or activity.
- Minority Population is defined as any readily identifiable group of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons who will be similarly affected by a proposed DOT program, policy or activity.

EO 12898 and U.S. DOT Order 5610.2 do not address consideration of the elderly or disabled population. However, the U.S. DOT encourages the study of these populations in EJ discussions and in accordance with EJ, Title VI of the Civil Rights Act of 1964 and the Kentucky Transportation Cabinet's advocacy of inclusive public involvement and equal treatment of all persons this study includes statistics for persons age 65+ that are within the project and comparison areas, as well as individuals with one or more disabilities.

3.0 METHODOLOGY

For this study, data was collected by using the method outlined by the KYTC document, "Methodology for Assessing Potential Environmental Justice Concerns for KYTC Planning Studies." (See *Appendix 2*)

The primary sources of data were the US Census Bureau Census 2000, local leaders, and field observations. Statistics were compiled to present a detailed analysis of the community conditions for the US 431 Project Area.

4.0 CENSUS DATA ANALYSIS

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.”

The project and comparison area analysis include the percentages for minorities, low-income, elderly, and disabled population levels for the census tracts, block groups, Logan County, Muhlenberg County, McLean County, Daviess County, the Commonwealth of Kentucky, and the United States.

5.0 PHASE I – US 431 from the Tennessee state line to the Western Kentucky Parkway

This section of the Environmental Justice and Community Impact Report is to be used as a component of a Planning Study for highway transportation improvements to US 431 between the Tennessee state line & Owensboro, KY. This study is intended to help define the location and purpose of the project and better meet federal requirements regarding consideration of environmental issues as defined in the National Environmental Policy Act (NEPA).

The 2000 Census identifies two counties, 6 census tracts, and 16 block groups in this phase of the study. (See *Figures 9.1 and 9.2*)

Logan County – 3 census tracts, 9 block groups
Muhlenberg County – 3 census tracts, 7 block groups

5.1 STUDY FINDINGS / POPULATION BY RACE (Figure 5.1)

5.1.1 Logan County

This Environmental Justice and Community Impacts Report is to be used as a component of a *Scoping Study for Safety Improvements on US 431 from the Tennessee state line to the Owensboro Bypass*. The US 431 study area in Logan County encompasses an environmental footprint of 2,000 feet from the centerline of US 431 for a total width of 4,000 feet. This area encompassed portions of the following census tracts and block groups:

- Census Tract 9602
 - Block Group 1
 - Block Group 2
 - Block Group 3
 - Block Group 4
- Census Tract 9605
 - Block Group 1
 - Block Group 2
- Census Tract 9606
 - Block Group 1
 - Block Group 2

One additional block group, Block Group 3 of Census Tract 9605 was also analyzed because it is considered a nearby census block group.

Following a compilation of census information including data related to total population and specific target population groups within the study area, the Barren River Area Development District staff met with local officials and community members to review maps and census data related to the study. Specific targeted population groups included population by poverty level, minority and age group populations, and persons with disabilities. The intent of consulting local officials and community members was to confirm previous conclusions and to solicit input into the process of developing the Environmental Justice Report.

Within Logan County the predominant minority population is black. Of the three census tracts contained in the Logan County portion of the study area, none have a higher concentration of minorities than the United States average. However, two of the three census tracts, 9605 and 9606, do have a larger proportion of minorities than Kentucky or Logan County. Census Tract 9605 encompasses the southern part of Russellville and extends into southern Logan County. Census Tract 9606 includes Adairville and the remainder of south Logan County. Neither Census Tract 9602 nor its four block groups contains a significant number of minorities.

When the two census tracts, 9605 and 9606, are broken down into block groups it is revealed that two of the three block groups in Census Tract 9605 have higher concentrations of minority populations than Kentucky or Logan County. Census Block Group 1 of Census Tract 9605 has 17.2 percent of its residents as minorities, compared to Kentucky's 10.7 percent and Logan County's 9.3 percent. Census Block Group 3 has 15.1 percent of its population being minority. In discussions with local leaders, it was confirmed that Block Group 3 has a concentration of minorities along US 431 and in blocks in close proximity to US 431. This area of concentration was located from Rhea Boulevard north to Ninth Street in Russellville.

Within Census Tract 9606, Block Group 1 has 12.6 percent minority and Block Group 2 has 17.9 percent. Neither block group has more than 200 minorities. Local community leaders verified that there are no longer significant concentrations or predominant neighborhoods of minorities but they are fairly evenly distributed throughout Census Tract 9606.

5.1.2 Muhlenberg County Phase I: South of the WK Parkway

The previously defined Phase I study area of Muhlenberg County encompasses Census Tract 9601, 9607 and 9608. After compiling relative data, PADD staff met with local officials and community members to review maps and census data related to the study area. The intent of these discussions was to confirm previous conclusions and solicit input into the process of developing the Environmental Justice Report.

The majority of the census block groups in the study area contain minority populations that are considerably less than the national, state, and county averages. However, there are a few block groups in the study area that warrant further discussion. Figure 5.1 displays that Block Group 2 in Tract 9607 has higher percentages of minority populations than the overall county population with 9.8 percent or 142 black residents and 1.3 percent or 20 Hispanic residents. The black population for Muhlenberg County is 4.6 percent, the State of Kentucky is 7.3 percent, and the United States is 12.1 percent. The Hispanic population for Muhlenberg County is 0.7 percent, the State of Kentucky is 1.5 percent and the United States is 12.5 percent. There is a small minority neighborhood in Block Group 2 in the City of Drakesboro, Kentucky as indicated on *Figure 11.1A, Environmental Justice Target Populations in Muhlenberg County, Kentucky*.

Block Group 1 in Tract 9601 has the second highest black population with 6.1 percent or 59 black residents. These African-American residents are mainly located in the Village of Cleaton, an unincorporated community, which is approximately 2 miles south of the Western Kentucky Parkway and just east of US 431. The Village of Cleaton is indicated on Figure 11.1A, Environmental Justice Target Populations in Muhlenberg County, Kentucky. This is slightly higher than the county average of 4.6 percent, but is lower than the State and national percentages. It must be noted that only a small portion of this block group is in the project area. This black population appears to be the only noteworthy minority group in the area.

Meetings with local officials and community members resulted in the conclusion that additional concentrations of minorities are not located in the study area. It is believed that the implementation of this project would not have a disproportionate effect on minorities residing in the proposed study area. The Pennyrile ADD staff will continue to monitor racial composition in the study area and report any changes and/or developments that may occur in the future that could alter the findings of this report.

5.2 STUDY FINDINGS / *POPULATION BY POVERTY LEVEL (Figures 5.2 and 7.2)*

5.2.1 Logan County

The percentage of population considered below the poverty level in Logan County, 15.3 percent, is above the national level, of 12.0 percent, and is comparable to the Kentucky level of 15.4 percent. When comparing the percent of population considered to be below the poverty level within each of the three census tracts, only Census Tract 9602 has a higher percent of its residents in this category when compared to the United States, Kentucky or Logan County. It should be acknowledged that Census Tracts 9605 and 9606 do have rates of poverty approaching the United States figure of 12.0 percent.

When the census tracts are broken down into block groups, a more complex picture emerges. In Census Tract 9602, all four of the block groups exceed the United States poverty figure. Three of the four Block Groups, 1,2,and 4, have a higher percent of low-income persons than either Kentucky or Logan County. Block Group 1 has nearly one fourth of its residents below the poverty level while Block group 2 and 4 have rates of poverty at 21.5 percent and 18.3 percent respectively. It was confirmed by local community leaders that there were concentrations of low income in the blocks just east of US 431 in Lewisburg, but otherwise low-income persons are uniformly scattered throughout Census Tract 9602.

Within Census Tract 9605, Block Groups 2 and 3, the number of residents below the poverty level, 13.8 percent and 13.1 percent respectively, is higher than United States rates, 12.05 percent, but below Logan County or Kentucky rates of 15.3 percent and 15.4 percent respectively. As with the discussion of minorities, local leaders confirmed that Block Group 3 has a concentration of low-income persons along US 431, and in blocks in close proximity to US 431. This area of concentration was described as being located from Rhea Boulevard north to 9th Street in Russellville. Local officials did not identify any concentrations of low-income persons in Census Tract 9605, Block Group 2.

The two block groups of Census Tract 9606 show marked contrast to each other. Block Group 1 is higher in percentage of persons, 15.8 percent, living below the poverty line than the United States, Kentucky, or Logan County. Conversely, Block Group 2 has significantly fewer people living below the poverty level than the United States (12.0 percent), Kentucky (15.4 percent), or Logan County (15.3 percent). Local officials identified two elderly and low income housing complexes and a trailer park as being located just east of US 431 in downtown Adairville. Each of these developments is in Block Group 1.

5.2.2 Muhlenberg County Phase I: South of the WK Parkway

Figure 5.2 displays that all tracts in the study area contain low-income populations that are higher than the county, state and national averages. Additionally, the majority of the census block groups in the study area contain low-income populations that are higher than the county, state and national averages. Block Group 3 in

Tract 9607 has a low-income population of 35.3 percent, which comprises 284 residents. Block Group 1 in Tract 9608 has the second highest low-income population with 31.9 percent, which comprises 410 residents. Block Group 2 in Tract 9607 also has a high low-income population of 27.7 percent or 416 residents. The low-income population of the county, state and nation is 18.9 percent, 15.4 percent and 12.0 percent, respectively. These low-income populations are not believed to be concentrated in any one neighborhood. They are spread over each block group and reflect the high poverty rate of the county as a whole, which currently has one of the highest unemployment rates in the State.

Meetings with local officials and community members resulted in the conclusion that additional concentrations of low-income residents are not located in the study area. It is believed that the implementation of this project would not have a disproportionate effect on low-income residents residing in the proposed study area. The Pennyrile ADD staff will continue to monitor low-income composition in the study area and report any changes and/or developments that may occur in the future that could alter the findings of this report.

5.3 STUDY FINDINGS / POPULATION BY AGE GROUP (Figures 5.3 and 7.1)

5.3.1 Logan County

The percentage of population considered elderly in Logan County was 13.8 percent in 2000, which is above both the national and state levels of 12.4 percent and 12.5 percent respectively. When comparing the percentage of elderly population, within each of the three census tracts, each of these mirrors Logan County in that they have a higher percentage of elderly residents than the United States or Kentucky.

An analysis of the Block Groups within Census Tract 9602 shows that Block Group 1 has a smaller percentage of elderly population, 11.9 percent, than the United States, Kentucky or Logan County. The other three block groups also mirror Logan County and their parent census tract in that they have higher percentages of their population in the category of elderly than the United States or Kentucky.

The three block groups in Census Tract 9605 show similar trends as shown in Census Tract 9602 in that Block Group 1 has a lower concentration of elderly populations than the United States, Kentucky or Logan County. The other two census block groups list 17.6 percent and 20.6 percent of their residents as elderly, which is higher than the United States or Kentucky.

Census Tract 9606 and both Block Groups, 1 and 2, have a higher percent of elderly population than either the United States or Kentucky. In discussions with local leaders, there are two elderly and low income housing complexes in Adairville. These housing developments are located east of US 431 and were the only concentrations of elderly discussed.

5.3.2 Muhlenberg County Phase I: South of the WK Parkway

The previously defined Phase I study area of Muhlenberg County encompasses Census Tract 9601, 9607 and 9608. Only one of the census block groups in the study area contained an elderly population that is higher than the county average. The elderly population of the county, state and nation is 15.5 percent, 12.5 percent and 12.4 percent, respectively.

Figure 5.3 displays that Block Group 2 in Tract 9608 has the highest percentage of elderly population with 17.1 percent or 134 elderly residents. All the other block groups in the study area are lower than the county averages for elderly populations. This elderly population is not believed to be concentrated in any one neighborhood. They are spread over the block group and reflect the high elderly population of the county as a whole, which currently has a higher elderly population than the state and nation.

Discussions with local officials and community members resulted in the conclusion that additional concentrations of persons age 65 and over are not located in the project area. It is believed that the implementation of this project would not disproportionately effect the population of persons age 65 and over residing in the proposed study area.

5.4 STUDY FINDINGS / POPULATION BY DISABILITY (Figure 5.4)

5.4.1 Logan County

The percentage of population considered to have a disability in Logan County of 20.1 percent is above the national level of 17.7 percent but below the Kentucky level of 21.6 percent. When comparing the number of persons with disabilities within each of the three census tracts, Census Tracts 9605 and 9606 have comparable percentages to state, nation, and county averages. The third, Census Tract 9602, has a higher percentage of population with disabilities than Logan County, Kentucky, and the United States.

When Census Tracts, 9602, 9605 and 9606 are broken down into block groups the following emerges:

Of the four block groups in Census Tract 9602, only Block Groups 2, 3 and 4 have a higher concentration of disabled persons than the United States, Kentucky, and Logan County.

In Census Tract 9605, Census Block Group 3 has 29.4 percent of its population being disabled which is higher than the United States, Kentucky, and Logan County. Of the other two block groups, Block Group 2, with 20.9 percent of its population considered disabled, exceeds the Logan County and United States rate, and Block Group 1 has a lower percentage of disabled persons than either the United States, Kentucky, or Logan County.

Within Census Tract 9606, the percentage of disabled persons in Block Groups 1 and 2 is relatively equal to county and state averages. Discussions with local leaders did not indicate a concentration of disabled persons in any area of the US 431 Environmental Justice Study area.

5.4.2 Muhlenberg County Phase I: South of the WK Parkway

The previously defined Phase I study area of Muhlenberg County encompasses Census Tract 9601, 9607 and 9608. All three census tracts contain disabled populations which are higher than the county, state, and national averages. All of the census block groups in the study area contain populations of persons with a disability which are higher than the national average of 17.7 percent except Block Group 1 of Tract 9608, which has a population of persons with a disability of 13.9 percent. Discussions with local officials indicated that there were no concentrations of this population in the block groups and it is not deemed to be a significant population.

All of the other Block Groups in the study area are either relatively equal to the Muhlenberg County average or higher than the county average for populations of persons with a disability. Discussions with local officials and community members resulted in the conclusion that additional concentrations of persons with disabilities are not located in the project area. It is believed that the implementation of this project would not disproportionately affect the population of persons with disabilities residing in the proposed study area.

5.5 CONCLUSION

5.5.1 Logan County

The Logan County portion of the US 431 corridor runs from the Tennessee State line to Dunmore at the Muhlenberg County line. Within this part of the US 431 corridor, there is a variety of existing land uses. US 431 passes through three incorporated towns, Adairville, Russellville and Lewisburg. Each town has its own unique resources that must be considered during the development of recommendations.

Adairville is the first community on US 431 traveling north from the Tennessee line. In discussions with local community leaders, Adairville was described as a tightly knit rural community with US 431 running through the center of town.

The Adairville Elementary School was one of the major facilities identified by a visual survey of Adairville. The elementary school is located two blocks west of US 431. In addition, local officials identified two elderly and low-income apartment complexes, the Adairville Arms and Robert L. Staggers Manor. The two apartment complexes are located a block east of US 431 and downtown is bisected by US 431. The US 431 corridor between Adairville and Russellville is primarily agricultural with scattered farm residents.

5.5.2 Muhlenberg County Phase I: South of the WK Parkway

Based on data obtained from the US Census Bureau for income, race, age, persons with disabilities, and discussions with local officials and field observations, there appear to be two small concentrations of populations by race in the Phase I study area of Muhlenberg County, which is south of the WK Parkway. There also does not appear to be any religious group like the Amish or Mennonites that are in this portion of the study area.

An analysis of the minority population data showed two (2) of the block groups as having a relatively higher percentage of black population. The somewhat higher black populations in the study area are indicated on Figure 11.1A, Environmental Justice Target Populations in Muhlenberg County, Kentucky. These populations are mainly located in Drakesboro and Cleaton.

The elevated percentages of populations below the poverty level might be indicative of concentrations throughout the study area. However, based on the economic status of these rural depressed counties, these higher than average percentages for poverty levels are not uncommon for this area.

An analysis of elderly population data showed only one (1) Block Group with a slightly higher elderly population in the study area. The analysis showed an even distribution with no concentrations within this block group.

The Pennyrile ADD Staff feels that the possibility of adversely impacting any population group targeted by the E.J. Study would be very remote. However, the Pennyrile ADD Staff recommends that the data be reviewed again once the proposed improvements of US 431 are more advanced.

6.0 PHASE II – US 431 from the Western Kentucky Parkway to the Owensboro Bypass

This section of the Environmental Justice and Community Impact Report is to be used as a component of a Planning Study for highway transportation Improvements to US 431 between the Tennessee state line & Owensboro, KY. This study is intended to help define the location and purpose of the project and better meet federal requirements regarding consideration of environmental issues as defined in the National Environmental Policy Act (NEPA).

The 2000 Census identifies two counties, 6 census tracts, and 15 block groups in this phase of the study. (See *Figures 10.1, 10.2, and 10.3*)

Muhlenberg County – 1 tract, 6 block groups
McLean County – 2 tracts, 4 block groups
Daviess County – 3 tracts, 5 block groups

6.1 STUDY FINDINGS / POPULATION BY RACE (*Figure 6.1*)

6.1.1 Muhlenberg County Phase II: North of the WK Parkway

The previously defined Phase II study area of Muhlenberg County encompasses Census Tract 9602. After compiling relative data, PADD staff met with local officials and community members to review maps and Census data related to the study area. The intent of these discussions was to confirm previous conclusions and solicit input into the process of developing the Environmental Justice Report.

The majority of the census block groups in the study area contain minority populations that are considerably less than the national, state and county averages. However, there are a few block groups in the study area that warrant further discussion.

Figure 6.1 displays that BG 2 and 5 in Tract 9602 have considerably higher percentages of black populations. Block Group 2 has the highest percentage with 18.1 percent or 344 black residents. The black population for Muhlenberg County is 4.6 percent, the state of Kentucky is 7.3 percent, and the United States is 12.1 percent. The reason for the high black population in Block Group 2 is the Green River Correctional Complex, which is the State Prison that is located in this block group. Block Group 5 has the second highest percentage with 15.7 percent or 153 black residents. There is a small African American neighborhood in Block Group 5 that is indicated in *Figure 11.1, Environmental Justice Target Populations in Muhlenberg County, Kentucky*, which accounts for the higher than normal black population in this block group. The US 431 project area is contiguous to the outer edge of this minority neighborhood. It must be noted that only a small portion of these block groups are in the project area. These two (2) aforementioned block groups are located in Central City, Kentucky.

Block Group 3 in Tract 9602 has a black population of 5.7 percent, which comprises 48 residents. This is slightly higher than the county average of 4.6 percent, but is lower than the state and national percentages. Block Group 3 is also located in the Central City. Furthermore, there appears to be no significant minority groups in the study area other than the aforementioned black populations.

Meetings with local officials and community members resulted in the conclusion that additional concentrations of minorities are not located in the study area. It is believed that the implementation of this project would not have a disproportionate affect on minorities residing in the proposed study area. The Pennyrile ADD staff will continue to monitor racial composition in the study area and report any changes and/or developments that may occur in the future that could alter the findings of this report.

6.1.2 McLean County

The previously defined study area in McLean County encompasses portions of the following Census Tracts: 9701 and 9704. Following a compilation of pertinent information, GRADD Staff met with local officials and community members to review maps and census data related to the study. The intent of these discussions was to confirm previous conclusions and solicit input into the process of developing the Environmental Justice Report.

When viewing Figure 6.1a, you see that the population by race percentages for McLean County are comparable to or lower than those of the counties in the study area and considerably lower than the national and state averages. Based on the census data and meeting with local officials, there appears to be no concentrations of minorities in this specific study area.

6.1.3 Daviess County

The defined study area within Daviess County encompasses portions of the following Census Tracts: 17.01, 17.02, and 17.03. Figure 6.1 illustrates that Daviess County's population by race percentages are comparable to that of the other counties in the study area and often lower than the national and state averages. There are a few exceptions in Tracts 17.01 and 17.02

Tract 17.02 shows a small increase in the Asian population that is higher than the state average, but lower than the national average. Upon review and discussion with local community members, the higher concentration occurs in Block Group 2 (Figure 6.1b). The percentage is 2.5 percent, which is higher than the state percentage of 0.7 percent but lower than the national 3.6 percent average. Upon further review and discussion with area experts, it was determined that there is not a major concentration of the Asian population within the actual environmental footprint for this study. Though the number is elevated it still is comparable with the national average, which indicates the cultural diversity and the widespread racial immigration within the United States today.

Census Tract 17.01 (Figure 6.1a) shows a higher percentage of 'other race' populations when compared to all other averages. The percentage is 2.5 percent, which is higher than the state percentage of 1 percent and the national 1.9 percent average. There is an elevated percentage of Hispanics in this region as well – 3.1 percent. This is twice the state average, but significantly lower than the US average of 12.5 percent. Further analysis of census data tells us that these populations are housed in an apartment complex on the edge of the environmental footprint. There does not, however, appear to be a specific minority concentration in this area.

Otherwise, the majority of census tracts and block groups in the Daviess County Study Area contain population percentages that are considerably less than the national, state, and county averages and does not appear to have any specific minority concentration of race.

Meetings with local officials and community members resulted in the conclusion that additional concentrations of minorities are not located in the study area; therefore, it is anticipated that the implementation of this project would not have a disproportionate effect on minorities residing in the proposed study area. GRADD Staff will continue to monitor racial composition in the study area and report any changes and/or developments that may occur in the future that could alter the findings of this report.

6.2 STUDY FINDINGS / *POPULATION BY POVERTY LEVEL (Figures 6.2 and 8.2)*

6.2.1 Muhlenberg County Phase II: North of the WK Parkway

The previously defined Phase II study area of Muhlenberg County encompasses Census Tract 9602. The majority of the block groups in the study area contain low-income populations that are higher than the county, state and national averages.

Tract 9602 has a low-income population of 18 percent, which comprises 1,429 residents. The low-income population of the county, state, and nation is 18.9 percent, 15.4 percent and 12.0 percent respectively.

Figure 6.2 displays that Block Groups 3 and 7 in Tract 9602 have considerably higher percentages of low-income populations. Block Group 3 has the highest percentage with 32.1 percent or 271 low-income residents. Block Group 7 has the second highest percentage with 22.1 percent or 220 low-income residents. It must be noted that only a small portion of these block groups are in the project area. Block Group 3 is located on the southeast side of Central City and Block Group 7 is located north of Central City.

Block Group 6 of Tract 9602 has a low-income population of 15.9 percent. This is slightly lower than the county average of 18.9 percent, but is higher than the state and national percentages. Block Group 6 is located in Central City.

Meetings with local officials and community members resulted in the conclusion that additional concentrations of low-income residents are not located in the study area. It is believed that the implementation of this project would not have a disproportionate effect on low-income residents residing in the proposed study area. The Pennyryle ADD staff will continue to monitor low-income composition in the study area and report any changes and/or developments that may occur in the future that could alter the findings of this report.

6.2.2 McLean County

The defined study area within McLean County encompasses portions of the following Census Tracts: 9701 and 9704. Figure 6.2 illustrates the percentages of the population below poverty level for these tracts. Tract 9704, 15.0%, is comparable to McLean County, 15.7%, and the state, 15.4%, but higher than the nation, 12.0%. However, Tract 9701 and all its block groups have elevated percentages of low-income individuals. The percentage for Tract 9701 is 20.5 percent, while the state is 15.4 percent and the nation is 12 percent. Block groups 1 through 3 are 16.4 percent, 16.3 percent, and 17.8 percent, respectively. These numbers are noteworthy, and local officials were consulted to determine where these people are located and whether or not a 431 project might affect them.

It was determined through meeting with local officials that the only concentrations of low-income individuals that are within the project area are within the city of Livermore. There are six low-income housing units near Prells Lane, several near Sixth Street and some near Ridge Court. These units are located within the environmental footprint of the project.

GRADD Staff recommends that a subsequent review of poverty data within affected census divisions be undertaken to determine if particular concentrations of population below the poverty level exist in the project area; and if so, proactive measures should be undertaken to insure that these groups are not disproportionately affected by the project.

6.2.3 Daviess County

Figure 6.2 illustrates that, except for Tract 17.01, BG 4, the percentages of the population below poverty level for Daviess County are comparable to or significantly lower than state and national averages. Percentages of population below the poverty level in these tracts and block groups range from a low of 3.1 percent to a high of 16.9 percent. The 16.9 percent is located in Tract 17.01, BG 4. This 16.9 percent is significantly higher than the state average of 15.4 percent and the national average of 12 percent.

Upon further review of this segment, the most probable reason for this increase is a senior citizen's personal care home and some low-income housing in the area. Both are located within 2000 feet of US 431. Due to the distance between US 431 and these housing areas, it is doubtful they will be disproportionately affected by the project.

6.3 STUDY FINDINGS / POPULATION BY AGE GROUP (Figures 6.3 and 8.1)

6.3.1 Muhlenberg County Phase II: North of the WK Parkway

The previously defined Phase II study area of Muhlenberg County encompasses Census Tract 9602. Half of the block groups in the study area contain elderly populations that are higher than the county, State and national averages.

Tract 9602 has an elderly population of 15.2 percent. The elderly population of the county, state, and nation is 15.5 percent, 12.5 percent and 12.4 percent, respectively.

Figure 6.3 displays that Block Group 6 in Tract 9602 has the highest percentage of elderly population with 21.0 percent or 275 elderly residents. The high percentage of elderly residents in this block group is due largely to the Sparks Nursing Home being located in the block group, the location of which is indicated in *Figure 11.1, Environmental Justice Target Populations in Muhlenberg County, Kentucky*. Block Group 4 has the second highest percentage with 18.7 percent. This high percentage is largely due to the Courtyard Apartments that are located in this Block Group. The Courtyard Apartments are comprised mostly of elderly residents, and its location is also indicated in *Figure 11.1, Environmental Justice Target Populations in Muhlenberg County, Kentucky*. It must be noted that only a small portion of these Block Groups are in the project area. Block Groups 6 and 4 are located in Central City, Kentucky.

Block Group 3 and 5 of Tract 9602 have an elderly population of 15.6 percent and 14.2 percent, respectively. This is close to the county average of 15.5 percent, but is higher than the state and national percentages. Block Group 4 and 6 are also located in Central City.

Discussion with local officials and community members resulted in the conclusion that additional concentrations of persons age 65 and over are not located in the project area. It is believed that the implementation of this project would not disproportionately effect the population of persons age 65 and over residing in the proposed study area.

6.3.2 McLean County

The defined study area within McLean County encompasses portions of Census Tracts 9701 and 9704. The percentage of people age 65 and over in McLean County and Tract 9701 is slightly higher than the state and national averages of 12.5 percent and 12.4 percent, respectively. (Figure 6.3) The county average is 14.5 percent, and Tract 9701's average is 14.8 percent. These numbers are not overly significant, but local officials were consulted to determine where these people are located and whether or not the US 431 Project would affect them.

The elevated elderly population for Tract 9701 in Livermore is attributed to two senior citizens homes in the city. In addition, many elderly, disabled, and low-income individuals live in the area around Sixth Street, which is within the environmental footprint.

An additional review of population by age data within affected census divisions was conducted to determine if particular concentrations of elderly people exist in the project area; none were found. It is believed that this project would not disproportionately effect the population of persons age 65 and over residing in the proposed study area.

6.3.3 Daviess County

Aging characteristics in the overall population of Daviess County are very similar to the national and state averages; however, there is one block group that has a higher percentage of persons age 65 and over than the national, state, and county averages – Block Group 4 in Tract 17.01. The national average is 12.4 percent, the state average is 12.5 percent, and this block group's average is 18.9 percent. (Figure 6.3)

Upon further review of this segment, the most probable reason for this higher percentage is a senior citizen's personal care home in the area. It is located within 2000 feet of US 431. The US 431 project would probably not disproportionately affect this group.

6.4 STUDY FINDINGS / POPULATION BY DISABILITY (Figure 6.4)

6.4.1 Muhlenberg County Phase II: North of the WK Parkway

The previously defined Phase II study area of Muhlenberg County encompasses Census Tract 9602. All of the block groups in the study area contain populations of persons with a disability which are greater than the national average of 17.7 percent, except for Block Group 2, which has 13.2 percent. Three block groups in the

study area have a higher percentage of persons with a disability than the state average of 21.6 percent. These are Block Groups 3, 4, and 7 of Tract 9602, which have respective percentages of 25.9, 37.4, and 23.8.

Discussions with local officials indicated that there were no concentrations of disabled persons in BG 4. Given this discrepancy, ADD staff recommends further study of this tract as a whole.

All of the other block groups in the study area are either relatively equal to the Muhlenberg County average or less than the county average for populations of persons with a disability. Discussions with local officials and community members resulted in the conclusion that additional concentrations of persons with disabilities are not located in the project area. It is believed that the implementation of this project would not disproportionately effect the population of persons with disabilities residing in the proposed study area.

6.4.2 McLean County

Both tracts in McLean County that are within the project area have elevated percentages of persons with disabilities. The state and national averages are 21.6 percent and 17.7 percent, respectively. McLean County as a whole has a percentage of 24.2, Tract 9701's percentage is 22.9, its Block Group 1 is 24.9 percent, and Tract 9704's population is 26.5 percent disabled.

These numbers are hard to attribute to any one population or concentration, aside from residents of the cities of Livermore and Island. There are several areas in Livermore that are home to elderly, low-income, and minority groups. Many of these elderly may be disabled as well. Discussions with local leaders did not indicate a concentration of disabled persons in any area of the US 431 Study environmental footprint. Further study is recommended.

6.4.3 Daviess County

The previously defined Phase II study area of Daviess County encompasses Census Tracts 17.01, 17.02, and 17.03. Disabled characteristics in the overall population of Daviess County are very similar to the national and state averages; however, there is one block group that has a higher percentage of disabled persons than the national, state, and county averages – Block Group 4 in Tract 17.01. The national average is 17.7 percent, the state average is 21.6 percent, and this block group's average is 27.1 percent. (Figure 6.4)

Upon further review of this segment, the most probable reason for BG 4's higher percentage is a senior citizen's personal care home and some low-income housing in the area. Both are located within 2000 feet of US 431, but not on the road. Due to the distance between US 431 and these housing areas, it is doubtful they will be disproportionately affected by the project.

6.5 CONCLUSION

6.5.1 Muhlenberg County Phase II: North of the WK Parkway

Based on data obtained from the US Census Bureau for income, race, age, persons with disabilities, and discussions with local officials and field observations, there appear to be several small concentrations of populations by race, age, and low-income in the Phase II study area of Muhlenberg County, which is north of

the WK Parkway. There also does not appear to be any religious group like the Amish or Mennonites that are in this portion of the study area.

An analysis of the minority population data showed a few of the block groups as having a relatively higher percentage of a black population. The somewhat higher black populations in the study area are indicated on *Figure 11.1, Environmental Justice Target Populations in Muhlenberg County, Kentucky*. The Green River Prison complex is the main factor contributing to the high black population in Census Tract 9602. However, there is a small African American neighborhood in Block Group 5 of Tract 9602 that is contiguous to the western edge of the US 431 project area.

The elevated percentages in the populations below the poverty level might be indicative of concentrations throughout the study area. However, based on the economic status of these rural depressed counties, these higher than average percentages for poverty levels are not uncommon for this area.

An analysis of the elderly population data showed two(2) Block Groups with a relatively high elderly population in the study area. The two (2) nursing homes and one (1) elderly apartment complex in the study area are deemed to be the source of these increased populations. The locations of these facilities in the study area are indicated on *Figure 11.1, Environmental Justice Target Populations in Muhlenberg County, Kentucky*.

There do not appear to be any concentrations of disabled persons. All but three of the block groups were at, or below, the county, state and national averages.

The Pennyrile ADD Staff feels that the possibility of adversely impacting any population group targeted by the E.J. Study would be very remote. However, the Pennyrile ADD Staff recommends that the data be reviewed again once the proposed improvements of US 431 are more advanced.

6.5.2 McLean County

Based on data obtained from the US Census Bureau for income, race, age, persons with disabilities, and discussions with local officials and field observations, there appear to be few concentrations of populations by race, age, low-income, or disabled in the US 431 project study area of McLean County. There also does not appear to be any religious group like the Amish or Mennonites that are in this portion of the study area.

There are several locations in the McLean County environmental footprint that are of significance. In Livermore, there is one cemetery and three parks. In Island, there is one church, one school, and one park.

6.5.3 Daviess County

Based on data obtained from the US Census Bureau for income, race, age, persons with disabilities, and discussions with local officials and field observations, there appear to be few concentrations of populations by race, age, low-income, or disabled in the US 431 project study area of McLean County. There also does not appear to be any religious group like the Amish or Mennonites that are in this portion of the study area. The only area that could bring cause for additional study in Daviess County is Tract 17.01, Block Group 4. It has consistently elevated percentages of minority, low-income, elderly, and disabled persons.

There are several locations in the Daviess County environmental footprint that are of significance. There are four churches, one cemetery, and one school along the project route. Within the Owensboro city limits, there are several large shopping centers – centers of common employment.

APPENDIX 1

Identification of Community Leaders and Other Contacts

LOGAN COUNTY

TITLE	NAME	ADDRESS	PHONE NUMBER
County Judge/Executive	John Guion	PO Box 365, KY 42765	726-3116
Magistrates	Clem Carter	189 Concord Road, 42765	539-2600 (H)
	Harold Prince	704 Barren Plains Rd., Adairville, KY 42202	726-4101 (H)
	Curtis Wilkins	1518 Highland Lick Rd, KY 42765	726-2980 (H)
	Ranny Adler	245 Diamond D Springs Station Rd, KY 42765	657-8290
	Josephine Orange	1792 Sycamore Rd., KY 42765	542-6647 (H)
	Harris Dockins	217 Circle Dr., KY 42765	726-7267 (H)
Fiscal Court Clerk	Amanda Jenkins	PO Box 365, KY 42765	726-3116
Deputy Judge/Financial Officer	Karen Taylor	PO Box 365, KY 42765	726-3116
County Attorney	Tom Noe	PO Box 365, KY 42765	726-8999
County Court Clerk	Kenny Chapman	PO Box 365, KY 42765	726-6061
Sheriff	Wallace Whittaker	PO Box 113, KY 42765	726-2244
Jailer	Bill Jenkins	304 West Third St., KY 42765	726-3696
Coroner	Jackie Dunlap	PO Box 365, KY 42765	726-3003 (H)
County Treasurer	Elaine Jenkins	PO Box 365, KY 42765	726-2167
PVA	Ben Brown	PO Box 307, KY 42765	726-8334
Logan Co. Econ. Dev. Council	Jay Slayton	116 S. Main Street, KY 42276	791-7237
Road Supervisor	Terry Edwards	PO Box 365, KY 42765	726-7480
Supt. Of Schools	Marshall H. Kemp	PO Box 417, KY 42276	726-2436
Planning/Zoning Dir.	Bill Pearson	168 S. Main Street, KY 42276	726-5022
Emergency Mgmt.	Rodney Harkleroad	459 Homer Inesco Road, KY 42276	726-5044 (H)
Building Inspector	Vacant	PO Box 365, KY 42765	762-3523
Solid Waste Director	Denny Harris	PO Box 365, KY 42765	762-7220
Circuit Judge	Tyler Gill	Courthouse, KY 42765	726-2242
Commonwealth Atty.	Charles Orange		726-4300
State Senator	Brett Guthrie	1005 Wrenwood Dr., Bowling Green, KY 42103	781-5597
State Representatives	Sheldon Baugh	252 West Valley Dr., KY 42276	726-2712
Newspaper	Randy Fuqua	PO Box 270, KY 42276	726-8394
Radio Station	WRUS-WBVR	PO Box 298, KY 42276	726-2471
Public Library	Linda Kompanik	201 West 6th St., KY 42765	726-6129

LOGAN COUNTY

City of Adairville

TITLE	NAME	ADDRESS	PHONE NUMBER
Mayor	William Steen	PO Box 185, Adairville, KY 42202	539-6131
City Council	Danny Finch	PO Box 104, Adairville, KY 42202	539-7551
	Bernice Dickerson	PO Box 44, Adairville, KY 42202	539-8501 (H)
	Teddy Smith	137 Franklin Hills Dr., Adairville, KY 42202	539-4406 (H)
	Judy Tanner	147 Franklin Hills Dr., Adairville, KY 42202	539-5044
	Donna Blake	PO Box 214, Adairville, KY 42202	539-4341 (H)
	Tony Nichols	PO Box 39, Adairville, KY 42202	539-3486
City Clerk/Treasurer	Rebecca Tinch	PO Box 185, Adairville, KY 42202	539-6131
City Attorney	James Milam	101 SW Park Square, Russellville, KY 42765	726-3145
Fire Chief	James Trimble	PO Box 185, Adairville, KY 42202	539-6131
Police Chief	Jimmy Phelps	PO Box 185, Adairville, KY 42202	539-6131
Water/Sewer Super.	Russell S. Law	PO Box 185, Adairville, KY 42202	539-8661
Cemetery Sexton	Sean Willeford	PO Box 185, Adairville, KY 42202	539-6152 (H)
Adairville/South Logan Chamber of Comm.		PO Box 185, Adairville, KY 42202	539-6131

LOGAN COUNTY

City of Lewisburg

TITLE	NAME	ADDRESS	PHONE NUMBER
Mayor	Kenneth Whitson	PO Box 239, Lewisburg, KY 42256	755-4828
City Council	Joan Tooley	225 S. Main Street, Lewisburg, KY 42256	755-4636
	Donnie Smith	338 6th Street, Lewisburg, KY 42256	755-2891(H)
	Jeffery Laster	191 Churchn Street, Lewisburg, KY 42256	755-2516
	Diane Rainwater	248 S. Main Street, Lewisburg, KY 42256	755-2544
	Dean Webster	310 N. 2nd Street, Lewisburg, KY 42256	755-3277
	Hope Strode	166 Browning Street, Lewisburg, KY 42256	
City Clerk/Treasurer	Angela Swinney	PO Box 239, Lewisburg, KY 42256	755-4828
City Attorney	Fred Green	PO Box 490, Russellville, KY 42765	726-3149
Public Works	Jeff Cisney	PO Box 239, Lewisburg, KY 42256	755-4640
Fire Chief	Alan Gregory	PO Box 239, Lewisburg, KY 42256	755-2121
Police Chief	Alan Alsup	PO Box 239, Lewisburg, KY 42256	755-4805

LOGAN COUNTY

City of Russellville

TITLE	NAME	ADDRESS	PHONE NUMBER
Mayor	Shirlee Yassney	106 Southwest Park, Russellville, KY 42276	726-5000
City Council	Pat Bell	607 Sycamore Dirve, Russellville, KY 42276	726-2662
	Howard Wren	210 Dale View Circle, Russellville, KY 42276	726-3607
	Jean Hankins	1004 Brookhaven Dr., Russellville, KY 42276	726-6912
	Russell Jones	1496 Orndoff St, Russellville, KY 42276	726-2742
	Kenneth Barrett	930 Oak Lane, Russellville, KY 42276	726-3252
	Marie Sweat	714 West 7th St., Russellville, KY 42276	726-3794
City Clerk/Treasurer	Vacant	106 Southwest Park, Russellville, KY 42276	726-5007
City Attorney	Robert Hedges	106 Southwest Park, Russellville, KY 42276	726-5021
City Engineer	Vacant	607 Sycamore Dirve, Russellville, KY 42276	
Street Supervisor	Darrell Baldwin	106 Southwest Park, Russellville, KY 42276	726-5030
Fire Chief	J. L. Williamson	West 5th Street, Russellville, KY 42276	726-5021
Police Chief	James Pendergraff	106 Southwest Park, Russellville, KY 42276	726-5010
Building Inspector/Zoning Admin.	Bill Pierson	168 S. Main St., Russellville, KY 42276	726-5022
Sewer Superintendent & Utilities Director	Jane Kisselbaugh	106 Southwest Park, Russellville, KY 42276	726-5037
Water Super.	Ace Danes	106 Southwest Park, Russellville, KY 42276	726-5026
Cemetery Sexton	Donnie Warren	106 Southwest Park, Russellville, KY 42276	726-5036
Parks Director	Cathy Maroney	106 Southwest Park, Russellville, KY 42276	726-5033
Russellville Chamber of Commerce	Edna Hughes, Pres.	166 S. Main St., Russellville, KY 42276	726-2237
School Superintendent	Donna Preston	355 South Summer St., Russellville, KY 42276	726-8405

LOGAN COUNTY – Individuals Who Were Contacted for Information

TITLE	NAME	ADDRESS	PHONE NUMBER
County Judge/Executive	John Guion	PO Box 365, Russellville, KY 42765	726-3116
Mayor	Shirlee Yassney	106 Southwest Park, Russellville, KY 42276	726-5000
Building Inspector	Bill Pearson	168 S. Main St., Russellville, KY 42276	726-5022
Mayor	William Steen	PO Box 185, Adairville, KY 42202	539-6131
Mayor	Kenneth Whitson	PO Box 239, Lewisburg, KY 42256	755-4828
Branch Mgt. Planning	Jeff Moore, AICP	PO Box 599, Bowling Green, KY 42102	746-7898
	Bill Kimbro		726-0318
	Bill Decker	168 South Main St., Russellville, KY	726-5059
Retired Crt. Ct. Judge	Bill Steen	189 E. 4th Street, Russellville, KY 42276	726-4333
Plant Manager, Emerson Electric	Dan Brown	150 Emerson Bypass, Russellville, KY 42276	726-0302
	Jim Thompson	146 Nature Drive, Russellville, KY 42276	726-2436
Mgr. Ventra Plastic	Ron Barbe	140 Progress Dr., Russellville, KY 42276	726-4767
Transportation Planner	Kyle Key	PO Box 90005, Bowling Green, KY 42102-9005	781-2381
Russellville-Logan Co. Chamber Commerce Director	Martha Lane Wells	102 NW Park Sq., Russellville, KY 42276	726-2451
Russellville-Logan Airport Board Member	Gary Hendricks	1269 Jim Squires Rd., Russellville, KY 42276	726-9575
Ex. Dir. Russellville-Logan Co. Chamber of Commerce	Paula Timberlake	116 So. Main St., Russellville, KY 42276	726-9575
Magistrate	Josephine Orange	1792 Sycamore Rd., Russellville, KY 42765	542-6647 (H)
Magistrate	Curtis Wilkins	1518 Highland Lick Rd, Russellville, KY 42765	726-2980 (H)

MUHLENBERG COUNTY

TITLE	NAME	ADDRESS	PHONE #
County Judge/Executive	Rodney Kirtley	PO Box 137, Greenville, 42345	338-2520
Mayor – Central City	Hugh Sweatt	203 N Second St, Central City, 42330	754-5097
Mayor – Drakesboro	Jesse Gibson	PO Box 37, Drakesboro, 42337	476-8986
Mayor – Greenville	Billie Lewis	PO Box 289, Greenville, 42345	338-3966
KY State Representative	Brent Yonts	PO Box 370, Greenville, 42345	338-0816
Greenville City Clerk	Harold Summer	PO Box 283, Greenville, 42345	338-3966

MCLEAN COUNTY

TITLE	NAME	ADDRESS	PHONE #
County Judge/Executive	Larry B. Whitaker	PO Box 127, Calhoun 42327-0127	273-3213
County Magistrates	Ron Coleman Marshall Hatfield Bobby Johnson Robert A. Jennings, Jr.	PO Box 32, Calhoun 42327-0032 524 Hatfield Stevens Rd., Calhoun 6760 St. Rt. 85 E., Island 42350 145 Chestnut St., Sacramento 42372	273-5319 733-4203 486-3404 736-5180
County Attorney	W.E. (Bill) Quisenberry	PO Box 262, Calhoun 42327-0262	273-3237
County Clerk	Linda Johnson	PO Box 57, Calhoun 42327-0057	273-3082
Sheriff	Frank Cox	7610 Richland Rd., Calhoun 42327	273-3276
Jailer	Mike “Red” Sallee	150 Wilson Lane, Calhoun 42327	273-5920
Coroner	Mike Muster	PO Box 160, Calhoun 42327-0160	273-3124
Treasurer	Sherry Boyken	PO Box 127, Calhoun 42327-0127	273-9964
Finance Officer	Betty Ray	PO Box 127, Calhoun 42327-0127	273-3213
PVA	Shelia Fulkerson	PO Box 246, Calhoun 42327-0246	273-3291
Ec. Dev. Director	Sandra Wood	2500 E. Hwy. 85, Island 42350	736-2823
Road Eng./Supervisor	Danie O’Neal	PO Box 127, Calhoun 42327-0127	273-5307
Supt. Of Schools	Earl Melloy	PO Box 245, Calhoun 42327-0245	273-5257
Planning/Zoning Dir.	George Seymour	4500 KY Hwy. 138 E., Island 42350	273-3523
Emergency Mgmt.	David A. Sunn	PO Box 245, Calhoun 42327	273-3235
Health Officer	Amanda Kraus	310 W. Seventh St., Calhoun 42327	273-3062
Housing Inspector	Ellis W. Rust	45 KY 85 East, Sacramento 42372	736-2240
Circuit Judges	David Jernigan	PO Box 567, Greenville 42345	338-5930
Circuit Clerk	Stephanie King	PO Box 145, Calhoun 42327-0145	273-3966
Commonwealth Atty.	Ralph Vick	PO Box 567, Greenville 42345	
State Senator	Senator David Boswell (8)	5591 Panther Creek Park Drive, Owensboro 42301-9310	926-8000
State Representatives	Rep. Jim Gooch, Jr. (12)	210 Bradley Street, Providence 42450	667-9900
Chamber of Commerce	David M. Scott	PO Box 303, Calhoun 42327-0303	273-9760
Sr. Citizens Ctr. Dir.	Judy Brawner	PO Box 344, Calhoun 42327-0344	273-5412
Newspaper	McLean Co. News	PO Box 266, Calhoun 42327-0266	273-3287

MCLEAN COUNTY

City of Island

TITLE	NAME	ADDRESS	PHONE #
Mayor	Charlie Strole	145 N. Washington St., Island 42350	486-3992
City Commissioners	Ernest Bates, Jr. Sherman Fulkerson Frank Conrad Marilyn Cessna	210 Meadowview Road, Island PO Box 6, Island 42350-0006 140 E. Main, Island 42350 PO Box 121, Island 42350-0121	486-2168
City Clerk	Valaire Edmonds	PO Box 33, Island 42350-0033	486-3992
Assistant City Clerk	Janet Hughes	PO Box 132, Island 42350-0033	486-3992
City Attorney	John Hicks	PO Box 64, Calhoun 42327-0064	273-5749
Fire Chief	Steve Burden	PO Box 172, Island 42350-0172	486-9304
Chamber	Linda Hardison	PO Box 303, Calhoun 42327-0303	

MCLEAN COUNTY

City of Livermore

TITLE	NAME	ADDRESS	PHONE #
Mayor	Eldon Eaton	816 Sandhill Rd., Livermore 42352	278-2168(h)
City Council Members	Ronald Coffman Wendell Nantz Delbert Puckett Shelly Ranburger, Jr. Nancy Wetzel Todd A. Zuehl	PO Box 183, Livermore 42352-0183 PO Box 95, Livermore 42352-0095 PO Box 414, Livermore 42352-0414 PO Box 402, Livermore 42352-0402 PO Box 398, Livermore 42352-0398 PO Box 678, Livermore 42352-0678	278-2103 278-2572 278-9021 278-2708 278-5903
City Clerk	Stacy Maddox	PO Box 279, Livermore 42352-0279	278-2113
Assistant City Clerk	Deanna Edmonds	PO Box 279, Livermore 42352-0279	
City Treasurer/Finance	Same as City Clerk		
City Attorney	John Hicks	Main Street, Calhoun 42327	273-5749
Police Chief	Gary Campbell	PO Box 279, Livermore 42352-0279	278-2113
Fire Chief	Charles Wells	PO Box 279, Livermore 42352-0279	278-2113
Chamber of Commerce	Linda Hardison	PO Box 303, Calhoun 42327-0303	273-9760
Supt. Of Schools	Earl Melloy	Main Street, Calhoun 42327	
Building Inspector	Ellis Wade Rust	Sacramento 42376	736-2240

DAVISS COUNTY

TITLE	NAME	ADDRESS	PHONE #
County Judge/Executive	Reid Haire	PO Box 1716, Owensboro 42302-1716	685-8424
County Commissioners	Michael Riney	PO Box 1716, Owensboro 42302	685-8424
	Bruce Kunze	PO Box 1716, Owensboro 42302	685-8424
	Jim Lambert	PO Box 1716, Owensboro 42302	685-8424
County Attorney	Robert Kirtley	212 St. Ann St. – Rm. 202, O'boro 42303	685-8442
County Clerk	Mike Libs	212 St. Ann St. – Rm. 104, O'boro 42303	685-8434
Sheriff	Keith Cain	212 St. Ann St., Owensboro 42303	685-8444
Jailer	David Osborne	212 St. Ann St., Owensboro 42303	
Coroner	Bob Howe	212 St. Ann St. – Rm. 205, O'boro 42303	685-8428
Fire Chief	Brent Hayden	2140 Airport Rd., Owensboro 42301	685-8440
Treasurer	Tony Sook	212 St. Ann St. – Rm. 202, O'boro 42303	685-8424
Finance Officer	Tony Sook	212 St. Ann St. – Rm. 202, O'boro 42303	685-8424
PVA	Ron Durbin	212 St. Ann St. – Rm. 101, O'boro 42303	685-8474
Ec. Dev. Director		227 West Fourth Street, Owensboro 42303	926-1860
Road Eng./Supervisor	Sinan Rayyan	2945 Leitchfield Rd., Owensboro 42303	685-8456
Planning/Zoning Dir.	Gary Noffsinger	PO Box 732, Owensboro 42302-0732	687-8650
Emergency Mgmt.	Richard Payne	212 St. Ann Street, Owensboro 42303	685-8448
Housing Inspector	Jeff Dame	212 St. Ann St. – Room 203, O'boro 42303	685-8458
Solid Waste Director	Joey Fischer (Robbie Hocker)	7772 Highway 815, Owensboro 42301	229-4484
Circuit Judges	Judge Tom Castlen	100 East Second St., Owensboro 42301	687-7728
	Judge Henry Griffin	100 East Second St., Owensboro 42301	687-7726
Circuit Clerk	Pat Hardesty	100 East Second St., Owensboro 42301	687-7220
Commonwealth Atty.	Jay Wethington	100 East Second St., Owensboro 42301	687-7451
State Senator	Senator David Boswell	5591 Panther Creek Park Dr., O'boro 42301	926-8000
State Representatives	Rep. Brian Crall (13)		
	Rep. Tommy Thompson (14)	3336 Bryant Court, Owensboro 42303 4460 Hwy. 142, Owensboro 42303	684-2324 684-3237
	Rep. John Arnold (7)	PO Box 124, Sturgis 42459-0124	333-4641
	Rep. Jim Gooch (12)	210 Bradley Street, Providence 42450-1716	667-9900
Chamber of Commerce	Eric J. Davis	PO Box 825, O'boro 42302-0825	926-1860
Sr. Citizens Ctr. Dir.	Nora Bilbro	1650 W. Second St., Owensboro 42301	685-0712
Newspaper	Messenger-Inquirer	1401 Frederica St., Owensboro 42301	926-0123
Radio Stations	WBKR 92.5 FM	3301 Frederica St., Owensboro 42301	683-1558
Public Library	O'boro-Daviess Co	450 Griffith Avenue, Owensboro 42301	684-0211

DAVIESS COUNTY
City of Owensboro

TITLE	NAME	ADDRESS	PHONE#
Mayor	Waymond Morris	PO Box 10003, Owensboro 42302	687-8560
City Commissioners	Al Mattingly Mimi Davis James Wood Charlie Castlen	All use the same address: PO Box 10003, Owensboro 42302-9003	
City Clerk	Carol Blake	PO Box 10003, Owensboro 42302	687-8553
City Manager	Bob Whitmer	PO Box 10003, Owensboro 42302	687-8552
City Treasurer/Finance Director	J.T. Fulkerson	PO Box 10003, Owensboro 42302	687-8524
City Attorney	David Fowler	PO Box 10003, Owensboro 42302	687-8554
Metro Planning Dir. (City Planner)	Gary Noffsinger	PO Box 732, Owensboro 42302-0732	687-8650
Police Chief	John Kazlauskas	222 E. Ninth St., Owensboro 42303	687-8830
Fire Chief	Fred Hina	512 West Ninth St., Owensboro 42301	687-8405
Chamber of Commerce		PO Box 825, Owensboro 42302-0825	926-1860
Supt. Of Schools	Dr. Larry Vick	1335 W. 11 th St., Owensboro 42301	686-1000
Assoc. Dir. – Building/Electrical	Jim Mischel	PO Box 10003, Owensboro 42302-9003	687-8661
Street Dept. Supervisor	Lee Alls	1410 West Fifth St., Owensboro 42301	687-8683
City Engineer	Marwan Rayan	PO Box 10003, Owensboro 42302	687-8643
Solid Waste Supervisor	Bill Parrish	1410 West Fifth St., Owensboro 42301	687-8760
Parks Director	Cyndi Sturgeon	PO Box 10003, Owensboro 42302	687-8706

APPENDIX 2

*METHODOLOGY
FOR ASSESSING POTENTIAL
ENVIRONMENTAL JUSTICE CONCERNS
FOR
KYTC PLANNING STUDIES*

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.

Methodology for Assessing Potential Environmental Justice Concerns
for KYTC Planning Studies

Page 2

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 3

Phase I Census Data Sets

Phase I

Race Populations - By County & Tract

Figure 5.1a

COUNTIES	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
Logan	23,922	90.7%	2,014	7.6%	288	1.1%	52	0.2%	44	0.2%	253	1.3%	26,573
Muhlenberg	29,836	94.2%	1,472	4.6%	232	0.7%	39	0.1%	40	0.1%	220	0.8%	31,839

TRACTS	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
Logan	23,922	90.7%	2,014	7.6%	288	1.1%	52	0.2%	44	0.2%	253	1.3%	26,573
Tract 9602	3,794	98.9%	8	0.2%	19	0.5%	6	0.2%	3	0.1%	16	0.6%	3,846
Tract 9605	3,415	87.1%	417	10.6%	31	0.8%	10	0.3%	11	0.3%	57	1.7%	3,941
Tract 9606	2,695	88.5%	301	9.7%	73	2.4%	8	0.3%	0	0.0%	26	1.5%	3,103

TRACTS	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
Muhlenberg	29,836	94.2%	1,472	4.6%	232	0.7%	39	0.1%	40	0.1%	220	0.8%	31,839
Tract 9601	889	92.5%	59	6.1%	6	0.6%	1	0.1%	1	0.1%	9	1.1%	965
Tract 9607	3,659	94.7%	151	4.0%	28	0.7%	7	0.2%	5	0.1%	36	1.0%	3,886
Tract 9608	2,007	98.1%	7	1.5%	31	0.3%	8	0.4%	1	0.1%	14	1.1%	2,068

Phase I Race Populations - By Block Group

Figure 5.1b

LOGAN County BG	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
Tract 9602	3,794	98.9%	8	0.2%	19	0.5%	6	0.2%	3	0.1%	16	0.6%	3,846
Block 1	870	98.9%	5	0.6%	5	0.6%	0	0.0%	0	0.0%	4	0.6%	884
Block 2	835	98.6%	2	0.2%	9	1.1%	1	0.1%	1	0.1%	2	90.0%	850
Block 3	832	98.9%	0	0.0%	2	0.2%	3	0.4%	0	0.0%	6	0.7%	843
Block 4	1,257	99.2%	1	0.1%	3	0.2%	2	0.2%	2	0.2%	4	0.4%	1,269
Tract 9605	3,415	87.1%	417	10.6%	31	0.8%	10	0.3%	11	0.3%	57	1.7%	3,941
Block 1	1,636	82.8%	282	14.2%	10	0.5%	4	0.0%	8	0.4%	39	2.3%	1,979
Block 2	1,268	94.4%	58	4.4%	9	0.7%	1	0.1%	2	0.1%	8	1.0%	1,346
Block 3	511	84.9%	77	12.5%	12	1.9%	5	0.8%	1	0.2%	10	1.6%	616
Tract 9606	2,695	88.5%	301	9.7%	73	2.4%	8	0.3%	0	0.0%	26	1.5%	3,103
Block 1	1,019	87.4%	123	10.4%	30	2.5%	5	0.4%	0	0.0%	10	1.8%	1,187
Block 2	818	82.1%	162	15.9%	26	2.6%	3	0.3%	0	0.0%	8	1.7%	1,017

MUHLENBERG County BG	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
Tract 9601*	889	92.5%	59	6.1%	6	0.6%	1	0.1%	1	0.1%	9	1.1%	965
Block 1	889	92.5%	59	6.1%	6	0.6%	1	0.1%	1	0.1%	9	1.1%	965
Tract 9607	3,659	94.7%	151	4.0%	28	0.7%	7	0.2%	5	0.1%	36	1.0%	3,886
Block 1	671	98.2%	4	0.6%	4	0.6%	0	0.0%	5	0.7%	1	0.4%	685
Block 2	1,313	88.4%	142	9.8%	20	1.3%	3	0.2%	0	0.0%	25	1.7%	1,503
Block 3	787	98.0%	4	0.5%	2	0.2%	4	0.5%	0	0.0%	8	1.0%	805
Block 4	888	99.6%	1	0.1%	2	0.1%	0	0.0%	0	0.0%	2	0.3%	893
Tract 9608	2,007	98.1%	7	1.5%	31	0.3%	8	0.4%	1	0.1%	14	1.1%	2,068
Block 1	1,242	98.1%	2	0.2%	26	2.0%	8	0.6%	1	0.1%	6	1.0%	1,285
Block 2	765	98.1%	5	0.6%	5	0.6%	0	0.0%	0	0.0%	8	1.3%	783

*Muhlenberg County Tract 9601 consists of only one block group. The data listed for Tract 9601 and Tract 9601, Block Group 1 is identical because they cover the same geographical area.

PHASE I

Low-Income Populations

Figure 5.2

COUNTIES	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
Logan	4,061	15.3%
Muhlenberg	6,002	18.9%

TRACTS	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
Logan	4,061	15.3%
Tract 9602	750	19.5%
Tract 9605	461	11.7%
Tract 9606	348	11.2%

TRACTS	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
Muhlenberg	6,002	18.9%
Tract 9601	286	29.6%
Tract 9607	859	22.1%
Tract 9608	507	24.5%

LOGAN County BG	Population Below Poverty Level	Percent of Population
Tract 9602	750	19.5%
Block 1	219	24.8%
Block 2	183	21.5%
Block 3	116	13.8%
Block 4	232	18.3%
Tract 9605	461	11.7%
Block 1	194	9.8%
Block 2	186	13.8%
Block 3	81	13.1%
Tract 9606	348	11.2%
Block 1	188	15.8%
Block 2	52	5.1%

MUHLENBERG County BG	Population Below Poverty Level	Percent of Population
Tract 9601*	286	29.6%
Block 1	286	29.6%
Tract 9607	859	22.1%
Block 1	71	10.4%
Block 2	416	27.7%
Block 3	284	35.3%
Block 4	88	9.9%
Tract 9608	507	24.5%
Block 1	410	31.9%
Block 2	97	12.4%

*Muhlenberg County Tract 9601 consists of only one block group. The data listed for Tract 9601 and Tract 9601, Block Group 1 is identical because they cover the same geographical area.

PHASE I

Elderly Populations

Figure 5.3

COUNTIES	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
Logan	3,656	13.8%
Muhlenberg	4,926	15.5%

TRACTS	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
Logan	3,656	13.8%
Tract 9602	543	14.1%
Tract 9605	580	14.7%
Tract 9606	420	13.5%

TRACTS	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
Muhlenberg	4,926	15.5%
Tract 9601	120	12.4%
Tract 9607	487	12.5%
Tract 9608	326	15.8%

LOGAN County BG	Age 65 & Over	Percent of Population
Tract 9602	543	14.1%
Block 1	105	11.9%
Block 2	131	15.4%
Block 3	120	14.2%
Block 4	187	14.7%
Tract 9605	580	14.7%
Block 1	216	10.9%
Block 2	237	17.6%
Block 3	127	20.6%
Tract 9606	420	13.5%
Block 1	172	14.5%
Block 2	141	13.9%

MUHLENBERG County BG	Below Poverty Level	Percent of Population
Tract 9601*	120	12.4%
Block 1	120	12.4%
Tract 9607	487	12.5%
Block 1	102	14.9%
Block 2	183	12.2%
Block 3	99	12.3%
Block 4	103	11.5%
Tract 9608	326	15.8%
Block 1	192	14.9%
Block 2	134	17.1%

*Muhlenberg County Tract 9601 consists of only one block group. The data listed for Tract 9601 and Tract 9601, Block Group 1 is identical because they cover the same geographical area.

PHASE I

Disabled Populations

Figure 5.4

COUNTIES	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
Logan	5,566	20.1%
Muhlenberg	7,553	23.7%

TRACTS	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
Logan	5,566	20.1%
Tract 9602	896	23.3%
Tract 9605	714	18.1%
Tract 9606	628	20.2%

TRACTS	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
Muhlenberg	7,553	23.7%
Tract 9601	271	28.1%
Tract 9607	1,105	28.4%
Tract 9608	516	24.9%

LOGAN County BG	Persons with One or More Disabilities	Percent of Population
Tract 9602	896	23.3%
Block 1	92	10.4%
Block 2	276	32.5%
Block 3	211	25.0%
Block 4	317	24.9%
Tract 9605	714	18.1%
Block 1	278	14.1%
Block 2	281	20.9%
Block 3	181	29.4%
Tract 9606	628	20.2%
Block 1	252	21.2%
Block 2	198	19.5%

MUHLENBERG County BG	Population Below Poverty Level	Percent of Population
Tract 9601*	271	28.1%
Block 1	271	28.1%
Tract 9607	1,105	28.4%
Block 1	231	33.7%
Block 2	441	29.3%
Block 3	222	27.6%
Block 4	211	23.6%
Tract 9608	516	24.9%
Block 1	287	13.9%
Block 2	229	29.2%

*Muhlenberg County Tract 9601 consists of only one block group. The data listed for Tract 9601 and Tract 9601, Block Group 1 is identical because they cover the same geographical area.

APPENDIX 4

Phase II Census Data Sets

Phase II

Race Populations - By County & Tract

Figure 6.1a

COUNTIES	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
Muhlenberg	29,836	94.2%	1,472	4.6%	232	0.7%	39	0.1%	40	0.1%	220	0.8%	31,839
McLean	9,749	98.6%	36	0.4%	83	0.8%	15	0.2%	4	0.0%	51	0.8%	9,938
Daviess	85,302	93.7%	3,962	4.3%	845	0.9%	119	0.1%	374	0.4%	943	1.3%	91,545

TRACTS	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
Muhlenberg	29,836	94.2%	1,472	4.6%	232	0.7%	39	0.1%	40	0.1%	220	0.8%	31,839
Tract 9602	7,131	90.5%	652	8.2%	53	0.7%	4	0.1%	16	0.2%	63	1.0%	7,919

TRACTS	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
McLean	9,749	98.6%	36	0.4%	83	0.8%	15	0.2%	4	0.0%	51	0.8%	9,938
Tract 9701	3,081	98.6%	1	0.0%	37	1.2%	4	0.1%	1	0.0%	15	1.1%	3,139
Tract 9704	1,090	99.5%	0	0.0%	6	0.5%	1	0.1%	0	0.0%	4	0.4%	1,101

TRACTS	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
United States	194,552,774	69.1%	33,947,837	12.1%	35,305,818	12.5%	2,068,883	0.7%	10,123,169	3.6%	5,423,425	1.9%	281,421,906
Kentucky	3,608,013	89.3%	293,639	7.3%	59,939	1.5%	7,939	0.2%	29,368	0.7%	42,871	1.0%	4,041,769
Daviess	85,302	93.7%	3,962	4.3%	845	0.9%	119	0.1%	374	0.4%	943	1.3%	91,545
Tract 17.01	4,478	92.5%	201	4.1%	69	1.4%	3	0.1%	41	0.9%	85	2.5%	4,877
Tract 17.02	3,217	95.1%	78	2.3%	10	0.3%	2	0.1%	64	1.9%	18	0.6%	3,389
Tract 17.03	4,146	98.3%	34	0.8%	5	0.1%	10	0.2%	7	0.2%	22	0.5%	4,224

Phase II

Race Populations - By Block Group

Figure 6.1b

MUHLENBERG County BG	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
Tract 9602	7,131	90.5%	652	8.2%	53	0.7%	4	0.1%	16	0.2%	63	1.0%	7,919
Block 2	1,533	80.8%	344	18.1%	14	0.7%	1	0.1%	5	0.3%	8	0.8%	1,905
Block 3	777	92.8%	48	5.7%	6	0.7%	0	0.0%	1	0.1%	12	1.4%	844
Block 4	1,304	96.2%	35	2.6%	6	0.4%	0	0.0%	9	0.7%	4	0.5%	1,358
Block 5	816	83.6%	153	15.7%	1	0.1%	0	0.0%	0	0.0%	7	0.7%	977
Block 6	1,219	93.9%	59	4.5%	18	1.4%	2	0.2%	0	0.0%	11	1.5%	1,309
Block 7	963	97.5%	9	0.9%	8	0.8%	1	0.1%	1	0.1%	14	1.4%	996

McLEAN County BG	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
Tract 9701	3,081	98.6%	1	0.0%	37	1.2%	4	0.1%	1	0.0%	15	1.1%	3,139
Block 1	1,213	98.6%	0	0.0%	23	1.9%	2	0.0%	1	0.1%	2	1.1%	1,241
Block 2	754	98.1%	1	0.1%	7	0.9%	0	0.0%	0	0.0%	9	1.8%	771
Block 3	1,114	99.0%	0	0.0%	7	0.6%	2	0.2%	0	0.0%	4	0.8%	1,127
Tract 9704*	1,090	99.5%	0	0.0%	6	0.5%	1	0.1%	0	0.0%	4	0.4%	1,101
Block 1	1,090	99.5%	0	0.0%	6	0.5%	1	0.1%	0	0.0%	4	0.4%	1,101

DAVISS County BG	White	% of Total	Black	% of Total	Hispanic	% of Total	American Indian	% of Total	Asian	% of Total	Other	% of Total	Total Population
Tract 17.01	4,478	92.5%	201	4.1%	69	1.4%	3	0.1%	41	0.9%	85	2.5%	4,877
Block 2	1,145	92.1%	63	5.0%	20	1.6%	2	0.2%	2	0.2%	24	2.6%	1,256
Block 4	889	93.5%	24	2.5%	30	3.1%	0	0.0%	8	0.8%	11	3.3%	962
Tract 17.02	3,217	95.1%	78	2.3%	10	0.3%	2	0.1%	64	1.9%	18	0.6%	3,389
Block 2	1,350	93.0%	60	4.1%	4	0.3%	0	0.0%	37	2.5%	2	0.3%	1,453
Tract 17.03	4,146	98.3%	34	0.8%	5	0.1%	10	0.2%	7	0.2%	22	0.5%	4,224
Block 2	2,007	98.1%	24	1.2%	3	0.1%	4	0.2%	0	0.0%	10	0.5%	2,048
Block 3	1,000	97.7%	7	0.7%	0	0.0%	6	0.6%	7	0.7%	4	0.4%	1,024

*McLean County Tract 9704 consists of only one block group. The data listed for Tract 9704 and Tract 9704, Block Group 1 is identical because they cover the same geographical area.

PHASE II

Low-Income Populations

Figure 6.2

COUNTIES	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
Muhlenberg	6,002	18.9%
McLean	1,562	15.7%
Daviess	11,024	12.0%

MUHLENBERG County BG	Population Below Poverty Level	Percent of Population
Tract 9602	1,429	18.0%
Block 2	228	12.0%
Block 3	271	32.1%
Block 4	260	19.1%
Block 5	101	10.3%
Block 6	208	15.9%
Block 7	220	22.1%

TRACTS	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
Muhlenberg	6,002	18.9%
Tract 9602	1,429	18.0%

McLEAN County BG	Population Below Poverty Level	Percent of Population
Tract 9701	531	20.5%
Block 1	204	16.4%
Block 2	126	16.3%
Block 3	201	17.8%
Tract 9704*	165	15.0%
Block 1	165	15.0%

TRACTS	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
McLean	1,562	15.7%
Tract 9701	531	20.5%
Tract 9704	165	15.0%

DAVIESS County BG	Population Below Poverty Level	Percent of Population
Tract 17.01	545	11.2%
Block 2	145	11.5%
Block 4	163	16.9%
Tract 17.02	154	4.5%
Block 2	45	3.1%
Tract 17.03	298	7.1%
Block 2	139	6.8%
Block 3	47	4.6%

TRACTS	Population Below Poverty Level	Percent of Population
United States	33,899,812	12.0%
Kentucky	621,096	15.4%
Daviess	11,024	12.0%
Tract 17.01	545	11.2%
Tract 17.02	154	4.5%
Tract 17.03	298	7.1%

*McLean County Tract 9704 consists of only one block group. The data listed for Tract 9704 and Tract 9704, Block Group 1 is identical because they cover the same geographical area.

PHASE II Elderly Populations

Figure 6.3

COUNTIES	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
Muhlenberg	4,926	15.5%
McLean	1,438	14.5%
Daviess	12,643	13.8%

MUHLENBERG County BG	Age 65 & Over	Percent of Population
Tract 9602	1,205	15.2%
Block 2	215	11.3%
Block 3	132	15.6%
Block 4	254	18.7%
Block 5	139	14.2%
Block 6	275	21.0%
Block 7	117	11.7%

TRACTS	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
Muhlenberg	4,926	15.5%
Tract 9602	1,205	15.2%

McLEAN County BG	Age 65 & Over	Percent of Population
Tract 9701	385	14.8%
Block 1	178	14.3%
Block 2	94	12.2%
Block 3	113	10.0%
Tract 9704*	136	12.4%
Block 1	136	12.4%

TRACTS	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
McLean	1,438	14.5%
Tract 9701	385	14.8%
Tract 9704	136	12.4%

DAVIESS County BG	Age 65 & Over	Percent of Population
Tract 17.01	413	8.5%
Block 2	80	6.4%
Block 4	182	18.9%
Tract 17.02	373	11.0%
Block 2	188	12.9%
Tract 17.03	420	9.9%
Block 2	189	9.2%
Block 3	125	12.2%

TRACTS	Age 65 & Over	Percent of Population
United States	34,991,753	12.4%
Kentucky	504,793	12.5%
Daviess	12,643	13.8%
Tract 17.01	413	8.5%
Tract 17.02	373	11.0%
Tract 17.03	420	9.9%

*McLean County Tract 9704 consists of only one block group. The data listed for Tract 9704 and Tract 9704, Block Group 1 is identical because they cover the same geographical area.

PHASE II

Disabled Populations

Figure 6.4

COUNTIES	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
Muhlenberg	7,553	23.7%
McLean	2,404	24.2%
Daviess	18,166	19.8%

MUHLENBERG County BG	Persons with One or More Disabilities	Percent of Population
Tract 9602	1,657	20.9%
Block 2	251	13.2%
Block 3	219	25.9%
Block 4	508	37.4%
Block 5	204	20.9%
Block 6	238	18.2%
Block 7	237	23.8%

TRACTS	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
Muhlenberg	7,553	23.7%
Tract 9602	1,657	20.9%

McLEAN County BG	Persons with One or More Disabilities	Percent of Population
Tract 9701	721	22.9%
Block 1	310	24.9%
Block 2	159	20.6%
Block 3	252	22.4%
Tract 9704*	292	26.5%
Block 1	292	26.5%

TRACTS	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
McLean	2,404	24.2%
Tract 9701	721	22.9%
Tract 9704	292	26.5%

DAVIESS County BG	Persons with One or More Disabilities	Percent of Population
Tract 17.01	894	18.3%
Block 2	264	21.0%
Block 4	261	27.1%
Tract 17.02	274	8.1%
Block 2	132	9.1%
Tract 17.03	755	17.9%
Block 2	304	14.8%
Block 3	196	19.1%

TRACTS	Persons with One or More Disabilities	Percent of Population
United States	49,746,248	17.7%
Kentucky	874,156	21.6%
Daviess	18,166	19.8%
Tract 17.01	894	18.3%
Tract 17.02	274	8.1%
Tract 17.03	755	17.9%

*McLean County Tract 9704 consists of only one block group. The data listed for Tract 9704 and Tract 9704, Block Group 1 is identical because they cover the same geographical area.

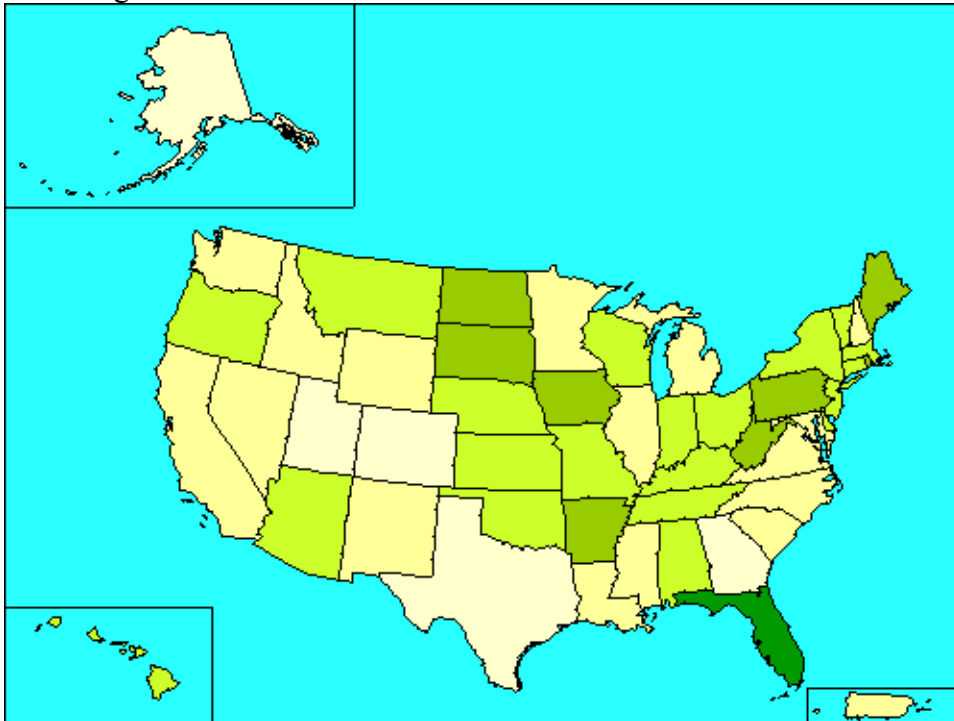
APPENDIX 5

Phase I Census Maps

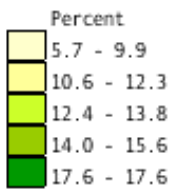
Phase I – Elderly Census Data

Figure 7.1

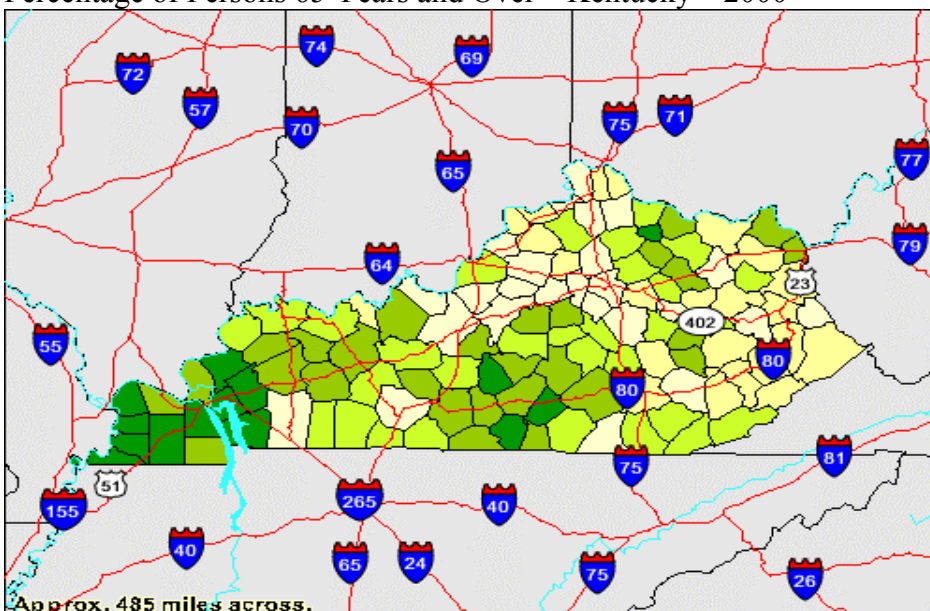
Percentage of Persons 65 Years and Over – US – 2000



Data Classes



Percentage of Persons 65 Years and Over – Kentucky – 2000

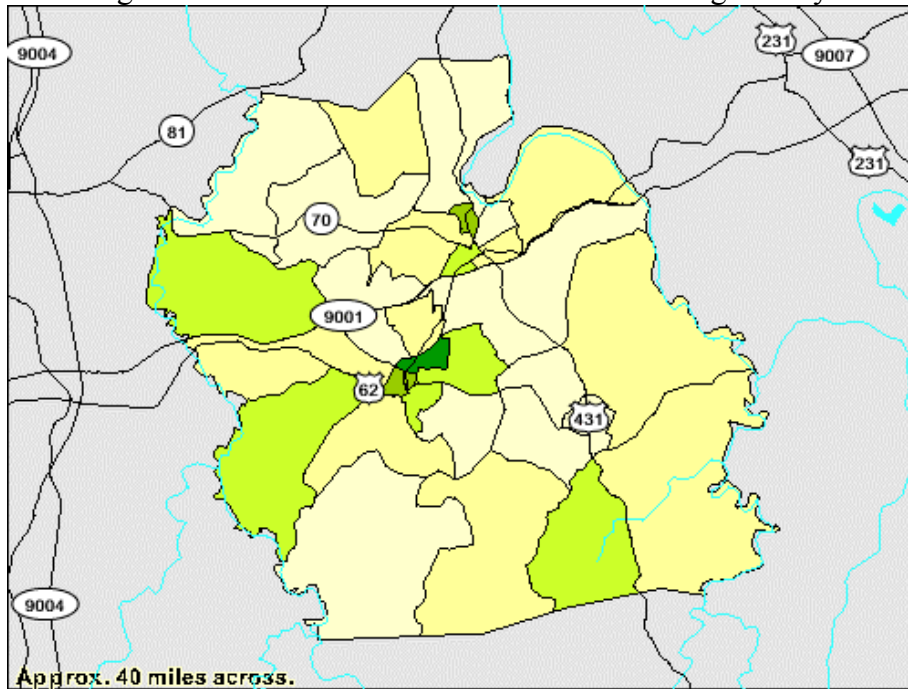


*Source: US Census Bureau website

Phase I – Elderly Census Data

Figure 7.1

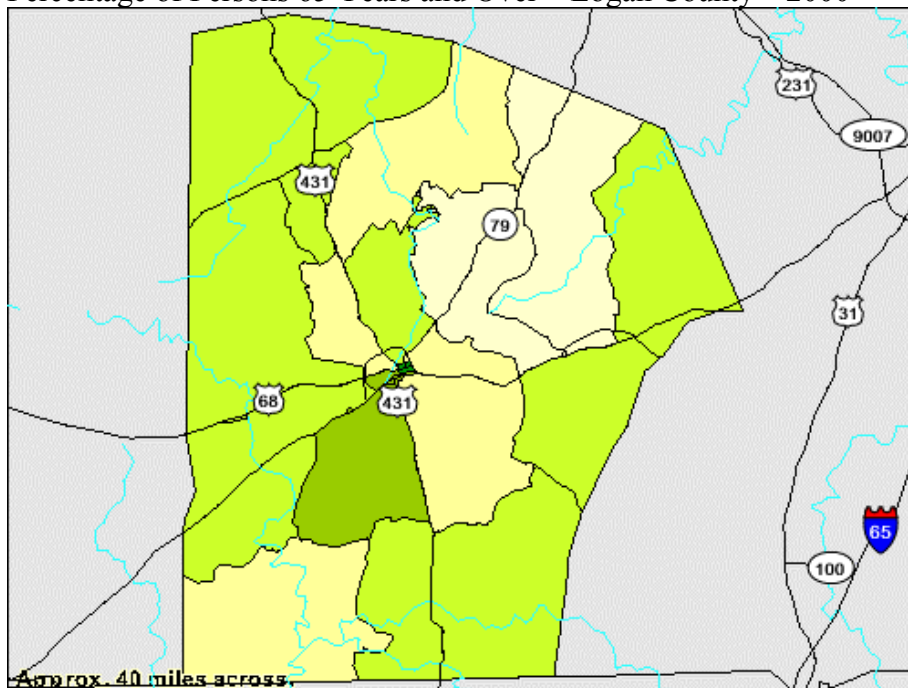
Percentage of Persons 65 Years and Over – Muhlenberg County – 2000



Data Classes

Percent
5.7 - 9.9
10.6 - 12.3
12.4 - 13.8
14.0 - 15.6
17.6 - 17.6

Percentage of Persons 65 Years and Over – Logan County – 2000

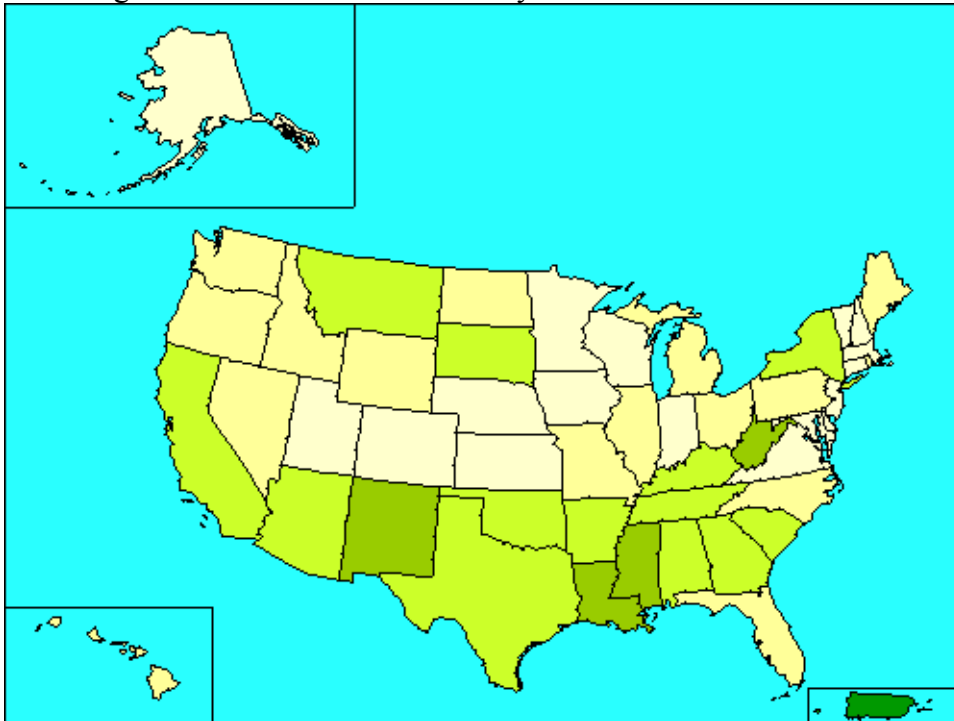


*Source: US Census Bureau website

Phase I - Low-Income Census Data

Figure 7.2

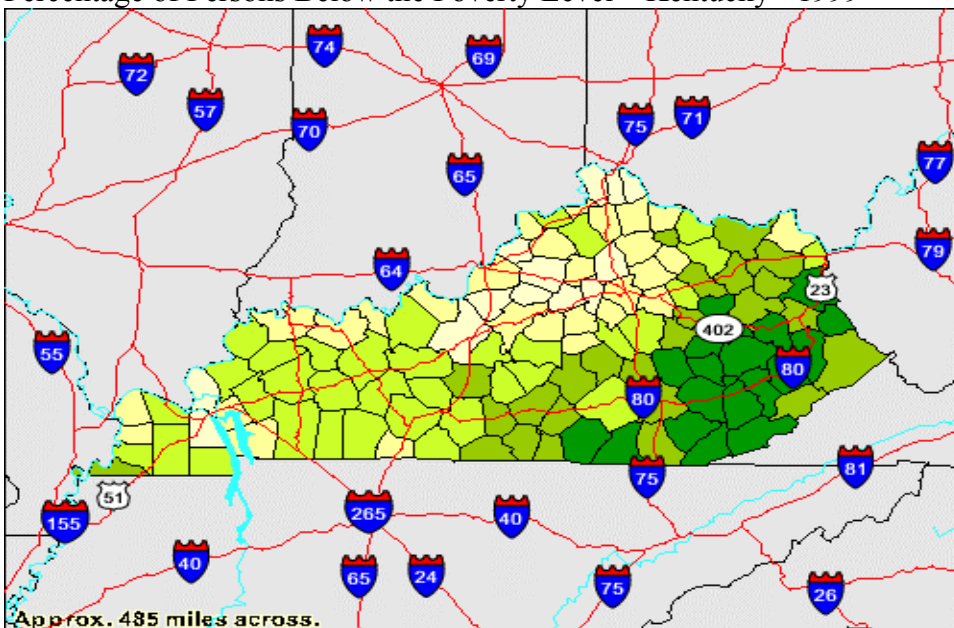
Percentage of Persons Below the Poverty Level – US - 1999



Data Classes

Percent	
6.5 - 9.9	Lightest yellow
10.5 - 12.5	Light yellow
13.0 - 16.1	Yellow-green
17.9 - 20.2	Green
48.2 - 48.2	Darkest green

Percentage of Persons Below the Poverty Level – Kentucky - 1999

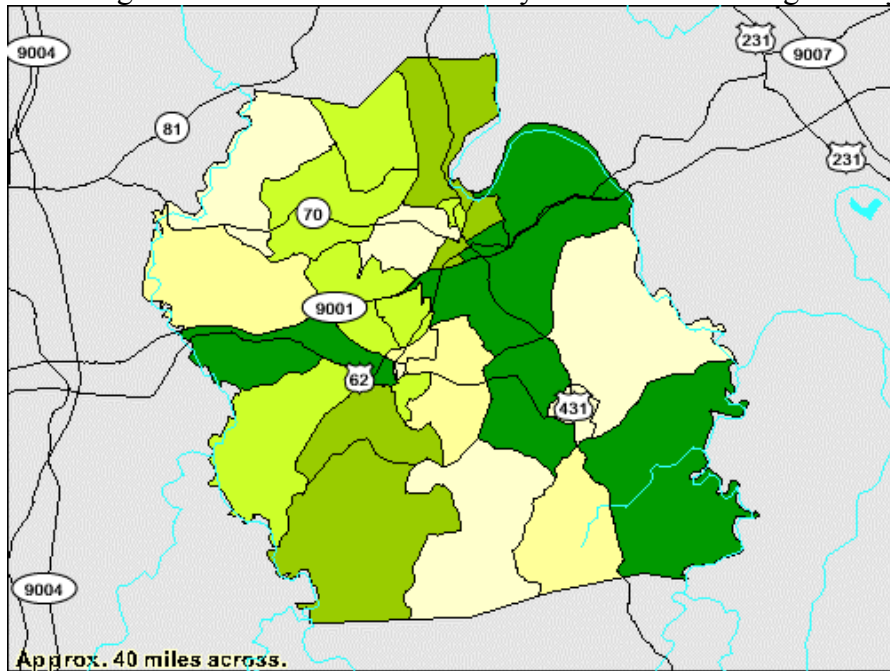


Approx. 485 miles across.
*Source: US Census Bureau website

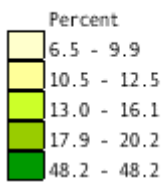
Phase I - Low-Income Census Data

Figure 7.2

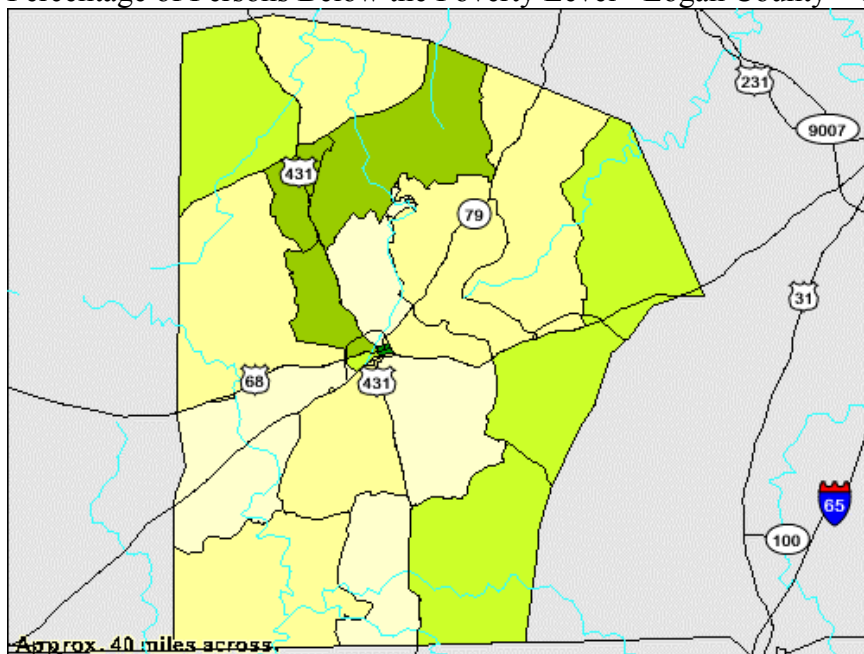
Percentage of Persons Below the Poverty Level - Muhlenberg County – 1999



Data Classes



Percentage of Persons Below the Poverty Level - Logan County – 1999



*Source: US Census Bureau website

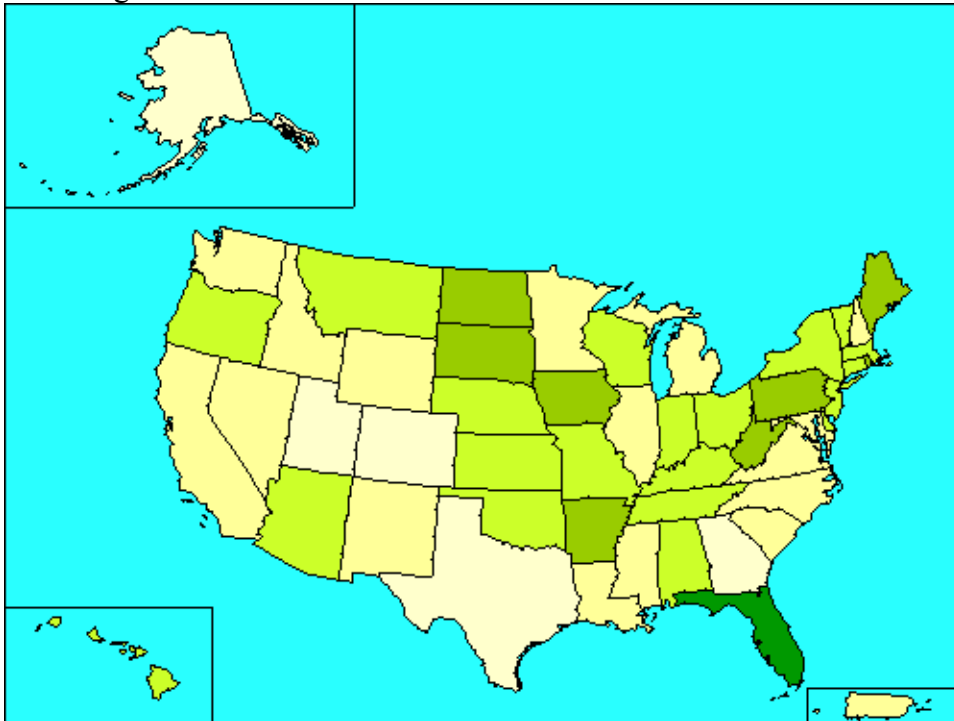
APPENDIX 6

Phase II Census Maps

Phase II – Elderly Census Data

Figure 8.1

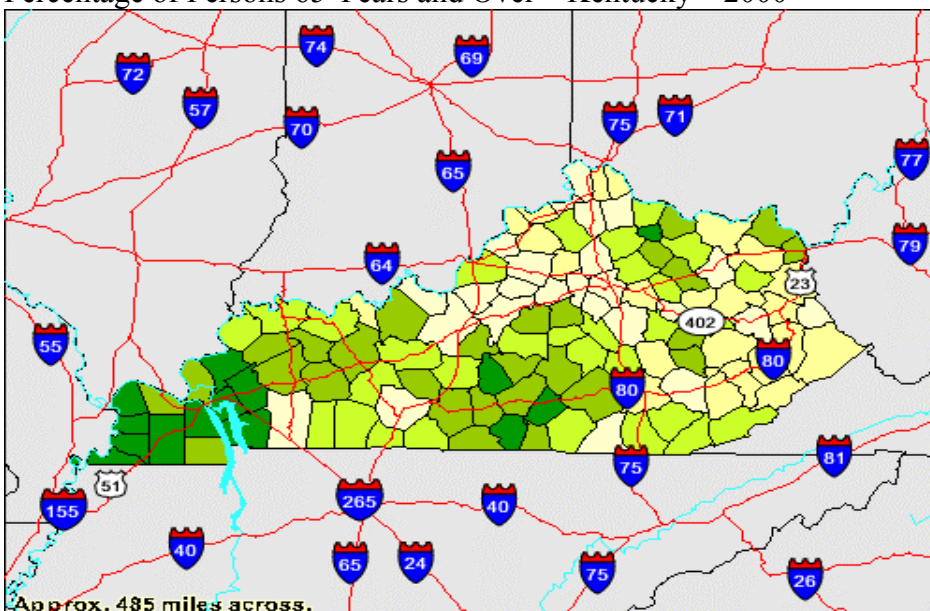
Percentage of Persons 65 Years and Over – US – 2000



Data Classes

Percent
5.7 - 9.9
10.6 - 12.3
12.4 - 13.8
14.0 - 15.6
17.6 - 17.6

Percentage of Persons 65 Years and Over – Kentucky – 2000

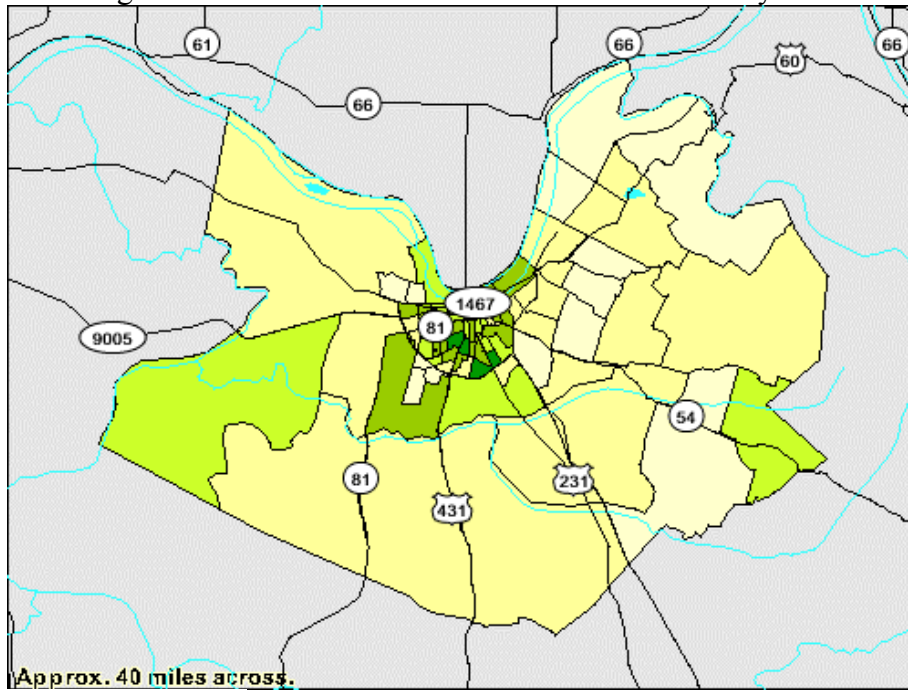


*Source: US Census Bureau website

Phase II – Elderly Census Data

Figure 8.1

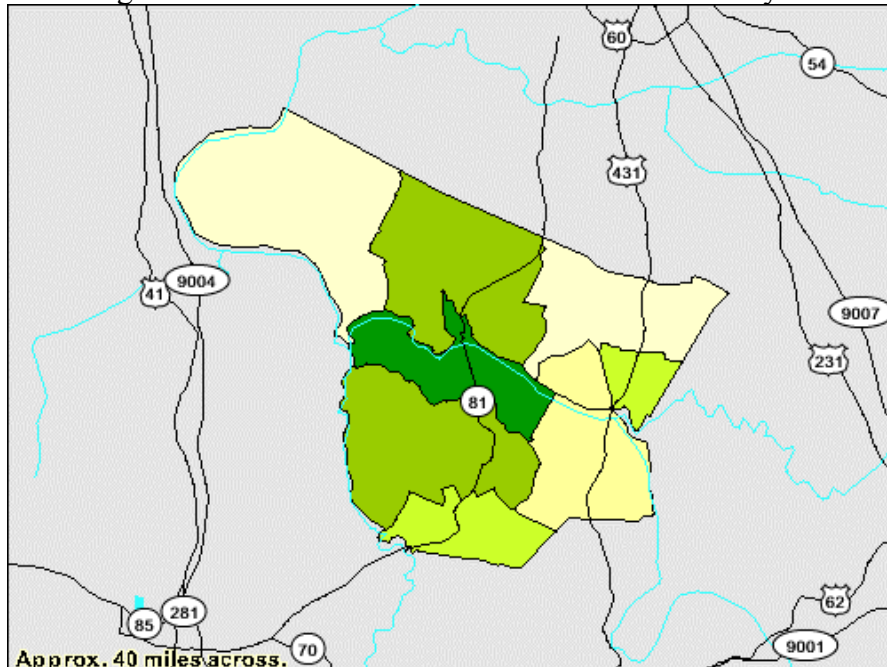
Percentage of Persons 65 Years and Over – Daviess County – 2000



Data Classes

Percent
5.7 - 9.9
10.6 - 12.3
12.4 - 13.8
14.0 - 15.6
17.6 - 17.6

Percentage of Persons 65 Years and Over – McLean County – 2000

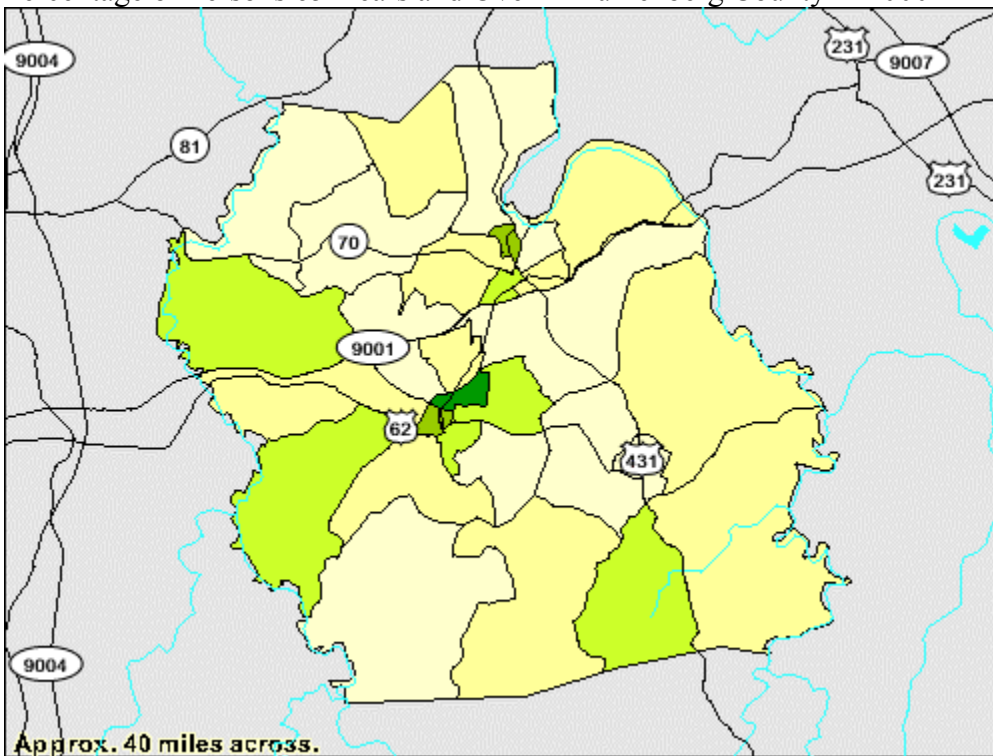


*Source: US Census Bureau website

Phase II – Elderly Census Data

Figure 8.1

Percentage of Persons 65 Years and Over – Muhlenberg County – 2000

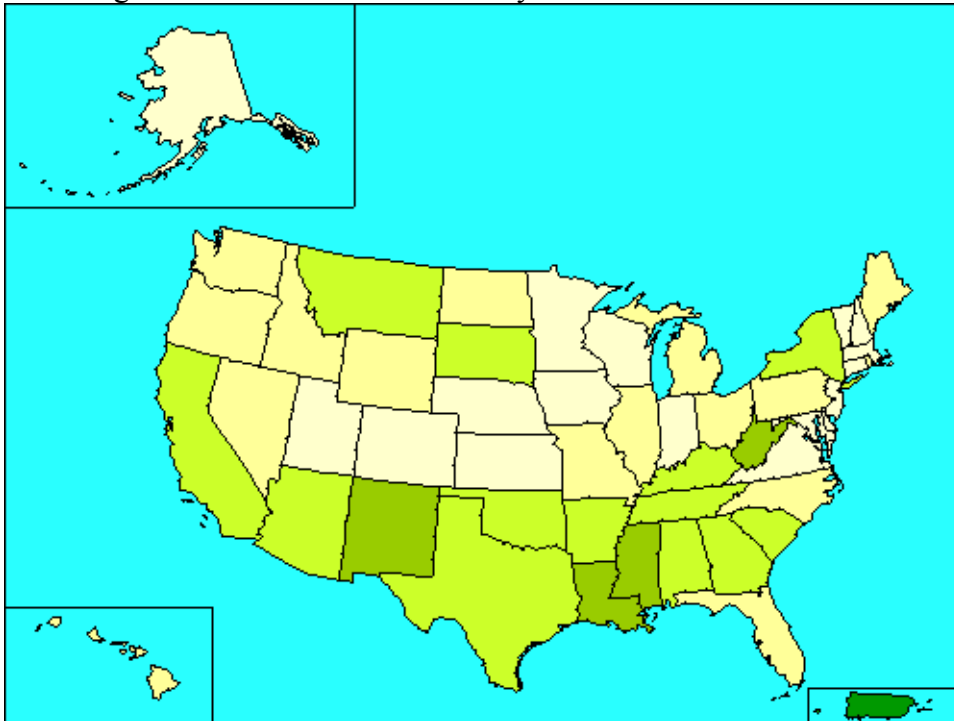


*Source: US Census Bureau website

Phase II – Low-Income Census Data

Figure 8.2

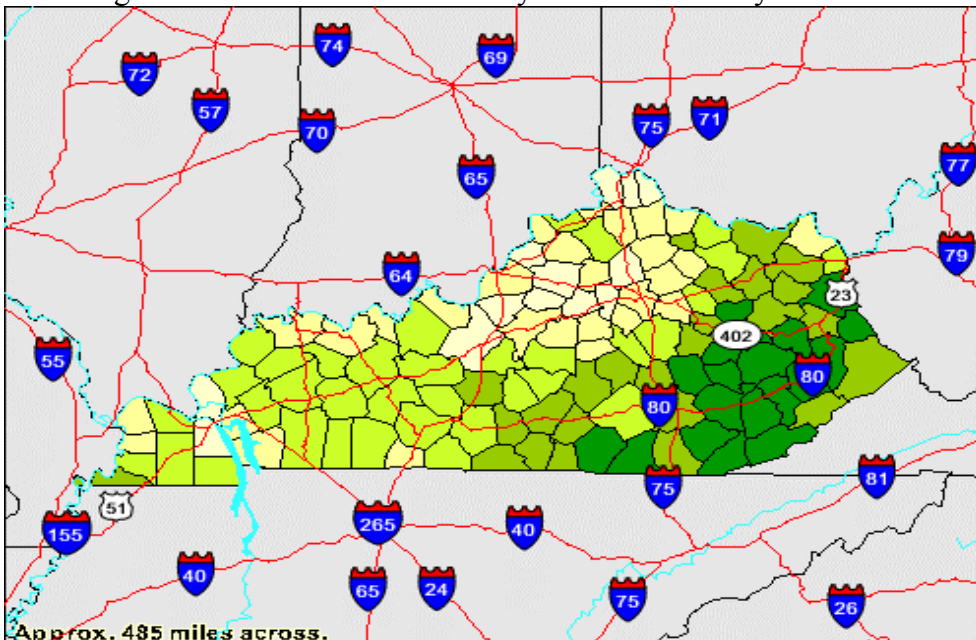
Percentage of Persons Below the Poverty Level – US - 1999



Data Classes

Percent	
Lightest Yellow	6.5 - 9.9
Light Yellow	10.5 - 12.5
Yellow-Green	13.0 - 16.1
Green	17.9 - 20.2
Darkest Green	48.2 - 48.2

Percentage of Persons Below the Poverty Level – Kentucky - 1999

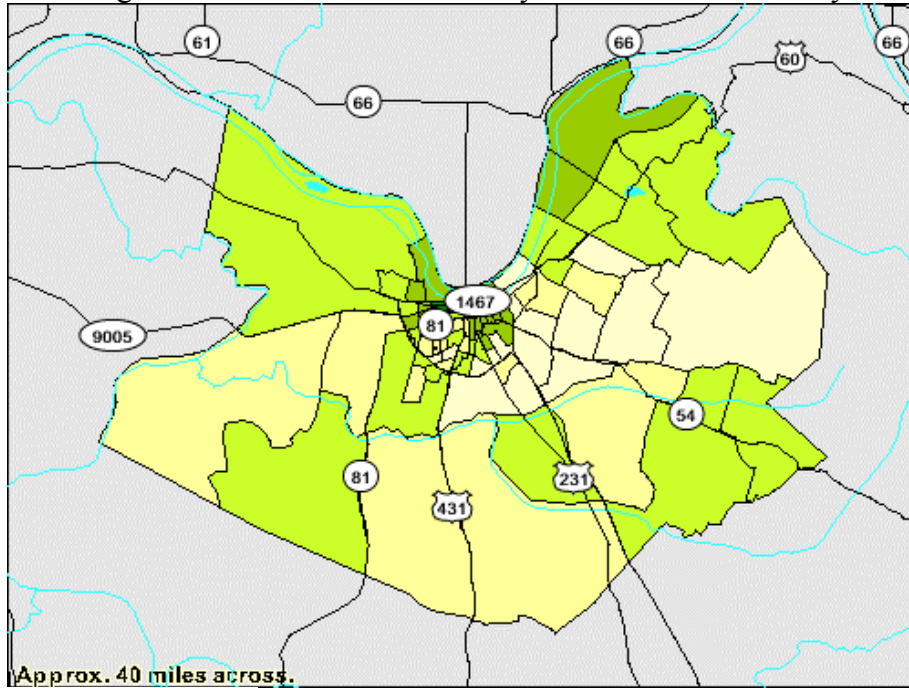


*Source: US Census Bureau website

Phase II – Low-Income Census Data

Figure 8.2

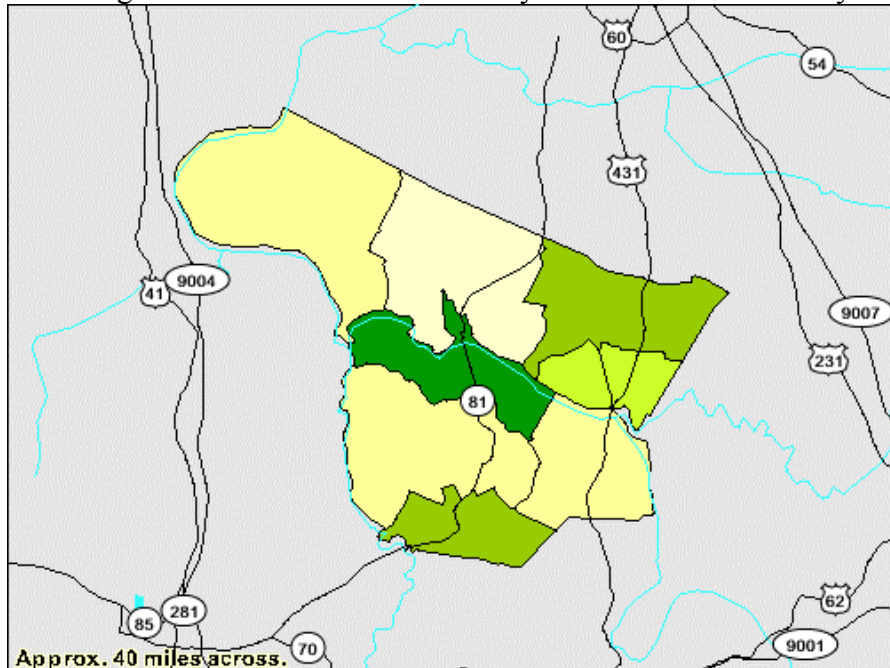
Percentage of Persons Below the Poverty Level - Daviess County – 1999



Data Classes

Percent	
6.5 - 9.9	Lightest Yellow
10.5 - 12.5	Yellow
13.0 - 16.1	Light Green
17.9 - 20.2	Medium Green
48.2 - 48.2	Darkest Green

Percentage of Persons Below the Poverty Level - McLean County – 1999

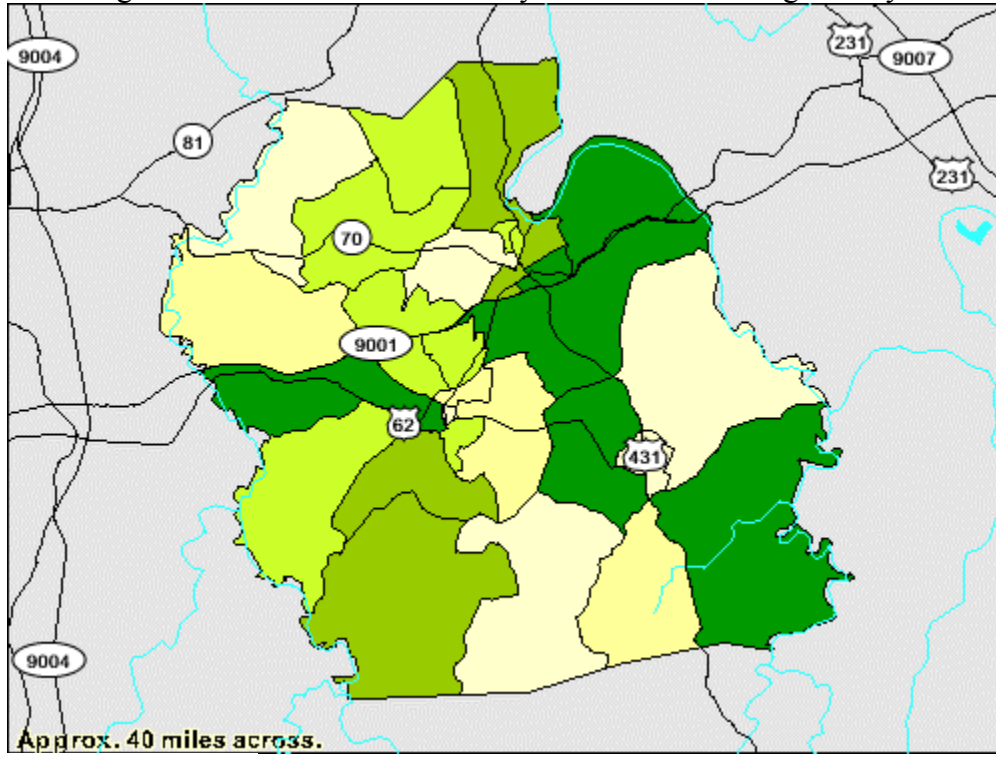


*Source: US Census Bureau website

Phase II – Low-Income Census Data

Figure 8.2

Percentage of Persons Below the Poverty Level - Muhlenberg County – 1999



Data Classes

Percent	
6.5 - 9.9	Lightest Yellow
10.5 - 12.5	Light Yellow
13.0 - 16.1	Yellow-Green
17.9 - 20.2	Green
48.2 - 48.2	Dark Green

*Source: US Census Bureau website

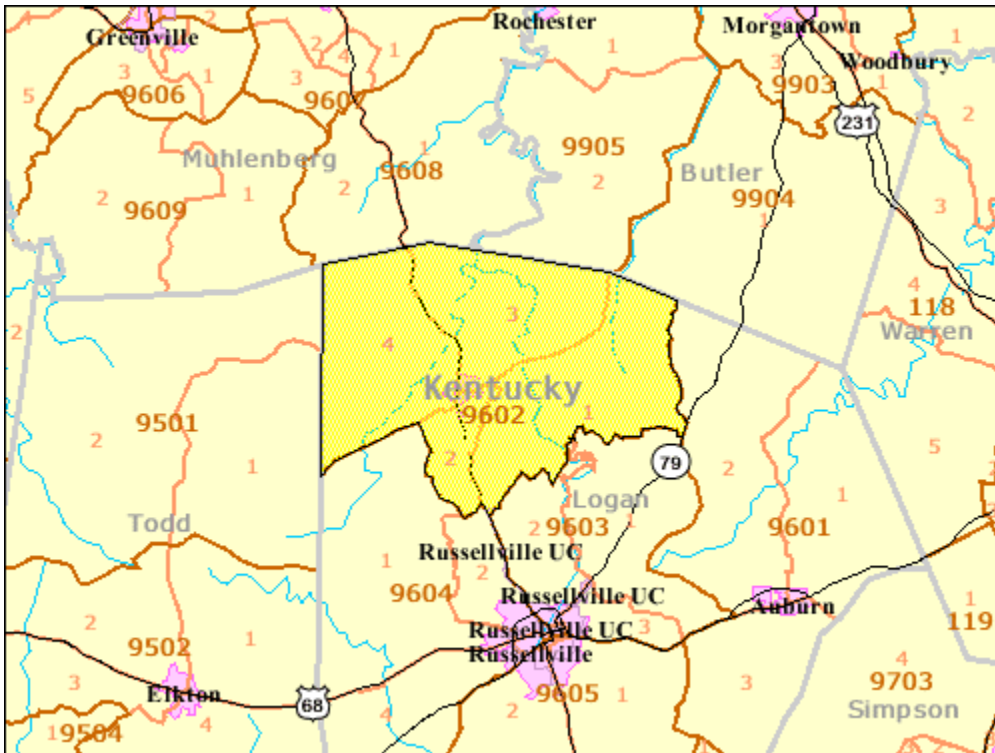
APPENDIX 7

Phase I Reference Maps

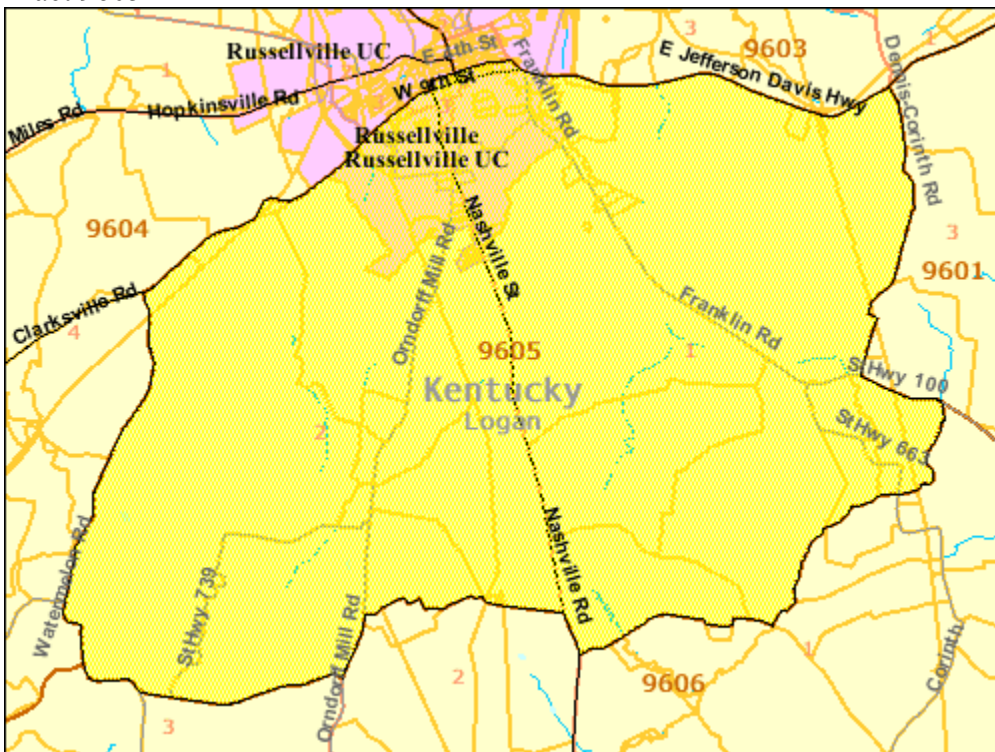
Phase I - Logan County Tracts

Figure 9.1

Tract 9602



Tract 9605

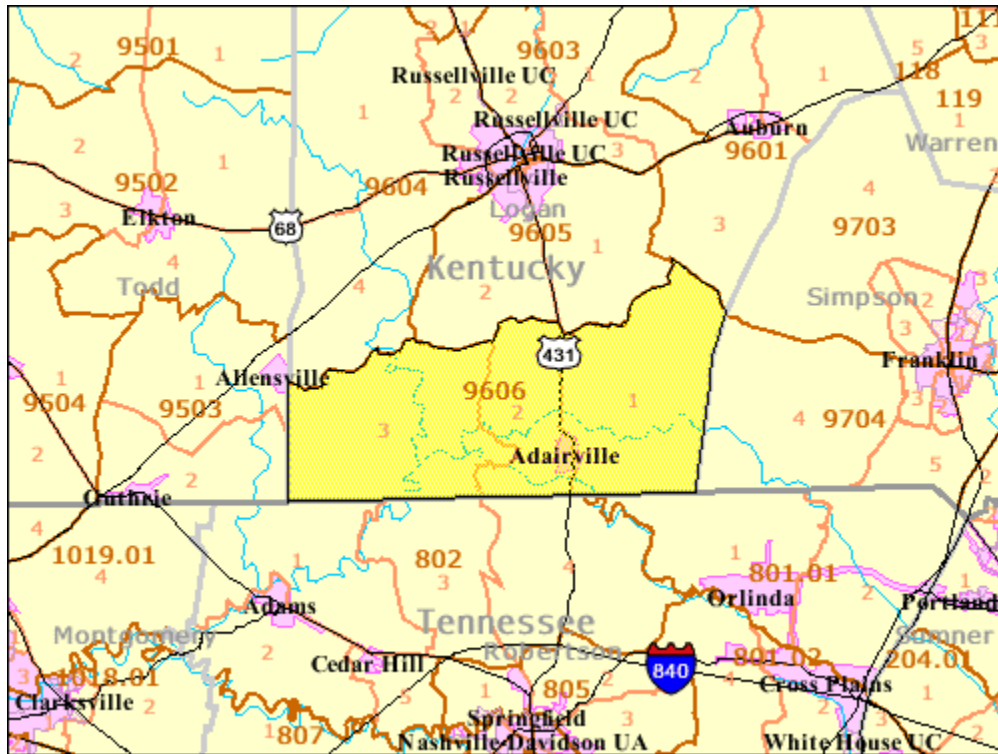


*Source: US Census Bureau website

Phase I - Logan County Tracts

Figure 9.1

Tract 9606

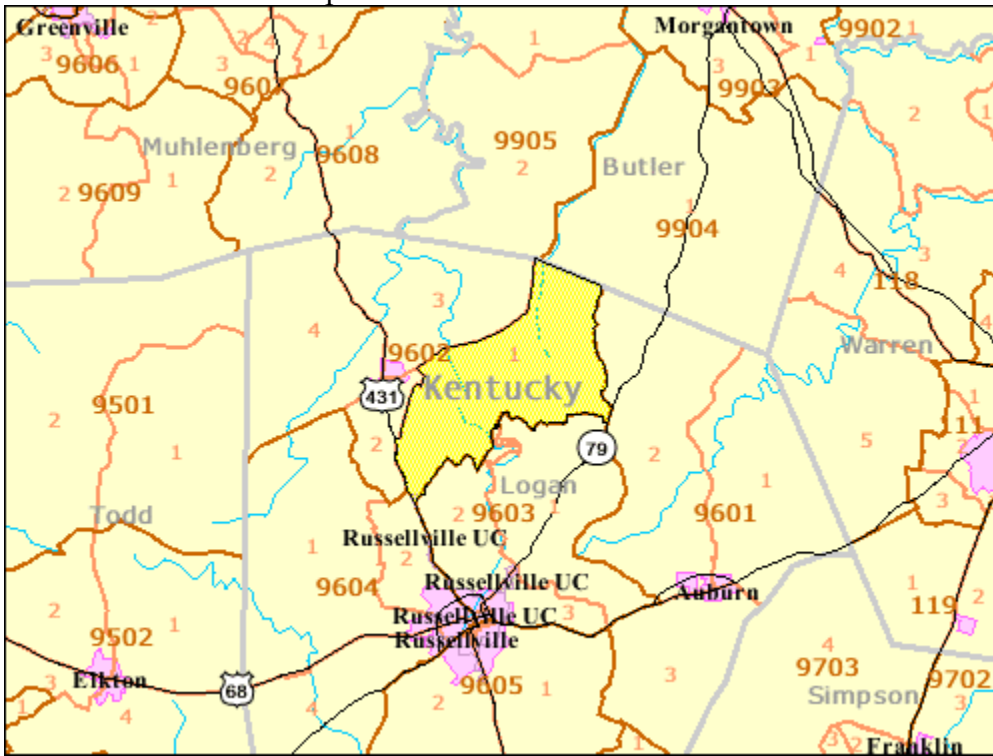


*Source: US Census Bureau website

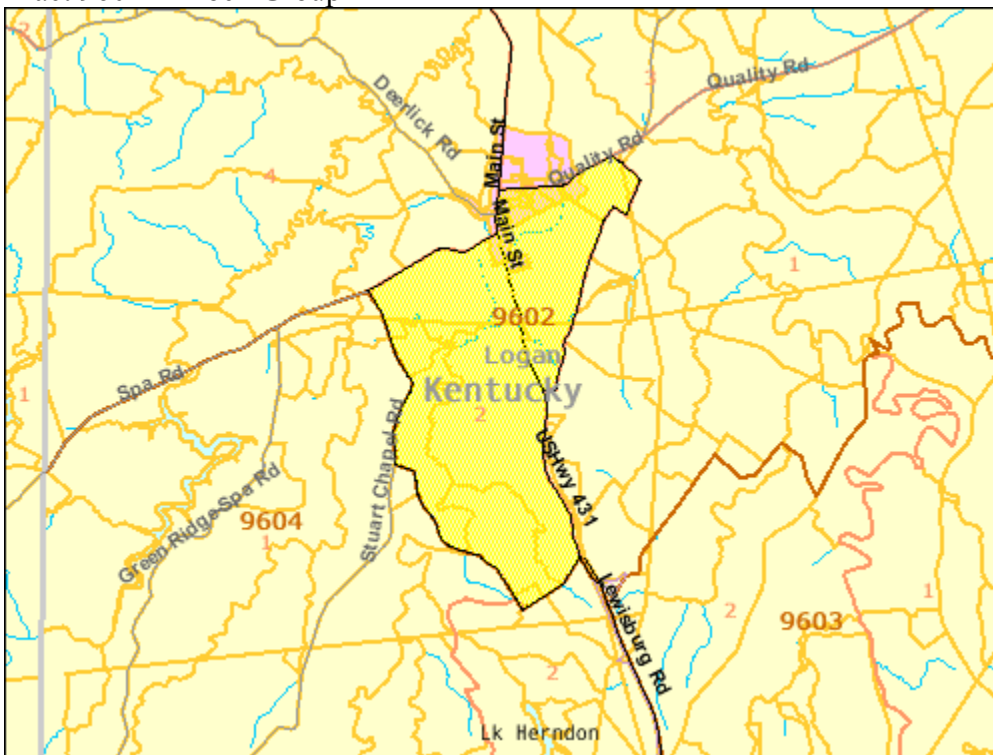
Phase I - Logan County Block Groups

Figure 9.1

Tract 9602 – Block Group 1



Tract 9602 – Block Group 2

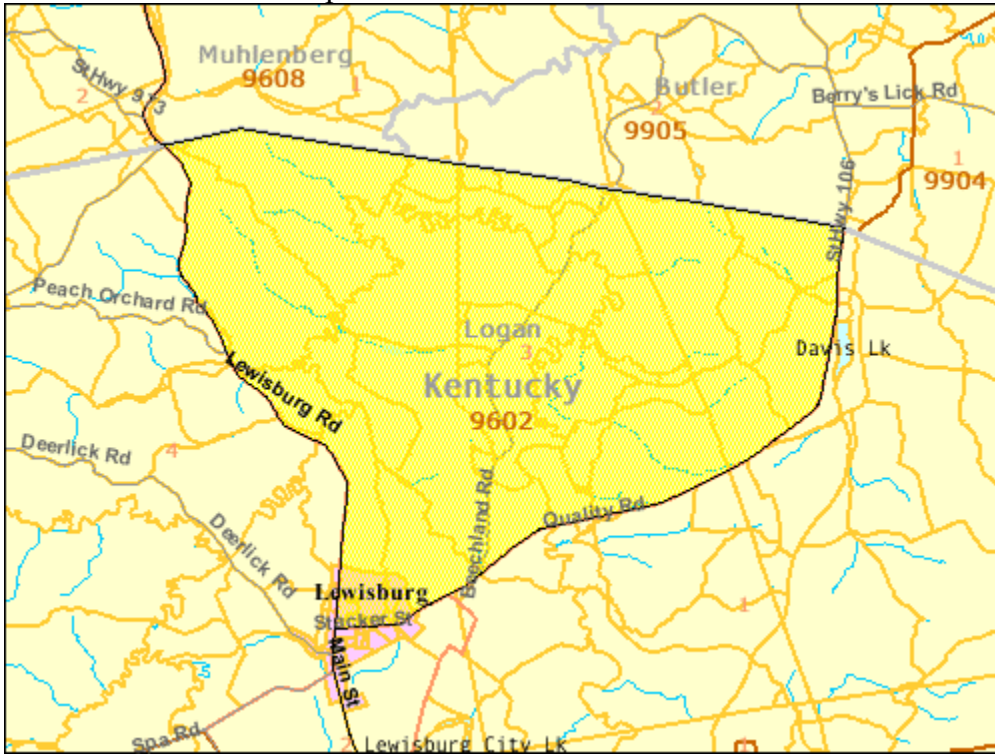


*Source: US Census Bureau website

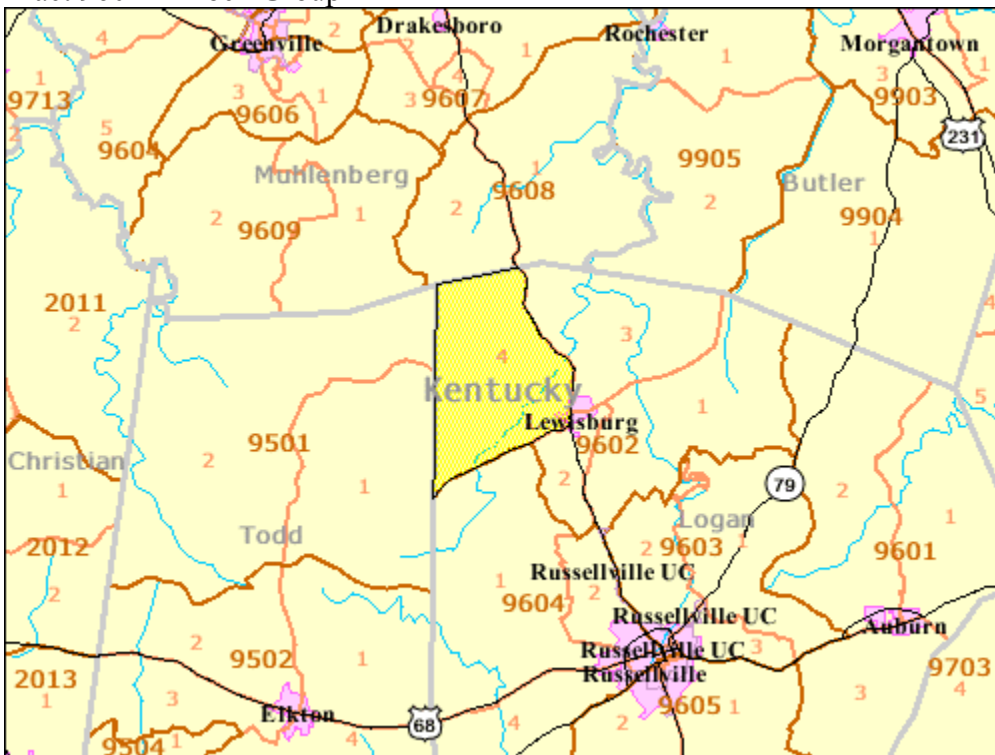
Phase I - Logan County Block Groups

Figure 9.1

Tract 9602 – Block Group 3



Tract 9602 – Block Group 4

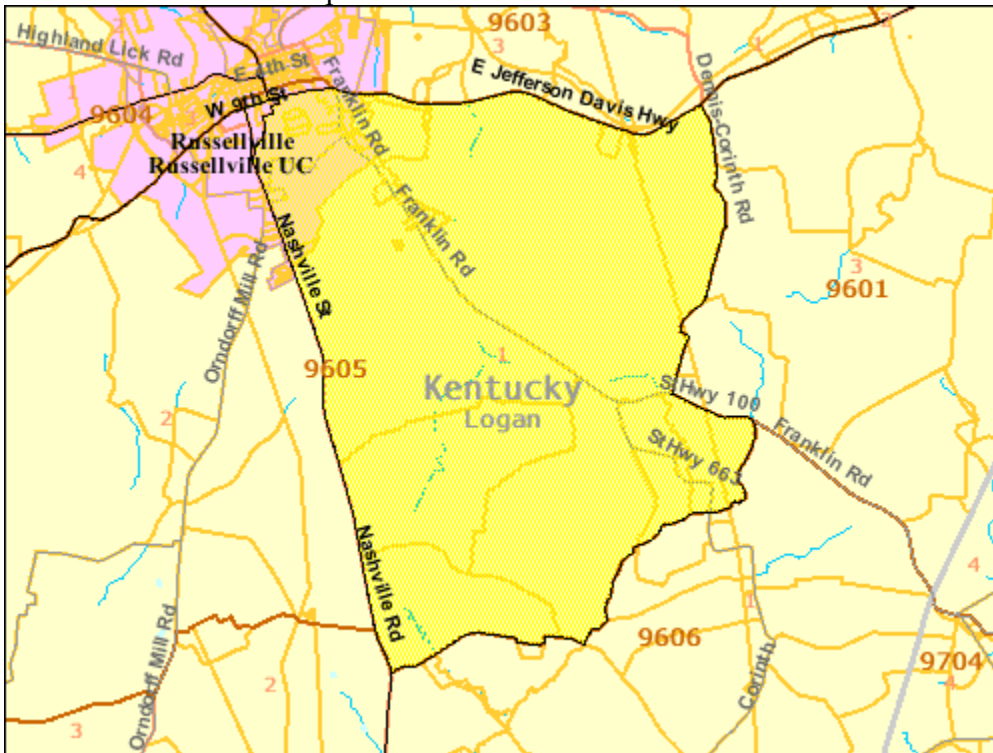


*Source: US Census Bureau website

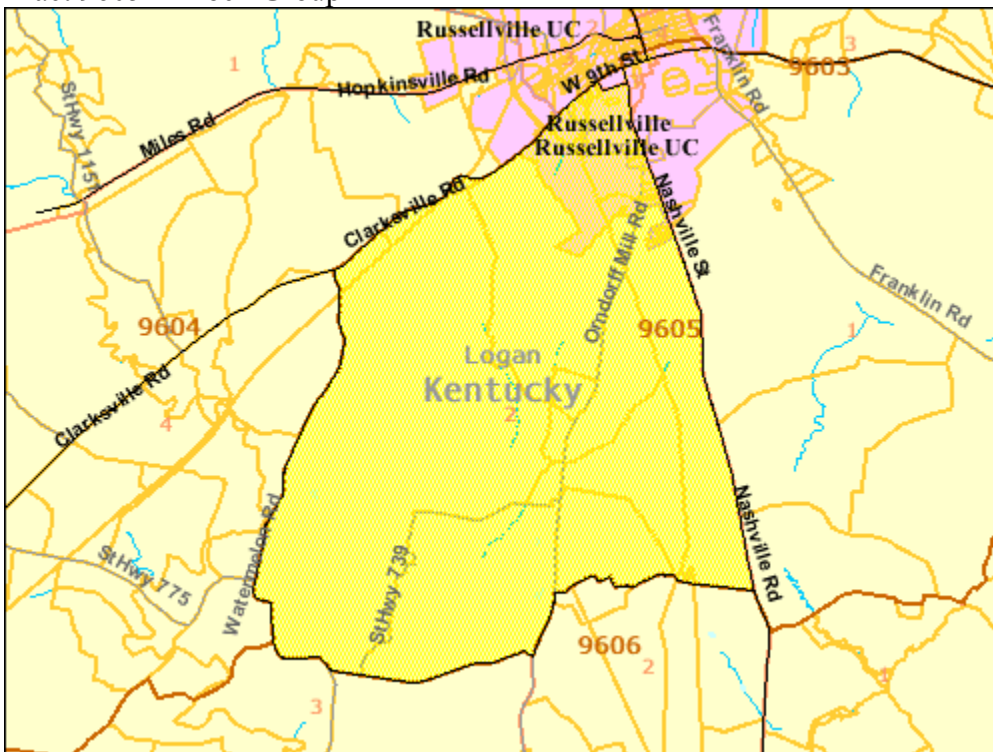
Phase I - Logan County Block Groups

Figure 9.1

Tract 9605 – Block Group 1



Tract 9605 – Block Group 2

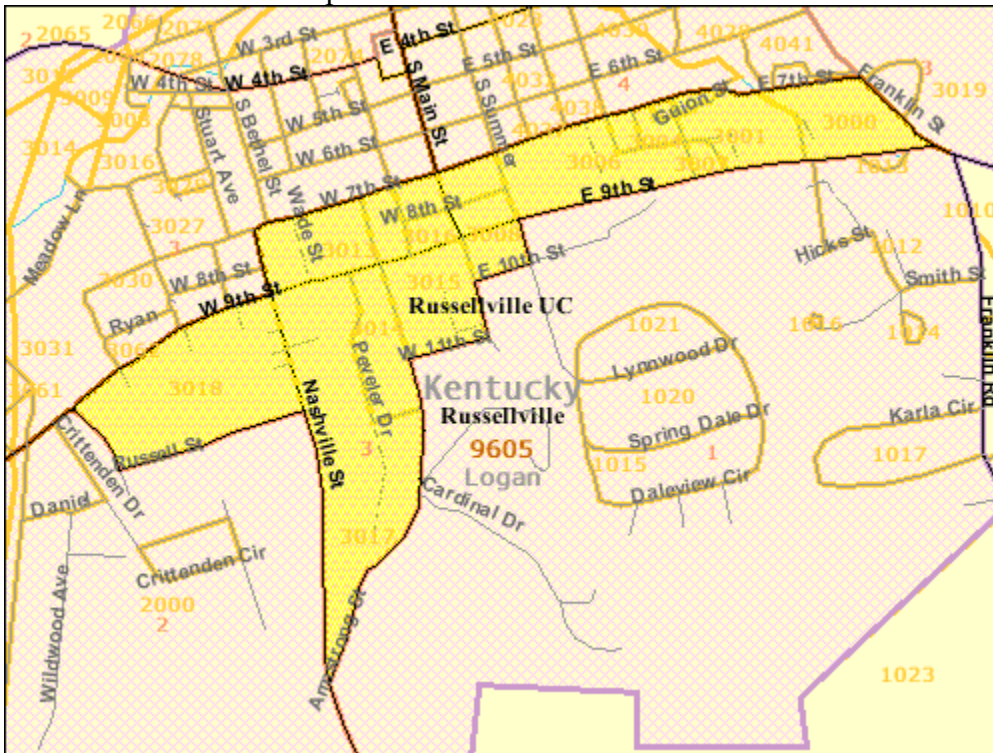


*Source: US Census Bureau website

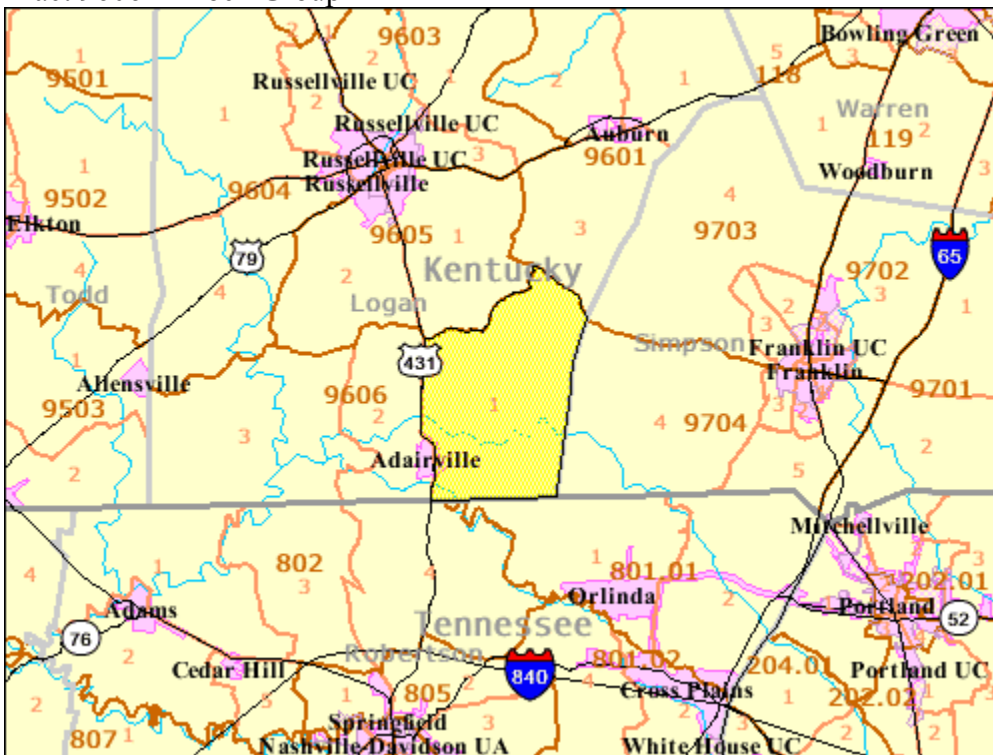
Phase I - Logan County Block Groups

Figure 9.1

Tract 9605 – Block Group 3



Tract 9606 – Block Group 1

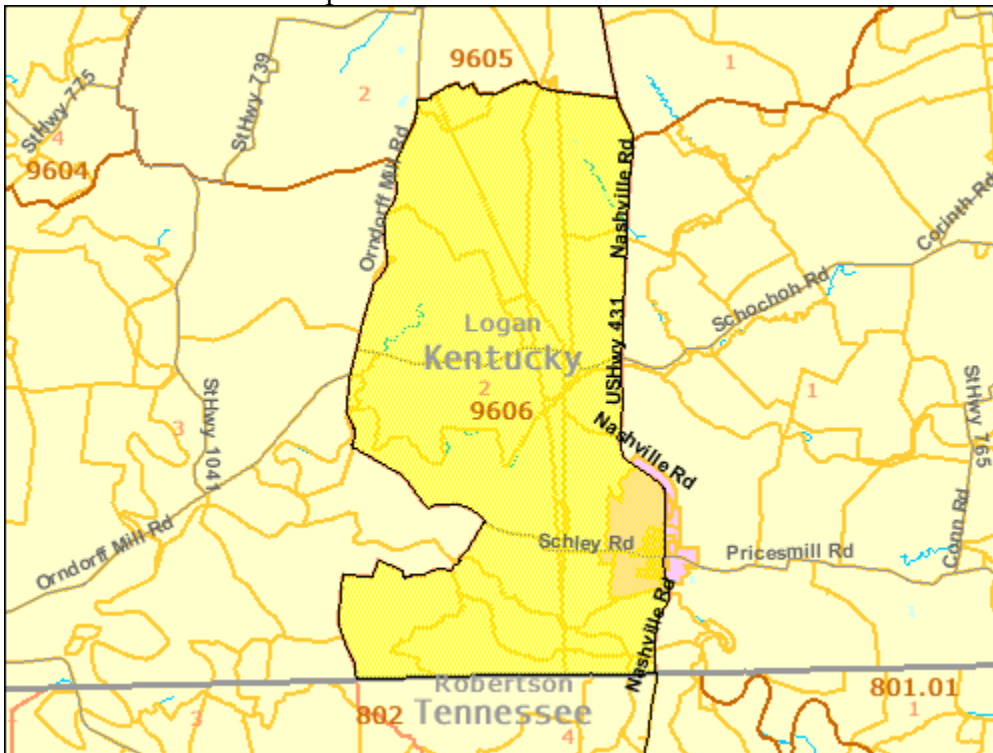


*Source: US Census Bureau website

Phase I - Logan County Block Groups

Figure 9.1

Tract 9606 – Block Group 2

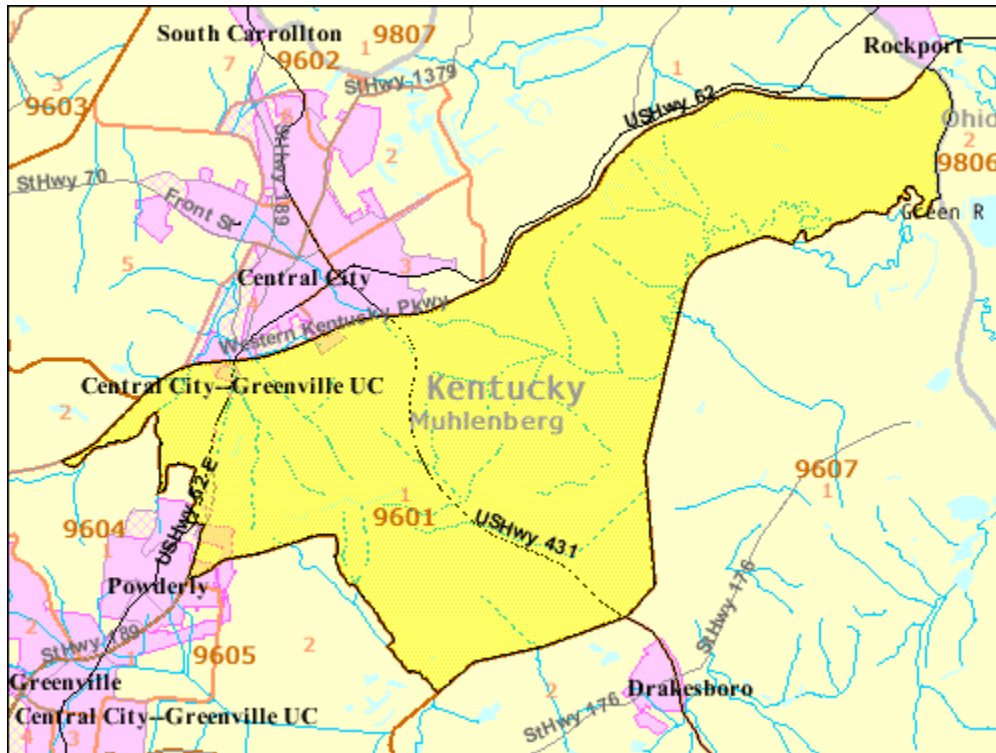


*Source: US Census Bureau website

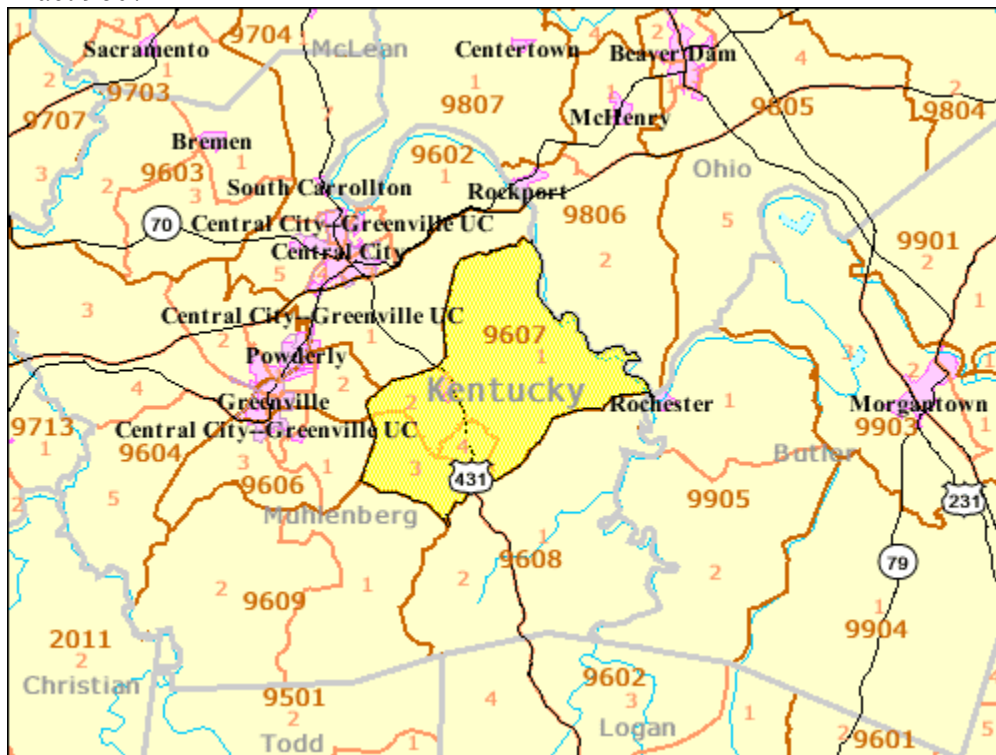
Phase I - Muhlenberg County Tracts

Figure 9.2

Tract 9601



Tract 9607

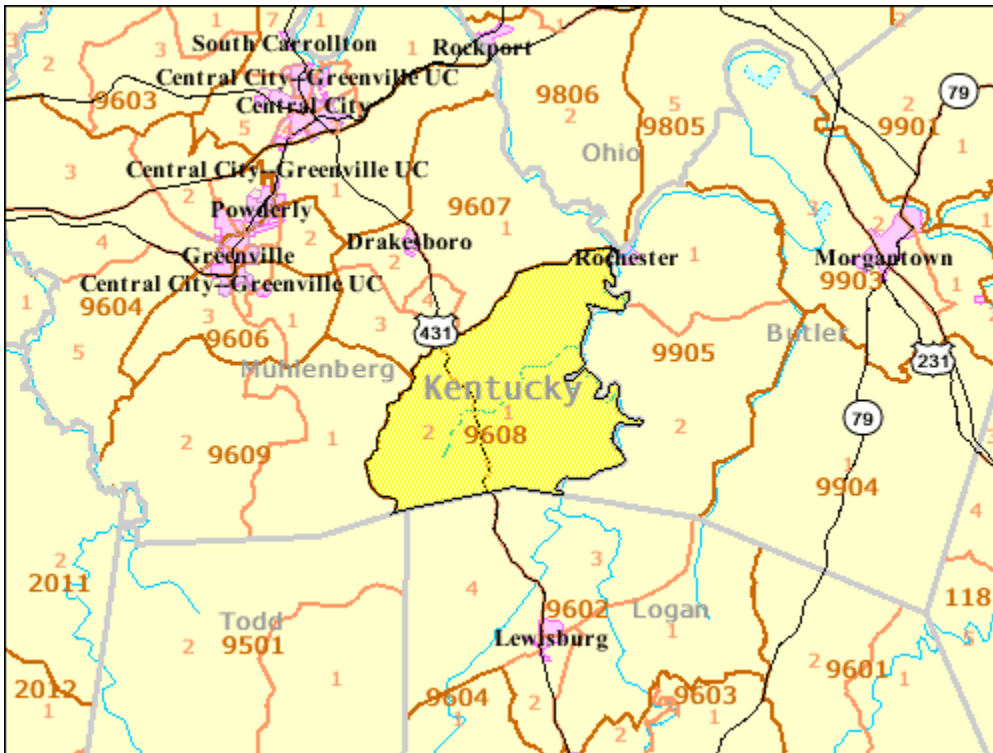


*Source: US Census Bureau website

Phase I - Muhlenberg County Tracts

Figure 9.2

Tract 9608

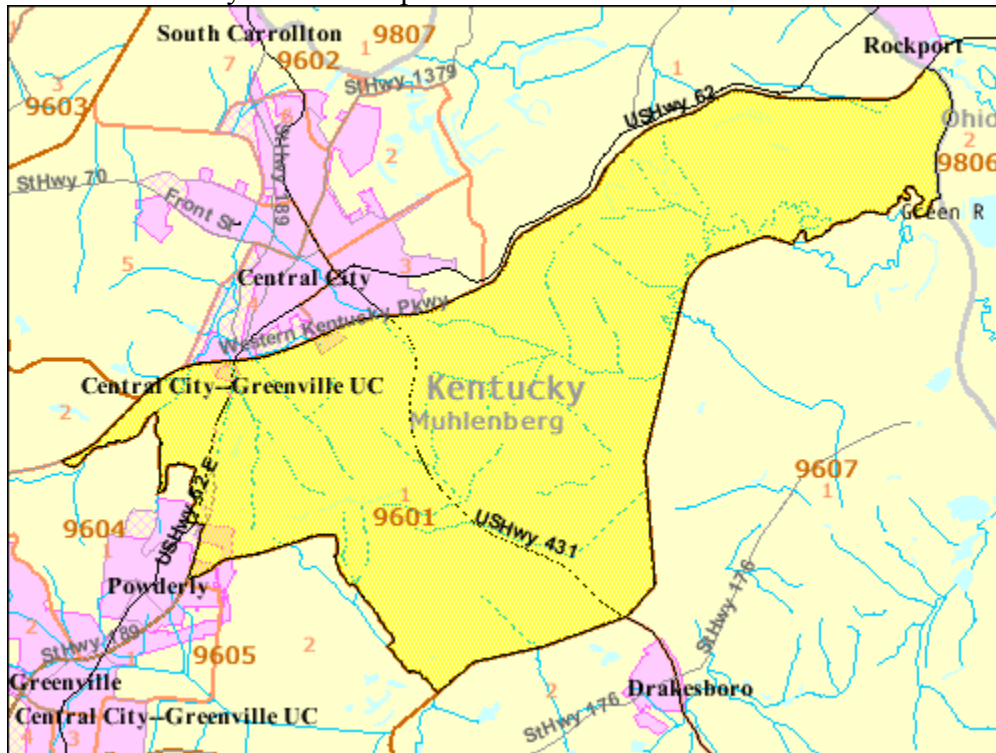


*Source: US Census Bureau website

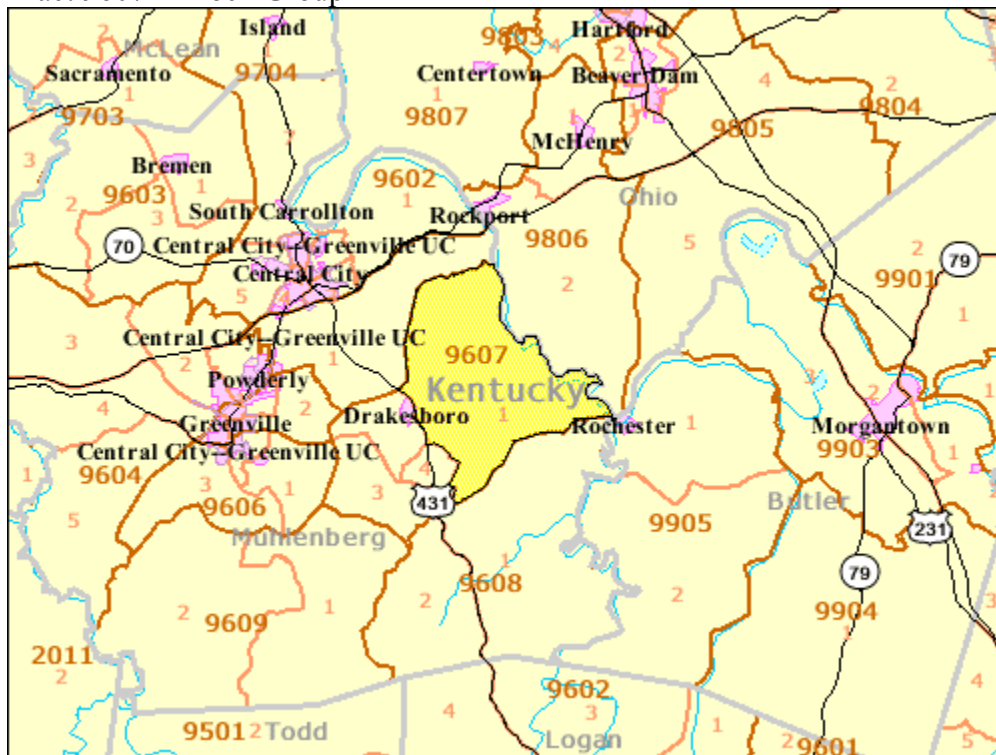
Phase I - Muhlenberg County Block Groups

Figure 9.2

Tract 9601 – Only Block Group



Tract 9607 – Block Group 1

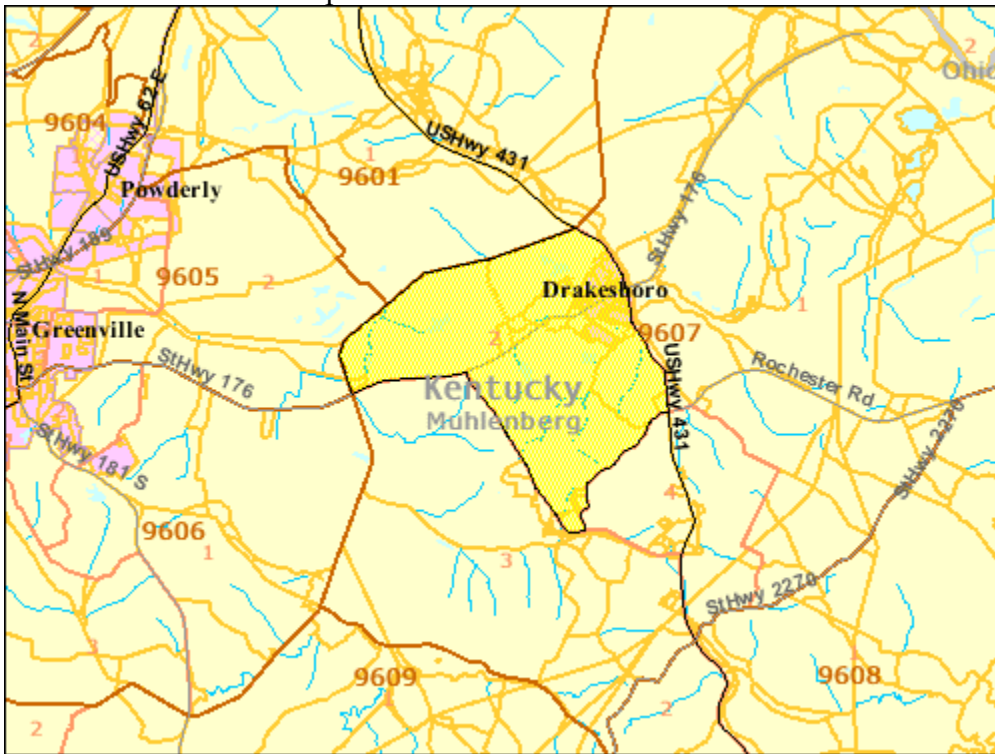


*Source: US Census Bureau website

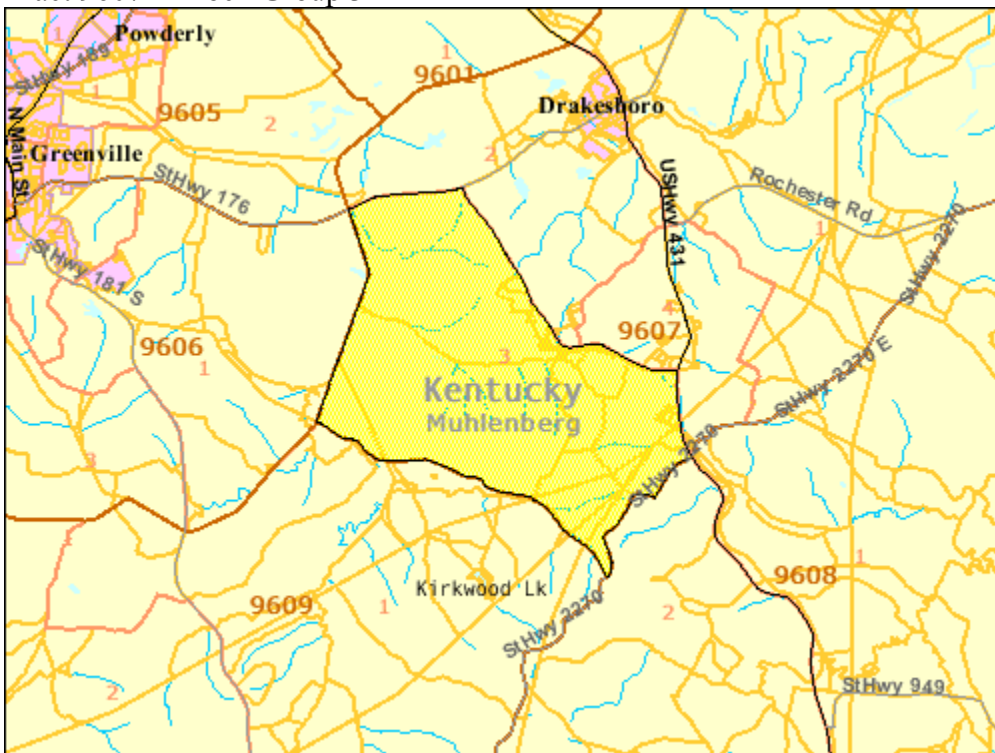
Phase I - Muhlenberg County Block Groups

Figure 9.2

Tract 9607 – Block Group 2



Tract 9607 – Block Group 3

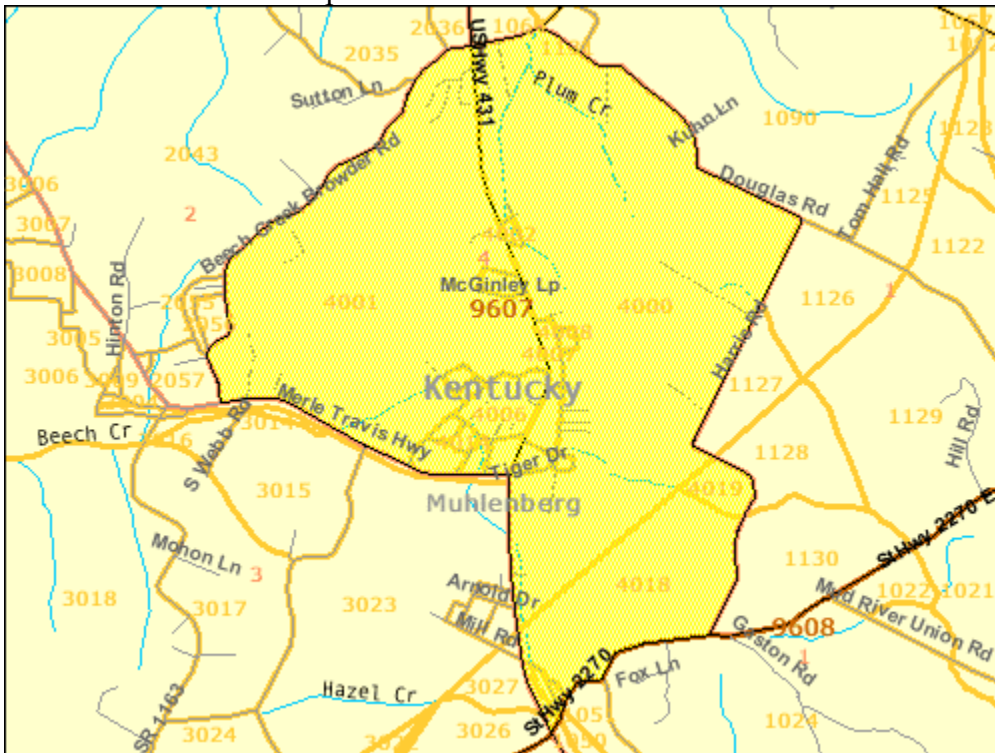


*Source: US Census Bureau website

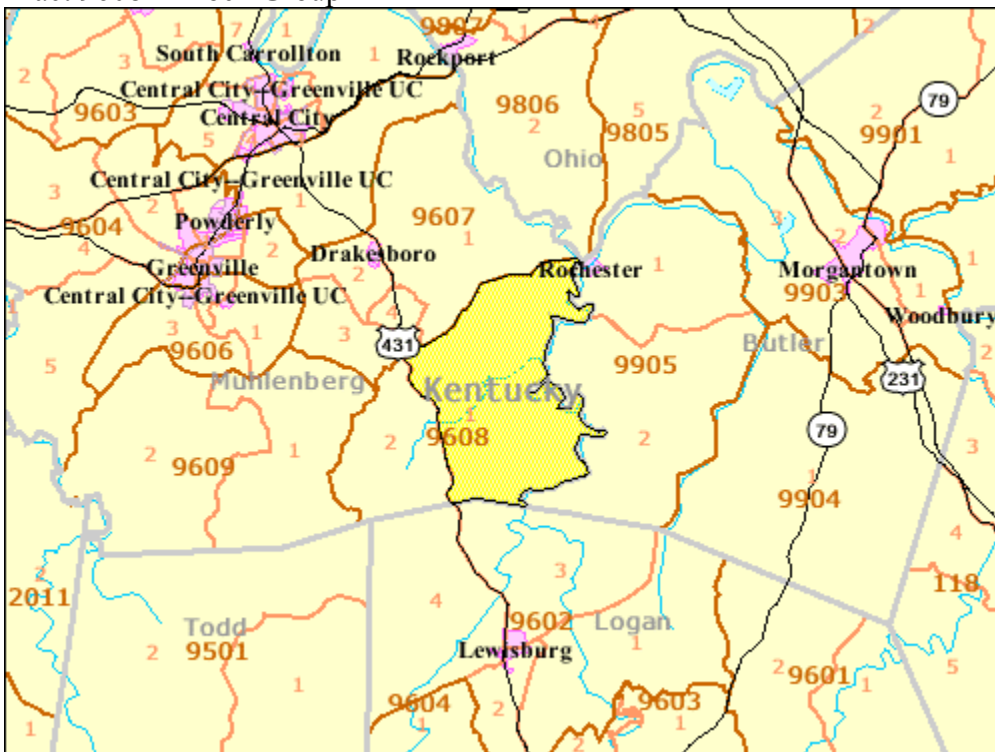
Phase I - Muhlenberg County Block Groups

Figure 9.2

Tract 9607 – Block Group 4



Tract 9608 – Block Group 1

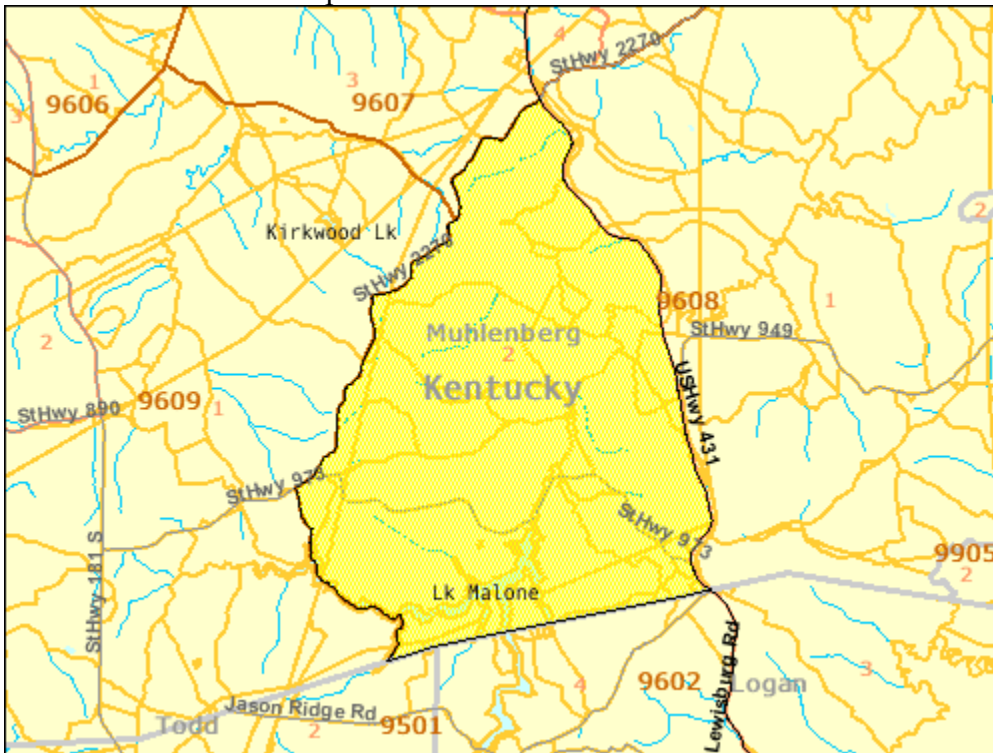


*Source: US Census Bureau website

Phase I - Muhlenberg County Block Groups

Figure 9.2

Tract 9608 – Block Group 2



*Source: US Census Bureau website

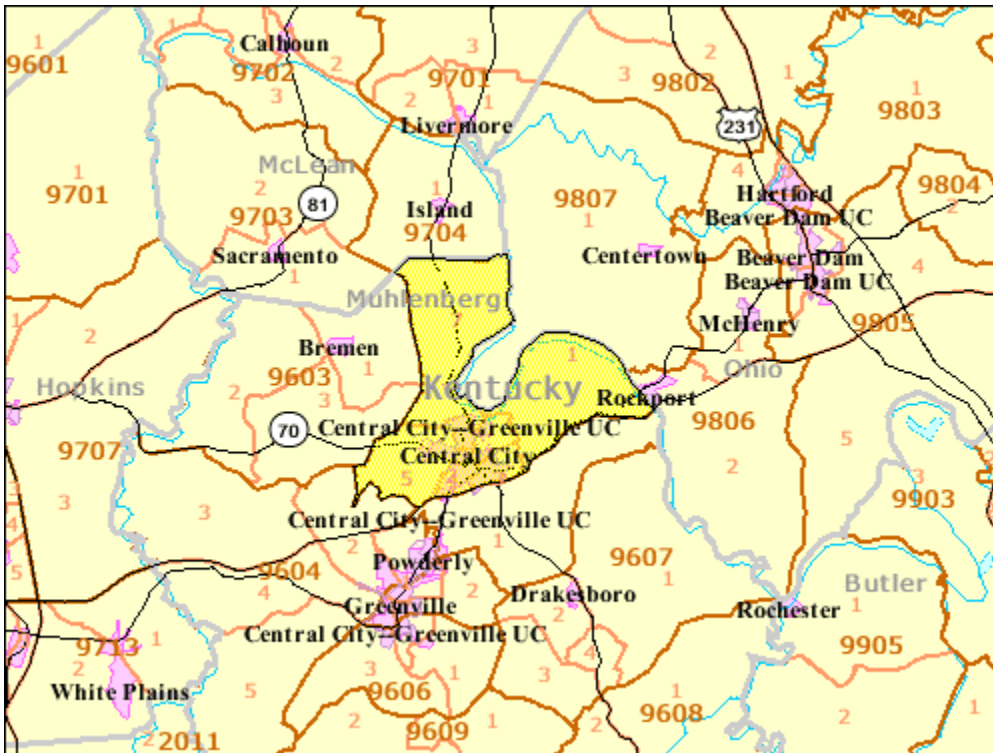
APPENDIX 8

Phase II Reference Maps

Phase II - Muhlenberg County Tract

Figure 10.1

Tract 9602

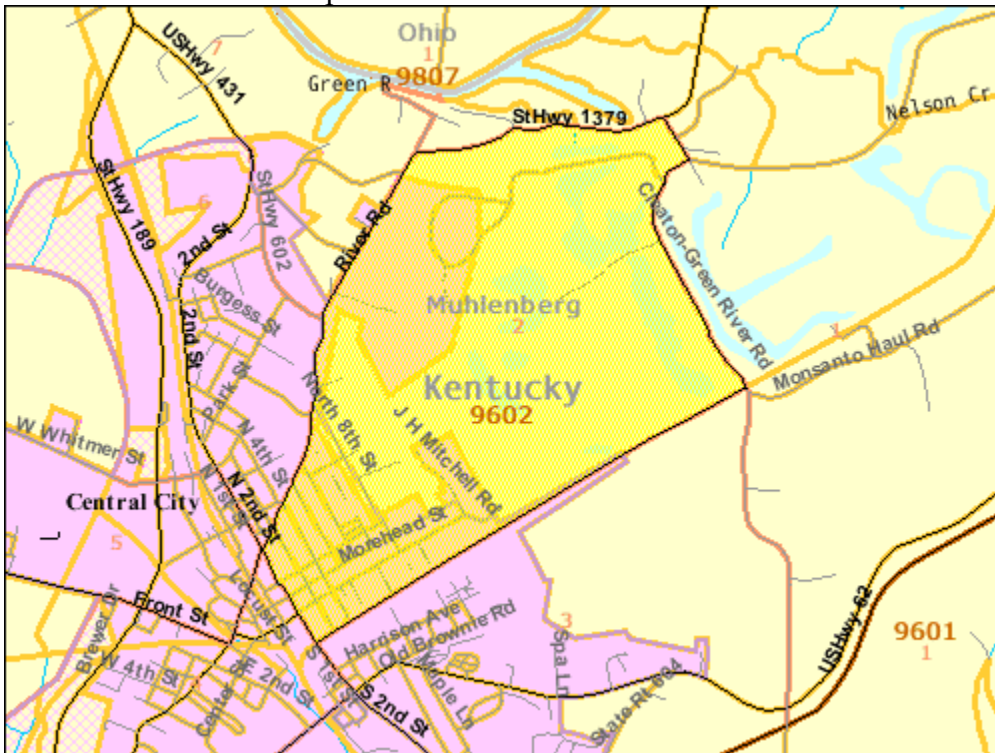


*Source: US Census Bureau website

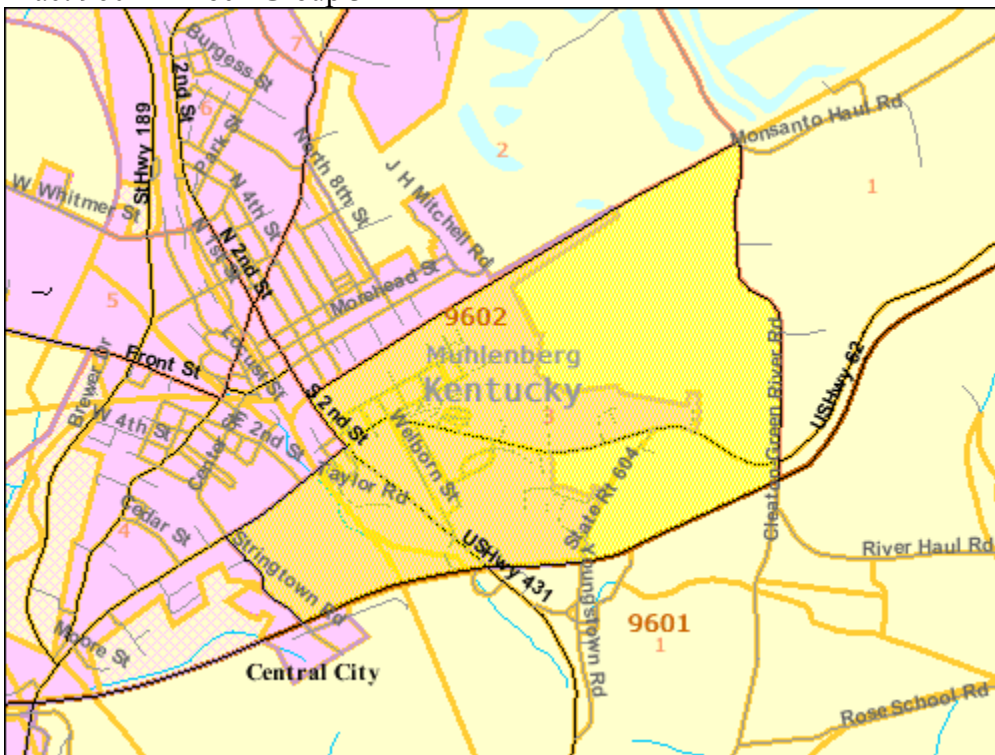
Phase II - Muhlenberg County Block Groups

Figure 10.1

Tract 9602 – Block Group 2



Tract 9602 – Block Group 3

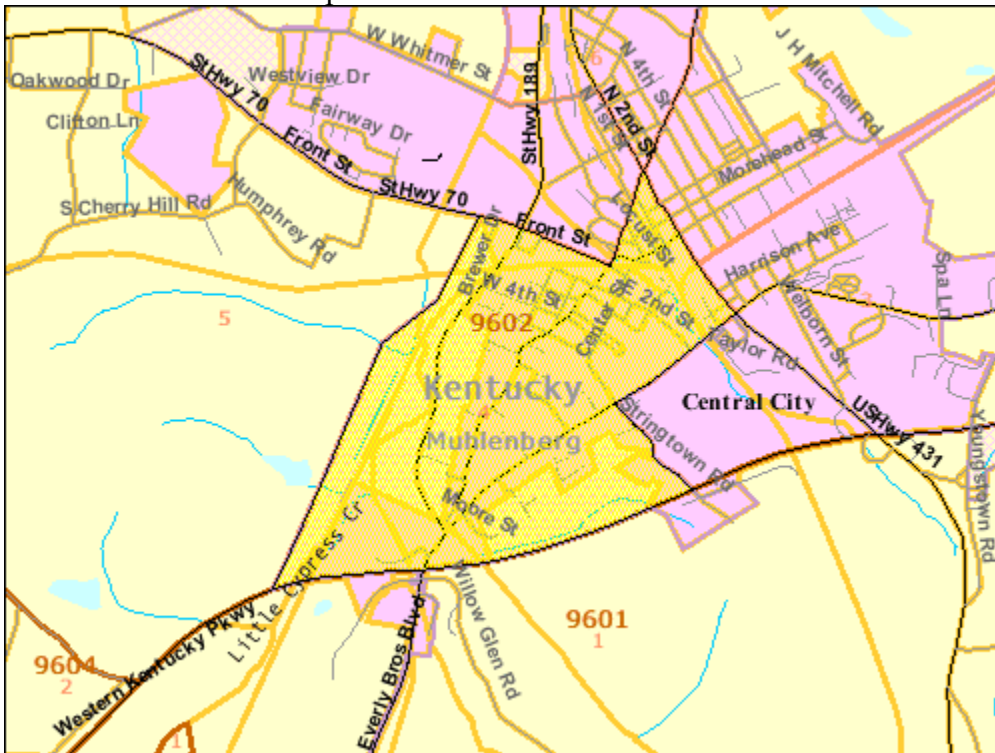


*Source: US Census Bureau website

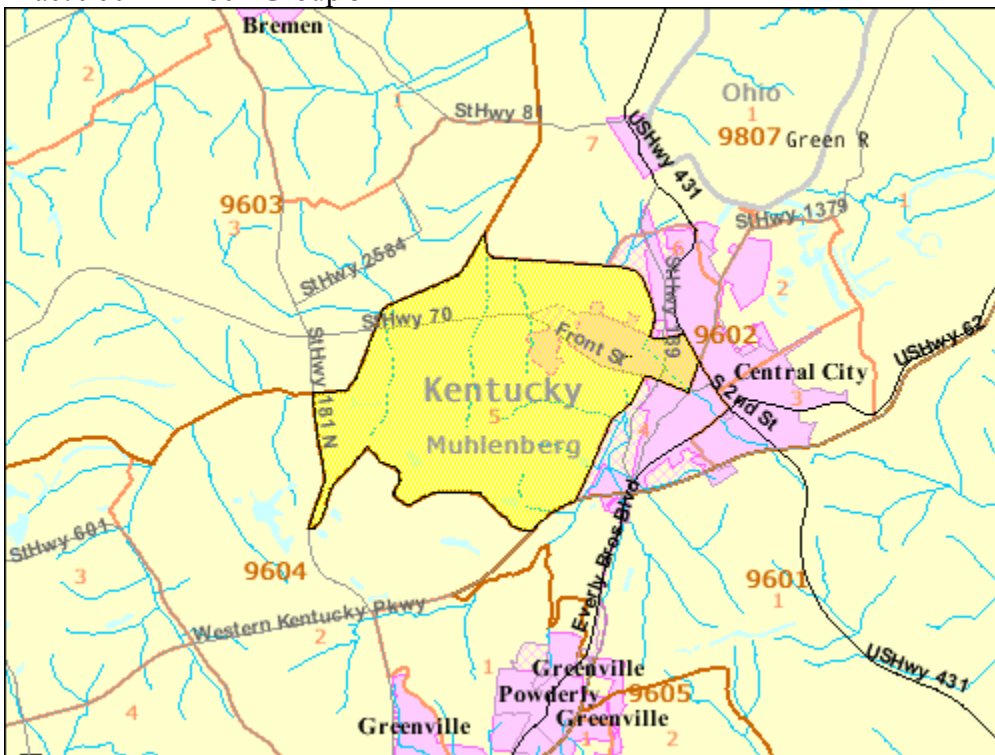
Phase II - Muhlenberg County Block Groups

Figure 10.1

Tract 9602 – Block Group 4



Tract 9602 – Block Group 5

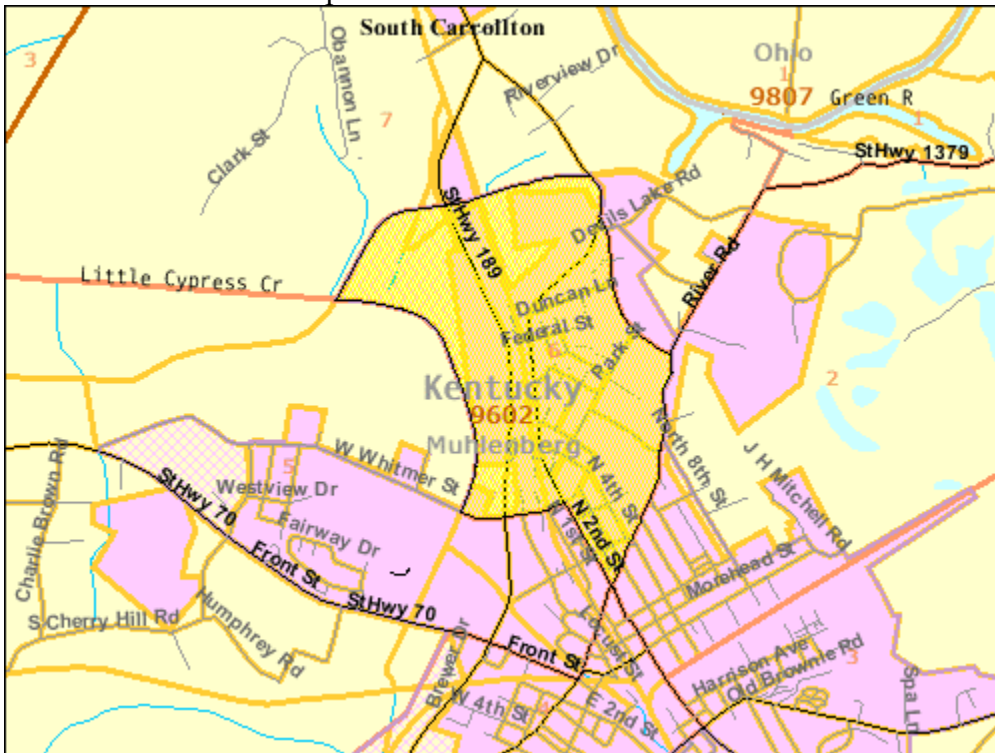


*Source: US Census Bureau website

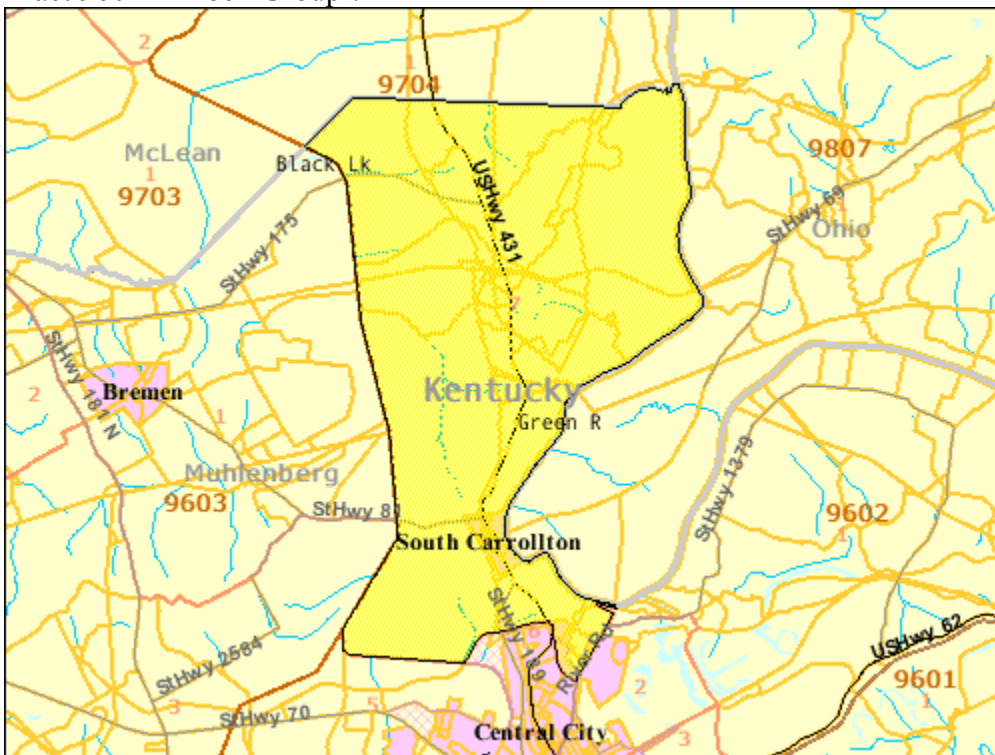
Phase II - Muhlenberg County Block Groups

Figure 10.1

Tract 9602 – Block Group 6



Tract 9602 – Block Group 7

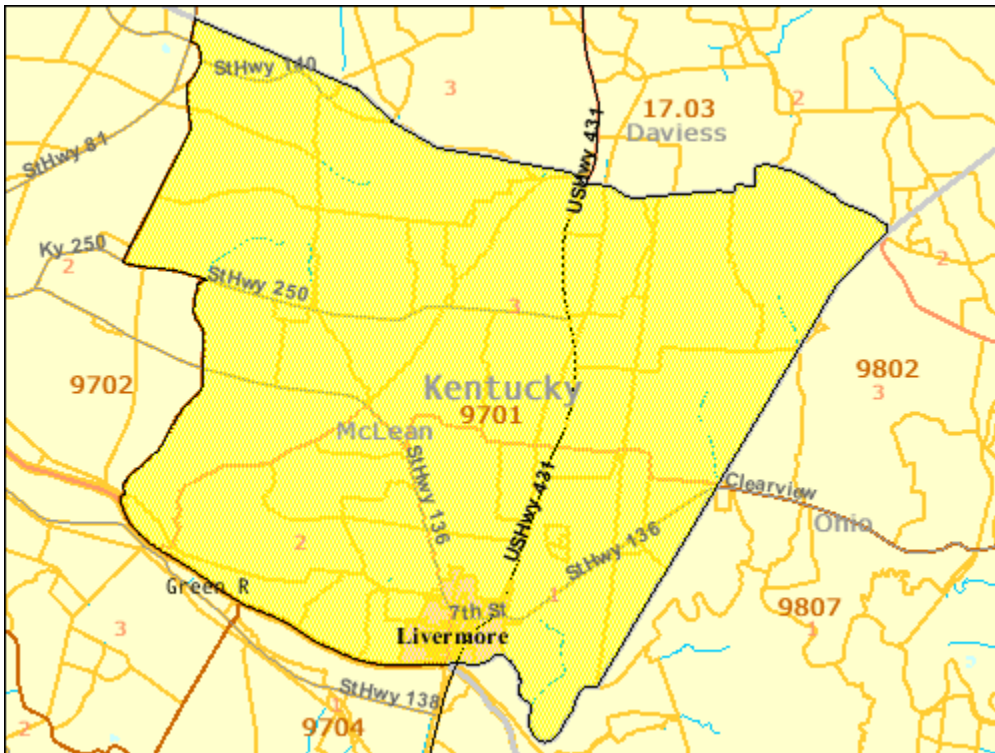


*Source: US Census Bureau website

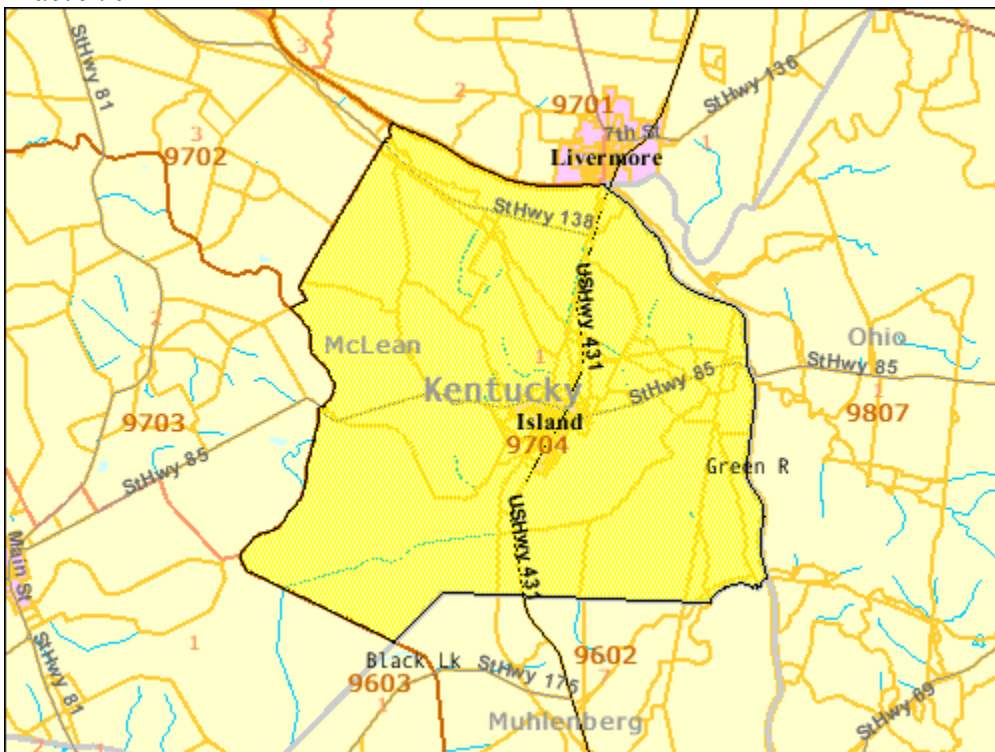
Phase II - McLean County Tracts

Figure 10.2

Tract 9701



Tract 9704

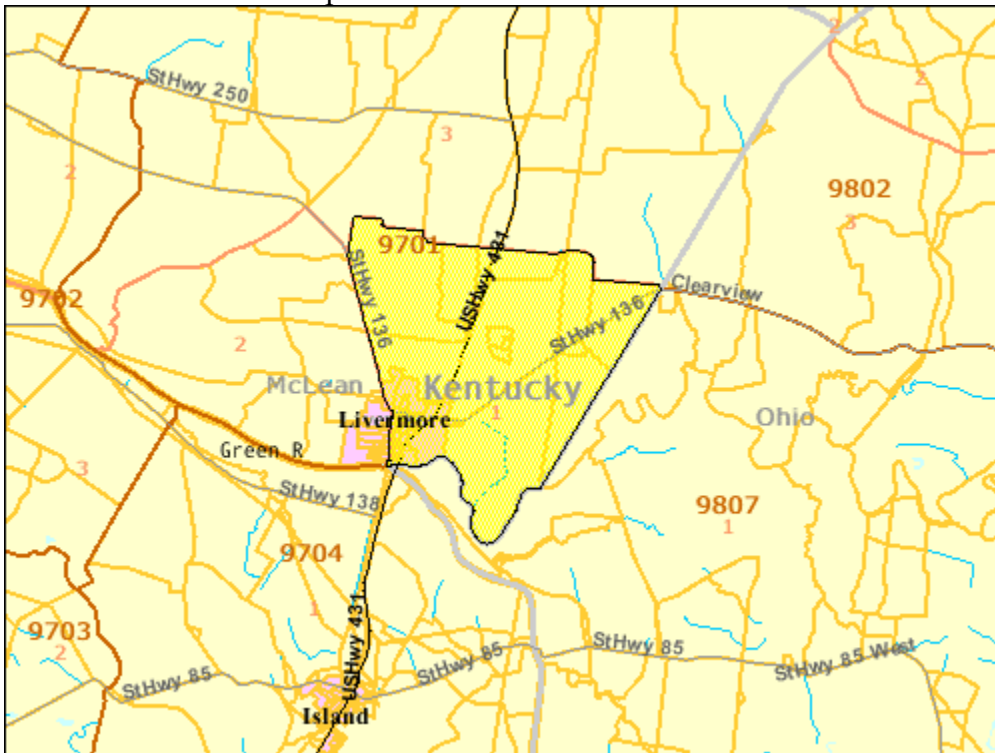


*Source: US Census Bureau website

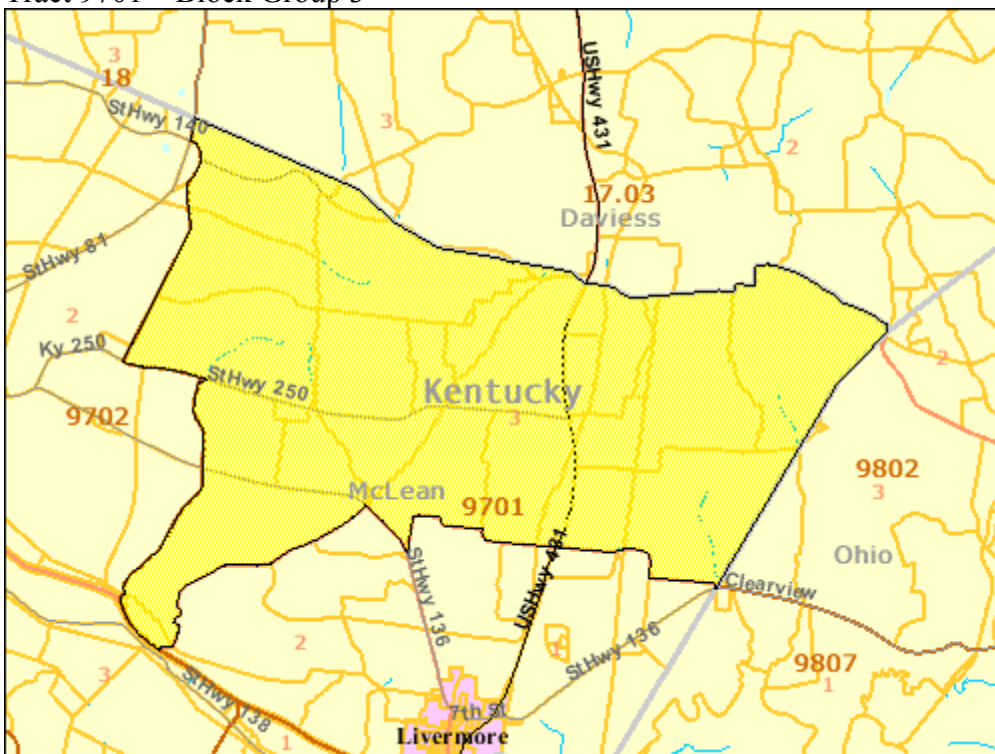
Phase II - McLean County Block Groups

Figure 10.2

Tract 9701 – Block Group 1



Tract 9701 – Block Group 3

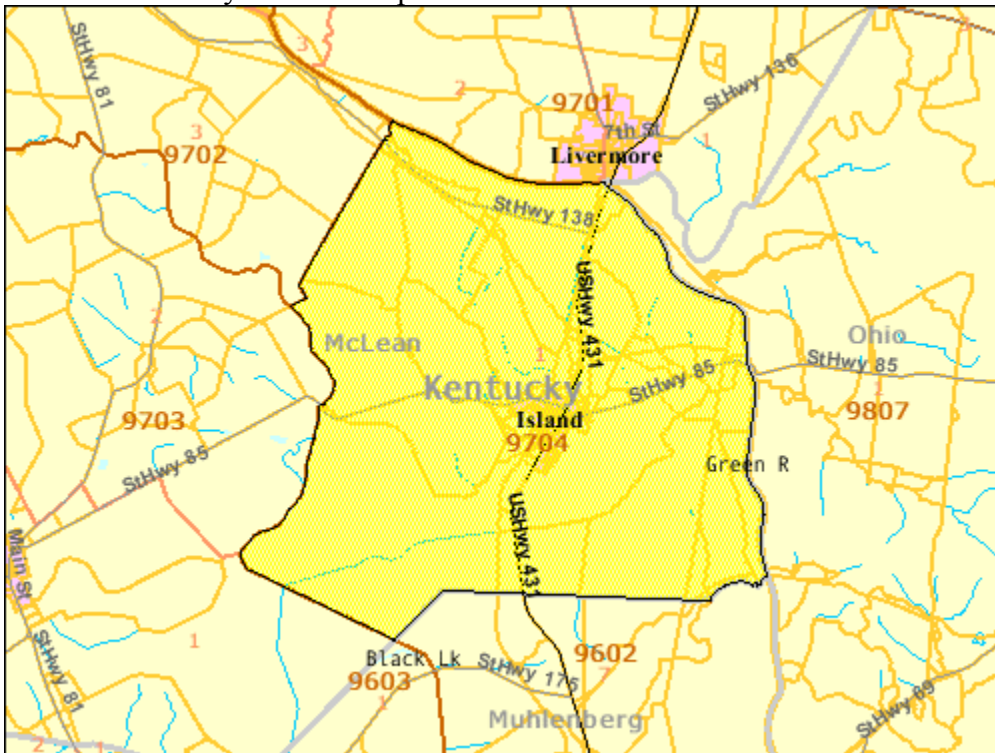


*Source: US Census Bureau website

Phase II - McLean County Block Groups

Figure 10.2

Tract 9704 – Only Block Group

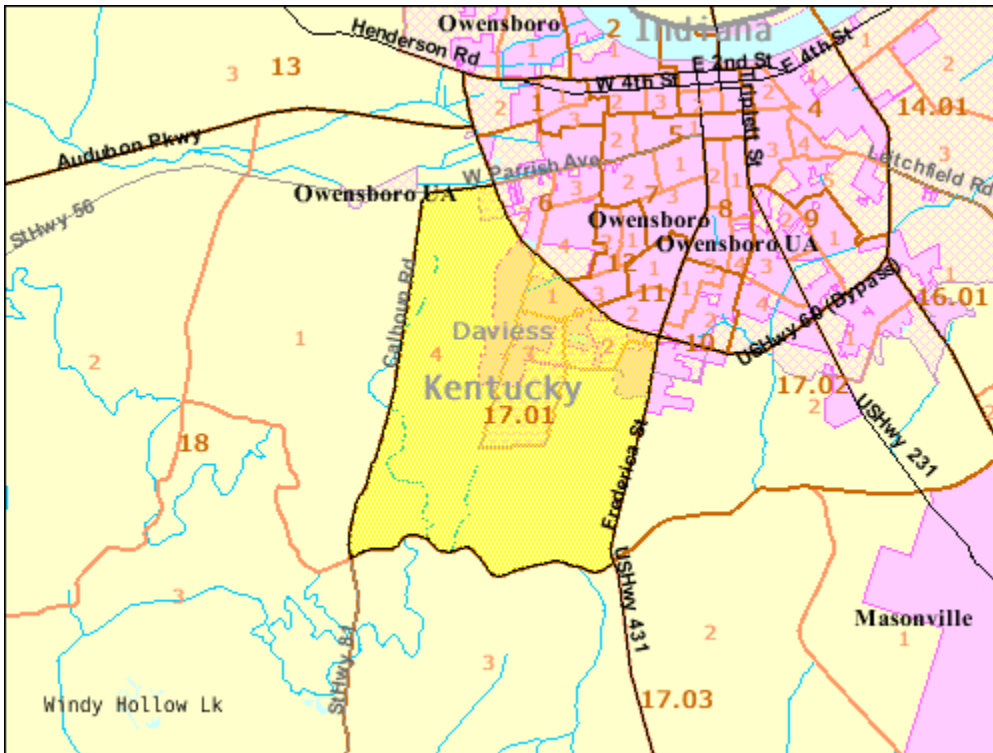


*Source: US Census Bureau website

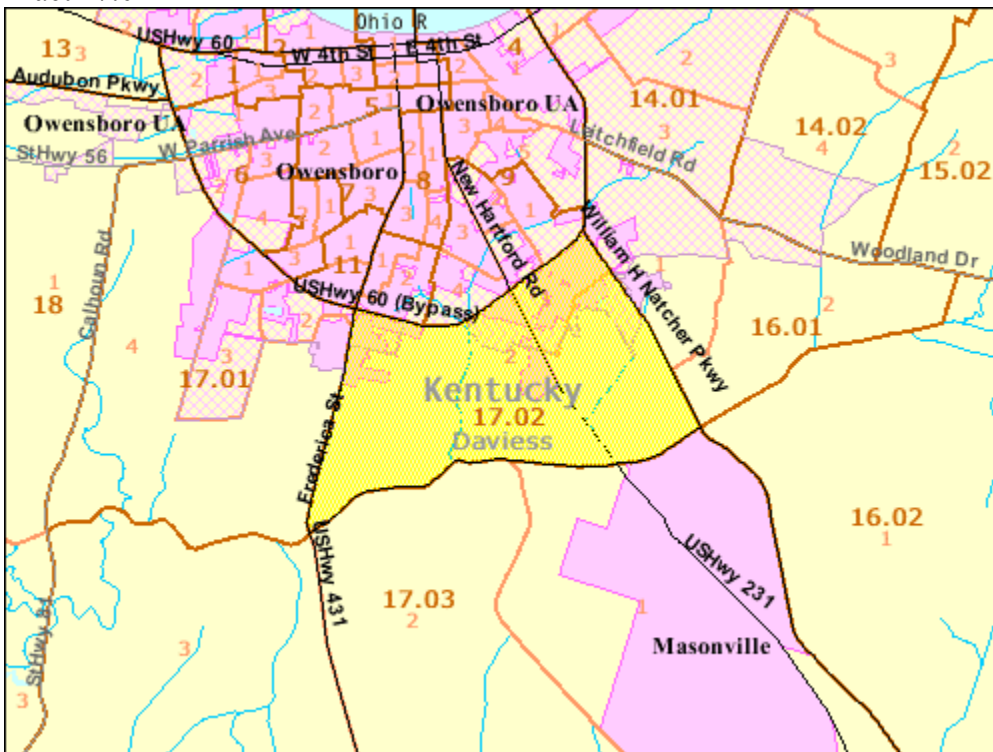
Phase II - Daviess County Tracts

Figure 10.3

Tract 17.01



Tract 17.02

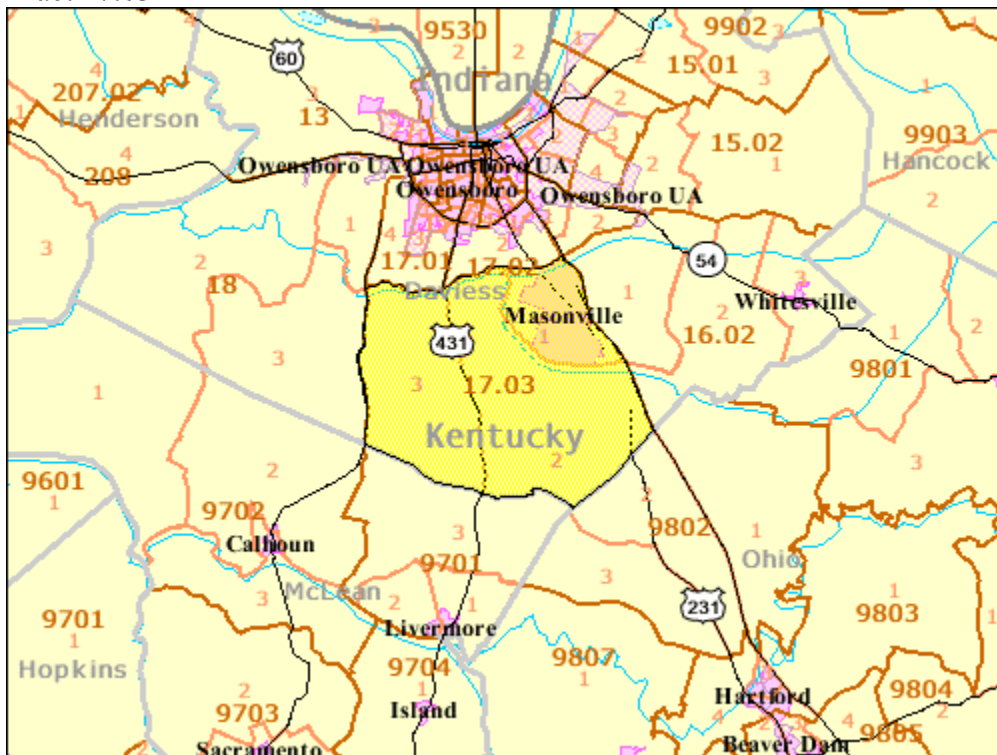


*Source: US Census Bureau website

Phase II - Daviess County Tracts

Figure 10.3

Tract 17.03

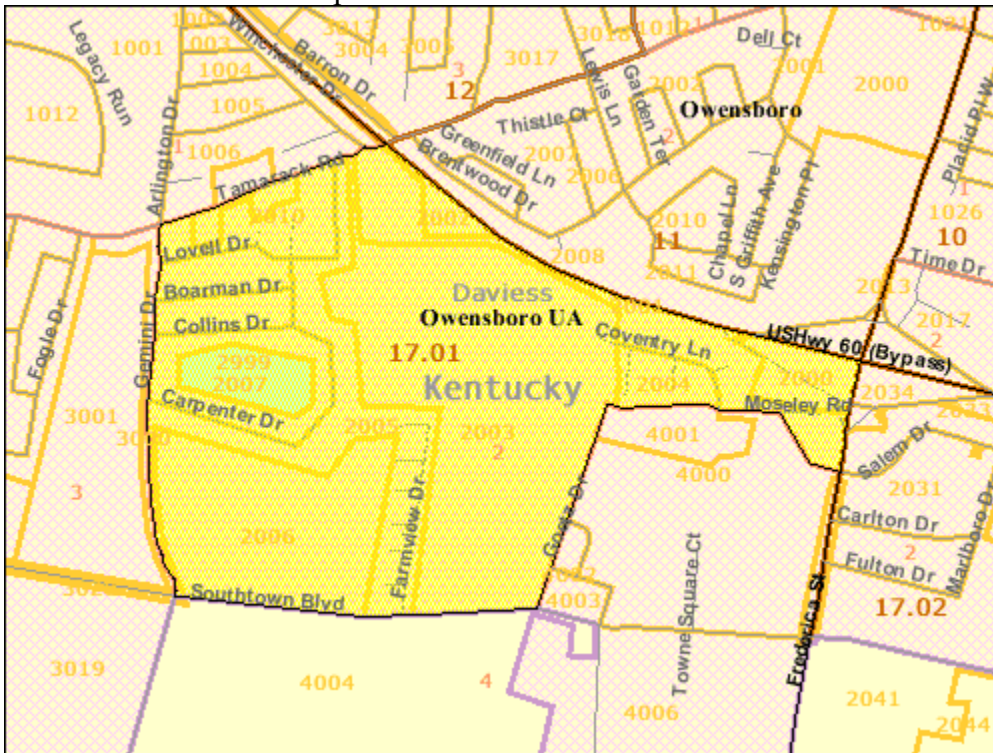


*Source: US Census Bureau website

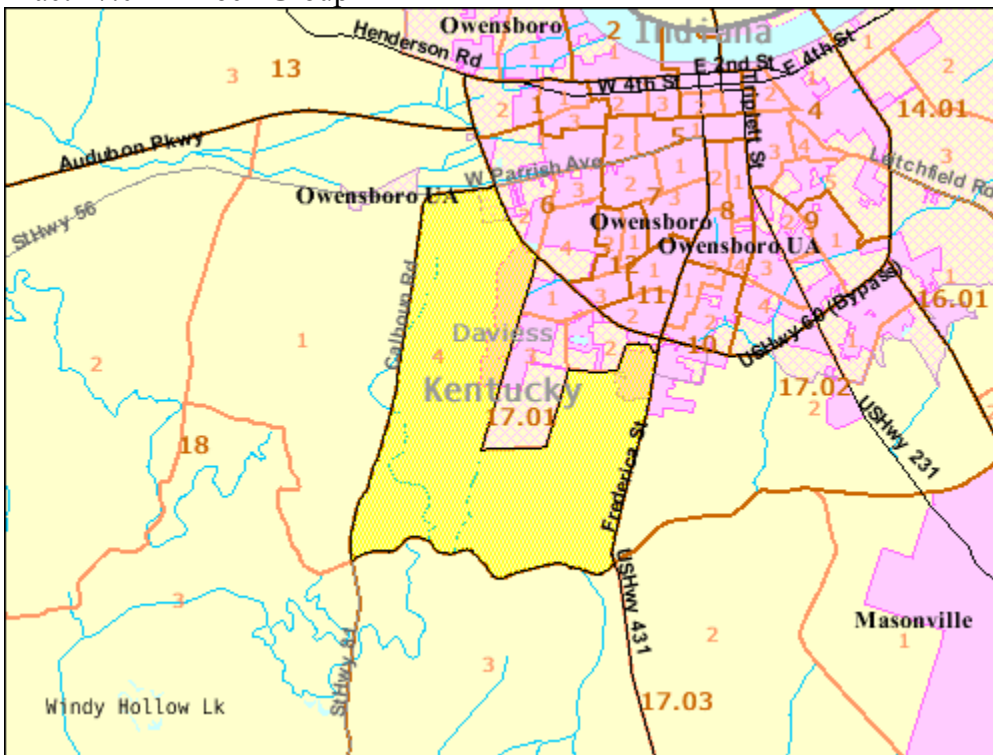
Phase II - Daviess County Block Groups

Figure 10.3

Tract 17.01 – Block Group 2



Tract 17.01 – Block Group 4

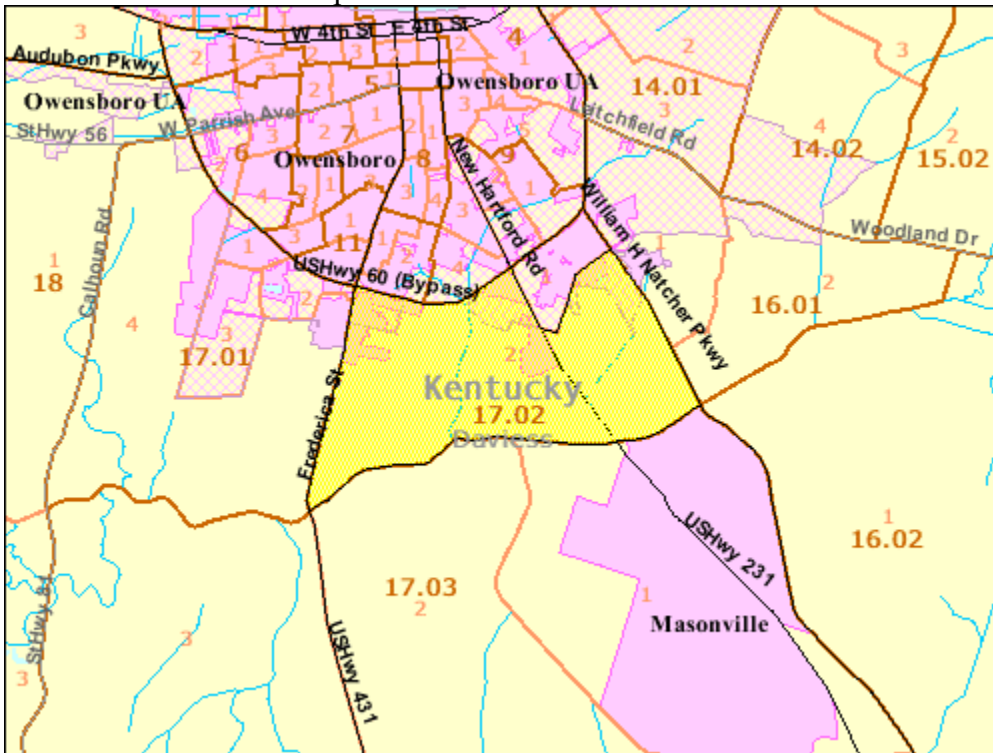


*Source: US Census Bureau website

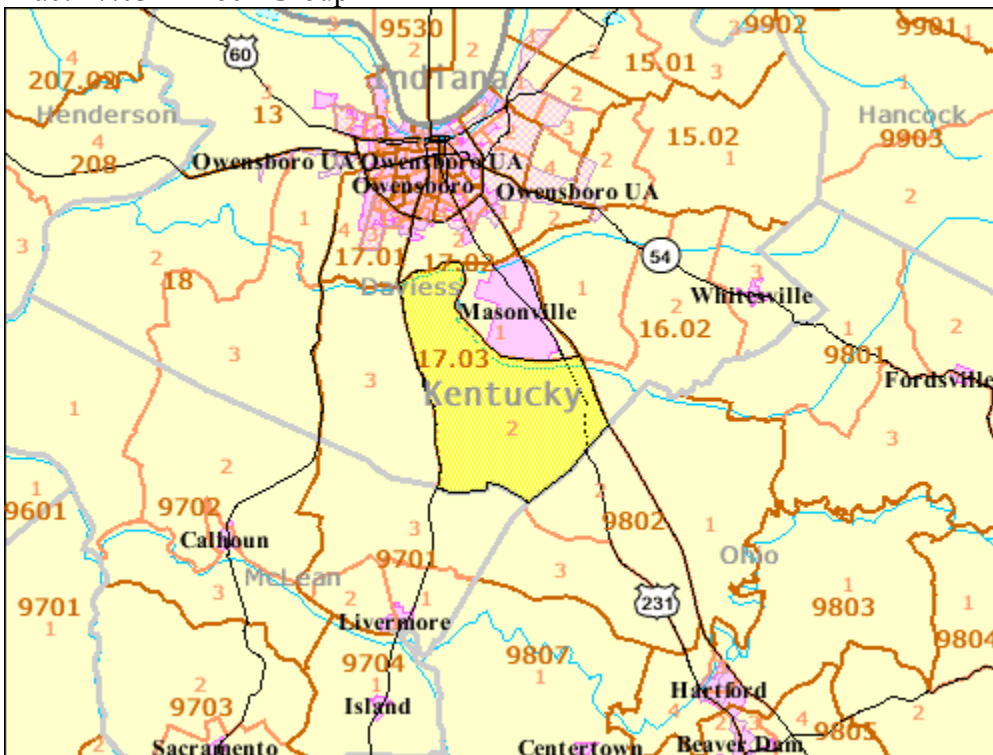
Phase II - Daviess County Block Groups

Figure 10.3

Tract 17.02 – Block Group 2



Tract 17.03 – Block Group 2

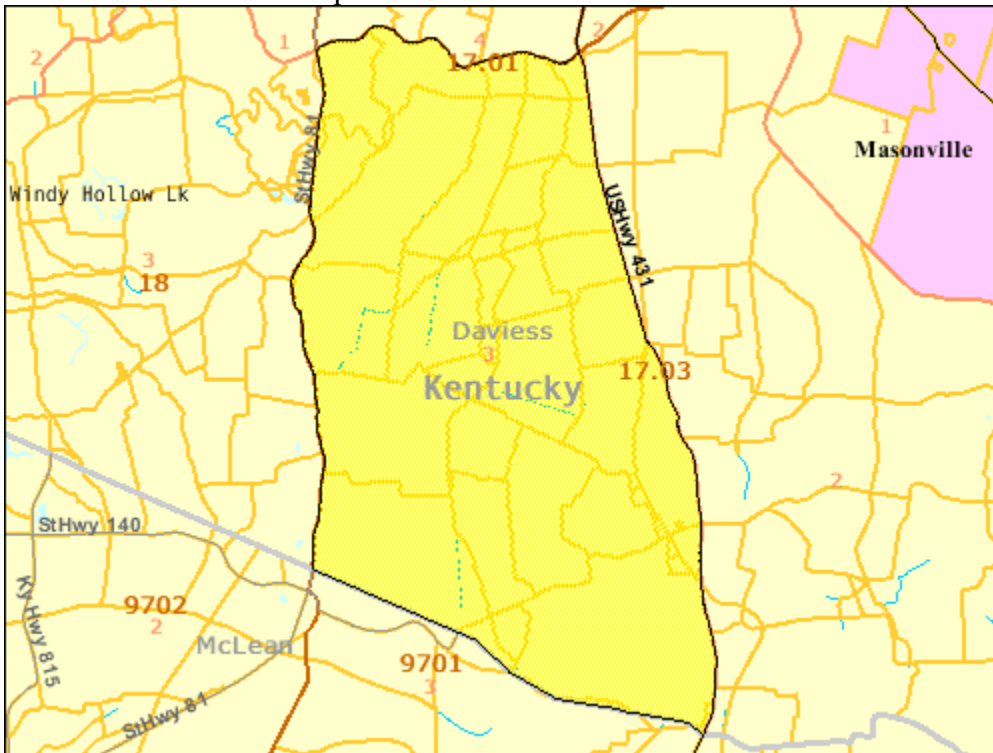


*Source: US Census Bureau website

Phase II - Daviess County Block Groups

Figure 10.3

Tract 17.03 – Block Group 3



*Source: US Census Bureau website

APPENDIX 9

Other Maps

Figure 11.1, Environmental Justice Target Populations in Muhlenberg County, Kentucky

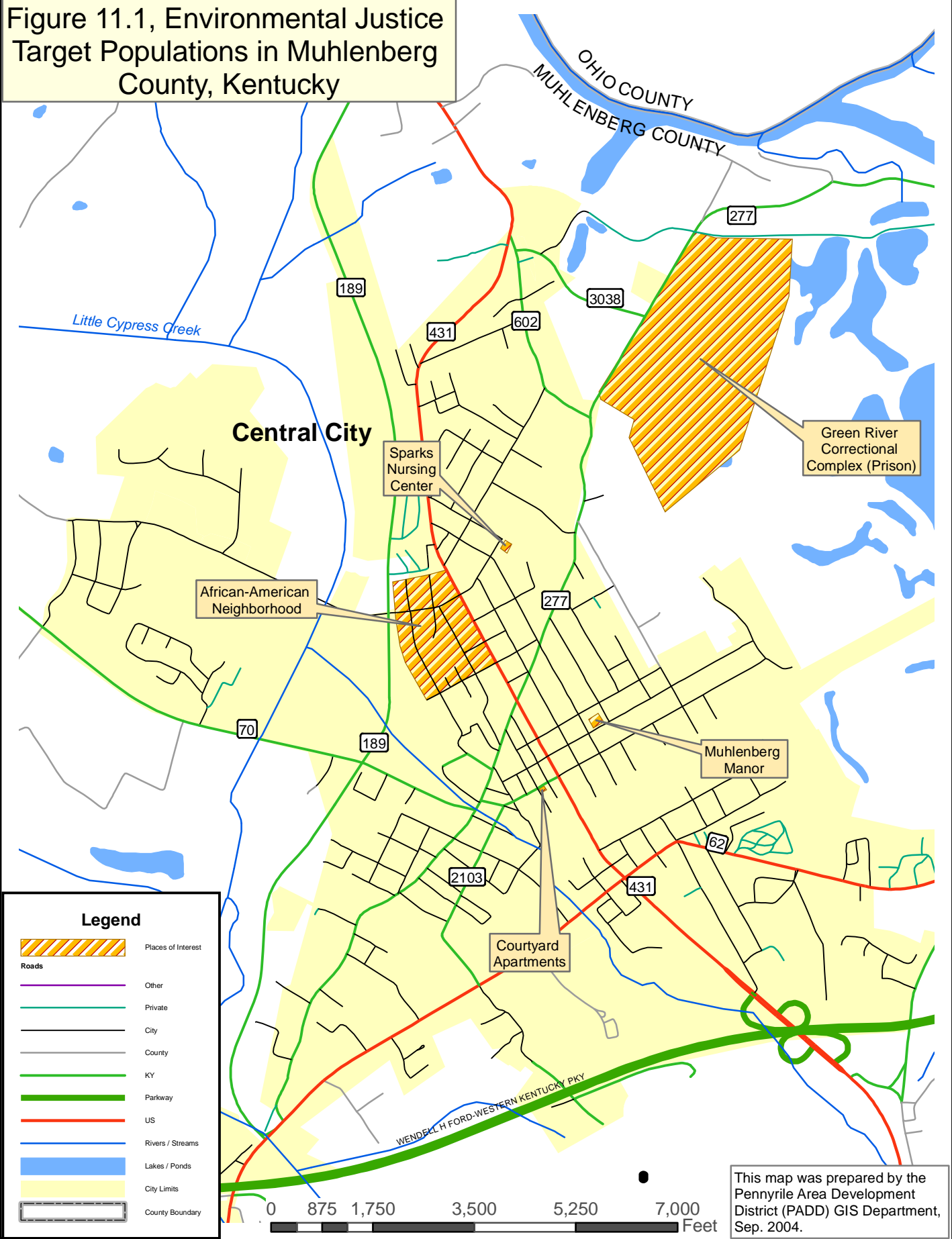


Figure 11.1A
Environmental Justice Target Population
in Muhlenberg County, Kentucky

African American
Neighborhoods

Cleaton

African American
Neighborhoods

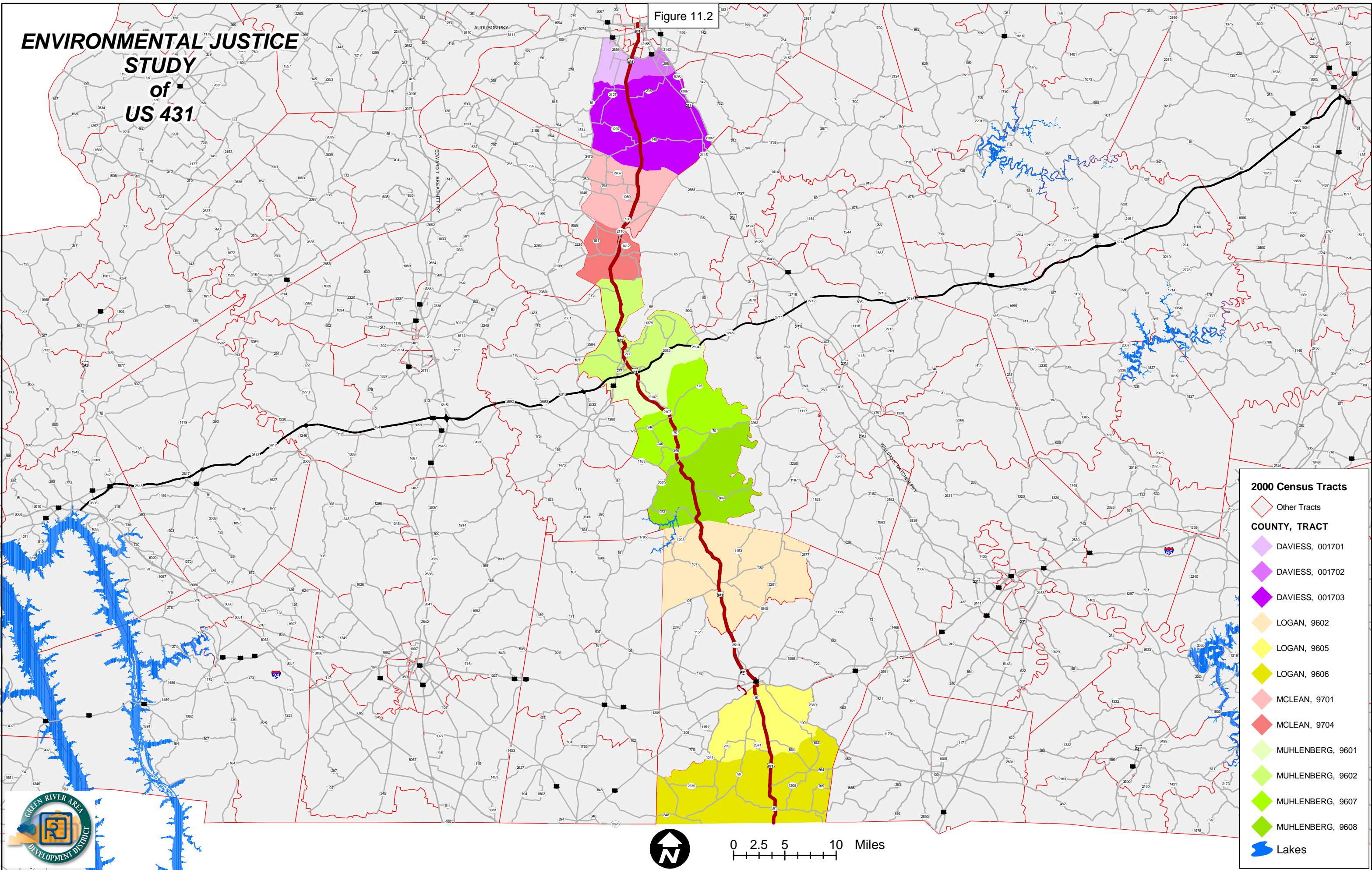
Drakesboro



1" = 2500 feet

ENVIRONMENTAL JUSTICE STUDY of US 431

Figure 11.2



2000 Census Tracts

- Other Tracts
- COUNTY, TRACT**
- DAVIESS, 001701
- DAVIESS, 001702
- DAVIESS, 001703
- LOGAN, 9602
- LOGAN, 9605
- LOGAN, 9606
- MCLEAN, 9701
- MCLEAN, 9704
- MUHENBERG, 9601
- MUHENBERG, 9602
- MUHENBERG, 9607
- MUHENBERG, 9608
- Lakes



PHASE I – Logan and Muhlenberg Counties

The meeting began at approximately 1:00 PM CT. Those attending were:

Rodney Kirtley	Muhlenberg County Judge Executive
Mary Murray	FHWA
Jessica Rich	FHWA
Gina Boaz	Green River ADD
Kyle Key	Barren River ADD
Craig Morris	Pennyrile ADD
Shane Shelby	Wilbur Smith Associates
Kevin McClearn	KYTC-District 2-Planning
Nick Hall	KYTC-District 2-Planning
Everett Green	KYTC-District 2-Pre-Construction
David McDowell	KYTC-District 2-Construction
Kenny Potts	KYTC-District 2-Traffic
Doug Taylor	KYTC-District 2-Environmental
Phillip Whitmer	KYTC-District 2-R/W
Jeff Moore	KYTC-District 3-Planning
Kenneth Cox	KYTC-District 3-Design
Kent Gilley	KYTC-District 3-Operations
Paul David Kees	KYTC District 3-Maintenance
Don McIntosh	KYTC-District 3-Construction
Renee Slaughter	KYTC-District 3-Environmental
Steve Hoefler	KYTC-Central Office-Design
James Simpson	KYTC-Central Office-Design
Daryl Greer	KYTC-Central Office-Planning
Steve Ross	KYTC-Central Office-Planning

Steve Ross opened the meeting with introductions and described the project as a programming study to recommend safety improvements on US 431 beginning in Logan County at the Tennessee state line, continuing north through Muhlenberg, McLean and ending in Daviess County at the Indiana state line. The project includes KYTC Districts 2 and 3 as well as three ADDS: the Barren River, Pennyrile and Green River. As listed in the FY 2003-2008 Six-Year Highway Plan, this project is divided into two phases. Phase I begins at the Tennessee state line and extends northward to the Muhlenberg/McLean County line. Phase II begins at the Muhlenberg/McLean County line and extends northward to the Indiana state line. The study is funded for \$300,000 for the planning phase only. No other phases have been approved or funded. This is an in-house study being managed by the Central Office Division of Planning. Wilbur Smith Associates (WSA) is preparing the Environmental Footprint/Overview.

- Prior study reports for US 431 were noted and described as follows:
 - April 2002 – US 431 Corridor Feasibility Study from Epleys Station to the Wendell H. Ford Western Kentucky Parkway – This study, prepared by the KYTC Division of Planning, recommend two-lane reconstruction west of the existing route. Reconstruction of US 431 from Epleys Station to Lewisburg is currently listed in the Six-Year Highway Plan for the Design Phase only, FY 2002 for \$850,000. GRW was selected for the design work and given a notice to proceed in September 2003. A Finding of No Significant Impact (FONSI) is projected for 2005.
 - December 1998 – US 431 Corridor Study, Central City to Owensboro – This study prepared by the Green River ADD recommended spot improvements along the existing corridor. (This is located in Phase II of the current study as listed in the Six-Year Highway Plan.)

Steve Ross distributed information packets and reviewed the following material:

- Project location maps for Logan and Muhlenberg County – corridor highlighted.
- Major Systems – This exhibit included information for Functional Classification, National Truck Network (NN), State System, National Highway System (NHS), and Defense Highway Network.
- Other Systems – This exhibit included information for Appalachian Development Highway System, Bike Route System, Forest Highway System and Scenic Byway System. While no Scenic Byway Systems were listed for US 431, the project team noted that there is an application for scenic byway status on a segment of US 431. Steve Ross will follow up on the application details. [*After the meeting, Cindy Griffin advised that the KYTC Division of Planning is recommending the segment of US 431 in Muhlenberg County between KY 176 at Drakesboro and KY 81 at South Carrollton for scenic byway status.*] The Division of Multimodal Programs has recommended that roadway cross sections should not obstruct or deter bicycle transportation at any of the bike routes along the corridor. In Logan County, the Southern Lakes Tour follows KY 591 and intersects US 431 at Adairville. In Muhlenberg County, the Midland Kentucky Tour follows KY 973 and intersects US 431 in Dunmor where it follows US 431 from MP 0.487 to MP 0.808. Regarding pedestrian facilities, the Division of Multimodal Programs has recommended that these be considered along the entire project in urban and suburban communities.
- Coal Haul - Tonnage along US 431 displayed by segment and county were shown on an exhibit for the years 2001 and 2002. The data noted an overall

decline in coal haul in the past year on US 431. The main exception is one segment showing a 617% increase for a 0.3 mile section in McLean County. No explanation was given other than it could be possibly due to a new mine opening. Judge Kirtley explained that he expects coal haul to increase in Muhlenberg County north of Drakesboro due to a planned \$3.3 billion powerplant north of Central City. Construction could begin in 2004, last five years, and employ 1200 construction workers. 500 permanent jobs could be created. The main entrance to this planned facility is to be on US 62 just east of US 431 and Central City. The Paradise Plant now gets the largest amount of the coal haul. Judge Kirtley stated that there are an estimated 300 years of coal reserves remaining.

- Route Log – This exhibit included intersection type and control information listed by county and mile point.
- Bridges – A listing of bridges on US 431 with bridge number, milepoint location, bridge type, features crossed, geometric data, load posting, structural function, substructure and superstructure condition, and sufficiency ratings was included. Several bridges in Logan and Muhlenberg Counties are listed as functionally obsolete. Narrow bridge width is also a concern along the route. Bridge No. B00056 at MP 27.713 in Muhlenberg County was noted in a previous report as needing to be replaced if the road was widened. No bridges are noted as being load posted. The team noted one bridge carrying US 431 over Pond Creek in Muhlenberg County at MP 12.448 was not included in the data presented.
- Geometric Characteristics – This exhibit listed number of lanes, divided/undivided, curbs, lane width, shoulder width, terrain and pavement type.
- Traffic Characteristics – This exhibit, listed by segment and county, included average daily traffic (ADT), percent trucks, design speed, posted speed limit, percent passing sight distance, volume to capacity (v/c) ratios and levels of service (LOS) for the current year. This exhibit also included ADT, v/c ratios and LOS for the projected year 2030. Low levels of service, D and E, were noted for both 2003 traffic and projected year 2030 traffic, except for the reconstructed 4-lane segment north of Russellville in Logan County, a short segment just north of the Tennessee border in Logan County and a short segment at the Western Kentucky Parkway in Muhlenberg County. There was a question as to whether traffic projections took into account the Tennessee State Route 840 project (proposed outer loop around Nashville). The answer given was that traffic projections were based on historical information for roads in Kentucky, based on functional classification, and the proposed project in Tennessee was not taken into consideration. The team noted that Tennessee has dropped work on the TN 840 project. However, there was some question

among the team as to whether this project may have been added back into Tennessee's plan. *[Note: Jeff Moore followed up after the meeting providing newspaper accounts indicating that the TN 840 project has been dropped.]* There was some confusion regarding the colors shown on the traffic maps. The exterior color bands indicate section breaks in the ADT. The interior color bands show changes in level of service.

- Crash Data – Crashes were identified and counted from 2000 through 2002 from State Police collision reports. Critical rate factors (CRF) were calculated for segments and 0.1 mile spots.
 - Logan County - The team noted that the data in Logan County looked unusual and that the segment from MP 13.896 to MP 20.590, with a CRF 1.053, has probably improved since the 4-lane opened two years ago. If the table presented at the meeting includes one year's data prior to the 4-lane, this might account for the odd results. The team also noted that "old 431" is now KY 3519. If some of these crashes are being miscoded due to confusion or ignorance regarding the new route number designations, that might also explain the unusual results. Also unexpected were two very high crash spots identified just north of the Tennessee border near Adairville. The team had no obvious answer as to why these large numbers and unusual crash types (several backing) would be recorded for these locations. *[After the meeting, Lance Meredith researched the collision reports for high crash spots in Logan County and found that a large number of the crashes were located incorrectly on the original police collision reports, including the two unusually high CRF spots just north of the Tennessee state line. The number of crashes on the new 4-lane section north of Russellville was actually much lower than what was shown in the meeting, with nearly half of those actual crashes involving deer.]*

Projects on US 431 in Logan County include a Safety-Hazard Elimination (HES) project, planned for design in 2003, between MP 4.09 and 4.2. The plan is to realign, eliminate offsets, and resurface at KY 663. A new Southern Russellville Bypass is listed in the Six-Year Highway Plan, scheduled for right-of-way acquisition in 2006. Already mentioned is a project listed in the Six-Year Highway Plan to reconstruct US 431 from Epleys Station north to Lewisburg.

- Muhlenberg County - There were four segments with CRF greater than one, totaling approximately 15 miles of roadway. There were also 26 spots identified with a CRF greater than one. The team noted HES projects underway that will address some of these spots: MP 22.4 (just north of KY 81) to 22.7 at South Carrolton, MP 23.9 to 24.1, and MP 24.3 (just north of Power Plant Drive) to 24.5 north of South Carrolton. These projects include vertical and horizontal realignment, shoulder widening, and

guardrail installation. Judge Kirtley noted that there have been two fatalities this year, one less than a week prior to this meeting, at a location known locally as “dead man’s curve.” The data presented in the handout packets are for the time period from January 2000 through December 2002 and will not show this most recent information. The Judge and other team member’s identified this curve on the crash handout as being near MP 6.35, Muhlenberg County, approximately one-half mile south of KY 2270. This spot has a CRF of 2.25 shown in the handouts. The team noted that a new HES project is planned for this location.

A graph showing the number of crashes by type from 1996 through 2002 was also provided. For Logan County, total crash numbers have doubled in these seven years given the available data. The increase has been relatively uniform from year to year. Single vehicle crashes top the list with rear-end crashes ranking next highest. For Muhlenberg County, there has only been a slight increase in total number of crashes, from approximately 135 in 1996 to 145 in 2002. The increase however has not been uniform, with some large fluctuations from year to year. The predominant type of reported crash is single vehicle. Rear-end crashes ranked next highest.

- Project Drive - Steve Ross noted that he planned to drive the route before Thanksgiving and that anyone interested in participating should contact him after the meeting. [*Jeff Moore, Kyle Key and David Martin participated in the project drive on November 12, 2003*]
- Environmental Issues- Some members of the team indicated they had not yet seen the draft environmental overview prepared by WSA. It was noted that copies have been sent to districts for comment and this was confirmed during discussion. Shane Shelby from WSA gave a summary of the environmental issues for Phase I of the study corridor noting that there is nothing major known at this time that might affect construction unless we get into relocation or major widening. Some of the issues presented were:
 - Logan County - There are water quality issues related to rivers and water sources. Schools, churches and cemeteries are located along the corridor. There are very few threatened/endangered species concerns; the Indiana bat was mentioned. Environmental justice areas include some minority and low income areas or “pockets.” There is a high percentage of prime farmland that would not likely interfere with spot improvements. There are also some underground storage tanks (UST’s) and gas/oil wells in the area. There are a few historic sites noted in the area and include two National Register listed structures in Russellville. In Russellville, there are 70 historic structures, with the possibility that a historic district may be established.

- Muhlenberg County –There is floodplain to consider near the Green River. Private water sources and water quality issues, schools, churches and cemeteries were noted along the corridor. There are a few more threatened/endangered species concerns in Muhlenberg County compared to Logan County. Environmental Justice issues are similar to those found in Logan County but without the numbers of isolated “pockets.” There are archaeological sites in the corridor but no National Register listed structures. There is not as much prime farmland as found in Logan County. Some UST’s were noted. The Peabody Wildlife Management Area (WMA), a privately owned area with public access, is located in the project corridor area but does not cross US 431.
- Environmental Justice (EJ) – A plan to handle the collection and organization of EJ data for this study was discussed. With three ADD’s involved in this project, it was decided to have each ADD collect EJ data for their respective areas. The Green River ADD will compile the data from the three ADD’s and submit a single document for the whole project. The end of February was suggested for submittal of the EJ study.
- Real Estate/Relocation – There are no relocation problems anticipated for the rural areas. There are some small community pockets or population clusters that could present difficulties in finding suitable relocation housing. Identification of the clusters and a more detailed evaluation will be needed to estimate the impacts. Bypasses may be necessary in some locations. Locations in Muhlenberg County could possibly push the project off alignment.
- Design Criteria will have to be determined on a spot by spot basis. A design speed of 55 mph will be used where possible. When selecting a typical section, increased dimension trucks will be considered as well as auxiliary/passing lanes.
- Logical Termini – As listed in the Six-Year Highway Plan, the termini for this phase of the study are the Tennessee/Kentucky state line on the south and the McLean/Muhlenberg County Line on the north. The team decided to keep the southern terminus but that a more logical break between Phases I and II would be the Western Kentucky Parkway. The team decided to exclude the improved four-lane segment of US 431 north of Russellville from the study. The revised termini then for Phase I will be from the Tennessee/Kentucky state line to Russellville at US 79, then from the beginning of the two-lane segment at Epleys Station north to the Western Kentucky Parkway.
- Other Discussion - Muhlenberg County Judge Executive Rodney Kirtley offered his services for the study and noted that US 431 is an economic link to Owensboro. Residents are now going to Bowling Green for shopping and services instead of Owensboro due to the traveling conditions along US 431.

- Goals & Objectives

- Safety improvements will be the primary focus of this study with the intent to identify and prioritize spots and/or segments. Priorities will be divided between short term and long term goals. Types of improvements for consideration will include:

- Lane widening
- Adding or widening shoulders
- Adding auxiliary truck lanes and/or passing lanes

It was noted that numerous communities and businesses rely on US 431 for access. The team recognizes that addressing existing safety issues and making an improvement at one location may result in a new problem surfacing at a different location where there had previously been none. The team will work to anticipate this type of situation when making its recommendations.

- Access and Connection – It was discussed that improving access and connection between communities is desirable. It was noted that US 431 is strategically placed between two parkways and provides access to services in Owensboro. While secondary to safety, access and regional connectivity benefits should be considered.

- Time Frame - Daryl Greer estimated project completion by the end of 2004.
- Public involvement - The team will seek public input through agency coordination. Local officials and ADD transportation and/or safety committee input will also be used in the study. Since there are no future phases approved, and it is difficult to anticipate what future phases might result from the recommendations made in this study, no formal officials or public meetings will be held.
- Report documentation – The study report will examine existing roadway and traffic conditions as well as environmental issues. Recommendations will be made for safety improvements. Reports will be distributed to FHWA, ADD, KYTC district, and central office personnel.

The Phase I meeting adjourned at approximately 2:45 PM CT.

PHASE II – McLean and Daviess Counties

After a short break following Phase I, the meeting resumed with a separate Phase II discussion at approximately 3:00 PM CT. Those attending were:

Mary Murray	FHWA
Jessica Rich	FHWA
Gina Boaz	Green River ADD
Shane Shelby	Wilbur Smith Associates
Kevin McClearn	KYTC-District 2-Planning
Nick Hall	KYTC-District 2-Planning
Everett Green	KYTC-District 2-Pre-Construction
David McDowell	KYTC-District 2-Construction
Kenny Potts	KYTC-District 2-Traffic
Doug Taylor	KYTC-District 2-Environmental
Phillip Whitmer	KYTC-District 2-R/W
Steve Hoefler	KYTC-Central Office-Design
Daryl Greer	KYTC Central Office Planning
Steve Ross	KYTC-Central Office-Planning

Since there were no new members for the Phase II discussion, the meeting continued without introductions.

- Prior study reports for US 431 were noted and described as follows:

Referencing the Phase I discussion, the only prior report pertaining to Phase II of this study is:

- December 1998 – US 431 Corridor Study, Central City to Owensboro – This study prepared by the Green River ADD recommended spot improvements along the existing corridor.

Information packets for Phase II were distributed and material reviewed as follows:

- Project location maps for McLean and Daviess County – corridor highlighted.
- Major Systems – This exhibit included information for Functional Classification, National Truck Network (NN), State System, National Highway System (NHS), and Defense Highway Network.
- Other Systems – This exhibit included information for Appalachian Development Highway System, Bike Route System, Forest Highway System and Scenic Byway System. Referencing discussion held during the Phase I

portion of the meeting, the project team noted that there is an application for scenic byway status on a segment of US 431. Steve Ross will follow up on the details. *[After the meeting, Cindy Griffin advised that the KYTC Division of Planning is recommending the segment of US 431 in Muhlenberg County between KY 176 at Drakesboro, and KY 81 at South Carrollton for scenic byway status.]* Also noted was a Greenbelt bike path in the city of Owensboro.

- Coal Haul – Tonnage along US 431 displayed by segment and county were shown on an exhibit for the years 2001 and 2002. Discussion during the Phase I portion of the meeting was referenced, noting mainly a decline in coal haul from 2001 to 2002 but the strong possibility of an increase with the construction of a new power plant near Central City. No new or additional information was presented for Phase II discussion.
- Route Log – This exhibit included intersection type and control information listed by county and milepoint.
- Bridges – A listing of bridges on US 431 with bridge number, milepoint location, bridge type, features crossed, geometric data, load posting, structural function, substructure and superstructure condition, and sufficiency ratings was included. Four bridges in McLean County are listed as functionally obsolete. Narrow bridge width is also a concern along the route. Only one bridge, No. B00049 at MP 8.543 in Daviess County, carrying US 431 over Panther Creek, is listed as requiring load posting. Its worst condition noted was a “satisfactory” superstructure rating (minor deterioration).
- Geometric Characteristics – This exhibit included number of lanes, divided/undivided, curbs, lane width, shoulder width, terrain and pavement type. Generally, the geometrics as presented for Phase II are good except for narrow shoulder widths south of the urban area of Owensboro.
- Traffic Characteristics – This exhibit, listed by segment and county, included average daily traffic (ADT), percent trucks, design speed, posted speed limit, percent passing sight distance, volume to capacity (v/c) ratios and levels of service (LOS) for the current year. This exhibit also included ADT, v/c ratios and LOS for the projected year 2030. McLean and Daviess Counties include mostly low levels of service, D and E, for both 2003 traffic and projected year 2030. The team noted a partially completed loop road intersecting US 431 near the rural/urban break south of the bypass and mall area in Owensboro. Completion/extension of this road across US 431 and to the west will most likely affect traffic along US 431 in the vicinity. Referencing the Phase I discussion, there was some confusion regarding the colors shown on the traffic maps. The exterior color bands indicate section breaks in the ADT. The interior color bands show changes in level of service.

- Crash Data – Crashes were identified and counted from 2000 through 2002 from State Police collision reports. Critical rate factors were calculated for segments and 0.1 mile spots.
 - McLean County - There were no high crash segments identified in McLean County, however, five 0.1 mile spots were identified with a CRF greater than one. Two of these spots are at intersections already identified for improvement. One is a scheduled Six-Year Highway Plan project to reconstruct the intersection of US 431 and KY 136 at Livermore in McLean County. Its letting is planned for the day after this meeting. Another spot at the intersection of US 431 and KY 1080 is an HES project planned to begin near year's end to add left turn lanes, improve vertical alignment and sight distance. Intersections of US 431 with KY 250 and KY 85 are spots with relatively high critical rate factors. The team noted that there is less than optimal sight distance at the KY 85 intersection. Currently there is a flashing beacon at this intersection, and the addition of stop bars has been recommended.
 - Daviess County - One continuous segment, from MP 10.632 to MP 14.670, with a high critical rate factor, was identified through the urban segment of Owensboro. Individual 0.1 mile spots with critical rate factors greater than one occurred frequently in that urban section. The rural segment south of Owensboro had a relatively low critical rate factor, less than one-half. Only one 0.1 mile spot in the rural section of Daviess County had a critical rate factor greater than one. That spot is at the intersection of US 431 and KY 140 and was noted by the team as having less than optimal sight distance.

A graph showing the number of crashes by type from 1996 through 2002 was also presented for each county. In McLean County, total crashes for the seven year period showed a very slight increase with single vehicle crashes leading the list and rear end crashes ranking next highest. In Daviess County, there was a significant reduction in total crashes since 1996, from approximately 430 to 100 crashes per year. In Daviess County, rear end crashes, and then angle collisions topped the list as would be expected in this more urban setting. It was also noted that there was a sharp spike in crashes for both McLean and Daviess Counties in the year 2000, which was unexplained.

- Environmental Issues– Referencing the Phase I discussion, some members of the team indicated they had not yet seen the draft environmental overview prepared by WSA. It was noted that copies have been sent to districts for comment and this was confirmed during discussion. Shane Shelby from WSA gave a summary of the environmental issues for Phase II of the study corridor.
 - McLean – Expect fewer surface water impacts than Phase I. There are flood prone areas in the corridor including floodplain issues at Livermore. Wetlands are mostly associated with the rivers. Private water sources are comparatively few. There are a handful of churches, schools and cemeteries. The Livermore Bridge was noted as being unique and of historic significance. There is potential for a historic district in Livermore with 18 or 19 structures from the Civil War period. There are currently no National Register structures, but there is potential that there will be after further evaluation. Endangered/threatened species concerns in this phase include the copperbelly water snake. There are some archaeological sites scattered along US 431 but most are located off the corridor. Also noted were locks and boating/regatta activities. A soil survey obtained by WSA identified prime farmland. Shane Shelby noted that polygon data may be available and asked if this would be something wanted for this project. The answer given was that if the polygon data would allow us to present the prime farmland data on a map the way we are showing other environmental footprint features, then yes, we would want the data in that form. There are scattered gas and oil wells around Livermore. Also noted are fault lines.
 - Daviess County – There are surface water streams, notably Panther Creek, and wetland areas around Panther Creek. There is flooding in the area south of the mall. There are several endangered/threatened species concerns. There are 13 socioeconomic locations identified along the corridor in Daviess County, the majority in Owensboro. Owensboro is home to the world's largest sassafras tree. There are 111 historic structures (22 are National Register listed) as well as an historic district in Owensboro. There are no known archaeological sites along the corridor. An estimated 64% of Daviess County is harvested cropland. There are over 200 underground storage tanks, 110 in Owensboro. There are also fault lines identified in southern Daviess County.
- Environmental Justice (EJ) – Referencing Phase I discussion, a plan to handle the collection and organization of EJ data for this study was discussed. With three ADD's involved in this project, it was decided to have each ADD collect EJ data for their respective areas. The Green River ADD will compile the data from the three ADD's and submit a single document for the whole project. The end of February was suggested for submittal of the EJ study.

- Real Estate/Relocation – Fewer small community clusters are expected than for Phase I. The team noted the community of Island was one such location.
- Intelligent Transportation Systems (ITS), Bike & Pedestrian Facilities – The team identified no obvious need for ITS on this project, Phase I or II. The Division of Multimodal Programs has recommended that roadway cross sections should not obstruct or deter bicycle transportation at any of the bike routes along the corridor. In Daviess County, the Ramblin' River Tour follows US 60 and intersects US 431 on the extreme north end in Owensboro. The Kentucky TransAmerica Trail follows KY 140 and crosses US 431 at Utica. The project team noted that the planned Greenbelt bike trail in Owensboro will cross south of the mall. Regarding pedestrian facilities, the Division of Multimodal Programs has recommended that these be considered along the entire project in urban and suburban communities.
- Logical Termini – As listed in the Six-Year Highway Plan, Phase II of this project begins at the McLean/Muhlenberg County Line and extends north to the Kentucky/Indiana border. Referencing discussion held in the Phase I meeting, the project team recommended breaking Phase I and II at the Western Kentucky Parkway instead of the Muhlenberg/McLean County line. The team maintained that recommendation during Phase II discussion and also recommended moving the northern terminus to the intersection of US 431 with the Owensboro bypass, eliminating from the study the urban segment north of the bypass.
- Other Discussion - The Green River ADD is looking at US 431 south of the bypass for widening. Gina Boaz noted that McLean County Judge Executive, Larry Whitaker, chairs Green River ADD's transportation committee and recommended contacting him prior to driving the project corridor for input or participating in the drive. Steve Ross said that he is planning to drive the project sometime prior to Thanksgiving and he will contact Judge Whitaker. Anyone else wanting to participate should contact Steve Ross after the meeting. *[Note that after the meeting, the Phase II project drive was held on November 19, 2003. Judge Whitaker was contacted and invited to participate but was unavailable for the drive. The Judge did discuss his concerns and identified locations to inspect. Nick Hall and David Martin participated in the drive.]*

- Goals & Objectives:

Referencing discussion held in the Phase I meeting, study goals are as follows:

- Safety improvements will be the primary focus of this study with the intent to identify and prioritize spots and/or segments. Priorities will be divided between short term and long term goals. Types of improvements for consideration will include:

- Lane widening
- Adding or widening shoulders
- Adding auxiliary truck lanes and/or passing lanes

It was noted that numerous communities and businesses rely on US 431 for access. The team recognizes that addressing existing safety issues and making an improvement at one location may result in a new problem surfacing at a different location where there had previously been none. The team will work to anticipate this type of situation when making its recommendations.

- Access and Connection – It was discussed that improving access and connection between communities is desirable. It was noted that US 431 is strategically placed between two parkways and provides access to services in Owensboro. While secondary to safety, access and regional connectivity benefits should be considered.
- Time Frame – Referencing discussion held in the Phase I meeting, Daryl Greer estimated project completion by the end of 2004.
- Public involvement - Referencing discussion held in the Phase I meeting, the team will seek public input through agency coordination. Local officials and ADD transportation and/or safety committee input will also be used in the study. Since there are no future phases approved, and it is difficult to anticipate what future phases might result from the recommendations made in this study, no formal officials or public meetings will be held.
- Report documentation – Referencing discussion held in the Phase I meeting, the study report will examine existing roadway and traffic conditions as well as environmental issues. Recommendations will be made for safety improvements. Reports will be distributed to FHWA, ADD, KYTC district, and central office personnel.

The Phase II meeting adjourned at approximately 4:00 PM CT.

AGENDA
INITIAL TEAM MEETING
SCOPING STUDY FOR SAFETY IMPROVEMENTS

US 431
FROM THE TENNESSEE TO THE INDIANA BORDER
LOGAN, MUHLENBERG, MCLEAN AND DAVIESS COUNTIES

Meeting Location: Career Advancement Center
50 Career Way
Central City, KY 42330

Meeting Date: October 23, 2003

Meeting Time: 1:00 P.M. – 4:00 P.M. CT

Phase I – Tennessee Border to the Muhlenberg/McLean County Line

- 1) Introduction and Purpose
- 2) Project Goals and Objectives
 - a) Project area
 - b) Prior reports
 - c) Roadway Conditions
 - i) Traffic data
 - ii) Crash data
 - iii) Existing geometry
 - iv) Other
 - d) Identify additional information needed to document problems
 - i) Environmental Footprint
 - ii) Environmental Justice
 - iii) Real Estate/Relocation Information
 - iv) Other (ITS/Bikes/Ped.)
 - e) Identify logical termini
 - f) Benefits of proposed project
 - g) Develop project goals and objectives
- 3) Probable Design Criteria
 - a) Functional class
 - b) ADT/DHV
 - c) Design speed
 - d) Typical section
 - e) Other criteria
- 4) Agency Coordination Needs
- 5) Public Involvement Needs
- 6) Documentation/Reports
 - a) Information to include/not include in report
 - b) Level of detail
 - c) Distribution
- 7) Q & A

Break

AGENDA
INITIAL TEAM MEETING
SCOPING STUDY FOR SAFETY IMPROVEMENTS

US 431
FROM THE TENNESSEE TO THE INDIANA BORDER
LOGAN, MUHLENBERG, MCLEAN AND DAVIESS COUNTIES

Phase II – Muhlenberg/McLean County Line to the Indiana Border

- 8) Introduction and Purpose
- 9) Project Goals and Objectives
 - a) Project area
 - b) Prior reports
 - c) Roadway Conditions
 - i) Traffic data
 - ii) Crash data
 - iii) Existing geometry
 - iv) Other
 - d) Identify additional information needed to document problems
 - i) Environmental Footprint
 - ii) Environmental Justice
 - iii) Real Estate/Relocation Information
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- 11) Agency Coordination Needs
- 12) Public Involvement Needs
- 13) Documentation/Reports
 - a) Information to include/not include in report
 - b) Level of detail
 - c) Distribution
- 14) Q & A
- 15) Adjourn

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The meeting began at approximately 1:00 PM CT. Those attending for the complete Phase I discussion and portions (noted below) of the Phase II discussion were:

Gina Boaz	Green River ADD
Craig Morris	Pennyrile ADD
Lance Meredith	Barren River ADD
Kevin McClearn	KYTC-District 2-Planning
Nick Hall	KYTC-District 2-Planning
Everett Green	KYTC-District 2-Pre-Construction
Phillip Whitmer	KYTC-District 2-Right of Way
Mark Brasher	KYTC-District 2-Traffic
David McDowell	KYTC-District 2-Construction
Jeff Moore	KYTC-District 3-Planning
Renee Slaughter	KYTC-District 3-Environmental
Travis Spidel	KYTC-District 3-Planning
Jim Wilson	KYTC-Central Office-Planning
Steve Ross	KYTC-Central Office-Planning

Steve Ross opened the meeting with introductions, discussed the purpose of the study (safety improvements to US 431) and reviewed the project goals from the first team meeting. The primary goal established for the study is to look at safety improvements, primarily spot-type improvements that can be implemented for relatively low cost within a reasonable time frame. The secondary goal for the project is to improve access and regional connectivity along US 431. The need for improved access to Owensboro from McLean and Muhlenberg Counties was specifically noted from resource agency coordination responses and discussion from the first project team meeting.

Environmental Justice

An Environmental Justice and Community Impact Report was prepared by the three Area Development Districts (ADD's). Jennifer Wedding, Green River ADD (GRADD); Craig Morris, Pennyrile ADD (PADD); and John Matheney, Barren River ADD (BRADD); prepared their portions of the report. The full document was compiled by Jennifer Wedding of the GRADD. Since Jennifer was not available for this meeting, Craig Morris led the discussion of the Environmental Justice (EJ) issues for those segments of the corridor included in the GRADD and the PADD. Lance Meredith who recently replaced John Matheney as BRADD Planner, presented the BRADD portion.

In the Phase I study area, the following EJ concerns were identified:

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- Logan County, Adairville - There are two apartment complexes located one block east of US 431 that contain concentrations of low-income and elderly residents.
- Logan County, Lewisburg - A low-income area located in Lewisburg was identified through a separate reconstruction project investigation (Epleys to Lewisburg, KYTC Item No. 03-273.00) and will be looked at more intensely as part of that process.
- Muhlenberg County, Drakesboro and Cleaton - There were six African American neighborhoods identified, three each in Drakesboro (along the west side of US 431) and Cleaton (along the east side of US 431).

In the Phase II study area, the following EJ concerns were identified:

- Muhlenberg County, Central City – There is a high black population in Census Tract 9602, primarily due to the Green River Correctional Complex (Prison). There was an African American neighborhood identified in Central City that is adjacent, on the west side, to US 431. Also, there were two nursing homes and one apartment complex identified in Central City with high concentrations of elderly residents.
- McLean County – There were no EJ locations identified of particular concern within the study area of McLean County.
- Daviess County – The only area that might require additional study in Daviess County is Tract 17.01, Block Group 4, located along the west side of US 431 south of the Owensboro bypass. This location contains elevated numbers of minority, low-income, elderly and disabled population.

Resource Agency Coordination

The Division of Planning requested comments from various resource agencies and public officials to identify issues associated with potential improvements along the study corridor. Steve Ross presented a summary of the responses (reference handout: Resource Agency Coordination Response Summary). The Kentucky Education Cabinet responded that it had no comments at this time. Jeff Moore recommended that the Division of Planning contact the Education Cabinet and ask that our request for comments be forwarded to the various school districts within the study corridor. It was noted that at least one new school is planned in the study area (Beechmont-Browder) and it would be helpful to know of similar projects, including proposed site locations, before the project team makes any final recommendations for safety improvements. The Division of Planning will

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follow-up to obtain additional information from the Education Cabinet regarding proposed school projects within the study area.

Related Projects

Discussion regarding related projects was included in the Alternatives Development and Recommendations portion of the meeting noted below.

Other

The only other discussion was that cost estimates would need to be prepared for the safety improvements identified. After developing a list of improvement alternatives, the division of Planning will request cost estimates from the respective District offices.

Alternatives Development and Recommendations, Phase I

A handout was presented to meeting attendees titled, "US 431 Recommendations Development." This handout listed 0.1 mile spot locations with critical crash rate factors greater than 0.9. Each spot location was numbered by phase number followed by a hyphen and a sequential number beginning with one at the south end of the project corridor. Each spot location included the following tabulated data: number of fatal, injury and property damage only (PDO) crashes; number of lanes; whether the lanes were divided or undivided; lane width; shoulder width; terrain; average daily traffic (ADT); truck percentage; design speed; posted speed; percent passing sight distance; volume/capacity (v/c) ratio; 2003 Level of Service (LOS). Also provided were the numbers and types of crashes at each location (e.g., 2 collisions with fixed objects); comments from public officials and resource agencies at or near each high-crash spot location and any additional information at these locations from crash segment analysis. In a few cases, segments longer than 0.1 miles were included for consideration if they had been noted as a possible high crash location by an agency or public official through the Resource Agency Coordination process.

The project team was asked to evaluate each spot or segment based on the data presented and also provide any additional information that might be helpful in deciding whether to include it in a list for recommended improvements. The team was then asked to prioritize each spot (or segment) as high, medium or low based on need for safety improvement, and then to suggest recommended improvements. During the discussion, team members noted that some of the data may need to be reevaluated for accuracy. Specifically, the design speeds that had been pulled from a Highway Information System (HIS) extract looked high in several records. Also, police collision reports will need to be pulled for many locations to more accurately identify the problems before making final recommendations. And, team members from district offices will take the list back with them to review with maintenance personnel for more detailed problem

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identification. Following is a list of each location presented at the meeting and a brief description of the team's recommendations and/or follow-up required. The crash statistics cited are for the three year period from January 1, 2000 through December 31, 2002.

Spot 1-1, Logan County, MP 1.485 - 1.585

The location of this spot is the KY 591 intersection in Adairville. The critical crash rate factor, CRF, was 0.917. This is a 4-way stop that has had several unusual accidents involving driver inattentiveness. Buildings are located very close to the roadway and the intersection is located at the northwest corner of the town square. Improvements here would be difficult to implement. No recommendations short of a bypass were recommended by the project team.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-2, Logan County, MP 13.796 - 13.896

The location is the intersection of US 79 in Russellville. The critical rate factor was 1.076. Problems include a high volume of traffic and trucks with tight turning radii at the intersection, business entrances located close to the intersection and properties located close to the roadway. The US 431 southern bypass project in Russellville will address the problems associated with this intersection by reducing traffic volume and providing trucks an alternate route.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-3, Logan County, MP 23.900 - 24.000

The location is Lewisburg, between KY 107 and KY 106. The critical rate factor was 1.258. This location will be addressed as a result of the Epleys to Lewisbug, US 431 reconstruction project, Item No. 3-273.00.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-4, Logan County, MP 29.952 – 30.052

The location is Hollow Bill, just north of HW McPherson Road. The critical rate factor was 1.618. Five of the six collisions at this spot were during bad weather conditions (wet or icy roads) on curves. The District and ADD personnel noted a history of crash problems at this location including a multiple fatality. This spot is also within the limits of a project listed on the Unscheduled Projects List (UPL) for relocation and assigned a medium (Local, ADD and District) priority. The terrain is rough in this area and the only conceivable improvement would be total reconstruction to improve the horizontal and vertical geometry.

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Preliminary Team Recommendation: Assign High Priority to reconstruct as described in the UPL from MP 28.900 to MP 31.050 (Logan/Muhlenberg County Line).

MP 31.043, Logan County - Added Spot

This location was recommended to be added to the list by District 3 personnel and is located at the intersection with KY 1293, almost on the Logan/Muhlenberg County line. While the CRF was not greater than 1.00 at this location, District 3 personnel noted poor sight distance and a potential for crashes.

Preliminary Team Recommendation: Assign medium priority for intersection improvements.

Spot 1-5, Muhlenberg County, MP 0.364 – 0.464

This spot is located at the intersection of KY 973. Only four crashes were cited here for a CRF of 0.983. None of the crashes involved fatalities. The team agreed that four crashes over a three-year period are probably not statistically significant.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-6, Muhlenberg County, MP 3.400 – 3.500

Six crashes were documented at this spot. The CRF was 1.688. This spot includes one narrow bridge carrying US 431 over Rocky Creek. The bridge width is 21.5 feet. Four of the six crashes were “sideswipe-opposite direction.” No injury or fatality crashes were documented. This bridge has been identified for replacement under HES 02-984 and accepted, but not a high priority.

Preliminary Team Recommendation: Assign high priority to replace or widen Rocky Creek Bridge.

MP 3.634, Muhlenberg County - Added Spot

This is the location of a bridge carrying US 431 over Rocky Creek Branch, immediately north of the preceding spot location. The bridge is similar to the Rocky Creek bridge and is also only 21.5 feet wide.

Preliminary Team Recommendation: Assign medium priority to replace or widen Branch of Rocky Creek Bridge.

Spot 1-7, Muhlenberg County, MP 3.930 – 4.030

This spot is about one mile south of Union Ridge Road and had a CRF of 1.688. Four of the six total crashes were “run-off-road” crashes. Also, four occurred

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during wet, dark conditions. Lencie Meredith noted that this is often indicative of an edgeline problem (worn/faded or nonexistent). If there is an existing edgeline and it is in good condition (reflective), then this type of crash problem could instead be due to geometry.

Preliminary Team Recommendation: Assign low priority to realign/widen. Follow-up is necessary to first determine existence/condition of edgeline and roadway geometry.

MP 6.0 – 7.0, Muhlenberg County

This segment was noted by Kentucky State Police Post 2 (Madisonville) as a high crash site. Crash data did not support this and the project team could not identify any obvious problem.

Preliminary Team Recommendation: Do nothing unless follow-up identifies an obvious problem.

Spot 1-8, Muhlenberg County, MP 6.3 – 6.4

This tight curve in Belton is known locally as “Dead Man’s Curve,” the site of recent fatalities and has already undergone improvements to correct sight distance deficiencies. There were eight total crashes for a CRF of 2.25. More work is scheduled for 2006 to widen the roadway and realign the curve under HES 2-900.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-9, Muhlenberg County, MP7.420 – 7.520

Located between KY 2270 and KY 246, this spot had a CRF of 1.125 due to only four crashes over a three year period. No fatalities or injuries were cited. The project team had no additional information for this location and agreed that four crashes over a three-year period are probably not statistically significant.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-10, Muhlenberg County, MP 7.950 – 8.050

This spot at the intersection of KY 246 had a total of 10 crashes for a CRF of 2.813. Three of these collisions were “rear end” and another three were “angle” collisions. Team members noted bifurcated turn lanes on KY 246 and a gas station on one of the corners possibly contributing to the crashes. They also noted that this intersection is just south of the Hughes-Kirk Elementary School.

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Preliminary Team Recommendation: Assign high priority for intersection improvements.

Spot 1-11, Muhlenberg County, MP 8.950 – 9.050

This spot, just south of Sylvania Street had six total crashes for a CRF of 1.186. Three of the crashes were “angle” collisions. The team noted no apparent problems at this location. They also noted that this may be just south of the proposed site of the new Beechmont-Browder Elementary School.

Preliminary Team Recommendation: Assign low priority and investigate further for improvement recommendations.

Spot 1-12, Muhlenberg County, MP 9.734 – 9.834

This spot in Browder includes the intersection of KY 70. There were nine total crashes for a CRF of 1.665. Three of the crashes were “angle” collisions and two were “rear end.” Team members noted that this intersection has bifurcated turning lanes on the east approach of KY 70. This is also within the limits (MP 8.0 – 9.90) of a location noted by Kentucky State Police Post 2 (Madisonville) for consideration as a possible high crash site.

Preliminary Team Recommendation: Assign High priority for intersection improvements.

Spot 1-13, Muhlenberg County, MP 10.222 – 10.322

This spot located north of KY 70 had six total crashes for a CRF of 1.076. Three of these crashes were “sideswipe-opposite direction” and three were “single vehicle” collisions. Team members noted sharp, reverse curves in this area.

Preliminary Team Recommendation: Assign Medium priority to reconstruct to correct horizontal alignment. Follow-up to check length of proposed reconstruction.

Spot 1-14, Muhlenberg County, MP 11.400 – 11.500

This spot includes the intersection of KY 176 in Drakesboro and had 10 crashes for a CRF of 1.71. Team members noted that this is a signalized intersection with no turn lanes and a “Pantry” store on the corner. Southbound coal trucks on US 431 turn eastbound on KY 176 to serve the Paradise Steam Plant. Muhlenberg High School is also accessed from this location by traveling westbound on KY 176. Five of the 10 crashes at this spot were “angle” collisions.

Preliminary Team Recommendations: Assign Medium priority for intersection improvements.

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Spot 1-15, Muhlenberg County, MP 11.982 – 12.082

This spot includes the KY 2107 intersection. There were a total of six crashes for a CRF of 0.908. Three of the crashes were “angle” collisions, two were “head on” and one was an “opposing left turn.” This spot is within the limits (MP 11.0 – 12.10) of a location noted by Kentucky State Police Post 2 (Madisonville) for consideration as a possible high crash site.

Preliminary Team Recommendations: Assign Low priority for intersection improvements.

One of the recommendations of Kentucky State Police (KSP) Post 2 (Madisonville), was to place additional signage upon approach to “high crash zones” stressing extra caution. Project team members noted that placing these types of signs is a liability problem and not an acceptable solution to addressing safety issues. Team members also recommended addressing this comment in the report write-up with an explanation as to why KSP’s recommendation for warning signs could not be implemented.

Spot 1-16, Muhlenberg County, MP 14.096 – 14.196

This spot is located approximately one mile south of Cleaton Road. There were a total of six crashes for a CRF of 0.908. Half of these crashes were coded “collision with animal.”

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 1-17, Muhlenberg County, MP 15.150 – 15.250

This spot is at the intersection of Cleaton Road. There were a total of nine crashes for a CRF of 1.464. Three of these crashes were “angle” collisions, two were “rear end” and two were “sideswipe-same direction.” Team members noted that there is a railroad grade-separation project planned north of this location, but it will probably not extend to this intersection.

Preliminary Team Recommendation: Assign Medium priority for intersection improvements/turn lanes.

That completed all discussion for Phase 1 of the study. After a short break, the meeting resumed with Phase II discussion of alternatives at approximately 2:30 PM CT. Those still attending were:

Gina Boaz
Kevin McClearn

Green River ADD
KYTC-District 2-Planning

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Nick Hall	KYTC-District 2-Planning
Everett Green	KYTC-District 2-Pre-Construction
Phillip Whitmer	KYTC-District 2-Right of Way
Mark Brasher	KYTC-District 2-Traffic
David McDowell	KYTC-District 2-Construction
Jim Wilson	KYTC Central Office Planning
Steve Ross	KYTC-Central Office-Planning

Alternatives Development and Recommendations, Phase II

Spot 2-1, Muhlenberg County, MP 17.400 – 17.500

This spot includes the Wendell H. Ford Western Kentucky Parkway interchange. There were a total of seven crashes for a CRF of 1.723. Two of the crashes were “vehicle entering/leaving entrance” and two were “angle” collisions. With four, twelve-foot lanes and ten-foot shoulders, the roadway section as well as the geometry are good at this location.

Preliminary Team Recommendation: Assign Low priority to reconstruct interchange as a long-term recommendation.

The following Spots, 2-2 through 2-8, are located within Central City, are very closely spaced, share common features and problems, and may need to be considered as one complete segment for improvement recommendations.

Spot 2-2, Muhlenberg County, MP 17.912 – 18.012

This spot located within Central City had seven total crashes for a CRF of 1.019. According to HIS records, this spot includes a transition from 10-foot to 2-foot shoulders. Three of the crashes recorded at this location were “rear end,” two were “opposing left turn” and two were “sideswipe-same direction.” Team members also noted an overhead railroad bridge nearby that trucks sometimes impact resulting in traffic delays.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

Kentucky State Police Post 2 (Madisonville) noted crash problems between MP 18.24 and 19.117 which includes Spots 2-3 through 2-8.

Spot 2-3, Muhlenberg County, MP 18.265 – 18.365

This spot located within Central City had 28 total crashes for a CRF of 3.247. This spot includes the intersection of Strouds Lane and according to HIS records is where a 2-foot shoulder transitions to curb-and-gutter. There were 10 “angle” collisions and eight “rear end” collisions recorded at this spot.

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Preliminary Team Recommendation: Assign Medium/High priority for intersection improvements.

Spot 2-4, Muhlenberg County, MP 18.378 – 18.478

This spot located within Central City had a total of 17 crashes for a CRF of 1.657. This spot includes the intersection of Harrison Avenue. There were 10 “angle” collisions and three “rear end” collisions recorded at this spot.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

Spot 2-5, Muhlenberg County, MP 18.479 – 18.579

This spot located within Central City had a total of 17 crashes for a CRF of 1.627. There were seven “single vehicle,” four “rear end,” three “angle,” and three “head on” collisions.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

Spot 2-6, Muhlenberg County, MP 18.670 – 18.770

This spot located within Central City had a total of 10 crashes for a CRF of 1.197. This spot includes the intersection of KY 70. There were four “angle,” three “rear end,” two “head on,” and one “sideswipe-same direction” collisions.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

Spot 2-7, Muhlenberg County, MP 18.862 – 18.962

This spot located within Central City had a total of 15 crashes for a CRF of 2.399. This spot includes the intersection with KY 277. There were seven “rear end” and six “angle” collisions. Team members noted this was a signalized intersection and is aligned on a skew with commercial businesses located on the corners. They also noted that this may be a location where traffic approaches the intersection over a crest vertical curve with limited sight distance resulting in rear end crashes.

Preliminary Team Recommendation: Assign Medium/High priority for intersection improvements.

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Spot 2-8, Muhlenberg County, MP 19.062 – 19.162

This spot located in Central City had a total of six crashes for a CRF of 1.075. All six crashes were “rear end, both vehicles moving” type crashes. Team members had no additional input on this location.

Preliminary Team Recommendation: Follow-up with further investigation as to spot conditions and possible crash causes. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

Spot 2-9, Muhlenberg County, MP 21.430 – 21.530

This spot located in South Carrollton includes the intersection with KY 189. There were five total crashes for a CRF of 1.198. Two of the crashes were “sideswipe-same direction.” Team members noted that there may be left turn lanes on all approaches at this intersection.

Preliminary Team Recommendation: Assign Low priority for intersection improvements.

MP 22.0 to 24.347, Muhlenberg County

Kentucky State Police Post 2 (Madisonville) identified this segment as worthy of consideration as a high crash site. This segment includes the Spots 2-10 through 2-12. Improvements to this segment will be addressed by the spot improvement recommendations that follow.

Spot 2-10, Muhlenberg County, MP 22.298 – 22.398

This spot located in South Carrollton includes the intersection with KY 81. There were 16 total crashes at this location for a CRF of 3.669. There were seven “rear end” crashes included in the total. Team members noted that HES project 2-976 begins just north of this spot (MP 22.4 – 22.7) and does not include the KY 81 intersection.

Preliminary Team Recommendation: Assign High priority for intersection improvements.

Spot 2-11, Muhlenberg County, MP 22.398 – 22.498

This spot located in South Carrollton begins at the KY 81 intersection. There were ten total crashes for a CRF of 1.97. Four of the crashes were “single vehicle,” two were “angle” collisions and two were “rear end.” This spot is included in HES project 2-976 for horizontal and vertical realignment, shoulder widening, and guard rail installation. This project does not include improvements to the intersection at KY 81.

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Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 2-12, Muhlenberg County, MP 24.250 – 24.350

This spot located in South Carrollton is just north of Power Plant Drive. There were 12 total crashes for a CRF of 2.533. 10 of the crashes were “single vehicle” type collisions. Muhlenberg County Judge Kirtley noted the curve near the Kentucky Utilities plant as a location to consider for improvements. Team members noted that HES project 2-977 was originally two projects with the following limits: MP 23.9 – 24.1 and MP 24.3 – 24.5. These two projects were combined for horizontal and vertical realignment, shoulder widening, and guardrail installation. This spot will be addressed by this project.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

MP 0.0 – 1.5 and MP 1.0 – 2.5 (overlap noted), McLean County

Kentucky State Police (Henderson) recommended a segment in McLean County from the levee at the Muhlenberg County line north to MP 1.5 for widening and shoulder upgrade; and from MP 1.0 to 2.5 for shoulder upgrades. The team looked at the crash data for the segment from 0.000 to 4.354 and noted 26 total crashes for a 0.341 CRF. This data included two fatalities over that 3 year period. Project team members noted that the roadway sits up high on a narrow fill with deep ditches on each side. HIS data show 2-foot shoulders. Shoulder upgrades would involve bringing in large amounts of additional fill material given the height of the existing fill and length of the segment.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study. The study team considered recommending guard rails for this segment but decided against that recommendation. The reasoning was that there is a low CRF and the addition of guard rails on such a narrow segment of road would have a confining effect and could cause some drivers to “hug” the centerline, with the potential for head-on collisions and additional fatalities.

Spot 2-13, McLean County, MP 2.450 – 2.550

This spot located in Island includes the intersection with KY 85. There were five total crashes for a CRF of 0.976. Three of the crashes were “angle” collisions. Team members noted that this intersection is “Old” KY 85 and not the bypass that was recently constructed. Kentucky State Police (Henderson) recommended adding turning lanes at the intersection with Main Street in Island.

Preliminary Team Recommendation: Assign Low priority for intersection improvements.

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MP 5 – 11.6, McLean County

Kentucky State Police recommend shoulder upgrades on this segment of US 431. The team looked at crash data and noted no particularly high CRF's from segment analysis. However, Spots 2-14 through 2-18 are included within this segment's limits. Improvements to this segment will be addressed by the spot improvement recommendations that follow.

Spot 2-14, McLean County, MP 5.450 – 5.550

This spot in Livermore includes the Third Street intersection. There were six total crashes for a CRF of 1.035. Five of the six crashes at this spot were at the Third Street intersection. Four crashes were "rear end" collisions and two were "angle" collisions. Mayor Eaton noted in a response to our Resource Agency Coordination request for information that the intersection at the foot of the Green River Bridge is probably the most dangerous in the community. Livermore Mayor Eaton supports widening due to business prospects it would bring to Livermore. Team members noted that there is poor access control (continuous entrances from road to gas station and other businesses) at this location and that there is no one particular intersection causing problems from the bridge north. This location was recently converted from 2-lane to 3-lane and team members suggested evaluating updated crash data that applies to this reconstructed section.

Preliminary Team Recommendation: Assign Medium priority for 3-lane curb and gutter improvements with access control. Evaluate updated crash data for the reconstructed section.

Spot 2-15, McLean County, MP 6.038 – 6.138

This spot in Livermore includes the intersection with KY 136. There were 13 total crashes for a CRF of 2.348. Six of the crashes were "rear end" collisions and four were "angle" collisions. This location is currently under construction to be completed in May or June of 2005 under KYTC Item No. 2-9.00.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 2-16, McLean County, MP 8.265 – 8.365

This spot includes the intersection with KY 1080. There were nine total crashes for a CRF of 1.557. This spot is within the limits of HES project, 2-972, to cut back embankments to improve sight distance and add left turn lanes on US 431 at KY 1080.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

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Spot 2-17, McLean County, MP 9.300 – 9.400

This spot is located just north of the intersection of Barrett Hill Road. There were seven total crashes for a CRF of 1.211. Three of the crashes were “angle” collisions. Team members had no additional information immediately available on this spot.

Preliminary Team Recommendation: Assign Low priority for intersection improvements. Conduct more detailed analysis of crashes and reevaluate.

Spot 2-18, McLean County, MP 9.800 – 9.900

This spot includes the intersection with KY 250. There were seven total crashes for a CRF of 1.272. Four of the crashes were “rear end” collisions. Team members noted that this is a residential area with Buck Creek Baptist Church and a business (ADS Pipe) located near the intersection. They also noted that many students take KY 250 westbound to high school in Calhoun via this intersection.

Preliminary Team Recommendation: Assign Low/Medium priority for intersection improvements. Conduct more detailed analysis of crashes and reevaluate.

Spot 2-19, Daviess County, MP 2.599 – 2.699

This spot in Utica includes the intersection with KY 140. There were 10 total crashes for a CRF of 1.108. Three of the crashes were “angle” collisions, three were “single vehicle,” two were “rear end,” and two were “head on.” There are flashing beacons at this intersection and a Citgo Station on one corner. Team members noted a sight distance problem when approaching from the east on KY 140, that it is necessary to pull up close to US 431 in order to see. It was also noted that there is a historical marker just north of this intersection at the site of a Civil War skirmish. According to the Environmental Overview prepared for this study, this site has not been assessed for National Register potential.

Preliminary Team Recommendation: Assign Medium priority for intersection improvements and turning lanes.

MP 2.599 – 4.968, Daviess County

Kentucky State Police (Henderson) recommend horizontal and vertical alignment and routine road repairs for this segment. While there were no high crash spots noted within these limits, team members noted the terrain is rolling and there can be problems trying to pass for vehicles that get stuck behind slow moving farm equipment.

Preliminary Team Recommendation: Assign Medium priority for passing lanes. Conduct more detailed analysis of crashes and reevaluate.

Spots 2-20 through 2-24 are located in the general vicinity of the Mall on US 431 outside the Owensboro Bypass.

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Spot 2-20, Daviess County, MP 10.650 – 10.750

This spot had 14 total crashes for a CRF of 1.552. Seven of the crashes were “angle” collisions, five were “rear end” and two were “opposing left turn.” Team members noted that the location of this spot could include the light at Applebees. If so, then corrective action would probably have to be handled locally by petitioning the developer since the side streets are controlled by the property owners.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

Spot 2-21, Daviess County, MP 10.800 – 10.900

This spot had 22 total crashes for a CRF of 2.439. 10 of the crashes were “rear end” collisions, four were “angle,” four were “opposing left turn,” three were sideswipe-same direction,” and one was “single vehicle.” Team members noted that this is probably the middle entrance at the mall. This middle entrance is unsignalized but located between two signalized intersections. Team members suggested there was a left turn problem for vehicles exiting from the mall.

Preliminary Team Recommendation: Assign High priority to close median and eliminate left turns at this mall entrance.

Spot 2-22, Daviess County, MP 10.950 – 11.050

This spot includes the intersection of Southtown Boulevard. There were 30 total crashes for a CRF of 1.703. 16 of the crashes were “rear end” collisions and another eight were “angle” collisions. Team members noted that Southtown Boulevard is going to be widened to three outbound lanes, five lanes total, under project 2-221.00. This state-funded project is just finishing up with the design phase.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 2-23, Daviess County, MP 11.150 – 11.250

This spot includes the intersection with Carlton Drive. There were 33 total crashes for a CRF of 1.873. 17 of the crashes were “rear end” collisions, nine were “angle,” five were “opposing left turn,” and two were “backing.” Team members noted that this intersection is not signalized and the traffic backs up here. The backups could be due to the signal north of Carlton Drive.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

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Spot 2-24, Daviess County, MP 11.267 – 11.367

This spot includes the Owensboro Bypass interchange. There were 60 total crashes for a CRF of 2.681. 43 of these crashes were “rear end” collisions. Team members noted that both intersections for the ramps on each side of the bypass are signalized. Vehicles coming off the ramp and turning left to go southbound may be accelerating to make it through the light, but then reach the next light for the ramps south of the bypass unprepared to stop, resulting in the large number of “rear end” collisions.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

The meeting adjourned at approximately 4:10 PM CT.

AGENDA
2ND TEAM MEETING
SCOPING STUDY FOR SAFETY IMPROVEMENTS

US 431
FROM THE TENNESSEE TO THE INDIANA BORDER
LOGAN, MUHLENBERG, MCLEAN AND DAVIESS COUNTIES

Meeting Location: Career Advancement Center
50 Career Way
Central City, KY 42330

Meeting Date: February 17, 2005

Meeting Time: 1:00 P.M. – 4:00 P.M. CT

Phase I – Tennessee Border to the WK Parkway

- 1) Introductions, Review and Purpose
- 2) Environmental Justice
- 3) Resource Agency Coordination Responses
- 4) Related Projects
- 5) Other
- 6) Alternatives Development and Recommendations

Break

Phase II – WK Parkway to the Owensboro Bypass

- 7) Introductions, Review and Purpose
- 8) Environmental Justice
- 9) Resource Agency Coordination Responses
- 10) Related Projects
- 11) Other
- 12) Alternatives Development and Recommendations

- 13) Adjourn

Phase 1										
Logan County - No high crash segments										
Spot 1-1	From MP	To MP	Fatal	Injury	PDO	Total	CRF			
	1.485	1.585	0	3	2	5	0.917			
Adairville, 4-way stop, primarily inattention										
2 Collision with fixed object, single vehicle										
3 Angle collision										
No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain						
2	U	12	curbed	Rolling						
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS				
4170	12.8	70	35	30	0.20	E				
SPT 1-2	From MP	To MP	Fatal	Injury	PDO	Total	CRF			
	13.796	13.896	0	0	8	8	1.076			
Russellville, Intersection US431/US79, four involved trucks										
4 Vehicle backing (1 at dusk)										
2 Vehicle entering/leaving entrance										
1 Collision with fixed object, head on (dark, highway lighted)										
1 Angle collision, one vehicle turning left										
No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain						
2	U	10	2	Rolling						
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS				
8870	9.4	45	35	not avail	0.37	E				

										Tight quarters, gas station on one corner, cemetery on other corner	
										Southern bypass should provide some relief	
										Vehicle Enforcement recommended widening in the Russellville area to accommodate trucks	
SPOT 1-3	From MP	To MP	Fatal	Injury	PDO	Total	CRF				
	23.9	24	0	1	4	5	1.258				
										Lewisburg, between KY 107 and KY 106 to north	
										2 Rear end (1 at dusk)	
										1 Head on (dark, hwy not lighted)	
										1 Sideswipe, same direction (dark, hwy lighted/on)	
										1 Other, rear to rear	
	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain						
	2	U	11	4	Rolling						
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS				
	3490	not avail	65	35	35	0.17	E				
										Included in Epleys to Lewisburg reconstruction?	
SPOT 1-4	From MP	To MP	Fatal	Injury	PDO	Total	CRF				
	29.952	30.052	0	2	4	6	1.618				
										Hollow Bill, Just north of HW McPherson Rd (MP29.906)	
										5 of the 6 were bad weather conditions (wet or icy) on curves	
										1 Collision with fixed object, single vehicle	
										1 Rear end in traffic lanes, both vehicles moving	

SPOT 1-6	From MP	To MP	Fatal	Injury	PDO	Total	CRF
	3.400	3.500	0	0	6	6	1.688
Rocky Creek Bridge is at MP 3.454, 21' wide							
Branch of Rocky Creek Bridge is at MP 3.634, 21.5' wide							
Muhlenberg County Judge Kirtley noted two narrow bridges near Penrod							
	1	Collision with animal					
	4	Sideswipe - opposite directions					
	1	Rear end in traffic lanes, both vehicles moving					
	3	dark		1 ice, 1 wet			
		Divided/Undivided	Lane Width	Shoulder Width	Terrain		
	2	U	10	2	Rolling		
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS
	2850	not avail	65	55	20	0.14	D
SPOT 1-7	From MP	To MP	Fatal	Injury	PDO	Total	CRF
	3.930	4.030	0	3	3	6	1.688
About 1 mile south of Union Ridge Road							
	4	Ran off roadway, one vehicle with earth embankment/ditch					
	1	Head on					
	1	Collision with fixed object					
	1	dawn, 4 dark	4 wet				
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain		
	2	U	10	2	Rolling		

	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	
	2850	not avail	65	55	20	0.14	D	
SPOT 1-9	From MP	To MP	Fatal	Injury	PDO	Total	CRF	
	7.420	7.520	0	0	4	4	1.125	
	Between KY 2270 and KY 246							
	2	Rear end						
	1	Angle						
	1	Collision with non-fixed object						
	All daylight		All dry					
	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain			
	2	U	10	1	Rolling			
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	
	2850	not avail	70	55	40	0.14	D	
SPOT 1-10	From MP	To MP	Fatal	Injury	PDO	Total	CRF	
	7.950	8.050	0	6	4	10	2.813	
	Intersection KY 246							
	3.000	Rear end						
	3.000	Angle						
	1.000	Head on						
	1.000	Ran off road						
	1.000	Sideswipe						
	1.000	Vehicle entering/leaving entrance						
	2 dark		All dry					

From MP	To MP	Fatal	Injury	PDO	Total	CRF		
2.873	11.982	0	55	99	154	1.191		
and additional signage upon approach to "high crash zones" stressing extra caution.								
No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP		
2	U	11	2	Flat	2.300	11.776		
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP
6240	not avail	70	45	100	0.30	E	9.834	9.970
5310	not avail	70	45	100	0.26	E	9.669	9.834
5310	not avail	70	55	100	0.26	D	9.300	9.669
5310	not avail	70	55	0	0.26	E	8.550	9.300
5310	not avail	40	55	0	0.26	E	8.530	8.550
5310	not avail	40	35	0	0.26	E	8.400	8.530
5310	not avail	70	35	40	0.26	E	8.020	8.400
2850	not avail	70	45	40	0.14	E	7.520	8.020
SPOT 1-12	From MP	To MP	Fatal	Injury	PDO	Total	CRF	
	9.734	9.834	0	5	4	9	1.665	
Intersection KY 70 at Browder (MP 9.834)								
	3	ANGLE						
	2	REAR END						
	1	HEAD ON						
	1	SIDESWIPE-OPPOSITE DIRECTION						
	1	SIDESWIPE-SAME DIRECTION						
	1	SINGLE VEHICLE						
2	dark							
		1 wet						

	7080	not avail	70	45	30	0.35	E	11.467	11.550
	6240	not avail	70	45	30	0.30	E	11.427	11.467
	6240	not avail	70	35	30	0.30	E	11.300	11.427
	6240	not avail	65	35	30	0.30	E	11.000	11.300
SPOT 1-15	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	11.982	12.082	0	5	1	6	0.908		
	Intersection KY 2107 (MP 11.982)								
	3 ANGLE								
	2 HEAD ON								
	1 OPPOSING LEFT TURN								
	1 dark								
	all dry								
	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain				
	2	U	12	1	Rolling				
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS		
	8210	not avail	70	55	50	0.36	E		
SPOT 1-16	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	14.096	14.196	0	1	5	6	0.908		
	one mile south of Cleaton Road, no bridge, no intersection								
	3 SINGLE VEHICLE								
	2 REAR END								
	1 SIDESWIPE-OPPOSITE DIRECTION								
	3 dark								
	1 wet								

	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain				
	2	U	12	1	Rolling				
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS		
	8210	not avail	70	55	50	0.36	E		
SPOT 1-17	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	15.150	15.250	0	1	8	9	1.464		
	Intersection Cleaton Road (MP 15.184)								
	3	ANGLE							
	2	REAR END							
	2	SINGLE VEHICLE							
	2	SIDESWIPE-SAME DIRECTION							
	2	dark	1	wet					
	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain				
	2	U	12	1	Rolling				
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP
	7060	not avail	70	55	70	0.34	D	15.184	16.538
	8210	not avail	70	55	50	0.36	E	11.982	15.184
	Phase 2								
	Muhlenberg County - Two high crash segments:								
	From MP 17.484 to 19.462, 125 crashes, CRF 1.948, downtown Central City, includes 8 spots								
	From MP 21.481 to 24.232, 64 crashes, CRF 1.238, South Carrollton, includes 4 spots								

SPOT 2-1	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	17.400	17.500	0	3	4	7	1.723		
	Central City, interchange Parkway (MP 17.484)								
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain				
	4	D	12	10	Rolling				
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP
	7570	7.7	70	55	30	0.13	A	17.484	17.528
	7570	not avail	70	55	30	0.13	A	17.290	17.484
SPOT 2-2	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	17.912	18.012	0	3	4	7	1.019		
	Central City								
	Transition from 10' to 2' shoulders								
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP		
	2	U	12	2	Flat	17.955	18.278		
	2	U	12	10	Flat	17.810	17.955		
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS		
	8720	7.7	70	45	0	0.36	E		
	[Redacted]								
	KY State Police Post 2, Madisonville:								
	High crash sites in need of consideration:								
	MP 18.24- 19.117 Includes Spots 2-3 through 2-8								
	KSP recommends clearing alongside roadway for maximum sight distance								

and additional signage upon approach to "high crash zones" stressing extra caution.											
From MP	To MP	Fatal	Injury	PDO	Total	CRF					
16.538	19.462	0	30	107	137	1.627					
No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP					
2	U	12	curbed	Rolling	18.962	19.389					
2	U	12	curbed	Rolling	18.879	18.962					
2	U	10	curbed	Rolling	18.825	18.879					
2	U	12	curbed	Rolling	18.820	18.825					
2	U	12	curbed	Rolling	18.679	18.820					
2	U	12	curbed	Rolling	18.525	18.679					
2	U	12	curbed	Rolling	18.391	18.525					
2	U	12	curbed	Flat	18.278	18.391					
2	U	12	2	Flat	17.955	18.278					
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP			
6250	1.7	70	35	not avail	0.30	E	18.962	19.389			
8360	1.7	70	35	not avail	0.36	E	18.879	18.962			
8360	1.7	70	35	not avail	0.36	E	18.825	18.879			
8360	1.7	70	35	not avail	0.36	E	18.820	18.825			
9810	1.7	70	35	not avail	0.43	E	18.679	18.820			
16400	1.7	70	35	not avail	0.71	E	18.525	18.679			
16400	1.7	70	35	not avail	0.71	E	18.391	18.525			
16400	1.7	70	35	100	0.67	E	18.390	18.391			
12800	1.7	70	35	100	0.52	E	18.278	18.390			
8720	7.7	70	35	100	0.36	E	18.241	18.278			
8720	7.7	70	35	0	0.36	E	18.087	18.241			
SPOT 2-3	From MP	To MP	Fatal	Injury	PDO	Total	CRF				
	18.265	18.365	0	4	24	28	3.247				

Central City, intersection W. Stroude Lane (MP 18.330)												
Transition from 2 shoulder to curb and gutter												
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP					
	2	U	12	curbed	Flat	18.278	18.391					
	2	U	12	2	Flat	17.955	18.278					
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP			
	12800	1.7	70	35	100	0.52	E	18.278	18.390			
	8720	7.7	70	35	100	0.36	E	18.241	18.278			
SPOT 2-4	From MP	To MP	Fatal	Injury	PDO	Total	CRF					
	18.378	18.478	0	3	14	17	1.657					
Central City, intersection Harrison Ave (MP 18.392)												
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP					
	2	U	12	curbed	Rolling	18.391	18.525					
	2	U	12	curbed	Flat	18.278	18.391					
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP			
	16400	1.7	70	35	not avail	0.71	E	18.391	18.525			
	16400	1.7	70	35	100	0.67	E	18.390	18.391			
	12800	1.7	70	35	100	0.52	E	18.278	18.390			
SPOT 2-5	From MP	To MP	Fatal	Injury	PDO	Total	CRF					
	18.479	18.579	0	2	15	17	1.627					
Central City, no intersection, no bridge												
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain							
	2	U	12	curbed	Rolling							

Central City, no intersection, no bridge									
No. of Lanes	2	Divided/Undivided	U	Lane Width	12	Shoulder Width	curbed	Terrain	Rolling
2003 ADT	6250	Truck %	1.7	Design Speed	70	Posted Speed	35	% Passing Sight Dist	not avail
								v/c	0.30
								2003 LOS	E
Vehicle Enforcement recommended widening in S. Carrollton area (see Phase 2 spots 9-12)									
SPOT 2-9	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	21.430	21.530	0	1	4	5	1.198		
South Carrollton, intersection KY 189 (MP 21.481)									
No. of Lanes	2	Divided/Undivided	D	Lane Width	11	Shoulder Width	10	Terrain	Rolling
	2	U		11	10	10		Rolling	
2003 ADT	3810	Truck %	1.7	Design Speed	60	Posted Speed	55	% Passing Sight Dist	0
								v/c	0.19
								2003 LOS	C
KY State Police Post 2, Madisonville: High crash sites in need of consideration: MP 22.0 - 24.347 Includes Spots 2-10 through 2-12									
KSP recommends clearing alongside roadway for maximum sight distance and additional signage upon approach to "high crash zones" stressing extra caution.									

	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	24.232	27.779	1	16	27	44	0.696		
	21.481	24.232	0	24	40	64	1.238		
	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP		
	2	U	11	2	Rolling	21.660	27.779		
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP
	4750	8.7	70	55	20	0.23	D	24.232	26.411
	5340	8.7	65	55	20	0.26	D	22.465	24.232
	5340	8.7	65	45	20	0.26	E	22.450	22.465
	5340	8.7	65	45	30	0.26	E	22.398	22.450
	3810	1.7	65	45	30	0.19	E	21.663	22.398
	SPOT 2-10	From MP	Fatal	Injury	PDO	Total	CRF		
		22.298	0	6	9	15	3.439		
		South Carrollton, intersection KY 81 (MP 22.398)							
	No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain				
	2	U	11	2	Rolling				
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS		
	3810	1.7	65	45	30	0.19	E		
	SPOT 2-11	From MP	Fatal	Injury	PDO	Total	CRF		
		22.398	0	6	8	14	2.758		
		South Carrollton, intersection KY 81 (MP 22.398)							
		HES 2-976, MP 22.4 - 22.7, Horz. & Vert. Realignment, shoulder widening, install guardrail							

	Does the HES project include the intersection at KY 81?												
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain								
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS						
SPOT 2-12	From MP	To MP	Fatal	Injury	PDO	Total	CRF						
	24.250	24.350	1	5	6	12	2.533						
	South Carrollton, just north of Power Plant Drive (MP 24.232)												
	HES 2-977, 23.9 - 24.1 and MP 24.3 - 24.5, Horz. & Vert. Realignment, shoulder widening, install guardrail												
	Muhlenberg County Judge Kirtley noted curve near KU plant												
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain								
	2	U	11	2	Rolling								
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS						
	5340	8.7	65	45	30	0.26	E						
	McLean County - No high crash segments												
	KY State Police, Henderson												
	From the levee at the Muhlenberg Co. line north to MP 1.5, widen and upgrade shoulders.												
	From MP 1.0 - 2.5, upgrade shoulders												
	From MP	To MP	Fatal	Injury	PDO	Total	CRF						
	0.000	4.354	2	13	11	26	0.341						

No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP			
2	U	12	2	Rolling	1.045	2.585			
2	U	12	2	Flat	0.000	1.045			
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP	
5420	8.7	70	45	75	0.26	E	2.485	2.500	
5840	8.7	70	45	75	0.28	E	2.100	2.485	
4070	8.7	70	45	75	0.20	E	1.980	2.100	
4070	8.7	70	55	75	0.20	C	1.045	1.980	
4070	8.7	70	55	100	0.18	C	0.000	1.045	
KY State Police, Henderson, recommend adding turning lanes at intersection with Main Street in Island									
See spot 2-13, is KY 85 the same as Main Street?									
SPOT 2-13	From MP	To MP	Fatal	Injury	PDO	Total	CRF		
	2.450	2.550	0	3	2	5	0.976		
Island, Intersection KY 85 (MP2.485)									
No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain					
2	U	12	2	Rolling					
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP	
5420	8.7	70	45	75	0.26	E	2.485	2.500	
5840	8.7	70	45	75	0.28	E	2.100	2.485	

KY State Police recommend shoulder upgrades between MP 5 and 11.6											
From MP	To MP	Fatal	Injury	PDO	Total	CRF					
6.038	11.573	0	29	47	76	0.650					
4.354	6.038	1	5	19	25	0.526					
No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP					
2	U	12	3	Rolling	8.250	11.573					
2	U	12	2	Rolling	3.045	8.250					
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP			
5900	not avail	70	55	60	0.29	D	10.507	11.573			
5900	not avail	70	55	0	0.29	D	9.852	10.507			
6620	not avail	70	55	60	0.32	D	8.300	9.852			
6620	not avail	70	55	80	0.32	D	8.265	8.300			
6000	7.0	70	55	80	0.29	D	6.770	8.265			
6000	7.0	70	45	80	0.29	E	6.650	6.770			
6000	7.0	70	45	0	0.29	E	6.280	6.650			
6170	7.0	70	45	0	0.30	E	6.038	6.280			
8360	7.0	70	45	0	0.36	E	5.800	6.038			
7370	7.0	70	45	0	0.36	E	5.530	5.800			
6650	7.0	70	45	0	0.32	E	5.185	5.530			
6650	7.0	70	55	0	0.32	D	4.954	5.185			
See spots 2-14 through 2-18.											
SPOT 2-14	From MP	To MP	Fatal	Injury	PDO	Total	CRF				
	5.450	5.550	0	1	5	6	1.035				

Livermore, Third Street Intersection, MP 5.516												
Livermore Mayor, Eldon Eaton supports widening due to business prospects it would bring to Livermore.												
Mayor Eaton notes that intersection at foot of Green River Bridge is probably most dangerous in the community.												
5 of the 6 crashes at this spot location were at the Third Street Intersection, MP 5.516.												
No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain								
2	U	12	2	Rolling								
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP				
6650	7.0	70	45	0	0.32	E	5.185	5.530				
6650	7.0	70	55	0	0.32	D	4.954	5.185				
SPOT 2-15	From MP	Fatal	Injury	PDO	Total	CRF						
	6.038	0	7	6	13	2.348						
Livermore, intersection KY 136 (MP 6.038)												
2-9.00, Reconstruct KY 136 intersection in Livermore												
No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain								
2	U	12	2	Rolling								
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS						
6170	7.0	70	45	0	0.30	E						
SPOT 2-16	From MP	Fatal	Injury	PDO	Total	CRF						
	8.265	0	3	6	9	1.557						
Intersection KY 1080 (MP 8.265)												
HES 2-972, Intersection KY 1080, Vert. Realignment and cutback embankment to improve sight distance												

	No. of Lanes	2	Divided/ Undivided	U	Lane Width	12	Shoulder Width	3	Terrain	Rolling								
	2003 ADT	6620	not avail		Design Speed	70	Posted Speed	55	% Passing Sight Dist	60	v/c	0.32	2003 LOS	D	From MP	8.300	To MP	9.852
		6620	not avail			70		55		80		0.32		D		8.265		8.300
	SPOT 2-17	From MP	To MP	Fatal	Injury	PDO	Total	CRF										
		9.300	9.400	0	3	4	7	1.211										
	Just north of intersection Barrett Hill Road (MP 9.262)																	
	No. of Lanes	2	Divided/ Undivided	U	Lane Width	12	Shoulder Width	3	Terrain	Rolling								
	2003 ADT	6620	not avail		Design Speed	70	Posted Speed	55	% Passing Sight Dist	60	v/c	0.32	2003 LOS	D				
	SPOT 2-18	From MP	To MP	Fatal	Injury	PDO	Total	CRF										
		9.800	9.900	0	4	3	7	1.272										
	Intersection KY 250 (MP 9.852)																	
	No. of Lanes	2	Divided/ Undivided	U	Lane Width	12	Shoulder Width	3	Terrain	Rolling								
	2003 ADT	5900	not avail		Design Speed	70	Posted Speed	55	% Passing Sight Dist	0	v/c	0.29	2003 LOS	D	From MP	9.852	To MP	10.507
		6620	not avail			70		55		60		0.32		D		8.300		9.852

Daviess County - One high crash segment:										
From MP 10.632 to 11.367 (Owensboro Bypass), CRF 2.174, including about 5 spots										
SPOT 2-19	From MP	To MP	Fatal	Injury	PDO	Total	CRF			
	2.599	2.699	0	4	6	10	1.108			
Intersection KY 140 (MP 2.599), Utica										
KY State Police, Henderson, recommend adding turning lanes at intersection KY 140										
No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain						
2	U	12	2	Rolling						
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS				
8990	not avail	70	55	0	0.39	D				
KY State Police, Henderson, recommend Horz. & Vert. Alignment and routine road repairs, north of Utica (MP 2.599?) to MP 5.0. Zero passing sight distance between MP 2.599 to 4.968 noted in table below.										
From MP	To MP	Fatal	Injury	PDO	Total	CRF				
0.000	10.632	4	48	89	141	0.471				
No. of Lanes	Divided/ Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP				
2	U	12	2	Rolling	0.000	4.968				
2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	From MP	To MP		
8990	not avail	70	55	0	0.39	D	2.599	4.968		
6930	not avail	70	55	36	0.34	D	1.287	2.599		
6930	not avail	65	55	25	0.34	D	0.000	1.287		

	29200	6.0	70	35	100	0.50	C	
SPOT 2-23	From MP	To MP	Fatal	Injury	PDO	Total	CRF	
	11.150	11.250	0	7	24	31	1.760	
	Just outside Owensboro Bypass, Int. Carlton Drive (MP 11.155)							
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain			
	4	D	12	10	Flat			
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	
	29200	6.0	70	35	100	0.50	C	
SPOT 2-24	From MP	To MP	Fatal	Injury	PDO	Total	CRF	
	11.267	11.367	0	13	47	60	2.681	
	Owensboro, interchange US 60, Owensboro Bypass (MP 11.367)							
	No. of Lanes	Divided/Undivided	Lane Width	Shoulder Width	Terrain	From MP	To MP	
	4	U	12	10	Flat	11.322	11.471	
	4	D	12	10	Flat	10.632	11.322	
	2003 ADT	Truck %	Design Speed	Posted Speed	% Passing Sight Dist	v/c	2003 LOS	
	29200	6.0	70	35	100	0.50	C	

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Central City, Kentucky

The meeting began at approximately 1:05 PM CT. Those attending were:

Gina Boaz	Green River ADD
Craig Morris	Pennyrile ADD
Lance Meredith	Barren River ADD
Kevin McClearn	KYTC-District 2-Planning
Nick Hall	KYTC-District 2-Planning
Everett Green	KYTC-District 2-Pre-Construction
Jeff Moore	KYTC-District 3-Planning
Allen Cox	KYTC-District3-Maintenance
James Simpson	KYTC-Central Office-Design
Wheeler Nevels	KYTC-Central Office-Maintenance
Steve Ross	KYTC-Central Office-Planning

Steve Ross opened the meeting with introductions and briefly discussed the results of the second team meeting and that the primary purpose of this third meeting would be to continue with the spot analysis. The team will look at more detailed information collected from police collision reports for those spots that required follow-up and/or additional information. The team will also identify any outstanding items necessary to complete the study report.

Recent Correspondence

Handouts were distributed to the team including a newspaper article discussing a push by Representative Yonts to four-lane US 431 throughout Kentucky, a letter of support for widening US 431 from Mayor Boarman of Whitesville and a letter of support and resolution for widening US 431 from Mayor Yassney of Russellville. Also included in the handout were the Cabinet's responses to those letters acknowledging the importance of US 431 and explaining that the potential for widening has been studied, but would be costly for the entire route and best accomplished over the long-term.

The goals of this study were revisited by the team, the primary goal being to improve safety with an emphasis on identifying high crash spots along the corridor that could be addressed with limited funding. It was discussed that the team has not confined itself to considering only safety when looking at improvement alternatives. Secondary goals established at the beginning of the study include improving access and connectivity.

Alternatives Development and Recommendations

A handout was presented to meeting attendees titled, "Alternatives Development and Recommendations." This handout listed the spot locations and descriptions from the second team meeting with additional notes in blue from a more detailed

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review of the crash data and police collision reports. The project team reviewed this updated information and made final recommendations for improvements at each location.

The team made a decision to prioritize the crash spots based on critical rate factor, rather than the “high, medium, low” method begun in the second team meeting. The crash data evaluated initially was from 2000–2002. In the follow-up evaluation for this meeting, crash data was also collected and evaluated for 2003–2004.

Two tables (separately attached Excel spreadsheets) summarize the spots/segments selected by the team and their recommendations. The first table lists spots/segments for Phase I, the southern phase, from the Tennessee state line to the Wendell H. Ford Western Kentucky Parkway. The second table lists spots/segments for Phase 2, the northern phase, from the Wendell H. Ford Western Kentucky Parkway to the Owensboro Bypass.

Given the large number of spots identified on US 431 through Central City, an additional bypass option was considered and discussed. This idea was finally rejected by the team for several reasons. Trucks that exceed 11'-4" vertical clearance can already bypass Central City on the west side via US 62 and KY 189. To extend this bypass south of the Parkway would likely require an unconventional interchange to avoid much of the existing development in that area. A bypass on the east side of town would have to avoid a correctional facility, mine lands, wetlands and the Green River. The difficulty and cost of an additional or improved bypass if not unfeasible, would likely exceed the cost of the combined spot improvements.

Cost Estimates

It was discussed that cost estimates would need to be developed for the improvements recommended by the team. A letter will go out to each District requesting these estimates after this meeting. Estimates will need to be broken down by Design, Right-Of-Way, Utility Relocation and Construction phases.

Outstanding Items

There were no additional items brought forward for consideration by the team.

The meeting adjourned at 4:00 PM CT.

AGENDA

US 431
3rd Team Meeting
Career Advancement Center
Central City, KY
1-4 PM CT
November 1, 2005

- Welcome and Introductions
- Recent Correspondence
- Review updated/detailed crash information from police collision reports and update recommendations and prioritizations for safety improvements.
- Request cost estimates for safety improvements.
- Identify any other outstanding items necessary to complete the
- Adjourn

Alternatives Development and Recommendations
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Alternatives Development and Recommendations, Phase I

Spot 1-1, Logan County, MP 1.485 - 1.585 [KY591](#)

The location of this spot is the KY 591 intersection in Adairville. The critical crash rate factor, CRF, was 0.917. This is a 4-way stop that has had several unusual accidents involving driver inattentiveness. Buildings are located very close to the roadway and the intersection is located at the northwest corner of the town square. Improvements here would be difficult to implement. No recommendations short of a bypass were recommended by the project team.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Intersection CRF: 0.53 (2000-2002)

Spot 1-2, Logan County, MP 13.796 - 13.896

The location is the intersection of US 79 in Russellville. The critical rate factor was 1.076. Problems include a high volume of traffic and trucks with tight turning radii at the intersection, business entrances located close to the intersection and properties located close to the roadway. The US 431 southern bypass project in Russellville will address the problems associated with this intersection by reducing traffic volume and providing trucks an alternate route.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-3, Logan County, MP 23.900 - 24.000

The location is Lewisburg, between KY 107 and KY 106. The critical rate factor was 1.258. This location will be addressed as a result of the Epleys to Lewisbug, US 431 reconstruction project, Item No. 3-273.00.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-4, Logan County, MP 29.952 – 30.052 [Hollow Bill](#)

The location is Hollow Bill, just north of HW McPherson Road. The critical rate factor was 1.618. Five of the six collisions at this spot were during bad weather conditions (wet or icy roads) on curves. The District and ADD personnel noted a history of crash problems at this location including a multiple fatality. This spot is also within the limits of a project listed on the Unscheduled Projects List (UPL) for relocation and assigned a medium (Local, ADD and District) priority. The terrain is rough in this area and the only conceivable improvement would be total reconstruction to improve the horizontal and vertical geometry.

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Preliminary Team Recommendation: **Assign High Priority to reconstruct as described in the UPL from MP 28.900 to MP 31.050** (Logan/Muhlenberg County Line).

[Spot 1-4a](#), MP 31.043, Logan County - Added Spot [KY 1293](#)

This location was recommended to be added to the list by District 3 personnel and is located at the intersection with KY 1293, almost on the Logan/Muhlenberg County line. While the CRF was not greater than 1.00 at this location, District 3 personnel noted poor sight distance and a potential for crashes.

Preliminary Team Recommendation: **Assign medium priority for intersection improvements.**

Intersection CRF: 0.23 (2000-2002) not a typo – same as spot 1-5 at KY 973

This spot would be included within the limits (MP28.9 – 31.05) noted above for spot 1-4.

[Spot 1-5](#), Muhlenberg County, MP 0.364 – 0.464 [KY 973](#)

This spot is located at the intersection of KY 973. Only four crashes were cited here for a CRF of 0.983. None of the crashes involved fatalities. The team agreed that four crashes over a three-year period are probably not statistically significant.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study. *Reconsider, see below.*

Suggest revise limits to include cluster of intersections in Dunmor between MP 0.4 and 0.559. There were 7 crashes in this segment in 2003-2004

7 Total crashes (3injury, 4 PDO) 2003-2004

2 Angle (1 injury, 1 PDO)

One at the intersection of Elm St., vehicle crossing westbound

One pickup pulling small trailer pulling from side street (Oak St?) onto northbound US 431 into path of southbound vehicle

2 Sideswipe opposite direction (2 PDO)

One of these was attempting to turn left on KY 973

2 Single vehicle (1 injury, 1 PDO)

Both eastbound on KY973, failed to stop at US 431

1 Rear end (injury)

Pulled from driveway onto northbound US 431(immediately north of curve) into path of northbound vehicle coming out of left hand curve.

CRF: 2.384 (2003-2004) Segment MP 0.4 – 0.599.

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Intersection CRF: 0.23 (2000-2002) not a typo – same as spot 1-4 at KY 1293. This includes only the intersection at KY 973 – does not include the other driveways and intersections within the noted segment.

Suggest intersection improvements to KY 973 combined with access control to reduce number of conflict points at this cluster of intersections and driveways between MP 0.4 and 0.559.

Spot 1-6, Muhlenberg County, MP 3.400 – 3.500

Six crashes were documented at this spot. The CRF was 1.688. This spot includes one narrow bridge carrying US 431 over Rocky Creek. The bridge width is 21.5 feet. Four of the six crashes were “sideswipe-opposite direction.” No injury or fatality crashes were documented. This bridge has been identified for replacement under HES 02-984 and accepted, but not a high priority.

Preliminary Team Recommendation: **Assign high priority to replace or widen Rocky Creek Bridge.**

MP 3.634, Muhlenberg County - Added Spot

This is the location of a bridge carrying US 431 over Rocky Creek Branch, immediately north of the preceding spot location. The bridge is similar to the Rock Creek bridge and is also only 21.5 feet wide.

Preliminary Team Recommendation: **Assign medium priority to replace or widen Branch of Rocky Creek Bridge.**

Spot 1-7, Muhlenberg County, MP 3.930 – 4.030

This spot is about one mile south of Union Ridge Road and had a CRF of 1.688. Four of the six total crashes were “run-off-road” crashes. Also, four occurred during wet, dark conditions. Lencie Meredith noted that this is often indicative of an edgeline problem (worn/faded or nonexistent). If there is an existing edgeline and it is in good condition (reflective), then this type of crash problem could instead be due to geometry.

Preliminary Team Recommendation: Assign low priority to realign/widen. Follow-up is necessary to first determine existence/condition of edgeline and roadway geometry.

This section of road does have edge lines. Four crashes involved vehicles rounding curve and then seeing vehicles stopped or slowed resulting in run-off-road type crashes to avoid rear end collision. Three of these were during wet conditions. Suggest keep team’s recommendation to realign/widen.

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MP 6.0 – 7.0, Muhlenberg County

This segment was noted by Kentucky State Police Post 2 (Madisonville) as a high crash site. Crash data did not support this and the project team could not identify any obvious problem.

Preliminary Team Recommendation: Do nothing unless follow-up identifies an obvious problem.

[Spot 1-7a, Muhlenberg County, MP 6.146 – 6.246](#)

5 Total crashes, (2 injury, 3 PDO) 2000-2002

2 Head-on (2 injury)

Both were southbound vehicles that crossed centerline.

2 Single vehicle (2 PDO) Both were tractor-trailers

Northbound tractor trailer lost load of 5 steel beams into guard rail.

Southbound tractor trailer dropped off road into ditch and

overcorrected (said was run off road by southbound pickup truck)

1 Sideswipe opposite direction (PDO)

Passenger vehicles swapped mirrors.

CRF: 1.406

There were no crashes within this spot during 2003-2004. Immediately south at MP 5.964, there was a fatal head-on crash where a northbound pickup truck lost control on a wet road in a curve and crossed into the southbound lane. The only other crash during this time period in the vicinity was at MP 5.972 where a northbound motorcycle in a curve, on a dry road, ran off the road, not under proper control.

Some of these crashes may have occurred at the curve in Belton if they were not located precisely in the collision report. Suggest realignment from MP 5.96 to the MP 6.2 if not already addressed by improvements associated with Belton Curve project, 02-900.00 (between MP 6.2 and 6.4).

Spot 1-8, Muhlenberg County, MP 6.3 – 6.4 [Curve at Belton](#)

This tight curve in Belton is known locally as “**Dead Man’s Curve**,” the site of recent fatalities and has already undergone improvements to correct sight distance deficiencies. There were eight total crashes for a CRF of 2.25. More work is scheduled for 2006 to **widen the roadway and realign the curve under HES 2-900.**

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

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Spot 1-8a, Muhlenberg County, MP 6.964, Intersection KY 2270

Total 3 crashes 2000-2002 (1 injury, 2 PDO)

1 Rear end (injury) northbound at intersection KY 2270

1 Angle (PDO) vehicle pulled from gas station into path of southbound vehicle

1 Single vehicle (PDO) Fell asleep.

Total 2 crashes 2003-2004 (2 PDO)

2 Angle (2 PDO)

Eastbound Unit 1 pulled into intersection into path of southbound Unit 2.

Unit 1 turning northbound from driveway into path of south bound unit 2.

Intersection CRF: 0.68 (2003-2004) This number would be skewed high due to two crashes being incorrectly located at this spot in the crash records.

Crashes predominantly due to inattention. There is a gas station at the northeast corner of the unsignalized intersection with KY 2270.

No suggested improvements at this location.

Spot 1-9, Muhlenberg County, MP 7.420 – 7.520

Located between KY 2270 and KY 246, this spot had a CRF of 1.125 due to only four crashes over a three year period. No fatalities or injuries were cited. The project team had no additional information for this location and agreed that four crashes over a three-year period are probably not statistically significant.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-10, Muhlenberg County, MP 7.950 – 8.050 [KY 246](#)

This spot at the intersection of KY 246 had a total of 10 crashes for a CRF of 2.813. Three of these collisions were “rear end” and another three were “angle” collisions. Team members noted bifurcated turn lanes on KY 246 and a gas station on one of the corners possibly contributing to the crashes. They also noted that this intersection is just south of the Hughes-Kirk Elementary School.

Preliminary Team Recommendation: **Assign high priority for intersection improvements.**

Intersection CRF: 1.28 (2000-2002)

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Spot 1-11, Muhlenberg County, MP 8.950 – 9.050

This spot, just south of Sylvania Street had six total crashes for a CRF of 1.186. Three of the crashes were “angle” collisions. The team noted no apparent problems at this location. They also noted that this may be just south of the proposed site of the new Beechmont-Browder Elementary School.

Preliminary Team Recommendation: Assign low priority and investigate further for improvement recommendations.

One of these crashes was a duplicate. One was fluke where the wheel came off a pickup truck. One was an animal collision. One involved a driver who fell asleep. Another was mislocated. The remaining crash was an angle collision where unit 1 was westbound on Sylvania turning left onto US 431, pulled into path of southbound unit 2. There were only two crashes recorded for 2003-2004, both of these were single vehicle run-off-road.

There are a cluster of intersections in this area and Sylvania Street intersects on a heavy skew. However, collision reports do not indicate problems at this spot. Suggest either keep on list at a low priority to realign Sylvania and control access, or remove from list.

Spot 1-12, Muhlenberg County, MP 9.734 – 9.834 [KY 70](#)

This spot in Browder includes the intersection of KY 70. There were nine total crashes for a CRF of 1.665. Three of the crashes were “angle” collisions and two were “rear end.” Team members noted that this intersection has bifurcated turning lanes on the east approach of KY 70. This is also within the limits (MP 8.0 – 9.90) of a location noted by Kentucky State Police Post 2 (Madisonville) for consideration as a possible high crash site.

Preliminary Team Recommendation: **Assign High priority for intersection improvements.**

Intersection CRF: 1.21 (2000-2002)

Spot 1-13, Muhlenberg County, MP 10.222 – 10.322

This spot located north of KY 70 had six total crashes for a CRF of 4.076. Three of these crashes were “sideswipe-opposite direction” and three were “single vehicle” collisions. Team members noted sharp, reverse curves in this area.

Preliminary Team Recommendation: Assign Medium priority to reconstruct to correct horizontal alignment. Follow-up to check length of proposed reconstruction.

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Two of the single vehicle crashes were deer collisions. The other single vehicle was a northbound pickup that ran off the road. Two of the sideswipe collisions involved vehicles swapping mirrors. One of these involved a coal truck. The remaining sideswipe also involved a dump truck. All were during dry conditions.

*4 Total crashes not including deer collisions.
Revised CRF: 0.717 (2000-2002)*

No crashes were recorded for this spot in 2003-2004.

Suggest keeping team recommendation for realignment but consider lowering the priority. Limits of the series of reverse curves are between MP 10.2 and 10.7. Topography will be an issue.

Spot 1-14, Muhlenberg County, MP 11.400 – 11.500 [KY 176](#)

This spot includes the intersection of KY 176 in Drakesboro and had 10 crashes for a CRF of 1.71. Team members noted that this is a signalized intersection with no turn lanes and a “Pantry” store on the corner. Southbound coal trucks on US 431 turn eastbound on KY 176 to serve the Paradise Steam Plant. Muhlenberg High School is also accessed from this location by traveling westbound on KY 176. Five of the 10 crashes at this spot were “angle” collisions.

Preliminary Team Recommendations: **Assign Medium priority for intersection improvements.**

Intersection CRF: 1.00 (2000-2002)

*13 Total crashes 2003-2004 (4 injury, 9 PDO)
4 Left turns
3 Rear end
3 Single vehicle (includes 2 DUI)
3 From private entrance*

CRF: 2.833 (2003-2004)

Suggest keeping team recommendation for intersection improvements. Consider high priority.

Spot 1-15, Muhlenberg County, MP 11.982 – 12.082 [KY2107](#)

This spot includes the KY 2107 intersection. There were a total of six crashes for a CRF of 0.908. Three of the crashes were “angle” collisions, two were “head on” and one was an “opposing left turn.” This spot is within the limits (MP 11.0 – 12.10) of a location noted by Kentucky State Police Post 2 (Madisonville) for consideration as a possible high crash site.

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Preliminary Team Recommendations: **Assign Low priority for intersection improvements.**

One of the recommendations of Kentucky State Police (KSP) Post 2 (Madisonville), was to place additional signage upon approach to “high crash zones” stressing extra caution. Project team members noted that placing these types of signs is a liability problem and not an acceptable solution to addressing safety issues. Team members also recommended addressing this comment in the report write-up with an explanation as to why KSP’s recommendation for warning signs could not be implemented.

Intersection CRF: 0.29 (2000-2002)

Spot 1-16, Muhlenberg County, MP 14.096 – 14.196

This spot is located approximately one mile south of Cleaton Road. There were a total of six crashes for a CRF of 0.908. **Half of these crashes were coded “collision with animal.”**

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-17, Muhlenberg County, MP 15.150 – 15.250

This spot is at the intersection of Cleaton Road. There were a total of nine crashes for a CRF of 1.464. Three of these crashes were “angle” collisions, two were “rear end” and two were “sideswipe-same direction.” Team members noted that there is a railroad grade-separation project planned north of this location, but it will probably not extend to this intersection.

Preliminary Team Recommendation: **Assign Medium priority for intersection improvements/turn lanes.**

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Spot 2-1, Muhlenberg County, MP 17.400 – 17.500 *Parkway Interchange*

This spot includes the Wendell H. Ford Western Kentucky Parkway interchange. There were a total of seven crashes for a CRF of 1.723. Two of the crashes were “vehicle entering/leaving entrance” and two were “angle” collisions. With four, twelve-foot lanes and ten-foot shoulders, the roadway section as well as the geometry are good at this location.

Preliminary Team Recommendation: **Assign Low priority to reconstruct interchange as a long-term recommendation.**

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The following Spots, 2-2 through 2-8, are located within Central City, are very closely spaced, share common features and problems, and may need to be considered as one complete segment for improvement recommendations.

Spot 2-2, Muhlenberg County, MP 17.912 – 18.012 [Section change north of Parkway Interchange](#)

This spot located within Central City had ~~seven~~ total crashes for a CRF of ~~1.019~~. According to HIS records, this spot includes a transition from 10-foot to 2-foot shoulders. Three of the crashes recorded at this location were “rear end,” ~~two were “opposing left turn”~~ and two were “sideswipe-same direction.” Team members also noted an ~~overhead railroad bridge~~(See Spot 2-5 for RR overpass) nearby that trucks sometimes impact resulting in traffic delays.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

*5 Total crashes (2 injury, 3 PDO)
3 Rear end (1 injury, 2 PDO)
2 Sideswipe same direction (1 injury, 1 PDO)*

Revised CRF: 0.728

Roadway section narrows just north of interchange in this spot. Vehicles either stopped to make turns off US 431 or turning left onto US 431. Entrances to Pizza Hut and Fast Eddy’s were noted in reports. One pedestrian hit while adjusting tie-downs while parked on shoulder. Other than this instance, there was no indication of any parking along US 431 noted in the collision reports.

CRF is less than one. No suggestions for short term improvements.

Kentucky State Police Post 2 (Madisonville) noted crash problems between MP 18.24 and 19.117 which includes Spots 2-3 through 2-8.

Spot 2-3, Muhlenberg County, MP 18.265 – 18.365 [Everly Brothers Blvd. \(US 62\) and W. Stroud Lane](#)

This spot located within Central City had 28 total crashes for a CRF of 3.247. This spot includes the intersection of Strouds Lane and according to HIS records is where a 2-foot shoulder transitions to curb-and-gutter. There were 10 “angle” collisions and eight “rear end” collisions recorded at this spot.

Preliminary Team Recommendation: Assign Medium/High priority for intersection improvements.

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25 Total crashes (4 injury, 21 PDO)

11 Angle (2 injury, 9 PDO)

8 Rear end (2 injury, 6 PDO)

3 Sideswipe same direction (3 PDO)

2 Backing (2 PDO)

One to allow tractor-trailer to turn.

One tractor-trailer rolled back – driver out of vehicle.

1 Single Vehicle (PDO) Fell asleep and ran off road.

Revised CRF: 2.899

Intersection CRF: 1.62 (US 62) (2000-2002)

6 Crashes involved tractor-trailers. 4 of the six were making wide turns (3 at Everly Brothers Blvd.)

Turning movements and rear end collisions at intersections and entrances were noted – crashes primarily due to inattention. Entrances to Wendy's and McDonald's both noted along this spot. US 62 is signalized with turn lanes.

No specific short term recommendations beyond team's suggestion for intersection improvements. Consider high priority given the CRF.

Spot 2-4, Muhlenberg County, MP 18.378 – 18.478 [Harrison Avenue](#)

This spot located within Central City had a total of ~~17~~ crashes for a CRF of ~~4.657~~. This spot includes the intersection of Harrison Avenue. There were ~~10~~ "angle" collisions and three "rear end" collisions recorded at this spot.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

15 Total crashes (3 injury, 12 PDO)

11 Angle (3 injury, 8 PDO)

2 at Harrison St.

9 remaining were all leaving parking lots from: Ponderosa, Dairy Queen, IGA, Old National Bank (exiting from the entrance only lane), etc., to enter US 431

3 Rear end (3 PDO)

1 Single vehicle (PDO) at Harrison, tire blew out.

Revised CRF: 1.462

From Harrison Avenue, MP 18.392, north to the Railroad overpass, MP 18.525, there is strip development (KFC, Dairy Queen, Dollar Store, etc.) and a two-way

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left-turn lane (length: 0.13 mile). There are numerous access points and driveways into parking lots, but no parking directly along US 431.

No large numbers of crashes noted at Harrison, which is unsignalized. The majority of crashes are for vehicles exiting parking lots from the multiple access points along US 431.

Suggest access management to reduce number of access points along US 431.

Spot 2-5, Muhlenberg County, MP 18.479 – 18.579 *Railroad Overpass*

This spot located within Central City had a total of ~~17~~ crashes for a CRF of ~~1.627~~. There were ~~seven~~ “single vehicle,” four “rear end,” three “angle,” and ~~three~~ “head on” collisions.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

20 Total crashes (2 injury, 18 PDO)

*13 Single vehicle (13 PDO) All were trucks that hit RR overpass.
(8 northbound, 5 southbound)*

4 Rear end (4 PDO)

3 Angle (2 injury, 1 PDO)

Revised CRF: 1.914

From Harrison Avenue, MP 18.392, north to the Railroad overpass, MP 18.525, there is strip development (KFC, Dairy Queen, Dollar Store, etc.) and a two-way left-turn lane (length: 0.13 mile). There are numerous access points and driveways into parking lots, but no parking directly along US 431.

Nearly two-thirds of the crashes at this spot were trucks hitting the railroad overpass. The nine over-height trucks that hit the overpass blamed inattention, misreading the warning signs, and not noticing the warning signs in time to stop.

Suggest adding warning signs further in advance of the overpass with greater visibility. Also consider tell-tales.

Spot 2-6, Muhlenberg County, MP 18.670 – 18.770 *E. Broad St. (KY 70) & Morehead St.*

This spot located within Central City had a total of ~~40~~ crashes for a CRF of ~~1.197~~. This spot includes the intersection of KY 70. There were four “angle,” three “rear end,” ~~two~~ “head on,” and one “sideswipe-same direction” collisions.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

9 Total crashes (3 injury, 6 PDO)

4 Angle (4 PDO)

2 crashes, northbound vehicle avoided rear end with vehicle turning right onto Morehead St.

1 crash, northbound emergency vehicle turning left onto Broad through red light.

1 crash, vehicle exiting Methodist Church Parking lot (southeast corner of US 431 and Broad St.)

3 Rear End (2 injury, 1 PDO)

(1 at Broad southbound, 1 at Broad northbound, 1 at Morehead southbound)

1 Sideswipe Same Direction (PDO)

Northbound vehicle swung left prior to making right turn onto Morehead St (not a truck). Second unit pulled along right side and was sideswiped.

1 Head-on (injury)

Northbound Unit 1 passed left turning Unit-X on the right and hit southbound unit 2 turning left onto Morehead St.

Revised CRF: 1.317 includes E. Broad St. (KY 70) and Morehead St.

Intersection CRF: 0.34 (2000-2003) Includes E. Broad St. (KY 70) only.

Broad St. (KY 70) is signalized with left turn lanes. Morehead St. is unsignalized without turn lanes. There appears to be some difficulty for vehicles when northbound, making the right turn at Morehead Street. Three crashes involved right turning vehicles at this location. One was sideswiped while swinging wide. There does not appear to be parking along US 431 at this spot.

Suggest intersection improvements at Morehead St. including turn lanes.

Spot 2-7, Muhlenberg County, MP 18.862 – 18.962 [East Reservoir St. \(KY 277\)](#)

This spot located within Central City had a total of ~~15~~ crashes for a CRF of ~~2.399~~. This spot includes the intersection with KY 277. There were seven “rear end” and six “angle” collisions. Team members noted this was a signalized intersection and is aligned on a skew with commercial businesses located on the corners. They also noted that this may be a location where traffic approaches the intersection over a crest vertical curve with limited sight distance resulting in rear end crashes.

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Preliminary Team Recommendation: Assign Medium/High priority for intersection improvements.

14 (4 injury, 10 PDO)

7 Rear End (2 injury, 5 PDO)

4 northbound, 2 southbound, 1 eastbound

5 Angle (2 injury, 3 PDO)

4 ran red light (2 of these were southbound, 2 were westbound)

Remaining angle collision was eastbound in right turn lane, pulled into path of southbound vehicle. (Attempting to cross into Scott Market?)

1 Single Vehicle (PDO) pedestrian ran into street, arm hit mirror

1 Sideswipe Same Direction (PDO) avoiding rear end collision

Revised CRF: 2.239

Intersection CRF: 1.52 (2000-2002)

Nearly one-half of the crashes were rear-end collisions, predominantly northbound (due to crest vertical curve south of intersection?). Over one-quarter of the crashes involved drivers running a red light (none of these were northbound). Scott Market (Southeast corner, access to US 431 immediately south of intersection, with gas pumps) is one of the businesses noted in the reports. Islands dividing right turning movements are located on Reservoir Street. One collision report sketch appeared to show a vehicle using the right turn lane from eastbound Reservoir Street to cross US 431 immediately south of the intersection to access Scott Market.

Suggest keeping team's original recommendation for intersection improvements. As part of these improvements, consider constructing median to stop crossing movements into businesses from the right turn lanes off Reservoir Street. Consider northbound approach beacons at crest of hill south of intersection synchronized with traffic light.

Spot 2-8, Muhlenberg County, MP 19.062 – 19.162 [Pendleton Street](#)

This spot located in Central City had a total of ~~six~~ crashes for a CRF of ~~4.075~~. All six crashes were "rear end, both vehicles moving" type crashes. Team members had no additional input on this location.

Preliminary Team Recommendation: Follow-up with further investigation as to spot conditions and possible crash causes. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

5 Total Crashes (1 injury, 4 PDO)

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*5 Rear End (1 injury, 4 PDO)
(3 southbound, 2 northbound)*

Revised CRF: 0.896

This is the signalized intersection at Pendleton Street. All crashes occurred during daylight hours during clear conditions on a dry, straight and level road. These were all typical rear end type crashes in traffic caused by following too closely and inattention.

Suggest for short term: Intersection improvements (add turn lanes) Long term: Bypass.

Spot 2-9, Muhlenberg County, MP 21.430 – 21.530 [Phillip Stone Way \(KY189\)](#)
This spot located in South Carrollton includes the intersection with KY 189. There were **five** total crashes for a CRF of **4.498**. Two of the crashes were “sideswipe-same direction.” Team members noted that there may be left turn lanes on all approaches at this intersection.

Preliminary Team Recommendation: Assign Low priority for intersection improvements.

*4 Total Crashes (4 PDO)
2 Sideswipe same direction
(One trying to pass in emergency lane)
1 angle
(Tried to pass left turning vehicle)
1 Single Vehicle
(DUI)*

*Revised CRF: 0.958
Intersection CRF: 0.56 (2000-2002)*

There were only two crashes at this location during 2003-2004. One of these was a fatality. In that fatal crash, southbound unit one tried to pass and met northbound unit 2 head-on. This occurred at 2:06 PM in November. It was raining.

There are left turn lanes, full shoulders and one merge ramp. The intersection appears to be in good shape and collision reports don't indicate a problem the roadway.

Suggest remove from of list.

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MP 22.0 to 24.347, Muhlenberg County

Kentucky State Police Post 2 (Madisonville) identified this segment as worthy of consideration as a high crash site. This segment includes the Spots 2-10 through 2-12. Improvements to this segment will be addressed by the spot improvement recommendations that follow.

Spot 2-10, Muhlenberg County, MP 22.298 – 22.398

This spot located in South Carrollton includes the intersection with KY 81. There were 16 total crashes at this location for a CRF of 3.669. There were seven “rear end” crashes included in the total. Team members noted that HES project 2-976 begins just north of this spot (MP 22.4 – 22.7) and does not include the KY 81 intersection.

Preliminary Team Recommendation: **Assign High priority for intersection improvements.**

Spot 2-11, Muhlenberg County, MP 22.398 – 22.498

This spot located in South Carrollton begins at the KY 81 intersection. There were ten total crashes for a CRF of 1.97. Four of the crashes were “single vehicle,” two were “angle” collisions and two were “rear end.” This spot is included in [HES project 2-976](#) for horizontal and vertical realignment, shoulder widening, and guard rail installation. This project does not include improvements to the intersection at KY 81.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-12, Muhlenberg County, MP 24.250 – 24.350

This spot located in South Carrollton is just north of Power Plant Drive. There were 12 total crashes for a CRF of 2.533. 10 of the crashes were “single vehicle” type collisions. Muhlenberg County Judge Kirtley noted the curve near the Kentucky Utilities plant as a location to consider for improvements. Team members noted that **HES project 2-977** was originally two projects with the following limits: MP 23.9 – 24.1 and MP 24.3 – 24.5. These two projects were combined for horizontal and vertical realignment, shoulder widening, and guardrail installation. This spot will be addressed by this project.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

MP 0.0 – 1.5 and MP 1.0 – 2.5 (overlap noted), McLean County

Kentucky State Police (Henderson) recommended a segment in McLean County from the levee at the Muhlenberg County line north to MP 1.5 for widening and shoulder upgrade; and from MP 1.0 to 2.5 for shoulder upgrades. The team

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looked at the crash data for the segment from 0.000 to 4.354 and noted 26 total crashes for a 0.341 CRF. This data included two fatalities over that 3 year period. Project team members noted that the roadway sits up high on a narrow fill with deep ditches on each side. HIS data show 2-foot shoulders. Shoulder upgrades would involve bringing in large amounts of additional fill material given the height of the existing fill and length of the segment.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.** The study team considered recommending guard rails for this segment but decided against that recommendation. The reasoning was that there is a low CRF and the addition of guard rails on such a narrow segment of road would have a confining effect and could cause some drivers to “hug” the centerline, with the potential for head-on collisions and additional fatalities.

Spot 2-13, McLean County, MP 2.450 – 2.550

This spot located in Island includes the intersection with KY 85. There were five total crashes for a CRF of 0.976. Three of the crashes were “angle” collisions. Team members noted that this intersection is “Old” KY 85 and not the bypass that was recently constructed. Kentucky State Police (Henderson) recommended adding turning lanes at the intersection with Main Street in Island.

Preliminary Team Recommendation: Assign Low priority for intersection improvements.

Intersection CRF: 0.44 (2000-2002)

Three of the five crashes involved vehicles pulling out from KY 85, failing to stop and/or yield.

*2003-2004 crash data show 3 total crashes (1 fatal, 1 injury, 1 PDO)
2 angle (1 injury, 1 PDO)
1 single vehicle (fatal)*

The fatal crash involved a northbound vehicle that ran off the road and overcorrected, rolling four times. Conditions were clear and dry, daylight (10:20 AM) and a straight segment of road.

Both of the 2003-2004 angle collisions involved drivers who pulled out into US 431 from KY 85. One driver stated he thought the intersection was a 4-way stop.

Suggest keeping original team recommendation for intersection improvements, possibly including signing improvements.

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MP 5 – 11.6, McLean County

Kentucky State Police recommend shoulder upgrades on this segment of US 431. The team looked at crash data and noted no particularly high CRF's from segment analysis. However, Spots 2-14 through 2-18 are included within this segment's limits. **Improvements to this segment will be addressed by the spot improvement recommendations that follow.**

Spot 2-14, McLean County, MP 5.450 – 5.550

This spot in Livermore includes the Third Street intersection. There were six total crashes for a CRF of 1.035. Five of the six crashes at this spot were at the Third Street intersection. Four crashes were "rear end" collisions and two were "angle" collisions. Mayor Eaton noted in a response to our Resource Agency Coordination request for information that the intersection at the foot of the Green River Bridge is probably the most dangerous in the community. Livermore Mayor Eaton supports widening due to business prospects it would bring to Livermore. Team members noted that there is poor access control (continuous entrances from road to gas station and other businesses) at this location ~~and that there is no one particular intersection causing problems from the bridge north~~. This location was recently converted from 2-lane to 3-lane and team members suggested evaluating updated crash data that applies to this reconstructed section.

Preliminary Team Recommendation: Assign Medium priority for 3-lane curb and gutter improvements with access control. Evaluate updated crash data for the reconstructed section.

Crashes north of the bridge are bunched at the Third Street intersection. This is a T-intersection (the stem is Third Street on the west side of US 431). Aerial photograph shows opposite Third Street, across US 431 on the east side, is a gas station (Sam's) with an extended parking lot with continuous access. The access along the east side of this intersection may no longer be the same depending on the reconstruction that has been done.

2003-2004 crash data show only 3 crashes at this location:

*1 Angle (injury)
2 Rear End (0 injury, 2 PDO)*

2005 – No crashes have been recorded as of September 30.

Suggest that if reconstruction has addressed access problems at this intersection, then remove from list. Otherwise, keep original team recommendation for 3-lane curb and gutter with access control.

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Spot 2-15, McLean County, MP 6.038 – 6.138

This spot in Livermore includes the intersection with KY 136. There were 13 total crashes for a CRF of 2.348. Six of the crashes were “rear end” collisions and four were “angle” collisions. This location is currently under construction to be completed in May or June of 2005 under **KYTC Item No. 2-9.00**.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-16, McLean County, MP 8.265 – 8.365

This spot includes the intersection with KY 1080. There were nine total crashes for a CRF of 1.557. This spot is within the limits of **HES project, 2-972**, to cut back embankments to improve sight distance and add left turn lanes on US 431 at KY 1080.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-17, McLean County, MP 9.300 – 9.400 [Congested area north of Barrett Hill Rd.](#)

This spot is located just north of the intersection of Barrett Hill Road. There were seven total crashes for a CRF of 1.211. Three of the crashes were “angle” collisions. Team members had no additional information immediately available on this spot.

Preliminary Team Recommendation: Assign Low priority for intersection improvements. Conduct more detailed analysis of crashes and reevaluate.

<i>7 Total Crashes</i>	<i>(3 injury, 4 PDO)</i>
<i>3 Angle</i>	<i>(1 injury, 2 PDO) one involved tire failure</i>
<i>2 Single Vehicle</i>	<i>(1 injury, 1 PDO) both hydroplaned</i>
<i>1 Rear End</i>	<i>(PDO)</i>
<i>1 Head On</i>	<i>(injury) avoiding rear end collision</i>

CRF: 1.211

Police collision reports indicate this is not an intersection problem, but involves vehicles turning and/or stopped waiting to turn, at a short, busy segment of road with no less than eight driveways (four on each side of US 431) immediately north of the Barrett Hill Road intersection. Aerial photograph suggests heavy commercial, industrial or agricultural activity at this location.

Suggest access improvements. Also suggest investigating drainage/pavement improvements to address hydroplaning. Note further mention of hydroplane incidents in following descriptions.

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Spot 2-18, McLean County, MP 9.800 – 9.900 [KY 250](#)

This spot includes the intersection with KY 250. There were ~~seven~~ total crashes for a CRF of ~~4.272~~. Four of the crashes were “rear end” collisions. Team members noted that this is a residential area with Buck Creek Baptist Church and a business (ADS Pipe) located near the intersection. They also noted that many students take KY 250 westbound to high school in Calhoun via this intersection.

Preliminary Team Recommendation: Assign Low/Medium priority for intersection improvements. Conduct more detailed analysis of crashes and reevaluate.

6 Total Crashes (3 injury, 3 PDO)

<i>4 Rear End</i>	<i>(2 injury, 2 PDO)</i>
<i>1 Single Vehicle</i>	<i>(injury) hydroplane</i>
<i>1 Angle</i>	<i>(PDO) avoiding rear end collision</i>

Revised CRF: 1.091

Intersection CRF: 0.60 (KY 250 only)(2000-2002)

This spot includes two T-intersections, offset: The south-most is the west leg, KY 250; the north-most is the east leg, Buck Creek Church Road. On the east side of US 431, across from KY 250 is a parking lot for Buck Creek Baptist Church.

Five of the six crashes involved stopped vehicles waiting to turn.

Suggest realigning intersection and adding turn lanes. Also suggest eliminating church parking access directly off US 431. Also suggest investigating drainage/pavement improvements to address hydroplaning. Note further mention of hydroplane incidents in following descriptions.

Spot 2-19, Daviess County, MP 2.599 – 2.699 [KY 140](#)

This spot in Utica includes the intersection with KY 140. There were ~~40~~ total crashes for a CRF of ~~4.408~~. ~~Three~~ of the crashes were “angle” collisions, three were “single vehicle,” two were “rear end,” ~~and two~~ were “head on.” There are flashing beacons at this intersection and a Citgo Station on one corner. Team members noted a sight distance problem when approaching from the ~~east~~ on KY 140, that it is necessary to pull up close to US 431 in order to see. It was also noted that there is a historical marker just north of this intersection at the site of a Civil War skirmish. According to the Environmental Overview prepared for this study, this site has not been assessed for National Register potential.

Preliminary Team Recommendation: Assign Medium priority for intersection improvements and turning lanes.

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13 total crashes	(6 injury, 7 PDO)
7 Angle	(5 injury, 2 PDO)
3 Single Vehicle	(0 injury, 3 PDO) (2 hydroplane)
2 Rear End	(1 injury, 1 PDO)
1 Head On	(0 injury, 1 PDO)

Revised CRF: 1.441
Intersection CRF: 0.99 (2000 – 2002)

This is the intersection with KY 140. The intersection has flashing beacons and there is a Citgo Station on the northeast corner. An embankment on the southwest corner obstructs views to the south from the west leg. There is also a slight skew to the intersection adding to the difficulty in getting a good view looking south from the west leg. Five of the crashes involved an eastbound vehicle pulling into the path of a northbound vehicle (One of these was listed as a single vehicle because the northbound driver ran off the road to avoid the collision. The other four were angle collisions. Two of these resulted in injuries).

Note the two hydroplane crashes and see write-up in the next segment for MP 2.599 – 4.968 regarding other hydroplane crashes in this area.

Suggest cut back embankment, realign intersection and add turn lanes.

MP 2.599 – 4.968, Daviess County

Kentucky State Police (Henderson) recommend horizontal and vertical alignment and routine road repairs for this segment. While there were no high crash spots noted within these limits, team members noted the terrain is rolling and there can be problems trying to pass for vehicles that get stuck behind slow moving farm equipment.

Preliminary Team Recommendation: Assign Medium priority for passing lanes. Conduct more detailed analysis of crashes and reevaluate.

*54 total crashes including Spot 2-19. (1 fatal, 24 injury, 29 PDO)
CRF: 0.695*

*41 total crashes excluding Spot 2-19 (1 fatal, 18 injury, 22 PDO)
25 Single Vehicle (1 fatal, 12 injury, 12 PDO) (8 hydroplane)
8 Rear End (2 injury, 6 PDO)
4 Angle (3 injury, 1 PDO) (1 hydroplane)
3 Sideswipe Opposite Direction (1 injury, 2 PDO)
1 Sideswipe Same Direction (avoiding rear end collision), (0 injury, 1 PDO)
CRF: 0.548*

One fatal crash was noted: A single vehicle veered off the road on the right side and then overcorrected crossing back across both lanes off the left side of the road. This crash occurred during daylight hours (10:52 AM) on a clear day on a dry road. Sands Road intersects US 431 at the location where the vehicle first veered off the road. Sands road runs north-south and has a sharp bend at the south end where it intersects US 431 at a right angle, in a curve on US 431. This was a 36 year old female driver with 1 male and 3 female passengers. The driver and one passenger resided in Owensboro. The other three passengers were from Evansville, IN, Utica, KY, and Dallas, TX. DUI was not suspected. The driver was the only fatality.

Only 2 crashes were associated with passing (One involved a garbage truck being passed, the other a tractor trailer was being passed.)

The combination of driveway access and rolling terrain was noted as a factor when turning vehicles were rear ended after the vehicle approaching from behind topped the crest of a hill.

There were 9 hydroplane crashes noted including 2 within Spot 2-19 (plus 3 additional potential hydroplane crashes). These hydroplane crashes occurred throughout the corridor with 4 (plus one of the potential hydroplane crashes) concentrated around MP 3.5.

The CRF is well below one. Over half of the crashes were single vehicle and of these, almost one-third involved hydroplaning. Suggest drainage and/or pavement improvements.

Spots 2-20 through 2-24 are located in the general vicinity of the Mall on US 431 outside the Owensboro Bypass.

Spot 2-20, Daviess County, MP 10.650 – 10.750

This spot had 14 total crashes for a CRF of 1.552. Seven of the crashes were “angle” collisions, five were “rear end” and two were “opposing left turn.” Team members noted that the location of this spot could include the light at Applebees. If so, then corrective action would probably have to be handled locally by petitioning the developer since the side streets are controlled by the property owners.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

South Mall/Wal-Mart Entrance

15 Total crashes (3 injury, 12 PDO)

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6 Rear End (0 injury, 6 PDO)
(2 southbound, 4 northbound)
9 Angle (3 injury, 6 PDO)

Revised CRF: 1.663

The Mall is located on the west side of US 431. There are two Mall entrances off of US 431 separated by approximately 0.12 miles. This spot includes the south Mall entrance which is signalized with left turn lanes. The entrance on the east side is for Wal-mart and Owensboro Center. Typical rear end crashes in stopped traffic due to inattention were noted. Vehicles crossing US 431 were noted trying to beat the light getting from the Mall to Wal-mart and vice versa.

No suggested roadway improvements to correct inattention and impatience. Intersection is already signalized with turn lanes.

Spot 2-21, Daviess County, MP 10.800 – 10.900

This spot had 22 total crashes for a CRF of 2.439. 10 of the crashes were “rear end” collisions, four were “angle,” four were “opposing left turn,” three were “sideswipe-same direction,” and one was “single vehicle.” Team members noted that this is probably the middle entrance at the mall. This middle entrance is unsignalized but located between two signalized intersections. Team members suggested there was a left turn problem for vehicles exiting from the mall.

Preliminary Team Recommendation: Assign High priority to close median and eliminate left turns at this mall entrance.

North Mall/Wal-Mart Entrance

16 Total crashes (6 injury, 10 PDO)
9 Rear End (6 injury, 3 PDO)
(5 southbound, 4 northbound)
5 Angle (0 injury, 5 PDO)
2 Sideswipe Same Direction (0 injury, 2 PDO)

Revised CRF: 1.774

The Mall is located on the west side of US 431. There are two Mall entrances off of US 431 separated by approximately 0.12 miles. This spot includes the north Mall entrance which is unsignalized and has a median break with left turn lanes. The entrance on the east side is for Wal-mart. Typical rear end crashes in stopped traffic due to inattention were noted. Left turns to/from Wal-Mart and the Mall resulted in angle collisions – vehicles crossing multiple lanes – left turn

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versus vehicle continuing straight – failure to yield – in one case, view of oncoming traffic obstructed by vehicle sitting in turn lane.

Suggest keeping team recommendation to close median.

Spot 2-22, Daviess County, MP 10.950 – 11.050 [Southtown Blvd.](#)

This spot includes the intersection of Southtown Boulevard. There were 30 total crashes for a CRF of 1.703. 16 of the crashes were “rear end” collisions and another eight were “angle” collisions. Team members noted [that Southtown Boulevard is going to be widened to three outbound lanes, five lanes total, under project 2-221.00.](#) This state-funded project is just finishing up with the design phase.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-23, Daviess County, MP 11.150 – 11.250 [Carlton Drive, Salem Dr./Goetz Rd.](#)

This spot includes the intersection with Carlton Drive. There were ~~33~~ total crashes for a CRF of ~~1.873~~. ~~17~~ of the crashes were “rear end” collisions, ~~nine~~ were “angle,” ~~five~~ were “opposing left turn,” and ~~two~~ were “backing.” Team members noted that this intersection is not signalized and the traffic backs up here. The backups could be due to the signal north of Carlton Drive.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

*51 Total crashes (14 injury, 37 PDO)
23 Rear End (5 injury, 18 PDO)
(15 northbound, 8 southbound)
25 Angle (9 injury, 16 PDO)
10 at Carlton: crossing multiple lanes and failure to yield to oncoming traffic, views obstructed by other vehicles, vehicles stopping to let traffic exit from Carlton - waving them into traffic.
13 at Salem/Goetz: primarily failure to yield, running red, trying to beat yellow
2 other entrances (Gas Station and Steak-n-Shake)
2 Sideswipe Same Direction (0 injury, 2 PDO)
1 Backing (0 injury, 1 PDO)*

*Revised CRF 2.895:
Intersection CRF at Goetz (KY2699): 0.61(2000-2002)*

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This spot includes Carlton Drive and Salem Drive/Goetz Road. Carlton (MP 11.155) is unsignalized and located between two signalized intersections: Fulton Drive (MP 11.066) to the south, and Salem/Goetz (MP 11.215) to the north; separated from Carlton by 0.09 mile and 0.06 mile respectively. There is a break in the median to allow left turns into and out of Carlton. Traffic backs up from Salem/Goetz contributing to the higher number of northbound rear end collisions. At least four vehicles exiting Carlton to turn left onto US 431 were hit by northbound drivers. The acute intersection angle may affect view to south for drivers exiting Carlton. Also, northbound US 431 vehicles in outside lane letting traffic out of Carlton block the view from Carlton of vehicles in the inside northbound lane on US 431. Vehicles in the US 431 southbound left turn lane also block the view of left turning vehicles exiting Carlton. Tractor-trailers in the left turn lanes on US 431 obstructed views at the intersection at Salem/ Goetz.

Suggest realigning Carlton to right angle and closing median. No suggestion for Salem/Goetz which is already signalized with turn lanes and has an intersection CRF less than one.

Spot 2-24, Daviess County, MP 11.267 – 11.367 *Bypass Interchange*

This spot includes the Owensboro Bypass interchange. There were ~~60~~ total crashes for a CRF of ~~2.684~~. ~~43~~ of these crashes were “rear end” collisions. Team members noted that both intersections for the ramps on each side of the bypass are signalized. Vehicles coming off the ramp and turning left to go southbound may be accelerating to make it through the light, but then reach the next light for the ramps south of the bypass unprepared to stop, resulting in the large number of “rear end” collisions.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

(Intersection south ramps: MP 11.322, Overpass: MP 11.367, Intersection north ramps: MP 11.471)

31 Total Crashes

*27 Rear End (6 injury, 21 PDO)
(16 southbound, 9 northbound, 2 on ramps)
4 Angle (0 injury, 4 PDO)
(left turns to/from ramps, failure to yield)*

Revised CRF: 1.385

Intersection CRF: 0.96 (2000-2002)

The rear end crashes were predominantly due to inattention. Distractions such as radio, passengers in back seat, looking away, checking mirrors, etc. were noted.

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There was no specific mention of drivers accelerating southbound toward next signal from north set of ramps. Suggest that southbound traffic from bypass is more prone to backups due to traffic around Mall and Wal-Mart. Intersections for both sets of ramps are already signalized with turn lanes. Improvements to spots discussed above, south of this interchange, may help alleviate traffic backups here. No other suggestions for roadway improvements to address rear end crashes and driver inattention.

**US 431 - Phase 1
Preliminary Recommendations**

Spot/Segment Number	County	BMP	EMP	Location Description	CRF	Proposed Action	Priority	Remarks
1-14	Muhlenberg	11.400	11.500	Int. KY 176, Drakesboro	2.833	Intersection Improvements	1	2.833 CRF for 2003-2004 (2000-2002 CRF was 1.71)
1-10	Muhlenberg	7.950	8.050	Int. KY 246, Beechmont	2.813	Intersection Improvements	2	Bifurcated turn lanes; gas station on corner; just south of Hughes Kirk Elementary School
1-5	Muhlenberg	0.400	0.500	Int. KY 973, MP 0.487	1.838	Intersection Improvements	3	1.838 CRF 2003-2004. 0.983 CRF 2000-2002. This spot included within Segment 1-5a
1-6	Muhlenberg	3.400	3.500	Rocky Creek Bridge	1.688	Bridge Replacement/Widening	4	Bridge width: 21.5 feet; Sideswipe crashes
1-7	Muhlenberg	3.930	4.030	1 mile south of Union Ridge Road	1.688	Realign/Widen	5	Combination of curve and vehicles entering/leaving driveways
1-12	Muhlenberg	9.734	9.834	Int. KY 70, Browder	1.665	Intersection Improvements	6	Unsignalized with bifurcated turn lanes
1-4	Logan	28.900	31.050	Hollow Bill	1.618	Reconstruction	7	Includes Spot 1-4a. CRF 1.618 is for 0.1 mile spot from MP 29.952 - 30.052. Complete segment CRF = 0.787.
1-17	Muhlenberg	15.150	15.250	Int. Cleaton Road	1.464	Intersection Improvements	8	Six of nine crashes involved left turns. Project to grade separate RR crossing at MP 15.674, KYTC Item No. 2-160.00, does not include improvements to this intersection.
1-7a	Muhlenberg	5.960	6.200	South of Belton	1.406	Realign/Widen	9	Curve south of Spot 1-8, vehicles crossing centerline.
1-4a	Logan	30.993	Muhlenberg 0.043	Int. KY 1293	1.348	Intersection Improvements	10	At Logan-Muhlenberg County line; District 3 is seeking funding for improvements
1-11	Muhlenberg	8.950	9.050	Int. Sylvania Street	1.186	Intersection Improvements	11	Cluster of street intersections in area. Sylvania intersects on a skew with a low east approach onto US 431; new school, Muhlenberg South Elementary is currently under construction and located immediately north of this spot.
1-6a	Muhlenberg	3.584	3.684	Branch of Rocky Creek Bridge	1.136	Bridge Replacement/Widening	12	Bridge width: 21.5 feet; immediately north of Spot 1-6, Rocky Creek Bridge
1-5a	Muhlenberg	0.000	0.513	Dunmor	0.933	Reconstruction	13	0.933 CRF 2003-2004. 0.708 CRF 2000-2002. Congested area with multiple street intersections; includes Spot 1-5.

**US 431 - Phase 1
Preliminary Recommendations**

Spot/Segment Number	County	BMP	EMP	Location Description	CRF	Proposed Action	Prior-ity	Remarks
1-15	Muhlenberg	11.982	12.082	Int. KY 2107 between Drakesboro and Cleaton	0.908	Intersection Improvements	14	5 of 7 crashes involved left turns on/off of US 431
1-13	Muhlenberg	10.200	10.700	Reverse curves north of KY 70 between Browder and Drakesboro	0.717	Realignment (horizontal)	15	CRF 0.717 for 0.1 mile spot from MP 10.222 to MP 10.322.
1-8	Muhlenberg	6.300	6.400	Dead Man's Curve	2.250	Remove from list	na	Addressed by HES 2-900, MP 6.2 to MP 6.4
1-3	Logan	23.900	24.000	Lewisburg	1.258	Remove from list	na	Lewisburg
1-2	Logan	13.796	13.896	Int. US 79, Russellville	1.076	Remove from list	na	Addressed by Russellville Southern Bypass, Item No. 03-311.10
1-1	Logan	1.485	1.585	Int. KY 591, Adairville 1 mile south of Cleaton Road	0.917	Remove from list	na	Crashes due to inattention
1-16	Muhlenberg	14.096	14.196	At IGA, between KY 2270 and KY 246	0.908	Remove from list	na	Three of six crashes were animal collisions
1-9	Muhlenberg	7.420	7.520		0.844	Remove from list	na	Only one crash 2003-2004

**US 431 - Phase 2
Preliminary Recommendations**

Spot/Segment Number	County	BMP	EMP	Location Description	CRF	Proposed Action	Priority	Remarks
2-10	Muhlenberg	22.298	22.398	Int. KY 81, South Carrollton	3.669	Intersection Improvements	1	HES project 2-976.00 (MP 22.4 - 22.7) begins just north of this spot but does not include the intersection. No signal or turn lanes. RR grade crossing on KY 81 immediately west of intersection
2-3	Muhlenberg	18.265	18.365	Int. US 62, Central City	3.247	Intersection Improvements	2	Tight turning radius problem for trucks. Signaled for permitted left at busy intersection.
2-23	Daviess	11.150	11.250	Intersection with Carlton Drive and Salem Dr./Goetz Rd., Owensboro	2.895	Close the median between Salem/Goetz and Southtown Blvd.	3	Carlton Drive intersection unsignalized. Left turns problematic in/out.
2-7	Muhlenberg	18.862	18.962	Int. KY 277, Central City	2.239	Intersection Improvements	4	Skewed intersection with bifurcated turn lanes; gas stations on two corners
2-5	Muhlenberg	18.479	18.579	RR overpass, Central city	1.914	Bridge Replacement	5	13 of 20 crashes involved overheight trucks impacting RR bridge
2-21	Daviess	10.800	10.900	Mall Entrance, Owensboro	1.774	Close the median	6	Middle Mall entrance - Unsignalized
2-1	Muhlenberg	17.400	17.500	Parkway Interchange	1.723	Reconstruct Interchange	7	
2-20	Daviess	10.650	10.750	Mall Entrance, Owensboro	1.663	Intersection Improvements	8	South Mall entrance - Signalized
2-4	Muhlenberg	18.378	18.478	Section with TWLTL between Harrison St. and RR overpass, Central City	1.462	Reconstruct	9	Left turns and strip development with multiple entrances
2-19	Daviess	2.599	2.699	Int. KY 140, Utica	1.441	Intersection Improvements	10	Embankment on southwest corner obstructs views to south from west leg of intersection. Gas station on northeast corner.
2-6	Muhlenberg	18.670	18.770	Intersections with KY 70 (E. Broad) and Morehead St., Central City	1.317	Intersection Improvements	11	Tight turning radius with Methodist Church on southeast corner KY 70, signalized, left turn lane northbound only. Morehead Street immediately north, unsignalized, no turn lanes.
2-17	McLean	9.300	9.400	Immediately north of Barrett Hill Road	1.211	Reconstruct	12	Congested industrial/agricultural properties with multiple entrances.
2-18	McLean	9.800	9.900	Int. KY 250, Buck Creek Church Rd., Tichenor	1.091	Intersection Improvements	13	Offset intersections with Buck Creek Baptist Church, AFS Industries and chicken farm

**US 431 - Phase 2
Preliminary Recommendations**

Spot/Segment Number	County	BMP	EMP	Location Description	CRF	Proposed Action	Prior-ity	Remarks
2-14	McLean	5.450	5.550	Int. Third St., Livermore	1.035	Reconstruction	14	Reconstruct consistent with 3-lane curb and gutter improvements to the north.
2-8	Muhlenberg	19.062	19.162	Int. Pendleton St., Central City	0.896	Intersection Improvements	15	Rear end crashes due to inattention.
2-19a	Daviess	2.599	4.968	From Utica to Browns Valley	0.695	Drainage/Pavement Improvements	16	Nine hydroplane crashes 2000-2002
2-12	Muhlenberg	24.250	24.350	Immediately north of Power Plant Drive, South Carrollton	2.533	Remove from list	na	Addressed by HES project 2-977.00 (MP 23.9 - 24.1 and MP 24.3 - 24.5))
2-15	McLean	6.038	6.138	Int. KY 136, Livermore	2.348	Remove from list	na	Addressed by KYTC Item No. 02-9.00
2-11	Muhlenberg	22.398	22.498	Immediately north of KY 81, South Carrollton	1.970	Remove from list	na	Addressed by HES project 2-976.00 (MP 22.4 - 22.7).
2-22	Daviess	10.950	11.050	Int. Southtown Blvd., Owensboro	1.703	Remove from list	na	Addressed by KYTC Item No. 02-221.00
2-16	McLean	8.265	8.365	Int. KY 1080, Nuckols	1.557	Remove from list	na	Addressed by HES project 2-972.00
2-24	Daviess	11.267	11.367	Bypass Interchange, Owensboro	1.385	Remove from list	na	Ramps are signalized with turn lanes. Collision reports do not indicate a problem with the roadway. Rear end crashes were due to inattention.
2-13	McLean	2.450	2.550	Int. old KY 85, Island	0.976	Remove from list	na	Only 3 crashes 2003-2004 including one fatal that was not intersection related.
2-9	Muhlenberg	21.430	21.530	Int. KY 189, Between Central City & South Carrollton	0.958	Remove from list	na	Collision reports do not indicate a problem with the intersection. Only 2 crashes 2003-2004.
2-2	Muhlenberg	17.912	18.012	Between Interchange and US 62, Central City	0.437	Remove from list	na	Only 4 collisions 2000-2002. Only 3 collisions 2003-2004.
2-12a	McLean	0.000	2.500	Levee north of Muhlenberg Co. line	0.341	Remove from list	na	Low CRF

Alternatives Development and Recommendations, Phase I

Spot 1-1, Logan County, MP 1.485 - 1.585 [KY591](#)

The location of this spot is the KY 591 intersection in Adairville. The critical crash rate factor, CRF, was 0.917. This is a 4-way stop that has had several unusual accidents involving driver inattentiveness. Buildings are located very close to the roadway and the intersection is located at the northwest corner of the town square. Improvements here would be difficult to implement. No recommendations short of a bypass were recommended by the project team.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Intersection CRF: 0.53 (2000-2002)

Spot 1-2, Logan County, MP 13.796 - 13.896

The location is the intersection of US 79 in Russellville. The critical rate factor was 1.076. Problems include a high volume of traffic and trucks with tight turning radii at the intersection, business entrances located close to the intersection and properties located close to the roadway. The US 431 southern bypass project in Russellville will address the problems associated with this intersection by reducing traffic volume and providing trucks an alternate route.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-3, Logan County, MP 23.900 - 24.000

The location is Lewisburg, between KY 107 and KY 106. The critical rate factor was 1.258. This location will be addressed as a result of the Epleys to Lewisburg, US 431 reconstruction project, Item No. 3-273.00.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-4, Logan County, MP 29.952 – 30.052 [Hollow Bill](#)

The location is Hollow Bill, just north of HW McPherson Road. The critical rate factor was 1.618. Five of the six collisions at this spot were during bad weather conditions (wet or icy roads) on curves. The District and ADD personnel noted a history of crash problems at this location including a multiple fatality. This spot is also within the limits of a project listed on the Unscheduled Projects List (UPL) for relocation and assigned a medium (Local, ADD and District) priority. The terrain is rough in this area and the only conceivable improvement would be total reconstruction to improve the horizontal and vertical geometry.

Preliminary Team Recommendation: **Assign High Priority to reconstruct as described in the UPL from MP 28.900 to MP 31.050 (Logan/Muhlenberg County Line).**

Spot 1-4a, MP 31.043, Logan County - Added Spot [KY 1293](#)

This location was recommended to be added to the list by District 3 personnel and is located at the intersection with KY 1293, almost on the Logan/Muhlenberg County line. While the CRF was not greater than 1.00 at this location, District 3 personnel noted poor sight distance and a potential for crashes.

Preliminary Team Recommendation: **Assign medium priority for intersection improvements.**

Intersection CRF: 0.23 (2000-2002) not a typo – same as spot 1-5 at KY 973

This spot would be included within the limits (MP28.9 – 31.05) noted above for spot 1-4.

Spot 1-5, Muhlenberg County, MP 0.364 – 0.464 [KY 973](#)

This spot is located at the intersection of KY 973. Only four crashes were cited here for a CRF of 0.983. None of the crashes involved fatalities. The team agreed that four crashes over a three-year period are probably not statistically significant.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study. *Reconsider, see below.*

Suggest revise limits to include cluster of intersections in Dunmor between MP 0.4 and 0.559. There were 7 crashes in this segment in 2003-2004

7 Total crashes (3injury, 4 PDO) 2003-2004

2 Angle (1 injury, 1 PDO)

One at the intersection of Elm St., vehicle crossing westbound

One pickup pulling small trailer pulling from side street (Oak St?) onto northbound US 431 into path of southbound vehicle

2 Sideswipe opposite direction (2 PDO)

One of these was attempting to turn left on KY 973

2 Single vehicle (1 injury, 1 PDO)

Both eastbound on KY973, failed to stop at US 431

1 Rear end (injury)

Pulled from driveway onto northbound US 431(immediately north of curve) into path of northbound vehicle coming out of left hand curve.

CRF: 2.384 (2003-2004) Segment MP 0.4 – 0.599.

Intersection CRF: 0.23 (2000-2002) not a typo – same as spot 1-4 at KY 1293.

This includes only the intersection at KY 973 – does not include the other driveways and intersections within the noted segment.

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Suggest intersection improvements to KY 973 combined with access control to reduce number of conflict points at this cluster of intersections and driveways between MP 0.4 and 0.559.

Businesses and residences are close to roadway within community of Dunmor, similar to Beechmont and South Carrollton. Any widening within this segment would have major impacts on utilities and significant right-of-way costs. US 431 has inadequate horizontal and vertical alignment within this segment from just south of the county line to just north of the intersection with KY 973, approximately 0.6 mile. In addition, there are wide access points, as mentioned above with issue of access control. Several of the approach roads within Dunmor (Dunmor Church Rd., Elm St., KY 973, and Oak St.) have inadequate sight distance.

District Observer recommends new alignment to the east of community of Dunmor, which would also alleviate safety issue at Spot 1-4a (Logan Co., just south of county line). New alignment would be approximately 1.2 mi. in length.

Spot 1-6, Muhlenberg County, MP 3.400 – 3.500

Six crashes were documented at this spot. The CRF was 1.688. This spot includes one narrow bridge carrying US 431 over Rocky Creek. The bridge width is 21.5 feet. Four of the six crashes were “sideswipe-opposite direction.” No injury or fatality crashes were documented. This bridge has been identified for replacement under HES 02-984 and accepted, but not a high priority.

Preliminary Team Recommendation: **Assign high priority to replace or widen Rocky Creek Bridge.**

Spot 1-6a, MP 3.634, Muhlenberg County - Added Spot

This is the location of a bridge carrying US 431 over Rocky Creek Branch, immediately north of the preceding spot location. The bridge is similar to the Rocky Creek bridge and is also only 21.5 feet wide.

Preliminary Team Recommendation: **Assign medium priority to replace or widen Branch of Rocky Creek Bridge.**

The roadway is flat with a slight horizontal curve. There is approximately 950 feet between the two bridges. District Observer recommends replacing both bridges and widening roadway to 12-foot lanes and wide shoulders between the two bridges.

Spot 1-7, Muhlenberg County, MP 3.930 – 4.030

This spot is about one mile south of Union Ridge Road and had a CRF of 1.688. Four of the six total crashes were “run-off-road” crashes. Also, four occurred during wet, dark conditions. Lencie Meredith noted that this is often indicative of an edgeline problem (worn/faded or nonexistent). If there is an existing edgeline and it is in good condition (reflective), then this type of crash problem could instead be due to geometry.

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Preliminary Team Recommendation: Assign low priority to realign/widen. Follow-up is necessary to first determine existence/condition of edgeline and roadway geometry.

This section of road does have edge lines. Four crashes involved vehicles rounding curve and then seeing vehicles stopped or slowed resulting in run-off-road type crashes to avoid rear end collision. Three of these were during wet conditions. Suggest keep team's recommendation to realign/widen.

MP 6.0 – 7.0, Muhlenberg County

This segment was noted by Kentucky State Police Post 2 (Madisonville) as a high crash site. Crash data did not support this and the project team could not identify any obvious problem.

Preliminary Team Recommendation: Do nothing unless follow-up identifies an obvious problem.

Spot 1-7a, Muhlenberg County, MP 6.146 – 6.246

5 Total crashes, (2 injury, 3 PDO) 2000-2002

2 Head-on (2 injury)

Both were southbound vehicles that crossed centerline.

2 Single vehicle (2 PDO) Both were tractor-trailers

Northbound tractor trailer lost load of 5 steel beams into guard rail.

Southbound tractor trailer dropped off road into ditch and overcorrected (said was run off road by southbound pickup truck)

1 Sideswipe opposite direction (PDO)

Passenger vehicles swapped mirrors.

CRF: 1.406

There were no crashes within this spot during 2003-2004. Immediately south at MP 5.964, there was a fatal head-on crash where a northbound pickup truck lost control on a wet road in a curve and crossed into the southbound lane. The only other crash during this time period in the vicinity was at MP 5.972 where a northbound motorcycle in a curve, on a dry road, ran off the road, not under proper control.

Some of these crashes may have occurred at the curve in Belton if they were not located precisely in the collision report. Suggest realignment from MP 5.96 to the MP 6.2 if not already addressed by improvements associated with Belton Curve project, 02-900.00 (between MP 6.2 and 6.4).

The segment between MP 6.146 and 6.246 includes the approach to "Dead Man's Curve." No suggestions for this segment.

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To the District Observer's surprise, the segment between MP 5.0 and MP 6.0 is not included in this report. This segment has several horizontal and vertical deficiencies. In one location at approx. MP 5.2, there looked to be a recent crash based on vehicle tracks in the ditch and large gouge marks in the pavement.

The intersection of Union Ridge Road at MP 5.072 should be listed for intersection improvements. The east and west approaches are offset by approximately 100 feet, located within a horizontal curve, and located just south of a crest vertical curve. There is almost no sight distance for vehicles on Union Ridge Road looking north, and the sight distance to the south is inadequate due to horizontal curve and skewed east approach. For vehicles crossing US 431, the driver must make several dangerous sight distance decisions. Of all the spot improvements that were visited for this report, it is the Observer's view that this intersection is one of the two worst, based on sight distance, speed, and number and type of vehicles using the intersection (also Spot 2-19). Realigning US 431 should be considered within this segment should be considered, although it will not be considered in this report since it was not listed as a specific spot improvement.

Spot 1-8, Muhlenberg County, MP 6.3 – 6.4 [Curve at Belton](#)

This tight curve in Belton is known locally as “**Dead Man's Curve**,” the site of recent fatalities and has already undergone improvements to correct sight distance deficiencies. There were eight total crashes for a CRF of 2.25. More work is scheduled for 2006 to **widen the roadway and realign the curve under HES 2-900.**

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

[Spot 1-8a, Muhlenberg County, MP 6.964, Intersection KY 2270](#)

Total 3 crashes 2000-2002 (1 injury, 2 PDO)

- 1 Rear end (injury) northbound at intersection KY 2270*
- 1 Angle (PDO) vehicle pulled from gas station into path of southbound vehicle*
- 1 Single vehicle (PDO) Fell asleep.*

Total 2 crashes 2003-2004 (2 PDO)

- 2 Angle (2 PDO)*
 - Eastbound Unit 1 pulled into intersection into path of southbound Unit 2.*
 - Unit 1 turning northbound from driveway into path of south bound unit 2.*

Intersection CRF: 0.68 (2003-2004) This number would be skewed high due to two crashes being incorrectly located at this spot in the crash records.

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Crashes predominantly due to inattention. ~~There is a gas station at the northeast corner of the unsignalized intersection with KY 2270.~~

No suggested improvements at this location.

There is no gas station at this location, but there is a post office and trash convenience center in the southwest quadrant. The two legs of KY 2270 at this intersection are offset by approximately 200 feet. There are major sight distance conflicts for the east approach with trees and signs to the north and an abandoned house and shrubs to the south. Vehicles must inch up into roadway to have any sight distance. Wide gravel access points exist within the intersection. District Observer recommends realigning east approach to line up with west approach. Doing so would require the replacement of a small (approx. 30-foot long) bridge over a creek just east of the intersection. A trailer and an abandoned house would also be in the path of realignment of the east approach.

At the minimum, sight distance could be improved by removing trees and signs, and, if right-of-way is purchased, an abandoned house.

Spot 1-9, Muhlenberg County, MP7.420 – 7.520

Located between KY 2270 and KY 246, this spot had a CRF of 1.125 due to only four crashes over a three year period. No fatalities or injuries were cited. The project team had no additional information for this location and agreed that four crashes over a three-year period are probably not statistically significant.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-10, Muhlenberg County, MP 7.950 – 8.050 [KY 246](#)

This spot at the intersection of KY 246 had a total of 10 crashes for a CRF of 2.813. Three of these collisions were “rear end” and another three were “angle” collisions. Team members noted bifurcated turn lanes on KY 246 and a gas station on one of the corners possibly contributing to the crashes. They also noted that this intersection is just south of the Hughes-Kirk Elementary School.

Preliminary Team Recommendation: **Assign high priority for intersection improvements.**

Intersection CRF: 1.28 (2000-2002)

It should be noted that Hughes-Kirk Elementary School closed in 2005. This intersection is located in the heart of Beechmont, a community with many residences and businesses close to the roadway. The sight distance at the intersection is adequate for a 35-mph roadway, but District Observer recommends eliminating the bifurcated lanes and making T-intersection. In addition, entrances will need to be delineated to improve the functionality of the intersection; currently there are wide access points within the intersection (gas station and bank).

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Observer notes that if a left turn lane is to be constructed on US 431, a two-way left-turn lane should be proposed within Beechmont, a half-mile length. However, even with an urban typical, many utilities and residences would be affected, and throughout Beechmont, there are wide access points for businesses.

Because of the congestion along the ¾-mile stretch of US 431 and the impact of widening for turn lanes within Beechmont, the District Observer recommends a bypass to the east but recognizes the high cost of this alternate. Even so, there will be a high cost to any widening (right-of-way acquisition and utility relocation) along the current alignment of US 431 within Beechmont.

Spot 1-11, Muhlenberg County, MP 8.950 – 9.050

This spot, just south of Sylvania Street had six total crashes for a CRF of 1.186. Three of the crashes were “angle” collisions. The team noted no apparent problems at this location. They also noted that this may be just south of the proposed site of the new Muhlenberg South Elementary School.

Preliminary Team Recommendation: Assign low priority and investigate further for improvement recommendations.

One of these crashes was a duplicate. One was fluke where the wheel came off a pickup truck. One was an animal collision. One involved a driver who fell asleep. Another was mislocated. The remaining crash was an angle collision where unit 1 was westbound on Sylvania turning left onto US 431, pulled into path of southbound unit 2. There were only two crashes recorded for 2003-2004, both of these were single vehicle run-off-road.

There are a cluster of intersections in this area and Sylvania Street intersects on a heavy skew. However, collision reports do not indicate problems at this spot. Suggest either keep on list at a low priority to realign Sylvania and control access, or remove from list.

There are many entrances within this short length of roadway. Residences are close to the roadway, so a two-way left-turn lane would be costly for right-of-way and utilities, although widening on west side would be a less expensive alternative. A left-turning lane was constructed just north of this segment at the entrance of the new elementary school. No problems were apparent to District Observer. Even though Sylvania St./Forsythe St. intersect US 431 at a skew, there is adequate sight distance since this segment of US 431 is in a long tangent section.

Spot 1-12, Muhlenberg County, MP 9.734 – 9.834 [KY 70](#)

This spot in Browder includes the intersection of KY 70. There were nine total crashes for a CRF of 1.665. Three of the crashes were “angle” collisions and two were “rear end.” Team members noted that this intersection has bifurcated turning lanes on the east approach of KY 70. This is also within the limits (MP 8.0

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– 9.90) of a location noted by Kentucky State Police Post 2 (Madisonville) for consideration as a possible high crash site.

Preliminary Team Recommendation: **Assign High priority for intersection improvements.**

Intersection CRF: 1.21 (2000-2002)

District Observer recommends eliminating the Y-ramps on the east approach (KY 70). No right-of-way would be needed for this cost-effective solution. Sight distance for east approach is slightly affected by slight vertical curve just south of the intersection and car lot vehicles parked close to roadway just north of the intersection. The west approach is a county road (Beechmont-Browder Road). Sight distance to the north for this approach is poor due to trees, bushes, and power pole.

Observer not sure if left-turning lane needed on US 431. If turn lanes are needed, one house on west side would be a potential relocation.

Spot 1-13, Muhlenberg County, MP 10.222 – 10.322

This spot located north of KY 70 had six total crashes for a CRF of ~~1.076~~. Three of these crashes were “sideswipe-opposite direction” and three were “single vehicle” collisions. Team members noted sharp, reverse curves in this area.

Preliminary Team Recommendation: Assign Medium priority to reconstruct to correct horizontal alignment. Follow up to check length of proposed reconstruction.

Two of the single vehicle crashes were deer collisions. The other single vehicle was a northbound pickup that ran off the road. Two of the sideswipe collisions involved vehicles swapping mirrors. One of these involved a coal truck. The remaining sideswipe also involved a dump truck. All were during dry conditions.

*4 Total crashes not including deer collisions.
Revised CRF: 0.717 (2000-2002)*

No crashes were recorded for this spot in 2003-2004.

Suggest keeping team recommendation for realignment but consider lowering the priority. Limits of the series of reverse curves are between MP 10.2 and 10.7. Topography will be an issue.

District Observer recommends this location for new alignment. Approximately 4000 feet of new roadway would be needed to eliminate the horizontal and vertical deficiencies. This area is mostly undeveloped, so no relocations should be necessary.

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Spot 1-14, Muhlenberg County, MP 11.400 – 11.500 [KY 176](#)

This spot includes the intersection of KY 176 in Drakesboro and had 10 crashes for a CRF of 1.71. Team members noted that this is a signalized intersection with no turn lanes and a “Pantry” store on the corner. Southbound coal trucks on US 431 turn eastbound on KY 176 to serve the TVA Paradise Steam Plant. Muhlenberg South High School is also accessed from this location by traveling westbound on KY 176. Five of the 10 crashes at this spot were “angle” collisions.

Preliminary Team Recommendations: **Assign Medium priority for intersection improvements.**

Intersection CRF: 1.00 (2000-2002)

13 Total crashes 2003-2004 (4 injury, 9 PDO)

4 Left turns

3 Rear end

3 Single vehicle (includes 2 DUI)

3 From private entrance

CRF: 2.833 (2003-2004)

Suggest keeping team recommendation for intersection improvements. Consider high priority.

This intersection serves a large percentage of truck traffic with the primary truck movements utilizing the north and east approaches. Turning radii on every quadrant need to be improved. Left-turning lanes on US 431 would benefit this intersection, especially the north approach where left-turning coal trucks often queue. Entrances will need to be delineated to improve the functionality of the intersection; currently there are wide access points within the intersection. Drainage improvements will need to be a part of the intersection project, since there are very few ditches or pipes and wide access points tend to trap water along the roadway (especially at the wide gravel entrance to the restaurant). There are three old buildings, all of which seem to be abandoned, that are just outside of the right-of-way, so each will be adversely affected by any widening at the intersection. In addition, the gas pumps at Kangaroo may also be affected by any widening. Power poles are close to the edge of KY 176, and sewer manholes were also noted by the observer near the intersection.

Spot 1-15, Muhlenberg County, MP 11.982 – 12.082 [KY2107](#)

This spot includes the KY 2107 intersection. There were a total of six crashes for a CRF of 0.908. Three of the crashes were “angle” collisions, two were “head on” and one was an “opposing left turn.” This spot is within the limits (MP 11.0 – 12.10) of a location noted by Kentucky State Police Post 2 (Madisonville) for consideration as a possible high crash site.

Preliminary Team Recommendations: **Assign Low priority for intersection improvements.**

One of the recommendations of Kentucky State Police (KSP) Post 2 (Madisonville) was to place additional signage upon approach to “high crash zones” stressing extra caution. Project team members noted that placing these types of signs is a liability problem and not an acceptable solution to addressing safety issues. Team members also recommended addressing this comment in the report write-up with an explanation as to why KSP’s recommendation for warning signs could not be implemented.

Intersection CRF: 0.29 (2000-2002)

KY 2107 (old US 431) intersects US 431 at a severe skew (Y-type intersection) and where US 431 is in a long horizontal curve. KY 2107 could be realigned for approximately 400 feet to intersect as a T-intersection (similar to Webster County project Item 2-985), but because US 431 is in a long horizontal curve, other sight distance problems may be created. KY 2107 could also be realigned in just the last 100 feet or so to create a T-intersection (the better sight distance option), but the vertical alignment on KY 2107 would need to be adjusted to prevent vehicles stopped on KY 2107 from being stopped on a grade. Either one of these recommendations should avoid any relocations. Power poles are located on the west side of the intersection and would not be affected by any realignment of US 431.

Spot 1-16, Muhlenberg County, MP 14.096 – 14.196

This spot is located approximately one mile south of Cleaton Road. There were a total of six crashes for a CRF of 0.908. **Half of these crashes were coded “collision with animal.”**

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 1-17, Muhlenberg County, MP 15.150 – 15.250

This spot is at the intersection of Cleaton Road. There were a total of nine crashes for a CRF of 1.464. Three of these crashes were “angle” collisions, two were “rear end” and two were “sideswipe-same direction.” Team members noted that there is a railroad grade-separation project planned north of this location, but it will probably not extend to this intersection.

Preliminary Team Recommendation: **Assign Medium priority for intersection improvements/turn lanes.**

This intersection is located at MP 15.184, while the railroad crossing involved with SYP project Item 2-160 is at MP 15.764, so that project should not affect this spot improvement. This location involves high speed traffic (nearly tangent section) with a high percentage of coal trucks. There is a slight horizontal sight distance

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problem for vehicles in the east approach due to overhanging trees, which could be corrected with maintenance forces. If a turn lane is proposed, several power poles would be affected, but there are no other major right-of-way issues.

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Spot 2-1, Muhlenberg County, MP 17.400 – 17.500 [Parkway Interchange](#)

This spot includes the Wendell H. Ford Western Kentucky Parkway interchange. There were a total of seven crashes for a CRF of 1.723. Two of the crashes were “vehicle entering/leaving entrance” and two were “angle” collisions. With four, twelve-foot lanes and ten-foot shoulders, the roadway section as well as the geometry are good at this location.

Preliminary Team Recommendation: **Assign Low priority to reconstruct interchange as a long-term recommendation.**

Good sight distance, wide lanes and shoulders, 4-lane template in this location. No suggestion for improvements to US 431, but long-range goal should be to reconstruct for interstate-standard interchange for safety consideration of vehicles on parkway.

The following Spots, 2-2 through 2-8, are located within Central City, are very closely spaced, share common features and problems, and may need to be considered as one complete segment for improvement recommendations.

Spot 2-2, Muhlenberg County, MP 17.912 – 18.012 [Section change north of Parkway Interchange](#)

This spot located within Central City had ~~seven~~ total crashes for a CRF of ~~1.019~~. According to HIS records, this spot includes a transition from 10-foot to 2-foot shoulders. Three of the crashes recorded at this location were “rear end,” ~~two were “opposing left turn”~~ and two were “sideswipe-same direction.” Team members also noted an ~~overhead railroad bridge~~(See Spot 2-5 for RR overpass) nearby that trucks sometimes impact resulting in traffic delays.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

*5 Total crashes (2 injury, 3 PDO)
3 Rear end (1 injury, 2 PDO)
2 Sideswipe same direction (1 injury, 1 PDO)*

Revised CRF: 0.728

Roadway section narrows just north of interchange in this spot. Vehicles either stopped to make turns off US 431 or turning left onto US 431. Entrances to Pizza Hut and Fast Eddy’s were noted in reports. One pedestrian hit while adjusting tie-

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downs while parked on shoulder. Other than this instance, there was no indication of any parking along US 431 noted in the collision reports.

CRF is less than one. No suggestions for short term improvements.

To clarify above information, the 10-foot shoulder on the east side of US 431 ends at church, and narrower 2-foot shoulder runs ½ mile north to intersection with US 62 (See Spot 2-3). The 10-foot shoulder on the west side of US 431 runs the entire length with guardrail. This area just north of the parkway interchange has developed over the past two years: two new hotels in addition to an existing, one new restaurant in addition to an existing and one planned, and a new car wash. It is not uncommon to see semi-trucks parked in wide shoulder while drivers eat at adjacent restaurants. Suggest constructing two-way left turn lane. Could accomplish in some areas with equal widening by using existing shoulder; in area north to US 62, widen east side with less impact on adjacent properties. This spot improvement could tie into recommended added lane at intersection with US 62.

Kentucky State Police Post 2 (Madisonville) noted crash problems between MP 18.24 and 19.117 which includes Spots 2-3 through 2-8.

Spot 2-3, Muhlenberg County, MP 18.265 – 18.365 [Everly Brothers Blvd. \(US 62\)](#) and [W. Stroud Lane](#)

This spot located within Central City had 28 total crashes for a CRF of 3.247. This spot includes the intersection of Strouds Lane and according to HIS records is where a 2-foot shoulder transitions to curb-and-gutter. There were 10 “angle” collisions and eight “rear end” collisions recorded at this spot.

Preliminary Team Recommendation: Assign Medium/High priority for intersection improvements.

25 Total crashes (4 injury, 21 PDO)

11 Angle (2 injury, 9 PDO)

8 Rear end (2 injury, 6 PDO)

3 Sideswipe same direction (3 PDO)

2 Backing (2 PDO)

One to allow tractor-trailer to turn.

One tractor-trailer rolled back – driver out of vehicle.

1 Single Vehicle (PDO) Fell asleep and ran off road.

Revised CRF: 2.899

Intersection CRF: 1.62 (US 62) (2000-2002)

6 Crashes involved tractor-trailers. 4 of the six were making wide turns (3 at Everly Brothers Blvd.)

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Turning movements and rear end collisions at intersections and entrances were noted – crashes primarily due to inattention. Entrances to Wendy's and McDonald's both noted along this spot. US 62 is signalized with turn lanes.

No specific short term recommendations beyond team's suggestion for intersection improvements. Consider high priority given the CRF.

The biggest issue at this intersection in the opinion of the District Observer is the sight distance problem created by having northbound US 431 traffic "bypass" around the left turn lane. There is essentially no taper; the through lane gets added at Fast Eddy's. When vehicles are queuing in the left turn lane, sight distance is blocked for southbound vehicles turning left. This is especially the case when semi-trucks are queuing in the northbound left turn lane. A large number of trucks use this intersection: coal trucks entering Central City make a right turn onto US 62 eastbound to access coal mines, and the west approach of US 62 is the beginning of the truck route for US 431 around Central City. The southwest quadrant radius was improved in late 2001 to a 60-foot radius, but trucks are still hitting the guardrail that wraps around that quadrant. The southeast quadrant has a very small radius; the curb is destroyed and the landscaping blocks placed by the gas station are displaced due to trucks hitting them. Recommendation is to lengthen three-lane section of the south approach south and improve turning radius of southeast quadrant.

Spot 2-4, Muhlenberg County, MP 18.378 – 18.478 *Harrison Avenue*

This spot located within Central City had a total of 47 crashes for a CRF of 4.657. This spot includes the intersection of Harrison Avenue. There were 40 "angle" collisions and three "rear end" collisions recorded at this spot.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

15 Total crashes (3 injury, 12 PDO)

11 Angle (3 injury, 8 PDO)

2 at Harrison St.

9 remaining were all leaving parking lots from: Ponderosa, Dairy Queen, IGA, Old National Bank (exiting from the entrance only lane), etc., to enter US 431

3 Rear end (3 PDO)

1 Single vehicle (PDO) at Harrison, tire blew out.

Revised CRF: 1.462

From Harrison Avenue, MP 18.392, north to the Railroad overpass, MP 18.525, there is strip development (KFC, Dairy Queen, Dollar Store, etc.) and a two-way left-turn lane (length: 0.13 mile). There are numerous access points and driveways into parking lots, but no parking directly along US 431.

No large numbers of crashes noted at Harrison, which is unsignalized. The majority of crashes are for vehicles exiting parking lots from the multiple access points along US 431.

Suggest access management to reduce number of access points along US 431.

Narrow turning lane and poor entrance radii (“dustpan” curb cuts), vehicles often must swing out into other lane to complete turn from entrance onto US 431. Tight entrance radii also cause vehicles to slow considerably in order to exit roadway, and grade problems with two of the three entrances of IGA require vehicles exiting US 431 to come nearly to a complete stop. Also, left turning movements conflict, especially between US 62 and Harrison Street where multiple high-volume access points exist (Wendy’s, McDonald’s, etc.).

In the 15 minutes that District Observer was on site, he witnessed two over-height semi-trucks turn around in the shopping center parking area to avoid low clearance overpass. There appears to be plenty of warning signage.

Spot 2-5, Muhlenberg County, MP 18.479 – 18.579 [Railroad Overpass](#)

This spot located within Central City had a total of ~~17~~ crashes for a CRF of ~~1.627~~. There were ~~seven~~ “single vehicle,” four “rear end,” three “angle,” and ~~three~~ “head on” collisions.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

20 Total crashes (2 injury, 18 PDO)

*13 Single vehicle (13 PDO) All were trucks that hit RR overpass.
(8 northbound, 5 southbound)*

4 Rear end (4 PDO)

3 Angle (2 injury, 1 PDO)

Revised CRF: 1.914

From Harrison Avenue, MP 18.392, north to the Railroad overpass, MP 18.525, there is strip development (KFC, Dairy Queen, Dollar Store, etc.) and a two-way left-turn lane (length: 0.13 mile). There are numerous access points and driveways into parking lots, but no parking directly along US 431.

Nearly two-thirds of the crashes at this spot were trucks hitting the railroad overpass. The nine over-height trucks that hit the overpass blamed inattention, misreading the warning signs, and not noticing the warning signs in time to stop.

Suggest adding warning signs further in advance of the overpass with greater visibility.

Spot 2-6, Muhlenberg County, MP 18.670 – 18.770 *E. Broad St. (KY 70) & Morehead St.*

This spot located within Central City had a total of ~~40~~ crashes for a CRF of ~~4.197~~. This spot includes the intersection of KY 70. There were four “angle,” three “rear end,” ~~two~~ “head on,” and one “sideswipe-same direction” collisions.

Preliminary Team Recommendation: No recommendation at this time. Follow-up to determine whether parking is allowed along this spot. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

9 Total crashes (3 injury, 6 PDO)

4 Angle (4 PDO)

2 crashes, northbound vehicle avoided rear end with vehicle turning right onto Morehead St.

1 crash, northbound emergency vehicle turning left onto Broad through red light.

1 crash, vehicle exiting Methodist Church Parking lot (southeast corner of US 431 and Broad St.)

3 Rear End (2 injury, 1 PDO)

(1 at Broad southbound, 1 at Broad northbound, 1 at Morehead southbound)

1 Sideswipe Same Direction (PDO)

Northbound vehicle swung left prior to making right turn onto Morehead St (not a truck). Second unit pulled along right side and was sideswiped.

1 Head-on (injury)

Northbound Unit 1 passed left turning Unit-X on the right and hit southbound unit 2 turning left onto Morehead St.

Revised CRF: 1.317 includes E. Broad St. (KY 70) and Morehead St.

Intersection CRF: 0.34 (2000-2003) Includes E. Broad St. (KY 70) only.

Broad St. (KY 70) is signalized with left turn lanes. Morehead St. is unsignalized without turn lanes. There appears to be some difficulty for vehicles when northbound, making the right turn at Morehead Street. Three crashes involved right turning vehicles at this location. One was sideswiped while swinging wide. There does not appear to be parking along US 431 at this spot.

Suggest intersection improvements at Morehead St. including turn lanes.

At Morehead Street intersection, US 431 is wide enough that straight-through vehicles are able to pass turning vehicles, even though the pavement is not striped for that. Possible solution would be to stripe for center turning lane between railroad overpass south of Broad Street (KY 70) and just north of Reynolds Street. Pavement appears to be wide enough for that simple, cost-

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effective solution. This would separate left-turning vehicles from through traffic in an area that has several adjacent businesses (same as exists south of the overpass (See Spot 2-4 and 2-5). Some curb and gutter construction could be added since most of the existing is non-effective due to past overlays.

Spot 2-7, Muhlenberg County, MP 18.862 – 18.962 [East Reservoir St. \(KY 277\)](#)

This spot located within Central City had a total of ~~45~~ crashes for a CRF of ~~2.399~~. This spot includes the intersection with KY 277. There were seven “rear end” and six “angle” collisions. Team members noted this was a signalized intersection and is aligned on a skew with commercial businesses located on the corners. They also noted that this may be a location where traffic approaches the intersection over a crest vertical curve with limited sight distance resulting in rear end crashes.

Preliminary Team Recommendation: Assign Medium/High priority for intersection improvements.

14 (4 injury, 10 PDO)

7 Rear End (2 injury, 5 PDO)

4 northbound, 2 southbound, 1 eastbound

5 Angle (2 injury, 3 PDO)

4 ran red light (2 of these were southbound, 2 were westbound)

Remaining angle collision was eastbound in right turn lane, pulled into path of southbound vehicle. (Attempting to cross into Scott Market?)

1 Single Vehicle (PDO) pedestrian ran into street, arm hit mirror

1 Sideswipe Same Direction (PDO) avoiding rear end collision

Revised CRF: 2.239

Intersection CRF: 1.52 (2000-2002)

Nearly one-half of the crashes were rear-end collisions, predominantly northbound (due to crest vertical curve south of intersection). Over one-quarter of the crashes involved drivers running a red light (none of these were northbound). Scott Market (Southeast corner, access to US 431 immediately south of intersection, with gas pumps) is one of the businesses noted in the reports. Islands dividing right turning movements are located on Reservoir Street. One collision report sketch appeared to show a vehicle using the right turn lane from eastbound Reservoir Street to cross US 431 immediately south of the intersection to access Scott Market.

Suggest keeping team’s original recommendation for intersection improvements. As part of these improvements, consider constructing median to stop crossing movements into businesses from the right turn lanes off Reservoir Street. Consider northbound approach beacons at crest of hill south of intersection synchronized with traffic light.

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District Observer recalls that until recently, there was almost no all-red phase of the signal, which may have contributed to the crashes involving vehicles running the red. Long range solution would include lowering the vertical alignment just south of the signalized intersection, but this would involve multiple residential relocations.

Spot 2-8, Muhlenberg County, MP 19.062 – 19.162 [Pendleton Street](#)

This spot located in Central City had a total of ~~six~~ crashes for a CRF of ~~4.075~~. All six crashes were “rear end, both vehicles moving” type crashes. Team members had no additional input on this location.

Preliminary Team Recommendation: Follow-up with further investigation as to spot conditions and possible crash causes. We may include this spot with others for a long term bypass solution that is outside the scope of this study.

*5 Total Crashes (1 injury, 4 PDO)
5 Rear End (1 injury, 4 PDO)
(3 southbound, 2 northbound)*

Revised CRF: 0.896

This is the ~~signalized~~ intersection at Pendleton Street. All crashes occurred during daylight hours during clear conditions on a dry, straight and level road. These were all typical rear end type crashes in traffic caused by following too closely and inattention.

Suggest for short term: Intersection improvements (add turn lanes) Long term: Bypass.

This is not a signalized intersection. Pendleton Street is minor city street. Any widening along US 431 will have severe impacts to several residences which are close to roadway as well as utilities. There is a vertical crest just north of the intersection which interferes with sight distance, but the sight distance probably meets minimum standards for a 35-mph roadway.

Spot 2-9, Muhlenberg County, MP 21.430 – 21.530 [Phillip Stone Way \(KY189\)](#)

This spot located in South Carrollton includes the intersection with KY 189. There were ~~five~~ total crashes for a CRF of ~~4.498~~. Two of the crashes were “sideswipe-same direction.” Team members noted that there may be left turn lanes on all approaches at this intersection.

Preliminary Team Recommendation: Assign Low priority for intersection improvements.

*4 Total Crashes (4 PDO)
2 Sideswipe same direction
(One trying to pass in emergency lane)*

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*1 angle
(Tried to pass left turning vehicle)
1 Single Vehicle
(DUI)*

*Revised CRF: 0.958
Intersection CRF: 0.56 (2000-2002)*

There were only two crashes at this location during 2003-2004. One of these was a fatality. In that fatal crash, southbound unit one tried to pass and met northbound unit 2 head-on. This occurred at 2:06 PM in November. It was raining.

There are left turn lanes, full shoulders and one merge ramp. The intersection appears to be in good shape and collision reports don't indicate a problem the roadway.

Suggest remove from of list.

District Observer recalls that the fatal crash was actually not at the intersection but north of the intersection by approximately 1000 feet.

MP 22.0 to 24.347, Muhlenberg County
Kentucky State Police Post 2 (Madisonville) identified this segment as worthy of consideration as a high crash site. This segment includes the Spots 2-10 through 2-12. Improvements to this segment will be addressed by the spot improvement recommendations that follow.

Spot 2-10, Muhlenberg County, MP 22.298 – 22.398

This spot located in South Carrollton includes the intersection with KY 81. There were 16 total crashes at this location for a CRF of 3.669. There were seven "rear end" crashes included in the total. Team members noted that HES project 2-976 begins just north of this spot (MP 22.4 – 22.7) and does not include the KY 81 intersection.

Preliminary Team Recommendation: Assign High priority for intersection improvements.

This location has several constraints: a railroad parallel to US 431 on the west (toe of embankment is only two to three feet from edge of roadway), a cemetery in the northeast quadrant with tombstones up to the right-of-way, a former gas station property with verified contaminated soil, and residences and a convenience store close to the right-of-way. The intersection also involves other streets: Hill Road, which comes directly into the intersection to form a fourth leg; E. Church Street, which intersects US 431 about 200 feet south of the intersection; and Carroll Street, which intersects KY 81 about 200 feet west of the intersection. These are low-ADT streets, but complicate the geometry of the main

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intersection. There is a sight distance problem for vehicles northbound US 431 vehicles turning left due to US 431 curving beyond an embankment just north of the intersection. At the minimum, cutting back this embankment would improve the situation, but the cemetery would be impacted by that simple maintenance fix.

A left turn lane at the intersection would provide another benefit, but widening in this area will have a severe impact on several residences and at least one business. Because of the congestion along the ¾-mile stretch of US 431 and the impact of widening for turn lanes within South Carrollton, the District Observer recommends a bypass to the west (Green River is on the east side of town) but recognizes the high cost of this alternate. Even so, there will be a high cost to any widening (right-of-way acquisition and utility relocation) within South Carrollton. A bypass to the west of South Carrollton with a southern terminus that ties into the Central City bypass (KY 189) at the north end of a long tangent section and a northern terminus that begins just north of the intersection with KY 81 would combine Spots 2-9, 2-10, and 2-11 into one project and eliminate the constraints (cemetery, contaminated soil, railroad, river, congestion) that exist with alignment options through town center. The length of the bypass would be approximately two miles and involve 6-8 relocations.

Spot 2-11, Muhlenberg County, MP 22.398 – 22.498

This spot located in South Carrollton begins at the KY 81 intersection. There were ten total crashes for a CRF of 1.97. Four of the crashes were “single vehicle,” two were “angle” collisions and two were “rear end.” This spot is included in [HES project 2-976](#) for horizontal and vertical realignment, shoulder widening, and guard rail installation. This project does not include improvements to the intersection at KY 81.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-12, Muhlenberg County, MP 24.250 – 24.350

This spot located in South Carrollton is just north of Power Plant Drive. There were 12 total crashes for a CRF of 2.533. 10 of the crashes were “single vehicle” type collisions. Muhlenberg County Judge Kirtley noted the curve near the Kentucky Utilities plant as a location to consider for improvements. Team members noted that **HES project 2-977** was originally two projects with the following limits: MP 23.9 – 24.1 and MP 24.3 – 24.5. These two projects were combined for horizontal and vertical realignment, shoulder widening, and guardrail installation. This spot will be addressed by this project.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

MP 0.0 – 1.5 and MP 1.0 – 2.5 (overlap noted), McLean County

Kentucky State Police (Henderson) recommended a segment in McLean County from the levee at the Muhlenberg County line north to MP 1.5 for widening and

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shoulder upgrade; and from MP 1.0 to 2.5 for shoulder upgrades. The team looked at the crash data for the segment from 0.000 to 4.354 and noted 26 total crashes for a 0.341 CRF. This data included two fatalities over that 3 year period. Project team members noted that the roadway sits up high on a narrow fill with deep ditches on each side. HIS data show 2-foot shoulders. Shoulder upgrades would involve bringing in large amounts of additional fill material given the height of the existing fill and length of the segment.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.** The study team considered recommending guard rails for this segment but decided against that recommendation. The reasoning was that there is a low CRF and the addition of guard rails on such a narrow segment of road would have a confining effect and could cause some drivers to “hug” the centerline, with the potential for head-on collisions and additional fatalities.

Spot 2-13, McLean County, MP 2.450 – 2.550

This spot located in Island includes the intersection with KY 85. There were five total crashes for a CRF of 0.976. Three of the crashes were “angle” collisions. Team members noted that this intersection is “old” KY 85 and not the bypass that was recently constructed. Kentucky State Police (Henderson) recommended adding turning lanes at the intersection with Main Street (old KY 85) in Island.

Preliminary Team Recommendation: Assign Low priority for intersection improvements.

Intersection CRF: 0.44 (2000-2002)

Three of the five crashes involved vehicles pulling out from KY 85, failing to stop and/or yield.

*2003-2004 crash data show 3 total crashes (1 fatal, 1 injury, 1 PDO)
2 angle (1 injury, 1 PDO)
1 single vehicle (fatal)*

The fatal crash involved a northbound vehicle that ran off the road and overcorrected, rolling four times. Conditions were clear and dry, daylight (10:20 AM) and a straight segment of road.

Both of the 2003-2004 angle collisions involved drivers who pulled out into US 431 from KY 85. One driver stated he thought the intersection was a 4-way stop.

Suggest keeping original team recommendation for intersection improvements, possibly including signing improvements.

A vertical crest exists on US 431 just north of the intersection with Main Street (old KY 85) that contributes to poor sight distance for vehicles pulling out from old KY

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85. The higher speed of southbound vehicles just entering the city limits of Island at this vertical curve exacerbates the problem. Left turning lanes on US 431 are probably not warranted. Vertical realignment like was accomplished in the Hopkins County community of Beulah would be a good solution here.

MP 5 – 11.6, McLean County

Kentucky State Police recommend shoulder upgrades on this segment of US 431. The team looked at crash data and noted no particularly high CRF's from segment analysis. However, Spots 2-14 through 2-18 are included within this segment's limits. **Improvements to this segment will be addressed by the spot improvement recommendations that follow.**

Spot 2-14, McLean County, MP 5.450 – 5.550

This spot in Livermore includes the Third Street intersection. There were six total crashes for a CRF of 1.035. Five of the six crashes at this spot were at the Third Street intersection. Four crashes were "rear end" collisions and two were "angle" collisions. Mayor Eaton noted in a response to our Resource Agency Coordination request for information that the intersection at the foot of the Green River Bridge is probably the most dangerous in the community. Livermore Mayor Eaton supports widening due to business prospects it would bring to Livermore. Team members noted that there is poor access control (continuous entrances from road to gas station and other businesses) at this location ~~and that there is no one particular intersection causing problems from the bridge north~~. This location was recently converted from 2-lane to 3-lane and team members suggested evaluating updated crash data that applies to this reconstructed section.

Preliminary Team Recommendation: Assign Medium priority for 3-lane curb and gutter improvements with access control. Evaluate updated crash data for the reconstructed section.

Crashes north of the bridge are bunched at the Third Street intersection. This is a T-intersection (the stem is Third Street on the west side of US 431). Aerial photograph shows opposite Third Street, across US 431 on the east side, is a gas station (Sam's) with an extended parking lot with continuous access. The access along the east side of this intersection may no longer be the same depending on the reconstruction that has been done.

2003-2004 crash data show only 3 crashes at this location:

*1 Angle (injury)
2 Rear End (0 injury , 2 PDO)*

2005 – No crashes have been recorded as of September 30.

Suggest that if reconstruction has addressed access problems at this intersection, then remove from list. Otherwise, keep original team recommendation for 3-lane curb and gutter with access control.

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The US 431 improvements (center turning lane, curb and gutter, realigning of KY 136 intersection) completed in 2004 begin one-half mile north of this location. (See Spot 2-15) Expanding that project south to the Green River Bridge would address access-related crashes. Because the intersection of Third Street is only a few hundred feet north of the bridge, adding a northbound left turn lane for US 431 at Third Street would be difficult to achieve without widening the bridge approach (for example, the J.R. Miller Blvd. at 3rd Street intersection in Owensboro where the Ohio River bridge approach had to be widened.)

Spot 2-15, McLean County, MP 6.038 – 6.138

This spot in Livermore includes the intersection with KY 136. There were 13 total crashes for a CRF of 2.348. Six of the crashes were “rear end” collisions and four were “angle” collisions. This location is currently under construction to be completed in May or June of 2005 under **KYTC Item No. 2-9.00**.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-16, McLean County, MP 8.265 – 8.365

This spot includes the intersection with KY 1080. There were nine total crashes for a CRF of 1.557. This spot is within the limits of **HES project, 2-972**, to cut back embankments to improve sight distance and add left turn lanes on US 431 at KY 1080.

Preliminary Team Recommendation: **Drop from list of recommended improvements for this study.**

Spot 2-17, McLean County, MP 9.300 – 9.400 [Congested area north of Barrett Hill Rd.](#)

This spot is located just north of the intersection of Barrett Hill Road. There were seven total crashes for a CRF of 1.211. Three of the crashes were “angle” collisions. Team members had no additional information immediately available on this spot.

Preliminary Team Recommendation: Assign Low priority for intersection improvements. Conduct more detailed analysis of crashes and reevaluate.

<i>7 Total Crashes</i>	<i>(3 injury, 4 PDO)</i>
<i>3 Angle</i>	<i>(1 injury, 2 PDO) one involved tire failure</i>
<i>2 Single Vehicle</i>	<i>(1 injury, 1 PDO) both hydroplaned</i>
<i>1 Rear End</i>	<i>(PDO)</i>
<i>1 Head On</i>	<i>(injury) avoiding rear end collision</i>

CRF: 1.211

Police collision reports indicate this is not an intersection problem, but involves vehicles turning and/or stopped waiting to turn, at a short, busy segment of road with no less than eight driveways (four on each side of US 431) immediately north

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of the Barrett Hill Road intersection. Aerial photograph suggests heavy commercial, industrial or agricultural activity at this location.

Suggest access improvements. Also suggest investigating drainage/pavement improvements to address hydroplaning. Note further mention of hydroplane incidents in following descriptions.

There are a total of 13 access points within the half-mile section of commercial, industrial, and agricultural businesses. District Observer suggests two-way left turn lane.

Spot 2-18, McLean County, MP 9.800 – 9.900 [KY 250](#)

This spot includes the intersection with KY 250. There were ~~seven~~ total crashes for a CRF of ~~1.272~~. Four of the crashes were “rear end” collisions. Team members noted that this is a residential area with Buck Creek Baptist Church and a business (ADS Pipe) located near the intersection. They also noted that many students take KY 250 west to high school in Calhoun via this intersection.

Preliminary Team Recommendation: Assign Low/Medium priority for intersection improvements. Conduct more detailed analysis of crashes and reevaluate.

6 Total Crashes (3 injury, 3 PDO)

<i>4 Rear End</i>	<i>(2 injury, 2 PDO)</i>
<i>1 Single Vehicle</i>	<i>(injury) hydroplane</i>
<i>1 Angle</i>	<i>(PDO) avoiding rear end collision</i>

Revised CRF: 1.091

Intersection CRF: 0.60 (KY 250 only)(2000-2002)

This spot includes two T-intersections, offset: The south-most is the west leg, KY 250; the north-most is the east leg, Buck Creek Church Road. On the east side of US 431, across from KY 250 is a parking lot for Buck Creek Baptist Church.

Five of the six crashes involved stopped vehicles waiting to turn.

Suggest realigning intersection and adding turn lanes. Also suggest eliminating church parking access directly off US 431. Also suggest investigating drainage/pavement improvements to address hydroplaning. Note further mention of hydroplane incidents in following descriptions.

Sight distance problems exist at both intersections due to US 431 being in a reverse curve at this location. Realigning the approach roads would involve either relocating two houses on the west approach or a church on the east approach. As noted above, the majority of crashes involved vehicles stopped on US 431; therefore, adding a two-way left turn lane at this location would be a viable solution.

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Spot 2-19, Daviess County, MP 2.599 – 2.699 [KY 140](#)

This spot in Utica includes the intersection with KY 140. There were ~~40~~ total crashes for a CRF of ~~1.408~~. ~~Three~~ of the crashes were “angle” collisions, three were “single vehicle,” two were “rear end,” ~~and two~~ were “head on.” There are flashing beacons at this intersection and a Citgo Station on one corner. Team members noted a sight distance problem when approaching from the ~~east~~ on KY 140, that it is necessary to pull up close to US 431 in order to see. It was also noted that there is a historical marker just north of this intersection at the site of a Civil War skirmish. According to the Environmental Overview prepared for this study, this site has not been assessed for National Register potential.

Preliminary Team Recommendation: Assign Medium priority for intersection improvements and turning lanes.

13 total crashes	(6 injury, 7 PDO)
7 Angle	(5 injury, 2 PDO)
3 Single Vehicle	(0 injury, 3 PDO) (2 hydroplane)
2 Rear End	(1 injury, 1 PDO)
1 Head On	(0 injury, 1 PDO)

Revised CRF: 1.441

Intersection CRF: 0.99 (2000 – 2002)

This is the intersection with KY 140. The intersection has flashing beacons and there is a Citgo Station on the northeast corner. An embankment on the southwest corner obstructs views to the south from the west leg. There is also a slight skew to the intersection adding to the difficulty in getting a good view looking south from the west leg. Five of the crashes involved an eastbound vehicle pulling into the path of a northbound vehicle (One of these was listed as a single vehicle because the northbound driver ran off the road to avoid the collision. The other four were angle collisions. Two of these resulted in injuries).

Note the two hydroplane crashes and see write-up in the next segment for MP 2.599 – 4.968 regarding other hydroplane crashes in this area.

Suggest cut back embankment, realign intersection and add turn lanes.

District Observer agrees with suggestion and also notes that US 431 is in a horizontal curve at this intersection. Observer noted two large trees along US 431 just north of the intersection. The trees block the line of sight for vehicles on the west KY 140 approach. Due to the trees to the north and the embankment to the south, there is zero sight distance for vehicles in the west approach when stopped at the stop sign. Vehicles must move up several feet to gain any view. Also, the speed limit for US 431 does not drop through the community of Utica, so many vehicles are going 55+ mph. In fact, while making notes sitting in the parking area of Citgo, Observer witnessed a school bus pull out from the west approach into the path of another vehicle, causing the northbound driver to suddenly brake and

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sound horn. Utica Elementary School (slated to close soon) is located ¼ mile west of this intersection, therefore many busses use this intersection every day.

Of all the spot improvements that were visited for this report, it is the Observer's view that this intersection is one of the two worst, based on sight distance, speed, and number and type of vehicles using the intersection (also Spot 1-7a). Realigning US 431 around Utica would be a costly solution. Minor realignment of KY 140 to intersect US 431 just south of the existing intersection would be a less costly solution, involving one or two residential relocations. At the very minimum, the embankment in the southwest quadrant and the tress in the northwest quadrant should be removed. These are minor maintenance improvements that would drastically improve the safety of this intersection.

Spot 2-19a, Daviess County, MP 2.599 – 4.968

Kentucky State Police (Henderson) recommend horizontal and vertical alignment and routine road repairs for this segment. While there were no high crash spots noted within these limits, team members noted the terrain is rolling and there can be problems trying to pass for vehicles that get stuck behind slow moving farm equipment.

Preliminary Team Recommendation: Assign Medium priority for passing lanes. Conduct more detailed analysis of crashes and reevaluate.

*54 total crashes including Spot 2-19. (1 fatal, 24 injury, 29 PDO)
CRF: 0.695*

*41 total crashes excluding Spot 2-19 (1 fatal, 18 injury, 22 PDO)
25 Single Vehicle (1 fatal, 12 injury, 12 PDO) (8 hydroplane)
8 Rear End (2 injury, 6 PDO)
4 Angle (3 injury, 1 PDO) (1 hydroplane)
3 Sideswipe Opposite Direction (1 injury, 2 PDO)
1 Sideswipe Same Direction (avoiding rear end collision), (0 injury, 1 PDO)
CRF: 0.548*

One fatal crash was noted: A single vehicle veered off the road on the right side and then overcorrected crossing back across both lanes off the left side of the road. This crash occurred during daylight hours (10:52 AM) on a clear day on a dry road. Sands Road intersects US 431 at the location where the vehicle first veered off the road. Sands Road runs north-south and has a sharp bend at the south end where it intersects US 431 at a right angle, in a curve on US 431. This was a 36 year old female driver with 1 male and 3 female passengers. The driver and one passenger resided in Owensboro. The other three passengers were from Evansville, IN, Utica, KY, and Dallas, TX. DUI was not suspected. The driver was the only fatality.

Only 2 crashes were associated with passing (One involved a garbage truck being passed, the other a tractor trailer was being passed.)

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The combination of driveway access and rolling terrain was noted as a factor when turning vehicles were rear ended after the vehicle approaching from behind topped the crest of a hill.

There were 9 hydroplane crashes noted including 2 within Spot 2-19 (plus 3 additional potential hydroplane crashes). These hydroplane crashes occurred throughout the corridor with 4 (plus one of the potential hydroplane crashes) concentrated around MP 3.5.

The CRF is well below one. Over half of the crashes were single vehicle and of these, almost one-third involved hydroplaning. Suggest drainage and/or pavement improvements.

District Observer is familiar with one location of ponding of water at roadway's edge within this segment. A wide gravel entrance for a roadside business is located at MP 4.09, and water gets trapped there at the edge of pavement. This segment also has several horizontal and vertical alignment deficiencies. As noted above, there are numerous private entrances and four approach road intersections in this segment, two of which (McFarland and Brown's Valley) have sight distance problems, and another (Sands Lane) intersects at an acute angle.

Widening for passing lanes would not be ideal as passing lanes could encourage faster speeds. Considering the alignment deficiencies and numerous entrances, faster speeds would exacerbate the sight distance problems. In addition, a cemetery is located adjacent to the roadway near the intersection with Sands Lane, which could be impacted by widening.

District Observer recommends this location for new alignment. Approximately 8,100 feet of realignment on the east side of the existing roadway would eliminate the existing alignment deficiencies.

Spots 2-20 through 2-24 are located in the general vicinity of the Mall on US 431 outside the Owensboro Bypass.

Spot 2-20, Daviess County, MP 10.650 – 10.750

This spot had ~~14~~ total crashes for a CRF of ~~1.552~~. ~~Seven~~ of the crashes were "angle" collisions, ~~five~~ were "rear end" and ~~two~~ were "opposing left turn." Team members noted that the location of this spot could include the light at Applebee's. If so, then corrective action would probably have to be handled locally by petitioning the developer since the side streets are controlled by the property owners.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

South Mall/Wal-Mart Owensboro Center Entrance

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15 Total crashes (3 injury, 12 PDO)
6 Rear End (0 injury, 6 PDO)
(2 southbound, 4 northbound)
9 Angle (3 injury, 6 PDO)

Revised CRF: 1.663

*The Mall is located on the west side of US 431. There are two Mall entrances off of US 431 separated by approximately 0.12 miles. This spot includes the south Mall entrance which is signalized with left turn lanes. The entrance on the east side is for ~~Wal-Mart~~ and Owensboro Center. Typical rear end crashes in stopped traffic due to inattention were noted. Vehicles crossing US 431 were noted trying to beat the light getting from the Mall to ~~Wal-Mart~~ and vice versa. **Cannot access Wal-Mart from this intersection.***

No suggested roadway improvements to correct inattention and impatience. Intersection is already signalized with turn lanes.

See also remarks below for Spot 2-21.

District Observer noted that the left turn lanes on US 431 are offset from the opposing through lanes by a curbed divider of approximately 3 – 5 feet in width. Observer has noted that opposing left turning vehicles block the line of sight of oncoming traffic during the permitted left turn phase. This could contribute to the nine angle crashes at this intersection. Eliminating the curbed divider would allow left turning vehicles to be positioned farther to the left for better visibility but could cause other safety concerns; however, the curbed dividers were recently removed at the two signalized intersections at the Bypass interchange (Spot 2-24) with no apparent negative safety ramifications.

Spot 2-21, Daviess County, MP 10.800 – 10.900

This spot had **22** total crashes for a CRF of **2.439**. **10** of the crashes were “rear end” collisions, **four** were “angle,” **four** were “opposing left turn,” **three** were sideswipe-same direction,” and **one** was “single vehicle.” Team members noted that this is probably the **middle** entrance at the mall. This **middle** entrance is unsignalized but located between two signalized intersections. Team members suggested there was a left turn problem for vehicles exiting from the mall.

Preliminary Team Recommendation: Assign High priority to close median and eliminate left turns at this mall entrance.

North Mall/Wal-Mart Entrance

16 Total crashes (6 injury, 10 PDO)
9 Rear End (6 injury, 3 PDO)
(5 southbound, 4 northbound)

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5 Angle (0 injury, 5 PDO)
2 Sideswipe Same Direction (0 injury, 2 PDO)

Revised CRF: 1.774

The Mall is located on the west side of US 431. There are two Mall entrances off of US 431 separated by approximately 0.12 miles. This spot includes the north Mall entrance which is unsignalized and has a median break with left turn lanes. The entrance on the east side is for Wal-mart. Typical rear end crashes in stopped traffic due to inattention were noted. Left turns to/from Wal-Mart and the Mall resulted in angle collisions – vehicles crossing multiple lanes – left turn versus vehicle continuing straight – failure to yield – in one case, view of oncoming traffic obstructed by vehicle sitting in turn lane.

Suggest keeping team recommendation to close median.

District Observer noted that, in this location, there are no access roads between major businesses on the same side of the road – for example, between Home Depot/Sam’s Club and the Mall on the west side and between Wal-Mart and Target and their respective strip developments on the east side. Though this may be out of the jurisdiction of the Department, access between these businesses (frontage or “backage” roads) would eliminate the need for traveling public to use US 431 when making trips to multiple businesses. The effect would be to reduce the number of vehicles using this intersection and the intersection described above (Spot 2-20). It is worth noting that “backage” roads appear to be planned behind Wal-Mart and Target on the east side and a frontage road was constructed on the west side with the recent Home Depot development, but it ended at the property line of the Mall, i.e. no connection, due to property owner dispute (according to Messenger Inquirer article).

Spot 2-22, Daviess County, MP 10.950 – 11.050 [Southtown Blvd.](#)

This spot includes the intersection of Southtown Boulevard. There were 30 total crashes for a CRF of 1.703. 16 of the crashes were “rear end” collisions and another eight were “angle” collisions. Team members noted [that Southtown Boulevard is going to be widened to three outbound lanes, five lanes total, under project 2-221.00.](#) This state-funded project is just finishing up with the design phase.

Preliminary Team Recommendation: Drop from list of recommended improvements for this study.

Spot 2-23, Daviess County, MP 11.150 – 11.250 [Carlton Drive, Salem Dr./Goetz Rd.](#)

This spot includes the intersection with Carlton Drive. There were ~~33~~ total crashes for a CRF of ~~1.873~~. ~~17~~ of the crashes were “rear end” collisions, ~~nine~~ were “angle,” ~~five~~ were “opposing left turn,” and ~~two~~ were “backing.” Team

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members noted that this intersection is not signalized and the traffic backs up here. The backups could be due to the signal north of Carlton Drive.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

51 Total crashes (14 injury, 37 PDO)
23 Rear End (5 injury, 18 PDO)
(15 northbound, 8 southbound)
25 Angle (9 injury, 16 PDO)
10 at Carlton: crossing multiple lanes and failure to yield to oncoming traffic, views obstructed by other vehicles, vehicles stopping to let traffic exit from Carlton - waving them into traffic.
13 at Salem/Goetz: primarily failure to yield, running red, trying to beat yellow
2 other entrances (Gas Station and Steak-n-Shake)
2 Sideswipe Same Direction (0 injury, 2 PDO)
1 Backing (0 injury, 1 PDO)

Revised CRF 2.895:

Intersection CRF at Goetz (KY2699): 0.61(2000-2002)

This spot includes Carlton Drive and Salem Drive/Goetz Road. Carlton (MP 11.155) is unsignalized and located between two signalized intersections: Fulton Drive(MP 11.066) to the south, and Salem/Goetz (MP 11.215) to the north; separated from Carlton by 0.09 mile and 0.06 mile respectively. There is a break in the median to allow left turns into and out of Carlton. Traffic backs up from Salem/Goetz contributing to the higher number of northbound rear end collisions. At least four vehicles exiting Carlton to turn left onto US 431 were hit by northbound drivers. The acute intersection angle may affect view to south for drivers exiting Carlton. Also, northbound US 431 vehicles in outside lane letting traffic out of Carlton block the view from Carlton of vehicles in the inside northbound lane on US 431. Vehicles in the US 431 southbound left turn lane also block the view of left turning vehicles exiting Carlton. Tractor-trailers in the left turn lanes on US 431 obstructed views at the intersection at Salem/ Goetz.

Suggest realigning Carlton to right angle and closing median. No suggestion for Salem/Goetz which is already signalized with turn lanes and has an intersection CRF less than one.

District Observer noted that intersection angle of Carlton Drive is nearly perpendicular – maybe 15 degrees sharper than perpendicular, which is generally tolerated by our guidelines. Observer noted no sight distance problem due to intersection angle, but does concur with observation of stopped traffic blocking view of vehicles turning to and from Carlton Drive. Observer agrees with suggestion to close median, which would not be unreasonable considering the entrances for at least six other adjacent businesses between Fulton and Salem

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have only right-in/right-out access. Department could consider constructing median to allow left-turning vehicles from US 431 on to Carlton but not allowing left-turning vehicles from Carlton on to US 431, as is proposed on US 41A at the Hopkinsville Mall, but stopped traffic blocking view of turning vehicles would still be an issue.

Spot 2-24, Daviess County, MP 11.267 – 11.367 [Bypass Interchange](#)

This spot includes the Owensboro Bypass interchange. There were ~~60~~ total crashes for a CRF of ~~2.684~~. ~~43~~ of these crashes were “rear end” collisions. Team members noted that both intersections for the ramps on each side of the bypass are signalized. Vehicles coming off the ramp and turning left to go southbound may be accelerating to make it through the light, but then reach the next light for the ramps south of the bypass unprepared to stop, resulting in the large number of “rear end” collisions.

Preliminary Team Recommendation: Conduct a more detailed analysis of the crash data and reevaluate.

(Intersection south ramps: MP 11.322, Overpass: MP 11.367, Intersection north ramps: MP 11.471)

31 Total Crashes

- 27 Rear End (6 injury, 21 PDO)
(16 southbound, 9 northbound, 2 on ramps)*
- 4 Angle (0 injury, 4 PDO)
(left turns to/from ramps, failure to yield)*

*Revised CRF: 1.385
Intersection CRF: 0.96 (2000-2002)*

The rear end crashes were predominantly due to inattention. Distractions such as radio, passengers in back seat, looking away, checking mirrors, etc. were noted. There was no specific mention of drivers accelerating southbound toward next signal from north set of ramps. Suggest that southbound traffic from bypass is more prone to backups due to traffic around Mall and Wal-Mart. Intersections for both sets of ramps are already signalized with turn lanes. Improvements to spots discussed above, south of this interchange, may help alleviate traffic backups here. No other suggestions for roadway improvements to address rear end crashes and driver inattention.

District Observer noted potential problem with ramp at southwestern quadrant of interchange. Vehicles exiting bypass going southbound on US 431 are instructed by sign to yield, yet the end of the ramp adds a lane for a southbound right turn lane into Goetz. The added lane may impress upon drivers that merging is allowed, which could cause rear-end crashes (the highest type of crashes noted) between this intersection and the intersection at Goetz. No suggestions for improvements considering the short distance between the two intersections.

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Project Team Meeting 4
KYTC District 4 Office, Elizabethtown
August 15, 2007**

A project team meeting for the US 431 Programming Study was held at 10 a.m. EDT on Wednesday, August 15, 2007, in Elizabethtown, Kentucky. The purpose of the meeting was to review the updated crash data and discuss final team recommendations on spot improvements. The meeting agenda is attached.

Participants in the meeting came from the Kentucky Transportation Cabinet (KYTC) Central, District 2, and District 3 Offices, and Wilbur Smith Associates (WSA). Meeting attendees included the following:

Steve Ross	KYTC Central Office
Kevin McClearn	KYTC District 2
Joe Plunk	KYTC District 2
Jean Jones	KYTC District 2
Jeff Moore	KYTC District 3
Deneatra Hack	KYTC District 3
Misti Wilson	KYTC District 3
Carl Dixon	WSA
Bill Gulick	WSA
Brad Johnson	WSA
Rebecca Ramsey	WSA

1. Welcome and Introduction

Steve Ross opened the meeting, introducing the project team. The following session is intended as an informal discussion leading to recommendations to wrap up the US 431 study.

2. Project History

Steve Ross presented a brief history of the study process: begun as a planning study in 2003 or earlier, this project is intended to produce a list of safety improvements along the US 431 corridor from Tennessee to Indiana. While there has been some local interest in converting the route to a four lane section, continued discussions affirm that spot improvements are a more appropriate and cost effective recommendation given the existing conditions and needs along the corridor. WSA was included in the project in July 2007 to update the data, make recommendations, and create a report. Steve also noted that a secondary goal of the study was to improve access and connectivity.

3. Purpose of Meeting

Steve Ross explained that the purpose of the meeting was to review the updated crash information prepared by WSA. Additionally, a new set of recommendations for spot improvements and a prioritization scheme were developed for team approval.

4. Overview of Tasks Completed to Date

Rebecca Ramsey presented a brief overview of the US 431 study process to date and outlined the crash analysis methodology employed. "Segments" and 1/10-mile "spots"

are defined by the Kentucky Transportation Center and can be statistically analyzed to compare crash rates within the state. WSA further defined “locations” as a group of 1/10-mile spots clustered into a short length of roadway, reasoning similar factors may be leading to crashes in such close proximity.

The Critical Rate Factor (CRF) is a measure used to compare the frequency of crashes at one spot/segment with similar spots/segments throughout the state. There was some discussion during the meeting about whether a CRF of 1.0 implies that crashes are occurring at the average rate or that there is 99.5% likelihood that crashes are attributable to nonrandom events. **Steve Ross agreed to follow up on this topic.**

5. Crash Spot/Location Presentation and Discussion

Brad Johnson led the discussion of the identified crash spots and locations by mentioning general trends observed during a field review.

- All or some of the corridor has been identified as a candidate for eventual 4-laning.
- Projects currently programmed with a construction phase in the Six Year Highway Plan have been identified along the route. Following discussion by the team, it was decided that projects with a programmed right-of-way phase would be included in the list of committed projects as well.
- Large volumes of heavy trucks travel the route, especially coal trucks in Muhlenberg County. A portion of the route south of Russellville has been designated part of the truck network.
- In communities along the route, the large number and excessive widths of driveways and other access points has a negative impact on level of service and safety. Applying forms of access control applications (e.g. limiting widths or consolidating entrances) would likely improve safety and operational performance.
- Roadside features should be incorporated into any improvements occurring along the roadway.

Brad Johnson outlined the five categories established to group spots/locations. These include:

- Category 1: KYTC and WSA agree to drop spot from further consideration because of a low CRF or another scheduled project that will address the area.
- Category 2: KYTC and WSA agree about the problem and solution at a particular site.
- Category 3: Site identified in KYTC (2000-2002) crash data that does not appear in WSA (2003-2006) crash data.
- Category 4: New sites that appeared based on WSA crash data which were not included in KYTC crash data.
- Category 5: KYTC and WSA agree about the problem at a particular site but differ on recommended solutions.

As the meeting progressed, another category was added to this list. Category 6 will be the designation for sites which are recommended for continuing consideration. In these cases, the problem leading to elevated crash rates is unclear or projects identified may not primarily impact safety but would still add value to the transportation system.

5a. Recommendations

Category 1 – Sites to Drop from Priority List

The following sites were recommended to be dismissed from further consideration due to low CRF values or because a previously scheduled project is anticipated to address the issue:

- Location 1-B (Spot 1-1) at the KY 591 intersection
- Location 1-F (Spot 1-3) between KY 106 and KY 107
- Location 1-L (Spot 1-7a, 1-8) around Dead Man's Curve
- Location 1-N (Spot 1-9) between KY 2270 and KY 246
- Location 1-S (Spot 1-16) south of Old Sawmill Road
- Location 2-E (Spot 2-12) at Power Plant Drive in South Carrollton
- Location 2-H (Spot 2-15) at the KY 136 intersection
- Location 2-I (Spot 2-16) at the KY 1080 intersection

Spot 1-7a in Location 1-L was called out for specific discussion. This spot falls just south of the improved section at Dead Man's Curve. Maintenance improvements at Dead Man's Curve were completed in 2004; the segment was reconstructed in late 2006. Crash data for 2003-2006 shows a number of crashes occurring on the curve to the south. It was decided that Spot 1-7a should be included in Category 6; the site should be monitored to determine if realigning Dead Man's Curve will improve safety on the curve to the south as well.

The team agreed that the other locations should be dismissed from further consideration.

Category 2 – Sites with WSA/KYTC concurrence

The following sites were identified in both KYTC (2000-2002) and WSA (2003-2006) crash data. The team agreed on the cause of the problem and the recommendation to address it.

- Location 1-G (Spot 1-4) at Hollow Bill is recommended for segment reconstruction.
- Location 1-J (Spot 1-6, 1-7) at the intersections with Belcher Lane and Penrod Cutoff Road and the Rocky Creek crossings is recommended to widen both bridges and reconstruct the mainline segment between structures.
- Location 1-O (Spot 1-10) at the KY 246 intersection is recommended to have the split lanes removed to form a single 3-leg intersection.
- Location 1-Q (Spot 1-12, 1-13) at the KY 70 intersection is recommended to have the split lanes removed to form a single 4-leg intersection.
- Location 1-R (Spot 1-14, 1-15) at the intersection with KY 176 is recommended for intersection improvements to increase turning radii, add turn lanes, and delineate entrances. The KY 2107 intersection at this location is recommended for realignment to form a T-intersection.
- Location 1-T (Spot 1-17) at the Cleaton Road intersection is recommended for turn lanes and removing sight distance obstacles.
- Location 2-A (Spot 2-2) north of the parkway interchange in Central City is recommended for a 3-lane section.
- Location 2-K (Spot 2-18) at the KY 250 intersection is recommended for turn lanes.

Category 3 – KYTC Spots not in WSA data

The following locations do not appear to be priority safety issues based on the updated crash data gathered by WSA. Discussion of these sites is presented below.

- Location 2-G (Spot 2-14) at the Third Street intersection in Livermore does not appear as a safety issue with a revised CRF of 0.44. However, this 2-lane section is recommended for widening to a 3-lane section within Livermore to the base of the bridge approach. Identified by the Green River ADD as the top regional priority, this improvement would improve access/connectivity, the secondary goal of this study. For this reason, Location 2-G was moved to Category 6.

Action Item: Districts 2 and 3 will forward a copy of any other ADD priorities to WSA to ensure these preferences are accounted for in other locations as necessary.

- Location 2-J (Spot 2-17) north of the Barrett Hill Road intersection in McLean County has an updated CRF of 0.45 from the 2003-2006 crash data. Drainage improvements to address hydroplaning were initially recommended, but the problem seems to have been addressed based on recorded crashes. The team agreed to drop this spot from further consideration.
- Location 2-O (Spots 2-20 through 2-24) in south Owensboro was recommended to be dropped. Recent widening, access consolidation, and other improvements have well addressed safety issues in this area.

Category 4 – New spots/locations appearing in WSA (2003-2006) crash data

Several new spots/locations appeared based on the analysis of the updated crash data. These were presented to the project team.

Jeff Moore brought up the routing issues occurring in Logan County. There has been some confusion when coding crash reports between US 431 and US 431X (Business) around Russellville. Many times, crashes showing up on US 431 have been inaccurately coded and are occurring on the other route. To address this, a recently approved order will rename US 431X as KY 3519.

Action Item: District 3 will access the detailed police reports for crashes as occurring at Locations 1-A, 1-C, 2-F, and 2-L to verify the coding of reported crashes.

The crash maps prepared by WSA should be updated to show the correct routing of US 431 north of Russellville.

Two narrow bridges in southern Logan County led to a discussion on functionally obsolete bridges. With the portion of US 431 south of Russellville designated as part of the truck network, these narrow structures may lead to increased incidents. The report for this project should address the narrow bridges.

- Location 1-A is a residential cluster ½ mile north of the TN state line. Coding errors may be responsible for a number of these crashes, actually occurring on US 431X. If District 3 verifies that this is the case, the team will drop this location from further consideration.
- Location 1-C at the northern limits of Adairville is another instance when incorrect coding may be locating crashes on US 431 instead of US 431X. District 3 will

follow up on this by checking police reports and the team will dismiss this spot from further consideration if this proves to be the case.

- Location 1-E at the Lewisburg-Edwards Road intersection has limited sight distance over a crest. The Lewisburg Bypass, currently in design phase now, should remove a significant portion of traffic from the mainline. The bypass will have a 4-lane cross section and drop to 2 lanes north of town to the county line. The team agreed to drop Location 1-E from further consideration.
- Location 1-K contains the intersections with Union Ridge Road and Hudson Lane. Notes from a District 2 observer on a previous field visit noted the Union Ridge intersection as one of the two worst along the route. The team recommends realigning the ½ mile segment at Location 1-K.
- Location 2-L at the McLean/Daviess County line contains several driveways and cross streets on a straight stretch of roadway. It was suggested that some of the crashes coded in this section were mislabeled;

Action Item: District 3 will include this location in the crash report investigation. Pending these results, District 2 will return with recommendations to the project team for this site.

- Location 2-M is the Mill Street intersection in Daviess County. The team agreed to recommend cutting back the embankment to the north to improve sight distances.

Category 5 – Spots identified in both data sets with different recommendations

Discussion continued for the remaining spots which appeared as problem sites in both data sets.

In light of a number of small, short term projects recommended along the route, the project team recommends undertaking a road safety audit along the length of the corridor to identify additional items to address.

- Location 1-D is the US 431 intersection with KY 79 (Nashville St with West 9th St) in Russellville. As mentioned previously, several routes within Russellville are being renumbered to eliminate confusion. US 431 will approach this intersection as the southern and western legs until the southern bypass is constructed. The eastern approach is KY 3519. The bypass is anticipated to remove a significant portion of truck traffic from this intersection and should be considered a higher priority than any improvements to the intersection itself. Right-of-way constraints in both southern quadrants make it challenging to improve tight turning radii. The eastern leg of the intersection leads to a historic neighborhood; eventually, this portion of roadway may be turned over to the city.
- Location 1-H (Spot 1-4a) includes the intersection of KY 1293 and several local roads near the Logan/Muhlenberg county line. The embankment at this location is included in the UPL to be cut but does not lie within state right-of-way. A crest on KY 1293 from Lake Malone should be addressed if a project occurs at this point. Location 1-I (Spot 1-5) includes the intersection with KY 973 less than a ½ mile north of 1-H. As a short term project, road signs obscuring sight distance at KY 973 are recommended for relocation. Locations 1-H and 1-I are recommended to be included in a bypass of Dunmor to the east, extending the newly improved section north from the Muhlenberg/Logan county line.

- Location 1-M (Spot 1-8a) at the KY 2270 intersection is recommended to have sight distance obstacles removed and/or relocated.
- Location 1-P at the Sylvania Street intersection is a wide, straight stretch of road just south of an elementary school which opened in January 2006. The team recommends no improvements at this location; however, it recommends moving this location to Category 6 for continued monitoring.
- Location 1-U (Spot 2-1) is just south of the parkway interchange at Central City. The team recommends extending the tapers south beyond the horizontal curve to allow a longer merging period for southbound vehicles. Converting the parkway interchange to a diamond configuration was identified as a long term goal on the UPL. Because the parkway is destined to be designated as I-66, reconfiguration of the ramps should be reconsidered as part of a future study for the interstate.
- Location 2-B includes several urban intersections in Central City. Widening US 62 west of US 431 to 3 lanes is a district priority and may impact the US 431/US 62 intersection. Flooding issues are common on low parts of the route near the railroad overpass. Trucks traveling through Central City are encouraged to take US 62 west to KY 189 and return to US 431 north of town. It was suggested that District 2 consider renumbering the routes to make this path a more obvious alternative for trucks.

Action Item: District 2 will review the details of the spots within Location 2-B and return with recommendations.

- Location 2-C (Spot 2-9) is the KY 189 intersection. This is where the truck route through Central City rejoins the mainline. This location is recommended for a number of improvements including raising grade, additional signing, and possibly rumble strips to alert the driver. It was noted that a fatality coded at this intersection occurred 1,000 feet north and may not have been coded correctly.
- Location 2-D (Spot 2-10, 2-11) at the KY 81 intersection has the highest CRFs in both data sets. Cemetery, homes, and a gas station with contaminated soils abut the existing alignment. Falling just south of safety improvements of project 02-976.00, this segment is recommended for reconstruction.
- Location 2-F (Spot 2-13) is the Main Street intersection in Island, just south of the improved KY 85 intersection. The team recommends realigning the grade to address sight distance deficiencies. Problems are still reported as occurring at the improved KY 85 intersection. *[Upon further review, the 2003-2006 crash data supports this report. The CRASH Database reports one (1) crash occurred at Main Street, while seven (7) were reported at the KY 85 intersection. Due to potential reporting inaccuracies, it is recommended these locations be further investigated by the District. This may impact the prioritization of this project.]*
- Location 2-N (Spot 2-19) is the KY 140 intersection at Utica. The embankment in the southwest quadrant is in the process of being cut back by maintenance forces. The team recommends adding/stripping for turn lanes at this intersection.

5b. Prioritization

Initially, spot improvement projects identified by KYTC were prioritized in order of CRF for each of the two phases. Since safety is the primary goal of this project, this was thought to be the best rationale for justification. Expanding on this idea, WSA proposed indexing each project as high/medium/low based on CRF, cost, and severity. This

process would provide a generalized cost/benefit weighting, encouraging low cost, high CRF projects to be completed as highest priorities, progressing down to high cost items with CRFs at or near 1.0 last. This would make the safety audit the top priority.

WSA will update the prioritized list based on comments from the project team meeting and submit an updated draft to each District for additional review and comment.

5c. Cost Estimates

There was some discussion about the cost estimates. Recommended items carried forward from initial KYTC items have detailed costs for right-of-way, utilities, and construction. New or modified projects do not have associated costs yet. For the prioritization scheme, WSA divided items into 3 cost categories: Low (<\$500,000), Medium (\$500,000 - \$2 Million), and High (>\$2 Million). Keeping cost estimates in this general format would be adequate for prioritization but would require an extra step before becoming available for programming. With large cost variances year-to-year, this level of detail may be the most practical estimate available.

Action Item: Districts 2 and 3 will provide additional cost estimates for the new and updated projects suggested during the meeting.

6. Q&A

No further questions were asked.

7. Next Steps

Several action items were noted throughout the meeting and need to be acted on. Once this information is gathered, a prioritization of projects will be developed and emailed to the project team. Review, comment, and finalization of the project list and priority will be completed via phone and email correspondence. Following completion of this step, a draft report will be prepared.

The meeting was adjourned at 1:30 PM EDT.

AGENDA

**US 431 Programming Study
Project Team Meeting
August 15, 2007
KYTC District 4, Elizabethtown**

- | | |
|--|-------------------------|
| 1. Welcome and Introductions | KYTC |
| 2. Project History | KYTC |
| 3. Purpose of Meeting | KYTC/WSA |
| 4. Overview of Tasks Completed to Date | WSA |
| 5. Crash Spot/Location Presentation and Discussion Discussion | WSA/Group |
| a. Recommendations by Spot/Location | |
| b. Prioritization of Spots | |
| c. Development of Cost Estimates | |
| 6. Q & A | Group Discussion |
| 7. Next Steps | WSA |
| ADJOURN | |



KENTUCKY TRANSPORTATION CABINET
FRANKFORT, KENTUCKY 40622
WWW.KENTUCKY.GOV

ERNIE FLETCHER
GOVERNOR

MAXWELL C. BAILEY
SECRETARY

September 8, 2004

See Attached List

Dear :

SUBJECT: Planning Study
Logan, Muhlenberg, McLean, and Daviess Counties
US 431 from the Tennessee Border to the Owensboro Bypass
Item No. 02-8106.00

We are requesting your agency's input and comments on a planning study to determine the need for and potential impacts of a proposed highway project. The Kentucky Transportation Cabinet has assembled a study team to develop recommendations for safety improvements on US 431 in two separate phases. Phase I, the southern phase, begins at the Tennessee border and extends northward through Logan and Muhlenberg Counties, excluding the four-lane segment of US 431 north of Russellville and ending at the Wendell H. Ford Western Kentucky Parkway. Phase II, the northern phase, begins at the Wendell H. Ford Western Kentucky Parkway, and extends through Muhlenberg, McLean, and Daviess Counties ending at the Owensboro Bypass. The study is currently in the initial data-gathering stage.

We ask that you identify specific issues or concerns of your agency for Phase I and/or Phase II that could affect the development of the project. This planning study will include a scoping process for the early identification of potential issues and impacts related to the proposed project. At this time our focus is on spot and segment improvements aimed at improving safety in the corridor. If there are any locations that are of particular concern to you, please let us know. We believe that early identification of issues or concerns can help us develop highway projects that avoid or minimize negative impacts.

We respectfully ask that you provide us with your comments by November 1, 2004, to ensure timely progress in this planning effort.

During the development of this planning study, comments will be solicited from federal, state, and local agencies, as well as other interested persons and the general public, in accordance with principles set forth in the National Environmental Policy Act (NEPA) of 1969. The Federal Highway Administration is partnering with us in these efforts.

Other Transportation Cabinet offices or consultants working on behalf of the Transportation Cabinet may also contact you seeking more detailed data or information to assist them in completing their environmental studies for this phase of the project.

We have enclosed the following project information for your review and comment:

- A draft statement of Study Purpose and Project Goals

Phase I

- Project Location Map
- Year 2003 Traffic and Level of Service
 - Logan County
 - Muhlenberg County
- Year 2030 Traffic and Level of Service
 - Logan County
 - Muhlenberg County
- Crash Data
 - Logan County
 - Muhlenberg County
- Environmental Footprints
 - Logan County
 - Muhlenberg County

Phase II

- Project Location Map
- Year 2003 Traffic and Level of Service
 - Muhlenberg County
 - McLean County
 - Daviess County
- Year 2030 Traffic and Level of Service
 - Muhlenberg County
 - McLean County
 - Daviess County
- Crash Data
 - Muhlenberg County
 - McLean County
 - Daviess County
- Environmental Footprints
 - Muhlenberg County
 - McLean County
 - Daviess County

We appreciate any input you can provide concerning this project. Please direct any comments, questions, or requests for additional information to Steve Ross of the Division of Planning at 502/564-7183 or to steve.ross@ky.gov. Please address all written correspondence to Annette Coffey, P.E., Director, Division of Planning, Kentucky Transportation Cabinet, 200 Mero Street, Frankfort, KY 40622.

Sincerely,



Annette Coffey, P.E.
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AC:RSR:RC

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Capitol Annex, Room 329 E
Frankfort KY 40601

The Honorable Dwight Butler
Kentucky State Representative
Kentucky House of Representatives
Capitol Annex, Room 405 D
Frankfort KY 40601

The Honorable Tommy Thompson
Kentucky State Representative
Kentucky House of Representatives
Capitol Annex, Room 432 A
Frankfort KY 40601

The Honorable John H. Guion III
County Judge Executive
Logan County
PO Box 365
Russellville KY 42276-0608

The Honorable Rodney Kirtley
County Judge Executive
Muhlenberg County
PO Box 137
Greenville KY 42345

The Honorable Larry B. Whitaker
County Judge Executive
McLean County
PO Box 127
Calhoun KY 42327-0127

The Honorable Louis Reid Haire
County Judge Executive
Daviness County
PO Box 1716
Owensboro KY 42302-1716

The Honorable William Steen
Mayor of Adairville
City of Adairville
PO Box 185
Adairville KY 42202

The Honorable Shirlee Yassney
Mayor of Russellville
City of Russellville
106 SW Park Square
Russellville KY 42276

The Honorable Kenneth Whitson
Mayor of Lewisburg
City of Lewisburg
451 Stacker Street
Lewisburg KY 42256-0239

The Honorable Jesse Gibson
Mayor of Drakesboro
City of Drakesboro
PO Box 129, Main Street
Drakesboro KY 42337

The Honorable Hugh Sweatt Jr.
Mayor of Central City
City of Central City
203 N Second Street
Central City KY 42330-1296

The Honorable Charles Strole
Mayor of Island
City of Island
PO Box 33
Island KY 42350-0033

The Honorable Eldon Eaton
Mayor of Livermore
City of Livermore
105 W Third Street
Livermore KY 42352-0279

The Honorable Waymond Morris
Mayor of Owensboro
City of Owensboro
PO Box 10003, 101 E Fourth Street
Owensboro KY 42302-9003

BRADD

Barren River
Area Development District



DOT DARBY
Executive Director

JOHN GUION, Chair
SANDY JONES, Vice-Chair
WILLIAM WEBB, Secretary
N. E. REED, Treasurer

October 22, 2004

Annette Coffey, PE
Director
Division of Planning
Kentucky Transportation Cabinet
200 Metro Street
Frankfort, KY 40622

Dear Ms. Coffey:

As per the request in your letter of September 8, 2004, I have reviewed the documents provided for the US 431 Planning Study in Logan, Muhlenberg, McLean, and Daviess Counties. I commend you and your staff for the professionalism and thoroughness shown in the documentation.

As you are aware, Logan County is the only county in the US 431 Planning Study that is also in the Barren River Area Development District; therefore, I will only make comments concerning that county. It is my belief that the study identifies the locations that present safety concerns. It would be helpful if additional information were given for the locations shown as having a Critical Rate Factor greater than one. Perhaps listing the actual number of crashes and the Critical Rate Factor for each location, as was done with the various roadway segments, would help those reviewing the documents.

If I can be of any assistance, please feel free to contact me.

Sincerely,

A handwritten signature in cursive script that reads 'Lencie J. Meredith'.

Lencie J. Meredith, PE
Director of Transportation
Barren River ADD



DELTA REGIONAL AUTHORITY

236 SHARKEY AVENUE / SUITE 400 / CLARKSDALE, MS 38614 / (662) 624-8600 / FAX: (662) 624-8537 / www.dra.gov

October 28, 2004

Annette Coffey, P.E.
Director
Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

RE: Planning Study Comments

Dear Mrs. Coffey,

The Delta Regional Authority is in receipt of the above referenced material in accordance with Executive Order 12372. We find this project to be beneficial to the DRA Counties in the area and have no comments at this time.

Thank you for including Delta Regional Authority in this process.

Sincerely,

Kemp Morgan
Federal Program Coordinator
Delta Regional Authority

DIV OF PLANNING
2004 NOV - 1 A 11: 43

McLean Co.
LIVERMORE
D-2
MERRYMAN
11-03-04

City of Livermore

P.O. Box 279, 105 W. 3rd Street, Livermore, KY 42352
Phone (270) 278-2113 Fax (270) 278-9092

Eldon Eaton, Mayor

Council: Connie Eaton, Wendell Nantz, Delbert Puckett,
Shelly Ranburger, Jr., Shirley Sartain and Nancy Wetzel

October 28, 2004

Kentucky Transportation Cabinet
Attn: Secretary Maxwell C. Bailey
Frankfort, KY 40622

RE: Planning Study of widening US 431

Dear Mr. Bailey,

I have looked over with great detail the maps that you recently mailed to my office. The City of Livermore is located right on Hwy. 431 and most all of our businesses are located there as well. That I believe will be the biggest stumbling block when dealing with this issue.

The City of Livermore supports the widening of US Hwy. 431 due to the potential business prospects that this would bring to our city.

Safety is always the main issue when looking at a project of this size and we hope that the widening would alleviate the problems that we have at the foot of the Green River Bridge. This is probably the most dangerous intersection in our community.

Again, we support your efforts and look forward to this project moving forward.

Sincerely,

Eldon Eaton
Eldon Eaton
Mayor
City of Livermore

RECEIVED
MARC D WILLIAMS
COMM. OF HIGHWAYS
2004 NOV - 1 P 1:09



KENTUCKY TRANSPORTATION CABINET
FRANKFORT, KENTUCKY 40622
WWW.KENTUCKY.GOV

ERNIE FLETCHER
GOVERNOR

MAXWELL C. BAILEY
SECRETARY

November 19, 2004


The Honorable Eldon Eaton
Mayor of Livermore
P O Box 279
105 West Third Street
Livermore KY 42352

Dear Mayor Eaton:

Thank you for supporting future improvements to US 431. As you are aware, our Division of Planning is preparing a scoping study of this route from the Tennessee State Line to the Owensboro Bypass in Daviess County. Existing conditions will be documented, accidents will be studied, an "environmental overview" will be completed and comments from resource agencies will be compiled and studied. The final purpose of this study will focus upon spot improvements throughout the route to address safety issues.

The Kentucky Transportation Cabinet agrees with your sentiment that safety is the "main issue" and we will take a close look at the accident location at the foot of the Green River Bridge as part of this study effort. Additionally, a copy of your letter and this response will be forwarded to Annette Coffey, Director of the Division of Planning for her use in preparing the scoping study.

Sincerely,


Maxwell C. Bailey
Secretary

MCB:EHM;jr

c: Office of the Governor, Constituent Services
Marc D. Williams, Commissioner
Annette Coffey, Director, Division of Planning
E. H. Merryman, Chief District Engineer, D2

2004 NOV 23 A 10:58
DIV OF PLANNING



U.S. Department
of Transportation
**Federal Aviation
Administration**

DIV OF PLANNING

2004 SEP 27 A 11:03

Airports District Office, FAA
3385 Airways Blvd., Suite 302
Memphis, Tennessee 38116-3841
(901) 544-3495 FAX: (901) 544-4243
Email: 7-aso-mem-ado@faa.gov

September 24, 2004

Ms. Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

Dear Ms. Coffey:

Planning Study
Logan, Muhlenberg, McLean and Daviess County
US 431 from the Tennessee Border to Owensboro Bypass
Item No. 02-8106.00

I am writing to comment on the subject project that was described in your letter dated September 8, 2004.

As long as construction activities do not exceed 200 feet in height above the ground level, there will be no impacts on FAA programs and no notice of proposed construction will be required.

Thank you for the opportunity to comment on the proposed highway project.

Sincerely,

Cynthia K. Wills
Program Manager



Greater Owensboro

CHAMBER OF COMMERCE &
ECONOMIC DEVELOPMENT CORPORATION

P: 270.926.1860
F: 270.926.3364
P.O. Box 825
Owensboro, KY 42302
owensboro.com

October 28, 2004

Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

Ms. Coffey,

On behalf of the Board of Directors of the Greater Owensboro Chamber of Commerce and its 950+ member businesses, we would like to submit the following resolution regarding the planning study being conducted on the U.S. Highway 431 from the Tennessee-Kentucky state line north to the Owensboro bypass. This resolution was passed at our October 27th board of directors meeting.

Improving U.S. 431 from Muhlenberg County north to Owensboro is vital for much of our retail community, especially the "south Frederica" portion of U.S. 431 which has seen tremendous growth in recent years. Some of the major stores in that area include a Wal-Mart Supercenter, Lowe's, Home Depot, Towne Square Mall, Target and many smaller outlets. A new Sam's Club has just been announced for the area, and other roadway improvements promise even more commercial development.

Unfortunately, U.S. 431 has developed a reputation for being narrow and dangerous. It is widely believed that many consumers in McLean and particularly Muhlenberg County purposely avoid U.S. 431 and instead travel south to Bowling Green instead of taking the shorter trip mileage-wise to Owensboro. Spot safety improvements from Muhlenberg County north to the Owensboro bypass are long overdue and of vital concern to the Owensboro business community. We would also hope that improvements to this northern section of U.S. 431 would be considered paramount to the southern sections and urge you to consider the northern portion as Phase I of the project.

Thank you for your consideration of our resolution. Please call me at 270-926-1860 or email me at jwassmer@owensboro.com with any questions.

Sincerely,

A handwritten signature in black ink that reads "Jody Wassmer".

Jody Wassmer
Executive Vice President

enclosure



U.S. 431 Planning Study Resolution Adopted October 27, 2004

WHEREAS the Kentucky Transportation Cabinet is conducting a planning study to determine the need and potential impact of safety improvements to U.S. Highway 431 from the Tennessee border north to the Owensboro bypass.

WHEREAS Owensboro is the business and retail shopping hub for a wide service area, including Daviess, Ohio, Hancock, McLean and Muhlenberg counties in Kentucky and Spencer and Perry counties in Indiana.

WHEREAS U.S. 431 is the primary north/south two-lane highway leading to Daviess County.

WHEREAS the "South Frederica" portion of U.S. 431 in Owensboro has seen tremendous growth in recent years, is home to Towne Square Mall, several restaurants, and at least 48 retail businesses within a one-mile radius.

WHEREAS state traffic studies show that 30,000 cars per day travel "South Frederica"—much of them traveling to the area from the south on U.S. 431.

WHEREAS U.S. 431 from Muhlenberg County to Owensboro has developed the reputation for being dangerous, narrow and a highway to be avoided when possible.

WHEREAS it is widely believed that many residents of McLean and especially Muhlenberg counties avoid traveling to Owensboro because of U.S. 431's negative reputation.

WHEREAS the Greater Owensboro Chamber of Commerce's mission is to influence the development of a favorable regional business climate and represents the interests of 950+ businesses in the area.

NOW THEREFORE BE IT RESOLVED that the Board of Directors of the Greater Owensboro Chamber of Commerce hereby requests the Kentucky Transportation Cabinet and General Assembly to:

1. Give top priority for improvements to Phase II of the study from Muhlenberg County to the Owensboro bypass;
2. Incorporate U.S. 431 Phase II improvements into the state's six-year road plan; and
3. Initiate a plan for the eventual construction of a new four-lane U.S. 431 covering the same route.



KENTUCKY TRANSPORTATION CABINET
FRANKFORT, KENTUCKY 40622
WWW.KENTUCKY.GOV

ERNIE FLETCHER
GOVERNOR

MAXWELL C. BAILEY
SECRETARY

December 8, 2004

Mr. Jody Wassmer
Executive Vice President
Greater Owensboro Chamber of Commerce
& Economic Development Corporation
P.O. Box 825
Owensboro KY 42302

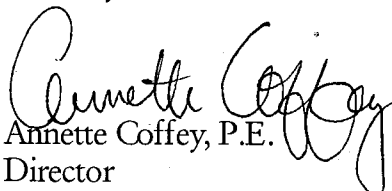
Dear Mr. Wassmer:

Subject: US 431 Planning Study

Thank you for your comments in your letter dated October 28, 2004, and for forwarding the planning study resolution adopted by the Greater Owensboro Chamber of Commerce on October 27, 2004.

We will give your comments and resolution full consideration as we complete this planning study. Please note that while this study is divided into Phase I and Phase II, neither phase carries a higher priority at this point than the other. If you have any questions, feel free to contact me or project manager, Steve Ross at (502) 564-7183, or by e-mail at Steve.Ross@ky.gov.

Sincerely,


Annette Coffey, P.E.
Director
Division of Planning

AC:SR:NH

c: Maxwell C. Bailey, Secretary
Richard L. Murgatroyd, Deputy Secretary
Marc D. Williams, Commissioner
Mike Hancock, Deputy State Highway Engineer



ERNIE FLETCHER
GOVERNOR

MARVIN E. STRONG, JR.
SECRETARY

COMMONWEALTH OF KENTUCKY
Cabinet for Economic Development

500 MERO STREET
CAPITAL PLAZA TOWER
FRANKFORT, KENTUCKY 40601-1975

October 26, 2004

Ms Annette Coffee, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
W5-05-01
2000 Mero Street
Frankfort, KY 40622

Dear Ms Coffee:

SUBJECT: Planning Study
Logan, Muhlenberg, McLean, and Daviess Counties
US 431 Study from Tennessee Border to Owensboro Bypass
Item No. 02-8106.00

2004 OCT 29 P 1:35
DIV OF PLANNING

Below is the Cabinet for Economic Development, Site Evaluation Branch's response to the planning study of the US 431 widening in regard to Logan, Muhlenberg, McLean and Daviess Counties from the Tennessee border to the Owensboro Bypass.

Logan County Response: Prepared by Terri Stamper

Logan County currently has five active industrial sites. Two of the sites, Lewisburg and Adairville, will have a significant impact due a road widening. In fact, both of these sites will lose acreage as a result of widening the road. The Lewisburg site currently has fifteen acres, which lies 400 feet east of US 431; and depending on the width of the proposed road, the entire site may be engulfed by a new road. The Adairville site has 148.6 acres and lies adjacent to US 431, and again, would lose some acreage to a widened road.

The remaining industrial sites are outside the scope of this road project, so there would be a positive impact on the ingress and egress traffic through the communities and to the industrial sites as well.

Muhlenberg County: Prepared by Tammy Bullock

Based on the location of current industrial sites and available buildings, I see no direct impact. The closest site is 5-6 miles to the west of the project corridor. The Paradise Regional Park is located approximately 9-10 miles west of project corridor. While there may be some access improvement and regional connectivity, there doesn't appear to be a direct impact to sites or buildings in Muhlenberg County.



Ms. Coffee
October 26, 2004
Page 2

McClellan County Response: Prepared by Tammy Bullock

Currently there are no buildings or industrial sites listed in McClellan County that would be impacted by this road improvement project.

Daviess County Response: Prepared by Tammy Bullock

Based on the current location of sites and buildings, there will be a direct impact from the US 431 Improvement Project. The nearest site Mid-America Airpark is about 2 miles west of US 431. Several buildings are either located on US 431, or are one block removed from US 431. This project would definitely improve traffic ingress and egress for Owensboro thus addressing the transportation needs of the community.

Sincerely,

A handwritten signature in black ink, appearing to read "René F. True". The signature is fluid and cursive, with a long horizontal stroke at the end.

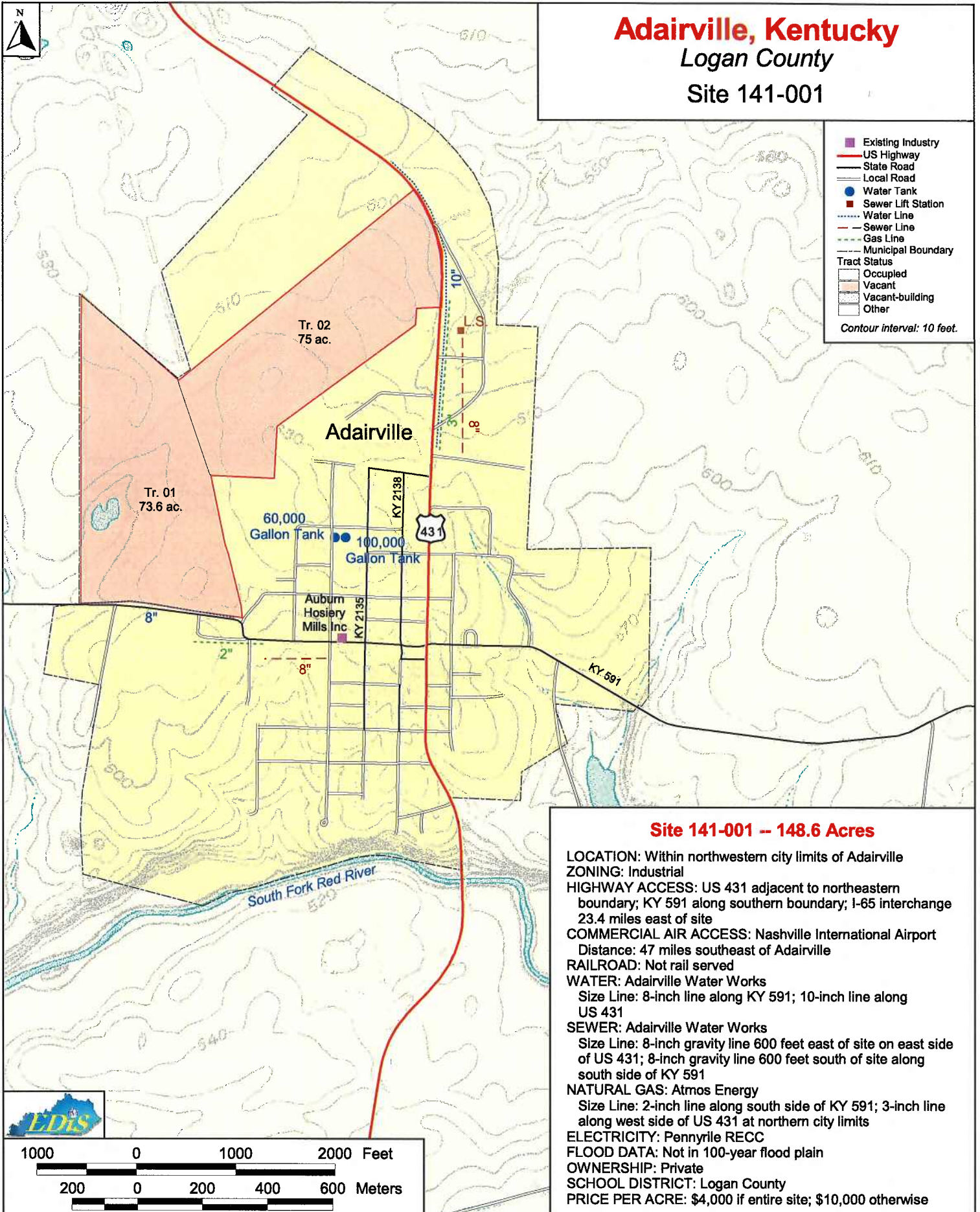
René F. True,
Executive Director
Office of Research and Information
Technology

RFT/RSC

Adairville, Kentucky

Logan County

Site 141-001



Site 141-001 -- 148.6 Acres

LOCATION: Within northwestern city limits of Adairville
ZONING: Industrial
HIGHWAY ACCESS: US 431 adjacent to northeastern boundary; KY 591 along southern boundary; I-65 interchange 23.4 miles east of site
COMMERCIAL AIR ACCESS: Nashville International Airport
Distance: 47 miles southeast of Adairville
RAILROAD: Not rail served
WATER: Adairville Water Works
Size Line: 8-inch line along KY 591; 10-inch line along US 431
SEWER: Adairville Water Works
Size Line: 8-inch gravity line 600 feet east of site on east side of US 431; 8-inch gravity line 600 feet south of site along south side of KY 591
NATURAL GAS: Atmos Energy
Size Line: 2-inch line along south side of KY 591; 3-inch line along west side of US 431 at northern city limits
ELECTRICITY: Pennyrite RECC
FLOOD DATA: Not in 100-year flood plain
OWNERSHIP: Private
SCHOOL DISTRICT: Logan County
PRICE PER ACRE: \$4,000 if entire site; \$10,000 otherwise

For more information contact the Kentucky Cabinet for Economic Development, Department for Business Development, Capital Plaza Tower, 500 Mero Street, Frankfort, Kentucky 40601 Tel: (502) 564-7140 Fax: (502) 564-3256

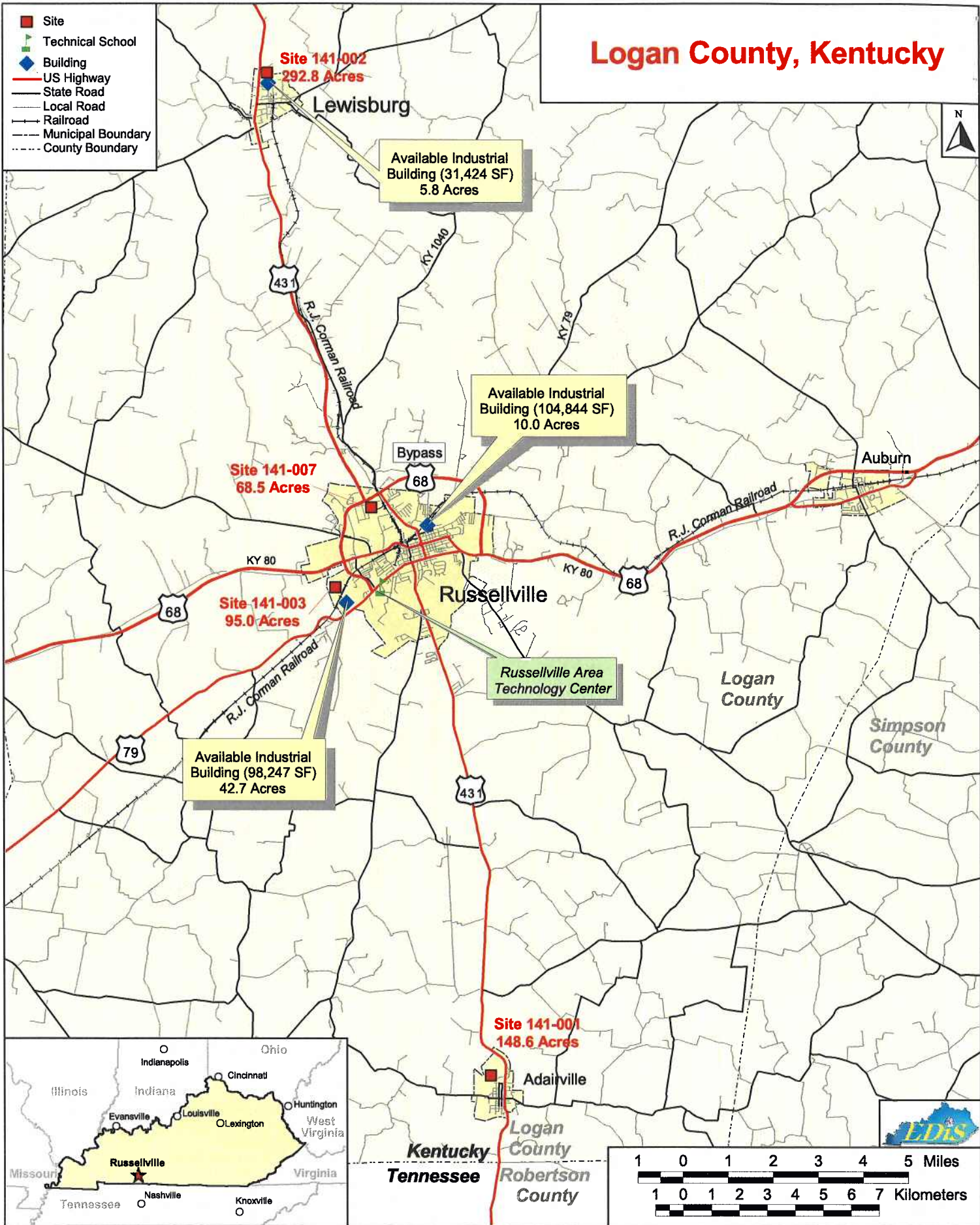
www.thinkkentucky.com/edis/

Portions of this map include data from the KTC, BTS, ESRI, USGS as well as internal data of KCED.

All information shown on this map is from sources deemed reliable. No warranty or representation is made to its accuracy, errors or omissions that may be contained within.

Map date: 5/24/04

Logan County, Kentucky



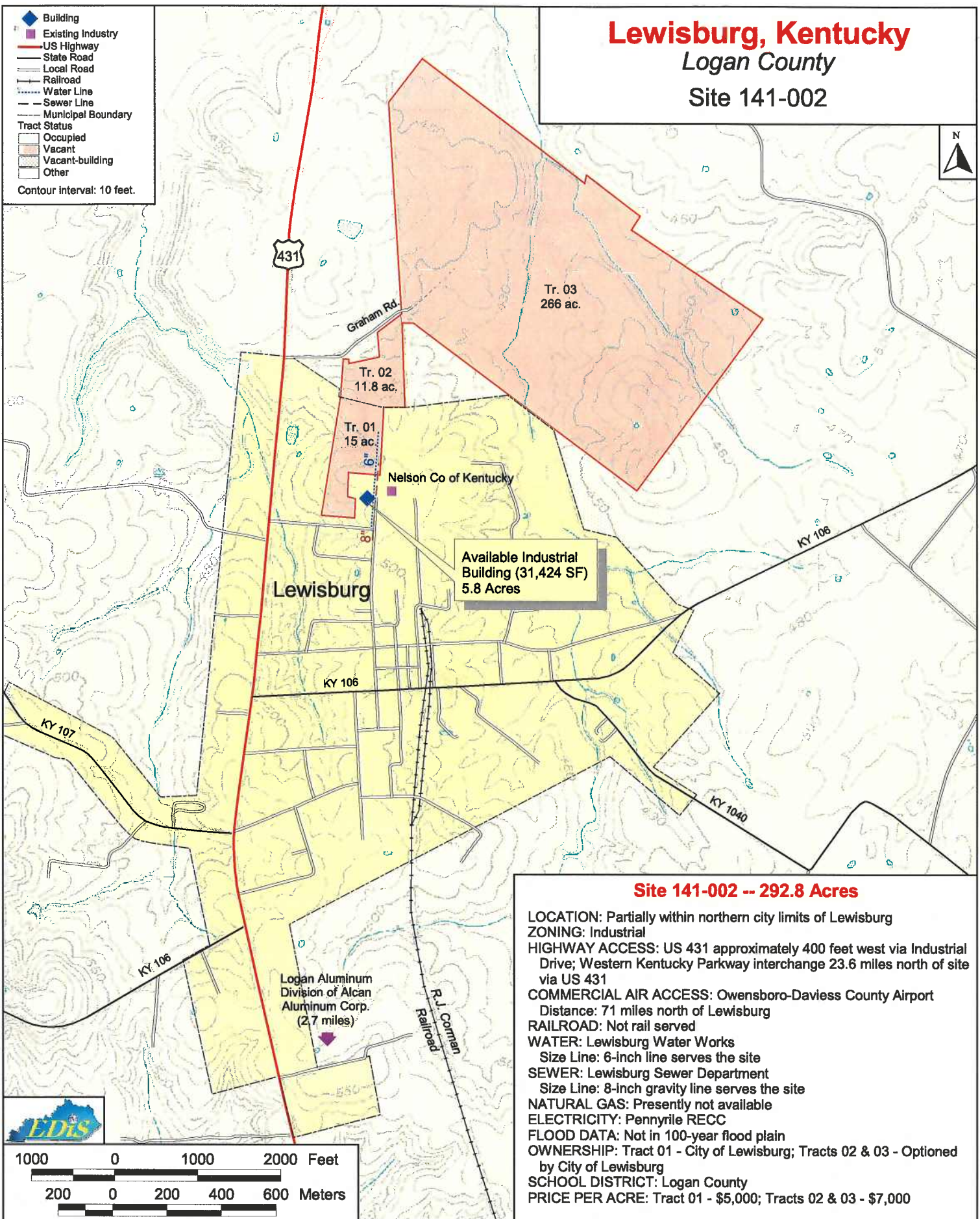
For more information contact the Kentucky Cabinet for Economic Development, Department for Business Development, Capital Plaza Tower, 500 Mero Street, Frankfort, Kentucky 40601 Tel: (502) 564-7140 Fax: (502) 564-3256 www.thinkkentucky.com/edis/

Lewisburg, Kentucky

Logan County

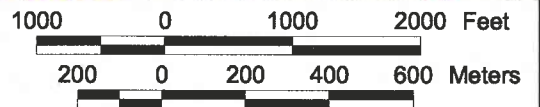
Site 141-002

- Building
 - Existing Industry
 - US Highway
 - State Road
 - Local Road
 - Railroad
 - Water Line
 - Sewer Line
 - Municipal Boundary
 - Tract Status
 - Occupied
 - Vacant
 - Vacant-building
 - Other
- Contour interval: 10 feet.



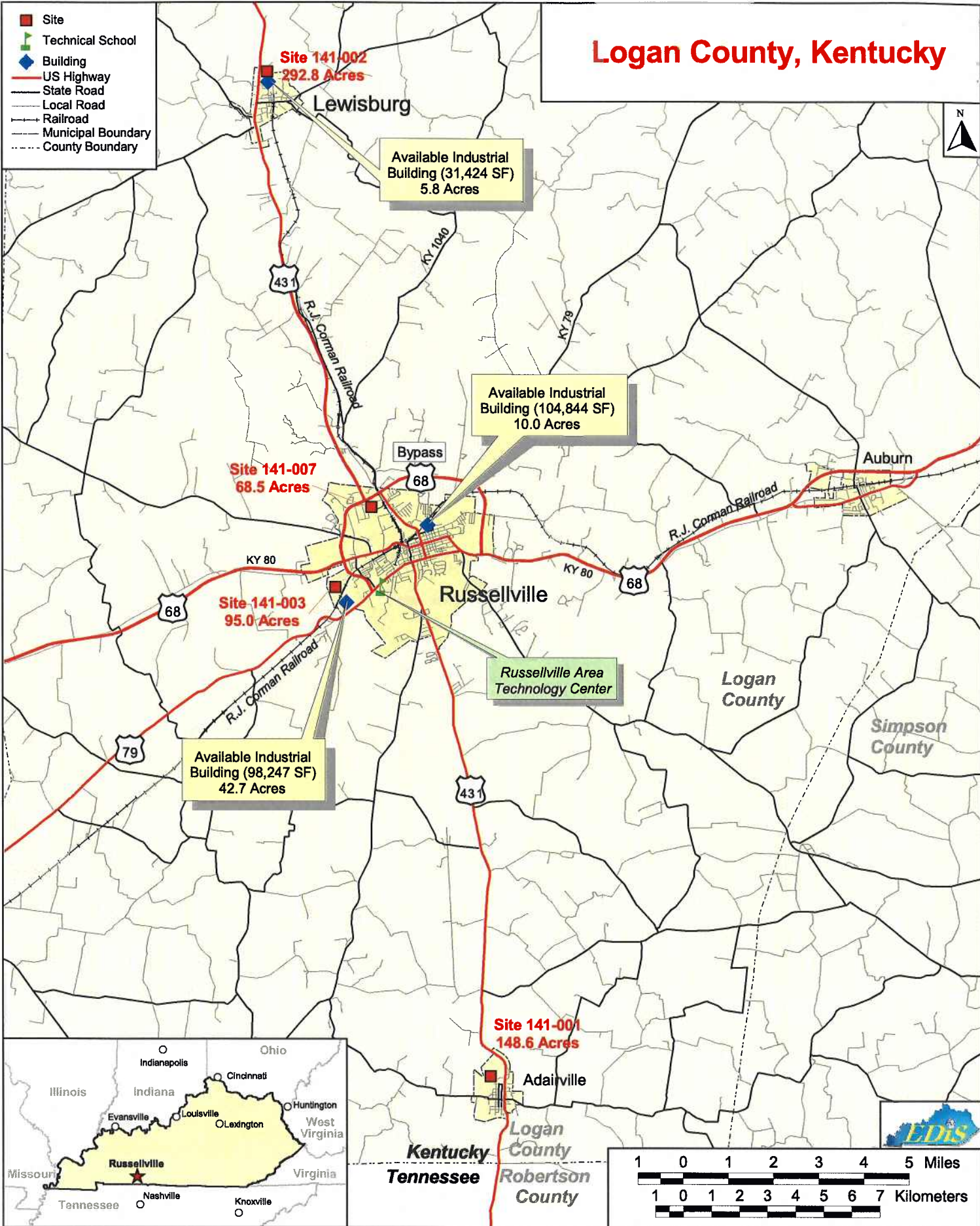
Site 141-002 -- 292.8 Acres

LOCATION: Partially within northern city limits of Lewisburg
ZONING: Industrial
HIGHWAY ACCESS: US 431 approximately 400 feet west via Industrial Drive; Western Kentucky Parkway interchange 23.6 miles north of site via US 431
COMMERCIAL AIR ACCESS: Owensboro-Daviess County Airport
Distance: 71 miles north of Lewisburg
RAILROAD: Not rail served
WATER: Lewisburg Water Works
Size Line: 6-inch line serves the site
SEWER: Lewisburg Sewer Department
Size Line: 8-inch gravity line serves the site
NATURAL GAS: Presently not available
ELECTRICITY: Pennyriple RECC
FLOOD DATA: Not in 100-year flood plain
OWNERSHIP: Tract 01 - City of Lewisburg; Tracts 02 & 03 - Optioned by City of Lewisburg
SCHOOL DISTRICT: Logan County
PRICE PER ACRE: Tract 01 - \$5,000; Tracts 02 & 03 - \$7,000



For more information contact the Kentucky Cabinet for Economic Development, Department for Business Development, Capital Plaza Tower, 500 Mero Street, Frankfort, Kentucky 40601 Tel: (502) 564-7140 Fax: (502) 564-3256 www.thinkkentucky.com/edis/

Logan County, Kentucky



For more information contact the Kentucky Cabinet for Economic Development, Department for Business Development, Capital Plaza Tower, 500 Mero Street, Frankfort, Kentucky 40601 Tel: (502) 564-7140 Fax: (502) 564-3256 www.thinkkentucky.com/edis/

Portions of this map include data from the KTC, BTS, ESRI, USGS as well as internal data of KCED. All information shown on this map is from sources deemed reliable. No warranty or representation is made to its accuracy, errors or omissions that may be contained within. Map date: 5/24/04



DIV OF PLANNING

ERNIE FLETCHER
GOVERNOR

COMMERCE CABINET
CAPITAL PLAZA TOWER
500 MERO STREET, 24TH FLOOR
FRANKFORT, KENTUCKY 40601-1974
PHONE (502) 564-4270 FAX (502) 564-1512
commerce.ky.gov

2004 OCT 13 A 11:20

W. JAMES HOST
SECRETARY
COMMERCE CABINET

DERRICK K. RAMSEY
DEPUTY SECRETARY
COMMERCE CABINET

October 5, 2004

Annette Coffey, P.E.
Kentucky Transportation Cabinet
Director
Division of Planning
200 Mero Street
Frankfort, Kentucky 40622

Subject: Logan, Muhlenberg, McLean and Daviess Counties
US 431 from the Tennessee Border to the Owensboro Bypass
Item No. 02-8106.00

Dear Ms. Coffey,

Thank you for providing the opportunity to review and comment upon the alternatives being considered for the restructuring of US 431 from the Tennessee Border to the Owensboro Bypass.

I have reviewed the material provided by your office relating to both Phase 1 and Phase 2 of this project. Phase 1 appears to be quite sensitive due to the large number of historical sites that may be impacted by this project. In addition to the historical sites there appears to be potential intersections with wildlife management areas and national wetlands. In this region of the state such areas greatly impact tourism in the area. Keeping in mind the importance of safety, the potential environmental impact upon these areas should be of particular concern.

It appears Phase 2 will be as challenging. This route also appears to impact national wetlands and river ways. It appears there are several historic structures in Livia as well as a cemetery between state routes 250 and 1080 in Mclean County that may be impacted as well.

These are areas of interest in the development and stability of the tourism industry and cultural activities in the area. I ask that the Kentucky Department of Fish and Wildlife, Kentucky Historical Society, and the Kentucky Heritage Council be contacted,

if this has not already occurred, to insure properties of interest to these agencies are not impacted in a negative manner.

Your efforts to improve the Kentucky roadways are greatly appreciated. Providing safe and pleasant diving experiences, while protecting the area's assets, will assist in our efforts to grow the tourism industry within the Commonwealth.

If I may be of further assistance please do not hesitate to contact my office. I can be reached at 564-4270.

Sincerely,

A handwritten signature in black ink that reads "W. James Host" with a large, sweeping flourish extending from the end of the name.

W. James Host
Secretary

RICHIE FARMER
COMMISSIONER



OFFICE TELEPHONE
(502) 564-5126
FAX: (502) 564-5016
TTY: (502) 564-2075

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF AGRICULTURE
OFFICE OF THE COMMISSIONER
CAPITOL ANNEX, SUITE 188
FRANKFORT, KY 40601

September 15, 2004

Ms. Annette Coffey, P.E.
Director
Division of Planning
Kentucky Transportation Cabinet
W5-05-01
200 Mero Street
Frankfort, Kentucky 40622

RE: Planning Study
Logan, Muhlenberg, McLean, and Daviess Counties
US 431 from the Tennessee Border to the Owensboro Bypass
Item No. 02-8106.00

Dear Ms. Coffey:

Please be advised that this agency has no specific concerns or issues concerning the above-noted project.

Yours truly,

Ann Stewart
Staff Assistant

DIV OF PLANNING
2004 SEP 16 P 3:13

Ross, Steve (KYTC)

From: Houlihan, John (KYTC)
Sent: Friday, September 10, 2004 10:49 AM
To: Ross, Steve (KYTC)
Subject: Item No. 02-8106.00 US 431

Steve, I have reviewed the proposed planning study and I find no negative impact to any airport or air traffic. The only reminder is that if any construction equipment exceeds 200 feet above ground level it must be permitted through this office. I will be glad to supply you with the proper forms. If you have any questions let me know.

Thank you.



DIV OF PLANNING

ERNIE FLETCHER
GOVERNOR

COMMERCE CABINET
DEPARTMENT OF FISH & WILDLIFE RESOURCES
#1 GAME FARM ROAD
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-3400 FAX (502) 564-0506
(800) 858-1549
www.kentucky.gov

2004 NOV - 1 AM 10:44
JAMES HOST
SECRETARY, COMMERCE CABINET

C. TOM BENNETT
COMMISSIONER

October 27, 2004

Annette Coffey, P. E.
Director
Kentucky Transportation Cabinet
Division of Planning
200 Mero Street
Frankfort, Kentucky 40622

RE: Threatened/endangered species, critical habitat review, and potential environmental impacts associated with the proposed safety improvements on US 431 from the Owensboro Bypass to the Tennessee state line.
Item No. 02-8106.00

Dear Ms. Coffey:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System (KFWIS) indicates that federally threatened and endangered species are known to occur within a 10 mile radius of the project and state threatened and endangered species are known to occur within a 2 mile radius of the project (see attached lists). Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

Based on this information, KDFWR makes the following recommendations:

- In areas in which Indiana bats are known to occur, any wooded areas, fencerows, or livestock pastures that may be impacted by the proposed project should be examined for the presence of Indiana bat habitat. Indiana bats form maternity colonies and roost under the bark of trees in both riparian and upland areas. Therefore, disturbance of trees with exfoliating bark, dead limbs, or cavities should be avoided during the time of year when Indiana bats are active.
- The project area should be surveyed for caves or mine portals that could be used by Indiana bats as wintering habitat.
- In areas where gray bats are known to occur, cave entrances that exist within the project area should be surveyed for potential use by gray bats. Because gray bats are cave residents year-round and maternity colonies are generally found in close proximity to rivers, streams, and lakes, any caves within the project area could offer potentially valuable habitat to resident gray bats.
- Several federal and state listed mussel records occur within close proximity to the project area. Surveys may need to be conducted to determine presence/absence of any listed mussels. Erosion control measures should be developed and utilized to insure that siltation is kept to a minimum during construction.
- To minimize impacts to mussels and bat foraging areas strict erosion control measures should be developed and implemented prior to construction to minimize siltation into waterways located within the project area. Such erosion control measures may include, but are not limited to silt

fences, staked straw bales, brush barriers, sediment basins, and diversion ditches. Erosion control measures will need to be installed prior to construction and should be inspected and repaired regularly as needed.

For more information on how to proceed with the threatened/endangered species surveys please contact the US Fish and Wildlife Service Kentucky Field Office at (502) 695-0468 or this office at (502) 564-7109 Extension 366.

It appears that the proposed project may impact wetland habitats. KDFWR recommends that you look at the appropriate US Department of Interior National Wetland Inventory Map (NWI) and the appropriate county soil surveys to determine where the proposed project may impact wetlands. Additionally, field verification may be needed to determine the extent and quality of wetland habitats within the project area. Any planning should include measures designed to eliminate and/or reduce impacts to wetland habitats. If impacts cannot be avoided, mitigation should be properly designed and proposed to offset the losses. KDFWR will recommend, at a minimum, a 2:1 mitigation ratio for any permanent loss or degradation of wetland habitats.

KDFWR recommends that you contact the appropriate US Army Corps of Engineers office and the Kentucky Division of Water prior to any work within the waterways or wetland habitats of Kentucky. Additionally, KDFWR recommends the following for the portions of the project that crosses intermittent or perennial streams:

- Channel changes located within the project area should incorporate natural stream channel design.
- Development/excavation during low flow period to minimize disturbances.
- Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt to the stream.
- Replanting of disturbed areas after construction, including stream banks and Right-of-Ways, with native vegetation for soil stabilization and enhancement of fish and wildlife populations.
- Return all disturbed instream habitat to its original condition upon completion of construction in the area.
- Preservation of any tree canopy overhanging the stream.
- Return all right-of-ways to original elevation.

I hope this information proves helpful to you. If you have any questions or require additional information, please call me at (502) 564-7109 Extension 366.

Sincerely,



Doug Dawson
Wildlife Biologist III

Attachments

Cc: Environmental Section File

Federal T & E Species within a 10 Mile Radius of the Project Area

<u>Scientific Name</u>	<u>Common Name</u>	<u>Quad Name</u>	<u>County Name</u>	<u>Federal Status</u>
<i>Haliaeetus leucocephalus</i>	BALD EAGLE	Paradise	OHIO	PS:LT,PDL
<i>Epioblasma obliquata</i>	CATSPAW		BUTLER	LE,XN
<i>Epioblasma obliquata obliquata</i>	CATSPAW		MUHLENBERG	LE
<i>Epioblasma obliquata obliquata</i>	CATSPAW	Rochester	MUHLENBERG	LE
<i>Pleurobema clava</i>	CLUBSHELL		OHIO	LE,XN
<i>Pleurobema clava</i>	CLUBSHELL	Olaton	OHIO	LE,XN
<i>Cyprogenia stegaria</i>	FANSHELL		TODD	LE
<i>Cyprogenia stegaria</i>	FANSHELL		OHIO	LE
<i>Cyprogenia stegaria</i>	FANSHELL		MUHLENBERG	LE
<i>Cyprogenia stegaria</i>	FANSHELL		BUTLER	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Rochester	MUHLENBERG	LE
<i>Cyprogenia stegaria</i>	FANSHELL	Rochester	OHIO	LE
<i>Potamilus capax</i>	FAT POCKETBOOK		HENDERSON	LE
<i>Ptychobranthus subtentum</i>	FLUTED KIDNEYSHELL		TODD	C
<i>Myotis grisescens</i>	GRAY MYOTIS		SIMPSON	LE
<i>Myotis grisescens</i>	GRAY MYOTIS		MUHLENBERG	LE
<i>Myotis grisescens</i>	GRAY MYOTIS		LOGAN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS		HOPKINS	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Dot	LOGAN	LE
<i>Myotis grisescens</i>	GRAY MYOTIS	Millport	MUHLENBERG	LE
<i>Myotis sodalis</i>	INDIANA BAT		LOGAN	LE
<i>Myotis sodalis</i>	INDIANA BAT		DAVISS	LE
<i>Pegias fabula</i>	LITTLEWING PEARLYMUSSEL		LOGAN	LE
<i>Pegias fabula</i>	LITTLEWING PEARLYMUSSEL		TODD	LE
<i>Pegias fabula</i>	LITTLEWING PEARLYMUSSEL	Dot	LOGAN	LE
<i>Lampsilis abrupta</i>	PINK MUCKET		BUTLER	LE
<i>Obovaria retusa</i>	RING PINK		TODD	LE
<i>Obovaria retusa</i>	RING PINK		BUTLER	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE		BUTLER	LE
<i>Pleurobema plenum</i>	ROUGH PIGTOE		MUHLENBERG	LE
<i>Lexingtonia dolabelloides</i>	SLABSIDE PEARLYMUSSEL		LOGAN	C
<i>Lexingtonia dolabelloides</i>	SLABSIDE PEARLYMUSSEL	Dot	LOGAN	C
<i>Plethobasus cicatricosus</i>	WHITE WARTYBACK		TODD	LE
<i>Epioblasma florentina</i>	YELLOW BLOSSOM		TODD	LE,XN

State T & E Species within a 2 Mile Radius of the Project Area

<u>Scientific Name</u>	<u>Common Name</u>	<u>Quad Name</u>	<u>CountyName</u>	<u>KSNPC Status</u>
<i>Alosa alabamae</i>	ALABAMA SHAD		DAVISS	E
<i>Alosa alabamae</i>	ALABAMA SHAD		OHIO	E
<i>Alosa alabamae</i>	ALABAMA SHAD		MUHLENBERG	E
<i>Alosa alabamae</i>	ALABAMA SHAD		MCLEAN	E
<i>Botaurus lentiginosus</i>	AMERICAN BITTERN	Central City West	MUHLENBERG	H
<i>Lampetra appendix</i>	AMERICAN BROOK LAMPREY		BUTLER	T
<i>Fulica americana</i>	AMERICAN COOT		OHIO	H
<i>Fulica americana</i>	AMERICAN COOT	Drakesboro	MUHLENBERG	H
<i>Lithasia armigera</i>	ARMORED ROCKSNAIL		LOGAN	S
<i>Lithasia armigera</i>	ARMORED ROCKSNAIL		TODD	S
<i>Etheostoma cinereum</i>	ASHY DARTER		LOGAN	S
<i>Riparia riparia</i>	BANK SWALLOW	Central City East	MUHLENBERG	S
<i>Riparia riparia</i>	BANK SWALLOW	Central City West	MUHLENBERG	S
<i>Riparia riparia</i>	BANK SWALLOW	Drakesboro	MUHLENBERG	S
<i>Hyla gratiosa</i>	BARKING TREEFROG	Adairville	LOGAN	S
<i>Vireo bellii</i>	BELL'S VIREO	Central City East	MUHLENBERG	S
<i>Vireo bellii</i>	BELL'S VIREO	Central City West	MUHLENBERG	S
<i>Vireo bellii</i>	BELL'S VIREO	Drakesboro	MUHLENBERG	S
<i>Vireo bellii</i>	BELL'S VIREO	Rochester	MUHLENBERG	S
<i>Hyla avivoca</i>	BIRD-VOICED TREEFROG	Central City West	MUHLENBERG	T
<i>Hyla avivoca</i>	BIRD-VOICED TREEFROG	Livermore	MCLEAN	T
<i>Ictiobus niger</i>	BLACK BUFFALO		MUHLENBERG	S
<i>Ictiobus niger</i>	BLACK BUFFALO		MCLEAN	S
<i>Ictiobus niger</i>	BLACK BUFFALO		OHIO	S
<i>Erimystax insignis</i>	BLOTCHED CHUB	Dot	LOGAN	E
<i>Anas discors</i>	BLUE-WINGED TEAL	Central City East	MUHLENBERG	E
<i>Dolichonyx oryzivorus</i>	BOBOLINK	Central City West	MUHLENBERG	S
<i>Epioblasma obliquata obliquata</i>	CATSPAW		MUHLENBERG	E
<i>Epioblasma obliquata obliquata</i>	CATSPAW		BUTLER	E
<i>Ichthyomyzon castaneus</i>	CHESTNUT LAMPREY		OHIO	S
<i>Ichthyomyzon castaneus</i>	CHESTNUT LAMPREY		LOGAN	S
<i>Pleurobema clava</i>	CLUBSHELL		OHIO	E
<i>Pleurobema clava</i>	CLUBSHELL	Olaton	OHIO	E
<i>Gallinula chloropus</i>	COMMON MOORHEN	Rochester	MUHLENBERG	T
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Central City East	MUHLENBERG	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Central City West	MUHLENBERG	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Dunmor	LOGAN	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Dunmor	BUTLER	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Equality	OHIO	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Livermore	MCLEAN	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Livermore	MUHLENBERG	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Sutherland	DAVISS	S
<i>Nerodia erythrogaster neglecta</i>	COPPERBELLY WATERSNAKE	Sutherland	DAVISS	S
<i>Hybognathus hayi</i>	CYPRESS MINNOW		MUHLENBERG	E
<i>Hybognathus hayi</i>	CYPRESS MINNOW		DAVISS	E
<i>Hybognathus hayi</i>	CYPRESS MINNOW	Panther	DAVISS	E
<i>Phalacrocorax auritus</i>	DOUBLE-CRESTED CORMORAN	Central City East	MUHLENBERG	H
<i>Thamnophis sauritus sauritus</i>	EASTERN RIBBON SNAKE	Equality	OHIO	S
<i>Thamnophis sauritus sauritus</i>	EASTERN RIBBON SNAKE	Lewisburg	LOGAN	S

<i>Alasmidonta marginata</i>	ELKTOE	Dot	LOGAN	T
<i>Nycticeius humeralis</i>	EVENING BAT	Central City West	MUHLENBERG	T
<i>Cyprogenia stegaria</i>	FANSHELL		TODD	E
<i>Cyprogenia stegaria</i>	FANSHELL		MUHLENBERG	E
<i>Cyprogenia stegaria</i>	FANSHELL		BUTLER	E
<i>Cyprogenia stegaria</i>	FANSHELL		OHIO	E
<i>Ptychobranchnus subtentum</i>	FLUTED KIDNEYSHELL		TODD	E
<i>Myotis grisescens</i>	GRAY MYOTIS		MUHLENBERG	E
<i>Myotis grisescens</i>	GRAY MYOTIS		LOGAN	E
<i>Myotis grisescens</i>	GRAY MYOTIS	Dot	LOGAN	E
<i>Ardea herodias</i>	GREAT BLUE HERON	Central City West	MUHLENBERG	S
<i>Ardea herodias</i>	GREAT BLUE HERON	Dot	LOGAN	S
<i>Ardea herodias</i>	GREAT BLUE HERON	Drakesboro	MUHLENBERG	S
<i>Ardea herodias</i>	GREAT BLUE HERON	Paradise	OHIO	S
<i>Ardea herodias</i>	GREAT BLUE HERON	Pleasant Ridge	OHIO	S
<i>Ardea herodias</i>	GREAT BLUE HERON	Rochester	MUHLENBERG	S
<i>Ardea alba</i>	GREAT EGRET	Rochester	MUHLENBERG	E
<i>Ammodramus henslowii</i>	HENSLOW'S SPARROW	Central City West	MUHLENBERG	S
<i>Ammodramus henslowii</i>	HENSLOW'S SPARROW	Drakesboro	MUHLENBERG	S
<i>Myotis sodalis</i>	INDIANA BAT		DAVISS	E
<i>Myotis sodalis</i>	INDIANA BAT		LOGAN	E
<i>Villosa ortmanni</i>	KENTUCKY CREEKSHELL		LOGAN	T
<i>Clonophis kirtlandii</i>	KIRTLAND'S SNAKE	Calhoun	MCLEAN	T
<i>Erimyzon sucetta</i>	LAKE CHUBSUCKER	Central City West	MUHLENBERG	T
<i>Chondestes grammacus</i>	LARK SPARROW	Drakesboro	MUHLENBERG	T
<i>Epioblasma flexuosa</i>	LEAFSHELL		TODD	X
<i>Epioblasma flexuosa</i>	LEAFSHELL		TODD	X
<i>Ixobrychus exilis</i>	LEAST BITTERN	Drakesboro	MUHLENBERG	T
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE		LOGAN	S
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE		MUHLENBERG	S
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE		OHIO	S
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE		BUTLER	S
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE		MCLEAN	S
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE	Dunmor	LOGAN	S
<i>Villosa lienosa</i>	LITTLE SPECTACLECASE	Livermore	MCLEAN	S
<i>Pegias fabula</i>	LITTLEWING PEARLYMUSSEL		TODD	E
<i>Pegias fabula</i>	LITTLEWING PEARLYMUSSEL		LOGAN	E
<i>Pegias fabula</i>	LITTLEWING PEARLYMUSSEL	Dot	LOGAN	E
<i>Asio otus</i>	LONG-EARED OWL	Central City West	MUHLENBERG	E
<i>Fusconaia subrotunda subrotunc</i>	LONGSOLID		BUTLER	S
<i>Fusconaia subrotunda subrotunc</i>	LONGSOLID		MUHLENBERG	S
<i>Villosa vanuxemensis</i>	MOUNTAIN CREEKSHELL		TODD	T
<i>Villosa vanuxemensis</i>	MOUNTAIN CREEKSHELL		LOGAN	T
<i>Villosa vanuxemensis</i>	MOUNTAIN CREEKSHELL	Adairville	LOGAN	T
<i>Villosa vanuxemensis</i>	MOUNTAIN CREEKSHELL	Dot	LOGAN	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Central City East	MUHLENBERG	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Central City West	MUHLENBERG	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Drakesboro	MUHLENBERG	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Equality	MCLEAN	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Glenville	MCLEAN	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Lewisburg	LOGAN	T

<i>Circus cyaneus</i>	NORTHERN HARRIER	Rochester	MUHLENBERG	T
<i>Circus cyaneus</i>	NORTHERN HARRIER	Utica	MCLEAN	T
<i>Pandion haliaetus</i>	OSPREY	Central City East	MUHLENBERG	T
<i>Hybopsis amnis</i>	PALLID SHINER		LOGAN	H
<i>Hybopsis amnis</i>	PALLID SHINER		MCLEAN	H
<i>Hybopsis amnis</i>	PALLID SHINER		OHIO	H
<i>Hybopsis amnis</i>	PALLID SHINER	Equality	OHIO	H
<i>Hybopsis amnis</i>	PALLID SHINER	Lewisburg	LOGAN	H
<i>Podilymbus podiceps</i>	PIED-BILLED GREBE	Central City East	MUHLENBERG	E
<i>Podilymbus podiceps</i>	PIED-BILLED GREBE	Drakesboro	MUHLENBERG	E
<i>Lampsilis abrupta</i>	PINK MUCKET		BUTLER	E
<i>Lampsilis ovata</i>	POCKETBOOK		TODD	E
<i>Lampsilis ovata</i>	POCKETBOOK		BUTLER	E
<i>Toxolasma lividus</i>	PURPLE LILLIPUT		LOGAN	E
<i>Toxolasma lividus</i>	PURPLE LILLIPUT		TODD	E
<i>Toxolasma lividus</i>	PURPLE LILLIPUT	Dot	LOGAN	E
<i>Pleurobema rubrum</i>	PYRAMID PIGTOE		MUHLENBERG	E
<i>Pleurobema rubrum</i>	PYRAMID PIGTOE		BUTLER	E
<i>Quadrula cylindrica cylindrica</i>	RABBITSFOOT		OHIO	T
<i>Quadrula cylindrica cylindrica</i>	RABBITSFOOT	Dot	LOGAN	T
<i>Sitta canadensis</i>	RED-BREASTED NUTHATCH	Drakesboro	MUHLENBERG	E
<i>Lepomis miniatus</i>	REDSPOTTED SUNFISH	Lewisburg	LOGAN	T
<i>Lepomis miniatus</i>	REDSPOTTED SUNFISH	Sharon Grove	LOGAN	T
<i>Obovaria retusa</i>	RING PINK		TODD	E
<i>Obovaria retusa</i>	RING PINK		BUTLER	E
<i>Pleurobema plenum</i>	ROUGH PIGTOE		BUTLER	E
<i>Pleurobema plenum</i>	ROUGH PIGTOE		MUHLENBERG	E
<i>Simpsonaias ambigua</i>	SALAMANDER MUSSEL		BUTLER	T
<i>Passerculus sandwichensis</i>	SAVANNAH SPARROW	Drakesboro	MUHLENBERG	S
<i>Plethobasus cyphus</i>	SHEEPNOSE		BUTLER	S
<i>Asio flammeus</i>	SHORT-EARED OWL	Central City East	MUHLENBERG	E
<i>Asio flammeus</i>	SHORT-EARED OWL	Central City West	MUHLENBERG	E
<i>Asio flammeus</i>	SHORT-EARED OWL	Drakesboro	MUHLENBERG	E
<i>Asio flammeus</i>	SHORT-EARED OWL	Rochester	MUHLENBERG	E
<i>Lexingtonia dolabelloides</i>	SLABSIDE PEARLYMUSSEL		LOGAN	H
<i>Etheostoma microlepidum</i>	SMALLSCALE DARTER		LOGAN	E
<i>Etheostoma microlepidum</i>	SMALLSCALE DARTER	Adairville	LOGAN	E
<i>Epioblasma triquetra</i>	SNUFFBOX		BUTLER	S
<i>Epioblasma triquetra</i>	SNUFFBOX	Dot	LOGAN	S
<i>Cumberlandia monodonta</i>	SPECTACLECASE		BUTLER	E
<i>Phenacobius uranops</i>	STARGAZING MINNOW		MCLEAN	S
<i>Epioblasma arcaiformis</i>	SUGARSPOON		TODD	X
<i>Pleurobema oviforme</i>	TENNESSEE CLUBSHELL		LOGAN	E
<i>Pleurobema oviforme</i>	TENNESSEE CLUBSHELL	Dot	LOGAN	E
<i>Plethobasus cicatricosus</i>	WHITE WARTYBACK		TODD	X
<i>Epioblasma florentina florentina</i>	YELLOW BLOSSOM		TODD	X



ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DEPARTMENT FOR NATURAL RESOURCES
663 TETON TRAIL
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-2184 FAX (502) 564-6193
www.naturalresources.ky.gov
www.kentucky.gov
October 28, 2004

LAJUANA S. WILCHER
SECRETARY

SUSAN C. BUSH
COMMISSIONER

Annette Coffey, P.E., Director
Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

RE: Planning Study
Logan, Muhlenberg, McLean and Daviess Counties
U.S. 431 from the Tennessee Border to the Owensboro Bypass
Item No. 02-8106.00

Dear Ms. Coffey:

Thank you for the opportunity to review and comment on the above referenced proposed highway construction project.

Personnel from our department's field offices have conducted a review of the information provided and have identified one active rock quarry in this area. The quarry is located on U.S. 431 South of Lewisburg in Logan County.. This is a building stone operation permitted by Kentucky Kolor Building Stone. The Latitude is 36 degrees 56'00", Longitude 86 degrees 56'51".

If I, or my staff can be of any further assistance in this matter, please don't hesitate to contact me at (502) 564-6940.

Sincerely,

Susan Bush
Commissioner

SB/JM/ksm

cc: Non-coal file

DIV OF PLANNING
2004 OCT 29 P 2:25

Ross, Steve (KYTC)

From: Ross, Steve (KYTC)
Sent: Friday, November 12, 2004 9:11 AM
To: Potter, Linda (EPPC, DNR)
Subject: RE: Transportation Cabinet Planning Study

Linda,

I will include the message below with the other responses. It won't be necessary to prepare another letter. Thanks,

Steve

R. Steven Ross, P.E.

Kentucky Transportation Cabinet
Division of Planning
200 Mero Street
Frankfort, KY 40622
Phone: 502-564-7183
Fax: 502-564-2865
E-Mail: Steve.Ross@ky.gov

-----Original Message-----

From: Potter, Linda (EPPC, DNR)
Sent: Tuesday, November 09, 2004 8:38 AM
To: Ross, Steve (KYTC)
Subject: FW: Transportation Cabinet Planning Study

Steve, I received this after responding by the due date. Do you want me to follow-up with another letter?
Thanks...Linda

-----Original Message-----

From: Collings, Kim (EPPC, DNR)
Sent: Friday, November 05, 2004 4:28 PM
To: Potter, Linda (EPPC, DNR)
Subject: RE: Transportation Cabinet Planning Study

The proposed project is located in an area of known oil and gas exploration activity. Oil and gas wells may be encountered in this area and the oil and gas operators may need to be contacted in order to work out any possible impact.

Thanks

Kim

-----Original Message-----

From: Potter, Linda (EPPC, DNR)
Sent: Friday, September 17, 2004 12:28 PM
To: Collings, Kim (EPPC, DNR); Davis, Mark J (EPPC, DNR); Eddins, Mary Jean (EPPC, DNR); Hohmann, Steve (EPPC, DSMRE); MacSwords, Leah (EPPC, DNR); McCoy, Holly (EPPC, DNR); Smith, Keith (EPPC, DSMRE); Wahrer, Richard (EPPC, DSMRE)
Subject: Transportation Cabinet Planning Study

Hopefully you all received a copy of the planning study for US431 in Logan, Muhlenberg, McLean and Daviess Counties. If not, let me know and I will get all maps, etc. to you. As usual, just send me your responses and I'll do a letter from Commissioner Bush. Thanks.
Linda

Linda Potter
Department for Natural Resources

663 Teton Trail
Frankfort, Kentucky 40601
linda.potter@ky.gov
502-564-2184



ERNIE FLETCHER
GOVERNOR

DEPARTMENT OF PARKS
COMMERCE CABINET
CAPITAL PLAZA TOWER
500 MERO STREET, 11TH FLOOR
FRANKFORT, KENTUCKY 40601-1974
PHONE (502) 564-2172 FAX (502) 564-9015
parks.ky.gov

W. JAMES HOST
SECRETARY
COMMERCE CABINET

GEORGE WARD
COMMISSIONER
DEPARTMENT OF PARKS

October 7, 2004

Ms. Annette Coffey, P.E., Director
Division of Planning
Kentucky Transportation Cabinet
W5-05-01
200 Mero Street
Frankfort, Kentucky 40622

Re: Planning Study
Logan, Muhlenburg, Mclean and Davies Counties
US 431 from the Tennessee Border to the Owensboro Bypass
Item No. 02-8106.00

Dear Ms. Coffey:

The Department of Parks has reviewed your correspondence to me regarding the subject. The study will not directly impact any of our facilities. The route however is in the vicinity of two of our state parks, Lake Malone and Ben Hawes. Sediment control to prevent runoff into the Lake is a concern and in general our Agency's mission is protecting the environment associated with our facilities.

I appreciate you seeking our Agency's comments on this project.

Sincerely:

Mr. George Ward, Commissioner
Kentucky Department of Parks

C: John Drake

DIV OF PLANNING
2004 OCT 13 A 11:19



COMMONWEALTH OF KENTUCKY
ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION FOR AIR QUALITY
803 SCHENKEL LN
FRANKFORT, KY 40601-1403

September 24, 2004

Ms. Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Station W5-05-01
Frankfort, Kentucky 40622

Dear Ms. Coffey,

The Division has reviewed the Planning Study for a proposed highway project on US 431, to be developed in two phases. Phase I begins at the Tennessee border and extends through Logan and Muhlenberg Counties. Phase II extends through Muhlenberg, McLean, and Daviess Counties and ends at the Owensboro Bypass. The project is identified as Item Number 02-8106.00. The following Kentucky Administrative Regulations apply to this proposed project:

Kentucky Division for Air Quality Regulation **401 KAR 63:010** Fugitive Emissions states that no person shall cause, suffer, or allow any material to be handled, processed, transported, or stored without taking reasonable precaution to prevent particulate matter from becoming airborne. Additional requirements include the covering of open bodied trucks, operating outside the work area transporting materials likely to become airborne, and that no one shall allow earth or other material being transported by truck or earth moving equipment to be deposited onto a paved street or roadway. Please note the Fugitive Emissions Fact Sheet located at http://www.air.ky.gov/e_clearinghouse.html.

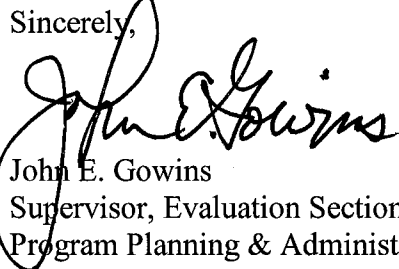
Kentucky Division for Air Quality Regulation **401 KAR 63:005** states that open burning is prohibited. Open Burning is defined as the burning of any matter in such a manner that the products of combustion resulting from the burning are emitted directly into the outdoor atmosphere without passing through a stack or chimney. However, open burning may be utilized for the expressed purposes listed on the Open Burning Fact Sheet incorporated by reference in 401 KAR 63:005 Section 3, Prohibition of Open Burning. The Fact Sheet is located at http://www.air.ky.gov/e_clearinghouse.html.

Finally, the projects listed in this document must meet the conformity requirements of the Clean Air Act as amended and the transportation planning provisions of Title 23 and Title 49 of United States Code.



Ms. Annette Coffey Letter
September 24, 2004
Page 2

Every effort should be made to maintain compliance with the preceding regulations and requirements. The Division also suggests an investigation into compliance with applicable regulations in the local governments. If there are any questions relating to this matter, please contact me at (502) 573-3382 extension 347.

Sincerely,

John E. Gowins
Supervisor, Evaluation Section
Program Planning & Administration Branch

JEG/jmf

DIV OF PLANNING
2004 SEP 29 P 4: 00



DIV OF PLANNING

ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DIVISION OF CONSERVATION
663 TETON TRAIL
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-3080 FAX (502) 564-9195
www.kentucky.gov

2004 NOV 24 P 2:00
LAURIE S. WILCHER
SECRETARY

STEPHEN A. COLEMAN
DIRECTOR

November 22, 2004

Ms. Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

Subject: US 431 from the Tennessee Border to the Owensboro Bypass

Dear Ms. Coffey:

As requested, the Division of Conservation has reviewed the planning study for impacts to a proposed highway project affecting US 431 and would like to provide the following comments that may help in the development of this project.

There are three agricultural districts established in Logan County that may be impacted by this project, 017-02, 017-15, and 017-19. These agricultural districts were certified by the Kentucky Soil and Water Conservation Commission on July 13, 2003, March 15, 2004, and May 15, 2004 respectively, in order to conserve, protect, develop, and improve agricultural land for production of food, fiber, and other agricultural products. Under KRS 262.850(12), state agencies must mitigate any impact their programs may have on land in agricultural districts. Shape files showing location of these districts have been sent to Steve Ross, P.E., Project Manager.

We would like to see the issue of the loss of farmland addressed. Both prime farmland and farmland of statewide importance could be impacted by this project. Every year pressure imposed by utility right-of-ways, urban expansion, and new roads reduce the land available for agricultural use in the Commonwealth. There are four documents that could be utilized to identify these farmland designations: the *Soil Survey of Logan County (NRCS 1975)*, the *Soil Survey of McLean and Muhlenburg Counties (NRCS 1980)*, the *Soil Survey of Daviess and Hancock Counties (NRCS 1975)*, and *Important Farmland Soils of Kentucky (NRCS 1981)*. This information is available through our office. The soil survey information for the project counties can also be downloaded from the following web site: <http://soildatamart.nrcs.usda.gov/>.

One other concern we would like to comment on is the control of erosion and sedimentation during and after earth-disturbing activities once this project begins. We recommend best management practices (BMPs) be utilized to prevent nonpoint source water pollution.

Ms. Annette Coffey, P.E.

November 22, 2004

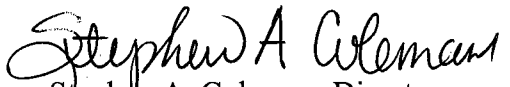
Page Two

This would protect the water quality and aquatic habitat of several perennial and intermittent streams that this project could impact.

The manual, *Best Management Practices for Construction Activities*, contains information on the kinds of BMPs most appropriate for this project and is available through the Lyon and Caldwell County Conservation Districts or this office. Also an electronic version of the *Kentucky Erosion Prevention and Sediment Control Field Guide* is available online at <http://www.water.ky.gov/sw/nps/Publications.htm>

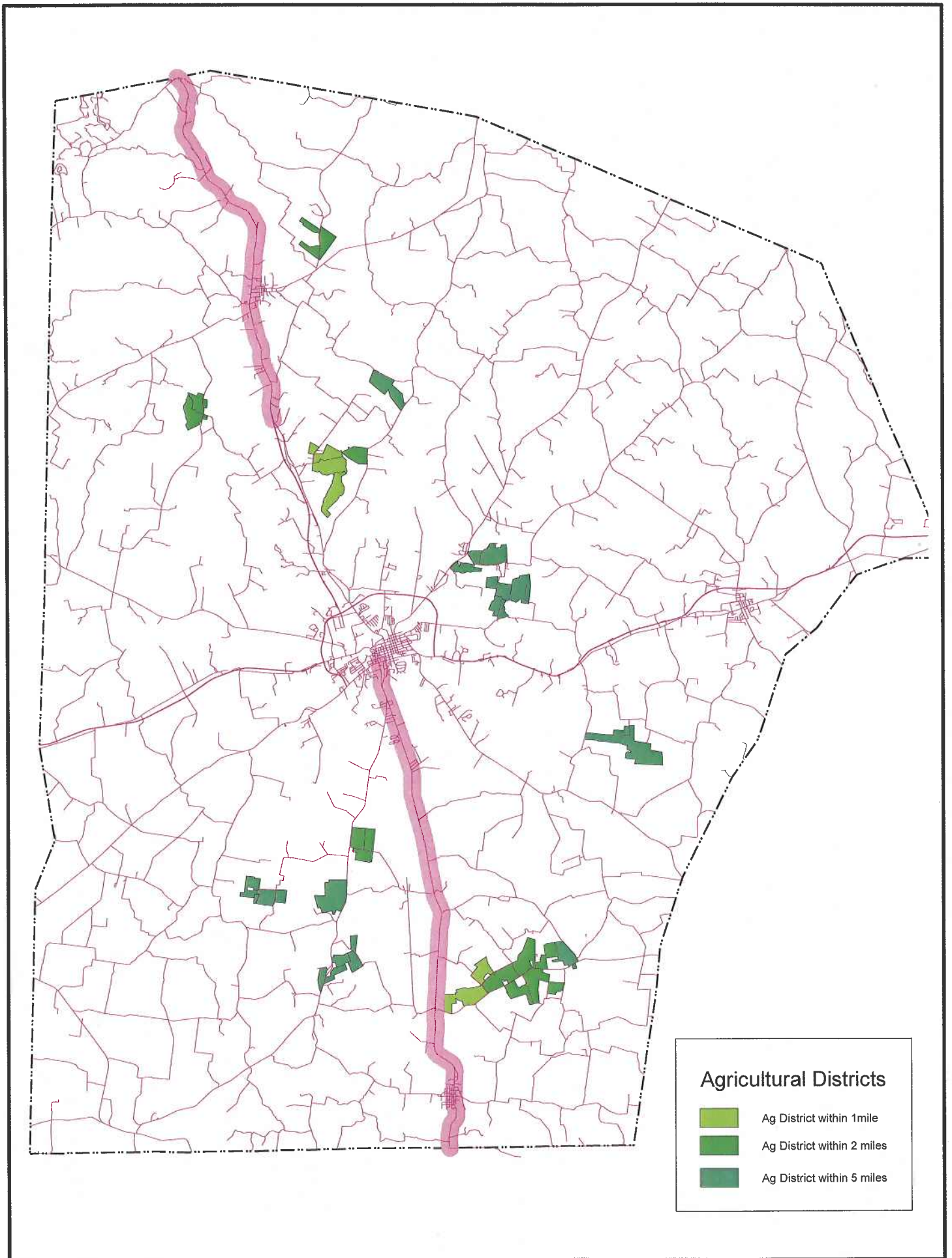
We appreciate the opportunity to comment on this project. If you have any questions, please contact this office any time.

Sincerely,





Stephen A. Coleman, Director
Kentucky Division of Conservation

SAC/aeh

Enclosure



Agricultural Districts

-  Ag District within 1 mile
-  Ag District within 2 miles
-  Ag District within 5 miles



ERNIE FLETCHER
GOVERNOR

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DEPARTMENT FOR NATURAL RESOURCES
663 TETON TRAIL
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-2184 FAX (502) 564-6193
www.naturalresources.ky.gov
www.kentucky.gov

LAJUANA S. WILCHER
SECRETARY

SUSAN C. BUSH
COMMISSIONER

November 3, 2004

Ms. Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

RE: Planning Study
Logan, Muhlenberg, McLean, and Daviess Counties
Item No. 02-8106.00

Dear Ms. Coffey:

The Department for Natural Resources has examined the documentation for the planning study regarding US 431 from the Tennessee border to the Owensboro Bypass.

The Kentucky Division of Forestry responds as follows:

No specific problems with individual trees or forestland were found along this route, especially pertaining to specimens of unusually large size (potential state champions), unique species, or of known historic value.

The Division of Forestry encourages native tree planting in other locations as a replacement for any trees that might be removed along this highway route. Some portions along this route have been void of trees for some time due to past clearing for agriculture (farming) and construction projects. Replacement plantings could at least help offset the further loss of trees in this study area.

Sincerely,

Susan C. Bush, P.G.
Commissioner

2004 NOV - 8 P 12: 06
DIV OF PLANNING

ERNIE FLETCHER
GOVERNOR



LAJUANA S. WILCHER
SECRETARY

COMMONWEALTH OF KENTUCKY
ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR NATURAL RESOURCES
FRANKFORT, KENTUCKY 40601
SUSAN C. BUSH
COMMISSIONER

October 13, 2004

Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, Kentucky 40622

Dear Ms. Coffey:

I have been asked by Keith Smith, Acting Director, Division of Mine Reclamation and Enforcement, to review your proposed project for US 431 in Logan, Muhlenberg, McLean and Daviess counties. It is referenced as item #02-8106.00.

Review by this office indicates that this proposed project would not impact any active mining operations. Additionally, there are no operations currently proposed in this area. Should an operation be proposed in the future, your office would be notified in the permitting process.

If I may be of further assistance concerning this matter, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "KVAUGHN".

Kenny Vaughn, Environmental Control Manager
Department for Natural Resources
Madisonville Regional Office

KV:dlc

c: Keith Smith, Acting Director
Division of Mine Reclamation and Enforcement

DIV OF PLANNING
2004 OCT 18 A 11:32

Ross, Steve (KYTC)

From: Harman, Charles L (WFD-FK)
Sent: Monday, September 13, 2004 8:45 AM
To: Ross, Steve (KYTC)
Cc: Coffey, Annette (KYTC)
Subject: Item No. 02-8106.00 Planning study

Steve,

I have reviewed the subject material for the Education Cabinet and we have no comments to offer at this time.

ch

Charlie Harman
Office of Budget and Administrative Services
Education Cabinet
502.564.6606

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DIV OF PLANNING

UNIVERSITY OF KENTUCKY

2004 OCT -4 A 11: 16

Kentucky Geological Survey
Research and Graduate Studies
228 Mining and Mineral Resources Building
Lexington, KY 40506-0107
Phone: (859) 257-5500
Fax: (859) 257-1147
www.uky.edu/kgs

September 29, 2004

Annette Coffey, P.E.
Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, Kentucky 40622

Dear Ms. Coffey:

This letter is to summarize geologic concerns for the planning study:

Logan, Muhlenberg, McLean, and Daviess Counties
U.S. 431 from the Tennessee border to the Owensboro bypass
Item No. 02-8106.00

This planning study occurs in two phases. Phase I is in the Mississippian Plateau physiographic region and crosses over to the Western Kentucky Coal Field physiographic region. Phase II is in the Western Kentucky Coal Field physiographic region.

PHASE 1 (The southern phase)

Physiographic Region

This part of the planning study begins in the Mississippian Plateau (Pennyroyal or Pennyrile) physiographic region, which is underlain by limestone, sandstone, siltstone, gravel, sand, and silt. The planning study crosses the Dripping Springs Escarpment in the Dunmor 7.5-minute quadrangle and enters into the Western Kentucky Coal Field physiographic region. The Western Kentucky Coal Field is underlain by limestone, sandstone, conglomerates, shale, siltstone, underclay, coal, gravel, sand, silt, and clay.

Karst Potential

This part of the planning study would encounter karst features, such as sinkholes and caves, until it enters the Western Kentucky Coal Field.

Landslide Potential

This part of the planning study would encounter pre- or post-landslide hazards in the unconsolidated sediments

Unconsolidated Sediments

This part of the planning study would encounter unconsolidated sediments at or near stream drainage, such as gravel, sand, silt, and clay.



Resource Conflicts

The portion of the planning study would encounter oil and gas well ownership issues, especially in the counties in the Western Kentucky Coal Field. The corridors cross the rights of way of several natural gas pipelines and may encounter compressor stations and other related service facilities. Additional details can be supplied on request from Rick Bender of the Division of Oil and Gas. Also, in the Western Kentucky Coal Field, the planning study might encounter coal and limestone ownership issues.

Subsidence Potential

This part of the planning study may cross over abandoned underground coal mines. Additional details can be supplied by John Hiatt of the Division of Mines and Minerals.

Materials Suitability

This part of the planning study would encounter some limestone units suitable for aggregate and may be suitable for construction stone; however, the St. Louis Limestone would not be suitable for construction stone, as it may contain expansive material.

Fault Potential

This part of the planning study would encounter numerous faulted areas once it enters the Western Kentucky Coal Field.

Earthquake Ground Motions

This part of the planning study has probable peak ground acceleration (PGA) due to earthquake ground motion of 0.09 to 0.15g. There would be a low potential for liquefaction or slope failure in the unconsolidated sediments at or near streams caused by earthquake bedrock ground motion.

PHASE II (The Northern Phase)

Physiographic Region

This part of the planning study is in the Western Kentucky Coal Field. It is underlain by sandstone, siltstone, shale, limestone, coal, underclay, gravel, sand, silt, and clay.

Karst Potential

This part of the planning study would encounter minimal karst features, such as sinkholes and caves.

Landslide Potential

This part of the planning study would encounter moderate pre- or post-landslide hazards in the unconsolidated sediments.

Unconsolidated Sediments

This part of the planning study would encounter unconsolidated sediments at or near stream drainage, such as gravel, sand, silt, and clay.

Resource Conflicts

The part of the planning study would encounter oil and gas well ownership issues. The corridors cross the rights of way of several natural gas pipelines and may encounter compressor stations and other related service facilities. Additional details can be supplied on request from Rick Bender of the Division of Oil and Gas. Also, in the planning study might encounter coal and limestone ownership issues.

Subsidence Potential

This part of the planning study may cross over abandoned underground coal mines. Additional details can be supplied by John Hiatt of the Division of Mines and Minerals.

Materials Suitability

This part of the planning study might encounter some thick limestone beds for use as construction stone.

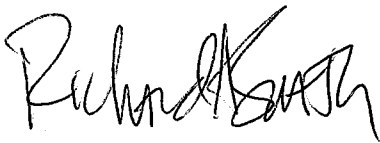
Fault Potential

This part of the planning study would encounter numerous faulted areas.

Earthquake Ground Motions

This part of the project area has probable peak ground acceleration (PGA) due to earthquake ground motion of 0.15g. There would be a low potential for liquefaction or slope failure in the unconsolidated sediments at or near streams caused by earthquake bedrock ground motion.

Sincerely,



Richard A. Smath
Geologist

cc: Mike Blevins



DIV OF PLANNING

2004 SEP 22 P 3: 23

ERNIE FLETCHER
GOVERNOR

COMMONWEALTH OF KENTUCKY
JUSTICE AND PUBLIC SAFETY CABINET
KENTUCKY VEHICLE ENFORCEMENT
FRANKFORT, KY 40601

LT. GOV. STEPHEN B. PENCE
SECRETARY

GREG HOWARD
COMMISSIONER

MEMORANDUM

TO: Annette Coffey, P.E., Director
Division of Planning
Transportation Cabinet

FROM: Greg Howard, Commissioner *GH 9-21-04*
Department of Kentucky Vehicle Enforcement
Justice and Public Safety Cabinet

DATE: September 21, 2004

SUBJECT: Planning Study
Logan, Muhlenberg, McLean, & Daviess Counties
US 431 from the Tennessee Border to the Owensboro Bypass
Item No. 02-8106.00

After having my staff research the above mentioned item, we can see no problem with this highway project provided that any widening projects are done to accommodate large trucks.

It is our understanding that US 431 was added to the designated highway list to allow trucks access to Russellville, however, to our knowledge it was not widened to accommodate the larger dimension trucks.

We have talked to the Commander of the northern counties listed in the project and he states US 431 would be a good road to widen with emphasis on the area of the road around the south Carrollton area.

Kentucky Vehicle Enforcement can foresee no problems with improving the roads proposed in the study provided the roads are made a part of the designated highway system.

Ross, Steve (KYTC)

From: Ross, Steve (KYTC)
Sent: Tuesday, October 12, 2004 10:27 AM
To: Palmer-Ball, Brainard (EPPC, KSNPC)
Subject: RE: US 431

Thanks Brainard and yes, rare plants and faunal species including the copperbelly water snake have been included in the environmental review. I'll include your comments in the agency coordination section of our report. If you have any other questions or suggestions, please let me know. Thanks again.

R. Steven Ross, P.E.
KYTC - Division of Planning
(502) 564-7183

-----Original Message-----

From: Palmer-Ball, Brainard (EPPC, KSNPC)
Sent: Tuesday, October 12, 2004 8:55 AM
To: Ross, Steve (KYTC)
Subject: RE: US 431

Steve,

No; that helps immensely; I don't think we have any comments at this time, although I'm sure you guys will be looking at rare plant potential along the existing r-o-w (there are often rare plants on roadsides! -- potential highest around Russellville area) and working through any mitigative measures with KDFWR for copperbelly water snakes from Muhlenberg Co to Owensboro. Restoration with native species would be an especially sound practice in more naturally vegetated portions.

Brainard P-B

-----Original Message-----

From: Ross, Steve (KYTC)
Sent: Monday, October 11, 2004 3:33 PM
To: Palmer-Ball, Brainard (EPPC, KSNPC)
Cc: Wilson, Jimmy (KYTC)
Subject: RE: US 431

Since we aren't looking at alternates, we shouldn't be making any recommendations that make drastic departures from the existing alignment. Many segments of US 431 have buildings close to the roadway. Improvements, such as widening, along these stretches could involve purchasing additional right-of-way which would have to be considered when making our study recommendations. For the environmental footprint, we are looking at 2000 feet each side of centerline (4000' total).

I hope this has answered your question. If not, or if you have other questions, please let me know. Thanks,

R. Steven Ross, P.E.
Kentucky Transportation Cabinet
Division of Planning
200 Mero Street
Frankfort, KY 40622
Phone: 502-564-7183
Fax: 502-564-2865
E-Mail: Steve.Ross@ky.gov

Visit our web page at <http://www.kytc.state.ky.us/planning/index2.asp>

-----Original Message-----

From: Palmer-Ball, Brainard (EPPC, KSNPC)
Sent: Monday, October 11, 2004 1:46 PM
To: Ross, Steve (KYTC)

Subject: US 431

Steve,

Is the US 431 improvement essentially a close-to-in-current-right-of-way proposal?

Brainard Palmer-Ball, Jr., KSNPC



COMMONWEALTH OF KENTUCKY
KENTUCKY STATE POLICE
919 VERSAILLES ROAD
FRANKFORT 40601

DIV OF PLANNING

2004 NOV -1 A 11: 40

ERNIE FLETCHER
GOVERNOR

MARK L. MILLER
COMMISSIONER

Kentucky State Police
8415 US 41 S
Henderson, KY 42420
October 28, 2004

Ms. Annette Coffey
P.E., Director
Division of Planning
Kentucky State Transportation Cabinet
200 Metro Street
Frankfort, KY 40622

Dear Ms. Coffey:

Regarding your written request dated September 8, 2004, pertaining to planning study, item # 02-8106.00, the following is a list of suggested improvements to the U.S. 431 planning study

- The levee beginning at the Muhlenberg County line north to the 1.5 mile marker should be improved by widening and shoulder up-grades
- Mile marker 1 to mile marker 2.5 is in need of shoulder up-grades
- Turning lanes should be added at the intersection of U.S. 431 and Main Street in Island
- Shoulder up-grades are needed from mile marker 5 to mile marker 11.6
- Turning lanes should be added at the intersection of U.S. 431 and KY 140 at Utica
- The section north of Utica to the 5 mile marker should be straightened and leveled (this section is also in need of routine road repairs).

If I can be of further assistance, please contact me at your earliest convenience.

Captain Greg Baird
Commander, Post 16

GB:kae



COMMONWEALTH OF KENTUCKY
KENTUCKY STATE POLICE
919 VERSAILLES ROAD
FRANKFORT KY. 40601

DIV OF PLANNING

2004 NOV -8 P 12: 09

ERNIE FLETCHER
GOVERNOR

MARK L. MILLER
COMMISSIONER

October 29, 2004

Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort KY 40622

RE: Planning Study—US 431 from Tennessee border to the Owensboro Bypass
Item # 02-8106.00

Dear Director Coffey:

Thank you for requesting our Agency's input on the planning study for US 431, Item No. 02-8106.00, from the Tennessee border to the Owensboro Bypass.

Kentucky State Police Post 2, Madisonville includes the Muhlenberg County segment of the US 431 corridor. Muhlenberg County encompasses parts of both Phase I and Phase II, and is divided by the Wnedell H. Ford Western Kentucky Parkway.

After review of the provided material, observance of roadway, and CRASH data for US 431 (in Muhlenberg County only), the following conclusions were drawn:

- The traffic and level of service is measurably greater in the Phase II segment (north of the WK Parkway) than in Phase I.
- The projected year 2030, shows an even greater amount of traffic and level of service in Phase II vs. Phase I.
- From Milepost 0.000 – 17.484 (Phase I), from the Muhlenberg/Logan county line, from 01/01/02 to 10/01/04 on US 431, there were 81 injury/fatal collisions with 9 fatals/deaths.



AN EQUAL OPPORTUNITY EMPLOYER M/F/D

- From Milepost 17.484 – 27.779 (Phase II), from the WK Parkway to McClean County line, from 01/01/02 to 10/01/04 on US 431, there were 46 injury/fatal collisions with 7 fatalities/deaths.

- On US 431 in Muhlenberg County (MP 0.000 – 27.779) fatalities were as follows:

2002-----3
2003-----8
2004-----5 (as of 10/01/04)

- Overall, widening US 431 from the Tennessee border to the Owensboro Bypass would be the primary recommendation for safety improvements.
- The “Dead Man’s Curve” (in the Phase I segment) has already undergone some curve alignment.
- The roadway near the KU Plant, north of Central City (Phase II) will have increased truck traffic and would benefit by adding auxiliary truck lanes and/or passing lanes.
- The following sections of US 431 (both Phase I & II) are high crash sites in need of much consideration:

Milepost 5.000 -- 6.000
 8.000 -- 9.900
 11.000 --12.100
 18.240 --19.117
 22.000 --24.347

- Clearing alongside the roadway for maximum sight distance is recommended.
- Additional signage upon approach to the above named “high crash zones”, indicating as such, stressing extra caution would prove beneficial.

These are only a few recommendations along with some of the statistics related directly to US 431. I look forward to working with you in the near future as this study progresses and we concentrate on making this roadway a safer path to travel.

Page 3
Correspondence
October 29, 2004

Should you have any questions regarding the submitted information, please contact me at (270) 676-3313, at your convenience.

Sincerely,

Captain Leslie Gannon
Captain Leslie Gannon

MEMORANDUM

P-5-04
DIV OF PLANNING

TO: Annette Coffey, P.E.
Director
Division of Planning

FROM: William Broyles P. E.
Geotechnical Engineering
Branch Manager
Division of Materials

BY: Michael Blevins P. G. *MB*
Geotechnical Branch

DATE: November 12, 2004

SUBJECT: Logan, Muhlenberg, McLean, and Daviess County
Planning Study US 431
FD04 071 0431 000-032 P
Item # 02-8106.00
Mars # 73351 01 P

2004 NOV 15 A 10: 58

At your request, the Geotechnical Branch has reviewed the proposed project and the following comments are provided.

PHASE I

Tennessee State Line to Russellville:

This portion of the project is underlain by bedrock of the Paint Creek Limestone, Bethel Sandstone, Girkin Formation (including the Renault Limestone,) Ste. Genevieve Limestone and St. Louis Limestone. Limestone from roadway excavation is suitable for roadway applications provided sufficient quantities are available. Sinkholes are very common in the Ste. Genevieve and St. Louis Limestone and will likely be encountered. Sinkholes are identified on the geologic quadrangle maps and some are indicated to hold water periodically. Sinkholes should be avoided if possible. Mitigation measures to treat surface runoff from the roadway may be required if directed into or toward a sinkhole. This may include 150 feet of grass lined ditches with silt checks or detention basins. The mitigation measures are required to comply with EPA requirements concerning water quality.

Surface water drains through the subsurface and no streams should be encountered except the Red River and possibly a few of its tributaries. Any structures over the Red River may require the foundations to be drilled shafts if solutioned bedrock is encountered.

Memorandum
Annette Coffey
November 12, 2004
Page-2-

Russellville to Central City:

This portion of the project is underlain by the Lisman Formation, Carbondale Formation, Tradewater and Caseyville Formations, Clore Limestone, Palestine Sandstone, Menard Limestone, Waltersburg Formation, Vienna Limestone, Tar Springs Sandstone, Glen Dean Limestone, Hardinsburg Sandstone, Golconda Formation (includes the Haney Limestone, Big Clifty Sandstone, Beech Creek Limestone Members), Cypress Formation and the Paint Creek Limestone. Limestone from the Vienna and Glen Dean and portions of the Menard and Paint Creek Limestone are generally suitable for roadway applications. Limestone, Sandstone and Shales may be encountered through this section. The sandstone's are generally considered as friable and nondurable and the shales are generally clay shales and susceptible to weathering when exposed in cut slopes.

Numerous faults will be encountered. The strike of these faults is generally in an East - West direction. It is preferred to cross the faults in fill sections when possible. In cut sections, it's preferred to cross the faults perpendicular to the strike. Flatter than normal cut slopes may be required through faulted bedrock.

Oil and gas wells have been drilled throughout this portion of the project area and should be avoided.

Underground coal mines and strip mines exist along and beneath US 431. The mines are in the Number 9, 11 and 12 coal seams. Cut slopes through strip mine material may be unstable and require flatter slopes. Cut Slopes in reclaimed strip mines should be avoided if possible. Surface runoff in strip mined areas may be acidic and will require treatment to reduce and/or eliminate acidic runoff conditions.

PHASE 2

Central City to Owensboro:

This portion of the project area is underlain by Alluvium, Outwash, Lacustrine and Loss deposits and by bedrock of the Sturgis, Lisman, Carbondale, Tradewater and Caseyville Formations.

The Alluvium, Outwash, Lucustrine and Loss Deposits are highly erosive and susceptible to weathering in cut sections. Flatter slopes with slope protection may be required to help stabilize the cut slopes and prevent erosion. Embankments constructed from these materials may require flatter fill slopes in order to construct a stable embankment. Soil sub-grades will require some type of stabilization.

Memorandum
Annette Coffey
November 12, 2004
Page-3-

Sandstone, Shales and Coal are the main materials found in the formations listed above. The sandstone and shale are generally found to be nondurable. Flatter slopes may be necessary in cut sections. Coal mines both surface and underground, may also be encountered on this Phase of the project. Most of the mining occurs in the number 9, 11, 12 and 14 coal seams. Generally the number 9 is deep mined. Mine subsidence will be of concern in underground mined areas.

Many faults could be encountered on this portion of the project. The faults are associated with the Rough Creek Fault zone. The faults generally strike in a East – West direction. It is recommended to intersect the faults perpendicular to the strike in cut sections. Flatter cut slopes may be required in faulted bedrock.

Oil and gas wells are numerous and should be avoided.

Conclusions:

The Branch has no specific areas of concern at this time. A more detailed study of the areas should be made when more specific areas are chosen. Strip and underground mines should be identified at a latter date when specific corridors or sections are chosen. Mine subsidence will be of concern in underground mined areas and maximum subsidence may need to be calculated. Oil and gas wells should also be identified. Corridors may need to be adjusted to avoid mining areas and oil and gas wells. It is very unlikely that a corridor can be adjusted to avoid faulted zones.

If there are any questions, please advise.



DIV OF PLANNING

2004 SEP 20 A 11:41

KENTUCKY TRANSPORTATION CABINET
FRANKFORT, KENTUCKY 40622
WWW.KENTUCKY.GOV

ERNIE FLETCHER
GOVERNOR

MAXWELL C. BAILEY
SECRETARY

MEMORANDUM

TO: Annette Coffey
Director
Division of Planning

FROM: M. Chad LaRue *MCL*
Branch Manager
Permits

DATE: September 13, 2004

RE: Planning Study
Logan, Muhlenberg, McLean and Daviess Counties
Item No. 02.8106.00

The Permits Branch has reviewed the data provided for subject study site and wish to offer the following.

1. We urge the Cabinet to classify this project as partially controlled access facilities.
2. Assuming the project is partial control access, we encourage all possible access points be set on the plans in accordance with 603 KAR 5:120, even if they are not to be constructed at that time.
3. When buying R/W for this, assuming the access control is partial control, new deeds for all adjoining property owners need to be executed to identify the access control even if no new R/W is acquired.
4. In addition, we would like to make every effort possible to have the design speed to be the same as anticipated posted speed when the project is complete.
5. We would like to see access control fence installed with the project.
6. Please notify this office if the proposed roadway is to be placed on the National Highway System (NHS). This information is needed to assist this office in regulating the installation of any outdoor advertising device.
7. If the proposed roadway is to be on the NHS, early notification of the final line and grade is needed. This enables us to monitor outdoor advertising devices prior to road construction being completed.

Thank you for the opportunity to verbalize our concerns.

MCL/elc



Rodney Kirtley

Muhlenberg County Judge Executive

P.O. Box 137 • Greenville, Kentucky 42345
(270) 338-2520 • 1-888-251-3364 • Fax (270) 338-6116

DIV OF PLANNING

2004 SEP 16 P 12: 12

September 14, 2004

Ms. Annette Coffey, P.E.
Director, Division of Planning
KY Transportation Cabinet
Frankfort, KY 40622

SUBJECT: Planning Study US 431

Dear Ms. Coffey:

Per your letter of Sept. 8, I appreciate the opportunity to offer my input and comments on the planning study of US 431. Concerning Phase I, the southern phase, I consider most of this entire stretch of US 431 to be extremely dangerous. Dead Man's Curve near Belton, even though it has been widened recently, still desperately needs straightening. There are two very narrow bridges near the community of Penrod that are very dangerous. An extremely high number of large trucks travel US 431 serving the Paradise Steam Plant, Logan Aluminum, and the Owensboro Riverport increasing the danger on this stretch of US 431.

Concerning Phase II, the northern phase, the curve near the KY Utilities plant is difficult to negotiate and has been the site of numerous fatalities over the past few years. Also, many people avoid traveling this stretch of highway due to the fact that there are few places where one can pass slow moving traffic. There is also a high number of large trucks traveling this stretch of US 431.

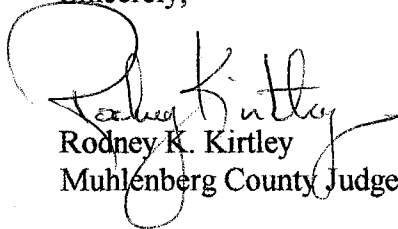
With the future development of the Thoroughbred Energy Plant in this county, truck traffic on US 431 will greatly increase and I am quite certain the current highway will not adequately accommodate this volume of traffic. With the development of this plant almost a certainty, I respectfully request that this planning study be implemented as

Annette Coffey
Page 2
September 14, 2004

soon as possible.

Again, thank you for allowing me to express my concerns about this highway and I am grateful that this planning study is being implemented. Please contact me for any other assistance I can give with this project.

Sincerely,



Rodney K. Kirtley
Muhlenberg County Judge Executive

RKK/lm



City of Owensboro Kentucky

P.O. BOX 10003
OWENSBORO, KENTUCKY 42302-9003

City Manager
BOB WHITMER

October 29, 2004

Annette Coffey, P.E.
Director
Kentucky Transportation Cabinet
Division of Planning
200 Mero Street
Frankfort, KY 40622

Ms. Coffey,

On behalf of the Owensboro Metropolitan Planning Organization (MPO) Transportation Advisory Committee (TAC), I would like to comment on the U.S. 431 scoping study currently being done by your department.

We do support this scoping study to determine the need for any safety improvements to U.S. 431.

A portion of US 431 is currently in the MPO Long Range Transportation Plan (LRP), page 14, GR-02-0033. This portion is from the Panther Creek Bridge to the current four-lane in Owensboro, mp 8.543 to mp 10.185. The remaining segment is identified on the Unscheduled Projects List, control number 02 030 B0431 25.00, from mp 0.00 to mp 8.543. Both segments are identified for reconstruction to a four-lane facility.

U.S. 431 is the major two-lane highway connecting Owensboro-Daviess County to the south. The route is very important to our community and leads directly to our busiest retail area—the “south Frederica” portion of Owensboro—where 30,000 vehicles per day make it extremely busy.

We would also encourage the cabinet to consider the northern portion of the study area, from the Western Kentucky Parkway to the Owensboro Bypass, as Phase I of the project in regards to any planned improvements that result from the study.

Thank you for your consideration.

Sincerely,

Bob Whitmer
City Manager and TAC Chairman

BW/bl

cc: Keith Harpole

2004 NOV - 1 A 11:43
DIV OF PLANNING

U.S. Department of
Homeland Security

United States
Coast Guard



Commander
Eighth Coast Guard District

1222 Spruce Street
St. Louis, MO 63103-2832
Staff Symbol: obr
Phone: (314)539-3900, x2234
Fax: (314)539-3755
Email:

DIV OF PLANNING

2004 OCT -4 A 11: 16

16591.1/71.3 GRN
September 23, 2004

Ms. Annette Coffey, P.E.
Director, Division of Planning
Kentucky Transportation Cabinet
200 Mero Street
Frankfort, KY 40622

Subj: LIVERMORE HIGHWAY BRIDGE, MILE 71.3, GREEN RIVER

Dear Ms. Coffey:

This is in reply to your letter of September 8, 2004, regarding the proposed safety improvements on US 431 extending from the Tennessee Border to the Owensboro Bypass. The subject bridge is located in the area identified in Phase 2 of the project.

The General Bridge Act of 1946 requires that the location and plans for bridges over navigable waters of the United States be approved by the Commandant, U.S. Coast Guard prior to commencing construction. The Green River is considered to be a navigable waterway of the United States for bridge administration purposes at the bridge site.

Applications for bridge permits, or permit amendments, should be addressed to Commander (obr), Eighth Coast Guard District, 1222 Spruce Street, St. Louis, Missouri 63103-2832, Attention: Bridge Branch. The application must be supported by sufficient information to permit a thorough assessment of the impact of the bridge and its immediate approaches on the environment. We recommend that the impacts of procedures for constructing cofferdams, sand islands, and falsework bents, etc., that will be employed to build the bridge and demolish the old bridge be discussed. The Environmental Assessment (EA) should also contain data on the number, size and types of vessels currently using the waterway. This information should be compared with past and projected future trends on the use of the waterway.

We agree to serve as a Cooperating Agency for the project from a navigation standpoint. We should be given the opportunity to review the EA and be consulted before a decision is made to prepare a FONSI in lieu of an EIS. Our review and recommendations on the vertical and horizontal clearance requirements for river traffic will be coordinated with the Kentucky Transportation Cabinet Bridge and Structure Division office.

If the old bridge is eligible for the National Register of Historic Places, a Guidance Memorandum signed by the Federal Highway Administration and the Coast Guard requires the preparation of an Environmental Impact Statement (EIS) for demolition of a historic bridge unless the structure is not considered important for preservation. You will note that documentation and coordination beyond Section 106 requirements are necessary in order for us to accept a FONSI for such projects.

Subj: LIVERMORE HIGHWAY BRIDGE,
MILE 71.3, GREEN RIVER

16591.1/71.3 GRN
September 23, 2004

The other river and stream crossing locations found in the project area have also been reviewed. The other bridges in the project area are over rivers or streams that the U.S. Coast Guard does not exercise jurisdiction for bridge administration purposes at this time.

We appreciate the opportunity to comment on the project in this early stage. You can contact Mr. William Knutson at (314) 539-3900 Ext. 2234 if you have questions regarding our comments or requirements.

Sincerely,



ROGER K. WIEBUSCH
Bridge Administrator
By direction of the District Commander

**COMMONWEALTH OF KENTUCKY
HOUSE OF REPRESENTATIVES**

DIV OF PLANNING



2004 OCT 18 A 11: 38

**BRENT YONTS
15TH Legislative District**

October 14, 2004

Ms. Annette Coffey, P.E., Director
Kentucky Transportation Cabinet
Division of Planning
200 Mero Street
Frankfort, Kentucky 40622

RE: Study US 431 Tennessee to Kentucky
Item Number 02-8106.00

Dear Ms. Coffey:

I have reviewed the report of your findings thus far regarding the review of US 431 from Tennessee to Kentucky. I appreciate the thoroughness with which you have demonstrated the need for improvement. As you know, this road is a two-lane road with a lot of curves, many of which have been fatal over time to many people. There is a lot of traffic that goes on this road, transferring the commerce of the United States.

This is a connector road to Indiana and to Tennessee and leads in both directions to major interstate roads which transverse the nation. In between, multiple roads of the state of Kentucky intersect with US 431, making it a hub of commerce for the country.

Needed repairs are being made to try to remove safety concerns, for example, "Dead Man's Curve" in Muhlenberg County. These are interim and transitional resolutions of problems.



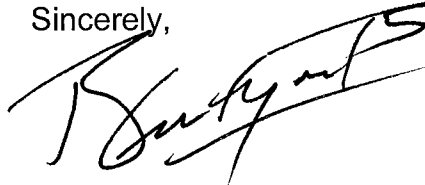
Page Two
Ms. Annette Coffey, P.E.
October 14, 2004

The big picture requires that in the long-range plan for the Department of Transportation, this major thoroughfare for north-south transportation be improved. It should be four-lane like 68-80, which goes from Bowling Green to Murray and which is almost complete. This is a major improvement in transportation through that corridor of Kentucky. Likewise, making US 431 such a corridor will improve the flow of traffic, stimulate economic development to the communities along the path, and will bring safety to a dangerous highway.

I realize that there are many buildings of a commercial nature and homes that may be too close to the highway for there to be four-lane construction in its current location. Certainly, there will have to be acquisitions and relocation of utilities. Never the less, where there is congestion with large blocks of these developments, there will be by-passes like there is on 68-80.

I strongly recommend that the Transportation Cabinet adopt the objective of four-lane construction of US 431 and obtain federal funds for doing so. The interests of safety and commerce require that we improve this vital corridor of commerce and transportation.

Sincerely,



Brent Yonts
State Representative

BY:pjd

cc: Mr. Steve Ross, P.E., Project Manager
Kentucky Transportation Cabinet
Division of Planning
200 Mero Street
Frankfort, Kentucky 40622

Mr. Ted Merryman
Chief District Engineer
1840 North Main Street
Madisonville, KY 42431

The Leader News Messenger Inquirer
Times Argus

CITY OF WHITESVILLE
P O BOX 51
WHITESVILLE, KENTUCKY 42378
Phone: (270) 233-5666
Fax: (270) 233-9947

September 26, 2005

The Honorable Ernie Fletcher, Governor
Commonwealth of Kentucky
700 Capital Avenue
Frankfort, Kentucky 40601

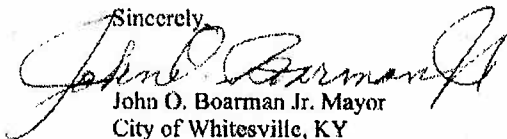
Dear Governor Fletcher,

On behalf of the Citizens of Whitesville I would like to express our thanks for the time and efforts you have so often spent to make our area a better place to live.

I am also asking for your consideration and support to straighten and widen State Highway 431 through Kentucky from Indiana to Tennessee.

Thanking you again for your efforts.

Sincerely,



John O. Boarman Jr. Mayor
City of Whitesville, KY



DIV OF PLANNING

2005 OCT 20 TRANSPORTATION CABINET

Ernie Fletcher
Governor

Frankfort, Kentucky 40622
www.kentucky.gov

Bill Nighbert
Acting Secretary

Marc Williams
Commissioner of Highways

October 20, 2005

The Honorable John O. Boarman Jr.
Mayor of Whitesville
P.O. Box 51
Whitesville KY 42378

Dear Mayor Boarman:

Thank you for your recent letter of support for widening US 431 through western Kentucky.

The Kentucky Transportation Cabinet is very much aware of the importance of US 431 to western Kentucky, as this route serves as the primary north-south regional connection between Interstates 24 and 64. We have studied the potential for widening or reconstructing US 431 from border to border and have implemented projects at several locations along the route. Four-laning the entire route is a costly venture that will best be accomplished over the long-term as we seek to invest Kentucky's highway dollars wisely across the state.

We appreciate your support for US 431 improvements and assure you that we will give your request full consideration as we update Kentucky's Six-Year Highway Plan later this year.

Sincerely,

Marc D. Williams, P.E.
Commissioner of Highways

MDW/MWH/DCC

- c: Bill Nighbert, Acting Secretary
- Ted Merryman, Chief District Engineer— Madisonville/District 2
- Mike Hancock, Deputy State Highway Engineer for Program Planning



CITY OF RUSSELLVILLE

City Hall • 168 S. Main Street • Russellville, KY 42276 • Phone 270.726.5000 • Fax 270.726.5008

Shirlee Yassney
Mayor

Russell Jones
Councilman

Lanny McPherson
Councilman

Chuck Phillips
Councilman

Mark Stratton
Councilman

Jack Whitely
Councilman

Gene Zick
Councilman

The Honorable Ernie Fletcher, Governor
Commonwealth of Kentucky
700 Capitol Avenue
Frankfort, KY 40601

September 26, 2005

Dear Governor Fletcher:

The City Council, Mayor, and City of Russellville are pleased to support the widening of Hwy 431 throughout the state.

Please find enclosed Resolution 2005-15 regarding the support of the expansion of KY Hwy 431 from two lanes to four lanes along its entire length from the Indiana border to the Tennessee border.

Sincerely,

Shirlee Yassney
Mayor

SY/pc
Enclosure
cc: Brent Yonts
State Representative

RESOLUTION 2005-15

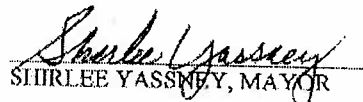
REGARDING THE EXPANSION OF KENTUCKY HIGHWAY 431
FROM TWO LANES TO FOUR LANES ALONG ITS ENTIRE INDIANA BORDER
TO TENNESSEE BORDER ROUTE

WHEREAS, Highway 431 has long been a busy commercial and private use highway, with dangerous curves and narrow bridges and only one lane in each direction; and

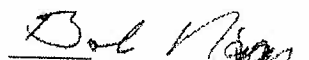
WHEREAS, the state of Kentucky and all counties and cities through which the highway runs would benefit from the widening of the highway from two lanes to four, thereby correcting the conditions which lead to accidents and travel delays and, secondarily, fostering greater commercial use and development, which would be of economic benefit to the state, and the counties and cities along its route. We have proof that widening busy one lane (each direction) highways is beneficial: we have seen firsthand the positive effects brought about by the expansion of Highway 68/80 between Bowling Green and Murray.

WHEREAS, the City Council and Mayor of the City of Russellville, Kentucky, would be pleased to see Highway 431 widened throughout this community and throughout the state, and hereby declare their public support for the project and urge the other cities and counties along the highway to do the same.

BE IT SO RESOLVED THIS 20TH day of SEPTEMBER, 2005.


SHIRLEE YASSNEY, MAYOR

ATTEST:


BOB RIGGS, CITY CLERK



DIV OF PLANNING

2005 OCT 20 TRANSPORTATION CABINET

Frankfort, Kentucky 40622
www.kentucky.gov

Ernie Fletcher
Governor

Bill Nighbert
Acting Secretary

Marc Williams
Commissioner of Highways

October 20, 2005

The Honorable Shirlee Yassney
Mayor of Russellville
City Hall
168 South Main Street
Russellville KY 42276

Dear Mayor Yassney:

Thank you for your recent letter to Governor Fletcher forwarding City Resolution 2005-15 regarding the support of the city of Russellville for the widening of US 431 throughout the state.

The Kentucky Transportation Cabinet is very much aware of the importance of US 431 to western Kentucky, as this route serves as the primary north-south regional connection between Interstates 24 and 64. We have studied the potential for widening or reconstructing US 431 from border to border and have implemented projects at several locations along the route. Four-laning the entire route is a costly venture that will best be accomplished over the long-term as we seek to invest Kentucky's highway dollars wisely across the state.

We appreciate the city of Russellville's support for US 431 improvements and assure you that we will give your request full consideration as we update Kentucky's Six-Year Highway Plan later this year.

Sincerely,

Marc D. Williams, P.E.
Commissioner of Highways

MDW/MWH/DCC

- c: Bill Nighbert, Acting Secretary
- Greg Meredith, Chief District Engineer— Bowling Green/District 3
- Mike Hancock, Deputy State Highway Engineer for Program Planning

Yonts pushing for four-laning of U.S. 431

09/16/05

By [Adrienne Steinfeldt](#)
Messenger-Inquirer

Trouble spots along U.S. 431 are being addressed, but Rep. Brent Yonts says the whole road needs attention -- it should be more than a winding country road.

The Greenville Democrat hopes to start a "flurry of letter-writing or resolution adopting" in the four counties along U.S. 431, urging Gov. Ernie Fletcher to push for four-laning the road instead of just fixing it in spots.

"These two sections in Muhlenberg County are just part of the road that is very dangerous for all who travel it from Indiana to Tennessee," he said in a letter to the governor. "This road is replete with areas where people have been severely injured or killed because of the dangerous nature of its design."

Progress toward the straightening and widening of "Dead Man's Curve" in Muhlenberg County continues, with the purchase of the right of way near Belton upcoming. Another section of the road, near South Carrollton, is also being upgraded. A study of U.S. 431 is nearing completion to identify other trouble spots.

Every county and city official in the counties along U.S. 431 received a copy of Yonts' letter, and he is urging them to follow suit.

"It's easier to get something done when the governor proposes it as an administrative initiative," Yonts said.

Earlier this week, Fletcher told a crowd of about 200 local leaders and business people that he hoped to make the state's six-year road plan more equitable for western Kentucky.

"It's an area that has a lot of potential," Fletcher said in Muhlenberg County. "We want to make sure we tap that potential."

Making the federal highway a four-lane could fuel economic growth, said Daviess County Commissioner Bruce Kunze.

U.S. 431 "carries a lot of traffic between McLean, Muhlenberg and Daviess," Kunze said. "Ultimately, I think four-laning would be the best scenario."

He said county officials are "going to do whatever we can do to try to aid in the process and see that this happens."

In the meantime, he said, spot improvements should continue.

Muhlenberg County Judge-Executive Rodney Kirtley said that if the road is improved, more people in the area would head to Owensboro for shopping.

"Right now all of our shoppers are going to Bowling Green," he said. "Everyone here used to go shopping in Owensboro," but with the high number of fatalities, "people are afraid to travel 431."

He said the road is "vital to the economy of this entire region," though he believes that widespread improvements to the road -- adding lanes and shoulders and straightening curves -- could be more practical than making it a four-lane.

Even if Fletcher requests the inclusion of four-laning U.S. 431 in the six-year road plan, the project would come at a significant cost, said Keith Todd with the Department of Highways.

No study has been done on the price tag for this particular road, but -- to compare -- four-laning 5.6 miles of U.S. 641 is budgeted at \$44 million.

U.S. 431 is about 86 miles from the Tennessee state line to the Indiana state line.

The high price tag is worth it, Yonts said.

The road "represents the hope for economic development along this corridor for areas which are largely stagnant, particularly in rural sections of Muhlenberg, McLean and some portions of Logan and Daviess counties," Yonts wrote.

Appendix G

Crash Data Set Comparison Tables

Each Location is an identified safety problem segment containing one or more spots. Key information for each Location is presented in tabular format, similar to the example shown below.

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
1 Location 1-G: <i>Hollow Bill</i>						3	1.57	0	2	11
2 KYTC Spot 1-4/W SA Spot	29.952	30.100	1.62	0	2	6	1.27	0	1	5
W SA Spot	30.106	30.206	N/A				1.27	0	1	5
4 Trends: 11 Single Vehicle, 2 Angle, 2 Sswipe, 1 Rear End										

- (1) **Location Header** – Each Location is named with a number (indicating the Phase) and unique letter. There is also a short description about key features in the area.
- (2) **Spot Calculations** – Individual 1/10 mile spots are called out in the rows beneath the location header. Spots previously identified by KYTC include data crash data from 2000-2002, in addition to 2003-2006. The number of fatal, injury, and total (including fatal, injury, and property damage only) crashes are presented for each data set. The critical rate factor (CRF) for each data set describes the frequency at which crashes are occurring as compared to similar roadways in the state.

Critical Rate Factors are color coded for each spot. A CRF between 0.90 and 0.99 is shown in gold to indicate there is a potential concentration of crashes. A CRF between 1.00 and 1.19 is shown in red to indicate there is a crash concentration. All CRF greater than 1.20 are shown in purple to indicate there is a severe crash concentration. This scheme applies to both spot and Location calculations.

In some cases, the milepoint limits shown associated with a spot are not exactly 1/10 mile apart. In these cases, spots appeared in each data set slightly offset from one another. Based on “KYTC Spot 1-4/W SA Spot” in the above example, a spot was identified from MP 29.952-30.052 based on initial KYTC analysis. A spot also appeared from MP 30.000-30.100 based on WSA analysis of the later crash data. Due to proximity, it was assumed that these spots are functionally the same. All calculations were performed on the actual 1/10 mile spots but spots are listed in this combined format to facilitate comparison.

- (3) **Location Calculations** – Based on the milepoint boundaries of the spots falling within a Location, the milepoint reach for the location was determined. In the example above, the Location corresponds to milepoints 29.952 to 30.206. The crash data for this Location range was investigated, determining the number of fatal, injury, and total crashes, and the CRF during 2003-2006 data. Crashes occurring within the Location that fall between the component spots were included in this investigation as well.
- (4) **Description** – Summary information on crash types and site descriptions are included below the tabular information.

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
Logan County										
Location 1-A: Residential cluster north of state line						2.15	0	2	∑ = 21	
WSA Spot	0.390	0.490	N/A			1.46	0	1	∑ = 7	
WSA Spot	0.589	0.689	N/A			2.51	0	1	∑ = 12	
Trends: 8 Turning, 7 Rear Ends, 4 Sideswipe										
Location 1-B: Intersection with KY 591										
KYTC Spot 1-1	1.485	1.585	0.92	0	3	∑ = 5	0.21	0	0	∑ = 1
Trends: 3 Turning, 2 Single Vehicle, 1 Sideswipe										
Location 1-C: Northern Adairville city limits						0.91	0	2	∑ = 11	
WSA Spot	2.697	2.797	N/A			1.04	0	0	∑ = 5	
WSA Spot	2.997	3.097	N/A			1.04	0	1	∑ = 5	
Trends: 8 Single Vehicle, 2 Rear Ends 1/2 of reported crashes occur in wet conditions										
Location 1-D: Intersection with US 79/Russellville										
KYTC Spot 1-2/WSA Spot	13.795	13.896	1.08	0	0	∑ = 8	1.18	0	1	∑ = 11
Trends: 7 Rear End, 6 Turning, 2 Single Vehicle, 4 Backing Vehicle Enforcement recommends widening for large trucks at Russellville										
Location 1-E: Intersection with Lewisburg/Edwards Road										
WSA Spot	21.640	21.740	N/A				1.15	0	1	∑ = 7
Trends: 5 Single Vehicle, 1 Head on, 1 Sideswipe										
Location 1-F: Between KY 106 & KY 107										
KYTC Spot 1-3	23.900	24.000	1.26	0	1	∑ = 5	0.17	0	1	∑ = 1
Trends: 2 Rear Ends, 1 Head On, 1 Sideswipe, 2 Other										
Location 1-G: Hollow Bill						1.57	0	2	∑ = 11	
KYTC Spot 1-4/WSA Spot	29.952	30.100	1.62	0	2	∑ = 6	1.27	0	1	∑ = 5
WSA Spot	30.106	30.206	N/A				1.27	0	1	∑ = 5
Trends: 11 Single Vehicle, 2 Turning, 2 Sideswipe, 1 Rear End										
Location 1-H: Intersection with Iron Mountain Road & KY 1293						1.54	0	7	∑ = 28	
WSA Spot	30.850	30.950	N/A				1.27	0	2	∑ = 5
KYTC Spot 1-4a	30.993	0.043	0.23							
WSA Spot	31.030	0.080	N/A				1.06	0	1	∑ = 4
Trends: 7 Single Vehicle, 1 Rear End, 1 Head On MP 31.043 is intersection with KY 1293; poor sight distance noted by District										
Muhlenberg County										
Location 1-I: Intersection with KY 973/Dunmor										
KYTC Spot 1-5/WSA Spot	0.364	0.500	0.98	0	3	∑ = 4	2.92	0	3	∑ = 11
Trends: 5 Single Vehicle, 4 Turning, 6 Other District noted poor alignment(s) and limited sight distances KSP (Henderson) recommend widening shoulders and leveling MP 0.0-1.5										
Location 1-J: Intersection with Belcher Lane & Penrod Cutoff Road; Rocky Creek						1.56	0	6	∑ = 20	
KYTC Spot 1-6/WSA Spot	3.354	3.500	1.69	0	0	∑ = 6	2.39	0	2	∑ = 9
WSA Spot	3.600	3.700	N/A				2.39	0	3	∑ = 9
KYTC Spot 1-7	3.930	4.030	1.69	0	3	∑ = 6	0.27	0	1	∑ = 1
Trends: 9 Sideswipe, 16 Single Vehicle, 1 Turning, 3 Rear End, 1 Head On 12 crashes occur on wet/icy roadways Two narrow bridges near Penrod cited as issue by Muhlenberg County Judge Kirtley										
Location 1-K: Intersections with Hudson Lane, Union Ridge Road						1.83	1	8	∑ = 19	
WSA Spot	4.600	4.700	N/A				1.33	0	2	∑ = 5
WSA Spot	4.800	4.900	N/A				1.06	1	2	∑ = 4
WSA Spot	5.000	5.100	N/A				2.65	0	4	∑ = 10
Trends: 14 Single Vehicle, 3 Turning, 1 Rear End, 1 Head On Crash Intersection with Union Ridge Rd identified as one of two worst intersections in study by District reviewer KSP (Henderson) recommend widening shoulders, MP 5.0-11.6 Section from MP 5.0-6.0 identified as likely problem area by District										

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
Muhlenberg County										
Location 1-L: Dead Man's Curve - Addressed by 02-900.00 (2006 construction \$)										
KYTC Spot 1-7a	6.146	6.246	1.41	0	2	∑ = 5	0.27	1	0	∑ = 1
KYTC Spot 1-8	6.300	6.400	2.25	0	4	∑ = 6	0.53	1	1	∑ = 2
WSA Spot	6.400	6.500	N/A				1.86	0	1	∑ = 7
KYTC Spot 1-7a proposed to realign curve (MP 5.6-6.2) south of completed project										
Location 1-M: Intersection with KY 2270										
KYTC Spot 1-8a/WSA Spot	6.950	7.050	0.75	0	1	∑ = 3	1.09	1	2	∑ = 6
Trends: 3 Single Vehicle, 3 Turning, 2 Rear End, 1 Sideswipe KSP (Henderson) recommend widening shoulders, MP 5.0-11.6										
Location 1-N: Between KY 2270 & KY 246										
KYTC Spot 1-9	7.420	7.520	1.13	0	0	∑ = 4	0.18	0	0	∑ = 1
Trends: 2 Turning, 2 Rear End, 1 Single Vehicle KSP (Henderson) recommend widening shoulders, MP 5.0-11.6										
Location 1-O: Intersection with KY 246/Beechmont										
KYTC Spot 1-10/WSA Spot	7.950	8.050	2.81	0	6	∑ = 10	0.93	0	1	∑ = 7
KYTC Spot/WSA Spot	8.020	8.120	1.19	0	4	∑ = 6	1.09	0	1	∑ = 6
Trends: 4 Turning, 6 Rear End, 6 Other, 1 Head on KSP (Henderson) recommend widening shoulders, MP 5.0-11.6										
Location 1-P: Intersection with Sylvania St/Beechmont										
KYTC Spot 1-11/WSA Spot	8.950	9.100	1.19	0	3	∑ = 6	1.14	0	2	∑ = 6
Trends: 3 Turning, 1 Rear End, 1 Head on, 5 Single Vehicle, 2 Sideswipe Muhlenberg South Elementary school constructed just north of Location 1-P KSP identified segment as "high crash zone" (MP 8.00-9.90), recommend shoulder widening										
Location 1-Q: Intersection with KY 70										
KYTC Spot 1-12/WSA Spot	9.734	9.900	1.67	0	5	∑ = 9	1.12	0	10	∑ = 24
WSA Spot	10.000	10.100	N/A				2.33	0	6	∑ = 13
KYTC Spot 1-13	10.222	10.322	0.717	0	2	∑ = 4	1.14	0	1	∑ = 7
Trends: 11 Turning, 3 Head on, 5 Rear end, 11 Single Vehicle, 5 Sideswipe 5 crashes involve a vehicle running off the road between MP 10.03-10.09 KSP identified segment as "high crash zone" (MP 8.00-9.90), recommend shoulder widening MP 5.0-11.6										
Location 1-R: Drakesboro, intersections with (WSA) Frazier, (1-14) KY 176, (1-15) KY 2107										
WSA Spot	11.100	11.200	N/A				1.23	1	18	∑ = 47
KYTC Spot 1-14/WSA Spot	11.400	11.500	1.71	0	4	∑ = 10	1.14	0	4	∑ = 20
KYTC Spot 1-15/WSA Spot	11.920	12.082	0.91	0	5	∑ = 6	2.66	0	4	∑ = 8
Trends: 18 Turning, 2 Head on, 12 Rear end, 15 Single Vehicle, 4 Other KSP identified segment as "high crash zone" (MP 11.00-12.10)										
Location 1-S: South of Old Sawmill Road										
KYTC Spot 1-16	14.096	14.196	0.91	0	1	∑ = 6	1.14	0	1	∑ = 1
Trends: 3 Single Vehicle (collision with animal), 3 Rear End, 1 Sideswipe										
Location 1-T: Intersection with Cleaton Road										
KYTC Spot 1-17	15.150	15.250	1.46	0	1	∑ = 9	1.14	0	1	∑ = 5
Trends: 6 Rear End, 4 Turning, 4 Other High speed tangent section with lots of coal trucks										
Location 1-U: At WKY Parkway/Central City										
WSA Spot	17.300	17.400	N/A				1.79	2	4	∑ = 16
KYTC Spot 2-1/WSA Spot	17.400	17.584	1.72	0	3	∑ = 7	1.35	0	2	∑ = 6
Trends: 6 Rear End, 4 Turning, 5 Single Vehicle										
Location 2-A: North of WKY Parkway/Central City										
KYTC Spot 2-2/WSA Spot	17.900	18.012	0.73	0	2	∑ = 5	1.04	0	4	∑ = 9
Trends: 3 Turning, 5 Rear End, 3 Single Vehicle, 3 Sideswipe Developing commercial area; large trucks reportedly park on shoulder at times										

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
Muhlenberg County										
Location 2-B: Central City										
Intersections with (2-3) US 62, (2-4) Harrison Ave, (2-6) KY 70, (2-7) KY 277, (2-8) Pendelton										
							2.38	0	24	∑ = 111
KYTC Spot 2-3/WSA Spot	18.240	18.365	2.90	0	4	∑ = 25	2.81	0	4	∑ = 29
KYTC Spot 2-4/WSA Spot	18.350	18.478	1.46	0	3	∑ = 15	0.97	0	3	∑ = 10
KYTC Spot 2-5/WSA Spot	18.479	18.590	1.91	0	2	∑ = 20	2.13	0	4	∑ = 22
WSA Spot	18.600	18.700	N/A				1.87	0	4	∑ = 17
KYTC Spot 2-6/WSA Spot	18.670	18.800	1.32	0	3	∑ = 9	1.17	0	1	∑ = 9
KYTC Spot 2-7/WSA Spot	18.862	19.000	2.24	0	2	∑ = 14	2.62	0	5	∑ = 17
KYTC Spot 2-8	19.062	19.162	0.90	0	1	∑ = 5	0.46	0	2	∑ = 3
Trends: 59 Rear End, 75 Angle, 41 Single Vehicle, 2 Head On, 14 Sideswipe, 4 Backing Low overpass at Spot 2-5: records show trucks routinely impact this (20-27 crashes during 2000-2006) KSP identified segment as "high crash zone" (MP 18.240-19.117) (2-3) Lots of trucks; NB queues block SB sight dist; trucks hit guardrail and curbs during turns; no tapers (2-6) Signalized skew intersection; businesses on corners; crest on NB approach limits sight distance										
Location 2-C: Intersection with KY 189/South Carrollton										
KYTC Spot 2-9/WSA Spot	21.430	21.530	0.96	0	0	∑ = 4	1.02	1	2	∑ = 4
Trends: 3 Turning, 1 Run Off Road, 1 Head On, 1 Single Vehicle, 2 Sideswipe										
Location 2-D: Intersection with KY 81/South Carrollton										
							2.42	0	10	∑ = 21
KYTC Spot 2-10/WSA Spot	22.298	22.400	3.67	0	N/A	∑ = 16	4.85	0	9	∑ = 19
KYTC Spot 2-11	22.398	22.498	1.97	0	2-6	∑ = 10	0.51	0	1	∑ = 2
Trends: 14 Single Vehicle, 15 Rear End, 6 Turning, 1 Sideswipe KSP identified segment as "high crash zone" (MP 22.000-24.347) Vehicle Enforcement recommends widening for large trucks at South Carrollton Adjacent to Project 02-976.00 - Realign with Shoulders, guardrail for MP 22.4-22.7 (2009 construction \$) (2-10) Adjacent to rail line, cemetery, contaminated gas station, homes, embankment, other intersections										
Location 2-E: Intersection with Power Plant Drive/South Carrollton										
							1.14	0	4	∑ = 10
WSA Spot	24.132	24.232	N/A				1.46	0	4	∑ = 8
KYTC Spot 2-12	24.250	24.350	2.55	1	5	∑ = 12	0.18	0	0	∑ = 1
Trends: 18 Single Vehicle, 1 Sideswipe, 2 Other In Project 02-977.00 - Realign with Shoulders, guardrail for MP 23.9-24.1 & 24.3-24.5 (2006 construction \$) Muhlenberg County Judge Kirtley cites as problem crash spot										
McLean County										
Location 2-F: Intersection with Main Street/Island										
KYTC Spot 2-13/WSA Spot	2.400	2.550	0.98	0	3	∑ = 5	1.63	1	4	∑ = 9
Trends: 9 Turning, 5 other KSP identified segment as "high crash zone" at MP 0.0-2.5; recommend turn lanes at Main Street										
Location 2-G: Intersection with Third Street/Livermore										
KYTC Spot 2-14	5.450	5.550	1.04	0	1	∑ = 6	0.44	0	0	∑ = 3
Trends: 3 Turning, 5 Rear End, 1 Other Livermore Mayor says intersection at the foot of the bridge is the most dangerous in the community A recently converted from 2-lane to 3-lane section lies north of Location 2-G										
Location 2-H: KY 136 Intersection - Addressed by 02-9.00 (2005 construction \$)										
KYTC Spot 2-15/WSA Spot	6.038	6.138	2.35	0	7	∑ = 13	1.62	0	3	∑ = 11
Location 2-I: KY 1080 Intersection - Addressed by 02-972.00 (2004 construction \$)										
KYTC Spot 2-16	8.265	8.365	1.56	0	3	∑ = 9	0.74	0	1	∑ = 5
Location 2-J: North of Barrett Hill Road Intersection										
KYTC Spot 2-17	9.300	9.400	1.21	0	3	∑ = 7	0.45	0	1	∑ = 3
Trends: 5 Turning, 3 Single Vehicle, 1 Rear End, 1 Head On										
Location 2-K: Intersection with KY 250										
KYTC Spot 2-18/WSA Spot	9.800	9.900	1.09	0	3	∑ = 6	0.93	0	3	∑ = 6
Trends: 5 Rear End, 4 Single Vehicle, 3 Turning										

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
Daviess County										
Location 2-L: McLean/Daviess County Line										
WSA Spot	0.000	0.100	N/A				1.23	0	3	Σ = 8
Trends: 3 Rear End, 5 Single Vehicle										
Location 2-M: Intersection with Mill Street										
WSA Spot	1.950	2.050	N/A				1.07	0	2	Σ = 7
Trends: 2 Single Vehicle, 2 Rear End, 3 Other										
Location 2-N: Intersection with KY 140/Utica										
KYTC Spot 2-19/WSA Spot	2.599	2.699	1.44	0	6	Σ = 13	1.76	0	5	Σ = 14
Trends: 6 Rear End, 5 Single Vehicle, 13 Turning, 1 Sideswipe, 2 Head On Intersection with KY 140 identified as one of two worst intersections in study by District reviewer KSP (Henderson) recommend adding turn lanes at KY 140 and straightening to MP 5										
Location 2-O: Owensboro										
Intersection with (2-20 & 2-21) Mall entrances, (2-22) Southtown Blvd, (2-23) Salem/Goetz/Carlton, (2-24) Bypass										
							0.26	0	9	Σ = 21
KYTC Spot 2-20	10.650	10.750	1.66	0	3	Σ = 15	0.11	0	0	Σ = 1
KYTC Spot 2-21	10.800	10.900	1.77	0	6	Σ = 16	0.11	0	0	Σ = 1
KYTC Spot 2-22	10.950	11.050	1.70	0	4	Σ = 30	0.03	0	0	Σ = 1
KYTC Spot 2-23	11.150	11.250	2.86	0	14	Σ = 51	0.10	0	1	Σ = 3
KYTC Spot 2-24	11.267	11.367	1.39	0	6	Σ = 31	0.44	0	7	Σ = 13
Trends: 95 Rear End, 54 Turning, 13 Other (2-22) Southtown Blvd being widened to 5 lanes; may impact crash rates (2-23) Traffic queues limit sight distances										

Notes:

* Total crashes shows the sum of fatality, injury, and property damage only (PDO)

CRF 0.90 - 0.99
CRF 1.00 - 1.19
CRF > 1.20

Spots which show MP range greater than 0.1 miles represent two partially overlapping spots identified slightly offset between the 2000-2002 and 2003-2006 data sets. CRF calculations are still based on the 0.1 mile defined spot.

Appendix H

Recommended Project Cut Sheets



Intersection Improvements at US 79

Location 1-D: KYTC Spot 1-2

Logan County, Milepoint 13.896

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Logan County</i>										
Location 1-D: Intersection with US 79/Russellville										
KYTC Spot 1-2/WSA Spot	13.795	13.896	1.08	0	0	Σ = 8	1.18	0	1	Σ = 11

Description:

This four-leg signalized intersection in Russellville currently links US 79, US 431, and the Russellville Bypass. Each quadrant has tight turning radii, with stop bars set back from the intersection to provide enough space for trucks to complete turning movements. A number of crashes occur at this intersection when vehicles stop in front of the stop bars and then must back up along the mainline to clear space for turning trucks. Businesses in three quadrants have continuous paved entrances; the fourth quadrant contains a cemetery and historic property. The eastern approach to this intersection leads to a historic neighborhood in Russellville.

With the designation of US 431 south of Russellville to the National Truck Network, the size and number of trucks traveling on US 431 between Tennessee and Russellville is likely to increase. The Kentucky State Police recommend widening the route to accommodate these vehicles. However, a southern extension of the Russellville Bypass will remove a large portion of through car and truck trips from the existing intersection. The bypass extension has allotted funding for right-of-way acquisition and utilities relocation in the 2006-2012 Six Year Plan. Reconstruction of the US 431/US 79 intersection is identified in the 2007 Unscheduled Projects List as a high priority by both the ADD and KYTC District. Additional information is available in the 1999 Russellville Urban Area Transportation Study.

Recommendations:

Improve radii and delineate commercial entrances at standard widths. Improvements to this intersection should be considered a lower priority than the Russellville Bypass Extension.

Cost Estimate:

Design \$ 100,000
Right of Way \$ 500,000
Utilities \$ 200,000
Construction \$ 500,000

Corridor for Russellville Bypass Extension



US 79 approach to intersection with US 431, facing west



Realign Segment at Hollow Bill

Location 1-G: KYTC Spot 1-4

Muhlenberg County, Milepoint 29.700-30.600

Priority: MEDIUM

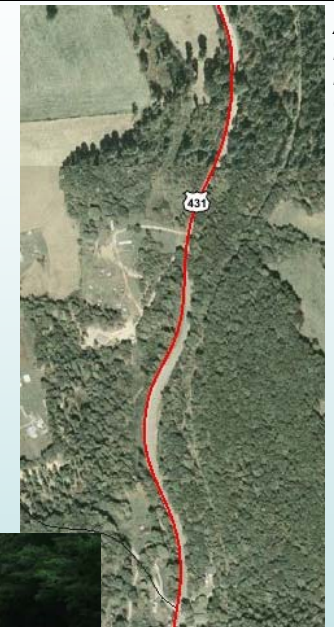
Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Logan County</i>										
Location 1-G: Hollow Bill										
KYTC Spot 1-4/WSA Spot	29.952	30.100	1.62	0	2	Σ = 6	1.57	0	2	Σ = 11
WSA Spot	30.106	30.206	N/A				1.27	0	1	Σ = 5

Description:

This segment of roadway is composed of a series of reverse curves just north of H.W. McPherson Road. Sight distances at the intersection and along the adjacent curves are severely limited. Travel lanes are 9-foot wide with 4-foot wide shoulders and carry an estimated 2,800 vehicles per day at Level of Service (LOS) C.

The CRF in both 2000-2002 and 2003-2006 data sets is greater than 1.00 with multiple injury collisions. Crash types are primarily single vehicle off-road collisions. Guardrails show evidence of numerous impacts.

The realignment of this segment is included in the 2007 Unscheduled Projects List as a medium priority at both the ADD and KYTC District levels. This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allotted to design for the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.



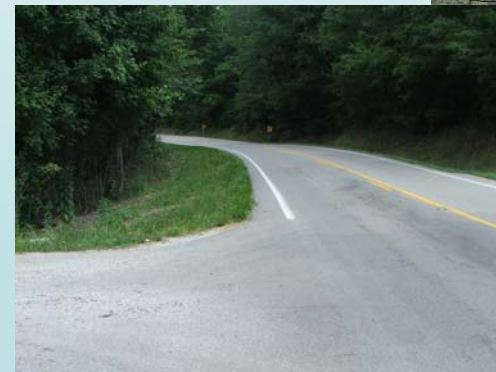
Aerial of
Hollow
Bill
Curves

Recommendations:

Realign segment to correct geometric deficiencies.

Cost Estimate:

Design	\$	400,000
Right of Way	\$	600,000
Utilities	\$	360,000
Construction	\$	4,040,000



View north from H.W.
McPherson Road



View south from
northernmost curve

Intersection Improvements at KY 1293

Location 1-H: KYTC Spot 1-4a

Logan County, MP 30.900 - Muhlenberg County, MP 0.260

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Logan County</i>										
Location 1-H: Intersection with Iron Mountain Road & KY 1293							1.54	0	7	Σ = 28
WSA Spot	30.850	30.950	N/A				1.27	0	2	Σ = 5
KYTC Spot 1-4a	30.993	0.043	0.23							
WSA Spot	31.030	0.080	N/A				1.06	0	1	Σ = 4

Description:

KY 1293 provides access to Lake Malone and the rural communities of Dunmor, Agnes, and Deer Lick. It intersects US 431 as a stop-controlled T-intersection at the Muhlenberg/Logan County line within a horizontal and vertical curve. An embankment stands on the western side of US 431, limiting sight distance for turning vehicles. In the area, US 431 has 9 to 10-foot wide lanes and 2 to 4-foot wide shoulders. The speed limit is 55 mph, dropping to 45 mph entering Dunmor. In 2007, an estimated 2,700 vehicles per day traveled this segment of roadway.

A number of intersections with local roadways lie to the immediate north in Dunmor, including Dunmor-Deerlick Road, Dunmor Church Road, and several commercial driveways. The increased number of access points within Dunmor affects both capacity and safety. The adjacent rural portion of this route operates at Level of Service (LOS) C, but this degrades to LOS E within the developed area. More turning opportunities exist within Dunmor; without turn lanes, motorists must use the mainline travel lanes to accelerate and decelerate. A high critical rate factor location appears in Dunmor as a result. In addition, terrain characteristics create steep grades for minor street approaches and mainline curves with poor sight distances.

This project falls within the limits of KYTC Item 3-8309.00 which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design for the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.



View north along US 431 through Dunmor



View north towards intersection with KY 1293

Recommendations:

Cut embankment and/or realign segment. For a long term improvement, a bypass east of the developed area at Dunmor is recommended for consideration.

Cost Estimate:

Design	\$	225,000
Right of Way	\$	570,000
Utilities	\$	160,000
Construction	\$	2,270,000



Intersection Improvements at KY 973

Location 1-I: KYTC Spot 1-5

Muhlenberg County, Milepoint 0.487

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-I: Intersection with KY 973/Dunmor										
KYTC Spot 1-5/WSA Spot	0.364	0.500	0.98	0	3	Σ = 4	2.92	0	3	Σ = 11

Description:

KY 973 meets US 431 at a three-leg, unsignalized intersection in the community of Dunmor. KY 973 provides access to Lake Malone State Park and the community of Rosewood. Seasonal vegetation and a series of curves have the potential to obstruct signage and limit sight distances for vehicles approaching US 431. Along US 431, a curve to the south and signs to the north limit sight distances at this intersection. Input from the Kentucky State Police suggests widening shoulders along this stretch of roadway from the Muhlenberg/Logan county line to milepoint 1.5, just south of Skipworth Lane.

In this area, US 431 has 10-foot wide lanes and 2-foot wide shoulders with a speed limit of 45 miles per hour. The estimated daily traffic volume is 2,600 vehicles. This segment operates at a Level of Service (LOS) E, primarily as a result of limited passing sight distances and the number of driveways and access points within the developed area.

This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design of the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Relocate sight distance obstacles on US 431. Improve or relocate signage on KY 973 approaching US 431. For a long term improvement, a bypass east of the developed area of Dunmor is recommended for consideration.

Cost Estimate:

Design	\$ 20,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 50,000

View north (left) and south (right) at KY 973 intersection





Widen Bridges over Rocky Creek and Branch

Location 1-J: KYTC Spot 1-6 & 1-6a

Muhlenberg County, Milepoints 3.454, 3.634

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-J: Intersection with Belcher Lane & Penrod Cutoff Road; Rocky Creek							1.56	0	6	Σ = 20
KYTC Spot 1-6/WSA Spot	3.354	3.500	1.69	0	0	Σ = 6	2.39	0	2	Σ = 9
KYTC Spot 1-6a/WSA Spot	3.600	3.700	N/A				2.39	0	3	Σ = 9
KYTC Spot 1-7	3.930	4.030	1.69	0	3	Σ = 6	0.27	0	1	Σ = 1

Description:

These 30-foot long RCDG structures lie northwest of the community of Penrod in southern Muhlenberg County. The bridges cross Rocky Creek and a branch of Rocky Creek approximately 950 feet apart. At 21 feet wide, both structures are functionally obsolete with sufficiency ratings of 65.9 and 60.6¹, respectively, and satisfactory/minor deterioration ratings for both sub- and super-structure.

The impact of the narrow bridges is expressed in elevated numbers of single vehicle collisions with roadside features (e.g., bridge railing) and the increased occurrence of sideswiping vehicles bound in opposite directions. The southern bridge displays these trends more directly but guardrails along both structures show evidence of previous impacts. Warning signs are posted approaching each structure to alert motorists that the route narrows.

Both bridges were identified by the Muhlenberg County Judge Executive during the public input portion of this project as a candidate for widening/replacement. This project also falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Replace/widen both bridges to meet current width standards. Also consider widening mainline shoulders between the structures.

Cost Estimate:

Design	\$	120,000
Right of Way	\$	150,000
Utilities	\$	130,000
Construction	\$	1,200,000



View along US 431 of southern bridge over Rocky Creek

¹ Based on May 2006 State Bridge Inventory Guide



Realign Segment north of Penrod

Location 1-J: KYTC Spot 1-7

Muhlenberg County, Milepoints 3.900-4.200

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-J: Intersection with Belcher Lane & Penrod Cutoff Road; Rocky Creek							1.56	0	6	Σ = 20
KYTC Spot 1-6/WSA Spot	3.354	3.500	1.69	0	0	Σ = 6	2.39	0	2	Σ = 9
KYTC Spot 1-6a/WSA Spot	3.600	3.700	N/A				2.39	0	3	Σ = 9
KYTC Spot 1-7	3.930	4.030	1.69	0	3	Σ = 6	0.27	0	1	Σ = 1

Description:

This horizontal curve north of Penrod occurs just north of two narrow bridges crossing Rocky Creek. In this segment, US 431 has 10-foot wide lanes and 2-foot wide shoulders. The annual daily traffic is estimated at 2,600 vehicles per day and the roadway operates at a Level of Service (LOS) C through the 2030 design year.

A number of crashes occurred during 2000-2002, primarily involving vehicles running off the road to avoid colliding with a stopped vehicle ahead; the majority of these crashes occurred during wet roadway conditions. The number of crashes has been reduced based on 2003-2006 data. Injury collisions make up a large portion of the total crash composition.

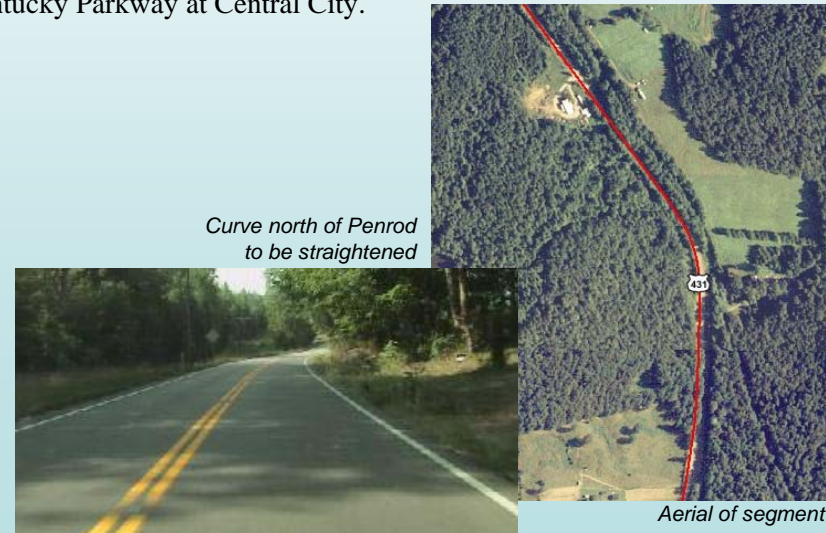
This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for the design phase to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway at Central City.

Recommendations:

Realign inside existing curve to increase radius.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 220,000
Utilities	\$ 180,000
Construction	\$ 750,000



Curve north of Penrod
to be straightened

Aerial of segment



Realign Segment at Hudson Lane/Union Ridge Road Intersections

Location 1-K

Muhlenberg County, Milepoints 4.600-5.100

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 1-K: Intersections with Hudson Lane, Union Ridge Road										
WSA Spot	4.600	4.700	N/A				1.83	1	8	∑ = 19
WSA Spot	4.800	4.900	N/A				1.06	1	2	∑ = 4
WSA Spot	5.000	5.100	N/A				2.65	0	4	∑ = 10

Description:

The intersection of Union Ridge Road provides access to US 431 for the community of Union Ridge and other scattered residences in rural southern Muhlenberg County. Myers Chapel Road intersects US 431 approximately 100 feet to the north. Hudson Lane, approximately a half-mile southwest, also provides residential access from US 431 with a steep uphill grade approaching the mainline. These intersections lie in a series of vertical and horizontal curves which severely limit sight distances.

The impact of this alignment is expressed in the number and type of crashes: 63 percent of reported crashes involve a vehicle running off the roadway. An additional 21 percent directly involve a turning vehicle to or from US 431.

This segment falls within a larger section between milepoints 5.0-7.0 identified by the Kentucky State Police as a likely “high crash zone” recommended for shoulder widening. This project also lies within the limits of a design project (Item 3-8309.00) which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Realign this segment of roadway to improve reverse curves in alignment, adjusting entrances and improving sight distances. As a short term mitigation, vegetation south of Hudson Lane should be routinely trimmed by KYTC Maintenance personnel.

Cost Estimate:

Design	\$ 560,000
Right of Way	\$ 1,000,000
Utilities	\$ 900,000
Construction	\$ 5,600,000



Union Ridge Road Intersection, facing north



Hudson Lane Intersection looking southwest along US 431



Intersection Improvements at KY 2270

Location 1-M: KYTC Spot 1-8a

Muhlenberg County, Milepoint 6.964

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 1-M: Intersection with KY 2270										
KYTC Spot 1-8a/WSA Spot	6.950	7.050	0.75	0	1	Σ = 3	1.09	1	2	Σ = 6

Description:

The intersection of KY 2270 with US 431 lies in the community of Belton in southern Muhlenberg County. KY 2270 is offset across US 431 by approximately 200 feet, forming two closely spaced T-intersections. A continuous entrance runs along the southwest quadrant and provides access to a post office and commercial property. Roadway signage, vegetation, and an abandoned house limit sight distances for vehicles turning from KY 2270.

At this location, US 431 has 10-foot wide lanes and 1-foot wide shoulders. To the south, the route served an estimated 2,600 vehicles per day in 2007 at a Level of Service (LOS) C. On the segment north of the intersection, traffic volumes increase to almost 5,000 vehicles per day and the route operates at a LOS D. Daily traffic volumes are around 1,000 vehicles on KY 2270.

Input received from the Kentucky State Police during the public input portion of this study suggests widening shoulders from Union Ridge Road through Drakesboro. This project also falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Remove or relocate sight distance obstacles at this intersection.

Cost Estimate:

Design	\$ 20,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 50,000

Southern view from KY 2270 intersection at Belton



KY 2270 Intersection looking north



Intersection Improvements at KY 246

Location 1-O: KYTC Spot 1-10

Muhlenberg County, Milepoint 8.020

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-O: Intersection with KY 246/Beechmont										
KYTC Spot 1-10/WSA Spot	7.950	8.050	2.81	0	6	Σ = 10	0.93	0	1	Σ = 7
KYTC Spot/WSA Spot	8.020	8.120	1.19	0	4	Σ = 6	0.19	0	0	Σ = 1

Description:

KY 246 intersects US 431 in the community of Beechmont, providing a connection to the Beech Creek community and KY 176. Approaching US 431, KY 246 splits into two two-way segments, creating three three-leg intersections in close proximity. A number of driveway entrances fall adjacent to this intersection, further increasing the number of conflict points. This intersection lies within a segment identified by the Kentucky State Police for a potential shoulder widening.

Crashes at this location typically involve a vehicle turning left, rear end crashes while slowing/waiting to turn, or angle collisions during the turning maneuver. In Beechmont, US 431 has two 10-foot wide driving lanes and one-foot wide shoulders. The posted speed limit is 35 miles per hour. The 2007 ADT is reported at 4,600 vehicles per day, operating at a Level of Service E.

This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for the design phase to relocate and widen US 431 from north of Lewisburg to the Western Kentucky Parkway at Central City.

Recommendations:

Remove split lanes at intersection to form a single approach to a T-intersection. Improve driveway delineation and restrict entrance widths at adjacent commercial access points. In the long term, an opposing left turn lane through Beechmont or an alternative alignment east of the town may be considered.

Cost Estimate:

Design	\$ 50,000
Right of Way	\$ 50,000
Utilities	\$ 0
Construction	\$ 250,000



View from KY 246 east to US 431



Intersection Improvements at KY 70

Location 1-Q: KYTC Spot 1-12

Muhlenberg County, Milepoint 9.834

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-Q: Intersection with KY 70										
KYTC Spot 1-12/WSA Spot	9.734	9.900	1.67	0	5	Σ = 9	1.12	0	10	Σ = 24
WSA Spot	10.000	10.100	N/A				2.33	0	6	Σ = 13
KYTC Spot 1-13	10.222	10.322	0.717	0	2	Σ = 4	1.14	0	1	Σ = 7
							0.33	0	2	Σ = 2

Description:

KY 70 intersects US 431 in Muhlenberg County at the community of Browder, south of Drakesboro. As it approaches US 431, KY 70 splits into three two-way segments which form four intersections in close proximity to one another. Multiple entrances to commercial properties further complicate this intersection. A minor vertical curve limits sight distance to the south. Seasonal vegetation and parked vehicles at a car lot in the northeast quadrant limit sight distance to the north. A concentration of crashes involving vehicles turning to or from mainline US 431 appear in the 2003-2006 crash records at this intersection. The Kentucky State Police identified a segment of US 431 from milepoints 8.00 to 9.90 as a “high crash zone” and recommend shoulder widening be considered on this section.

Field observation indicates that these split lanes are used as passing opportunities for turning vehicles. As large trucks turn from US 431, smaller vehicles behind them will use one of the other approaches to attempt to get in front of the larger vehicle on KY 70. The intersection offset from US 431 then becomes a dangerous conflict point for inattentive motorists.

This project also lies within the limits of a design project (Item 3-8309.00) which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Remove split lanes to form a typical four way intersection. No additional right-of-way would be required for this cost-effective solution. As a maintenance procedure, vegetation and other sight distance obstacles should also be addressed.

Cost Estimate:

Design	\$ 25,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 100,000



View northeast at KY 70 intersections with US 431



Intersection Improvements at KY 176

Location 1-R: KYTC Spot 1-14

Muhlenberg County, Milepoint 11.467

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-R: Drakesboro, intersections with (1) Frazier, (2) KY 176, (3) KY 2107										
WSA Spot	11.100	11.200	N/A				1.23	1	18	Σ = 47
KYTC Spot 1-14/WSA Spot	11.400	11.500	1.71	0	4	Σ = 10	1.14	0	1	Σ = 7
KYTC Spot 1-15/WSA Spot	11.920	12.082	0.91	0	5	Σ = 6	2.66	0	4	Σ = 20
							1.06	0	4	Σ = 8

Description:

The US 431 intersection with KY 176 is located in Drakesboro, Kentucky. This four-leg signalized intersection has tight turning radii in each quadrant and continuous entrances to adjacent commercial properties. Reports indicate that water tends to pool in the roadway during rainfall events. A large number of heavy coal trucks use both the north and eastern approaches to access the TVA Paradise Steam Plant. Muhlenberg South High School is accessed by the western approach.

Like most intersections in developed areas, crash history trends indicate elevated rates for both rear end type and turning type crashes. A few mainline crashes related to the parking facilities at adjacent properties also are recorded. The Kentucky State Police identified this site as part of a segment at milepoints 11.00-12.10 for consideration as a “high crash zone” within the corridor.

In this area, US 431 is a two-lane undivided rural highway with 10-foot wide lanes and one-foot wide shoulders. The 2007 ADT is 8,000 vehicles; the roadway operates at a Level of Service (LOS) E under current conditions.

This project also lies within the limits of project 3-8309.00 which has funding allocated in the 2006-2012 Six Year Plan. \$2.5 million is included to design for the relocation and four-laning of US 431 from north of Lewisburg to the Western Kentucky Parkway.

Recommendations:

Widen US 431 and add left turn lanes to provide storage for vehicle queues. Restrict widths of adjacent commercial entrances to improve intersection functionality. Drainage improvements should also be incorporated.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 390,000
Utilities	\$ 350,000
Construction	\$ 820,000

View northwest at intersection



Intersection of US 431 (north-south) and KY 176 (east-west) in Drakesboro



Intersection Improvements at KY 2107

Location 1-R: KYTC Spot 1-15

Muhlenberg County, Milepoint 11.982

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-R: Drakesboro, intersections with (1) Frazier, (2) KY 176, (3) KY 2107										
WSA Spot	11.100	11.200	N/A				1.23	1	18	Σ = 47
KYTC Spot 1-14/WSA Spot	11.400	11.500	1.71	0	4	Σ = 10	1.14	0	1	Σ = 7
KYTC Spot 1-15/WSA Spot	11.920	12.082	0.91	0	5	Σ = 6	1.06	0	4	Σ = 8

Description:

KY 2107 intersects US 431 in Drakesboro, runs parallel to mainline US 431, and then rejoins US 431 farther north at milepoint 16.5, just south of Central City. The southern intersection lies at a severe skew, forming a Y-type intersection in a long horizontal curve on US 431. There is an additional connection between the two routes approximately 100 feet north of the first. Sight distance is somewhat limited due to seasonal vegetation, the curvature of US 431, and the skew of the southern intersection.

Crashes at this location include rear end and angle collisions associated with vehicles turning. The site geometry, particularly for northbound traffic, creates a potential to unintentionally drift onto KY 2107 which requires an abrupt correction to continue along the horizontal curve on mainline US 431. The Kentucky State Police identified a segment at milepoints 11.00-12.10 for consideration as a “high crash zone” within the corridor.

In this area, US 431 serves approximately 8,200 vehicles per day at a Level of Service (LOS) D. A large portion of this through traffic on US 431 is composed of heavy coal trucks traveling between the Western Kentucky Parkway to the north and the TVA Paradise Steam Plant to the southeast.

This project falls within the limits of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the parkway.

Recommendations:

Realign the southernmost 100 feet of KY 2107 to intersect US 431 as a T-intersection. The KY 2107 approach may require cutting an embankment and/or additional vertical adjustments.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 180,000
Utilities	\$ 100,000
Construction	\$ 350,000



Intersection of US 431 (left) and KY 2107 (right) looking north



Intersection Improvements at Cleaton Road

Location 1-T: KYTC Spot 1-17

Muhlenberg County, Milepoint 15.184

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 1-T: Intersection with Cleaton Road										
KYTC Spot 1-17	15.150	15.250	1.46	0	1	Σ = 9	0.67	0	1	Σ = 5

Description:

Cleaton Road crosses US 431 just south of the Wendell H. Ford Western Kentucky Parkway, providing access to the communities of Cleaton and Holt, and a few industrial developments. At this point, US 431 is in a tangent section with 12-foot wide lanes which encourages high speeds and provides an opportunity for passing. A large number of coal trucks use US 431 to travel between the Parkway and mining developments to the south. Vegetation may create sight distance limitations for vehicles on the east approach. Almost all crashes at this location for 2003-2006 can be linked to vehicles turning to or from mainline US 431.

Just north of this intersection, a project is scheduled in the Six-Year Plan (Item No. 2-160.00) to improve a railroad crossing with funding designated through 2009 for all phases. This project is not anticipated to directly impact the Cleaton Road intersection. In addition, this segment falls within the project limits of a reconstruction/widening project in the Six-Year Plan (Item No. 3-8309.00) from north of Lewisburg to the parkway, with dedicated funding for the design phase.

Looking north at US 431 from Cleaton Road, east approach



Recommendations:

Install a center turn lane to remove turning vehicles from the path of high speed through traffic on US 431. Vegetation bordering the roadway should be routinely trimmed by KYTC maintenance forces.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 140,000
Utilities	\$ 145,000
Construction	\$ 520,000



Looking south at US 431 from Cleaton Road, west approach



Extend 4-Lane Section

Location 1-U: KYTC Spot 2-1

Muhlenberg County, Milepoint 17.300-17.584

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 1-U: Intersection with WKY Parkway/Central City										
WSA Spot	17.300	17.400	N/A				1.79	2	4	Σ = 16
KYTC Spot 2-1/WSA Spot	17.400	17.584	1.72	0	3	Σ = 7	1.04	2	2	Σ = 9

Description:

The Wendell H. Ford Western Kentucky Parkway crosses US 431 in Muhlenberg County, just south of Central City. The existing interchange has toll-booth style cloverleaf ramps meeting US 431 in a four-lane section with 12-foot wide lanes and 10 foot shoulders. South of the interchange, tapers extend south into a horizontal curve. A large number of heavy coal trucks use this route.

Field observation indicates that passenger cars, traveling south along US 431, will speed up to pass slow moving trucks turning south from the parkway ramps. As vehicles enter the horizontal curve to the south side-by-side, one vehicle will infringe into northbound lanes as the tapers end abruptly, thus, creating a hazardous situation for northbound vehicles approaching the four lane section. Crashes at this site are primarily rear end collisions, but also include a number of single vehicle collisions with fixed objects. Guardrail in this area shows evidence of numerous impacts.

This project falls within on the northern boundary of KYTC Item 3-8309.00 in the 2006-2012 Six Year Plan. Funding is allocated for design to relocate and widen US 431 from north of Lewisburg to the parkway.

Recommendations:

Extend ramp tapers south beyond horizontal curve. Consideration may be given to reconfiguring parkway ramps to a diamond-style interchange as the parkway is considered for inclusion into the I-66 corridor.

Cost Estimate:

Design	\$ 50,000
Right of Way	\$ 50,000
Utilities	\$ 25,000
Construction	\$ 275,000



View north along US 431 to parkway interchange



Widen Mainline to 3-Lane Section

Location 2-A: KYTC Spot 2-2

Muhlenberg County, Milepoints 17.900-18.200

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>Muhlenberg County</i>										
Location 2-A: North of WKY Parkway/Central City										
KYTC Spot 2-2/WSA Spot	17.900	18.012	0.73	0	2	Σ = 5	1.04	0	4	Σ = 9

Description:

The US 431 corridor between US 62 and the Wendell H. Ford Western Kentucky Parkway has experienced sizeable commercial development in the last five years with the addition of two hotels, restaurants, and other shops. To the south, there is a four-lane section leading to the parkway. To the north, a three-lane section begins at the US 62 intersection and continues north through Central City. Between these two sections, US 431 has two 12-foot lanes, a series of vertical curves, and an increasing number of commercial access points. Shoulders transition from 10 to 2-foot wide in this stretch. Local reports indicate shoulders in this section are commonly used as parking facilities for large trucks while drivers stop at adjacent restaurants.

Sight distance restrictions in this segment, coupled with the number of turning opportunities, create an increased potential for collisions. Sixty percent of crashes falling in this segment lie within the southernmost 0.10 miles where the roadway transitions between a 4-lane and a 2-lane facility. Trend analyses show a large portion of crashes involve vehicles turning to or from commercial entrances.

The reconstruction of the US 431/US 62 intersection is included in the 2007 Unscheduled Projects List as a medium ADD and high District priority. Improvements to this segment should integrate with improvements to this adjacent intersection.



View north into Central City

Recommendations:

Install a center turn lane from the 4-lane section in the south to the US 62 intersection. Access management principles should be incorporated as development continues along this segment. Signage may be incorporated to deter vehicles from parking on shoulders.

Cost Estimate:

Design	\$ 115,000
Right of Way	\$ 200,000
Utilities	\$ 460,000
Construction	\$ 950,000



Approaching parkway from north near transition from 2-lane to 4-lane section



Realign Segment at KY 81

Location 2-D: KYTC Spot 2-10, 2-11

Muhlenberg County, Milepoint 22.298-22.498

Priority: HIGH

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Muhlenberg County</i>										
Location 2-D: Intersection with KY 81/South Carrollton							2.42	0	10	$\Sigma = 21$
KYTC Spot 2-10/WSA Spot	22.298	22.400	3.67	0	N/A	$\Sigma = 16$	4.85	0	9	$\Sigma = 19$
KYTC Spot 2-11	22.398	22.498	1.97	0	2-6	$\Sigma = 10$	0.51	0	1	$\Sigma = 2$
Adjacent to Project 02-976.00 - Realign with Shoulders, GR for MP 22.4-22.7 (2009 construction \$)										

Description:

US 431 intersects KY 81 in South Carrollton and contains an at-grade railroad crossing and the termini of two local streets. Right-of-way is constrained by a cemetery east of the existing alignment, a gas station with contaminated soil in the southwest quadrant, and a number of residential structures. Severe grades excessively limit sight distances. Input from the Kentucky State Police received during the public involvement portion of this study indicates that this site lies within a potential “high crash zone” through South Carrollton to the power plant entrance and is recommended for widening to accommodate large trucks.

Single vehicle collisions, angle crashes with turning vehicles, and rear end collisions composed the crashes reported at this location. Nearly half of the crash reports indicate an injury occurred, although no fatalities were reported within the analysis period. In both the 2000-2002 and 2003-2006 crash data sets, this location exhibited the highest CRF along the entire length of the corridor.

The segment immediately north of this intersection is scheduled for realignment and safety upgrades (Item 2-976.00) with funding dedicated through a 2009 construction phase. The 2007 Unscheduled Projects List also contains a reconstruction project from KY 189 in South Carrollton to the McLean county line which encompasses the KY 81 intersection. It is ranked as a medium priority at both ADD and District levels.

Recommendations:

Realign segment to improve intersection, including consolidation of local access points. Cut embankment north of intersection to improve sight distances. A bypass west of South Carrollton from KY 189 is also suggested for evaluation as a potential long term solution.

Cost Estimate:

Design	\$ 75,000
Right of Way	\$ 200,000
Utilities	\$ 125,000
Construction	\$ 300,000



Aerial image of intersection



Views north towards intersection with KY 81





Intersection Improvements at KY 250

Location 2-K: KYTC Spot 2-18

McLean County, Milepoints 9.800-9.950

Priority: LOW

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total*	CRF	Fatal	Injury	Total*
<i>McLean County</i>										
Location 2-K: Intersection with KY 250										
KYTC Spot 2-18/WSA Spot	9.800	9.900	1.09	0	3	Σ = 6	0.93	0	3	Σ = 6

Description:

KY 250 intersects US 431 in northeastern McLean County; approximately 250 feet north lies an offset T-intersection with Buck Creek Church Road. A cluster of homes, a church, and a business occupy the immediate area, increasing the number of driveways and access points for this segment of roadway. This intersection also provides access to McLean County High School in Calhoun.

Crashes at this location are due to a variety of circumstances; the limited sample size does not strongly suggest causation trends. Crash types include single vehicle collisions, rear ends, angle impacts, and a head on crash.

In this area, US 431 has two 12-foot wide lanes and 3-foot shoulders in a reverse curve, which limits sight distance. The ADT was around 6,200 vehicles per day in 2007, operating at a Level of Service (LOS) C. By 2030, traffic volumes are anticipated to reach 8,000 vehicles per day at a LOS D.

A project to address safety, condition, and service issues in McLean County from Livermore to the Daviess county line was identified as a high ADD priority and medium District priority in the 2007 Unscheduled Projects List.

Recommendations:

Install a center turn lane on US 431 to serve both KY 250 and Buck Creek Church Road. Consider removing access to the church parking lot from US 431. Drainage improvements should be considered with any other improvements to the roadway.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 200,000
Utilities	\$ 180,000
Construction	\$ 500,000



View north along US 431 at KY 250



Intersection of
US 431 (red) and
KY 250 (black)



Intersection Improvements at Harmons Ferry Road

Location 2-L

Daviess County, Milepoints 0.000-0.100

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Daviess County</i>										
Location 2-L: McLean/Daviess County Line										
WSA Spot	0.000	0.100	N/A				1.23	0	3	Σ = 8

Description:

At the McLean/Daviess county line, a concentration of crashes appears based on 2003-2006 crash data. At this location, US 431 lies in a tangent section terminating in a minor crest vertical curve to the south. The roadway has 12-foot wide lanes and 2-foot wide shoulders. Approximately 6,600 vehicles per day travel this segment, which operates at a Level of Service (LOS) D.

Several local cross streets and driveways turn off US 431 in this area. There is a wide gravel entrance to a commercial property along the eastern side of the route. Crash trend analyses indicate a large proportion of rear end type crashes.

The 2007 Unscheduled Projects List contains a road reconstruction/widening project from the McLean/Daviess county line through Panther Creek Bridge. This project is a medium priority at both the MPO and District levels.



View south (left) and north (below) along US 431 at McLean/Daviess county line



Recommendations:

Adjust vertical alignment south of the intersection with Harmons Ferry Road. Consider addition of turn lanes on US 431 and delineation of commercial entrance.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 150,000
Utilities	\$ 200,000
Construction	\$ 500,000



Improve Roadside Geometry

Location 2-M

Daviess County, Milepoint 1.985

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Daviess County</i>										
Location 2-M: Intersection with Mill Street										
WSA Spot	1.950	2.050	N/A				1.07	0	2	Σ = 7

Description:

The intersection with Mill Street lies in southern Daviess County, providing access to homes in the community of Utica and an additional connection between KY 140 and US 431. Mill Street approaches mainline US 431 at a steep grade; an embankment in the northwest quadrant limits sight distances for turning vehicles. US 431 has two 12-foot wide lanes and 2-foot wide shoulders. The speed limit is 55 miles per hour with limited passing sight distance.

A variety of crash types occur at this location, including rear end collisions, angle crashes with turning vehicles, and single vehicle collisions with fixed objects. The majority of crashes occur in poor lighting conditions; however, the limited number of records makes it difficult to determine if this is causal or coincidental.

In 2007, US 431 at Mill Street served 6,550 vehicles per day at a Level of Service (LOS) D. By 2030, this volume is expected to increase to 9,100 vehicles per day with operations continuing at LOS D.

The 2007 Unscheduled Projects List contains a road reconstruction/widening project from the McLean/Daviess county line through Panther Creek Bridge. This project is a medium priority at both the MPO and District levels.

Recommendations:

Cut embankment in northwest quadrant to increase sight distance.

Cost Estimate:

Design	\$ 20,000
Right of Way	\$ 0
Utilities	\$ 0
Construction	\$ 75,000



View north along US 431 at Mill Street intersection



Intersection Improvements at KY 140

Location 2-N: KYTC Spot 2-19

Daviess County, Milepoint 2.599

Priority: MEDIUM

Location	BMP	EMP	2000-2002 Data				2003-2006 Data			
			CRF	Fatal	Injury	Total	CRF	Fatal	Injury	Total
<i>Daviess County</i>										
Location 2-N: Intersection with KY 140/Utica										
KYTC Spot 2-19/WVA Spot	2.599	2.699	1.41	0	6	Σ = 13	1.76	0	5	Σ = 14

Description:

The intersection with KY 140 lies in the community of Utica in Daviess County. This four-leg intersection is stop-controlled and has flashing warning beacons. A gas station in the northeast quadrant has wide driveway entrances. An embankment in the southwest quadrant has recently been cut by KYTC maintenance personnel to improve sight distance from the western approach.

South of this intersection, traffic volumes were estimated at 6,600 vehicles per day in 2007. Due to severe passing sight distance limitations, the Level of Service (LOS) is D. North of the intersection, the route serves an estimated 9,000 vehicles per day at a LOS D. The speed limit remains at 55 miles per hour passing through Utica.

Input received from the Kentucky State Police recommends adding turn lanes at this intersection and potentially realigning the segment to the north through milepoint five near Browns Valley-Red Hill Road. Reports indicate water pooling in the roadway may also be a concern north of the intersection.

A project in the 2007 Unscheduled Projects List sets widening the section of roadway between Panther Creek and the existing 4-lane section in Owensboro as a high MPO and District priority.

Recommendations:

Construct left turn lanes on US 431 approaches to intersection.
Remove vegetation obstructing sight distance.

Cost Estimate:

Design	\$ 100,000
Right of Way	\$ 200,000
Utilities	\$ 200,000
Construction	\$ 750,000



View south along US 431 at KY 140 intersection