KENTUCKY 90

from the Barren County line to Burkesville

Metcalfe and Cumberland Counties

Item Number: 08-136.00

Final Report

PRE-DESIGN SCOPING STUDY

Prepared for:

KENTUCKY TRANSPORTATION CABINET

DIVISION OF PLANNING

January 2007

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Prepared by:

William C. Crawford
David E. Smith
Benjamin Brodbeck

KENTUCKY TRANSPORTATION CABINET

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Kentucky UNBRIDLED SPIRIT

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EXECUTIVE SUMMARY

The KY 90 Pre-Design Scoping Study was prepared to assist the Kentucky Transportation Cabinet (KYTC) in defining the scope and extent of improvements best suited to meet the current and future needs of this facility between the Metcalfe-Barren County line and Burkesville in Cumberland County, a distance of about 26 miles. A project study team approach was used, consisting of representatives from the KYTC Central Office, District 3, and District 8; Lake Cumberland and Barren River Area Development Districts; and Qk4. Public involvement activities included project team meetings, resource agency coordination, local officials and public information meetings, and website information.

KY 90 typically has two narrow driving lanes, narrow to no shoulders, and winds through a hilly and heavily wooded area with restricted sight distances, providing few opportunities to pass slower vehicles. Several small towns are situated along the roadway, including one National Register of Historic Places District, a potential expansion of that district, five potential historic districts, and numerous potentially eligible individual historic sites. Heavy freight truck and recreational vehicle traffic are common. KY 90 is a major east-west connector in Metcalfe and Cumberland Counties. Glasgow, located west of the study area, is the region's economic activity center, providing employment, health care, and educational opportunities to study area residents. Tourists are attracted to the major recreational areas of Lake Cumberland and Dale Hollow Lake east of the study area, and truck traffic to the major employers/manufacturers. KY 90 is a critical link for study area residents, as well as tourists, and manufacturers receiving and moving goods to markets. Improved connectivity would play an important role in the region's future economic growth and development, commercial truck access, projected traffic demands, and access to public recreational activities, health care services, jobs, higher education, and other opportunities.

Corridor issues and concerns were identified through discussions with KYTC officials, comments from local officials and stakeholders, on-site visits, traffic records, project team meetings, and public information meetings. Safety overshadowed all other issues, prompted mainly by the large volume of commercial truck and recreational vehicle traffic, and substandard roadway geometrics. Other corridor issues included: minimize/avoid impacts to communities and historic properties, promote economic development and tourism, environmental issues, compatibility with scheduled KY 90 improvements in Barren County, and the expectations of elected officials, community leaders, and citizens.

The project study team — following a careful consideration of corridor issues, concerns, and existing conditions — developed the project goals.

- *Improve safety along the KY 90 corridor.*
- *Provide a facility meeting current design standards, capable of serving recent growth, and sustaining current and projected traffic demands.*
- *Improve roadway geometrics to accommodate recreational vehicles and commercial trucks, including possible passing and climbing lanes.*
- *Minimize/avoid impacts to potential historic districts.*
- *Minimize/avoid impacts to communities.*
- *Provide roadway improvements between the Barren County line and Burkesville (KY 61) to compliment the planned Barren County improvements.*
- *Improve accessibility for local people seeking access to the recreational, employment, educational, and health care opportunities in south central Kentucky.*

An analysis of existing conditions confirmed the narrow lanes and shoulders, several reduced speed curves, steep inclines, heavy truck and recreational vehicle traffic volumes, and limited passing opportunities. Two high crash rate locations were identified: the areas around the KY 90/KY 640 intersection in Summer Shade, and the KY 90/KY 163 intersection. (KY 90/KY 163 intersection deficiencies are anticipated to be corrected with implementation of KYTC item no. 3-276.50, KY 163 relocation.) Percent passing sight distances are highly variable, ranging from 20-100 percent. Almost

all the 100-percent is located in Summer Shade, and just over half the project length is rated 71 percent or less passing sight distance. Passing opportunities are frequently prevented by the on-coming traffic. Most crashes occur during daylight hours on dry roads, with a majority involving a fixed object (*i.e.*, single vehicle, driver loses control), followed by rear end (*i.e.*, speed differentials due to congestion or entering/leaving roadway) and right-angle crashes (*i.e.*, common at crossroads and driveways due to right-of-way conflicts, or limited visibility and speed differentials). Traffic volume is projected to increase about 95-percent by the year 2030. Roadway improvements through the small towns are potentially difficult given the positioning of numerous historic resources. Any bypasses might incur adverse impacts to the residents and community businesses.

Improvement options in the following categories were evaluated:

- Do Nothing – involves only routine roadway maintenance. No action to improve the existing facility. This option was not recommended because it did not address the project goals. However, the Do Nothing option will be referred to as appropriate for baseline comparisons throughout the decision making process.
- Transportation System Management – involves relatively low-cost, but effective, improvements that can be quickly implemented through maintenance type activities (*e.g.*, traffic signing/signals at critical locations, lighting, pavement stripping, trim or remove vegetation and other visual obstacles, improve a street corner radius).
- Operational Improvements – are relatively short distance improvements addressing immediate and short-term needs, generally involving roadway reconstruction to correct horizontal and vertical deficiencies.
- Roadway Reconstruction – generally involves longer-term roadway construction on new alignment, or reconstruction of existing roadway sections of longer lengths. May include bypasses, new road on new alignment, or a new typical section for the existing roadway.

Recommendations

After a careful review and consideration of the existing conditions, cultural and environmental constrains, improvement opportunities were identified covering the full length of the study area. The project team categorized the improvements into one of the three types described below to facilitate implementation strategies.

- Bridge Replacements. Candidate bridges will be selected by the District as warranted by bridge condition and safety considerations. (3 bridge replacements)
- Operational Improvements. Includes improvements addressing immediate and short-term needs. The project team made no attempt to prioritize these improvement opportunities, believing it was best to allow the District to select the improvement(s) to implement based upon available funding and needs. (12 operational improvements)
- Roadway Reconstruction Improvements. Consists of longer-term roadway mainline reconstruction and bypass improvements. The project team prioritized these improvements based upon considerations of safety, traffic volumes, passing opportunities, estimated construction costs, and local knowledge. (16 reconstruction improvements)

The recommended KY 90 improvement opportunities are listed in the table on the following page, *Recommended KY 90 Improvement Opportunities*, by category, along with improvement lengths, estimated construction costs, and priority, if appropriate.

The Enacted Six-Year Highway Plan FY 2007-2012 authorize funding for Design, and a portion was used to fund this Pre-Design Scoping Study. The Enacted Six-Year Highway Plan FY 2007-2012 provided for the following phase costs: $3.25 million for design (2006), $7 million for right-of-way (2008), $2.8 million for utility relocation (2008), and $32 million for construction (2008). Each phase is programmed for funding with State Construction Funds (SP).

Recommended KY 90 Improvement Opportunities

Priority	Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
Bridge Replacements (no priority)				
	9	Replace existing bridge over Wisdom Creek.	--	0.5
	12	Replace existing bridge at Dutch Creek.	--	0.7
	13	Replace existing bridge west of Allen Creek Road.	--	0.6
Operational Improvements (no priority)				
	2	Reconstruct the KY 90 intersection at Bronston Howard Road (access road to Summer Shade Elementary School) in Summer Shade using the existing right-of-way.	0.14	0.2
	8.1	Reconstruct the KY 90/KY 3115 intersection in Marrowbone.	0.22	0.3
	D + 5	Roadway section from the Metcalfe-Cumberland County line to the curve at Anderson Lane (item 5). Reconstruct curve just east of the Metcalfe-Cumberland County line near Anderson Lane to meet current design standards.	0.291	0.4
	E + 6	Roadway section from the end of the curve at Anderson Lane (item 5) to the beginning of the curve near Pitman Creek (item 6). Reconstruct curve west of Pittman Creek Road to meet current design standards.	0.633	1.0
	F.1	Roadway section F between White Road and Ferris Fork Creek. Improve typical section safety and rock wall slope immediately north of roadway.	0.35	1.7
	11	Reconstruct the KY 90/KY 100 intersection. Existing intersection would be shifted west and KY 100 realigned to provide a more favorable geometry with KY 90. Turning lanes would be added to KY 90.	0.29	0.4
	14	Curve at Allen Creek. Reconstruct curve east of Allen Creek Road and near Grider to meet current design standards.	0.25	0.6
	18.1	Reconstruct the KY 90/KY 61 intersection in Burkesville. Add a right turn lane on KY 61 southbound.	0.17	0.3
	A-P	Passing lane only on this mainline section.	1.25	0.8
	C-P	Passing lane only on this mainline section.	1.36	1.1
	F-P	Passing lane only on this mainline section.	1.00	1.0
	H-P	Passing lane only on this mainline section.	1.22	0.9
Prioritized Mainline Road Reconstruction (priority order as indicated)				
1	Summer Shade Bypass: (1-1-P, 1-1, 1-2)			
	1-1-P	Summer Shade Bypass 1 with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 0.86 miles long, estimated construction cost is $0.6 million.	2.31	11.7
	1-1	Summer Shade Bypass 1. Begin west of Hill Top VW Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 east of Ernie Ferrell Road. This improvement is more expensive and longer than 1-2, and crosses more varying terrain features, but positions the roadway further from residential dwellings.	2.31	11.1
	1-2	Summer Shade Bypass 2. Begin east of Big Jack Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 about Ernie Ferrell Road. This improvement costs less and is shorter than 1-1, but locates the roadway closer to residential dwellings.	1.76	4.9
2	16 + 18	Reconstruct KY 90 from Burkesville Hill Road/Saw Mill Cut to the KY 90/KY 61 intersection. Begin east of the KY 90/KY 2276 intersection, follow the existing alignment east to the first curve, continue northeast on new alignment, curving east to reconnect with KY 90 near the hilltop and end near the county hospital. Continue by widening KY 90 to 3-lanes, and constructing curb, gutter and sidewalks from near the county hospital to the intersection; reconstructing the elementary school entrance and exit roads; and adding a right hand turn lane on KY 61 southbound.	1.29	9.1
3	15	Norris Branch Road to Owens Road. Relocate KY 90 on new alignment to eliminate curve at KY 691. Begin east of Norris Branch Road, proceed east on new alignment to reconnect with KY 90 in the vicinity of Owens Road.	0.92	10.3

Priority	Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
4	Waterview Bypass with a passing lane: (10-1-P, 10-1, 10-2)			
	10-1-P	Waterview Bypass 1 with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.15 miles long, estimated construction cost is $2.9 million.	2.15	10.6
	10-1	Waterview Bypass 1. Begin from the curve west of Waterview's limits, proceed northeast, curving east to bypass Waterview to the north on new alignment, then curving southeast to reconnect with KY 90 in the vicinity of Taylor Road.	2.15	7.7
	10-2	Waterview Bypass 2. Begin from the curve west of Waterview's limits, proceed in a more direct eastern alignment to bypass Waterview to the north and reconnect with KY 90 west of Dutch Creek Road. Improvement 10-2 crosses within the potential National Register Historic District boundaries.	1.52	5.1
5	A-P	Roadway section A with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.25 miles long, estimated construction cost is $0.8 million.	1.69	3.1
6	8	Reconstruct KY 90 through Marrowbone with curb, gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the KY 3115 intersection to more favorable geometrics.	0.72	0.6
7	J + K	Roadway section from Owens Road (end of item 15) to beginning of the Burkesville Bypass (item 17). Roadway section from the beginning of the Burkesville Bypass (item 17) to the beginning of the Burkesville Hill Road reconstruction (item 16).	0.88	1.5
8	I	Roadway section from the end of the curve at Allen Creek (item 14) to near Norris Branch Road (beginning of item 15).	0.63	1.1
9	H-P	Roadway section H with an eastbound passing lane beginning just east of Waterview (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane is 1.22 miles long, estimated construction cost is $0.9 million.	1.22	2.7
10	B	Roadway section from end of Summer Shade Bypass (item 1) to the scheduled KY 163 improvement.	1.32	2.2
11	G + 9	Roadway section from the end of the Marrowbone Bypass (item 7) to the beginning of the Waterview Bypass (item 10). Replace existing bridge over Wisdom Creek.	1.24	2.5
12	Beaumont Bypass: (4-1, 4-2)			
	4-1	Beaumont Bypass 1. Begin from the scheduled KY 163 improvement, proceed almost due east on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont. This improvement is more direct and slightly shorter than 4-2.	0.893	1.6
	4-2	Beaumont Bypass 2. Begin from the scheduled KY 163 improvement, curve southeast on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont.	0.916	2.0
13	F-P	Roadway section F with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.00 miles long, estimated construction cost is $1.0 million.	2.26	5.7
14	Burkesville Bypass: (17, 17-P)			
	17	Burkesville Bypass. Begin near KY 90/KY 2276 intersection, proceed southeasterly on new alignment to bypass Burkesville on the south, and reconnect with KY 90 at the KY 90/KY 61 intersection west of the Cumberland River Bridge. Includes reconstructing KY 90/KY 2276 intersection.	1.57	21.7
	17-P	Burkesville Bypass with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 0.73 miles long, estimated construction cost is $8.1 million.	1.57	29.8
15	C-P	Roadway section C with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.36 miles long, estimated construction cost is $1.1 million.	5.67	10.3
16	Marrowbone Bypass: (7-1, 7-2)			
	7-1	Marrowbone Bypass 1. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496.	2.02	35.2
	7-2	Marrowbone Bypass 2. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496. 7-2 follows the same alignment as 7-1, except the mid-section curves south of 7-1 on new alignment.	2.03	39.0

* Estimated construction cost based upon 2006 estimated bid costs. Does not include utility and right-of-way costs.

1.0 INTRODUCTION

1.1 Purpose of the Study

The pre-design scoping study purpose is to investigate the need to improve KY 90 from the Metcalfe-Barren County line to KY 61 in Burkesville in Cumberland County, a distance of about 26 miles. The study examines improvement strategies to address both current and future needs for KY 90 from mile point 0.00 to 11.72 in Metcalfe County and mile point 0.00 to 14.11 in Cumberland County. KY 90 is a major east-west route through the two counties.

1.2 Project Background

The Kentucky Transportation Cabinet (KYTC) recognized the need to study potential improvements to KY 90, and included study funds in the Fiscal Year 2005-2010 Six-Year Highway Plan (SYP), approved 2005; and again in the Enacted Six-Year Highway Plan FY 2007-2012, approved May 2006. The study's intent is to identify, collect, and study critical information concerning the project corridor. This, in turn, will help the KYTC make decisions regarding the need for roadway improvements, and define potential roadway improvements that would better serve the Metcalfe and Cumberland County residents. The study will also assist the KYTC in addressing environmental issues as defined in the 1969 National Environmental Policy Act (NEPA) should federal funding become available for any portion of this project. The study of KY 90 improvements initially began in early 2003, with a limited amount of preliminary work done under item number 3-112.00 in the 2002 SYP before the study's suspension. The study resumed in late 2005 under item number 8-136.00 in the 2005 SYP with an assessment of existing conditions, which included a review of existing reports, meeting minutes, plans, an analysis of existing and projected traffic volumes, and a crash history analysis of the roadway. An environmental overview/footprint was developed to identify environmentally and culturally sensitive locations. The KY 90 study area and project termini are indicated by the highlighted area on the attached exhibits (see Exhibit 1, *Project Study Area Location Map*, and Exhibit 3, *Environmental Footprint*, in Appendix A; and Appendix B, existing KY 90 photographs).

If implemented, the project would help improve the east-west connection from Glasgow to Burkesville. Public involvement included project team meetings, local officials meeting, stakeholders meeting, public information meetings, resource agency coordination, and website information.

1.3 Corridor Issues

Discussions with KYTC officials, comments from local officials, stakeholders, and citizens, on-site visits, and project team meetings identified corridor issues, which centered around safety and connectivity. Safety emerged as the overwhelming primary corridor issue, with concerns focused on crashes and near crashes, the high volume of commercial truck and recreational vehicles, speeding vehicles, and sub-standard roadway geometrics (*i.e.*, narrow driving lanes and shoulders, sharp turns/curves, steep grades, restricted sight distances, limited passing opportunities). Local users consistently voiced safety concerns associated with the large volume of wide freight trucks and recreational vehicles on KY 90's narrow lanes. Trucks use KY 90 as a "short-cut" to the manufacturing and fowl processing plants, business establishments, and other destinations generally located outside the project study area. Recreational vehicles (*e.g.*, trailers, campers, and boats of all sizes) are attracted to the major state recreational areas of Lake Cumberland and Dale Hollow Lake. Speed limits are seemingly frequently ignored, especially through the towns. KY 90 has some sharp curves, steep grades, and reduced speed limits that restrict traffic flow. Narrow lanes and restricted sight distances provide few opportunities to pass slower vehicles. Additionally, the high volume of on-coming traffic frequently prevents passing opportunities. Local users also claim meeting a wide-bodied truck or trailer on the narrow lanes with little to no shoulder width is an intimidating experience. Some sections of KY 90 apparently received resurfacing improvements, which left considerable differences in height between the pavement surface and the shoulder surface. This is especially

noticeable between the Metcalfe-Barren County line and Summer Shade. If the vehicle tires should drop off the pavement edge, then a safe recovery becomes very difficult.

It was generally agreed that an improved roadway would improve safety, and also enhance connectivity, tourism, and recreational vehicle and commercial truck access, thereby increasing the potential for future economic growth and development, while sustaining current and projected traffic demands. KY 90 is a major east-west connector in Metcalfe and Cumberland Counties, as well as a primary access route from the west to the major recreational areas. For local residents, KY 90 provides access to economic and employment centers, health care, and educational opportunities, especially those located to the west in Glasgow. KY 90 characteristically has narrow driving lanes and very narrow to no shoulders almost throughout the study area, along with geometric deficiencies that impede traffic flow. The National Register Historic District in Marrowbone, as well as the other numerous historic properties in the small towns potentially eligible for National Register listing as historic properties and districts, could make KY 90 improvements through the towns difficult. Therefore, by-pass options were suggested for consideration to avoid adverse impacts to the towns' cultural resources. The identified corridor issues fall into the following eleven major categories:

- *Geometric and Safety*
- *Truck and Recreational Vehicles*
- *Historical and Environmental*
- *Match KY 90 Improvements West of Beaumont*
- *Community Impacts (Amish)*
- *Expectations of Elected Officials and Community Leaders*
- *Growth and Economic Development*
- *Sidewalks in Marrowbone District*
- *Add Shoulders and Widen Lanes for Truck Traffic*
- *Passing and Truck Climbing Lanes*
- *Flooding at Marrowbone*

2.0 EXISTING CONDITIONS

2.1 Project Location

The project is located in south-central Kentucky in Metcalfe and Cumberland Counties. The project begins at the Metcalfe-Barren County line and extends east through southern Metcalfe County to terminate at the KY 90/KY 61 intersection in Burkesville (about 26 miles). The project corridor is a fairly typical south-central rural Kentucky 2-lane blacktop highway winding through hilly terrain, small towns, and agricultural-residential areas, with scattered small service-oriented commercial businesses.

Three other highway projects listed in the Enacted Six-Year Highway Plan FY 2007-2012 are near the KY 90 study area:

- 3-108.50, KY 90, Barren County, Spot Improvements. Reconstruct KY 90 from east of Glasgow to the Metcalfe County line.
- 3-276.50, KY 163, Monroe County, Relocation. From south of Cyclone Road in Monroe County extending north to KY 90 in Metcalfe County.
- 8-158.04, KY 61, Cumberland County, Relocation. Burkesville-Columbia Road, Burkesville to Jones Chapel.

2.2 Roadway Characteristics

A windshield survey of KY 90 between the Metcalfe-Barren County line and Burkesville reveals KY 90 as generally a narrow, 2-lane, undivided roadway with narrow shoulders closely following "the lay of the land" and the associated curves, hills, and creek valleys. Consequently, sight distances are sometimes limited, and vehicle-passing opportunities restricted. Shoulders are narrow to almost appearing non-existent, frequently falling off sharply near the roadway edge. One section of KY 90 appeared to have a more favorable typical section (*i.e.*, about 5-miles between Beaumont and the Metcalfe-Cumberland county line) with 11-foot wide lanes and 6-foot paved shoulders. Utility line/pole placement varies from adjacent to the roadway, to a significant offset from the roadway. Residences are generally situated some distance away from the roadway; except in the more built-up/urban areas where residences and commercial buildings sometimes almost abut the roadway, and roadside parking is the norm. The more recently constructed residences are positioned further from the roadway. The existing KY 90 roadway generally follows the terrain, which only occasionally required deep fills and rock cuts. Consequently, deviating from the current alignment could require significant fills, rock cuts, and other earthwork.

Tables 1 and 2 (*Existing Highway Systems*, and *Geometric and Traffic Characteristics of Existing Highways*) present an inventory of selected study area roadways and their characteristics. The shaded boxes in Table 2 indicate those roadway sections with widths less than the current design standards of 12-foot wide driving lanes and 8-foot wide shoulders. Refer to Exhibits 1, 3, and 4, *Typical Sections*, in Appendix A, and the color photographs in Appendix B illustrating typical examples of existing KY 90 roadway sections. According to the KYTC Highway Information System (HIS) database, KY 90, within the study area, is a 2-lane, undivided highway traversing rolling terrain. Lane widths vary from 9 to 11-feet wide, however the majority is 10-foot wide lanes. The posted speed limit is mostly 55 mph, reducing to 35 and 45 mph in the more populated areas or where roadway geometrics restrict travel speed. Shoulder width varies from 1-foot (curbed) to 8-feet wide, with 4-foot shoulders comprising about half the length, and the balance almost equally divided between 2-foot and 6-foot wide shoulders. The percent passing sight distance varies from 20 to 100 percent, with Metcalfe County having the largest variability, and Cumberland County mostly 88 percent. The 100-percent passing sight distance corresponds to mile points located in and around Summer Shade; however, KY 90 through Summer Shade is stripped for no passing. Just over half the project length has a 71 percent or less percent passing sight distance rating, and a windshield survey indicated few opportunities to pass. Only two truck climbing lanes (*i.e.*, 3-lane roadway)

exists in the study area. One is located just east of Summer Shade (about 0.64 mile long) on westbound KY 90; the second is located east of Beaumont (about 1.15 miles long), also on westbound KY 90. In addition, KY 90 has several locations with steep grades, reduced speed curves, and rock cuts. In the study area, KY 90 is a State Primary (Other) system, functionally classified as a *Rural Minor Arterial*, with an AAA truck weight class rating. It is not listed on the National Truck Network or National Highway System.

2.3 Traffic and Level of Service

The following paragraphs provide summaries of traffic information and crash analyses. Tables 1 and 2 provide roadway characteristics and information on the major roads within the study area. Existing traffic volumes (year 2005) and truck percentages were obtained from the KYTC Highway Information System (HIS) database.

The KY 90 roadway under study currently has traffic volumes ranging from 2,460 to 5,380 vehicles per day (vpd), which are projected to increase to 4,790 to 10,500 vpd at the same locations by the year 2030 (see Table 2, *Geometric and Traffic Characteristics of Existing Highways*, and Exhibit 2, *Traffic and Crash Locations*, in Appendix A). This represents a projected traffic volume increase of about 95 percent along KY 90 by the year 2030. Other study area highways have existing traffic volumes ranging from a low of 80 vpd along KY 2276 (located in the east near Burkesville) to 3,560 vpd along KY 163 (located in the west). Projected (year 2030) traffic volumes are expected to range from about 110 to 5,910 vpd at the same locations, representing increases of about 38 to 66 percent. Traffic volumes on other study area roadways are expected to increase about 39 to 44 percent. The predicted traffic volumes represent unconstrained traffic increases based on growth trends.

Truck traffic volumes along KY 90 range from about 16 to 19 percent, which is considered higher than average for this highway functional classification (state wide average truck percent for a rural minor arterial is 14.0 percent). Truck traffic volume on other study area roadways is generally not available.

Traffic conditions were examined to determine existing and projected Levels of Service. Level of service (LOS) is a method listed in the *2000 Highway Capacity Manual*, published by the Transportation Research Board, and is commonly used to evaluate and describe roadway functions. “Level of service” is defined as a qualitative measure of operational conditions, and the motorists’ perception of those conditions. The conditions are usually defined in terms such as speed, travel time, maneuverability, delay, and comfort and convenience. The letters “A” through “F” designate the six levels of service. LOS A represents the best operating conditions (*i.e.*, free flow conditions), while LOS F defines the worst (*i.e.*, severe congestion). According to the national standards, the lower levels of service (*i.e.*, D, E, and F) are unacceptable for safe and efficient operation. The lower levels generally involve unstable traffic flows, and drivers have little freedom to maneuver. Typically, LOS D is considered the minimum acceptable in urban areas, and LOS C the minimum acceptable in rural areas. Both the *Kentucky Transportation Cabinet Design Manual*, and the American Association of State Highway and Transportation Official’s (AASHTO) *A Policy on Geometric Design of Highways and Streets* state the desired LOS for the design of a rural highway is “C.”

The LOS analysis performed on study area highways indicates the existing LOS’s range from B to C (see Table 2, and Exhibit 2 in Appendix A). For KY 90, the existing 2005 LOS is either B or C, with the project length almost equally divided between the two LOS ratings (*i.e.*, LOS B is about 50.8 percent of the length, and LOS C about 49.2). Most of the LOS B rated roadway is located in the KY 90 section between Beaumont and the Metcalfe-Cumberland County line that has the more favorable typical section. In Cumberland County, the LOS B rated roadway is in the mid-section, which basically follows the valley bottom. The western half of KY 90 in Metcalfe County, which includes Summer Shade, is rated LOS C, whereas in Cumberland County, LOS C occurs in the more rugged areas in the west and east.

TABLE 1 Existing Highway Systems

Begin MP	Begin Route	End MP	End Route	State System	National Truck Network	National Highway System	Functional Classification	Truck Weight Class
KY 90, Metcalfe County								
0.000	Barren C/L	0.899	Pitcock Road	State Primary (Other)	No	No	Rural Minor Arterial	AAA
0.899	Pitcock Road	1.800	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
1.800	n/a	1.926	Whitlow Road	State Primary (Other)	No	No	Rural Minor Arterial	AAA
1.926	Whitlow Road	2.012	Bowman Estate	State Primary (Other)	No	No	Rural Minor Arterial	AAA
2.012	Bowman Estate	2.710	Trinity Lane	State Primary (Other)	No	No	Rural Minor Arterial	AAA
2.710	Trinity Lane	2.912	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
2.912	n/a	3.010	Cemetery Road	State Primary (Other)	No	No	Rural Minor Arterial	AAA
3.010	Cemetery Road	3.350	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
3.350	n/a	4.450	Branstetter Park Old Trace Rd	State Primary (Other)	No	No	Rural Minor Arterial	AAA
4.450	Branstetter Park Old Trace Rd	4.721	KY 163	State Primary (Other)	No	No	Rural Minor Arterial	AAA
4.721	KY 163	4.850	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
4.850	n/a	5.600	Lone Star Ridge Rd	State Primary (Other)	No	No	Rural Minor Arterial	AAA
5.600	Lone Star Ridge Rd	6.450	Martin Cemetery Rd	State Primary (Other)	No	No	Rural Minor Arterial	AAA
6.450	Martin Cemetery Rd	7.600	Stillhouse Branch	State Primary (Other)	No	No	Rural Minor Arterial	AAA
7.600	Stillhouse Branch	8.711	Harvey White Cemetery Rd	State Primary (Other)	No	No	Rural Minor Arterial	AAA
8.711	Harvey White Cemetery Rd	11.719	Cumberland C/L	State Primary (Other)	No	No	Rural Minor Arterial	AAA
KY 90, Cumberland County								
0.000	Metcalfe C/L	1.994	Ferris Fork Rd	State Primary (Other)	No	No	Rural Minor Arterial	AAA
1.994	Ferris Fork Rd	3.919	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
3.919	n/a	4.415	Grey Branch Rd	State Primary (Other)	No	No	Rural Minor Arterial	AAA
4.415	Grey Branch Rd	5.150	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
5.150	n/a	5.337	KY 496	State Primary (Other)	No	No	Rural Minor Arterial	AAA
5.337	KY 496	7.839	KY 100	State Primary (Other)	No	No	Rural Minor Arterial	AAA
7.839	KY 100	11.273	KY 691	State Primary (Other)	No	No	Rural Minor Arterial	AAA
11.273	KY 691	13.242	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
13.242	n/a	13.630	n/a	State Primary (Other)	No	No	Rural Minor Arterial	AAA
13.630	n/a	14.113	KY 61	State Primary (Other)	No	No	Rural Minor Arterial	AAA
KY 163, Metcalfe County								
0.000	Monroe C/L	2.251	Apple Grove Rd	State Secondary	No	No	Rural Major Collector	AAA
2.251	Apple Grove Rd	3.223	KY 90	State Secondary	No	No	Rural Major Collector	AAA
3.223	KY 90	4.518	Edgar Ford Rd	State Secondary	No	No	Rural Major Collector	AAA
4.518	Edgar Ford Rd	7.100	Robert-Shaw Rd	State Secondary	No	No	Rural Major Collector	AAA
KY 640, Metcalfe County								
0.000	KY 90	16.723	KY 2435 / KY 70	Rural Secondary	No	No	Rural Minor Collector	A

TABLE 1 Existing Highway Systems

Begin MP	Begin Route	End MP	End Route	State System	National Truck Network	National Highway System	Functional Classification	Truck Weight Class
KY 100, Cumberland County								
3.199	KY 3115	7.655	Beech Grove Church Rd	Rural Secondary	No	No	Rural Minor Collector	A
7.655	Beech Grove Church Rd	8.097	KY 90	Rural Secondary	No	No	Rural Minor Collector	A
KY 1312, Cumberland County								
0.000	KY 90	0.944	Metcalfe C/L	Supplemental Rd	No	No	Rural Local	A
KY 2276, Cumberland County								
0.000	KY 90	0.650	n/a	Supplemental Rd	No	No	Rural Local	A
0.650	n/a	1.432	Smith St	Supplemental Rd	No	No	Rural Local	A
1.432	Smith St	1.536	Herd St	Supplemental Rd	No	No	Rural Local	A
1.536	Herd St	1.669	KY 61	Supplemental Rd	No	No	Rural Local	A
KY 3115, Cumberland County								
0.000	KY 100	2.966	Turner Branch Rd	Rural Secondary	No	No	Rural Local	A
2.966	Turner Branch Rd	3.426	KY 90	Rural Secondary	No	No	Rural Local	A
KY 496, Cumberland County								
0.000	KY 90	2.054	Casey Fork Rd	Rural Secondary	No	No	Rural Minor Collector	A
2.054	Casy Fork Rd	2.899	Metcalfe C/L	Rural Secondary	No	No	Rural Minor Collector	A
KY 691, Cumberland County								
5.390	n/a	7.318	KY 90	Rural Secondary	No	No	Rural Minor Collector	A

Source: KYTC *Highway Information System* (HIS)

TABLE 2 Geometric and Traffic Characteristics of Existing Highways

Begin MP	End MP	Length (miles)	No. of Lanes	Lane Width (feet)[1]	Shoulder Width (feet)[1]	%Passing Sight Distance[2]	Speed Limit (mph)	Roadway Type	Terrain Type	Pavement Type	ADT 2005	ADT 2030	ADT percent increase	Truck %	LOS[1] 2005	LOS[1] 2030	Composite Adequacy Rating[3]	Composite Adequacy Percentile[3]
KY 90, Metcalfe County																		
0.000	0.899	0.90	2	9	2	61	55	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	81.80	67.45
0.899	1.800	0.90	2	9	2	100	55	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	81.80	67.45
1.800	1.926	0.13	2	9	2	100	55	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	58.80	22.07
1.926	2.012	0.09	2	9	2	100	45	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	58.80	22.07
2.012	2.710	0.70	2	9	2	100	35	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	58.80	22.07
2.710	2.912	0.20	3	9	6	100	35	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	62.00	28.65
2.912	3.010	0.10	3	9	6	100	45	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	62.00	28.65
3.010	3.350	0.34	3	9	6	82	55	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	62.00	28.65
3.350	4.450	1.10	2	9	6	82	55	Undivided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	85.00	74.56
4.450	4.721	0.27	2	10	2	37	55	Divided	rolling	High Flexible	4,770	9,290	94.8%	17.9	C	D	82.80	71.03
4.721	4.850	0.13	2	10	2	100	55	Divided	rolling	High Flexible	3,390	6,600	94.7%	17.9	B	C	82.80	71.03
4.850	5.300	0.45	2	10	2	22	55	Undivided	rolling	High Flexible	3,390	6,600	94.7%	17.9	B	C	82.80	71.03
5.300	5.554	0.25	2	10	2	22	55	Undivided	rolling	High Flexible	3,390	6,600	94.7%	17.9	B	C	77.30	58.38
5.554	5.600	0.05	2	10	2	22	55	Undivided	rolling	High Flexible	3,390	6,600	94.7%	17.9	B	C	72.80	46.00
5.600	6.450	0.85	2	10	2	47	55	Undivided	rolling	High Flexible	2,610	5,080	94.6%	17.9	B	C	77.30	58.38
6.450	7.600	1.15	3	11	6	47	55	Undivided	rolling	High Flexible	2,610	5,080	94.6%	17.9	B	C	95.00	99.98
7.600	8.711	1.11	2	11	6	54	55	Undivided	rolling	High Flexible	2,610	5,080	94.6%	17.9	B	C	95.00	99.98
8.711	11.719	3.01	2	11	6	71	55	Undivided	rolling	High Flexible	2,460	4,790	94.7%	15.6	B	C	89.50	83.41
KY 90, Cumberland County																		
0.000	1.994	1.99	2	9	4	20	55	Undivided	rolling	High Flexible	2,460	4,790	94.7%	15.6	C	C	70.00	41.75
1.994	3.919	1.93	2	10	4	68	55	Undivided	rolling	High Flexible	3,320	6,460	94.6%	15.6	C	C	82.00	69.06
3.919	4.415	0.50	2	10	8	68	35	Undivided	rolling	High Flexible	3,320	6,460	94.6%	15.6	C	C	82.00	69.06
4.415	5.150	0.74	2	10	1	68	35	Undivided	rolling	High Flexible	3,320	6,460	94.6%	15.6	C	C	82.00	69.06
5.150	5.337	0.19	2	10	4	88	55	Undivided	rolling	High Flexible	3,320	6,460	94.6%	15.6	B	C	82.00	69.06
5.337	7.839	2.50	2	10	4	88	55	Undivided	rolling	High Flexible	3,530	6,870	94.6%	16.4	B	C	82.00	69.06
7.839	11.273	3.43	2	10	4	88	55	Undivided	rolling	High Flexible	3,530	6,870	94.6%	16.4	B	C	82.00	69.06
11.273	13.242	1.97	2	10	4	88	55	Undivided	rolling	High Flexible	4,090	7,960	94.6%	16.4	C	C	82.00	69.06
13.242	13.630	0.39	2	10	4	88	45	Undivided	rolling	High Flexible	4,090	7,960	94.6%	16.4	C	C	82.00	69.06
13.630	14.033	0.40	2	10	4	88	45	Undivided	rolling	High Flexible	4,090	7,960	94.6%	16.4	C	C	82.00	69.06
14.033	14.113	0.08	2	10	4	88	45	Undivided	rolling	High Flexible	5,380	10,500	95.2%	18.6	C	D	90.00	83.72
KY 163, Metcalfe County																		
0.000	0.921	0.92	2	11	2	9	55	Undivided	rolling	High Flexible	2,750	4,570	66.2%	13.7	C	C	80.50	74.00
0.921	2.251	1.33	2	11	2	9	55	Undivided	rolling	High Flexible	3,560	5,910	66.0%	12.1	C	C	80.50	74.00
2.251	3.223	0.97	2	11	2	51	55	Undivided	rolling	High Flexible	3,560	5,910	66.0%	12.1	C	C	90.50	93.07
3.223	4.518	1.30	2	9	2	19	55	Undivided	rolling	High Flexible	1,790	2,970	65.9%	12.1	C	C	84.50	85.68
4.518	7.100	2.58	2	9	2	39	55	Undivided	rolling	High Flexible	1,790	2,970	65.9%	12.1	C	C	84.50	85.68

TABLE 2 Geometric and Traffic Characteristics of Existing Highways

Begin MP	End MP	Length (miles)	No. of Lanes	Lane Width (feet)[1]	Shoulder Width (feet)[1]	%Passing Sight Distance[2]	Speed Limit (mph)	Roadway Type	Terrain Type	Pavement Type	ADT 2005	ADT 2030	ADT percent increase	Truck %	LOS[1] 2005	LOS[1] 2030	Composite Adequacy Rating[3]	Composite Adequacy Percentile[3]
KY 640, Metcalfe County																		
0.000	8.678	8.68	2	9	3	**	55	Undivided	rolling	Mixed Bituminous	330	470	42.4%	**	B	B	**	**
8.678	16.723	8.05	2	9	3	**	55	Undivided	rolling	Mixed Bituminous	550	780	41.8%	**	B	B	**	**
KY 100, Cumberland County																		
3.199	7.655	4.46	2	9	2	0	55	Undivided	rolling	Bituminous	290	410	41.4%	**	B	B	**	**
7.655	8.097	0.44	2	9	2	0	55	Undivided	rolling	Bituminous	620	890	43.5%	**	B	B	**	**
KY 1312, Cumberland County																		
0.000	0.944	0.94	2	9	3	**	55	Undivided	rolling	Mixed Bituminous	200	280	40.0%	**	B	B	**	**
KY 2276, Cumberland County																		
0.000	0.650	0.65	2	9	3	**	55	Undivided	rolling	Mixed Bituminous	80	110	37.5%	**	B	B	**	**
0.650	1.432	0.78	2	9	3	**	55	Undivided	rolling	Mixed Bituminous	80	110	37.5%	**	B	B	**	**
1.432	1.536	0.10	2	9	3	**	25	Undivided	rolling	Mixed Bituminous	80	110	37.5%	**	B	B	**	**
1.536	1.669	0.13	2	9	2	**	25	Undivided	rolling	Mixed Bituminous	1,490	2,100	40.9%	**	C	C	**	**
KY 3115, Cumberland County																		
0.000	2.966	2.97	2	8	3	**	55	Undivided	rolling	Mixed Bituminous	210	300	42.9%	**	B	B	**	**
2.966	3.426	0.46	2	8	3	**	55	Undivided	rolling	Mixed Bituminous	210	300	42.9%	**	B	B	**	**
KY 496, Cumberland County																		
0.000	2.054	2.05	2	9	2	**	55	Undivided	rolling	Mixed Bituminous	250	350	40.0%	**	B	B	**	**
2.054	2.899	0.85	2	9	2	**	55	Undivided	rolling	Mixed Bituminous	250	350	40.0%	**	B	B	**	**
KY 691, Cumberland County																		
5.390	7.318	1.93	2	9	3	**	55	Undivided	rolling	Mixed Bituminous	440	610	38.6%	**	B	B	**	**

Source: KYTC *Highway Information System* (HIS). ** Information not available.

[1] Lane and shoulder widths that do not meet current design standards (i.e., less than 12-foot-wide driving lanes and 8-foot-wide shoulders), and unacceptable Level of Service (LOS) ratings (i.e., D, E, F) are shaded.

[2] Percent Passing Sight Distance - the percent of segment length (estimated to the nearest 10%) which has available passing sight distance (as measured from the driver's eye to the road surface) of at least 1,500 feet. This information is only available for Kentucky maintained roads classified as State Primary or State Secondary.

[3] Composite Adequacy Rating is a method being developed by KYTC to assess a roadway's condition and prioritize highway improvements. The ratings are calculated by individual functional class and based upon three roadway components (safety, service, and condition) with each component comprised of several measures. The rating scores 100 as a perfect, or near perfect, highway. The Composite Adequacy Percentile ranks a particular roadway section compared to other Kentucky roads in the same functional class into a percentile. For example, a road section with a composite adequacy percentile of 75.0 means that 25% of the roads are rated better. Composite adequacy data is from the December 22, 2005 update.

By the year 2030, nearly an additional 44 percent of the KY 90 roadway length is expected to deteriorate to LOS C or D, resulting in almost 80 percent of the project length classified as LOS C. About 20 percent would be rated LOS D, with the majority located in the western half of Metcalfe County, and the balance in Burkesville. The intersecting roadway LOS's generally remain unchanged. Without implementing a roadway improvement project, the increasing traffic volume combined with the LOS decreasing to C and D would eventually cause regularly occurring peak hour congestion and its associated delays in accessing businesses, along with increased driver frustration and the likelihood for higher crash rates.

2.4 Crash Analysis

Safety along KY 90 in the project study area was analyzed using crash analysis. Crash analysis is an analysis tool for finding roadway sections with abnormally high crash rates and, therefore, sections with potentially correctable hazards to traffic safety. Historical crash data from the five-year period January 2000 – December 2004 was used to identify KY 90 study area roadway sections with abnormally high crash rates, thus indicating a possible need for safety improvements. Only crashes with a valid mile-point listing were considered in the analysis. Crash analysis procedures involve assigning reported crashes to roadway locations by mile-point. Crashes are normally classified by severity into one of three categories: fatal, injury, or property damage only (PDO). Then, the average crash rate for roadway sections of various lengths is determined. Generally, the analysis procedure includes analyzing the entire roadway length under study, followed by analyzing successively smaller roadway sections, especially those containing higher concentrations of crashes. Roadway sections are classified as either spots or segments depending on their length — sections less than 0.30 miles are classified as a spot location, and sections over 0.30 miles are classified as a segment. Roadway section crash rates were normalized for comparison by either hundred-million-vehicle-miles traveled (HMVM) for segments, or millions-of-vehicles (MV) for spots. Using the average crash rate, the critical crash rate is obtained from Kentucky Transportation Research Center's (KTRC) *Analysis of Traffic Crash Data in Kentucky (2000-2004)*. The critical crash rate is the maximum crash rate expected to occur on a roadway section, given the statewide average crash rate for that functional road class, the average daily traffic (ADT) volume, and the roadway section length. The ratio of these two rates (*i.e.*, the actual annual crash rate to the critical crash rate) produces a critical rate factor (CRF), or a measure of crash frequency for each segment or spot location. If the roadway section's actual crash rate exceeds the critical rate (*i.e.*, the CRF is greater than 1.0), then that section is classified as a high crash location. In other words, if the CRF exceeds 1.0, then that highway section has more crashes than is statistically probable based on random occurrence. If the CRF is between 0.90 and 1.0, then that section is considered a potentially high crash location, with the potential increasing as 1.0 is approached.

Table 3, *Crash Analysis Summary*, lists the high crash locations for the project area. Appendix C, KY 90 Crash Analysis, contains the detailed crash analysis for the entire length of KY 90 in the project study area. Exhibit 2, *Traffic and Crash Locations*, provides a graphic presentation of the crashes. Metcalfe County had a recorded 130 crashes along nearly 12 miles of KY 90, while Cumberland County recorded 107 crashes along 15 miles (237 total crashes). A visual examination of Exhibit 2 reveals that while crashes tend to occur throughout the project length, there are areas of concentration and relative absence of crashes. The section of KY 90 east of Beaumont and nearly to the Cumberland County line (previously mentioned as having a more favorable typical section) has comparatively few crash incidents. The largest number of crashes occurs west and east of Summer Shade, roughly from the Barren-Metcalfe County line to KY 163. Another concentrated area of crashes begins about the base of Burkesville Hill (*i.e.*, KY 2276) and extends to KY 61 in Burkesville. Only two high crash spot locations were identified, and both are located in Metcalfe County: one in the vicinity of KY 640 in Summer Shade; and the other is in the vicinity of the KY 90/KY 163 intersection. No potentially high crash locations were identified in Metcalfe or Cumberland Counties. Of the 237 crashes reported, 4 resulted in fatalities (3 in Metcalfe County, 1 in Cumberland County). None of the fatalities occurred at the two high crash locations.

Table 3 Crash Analysis Summary

Begin MP	End MP	Length (miles)	ADT (veh/day)	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
KY 90, Metcalfe County																		
0.000	**11.719**	**11.719**	**3,460**	**2**	**R**	**239.00**	**3**	**62**	**65**	**130**	**6.3145**	**0.740**	**4.05**	**83.78**	**87.84**	**175.68**	**285.97**	**0.61**
vicinity KY 640 in Summershade																		
2.100	2.400	0.300	4,680	2	R	0.72	0	2	12	14	8.541	0.026	0.00	0.23	1.40	1.64	1.53	**1.07**
2.200	2.500	0.300	4,680	2	R	0.72	0	2	11	13	8.541	0.026	0.00	0.23	1.29	1.52	1.53	**1.00**
2.300	2.600	0.300	4,680	2	R	0.72	0	9	9	18	8.541	0.026	0.00	1.05	1.05	2.11	1.53	**1.38**
vicinity KY 163																		
4.500	4.800	0.300	4,680	2	R	0.72	0	23	5	28	8.541	0.026	0.00	2.69	0.59	3.28	1.53	**2.15**
4.600	4.900	0.300	3,200	2	R	0.72	0	23	5	28	5.84	0.018	0.00	3.94	0.86	4.79	1.71	**2.80**
4.700	5.000	0.300	3,200	2	R	0.72	0	25	5	30	5.84	0.018	0.00	4.28	0.86	5.14	1.71	**3.00**
KY 90, Cumberland County																		
0.000	**15.000**	**15.000**	**3,760**	**2**	**R**	**239.00**	**1**	**48**	**58**	**107**	**6.862**	**1.029**	**0.97**	**46.63**	**56.35**	**103.95**	**278.74**	**0.37**

Source: KYTC Highway Information System (HIS). Research period is January 2000 to December 2004.

[1] Critical Rate Factors that are statistically high (i.e., equal to or greater than 1.00) are shaded.

The KY 90/KY 640 intersection in Summer Shade is a T-intersection, marked by route signs. The intersection has poor geometrics and restricted visibility. KY 640 connects to the north side of KY 90, with an open field directly to the south, a gas station occupying the entire northwest corner, and a church occupying the northeast corner. Immediately east of the church is a curve to the north, further restricting sight distance.

The KY 90/KY 163 intersection is a four-way intersection, with flashing overhead lights ("caution" for KY 90, and "stop" for KY 163), "stop" signs for KY 163 traffic, and left turn lanes for east and west bound KY 90 traffic. Northbound KY 163 drivers approach KY 90 uphill from rolling terrain, with the intersection essentially located on a hilltop with restricted visibility to the west. Southbound KY 163 approaches the intersection downhill following a curve. Eastbound KY 90 drivers approach the intersection after cresting a small hilltop immediately before the intersection, while westbound traffic approaches the intersection uphill.

Table 4, *Crash Type Statistics*, lists factors contributing to crashes on the KY 90 roadway by county in terms of percentage of all crashes. The two high crash locations in Metcalfe County are also presented. Exhibit 2, *Traffic and Crash Locations*, provides a graphic presentation of the crashes. To reflect current conditions as closely as possible, only the most recent data available (*i.e.*, from January 2000 through December 2004) was used in this analysis. These crash factors can be used in analyzing crash causes and indicating potential solutions. Examining Table 4 reveals the majority of crashes are occurring on dry roads, which tends to exclude weather conditions as a major contributing factor affecting the safety on KY 90 in the study area. Additionally, about 85 percent of crashes are occurring during daylight hours, which tends to reduce the importance of low light conditions as a contributing factor affecting safety.

Fixed object crashes are generally the most common type of crash reported on a county wide basis (Metcalfe County 35 percent, Cumberland County 30 percent), and typically involves a single vehicle impacting immobile objects such as a tree, utility pole, fence, guardrail, earth embankment or ditch, signpost, animal, etc. When crashes occurring at the two high crash locations (predominantly right-angle crashes) are factored out, then 50 percent of all crashes in Metcalfe County are fixed object crashes. Contributing factors to fixed object crashes include excessive speed for existing conditions, and poor highway geometrics.

Rear end crashes typically occur because of congestion and large differentials in travel speed (*e.g.*, stop and go driving; turning into/out of access drives or roads). These types of crashes are the most common in Cumberland County (32 percent), and the third most frequent in Metcalfe County (19 percent). However, it is the most frequent type at the KY 640 intersection near Summer Shade (41 percent), identified as a high crash location.

Right-angle crashes occur most frequently at intersections (*e.g.*, crossroads or driveways) due to right-of-way conflicts, or limited visibility and large speed differences. Right-angle crashes are the second most frequent crash type in Metcalfe County (23 percent), and the third most frequent in Cumberland County (14 percent). The KY 163 intersection in Metcalfe County exhibits the highest crash rate of all crash types in the study area, with 81 percent right-angle crashes. Comments from local citizens attributed the high crash rate to north- and southbound KY 163 drivers failing to yield the right-of-way to KY 90 traffic. KY 163 drivers mistakenly believe the intersection is a four-way stop, expect KY 90 traffic to stop, and subsequently enter the intersection into the traffic flow.

Sideswipe crashes in the study area tend to implicate roadway geometric issues are involved, with Metcalfe County having more "opposite direction" sideswipes (12 percent), and Cumberland County having more "same direction" sideswipe crashes (10 percent). Same direction sideswipe crashes are commonly due to drivers changing lanes without checking the adjacent lane for traffic, and mainly occur on multi-lane roadways in congested areas. Since the majority of the KY 90 roadway has only one-driving lane in each direction, other factors must be

considered. Cumberland County exhibits a higher percentage of head-on crashes than Metcalfe County (*i.e.*, 6 percent versus 2 percent, or about three times higher), and head-on crashes could be interpreted as a more severe type of opposite direction sideswipe crash. Contributing factors to both sideswipe crashes and head-on crashes can be attributed either to drivers failing to maintain control and staying within their driving lane, or to improper passing procedures. Both of these contributing factors can be heavily influenced by roadway geometrics (*e.g.*, sharp curves, steep hills, limited visibility, limited passing opportunities). As Table 2, *Geometric and Traffic Characteristics of Existing Highways*, indicates, both counties have significant sections of roadway where the passing sight distance is insufficient to provide safe passing opportunities.

The traffic crash analysis indicates two roadway sections in the project study area are experiencing high crash rates. Poor/restricted visibility, speed differentials between vehicles, traffic congestion, and limited passing opportunities — combined with a roadway not meeting current design standards — are the likely leading factors for crash rates on KY 90. This argument is supported by the documented poor visibility on these roadways (see Table 2). Any roadway improvement satisfying the project goal of improving visibility and roadway geometrics will, in turn, satisfy the goal of increasing the KY 90 roadway's safety.

Table 4 Crash Type Statistics

Begin MP	End MP	Length (miles)	Total Crashes	Crashes		Type of Crash							
				During Daylight Hours	On Dry Roadway	Right-Angle	Backing	Head On	Opposing Left Turn	Rear End	Sideswipe Opposite Direction	Sideswipe Same Direction	Fixed Object
KY 90, Metcalfe County													
0.000	**11.719**	**11.719**	**130**	**86%**	**79%**	**23%**	**1%**	**2%**	**0%**	**19%**	**12%**	**7%**	**35%**
vicinity KY 640 in Summer Shade													
2.10	2.60	0.50		86%	82%	32%	5%	0%	0%	41%	9%	0%	14%
vicinity KY 163													
4.5	5.0	0.50		88%	75%	81%	0%	6%	0%	6%	0%	0%	6%
KY 90, Cumberland County													
0.000	**15.000**	**15.000**	**107**	**84%**	**71%**	**14%**	**1%**	**6%**	**5%**	**32%**	**2%**	**10%**	**30%**

Source: KYTC Highway Information System (HIS). Research period January 2000 to December 2004

2.5 Environmental Overview

This environmental overview identifies KY 90 project study area issues likely to require consideration during this and future studies. It summarizes the results of several environmental investigations, based primarily upon literature, archival, known database, and map research. Limited amounts of fieldwork were conducted, consisting mainly of windshield surveys to confirm identified sites, and visually identify previously unknown sites. Additional information was collected through correspondence with other state and federal agencies. This environmental overview does not provide a detailed analysis and assessment of any potential impacts. The study area is about 26 miles long, and typically extends about 2,000-feet from each side of the existing KY 90 centerline, as indicated by the highlighted area on Exhibits 1 and 3. Refer to Exhibits 1 and 3 in Appendix A, and Appendix B, color photographs of existing KY 90, for the following environmental discussions concerning the study area.

2.5.1 Topography and Geology. Both counties are located in the Pennyrile physiographic region of the state, which is a Mississippian plateau with a large karst region. Elevation in the study area ranges from about 560 to 1,120 feet above mean sea level. Northwestern Metcalfe County contains karst topography with abundant sinkholes, while the study area is mostly a well-dissected, rolling to hilly upland plateau. Cumberland County shares the same dissected plateau characteristics, with the Grider-Waterview area somewhat less rugged with low rolling

hills. The area is underlain by consolidated sedimentary rocks of Ordovician (limestone), Devonian (black shale), and Mississippian (sandstone and siltstone) age, and from unconsolidated sediments of Quaternary age (along larger streams and rivers). The study area crosses two river basins. At the Metcalfe/Barren County line is the fairly small Skaggs Creek Watershed, which is part of the Barren River Watershed. To the east is the larger Marrowbone Creek Watershed, which is part of the Upper Cumberland River Basin. Physiographic patterns and relief are mostly dictated by the drainage patterns of the surface waters, and Marrowbone Creek is the dominant surface drainage waterway and a major tributary to the Cumberland River. Topography is generally rolling ridge tops and deep valleys, with relief ranging from very steep on the side slopes to flat in the floodplains. One known cave is in the study area – Harvey Cave, located northeast of the KY 90/KY163 intersection. Land use within the study area is predominantly undeveloped wooded and open land, agricultural, with widely scattered rural-residential dwellings and limited commercial uses outside the built-up areas.

Any roadway improvement could possibly encounter and impact one or more of these features. This is especially true for surface and ground water sources, and karst features. Any future project development and/or design studies will need to take these features into consideration.

2.5.2 Culturally Sensitive Locations. This preliminary study identified the following culturally sensitive locations in the study area: 7 cemeteries, 13 churches, and 1 hospital. Two public schools are located in the study area: the Summer Shade Elementary School, and Cumberland County-Burkesville Elementary School (near KY 61). The Cumberland County High and Middle Schools are located just northeast of, and outside, the study area boundaries. The Cumberland County Hospital is located on the south side of KY 90, near KY 61. Two public parks were identified: a small roadside park located at the western city limits of Marrowbone between KY 90 and Marrowbone Creek; and Bransetter Park, located in the southwest quadrant of the KY 90/KY 163 intersection. Branstetter Park is a community run, non-profit park established in 1926, located about 0.5 mile south of KY 90 on Old Trace Road. No recreational areas are located within the study area.

These culturally sensitive locations vary from having local community significance to possible regional significance with state and/or federal jurisdictional responsibilities. Any future roadway improvements proposed should thoroughly consider potential impacts to these resources.

2.5.3 Historic, Archaeological, and Cultural Resources. The study area contains one National Register of Historic Places (NRHP) listing — the Marrowbone Historic District (listed 1983) in Cumberland County. Researching State Historic Preservation Office (SHPO) files revealed hundreds of sites previously documented with survey forms throughout both counties, however only one NRHP listed site is within the study area. A windshield survey and preliminary assessment identified an additional 23 individual historic sites, and 6 districts (including 12 expansion contributing properties in the Marrowbone Historic District), which appear potentially eligible to meet NRHP criteria. The sites are generally located along the KY 90 roadway, with most of the sites in Cumberland County. The potentially eligible sites are on the following page, and identified on the exhibits as National Register Potential. (A number in parentheses indicates the county site number of a previously identified site.) Preliminary NRHP boundaries for individual sites and districts follow the property lines on record at the respective PVA offices.

An additional 19 sites were surveyed for documentation only (*i.e.*, no apparent NRHP potential; identified on the exhibits as Surveyed Historic Site). The study area historic site survey included buildings visible from public roads only; buildings or structures inaccessible due to locked gates or farm fields were not included in the survey. No buildings were inspected in detail. This preliminary assessment was based primarily on Criterion C, architecture. NRHP eligibility determination will require additional research, photography, physical examination, and evaluation relative to integrity standards established by similar properties in Metcalfe and Cumberland Counties, and consultation with the SHPO.

Individual Historic Sites **Historic Districts**

Metcalfe County

Site	Description
QQQ	Willow Shade Church of Christ (MC-123)

Site	Description
RRR	Beaumont Historic District (NRP)
Summer Shade Historic District (NRP):	
SSS	Tom Riggs House (MC-177)
TTT	Bowman House (MC-178)
UUU	Swope House (MC-179)
VVV	Perkins House (MC-180)
WWW	Black School (MC-181)
XXX	Barber-Toomey House (MC-176)
YYY	Commercial Building (MC-175)
ZZZ	Witty House Site (MC-172)
AAAA	Cumberland House
BBBB	Funeral Home
CCCC	Foursquare
DDDD	Medford Bowman House (MC-170)
EEEE	Knipp House (MC-171)
FFFF	Bowman Office (MC-172)
GGGG	Five Bay House (MC-183)
HHHH	Huffman School (MC-184)
IIII	Commercial Building (MC-173)
JJJJ	Commercial Building (MC-174)

Cumberland County

Site	Description
B	First Christian Church (CUB-6)
E	Alexander Talbott House (CUB-13)
G	Burkesville Methodist Church (CUB-15)
H	Allie Keen House (CUB-17)
I	Huddleston House (CUB-18)
L	Grundy Methodist Chapel (CUB-22)
N	Owsley House (CUB-27)
O	Winfrey House (CUB-29)
R	Alpine Motel and Restaurant
S	Curtis Farm (CU-110)
T	Les Dickens House (CU-111)
U	William Hurt Farm (CU-130)
X	Dewitt's Grocery
Z	Titus Allen House (CU-133)
AA	Jim Lewis House (CU-190)
BB	Allen Farm (CU-175)
PP	Ingram Alexander Farm (CU-144)
QQ	James Wade Farm (CU-152)
RR	Gerhart Farm (CU-153)
LLL	Marrowbone Baptist Church (CU-159)
MMM	Chism Farm (CU-161)
OOO	Anderson Grocery (CU-162)

Site	Description
A	Burkesville Public Square Historic District (NRP): Cumberland County Courthouse (CUB-1), Sam Smith Building (CUB-2), Sam Smith Building (CUB-3), Curtis Dry Goods (CUB-4), Parkway Hotel (CUB-8)
P	North Main Street Historic District (NRP) in Burkesville: Shepherd House (CUB-31), McGee-Norris Funeral Home (CUB-34), Coe House (CUB-35), First Baptist Church (CUB-32)
Waterview Historic District (NRP):	
CC	Cumberland and Presbyterian Church (CU-138)
DD	Triple Wall-Gabled House (CU-139)
EE	Joe Henry Alexander Farm (CU-145)
FF	Marrowbone Iron Bridge (CU-140)
HH	Giddian Alexander Farm (CU-147)
II	Waterview Church of Christ (CU-146)
JJ	J.O. Alexander (CU-149)
KK	Turner House and Store (CU-150)
Marrowbone Historic District (NR District CU-8-10) expansion contributing properties (NRP):	
TT	Marrowbone Colored School (CU-174)
UU	Marrowbone Methodist Church (CU-155)
VV	Cumberland Presbyterian Church
WW	Martha Norris Memorial High School (CU-180)
XX	Sidney Pace House (CU-167)
YY	Cornelia Davis House (CU-166)
ZZ	Nunn House (CU-173)
DDD	Gray and Son Grocery (CU-172)
EEE	Stover's Grocery (CU-171)
FFF	Masonic Lodge (CU-170)
GGG	Leon Garmon House (CU-165)
HHH	Sammy Graves Store

The archaeological overview revealed the study area to be largely uninvestigated, with relatively few sites in the two counties assessed for NRHP eligibility. The overview identified 7 previous professional archeological surveys conducted between 1951 and 2002, with 13 known archaeological sites within the study area. Nine of the known sites were considered not eligible for the NRHP, and 4 sites were not assessed. The precise locations and current conditions of the sites were not field-verified for this study; therefore, additional archaeological investigation will be needed if a site is impacted by roadway improvements. Many of the previous assessments were based only on surface surveys and informant data (*i.e.*, no shovel testing or deep testing conducted). Consequently, the NRHP assessment for some sites was not based upon currently accepted methods for evaluating site significance, and the NRHP eligibility should be considered as "not assessed." KY 90 improvements would not impact 7 of the 13 known sites. Of the remaining 6 archaeological sites, 4 are near the existing KY 90 roadway where: 2 of the sites were assessed as not potentially NR eligible using inadequate methods and are now considered to have the potential to contain significant buried archaeological deposits; and 2 sites are in upland settings and the NRHP eligibility has not been assessed. Existing KY 90 appears to cross the remaining 2 sites. One of those sites was originally considered not eligible for the NRHP after testing in 1983 using inadequate methods, and is now considered to have the potential to contain significant buried archaeological deposits. The other site was tested in 1985, and it was determined the portion impacted by KY 90 contained no significant deposits. The remainder of this site was not assessed for NR eligibility and is now considered to have the potential to contain significant buried archaeological deposits.

Because little data was available concerning archaeological site eligibility in Metcalfe and Cumberland Counties, soils were used to predict the likely locations of significant sites. Soil series areas mapped as Chagrin (Cg), Elk (EkA and EkB), Huntington (Hg and Hu), Lawerence (La), Newark (Nk), Robinsonville (Rf), and Sensabaugh (Se and SgB) are likely to have the greatest potential to contain significant prehistoric archaeological sites. These soils generally consist of fine-grained alluvial sediments located along floodplains and terraces. The greatest potential for buried archaeological deposits occurs in areas undisturbed through historic and modern land uses (*i.e.*, agricultural plowing, construction activities).

Historic mapping review indicated no published nineteenth or early twentieth century maps that included the study area. The only historic maps of the study area were Kentucky Department of Highways maps from the 1930s through 1950s. The highway maps provided little information concerning possible significant historic sites, which would contain significant archaeological deposits. The earliest county highway maps (1949 for Metcalfe, 1937 for Cumberland) were used to identify 57 possible historic sites (PHS), with most containing multiple structures, and 7 cemeteries. Some PHSs are co-located with known archaeological sites, or standing structures recorded with the Kentucky Heritage Council (KHC). A review of KHC files identified 115 historic structures and one historic district within the study area, with several co-located with known archaeological sites. The extent and significance of the PHS and historic structure locations cannot be determined without additional investigation.

If improvements to KY 90 are implemented which require an environmental document, then impacted study area portions should be subjected to a Phase I level archaeological investigation (*i.e.*, shovel test probe excavations in accessible areas) and a historic structure survey.

2.5.4 Aquatic Resources. Topographic maps of the study area indicate the presence of numerous blue-line streams, with several perennial (water always present) and intermittent (water present except in late summer and fall) streams. Up to 49 streams could be impacted by structures (bridges, culverts) or rechannelization. A windshield survey indicated numerous potential ephemeral streams (water present only during or immediately after precipitation events) present in both counties. Several headwater ephemeral streams may be present in ravines, particularly in Cumberland County.

Potential perennial and intermittent stream impacts include the following, listed by county:

Metcalfe County: Glover Creek, Marrowbone Creek including the tributaries of Flood Catcher Hollow, Jobe Branch, Stillhouse Branch, Hurt Hollow, Leamon Hollow, Anderson Hollow, Garman Branch, Sulphur Spring Hollow, Stillhouse Hollow, Slate Creek, Cave Branch, Branstetter Branch, and 8 unnamed tributaries.

Cumberland County: Marrowbone Creek, Leatherwood Creek, Humphrey Hollow Branch, Pitman Creek, Ferris Fork Creek, Clark Hollow Creek, Davis Hollow Branch, White Hollow Branch, Casey Fork Creek, Franklin Branch, German Branch, Dutch Creek, Allen Creek, Haggard Branch, and several other unnamed tributaries.

No aquatic macro-invertebrates, fishes, or water quality sampling was conducted. If KY 90 improvements are implemented, then all streams in the study area may be impacted by sedimentation resulting from roadway construction improvements. Soil from exposed and erodible surfaces may directly enter surface water, temporarily increasing turbidity levels. Surface and ground water may also experience temporary increases in specific conductance, suspended solids, and nutrients. Streams could experience a loss of riparian vegetation and habitat for aquatic species. Rechannelization could disturb stream flow and water quality.

Located along the study area are several streams being impacted by agricultural and residential uses such as: farm animal access to streams, field cultivation resulting in riparian vegetation loss, manure discharge into streams, and “straightline” pipe discharge from residential wastes.

Jurisdictional waters, as defined by the United States Army Corps of Engineers (USACE), are located within the study area. Potential ephemeral stream impacts will require assessment prior to submission of a permit packet to USACE. Section 404 and Section 401 permits may be required. On-site stream impact mitigation may require consideration for this project. Potential restoration, mitigation, and/or in-lieu fees (average $150-200 per linear foot of disturbance) may be required.

Kentucky Division of Water (KDOW) will require a non-point source pollution control plan, and an erosion control plan. Application of Kentucky Transportation Cabinet’s (KYTC) *Specific Specifications for Road and Bridge Construction* and the Federal Highway Administration’s (FHWA) *Best Management Practices for Erosion and Sediment Control* can be used to alleviate most sedimentation problems.

No nationally listed wild and scenic rivers are located within the study area. No other rivers or streams are listed on the Kentucky Wild River System. No “special use” designated waters are located within the study area.

The KDOW recently implemented a policy change and now regards the location of municipal water supplies and groundwater protection areas as classified information. Therefore, only a limited amount of information is available, which mainly originates from other public information sources. No wellhead protection areas are located within, or adjacent to, the study area. No outstanding resource waters were identified in the study area.

According to the Kentucky Geological Survey’s (KGS) Ground-Water Resources website (http://www.uky.edu/KGS/water/library/webintro.htm) and the Water Resource Development Commission reports on county water-supply infrastructure accessible through the KGS county reports, the following information is known. About seventy percent of Metcalfe County households have public treated water available to them. Edmonton Water Works services the study area length along KY 90, and purchases all its water from the Glasgow Water Company, which obtains its water from the Barren River Reservoir. In the southern third of Metcalfe County, few wells yield enough water for domestic use. The KGS Kentucky’s Water Wells

website (http://kgsmap.uky.edu/website/kgsgw/viewer.htm) indicated only one recorded domestic water well along KY 90 in Metcalfe County. Public treated water is provided to about ninety-four percent of Cumberland County's residents. Burkesville Water Works and Cumberland County Water District service the KY 90 study area, and all water is obtained from the Cumberland River. Wells will not produce enough water for domestic use in most of Cumberland County, except for a few in lowland areas bordering streams. The KGS Kentucky's Water Wells website indicated only two recorded domestic water wells along KY 90 in Cumberland County.

A limited amount of floodplain information is available for the study area. Flood Insurance Rate Maps (FIRM) developed by the Federal Emergency Management Agency (FEMA) were consulted for information regarding floodplains. According to the FEMA website, no published information is available for Metcalfe County; however, it is likely floodplain impacts would be similar to those in Cumberland County. All Cumberland County floodplain areas potentially affected are listed as 100-year flood areas with no special flood hazard areas determined (*i.e.*, Zone A areas, FIRM 210060 panels 0003 and 0004, effective date December 16, 1977). Potential floodplain encroachment impacts are general in nature, and include loss of riparian vegetation, disturbance of habitat, and the potential for increased sedimentation into the streams. Any construction in floodplains on new alignment would have greater impact than construction on existing alignment. In certain locations, improvements to the existing roadway could create floodplain concerns. Therefore, floodplain issues are possible with this project.

2.5.5 Wetlands and Ponds. National Wetland Inventory (NWI) map reconnaissance revealed 108 wetlands and ponds within the study area. Palustrine wetlands were the most common, and defined as wetlands: (1) less than 20 acres in size, (2) not dependent or affected by erosive natures of wind and water, (3) water depth less than 2 meters at low water, and (4) salinity less than 0.5%. Typical palustrine wetlands include small, shallow, permanent or intermittent ponds. Palustrine wetlands in the study area are permanently flooded, and diked, excavated, or impounded in some manner.

Riverine wetlands, the second most numerous on the NWI maps, are defined as wetlands and deepwater habitats contained within a channel that is bounded by upland, a channel bank (natural or man-made), or an adjacent wetland dominated by trees, shrubs, and persistent emergent vegetation. A riverine wetland will usually have flowing water, but it is not a requirement. The riverine wetlands are permanently, semi-permanently, or temporarily flooded. One forested wetland was identified using the NWI map system.

No field investigations were conducted, nor a determination of size, jurisdictional, or non-jurisdictional wetland made. Farm ponds may be considered jurisdictional if they have a surface connection to a surface tributary. More intensive field surveys would be required to confirm and delineate NWI map wetlands, as well as identify any wetlands not appearing on the maps, and determine jurisdictional status.

Wetlands should be avoided if possible, or impacts minimized, during project development. If wetlands cannot be avoided and mitigation is required, then an evaluation of potential locations for on-site, in-kind mitigation should be considered. If on-site mitigation cannot be accomplished, then consider using a wetland bank for mitigation. According to KYTC District 8, impacts in the Marrowbone Creek Watershed (Upper Cumberland River Basin) can be mitigated at the Wayne County Wetland Restoration Site near the Betsy community in Wayne County. The KYTC is in the process of acquiring a Butler County parcel (Exel Clark) that will function as a mitigation bank for all of the Green River Basin.

A specific roadway design is needed before the type of USACE permit required (*i.e.*, Nationwide or Individual) can be determined. The *Nationwide Permit 14, Linear Transportation Crossings,* (NP 14) only authorizes activities with minimal adverse effects on the aquatic environment. An

Individual Permit (IP) is required if the stream impact is greater than 0.5 acres, or the wetland impact is greater than 0.1 acres; and must include a compensatory mitigation proposal.

The KDOW will probably require a Kentucky Pollutant Discharge Elimination System (KPDES) General Stormwater Permit, a Floodplain Construction Permit if filling within the one-hundred-year floodplain, and a Water Quality Certification.

2.5.6 Terrestrial Resources. The plant and animal life is considered typical for the area with no unique populations present.

2.5.7 Threatened and Endangered Species. In accordance with the provisions of the Fish and Wildlife Coordination Act, and the Endangered Species Act, coordination was made with the appropriate state and federal agencies (see Section 3.4, Resource Agency Coordination, and Appendix H). The following government agency website databases were researched to identify protected species potentially present in the study area: the US Fish and Wildlife Service (USFWS) for lists of federally protected species potentially affected by the project; the Kentucky Department of Fish and Wildlife Resources (KDFWR) to identify threatened or endangered species known to occur in the project vicinity; and the Kentucky State Nature Preserves Commission (KSNPC) for important elements and natural areas in the project vicinity. Table 5, *Protected Species in the Study Area*, lists the protected species identified by the federal and state agencies as potentially occurring in the study area. Database research identified fourteen endangered, threatened, or candidate species. Only one species (gray bat) occurs in Metcalfe County. The bald eagle was identified as threatened, but also noted it was recommended for delisting. All other species are aquatic, consisting of one fish and 11 mussel species.

Only those species with a known historic occurrence within the study area are cited. More detailed field surveys are required to confirm the presence of protected species in the study area, determine the presence or absence of suitable habitat for the species, and ascertain any potential impacts and mitigation requirements. Surveys must be conducted by a qualified biologist who holds the appropriate collection permits. Surveys would not be necessary if sufficient site-specific information was available demonstrating: (1) no potentially suitable habitat exists within the study area or its vicinity; or (2) the species would not be present in the study area or its vicinity due to site-specific factors.

Table 5 Protected Species in Study Area

Common Name	Scientific Name	Federal Status[1]	State Status[1]	County
Vascular Plants				
none				
Insects				
none				
Birds				
bald eagle	*Haliaeetus leucocepalus*	T (PDL)	T	Cumberland
Mammals				
gray bat	*Myotis grisescens*	E	T	Metcalfe
Freshwater Mussels				
purple catspaw pearlymussel	*Epioblasma o. obliquata*	E	E	Cumberland
Cumberland bean pearlymussel	*Villosa trabilis*	E	E	Cumberland
fanshell	*Cyprogenia stegaria*	E	E	Cumberland
oyster mussel	*Epioblasma capsaeiformis*	E	E	Cumberland
Cumberlandian combshell	*Epioblasma brevidens*	E	E	Cumberland
pink mucket	*Lampsilis abrupta*	E	E	Cumberland
ring pink	*Obovaria retusa*	E	E	Cumberland
orangefoot pimpleback	*Plethobasus cooperianus*	E	E	Cumberland
rough pigtoe	*Pleurobema plenum*	E	E	Cumberland
spectaclecase	*Cumberlandia monodonta*	C	E	Cumberland
sheepnose	*Plethobasus cyphyus*	C	E	Cumberland
Fishes				
palezone shiner	*Notropis albizonatus*	E	E	Cumberland

[1] Status: E=endangered; T=threatened; C=candidate; PDL=proposed for delisting.

2.5.8 Managed Land Areas. Managed land areas are under governmental or private regulatory control, typically to encourage environmental protection or resource procurement. No nature preserves, wildlife management areas, state or national forests are located within the study area. No state agricultural districts are located in or near the study area in Metcalfe or Cumberland Counties.

2.5.9 Farmlands. The respective Metcalfe and Cumberland County Natural Resources Conservation Service offices (NRCS) provided the available soil survey maps, and identified farmland, encompassing the study area. Both counties have published United States Department of Agriculture (USDA) Soil Survey maps: Metcalfe in 1967, and Cumberland in 1998.

Metcalfe County has a land area of about 291 square miles (186,175 acres), with 131,990 acres in farms (2002 Agricultural Census, down 2 percent from 1997). Major crops include: pasture (forage and hay), corn, tobacco, and soybeans. According to a color-coded map of *Important Farmland* (dated March 1984) provided by the Metcalfe NRCS, prime farmland totals about 55,500 acres, while statewide importance farmland totals about 38,500 acres. No unique or local importance farmland was reported. Metcalfe County as a whole has about 30 percent of its soil classified as prime farmland, with most of it in the northern and central parts of the county. In the county's southern half (where the study area is located), prime farmland is generally located around the river and creek valleys, and in other valleys. Statewide importance farmland accounts for about 21 percent of the soil, and most of it is in the northern and central parts of the county. Virtually the entire length of existing KY 90 in Metcalfe County crosses prime or statewide important farmland. The Metcalfe County Soil Survey contained a color coded

General Soil Map (dated October 1965), which indicates KY 90 traverses the two soil associations briefly described below.

- Baxter-Crider-Clarksville Association. This association composes about 61 percent of the county, occupying most of the central and western parts. It is characterized by nearly level to moderate steep, well-drained soils, mainly cherty, that formed in material weathered from limestone. This association is present along KY 90 from the Barren County line to just east of Beaumont.

- Dandridge-Westmoreland-Christian Association. This association composes about 20 percent of the county, occupying the southern part. It is characterized by mainly steep or very steep, somewhat excessively drained, shaley, highly dissected, shallow soils on side slopes and very narrow ridgetops. This association is present along KY 90 from just east of Beaumont to the Cumberland County line.

Cumberland County has a total area of about 311 square miles (198,892 acres; includes water area of 4,070 acres), with 89,389 acres in farms (2002 Agricultural Census, down 19 percent from 1997). Major crops include: pasture (forage and hay), corn, soybeans, and tobacco.

According to information provided by the Cumberland NRCS, prime farmland totals about 24,622 acres, while statewide importance farmland totals about 17,850 acres. No unique or local importance farmland was reported. Cumberland County as a whole has about 12.6 percent of its soil classified as prime farmland, generally located around the river and creek valleys, and in other valleys. Statewide importance farmland accounts for about 9.2 percent of the soil. Since KY 90 tends to follow the Marrowbone Creek valley, virtually the entire length of KY 90 in Cumberland County crosses prime or statewide important farmland.

The Cumberland County Soil Survey contained a color coded *General Soil Map* (compiled 1991), which indicates KY 90 traverses the four soil associations briefly described below in order of area crossed.

- Renox-Chagrin-Sensabaugh Association. This association composes about 9 percent of the county, and is scattered throughout the county, generally along tributaries to the Cumberland River. It is characterized by nearly level to very steep, very deep, well-drained soils on flood plains, alluvial fans, foot slopes, and terraces. This association is present along KY 90 from the Metcalfe County line to just west of Burkesville, along Marrowbone Creek and its tributaries.

- Garmon-Newbern-Carpenter Association. This association composes about 58 percent of the county, and is scattered throughout the county. It is characterized by gently sloping to very steep, very deep to shallow, well-drained to excessively well-drained soils on dissected uplands. This association is crossed by KY 90 west of Burkesville.

- Cynthiana-Faywood-Renox-Lowell Association. This association composes about 8 percent of the county, located in the west-central part of the county. It is characterized by gently sloping to very steep, very deep to shallow, well-drained to excessively well-drained soils on dissected uplands. This association is present along or near the central section of KY 90.

- Holston-Monongahela-Waynesboro Association. This association composes about 4 percent of the county, located along the Cumberland River. It is characterized by nearly level to steep, very deep, well-drained or moderately drained soils on flood plains, terraces, and the banks of the Cumberland River. This association is present along KY 90 in the vicinity of Burkesville near the KY 61 intersection.

Because prime farmland generally possesses the same qualities and characteristics desired for the construction of roadways and buildings, it is habitually the preferred construction site. Given the study area's topography, farmland and the existing KY 90 roadway frequently coincide. However, some of the prime and statewide important farmland's value has already been compromised due to residential and commercial development, and roadway construction.

2.5.10 Hazardous Materials Concerns. Land use in the study area is predominantly agricultural, with residential development and some commercial facilities scattered throughout, but concentrated in the urban areas. Relevant data was collected from numerous sources, including federal and state databases, and a windshield survey of the study area. The database search and survey identified 18 possible contamination sites (see Table 6, *Possible Contamination Sites*). Most of these sites involve fuel distribution and/or vehicle/equipment maintenance facilities, and have similar potential contamination concerns (*e.g.*, underground storage tanks (USTs), fuel spills/leaks, soil contamination, waste petroleum products, heavy metals, solvents, corrosives, batteries, tires, 55-gallon drums, miscellaneous debris piles, repair parts, abandoned equipment/vehicles, etc.). Other sources of potential contamination concerns include: pole-mounted electrical transformers (PCBs), aboveground storage tanks (ASTs), and pesticide/herbicide/rodenticide use on farms. Structures with suspected asbestos containing building materials (ACBM) were also observed. Construction activities in and near these sites will require further investigations to determine the risk and extent of any contamination, and may require special procedures and permits.

2.5.11 Air Quality. Metcalfe and Cumberland Counties are located within the South Central Kentucky Intrastate Air Quality Control Region. The study area is designated as an Attainment Area for all transportation-related pollutants, as per the 1990 Clean Air Act Amendments, and transportation control measures would not be required for the project. The project is not expected to adversely impact air quality in the region.

2.5.12 Traffic Noise. The study area land use is mixed, mostly rural in nature, with a more urbanized area at the eastern end. The study area contains clusters of residences, several churches and cemeteries, and small businesses. These land uses almost invariably have direct driveway access to KY 90. The highest potential for noise impacts to properties stems from potential additional right-of-way needs. Properties/residences somewhat removed from the roadway are not anticipated to be adversely affected by traffic noise, and noise impacts could be minimized by the sparse development pattern in the area. It is usually unreasonable to construct noise barriers for single, widely spaced residences, and the need to maintain road access would render any noise barriers ineffective.

2.5.13 Other Concerns. Representatives of the Cumberland County Water District stated water lines generally parallel the south side of KY 90 through Cumberland County. Two water storage tanks are located within the study area: one tank located on a hill top in the southwest quadrant of the KY 90/KY 163 intersection; and one located on a hilltop just north of Marrowbone.

KY 90 within the study area is not associated with any scenic byway or bike route system. However, west of Glasgow and east of Burkesville, KY 90 is part of the scenic byway system. KY 163 north of KY 90 is a scenic byway. KY 61 through Burkesville is part of the Central Heartlands Tour state bicycle route.

One cave is known to be located in study area: Harvey Cave, located northeast of the KY 90/KY163 intersection.

Table 6 Possible Contamination Sites

Site Number	Site Name or Description	Suspected Contaminant or Area of Concern
1	Ed's Express, Inc., 2241 Summer Shade Rd	Possible soil contamination from UST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
2	Summer Shade Service, Hwy 90 E	Possible soil contamination from UST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
3	Big Meadow Oil Co., 2340 Summer Shade Rd	Possible soil contamination from gasoline spills.
4	Oil Well, Summer Shade Rd	Possible heavy metal, volatile organic compound, and semi-volatile organic compound contamination in soils.
5	Electric Substation, Summer Shade Rd	Possible soil contamination from petroleum products and PCBs from electrical equipment.
6	Traveler's Food Plaza #9, 4770 Summer Shade Rd	Auto repair facility with ASTs, waste oils, used tire stockpiles, batteries, oils, greases and other petroleum products, solvents, corrosives, possible PCBs in older model hydraulic lifts, junk and waste stockpiling, multiple 55-gallon drums with unknown contents, and numerous stored salvage vehicles. Possible soil contamination from on-site operations in the form of volatile organic compounds, semi-volatile organic compounds, heavy metals, and drum contents.
7	Kingsford Manufacturing, 5126 Summer Shade Rd	Possible contamination stemming from fire at the facility.
8	Smith's Grocery, 5501 Summer Shade Rd	Former UST site. Possible soil contamination from heavy metals, volatile organic compounds, and semi-volatile organic compounds.
9	Willow Shade Trading Post, 9517 Summer Shade Rd	Former leaking UST site. Possible soil contamination from heavy metals, volatile organic compounds, and semi-volatile organic compounds.
10	Quik Mart, Glasgow Rd	Possible soil contamination from AST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
11	Marathon Gas Station, Glasgow Rd	Possible soil contamination from AST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
12	Hunley Gas Co., Glasgow Rd	Possible soil contamination from AST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
13	Former Auto Repair Garage, Glasgow Rd	Lacquers, paints, varnishes, solvents, corrosives, combustibles/ flammables, oils, greases, and possibly a variety of other hazardous material storage in the on-site structure interior.
14	Aboveground Storage Tanks, Glasgow Rd	Possible soil contamination from AST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
15	Sewell & Co., 6443 Glasgow Rd	Possible soil contamination from AST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds. Former leaking UST site.
16	Hewitt's Grocery, 4278 Glasgow Rd	Former UST site. Possible soil contamination from heavy metals, volatile organic compounds, and semi-volatile organic compounds.
17	Cumberland Co. Hospital, 299 Glasgow Rd	Possible soil contamination from UST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
18	Cumberland Kwik Stop, 211 Glasgow Rd	Possible soil contamination from UST systems usage in the form of heavy metals, volatile organic compounds, and semi-volatile organic compounds.
Not Mapped*	Power Pole Mounted Electrical Transformers	Polychlorinated Biphenyls (PCB's)
Not Mapped*	Farming Operations	Petroleum products, pesticides, and herbicides
Not Mapped*	Aboveground Storage Tanks (ASTs)	Heating fuel oils, gasoline, and liquid propane
Not Mapped*	Residential Dwellings and Commercial Buildings	Asbestos Containing Building Material (ACBM)

* Sites are found at various locations within the study area.

2.6 Environmental Justice and Community Impacts

The purpose of an environmental justice report is to identify geographic areas containing disproportionately high concentrations of minority, low-income, or elderly households. *Environmental Justice Executive Order 12898: Federal Actions to Address Environmental Justices in Minority Populations and Low-Income Populations* (signed February 11, 1994), directed federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects on minority and low-income populations.

The Lake Cumberland Area Development District (LCADD) prepared the *KY 90 Corridor Study Environmental Justice Review*, July 2006, and its related issues/concerns. The Environmental Justice Review was based upon US Census Bureau 2000 Census data, field observations, local officials/leaders meetings, and interviews. It focused on portions of the community that could be considered minority, low-income, and elderly (age 65 years and older) population areas, and made efforts to identify any high concentrations of a specific population. The review examined 2000 Census data at the Census Tract, Block Group, and Block levels, comparing national, state, and county averages. The environmental justice review concluded that several minority, low-income, and elderly population concentrations may exist in the study area; however, disproportionate impacts from KY 90 improvements were not anticipated. The environmental justice review recommended performing a subsequent data review after preferred alternatives/alignments are selected to identify specific populations in the project area; and, if any, take steps to insure they are not disproportionately affected by the project. The complete review is in Appendix I.

In general, minority populations in the study area were comparable to, or less than, county and state averages, with one notable exception. One minority population was several times the county average, however it was completely contained within the city limits of Burkesville where improvements to existing KY 90 were considered to have no adverse impacts. Poverty levels throughout Metcalfe and Cumberland Counties tend to be higher than both state and federal averages; therefore it is likely that implementing the improvement project would encounter impoverished populations. Several surrounding counties in this particular portion of southern Kentucky have comparable poverty rates, and the area is often characterized as economically distressed due to high unemployment rates and the unavailability of quality employment opportunities. Local leaders and community members view KY 90 corridor improvements as potentially beneficial for economic growth and development. The elderly population in both counties is generally slightly higher than the state average. The highest concentration occurred in an area adjacent to the study area, and contained a nursing home, which skewed the results. Implementation of the project is not anticipated to have a disproportionate effect on the population aged 65 and over.

2.7 Geotechnical Overview

The KYTC Division of Structural Design, Geotechnical Branch, and the University of Kentucky, Kentucky Geological Survey, provided summary reports of geologic concerns for the study area (see Appendix G).

The Geotechnical Branch report indicates the study area is underlain by alluvium and bedrock of the St Louis Limestone, Salem and Warsaw Limestone, Fort Pain Formation, Chattanooga Shale, Brassfield Dolomite, Cumberland Formation, and Leipers Limestone. Alluvium is along the major streams, at depths of 0-60 feet, and consists of clay, silt, sand, and gravel. Structures constructed along Marrowbone Creek and Cumberland River may require deep foundations. Concern was expressed about the unsuitability of some shaley layers for road aggregate because of their properties to expand when wet and breakdown. Chattanooga Shale can produce acid runoff conditions when exposed to water and air. Karst features such as caves and sinkholes may be encountered, with sinkholes common in the St Louis Limestone, and Salem and Warsaw Limestone. No faulted areas were noted. The study area was considered to have a low potential for liquefaction or slope failure in the unconsolidated sediments at or near streams by bedrock ground motion.

3.0 CABINET, AGENCY, AND PUBLIC INPUT

3.1 Project Team Meetings

The KY 90 pre-design scoping study project team met three times during the course of the study. Each meeting was documented with meeting minutes (see Appendix D). A brief summary of the major topics discussed at each meeting follows:

1. July 17, 2003, at KYTC District 8. This was the team's kick-off meeting where members were introduced, the type of study discussed, and the study's scope and schedule reviewed. Major topics of discussion included: the existing conditions; issues, problems, needs, and goals; alternative development and locations suggested for spot improvement consideration; and a review/discussion of other current, scheduled, and proposed projects near the KY 90 study area. Additional topics addressed included data collection, local officials and stakeholders meetings, and resource agency coordination.

2. April 17, 2006, at KYTC District 8. This was the first team meeting held under the new project item number, 08-136.00. The project was reviewed in terms of the expanded scope of work/project termini. Team members reviewed the environmental footprint/overview, existing highway conditions and crash statistics, public meeting comments summary, draft project goals, and the preliminary improvement alternatives. Exercises were conducted to identify team member's improvement alternative preferences and priorities.

3. October 17, 2006, at KYTC District 8. The project team reviewed the status of the study, the project goals, new information received since the last meeting (environmental justice report and resource agency coordination), and the initial set of improvement opportunities developed. The project team thoroughly discussed and evaluated the relative merits of each improvement opportunity in terms of project goals, safety, traffic volumes, passing opportunities, estimated construction costs, and local knowledge. The discussion and evaluation resulted in some modifications to the original list of improvement opportunities to better satisfy the project goals. The identified improvements were subsequently grouped by type, and the longer-term improvements prioritized. A list of recommended KY 90 improvements was developed and agreed upon. (see Section 6.0)

3.2 Local Officials / Stakeholders Meetings

Local officials (morning session) and stakeholders (afternoon session) meetings were held August 28, 2003, at the Burkesville Fire Department Training Center. Each group's written comments on issues/problems/needs closely paralleled those previously identified by the project team. Roadway geometrics and safety were at the top of each group's list. Each group also identified possible locations for spot improvement consideration. Minimizing impacts to potential historic districts and the Amish community were prime concerns. The meetings were documented with meeting minutes (see Appendix E).

3.3 Public Information Meetings.

Public information meetings were held February 28, 2006, at the Summer Shade Elementary School, and March 2, 2006, at the Cumberland County Middle School. Two hundred and two (202) people attended the meetings (106 at Summer Shade, 96 at Burkesville), and 28 comment forms were submitted, representing 37 people. No oral comments were received. The meetings were conducted to inform the public of the proposed KY 90 improvement project, and to receive their input/comments concerning issues to consider and problems to correct. No improvement alternatives were presented, however areas identified for potential improvement were indicated on the display maps.

Attendees were generally supportive of the project and agreed upon its necessity. Areas the public identified for improvement generally corresponded to those already identified by the project team, including some potential bypasses. Public concerns, expressed either through discussions with project team members or submitted in writing, generally fell into the following common themes: narrow driving lanes and no shoulders; an excessive number of speeding trucks and cars, especially through the towns and other reduced speed areas; large volumes of commercial truck and recreational vehicle traffic; limited opportunities to pass slower vehicles, and when passing is permitted then on-coming traffic frequently prevents the attempt. Poultry trucks were frequently mentioned for speeding, volume, and crash or spillage involvement. Most referred to a need for passing lanes as a remedy for congestion due to slower vehicles (*i.e.*, trucks, recreational vehicles and trailers), and to reduce the amount of improper and risky passing maneuvers. Others claimed a four-lane, divided highway was needed. Comments were received both favoring and opposed to bypassing the towns. Those favoring a bypass primarily envisioned it as a means of removing speeding vehicles and trucks from the town streets, and also maintaining traffic flow at a higher speed. Those opposed were concerned about potential adverse impacts to business establishments. There was a general consensus that any improvements to KY 90 would improve safety and traffic flow, improve local economies, and make it easier to attract businesses to the area.

See Appendix F for the public information meeting comments summary. The Public Involvement Summary Notebook is on file with KYTC.

3.4 Resource Agency Coordination

Appropriate state and federal resource agencies were identified and contacted for their concerns associated with the study area and KY 90 improvements. KYTC sent letters to about 100 agencies and organizations requesting their input and comments on this Pre-Design Scoping Study in order to address their concerns early in the project development process. The 24 agencies responding to the request for input and comments are listed below, along with a brief summary of their comments. See Appendix H for their complete response.

US Army Corps of Engineers, Louisville District: No comments on the general environmental impacts of the project. Agency "not funded or authorized to provide general environmental assessments for all federally related development proposals". Project may impact following waterways under USACE jurisdiction: Marrowbone Creek, Unnamed tributaries of Marrowbone Creek, Ferris Fork Creek, Casey Fork, Dutch Creek, Unnamed tributary of Dutch Creek, Allen Creek, Baggard Branch, and Unnamed tributaries of Baggard Branch. No current or future plans to develop the waterways. No known wetland mapping of the study area. If wetland impacts could occur by the discharge of dredged or fill material, then a wetlands delineation report must be submitted. If project would impact "waters of the United States," including jurisdictional wetlands, then submit a permit application.

US Army Corps of Engineers, Nashville District: Expressed concerns about potential impacts to wetlands and surface waters. Identified Marrowbone Creek as a Kentucky classified Outstanding Resource Water, and encouraged avoiding impacts to the stream and major tributaries[1]. No navigable waters of the United States in the study area. Briefly discussed permit requirements, applicable regulations, and some construction options to avoid/minimize impacts to wetlands and streams.

USDA, Natural Resources Conservation Service: Concerned with the potential impacts to prime and statewide important farmlands. If federal dollars used, submit form AD-1006.

US Department of Health and Human Services: Response provided on their behalf by the Center for Disease Control and Prevention, which had no project specific comments. Provided a list of health topics to consider during the NEPA, and draft and final EIS process.

[1] Kentucky Division of Water website for Special Use Waters does not list Marrowbone Creek as an Outstanding State Resource Water, nor is it listed under any other Special Use Water categories.

US Department of Housing and Urban Development: No issues or concerns affecting project development.

Kentucky Geological Survey, University of Kentucky: Letter summarized geologic characteristics and concerns for the study area. Karst features possible (*e.g.*, sinkholes, caves). No faulted areas, or units prone to landslides. Unconsolidated sediments present. Resource conflicts possible, such as prior ownership of property for quarrying or mining. Pipeline crossing by Stillhouse Branch and Marrowbone Creek. Probable peak ground acceleration due to earthquake ground motion of 0.09g.

KY Commerce Cabinet: The project will not directly impact any of their facilities.

KY Justice and Public Safety Cabinet, Vehicle Enforcement: No issues with the project. "In fact, it appears the [improved] road would…help accommodate the large volume of truck traffic."

KY Cabinet for Health and Family Services: Comments concerned considering impacts to existing septic systems and drainage.

KY Department of Agriculture: Project has no impact on agricultural operations.

KY Department of Fish & Wildlife Resources: State and federal threatened or endangered species are known to occur within close proximity to the project area. Included a list of potentially impacted species, and recommendations concerning several bat species. Provided several recommendations and guidance concerning minimizing wetland and aquatic impacts. Minimum 2:1 mitigation ratio for any permanent loss or degradation of wetland habitats.

KYTC Division of Environmental Analysis, Historic Preservation: Recommended a full baseline for the report, and re-evaluation for eligibility of known sites. Area between Burkesville and Marrowbone part of John Hunt Morgan's last raid, and the Morgan Trail was recently established. Historic structures may be located near project that were not previously identified.

KYTC Division of Environmental Analysis, Archaeology: Little archaeological survey work conducted in study area. No sites evaluated for national register eligibility. No NRHP listed sites. Native American prehistoric sites can be expected within study area, likely located in alluvial areas and rock shelters. Other historic sites possible. Potential for significant sites exists. Identified archaeological concerns/comments for many of the spot improvements. Archaeological work likely required if project proceeds to design.

KYTC Division of Structural Design, Geotechnical Branch: Provided an office review and geological map of the study area, which was summarized in section 2.7.

KY Division of Conservation: No agricultural districts or agricultural conservation easements established in study area. Expressed concerns on minimizing farmland land loss, and using BMPs to minimize soil erosion and sedimentation.

KY Division of Forestry: Most road improvements will have minimal impact to the existing forested areas (generally small forests, or wooded fence rows), and all forested areas consist of common trees for the area. Marrowbone Bypass will have the greatest timberland impact, however the timber is typical for the area and fragmentation is not a concern. Burkesville Bypass will affect hillsides that are very steep and suitable for little else than timber.

KY Division for Mine Reclamation and Enforcement: Active limestone quarry operating about 0.5-mile south of Grider. No abandoned or active underground mines within study area.

KY Division for Air Quality: The following regulations apply: 401 KAR 63:010, Fugitive Emissions; 401 KAR 63:005, Open Burning; Clean Air Act as amended, and transportation planning provisions of Title 23 and Title 49, United States Code. Compliance with local government regulations may also apply.

Kentucky State Police, Post 15 Columbia: Identified several problem locations and/or provided recommendations for spot improvements based upon comments from troopers patrolling KY 90 in study area.

Kentucky Airport Zoning Commission: Proposed project will have no adverse effect on air navigation. If any structure or construction equipment exceeds 200-feet above ground level, then a permit is required.

Kentucky State Nature Preserves Commission: Issues concerning Gray bat and several aquatic species (mussel and fish) may need to be addressed. Most can likely be mitigated by using strict erosion, sediment, and stream crossing control measures.

Metcalfe County Tourism, Cathy Nunn, Director: "...project would be an asset to the community…." "…could lead to economic growth for our county."

Cumberland County Judge Executive, Tim Hicks, submitted by Eugenia Ferguson, Deputy Judge Executive: Stated a "heavily traveled highway," and expressed concern about the volume of large trucks and recreational vehicles on KY 90. Requested project team consider improvements to Burkesville Hill, citing large amount of accidents and many deaths.

Burkesville Police Department, Stevie Wheat, Chief of Police: Requested project team consider improvements to Burkesville Hill, citing large number of accidents and fatalities.

4.0 STATEMENT OF PROJECT GOALS

Based upon a consideration of the identified corridor issues, input from local officials, citizens, and resource agencies, and an evaluation of existing and forecasted highway conditions, the project study team generated the following project goals:

- *Improve safety along the KY 90 corridor.*
- *Provide a facility meeting current design standards, capable of serving recent growth, and sustaining current and projected traffic demands.*
- *Improve roadway geometrics to accommodate recreational vehicles and commercial trucks, including possible passing and climbing lanes.*
- *Minimize/avoid impacts to potential historic districts.*
- *Minimize/avoid impacts to communities.*
- *Provide roadway improvements between the Barren County line and Burkesville (KY 61) to compliment the planned Barren County improvements.*
- *Improve accessibility for local people seeking access to the recreational, employment, educational, and health care opportunities in south central Kentucky.*

The rationalization for identifying and selecting these project goals are addressed below by individual project goal. Justification reasons are only briefly explained, since they are supported by information and documentation previously discussed in this study.

Improve safety along the KY 90 corridor.
Safety concerns emerged as the key project issue among those familiar with the roadway, and some resource agencies. Common KY 90 sub-standard characteristics include: narrow driving lanes, narrow to almost non-existent shoulders, sharp curves, steep grades, restricted visibilities, direct driveway access, and crossroads positioned at locations with horizontal and/or vertical deficiencies. Only two high crash locations were identified (one should be corrected through another KYTC scheduled project). Most crashes occur during daylight hours, on dry roadways, and involve a single vehicle impacting a fixed object. Other common crash types included: rear end, right angle, and sideswipe. These types of crashes are typically caused by a combination of factors such as: poor highway geometrics, excessive speed for conditions, restricted visibility, large travel speed differences between vehicles, and improper passing procedures. The existing sub-standard highway geometrics play a significant role in drivers failing to maintain control of their vehicles. Additionally, the heavy bi-directional traffic volume, especially trucks and recreational vehicles, together with the poor highway geometrics, combine to provide few opportunities to pass slower moving vehicles. Frustrated and impatient drivers sometimes exercise improper and risky passing maneuvers, thereby creating new safety hazards. Reduced congestion would result in improved driver safety.

Provide a facility meeting current design standards, capable of serving recent growth, and sustaining current and projected traffic demands.
The existing facility does not meet current design standards. KY 90 is typically a two-lane rural roadway winding through the natural terrain of valleys and hills. It has narrow driving lanes, narrow to virtually no shoulders (sometimes with sharp height differences between the roadway and shoulder; and/or a soft substrate; or shoulders that fall off steeply from the road bed), and poor vertical and horizontal geometrics with reduced speed curves, steep grades, and deep rock cuts. The driver's sight distance is frequently limited or obstructed by terrain features such as hills and curves, and other restrictions. The existing LOS is B and C, with most of the LOS B roadway located between Beaumont and the Metcalfe-Cumberland County line. The KY 90 study area, and the area immediately surrounding it, has experienced limited to modest growth and development in recent years in terms of residences and commercial business. However, commercial/light industry development and tourism/recreational activity outside the study area

has grown considerably, and KY 90 is the conduit to those activity centers. Traffic forecasts indicate traffic will increase about 95 percent on KY 90 by 2030, reducing the LOS to C and D.

Improve roadway geometrics to accommodate recreational vehicles and commercial trucks, including possible passing and climbing lanes.
KY 90 carries about 16-19 percent commercial truck traffic, plus a significant amount of recreational vehicles (*i.e.*, boats, camper trailers) enroute to the state parks and lakes. KY 90 traffic flow is restricted by narrow lanes, low speed limits through the small towns, sharp curves, steep grades, restricted sight distances, and limited opportunities to pass slower vehicles. Even though most of KY 90 has a posted speed limit of 55-mph, the existing roadway geometrics can require frequent speed reductions and hamper traffic movement. The highway's steep grades and sharp curves cause trucks and other large vehicles to repeatedly reduce their travel speed and prevent them from driving 55-mph. Passenger vehicles meeting an approaching large, wide-bodied truck on the narrow lanes may also reduce their speed as a precaution. Passenger size vehicles following behind the trucks and recreational vehicles also experience an increase in travel time because of limited opportunities to safely pass the slower moving trucks. Wider driving lanes, shoulders, and passing/truck climbing lanes at strategic locations would help improve traffic flow.

Minimize/avoid impacts to potential historic districts.
Historic cultural resources in the area are considered valuable and significant links to the past, and represent a rich cultural heritage. Discussions with local officials and citizens indicated a desire to preserve these areas along with the aesthetic qualities and the traditions they represent. Minimizing/avoiding impacts to cultural resources is also a goal of this proposed project.

Minimize/avoid impacts to communities.
Local officials and citizens also expressed a desire to minimize/avoid impacting established residential communities. Minimizing/avoiding impacts to communities is also a goal of this proposed project. Efforts will be made to avoid community impacts, and to minimize property impacts in general by following property lines to the maximum extent possible. Natural resources are also recognized as valuable commodities, important not only to the communities themselves, but to the health of the natural environment. State and federal guidelines will be followed to minimize impacts to the natural resources.

Provide roadway improvements between the Barren County line and Burkesville (KY 61) to compliment the planned Barren County improvements.
Improvements to KY 90 in Barren County are programmed under KYTC Item Number 3-108.50, reconstruct KY 90 from east of Glasgow to the Metcalfe County line. Typical sections from 3-108.50 were consulted to ensure a smooth transition at the Metcalfe-Barren County line, and provide the driver with a sense of roadway continuity.

Improve accessibility for local people seeking access to the recreational, employment, educational, and health care opportunities in south central Kentucky.
Glasgow, located west of the study area, and Burkesville, located at the eastern terminus, are the regional economic activity, employment, health care, retail, and educational centers. Major state recreational areas (Barren River Lake, Dale Hollow Lake, and Lake Cumberland) are located west and east of the study area. KY 90 is the major connector between these sites, both counties, and to other destinations beyond. Commuters in and surrounding the study area have limited opportunities for other north-south, and east-west travel. Consequently, KY 90 attracts a substantial amount of commuter, employee, tourist, and commercial traffic from Metcalfe and Cumberland Counties, and even the surrounding counties and communities, seeking the opportunities available only in the major activity centers. An improved KY 90 would help relieve traffic congestion, thereby, improving local commuters' access to the opportunities available in the urban activity centers.

5.0 STUDY ALTERNATIVES / IMPROVEMENT OPTIONS CONSIDERED

The following alternatives / improvement options were developed to address the goals and objectives formulated through the study process.

5.1 Do Nothing

This alternative involves no action to improve the facility. The Do Nothing alternative would leave the existing roadway essentially as is, other than routine roadway maintenance (*e.g.*, resurfacing, restriping, patching, etc.). In the short-term, the Do Nothing alternative is the least expensive improvement option, since no funds would be expended for right-of-way acquisition, displacement of residences or businesses, utility relocations, or improvement construction. There would also be no construction period traffic disruptions, or construction-induced environmental impacts. However, the Do Nothing alternative should not be construed as a continuation of the status quo. Traffic volumes and characteristics, as well as development inside and outside the project area, will change. Normal growth in the area would contribute to increases in traffic volumes. Traffic from existing and future development, as well as through traffic, would continue to use the existing roadway. Traffic forecasts conducted for this study show an increase in the 2030 traffic volume on KY 90 of approximately 95 percent over the 2005 volume. The Do Nothing alternative would leave the area with a transportation system that progressively becomes more incapable of handling the increased traffic demands, and fails to address safety concerns identified by the project team and area citizens. The existing geometric deficiencies would remain. Additional traffic congestion and an increased potential for crashes could be expected. This alternative was presented and discussed by the project team members, who concluded it was not in the public's best interests because the long-term benefits from implementing proposed improvement option(s) are expected to be substantially greater than any negative factors associated with their construction and operation. The Do Nothing alternative was not recommended because it did not address the project goals.

Even though the Do Nothing alternative does not meet the project goals, it does provide the decision making team with a basis for comparing the impacts and benefits of other improvement opportunities considered throughout the project development process, and will be referred to as appropriate for baseline comparisons.

5.2 Transportation System Management

Transportation System Management (TSM) involves relatively low-cost improvements, but effective in nature, that can be quickly implemented through roadway maintenance activities. TSM improvements generally refer to such things as signing at critical locations, traffic lights at intersections, lighting, and simple roadway improvements such as pavement stripping, removing vegetation to improve visibility, or improving the radius of a street corner. Due to KY 90's numerous horizontal and vertical geometric deficiencies, and rural nature, limited opportunities exist for TSM improvements. Caution and warning signs are generally already present at critical locations, and the pavement is striped.

KY 90/KY 163 intersection as seen by northbound KY 163 drivers.

KY 90/KY 163 intersection as seen by eastbound KY 90 drivers.

Only one TSM opportunity was identified: the KY 90/KY 163 intersection (see Appendix B, photos 14-19). This intersection is a high crash location, with predominantly right-angle (*i.e.*, side-impact) crashes. Even though this intersection is scheduled for reconstruction with KYTC Item No. 3-276.50, installation of warning signs alerting north and southbound KY 163 drivers that cross traffic does not stop could reduce the number of crashes.

5.3 Improvement Opportunities Considered

The improvement opportunities defined in this study, taken in their entirety, essentially improve the entire length of KY 90 from the Barren-Metcalfe County line to Burkesville. Individually, each improvement opportunity is intended to correct either: 1) a specific roadway alignment deficiency, 2) replace an existing bridge, 3) improve the existing roadway to current design standards for lane and shoulder width, or 4) improve the roadway's operational performance (such as the addition of passing lanes). Improvement opportunities were identified sequentially from west to east, with either a *number* (improvements involving bypasses, curve or intersection realignment, bridge replacement, or curb and gutter through towns), or a *letter* (reconstructing existing mainline road sections). Improvements that include the addition of a passing lane are indicated by the suffix "*-P*." Improvements would consist of 12-foot wide driving lanes and 8-foot shoulders, and are intended to compliment the planned KY 90 improvements in Barren County (see Exhibit 4, *Typical Sections*). Curb and gutter improvements through the towns are within the existing right-of-way to avoid impacting private property and historic sites. Each improvement's beginning and ending point is an approximation used for planning purposes only. More detailed design is required to accurately identify the start and end points of each improvement.

Throughout the planning process, the project team identified, considered, evaluated, and revised a variety of improvement opportunities, as documented in the meeting minutes (see Appendix D). Table 7, *KY 90 Improvement Opportunities*, lists and briefly describes the final set of improvement opportunities, and provides the estimated length of each improvement, estimated construction cost, and the number of the color photo in Appendix B illustrating the existing condition. Refer to Exhibit 3, *Environmental Footprint and Improvement Opportunities*, in Appendix A for the improvement locations. Table 8, *Comparison Matrix of KY 90 Improvements*, presents a summary comparison of the improvements. Construction costs were based upon 2006 estimated bid prices. Preliminary roadway alignments and grades were used to estimate earthwork construction cost for each improvement opportunity. Varying terrain features associated with each improvement opportunity were considered in the calculations; therefore, seemingly similar improvements may have very different cost estimates. Improvement opportunity 3 — the KY 90/KY 163 intersection, identified as a high crash location — was removed from the final list of improvement opportunities because it is scheduled for reconstruction under KYTC item number 3-276.50.

5.3.1 Operational Improvements

Operational improvements are relatively short distance improvements addressing immediate and short-term needs, generally involving roadway reconstruction to correct horizontal and vertical deficiencies. Operational improvements typically require greater expense and capital investment than TSM improvements. KY 90's roadway deficiencies provide many opportunities for operational improvements.

The project team believed it unwise and unsafe to potentially have individual operational improvement sections meeting current design standards interconnected by substandard roadway sections. The team was cautious not to create conditions where an improved section of roadway only served to speed motorists into a deficient section, nor possibly convey false expectations of the roadway's safety. Therefore, the project team carefully considered each operational improvement's termini (*i.e.*, the numbered improvements). Additionally, the project team considered the existing roadway between each operational improvement as a mainline reconstruction improvement (*i.e.*, the lettered improvements, discussed in Section 5.3.2). For planning purposes, this approach offered the advantage of studying KY 90 improvements along the entire project length, including documenting estimated project costs for all identified improvements. This approach allows future improvements to be selected based upon need and available funding.

5.3.2 Roadway Reconstruction

Roadway reconstruction generally involves longer-term roadway construction on new alignment, or reconstruction of existing mainline roadway sections of longer lengths. Roadway reconstruction can include bypasses, a new road on new alignment, or a new typical section to bring an existing road up to current design standards. Roadway reconstruction is usually the most expensive roadway improvement option and incurs greater capital investment than either TSM or operational improvements.

The project team discussed the relative merits of a total reconstruction of KY 90 from the Metcalfe-Barren County line to Burkesville (23 miles) versus numerous individual improvement opportunities. During the public information meetings, a number of people expressed a desire for a four-lane divided highway typical section, frequently citing Tennessee SR 111 as an example. The project team considered both a four-lane divided highway, and a two-lane total reconstruction option. The project team discussed a four-lane divided highway total reconstruction and considered it as unjustified based upon current and projected traffic volumes, high costs, right-of-way impacts, and environmental impacts. Therefore, the project team did not recommend a four-lane divided highway total reconstruction of KY 90. The project team favorably considered a two-lane total reconstruction of KY 90 to current design standards. However, given the project corridor length and the current availability of funding, implementing a two-lane total reconstruction as one project was considered to be cost prohibitive. Consequently, the project team decided to recommend individual improvement opportunities, focusing on the most critical locations (*i.e.*, high crash locations, sharp curves, steep hills, restricted/limited visibilities, limited passing opportunities).

One type of reconstruction improvement opportunity considered was a bypass around existing communities. Bypasses of Summer Shade, Beaumont, Marrowbone, and Waterview were considered for a variety of reasons. The characteristic urban features of reduced speed limits, some narrow streets, on-street parking, sharp curves, numerous cross street intersections and direct access, consumer traffic, and congestion combine to slow down and restrict traffic flow (see Table 2). A bypass can have both positive and negative effects on a small community. For example, a bypass would facilitate moving traffic through the area to its destination; however, a bypass would also remove traffic flow and potential customers from the business establishments in town. Additionally, a bypass could detract from the current aesthetic appeal of a rural, small-town area and potential historic district. The town businesses may rely heavily upon daily commuters; therefore, a bypass could be met with resistance from business owners and public officials.

Redesigning/improving KY 90 with curbs and gutters through these towns may also be difficult. These towns contain either a potential historic district, or an already designated National Register historic district. The existing physical location of buildings and roadway geometrics offers few opportunities for improving the roadway outside its existing boundaries. The town's historic nature may be an obstacle to obtaining approval of roadway improvements through town. Additionally, improving the roadway through town may serve to increase the speed at which traffic flows through the town, thereby potentially generating new problems of excessive speed and volume. On the positive side, improving KY 90 through the town would retain traffic flow and potential customers, is a less expensive improvement because it reconstructs existing roadways, and maintains the rural, "small-town" historic atmosphere of the area.

Bypassing a town requires the consideration of many issues. Included are specific details on town historic property locations and property boundaries, and the potential impacts on these properties by any improvement construction in or around the town. Any town bypass may also have adverse impacts to the residents and business establishments, and therefore requires careful consideration.

The bypass improvement opportunities indicated on Exhibit 3 were selected after a consideration of the existing conditions, constraints, and potential impacts surrounding the bypassed location. In each case, an "alternative bypass" to the north or south of a particular indicated bypass location was deemed to be impractical because of increased impacts, physical/natural barriers, and/or expense compared to the bypass shown. Increased impacts included potential residential relocations, potential historic properties, and environmental resources. In some cases, the indicated bypass is simply the most direct and expedient route, or the logical path given the existing KY 90 roadway. The decision-making rationale for selecting a particular bypass location, based upon a planning study level of effort, is described below.

- Summer Shade. A review of aerial photography and existing conditions indicated a northern bypass had a greater number of potential residential relocations than a southern bypass. Additionally, the existing roadway geometry and the large electric substation (hazmat Site 5) east of Summer Shade favors a southern bypass.

- Beaumont. A southern bypass is the most geometrically practical engineering option. A northern bypass could impact a large light industrial complex (hazmat Site 7), have more residential relocations, be significantly longer, and cause alignment difficulties with the programmed KY 163 improvements.

- Marrowbone. A northern bypass is the shortest distance around Marrowbone, with the fewest potential impacts. A southern bypass could be significantly longer, and involve potential environmental impacts to Marrowbone Creek, wetland impacts, residential relocations, and impacts to historic properties/district.

- Waterview. A northern bypass offers the shortest distance and fewest potential impacts. A southern bypass involves potential environmental impacts to Marrowbone Creek, and impacts to historic properties/district.

- Burkesville. A southern bypass offers the most direct route to the Cumberland River Bridge, traverses less rugged terrain (minimizes excavation), and removes truck and through traffic from downtown Burkesville. A northern bypass would cross more rugged terrain, is potentially a longer alignment with increased residential relocations and impacts, and does not resolve the KY 90/KY 61 intersection issues in Burkesville.

An issue consistently brought up by the public was the limited passing opportunities along KY 90. Passing opportunities on KY 90 are limited due to roadway geometry and oncoming traffic, and were considered an important safety issue by both the project team and the public. Public comment indicated a strong desire for, and an expectation of, passing opportunities. While passing lanes could conceivably be located anywhere along the roadway, the existing topography, town locations, and safety considerations were key factors in selecting passing lane locations for improvement opportunities. The project team did not want to create situations where vehicles were potentially accelerating just before entering a populated area (town) with reduced speed limits. Additionally, logical pairings of east-west passing lanes around selected locations was a desired feature. Passing lane opportunities for the mainline and bypasses are identified and indicated on Exhibit 3.

Table 7 KY 90 Improvement Opportunities

Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)	Photo Ref No
	Metcalfe County			
1	Bypass Summer Shade to the south:			
1-1 (yellow)	Summer Shade Bypass 1. Begin west of Hill Top VW Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 east of Ernie Ferrell Road. This improvement is more expensive and longer than 1-2, and crosses more varying terrain features, but positions the roadway further from residential dwellings.	2.31	11.1	
1-1-P	Summer Shade Bypass 1 with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	2.31	11.7	
1-2 (orange)	Summer Shade Bypass 2. Begin east of Big Jack Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 about Ernie Ferrell Road. This improvement costs less and is shorter than 1-1, but locates the roadway closer to residential dwellings.	1.76	4.9	
2	Reconstruct KY 90 through Summer Shade with curb and gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the intersections at Bronston Howard Road (access road to Summer Shade Elementary School) and KY 640.	0.14	0.2	6, 7, 8, 9, 10, 11
4	Bypass Beaumont to the south:			
4-1 (blue)	Beaumont Bypass 1. Begin from the scheduled KY 163 improvement, proceed almost due east on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont.	0.893	1.6	20
4-2 (orange)	Beaumont Bypass 2. Begin from the scheduled KY 163 improvement, curve southeast on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont.	0.916	2.0	20
	Cumberland County			
D + 5	Roadway section from the Metcalfe-Cumberland County line to the curve at Anderson Lane (item 5). Reconstruct curve just east of the Metcalfe-Cumberland County line near Anderson Lane to meet current design standards.	0.291	0.4	23
E + 6	Roadway section from the end of the curve at Anderson Lane (item 5) to the beginning of the curve near Pitman Creek (item 6). Reconstruct curve west of Pittman Creek Road to meet current design standards.	0.633	1.0	23
7	Bypass Marrowbone to the north:			
7-1 (red)	Marrowbone Bypass 1. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496.	2.02	35.2	
7-2 (blue)	Marrowbone Bypass 2. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496. 7-2 follows the same alignment as 7-1, except the mid-section curves south of 7-1 on new alignment.	2.03	39.0	
8	Reconstruct KY 90 through Marrowbone with curb, gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the KY 3115 intersection to more favorable geometrics.	0.72	0.6	24, 25, 26, 27
8.1	Reconstruct the KY 90/KY 3115 intersection in Marrowbone.	0.22	0.3	
9	Replace existing bridge over Wisdom Creek.	--	0.5	28, 29
10	Bypass Waterview to the north:			
10-1 (orange)	Waterview Bypass 1. Begin from the curve west of Waterview's limits, proceed northeast, curving east to bypass Waterview to the north on new alignment, then curving southeast to reconnect with KY 90 in the vicinity of Taylor Road.	2.15	7.7	
10-1-P	Waterview Bypass 1 with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.15 miles long, estimated construction cost is $2.9 million.	2.15	10.6	
10-2 (yellow)	Waterview Bypass 2. Begin from the curve west of Waterview's limits, proceed in a more direct eastern alignment to bypass Waterview to the north and reconnect with KY 90 west of Dutch Creek Road. Improvement 10-2 crosses within the potential National Register Historic District boundaries.	1.52	5.1	
11	Reconstruct the KY 90/KY 100 intersection. The existing intersection would be shifted west and KY 100 realigned to provide a more favorable geometry with KY 90. Turning lanes would be added to KY 90.	0.29	0.4	30, 31

Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)	Photo Ref No
12	Replace existing bridge at Dutch Creek.	--	0.7	32, 33, 34
13	Replace existing bridge west of Allen Creek Road.	--	0.6	35, 36
14	Curve at Allen Creek. Reconstruct curve east of Allen Creek Road and near Grider to meet current design standards.	0.25	0.6	
15	Norris Branch Road to Owens Road. Relocate KY 90 on new alignment to eliminate curve at KY 691. Begin east of Norris Branch Road, proceed east on new alignment to reconnect with KY 90 in the vicinity of Owens Road.	0.92	10.3	
16 + 18	Reconstruct KY 90 from Burkesville Hill Road/Saw Mill Cut to the KY 90/KY 61 intersection. Begin east of the KY 90/KY 2276 intersection, follow the existing alignment east to the first curve, continue northeast on new alignment, curving east to reconnect with KY 90 near the hilltop and end near the county hospital. Continue by widening KY 90 to 3-lanes, and constructing curb, gutter and sidewalks from near the county hospital to the intersection; reconstructing the elementary school entrance and exit roads; and adding a right hand turn lane on KY 61 southbound.	1.29	9.1	43, 44, 45, 46, 47, 48, 49, 50, 51
17	Burkesville Bypass. Begin near the KY 90/KY 2276 intersection, proceed southeasterly on new alignment to bypass Burkesville on the south, and reconnect with KY 90 at the KY 90/KY 61 intersection west of the Cumberland River Bridge. Includes reconstructing the KY 90/KY 2276 intersection.	1.57	21.7	
17-P	Burkesville Bypass with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 0.73 miles long, estimated construction cost is $8.1 million.	1.57	29.8	
18.1	Reconstruct the KY 90/KY 61 intersection in Burkesville. Add a right turn lane on KY 61 southbound.	0.17	0.3	50, 51
	Reconstruct existing KY 90 roadway to 12-foot wide lanes, 8-foot shoulders.			
A-P	Roadway section A with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.25 miles long, estimated construction cost is $0.8 million.	1.69	3.1	1, 2
B	Roadway section from the end of the Summer Shade Bypass 1-2 to the scheduled KY 163 improvement.	1.32	2.2	1, 2
C-P	Roadway section C with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.36 miles long, estimated construction cost is $1.1 million.	5.67	10.3	21, 22
F-P	Roadway section F with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.00 miles long, estimated construction cost is $1.0 million.	2.26	5.7	
F.1	Roadway section F between White Road and Ferris Fork Creek. Improve typical section safety and rock wall slope immediately north of roadway.	0.35	1.7	
G + 9	Roadway section from the end of the Marrowbone Bypass (item 7) to the beginning of the Waterview Bypass (item 10). Replace existing bridge over Wisdom Creek.	1.24	2.5	28, 29
H-P	Roadway section H with an eastbound passing lane beginning just east of Waterview (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane is 1.22 miles long, estimated construction cost is $0.9 million.	1.22	2.7	37
I	Roadway section from the end of the curve at Allen Creek (item 14) to near Norris Branch Road (beginning of item 15).	0.63	1.1	
J + K	Roadway section from Owens Road (end of item 15) to beginning of the Burkesville Bypass (item 17). Roadway section from the beginning of the Burkesville Bypass (item 17) to the beginning of the Burkesville Hill Road reconstruction (item 16).	0.88	1.5	42, 43

* Cost estimate is for construction only, based upon 2006 estimated bid costs. It does not include utility and right-of-way costs.

Table 8 Comparison Matrix of KY 90 Improvement Opportunities

County	Improvement Opportunity																		
	Metcalfe	Metcalfe	Metcalfe	Metcalfe	Metcalfe	Metcalfe	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland
	1-1	1-1-P	1-2	2	4-1	4-2	D + 5	E + 6	7-1	7-2	8	8.1	9	10-1	10-1-P	10-2	11	12	13
Improvement Description	Bypass	Bypass	Bypass	Intersection Reconstruction	Bypass	Bypass	Mainline/Curve Reconstruction	Mainline/Curve Reconstruction	Bypass	Bypass	Curb and Gutter	Intersection Reconstruction	Bridge Replacement	Bypass	Bypass	Bypass	Intersection Reconstruction	Bridge Replacement	Bridge Replacement
Passing Lane	No	Yes	No	No	No	No	No	No	No	No	No	No	No	No	Yes	No	No	No	No
Length (miles)	2.31	2.31	1.76	0.14	0.893	0.916	0.291	0.633	2.02	2.03	0.72	0.22	--	2.15	2.15	1.52	0.29	--	--
Estimated Cost (dollars)																			
Construction[1]	11,100,000	11,700,000	4,900,000	200,000	1,630,000	1,950,000	410,000	1,000,000	35,200,000	39,000,000	600,000	300,000	500,000	7,700,000	10,600,000	5,100,000	400,000	700,000	600,000
Community Impacts																			
Potential Relocations	1	1	0	0	2	2	0	2	3	3	0	0	0	4	4	2	0	0	0
Bypass (town)	Yes Summer Shade	Yes Summer Shade	Yes Summer Shade	No Summer Shade	Yes Beaumont	Yes Beaumont	No	No	Yes Marrowbone	Yes Marrowbone	No Marrowbone	No Marrowbone	No	Yes Waterview	Yes Waterview	Yes Waterview	No	No	No
Historic District	No	No	No	Yes	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes	Yes	Yes	No
Environmental Justice Issue	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
Potential Environmental Concerns																			
USGS Streams	1	1	1	0	0	0	1	1	3	3	0	0	1	2	2	1	0	1	1
Wetlands/Ponds	1	1	1	0	1	0	0	1	0	0	0	0	0	3	3	0	0	0	0
Historic	0	0	0	District	0	0	0	1	0	0	District	District	0	0	0	District	District	District	0
Archaeologic	Likely	Likely	Likely	Unlikely	Unlikely	Unlikely	Likely	Likely	Likely	Likely	Unlikely	Unlikely	Unlikely	Likely	Likely	Likely	Unlikely	Unlikely	Unlikely
Meets Project Goals																			
Improve Safety	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Limited	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Current Design Standards	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Limited	Yes	Yes	Yes	Yes	Limited	Yes	Yes
Accommodate Rec Vehicles, Trucks	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Limited	Yes	Yes	Yes	Yes	Limited	Yes	Yes
Avoid Potential Historic Districts	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No	Yes
Avoid Communities	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	Yes	Yes
Compliment Barren Co Hwy	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Limited	Yes	Yes	Yes	Yes	Limited	Yes	Yes
Improve Accessibility, Connectivity	Yes	Yes	Yes	Limited	Yes	Yes	Yes	Yes	Yes	Yes	Limited	Limited	Yes	Yes	Yes	Yes	Limited	Yes	Yes

[1] Estimated construction costs are based upon 2006 estimated bid costs. Cost does not include design, right-of-way acquisition, or utilities relocation.

Table 8 Comparison Matrix of KY 90 Improvement Opportunities, continued

County	Improvement Opportunity															
	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland		Metcalfe	Metcalfe	Metcalfe	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland	Cumberland
	14	15	16 + 18	17	17-P	18.1		A-P	B	C-P	F-P	F.1	G + 9	H-P	I	J + K
Improvement Description	Curve Reconstruction	Bypass	Curve/Mainline Reconstruction	Bypass	Bypass	Intersection Reconstruction		Mainline Reconstruction	Mainline Reconstruction	Mainline Reconstruction	Mainline Reconstruction	Spot Improvement	Mainline Recon Bridge Replace	Mainline Reconstruction	Mainline Reconstruction	Mainline Reconstruction
Passing Lane	No	No	No	No	Yes	No		Yes	No	Yes	Yes	No	No	Yes	No	No
Length (miles)	0.25	0.92	1.29	1.57	1.57	0.17		1.69	1.32	5.67	2.26	0.35	1.24	1.22	0.63	0.88
Estimated Cost (dollars)																
Construction[1]	550,000	10,300,000	9,100,000	21,700,000	29,800,000	250,000		3,100,000	2,200,000	10,300,000	5,700,000	1,700,000	2,500,000	2,700,000	1,100,000	1,500,000
Community Impacts																
Potential Relocations	3	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Bypass (town)	No	No	No	Yes Burkesville	Yes Burkesville	No		No	No	No	No	No	No	No	No	No
Historic District	No	No	No	No	No	No		No	No	No	No	No	No	No	No	No
Environmental Justice Issue	No	No	No	No	No	No		No	No	No	No	No	No	No	No	No
Potential Environmental Concerns																
USGS Streams	0	3	0	1	1	0		1	0	5	4	0	2	1	0	3
Wetlands/Ponds	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0
Historic	2	0	0	1	1	0		0	0	0	0	0	1	1	0	2
Archaeologic	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely		Likely	Likely	Likely	Likely	Likely	Likely	Likely	Unlikely	Likely
Meets Project Goals																
Improve Safety	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Current Design Standards	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Accommodate Rec Vehicles, Trucks	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avoid Potential Historic Districts	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Avoid Communities	No	Yes	No	Yes	Yes	No		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Compliment Barren Co Hwy	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Improve Accessibility, Connectivity	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Limited	Yes	Yes	Yes	Yes	Yes	Yes

[1] Estimated construction costs are based upon 2006 estimated bid costs. Cost does not include design, right-of-way acquisition, or utilities relocation.

6.0 RECOMMENDATIONS

6.1 KY 90 Improvement Recommendations

The project team members made a careful review and consideration of the existing conditions, cultural and environmental constraints, and engineering considerations. After thoroughly discussing the various TSM, operational, and roadway reconstruction improvement opportunities, and their relative merits in terms of satisfying project goals, the project team made several decisions. Ultimately, the project team decided to categorize the improvement opportunities into one of three types to facilitate implementation strategies, as described below. The project team's list of final recommended KY 90 improvement opportunities are in Table 9, *Recommended KY 90 Improvement Opportunities*, by category, along with their lengths, estimated construction costs, and priority for the mainline reconstruction improvements.

- Bridge Replacements. Candidate bridges will be selected by the District as warranted by bridge condition and safety considerations.
- Operational Improvements. This includes improvements addressing immediate and short-term needs. The project team made no attempt to prioritize these improvement opportunities, believing it was best to allow the District to select the improvement(s) to implement based upon available funding and needs.
- Roadway Reconstruction Improvements. Consists of longer-term roadway mainline reconstruction and bypass improvements. The project team prioritized these improvements based upon considerations of safety, traffic volumes, passing opportunities, estimated construction costs, and local knowledge.

6.2 Project Phases and Cost Estimates

Due to the relatively short length and nature of each recommended improvement, each improvement would be expected to be completed in one construction phase. Project construction cost estimates are in Table 9, and range from $200,000 to $39,000,000.

The Enacted Six-Year Highway Plan FY 2007-2012 authorized funding for Design, some of which was used to fund the Pre-Design Scoping Study. The Enacted Six-Year Highway Plan FY 2007-2012 provides additional funding for KY 90 improvements in Metcalfe and Cumberland Counties as follows:

Item No.	Length	Description	Funding	Phase	Year	Amount
08-136.00	25.000	Spot improvements along KY-90 between Barren County line and Burkesville. (Replaces 2002 SYP Item No. 3-112.00) Milepoints: From: 0 To: 11.719 Milepoints: From: 0 To: 14.113 Purpose and Need: Reliability/Spot Improvements(O)	SP	D	2006	$3,250,000
			SP	R	2008	$7,000,000
			SP	U	2008	$2,800,000
			SP	C	2008	$10,000,000
					Total	$23,050,000
08-136.01	25.000	Spot improvements along KY-90 between Barren County line and Burkesville. (Additional Funding for C Phase.) Milepoints: From: 0 To: 11.719 Milepoints: From: 0 To: 14.113 Purpose and Need: Reliability/Prefinanced Convrsn(O)	SP	C	2008	$10,000,000
					Total	$10,000,000
08-136.02	25.000	Spot improvements along KY-90 between Barren County line and Burkesville. (Additional Funding for C Phase.) Milepoints: From: 0 To: 11.719 Milepoints: From: 0 To: 14.113 Purpose and Need: Reliability/Prefinanced Convrsn(O)	SP	C	2008	$12,000,000
					Total	$12,000,000

Table 9 Recommended KY 90 Improvement Opportunities

Priority	Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
Bridge Replacements (no priority)				
	9	Replace existing bridge over Wisdom Creek.	--	0.5
	12	Replace existing bridge at Dutch Creek.	--	0.7
	13	Replace existing bridge west of Allen Creek Road.	--	0.6
Operational Improvements (no priority)				
	2	Reconstruct the KY 90 intersection at Bronston Howard Road (access road to Summer Shade Elementary School) in Summer Shade using the existing right-of-way.	0.14	0.2
	8.1	Reconstruct the KY 90/KY 3115 intersection in Marrowbone.	0.22	0.3
	D + 5	Roadway section from the Metcalfe-Cumberland County line to the curve at Anderson Lane (item 5). Reconstruct curve just east of the Metcalfe-Cumberland County line near Anderson Lane to meet current design standards.	0.291	0.4
	E + 6	Roadway section from the end of the curve at Anderson Lane (item 5) to the beginning of the curve near Pitman Creek (item 6). Reconstruct curve west of Pittman Creek Road to meet current design standards.	0.633	1.0
	F.1	Roadway section F between White Road and Ferris Fork Creek. Improve typical section safety and rock wall slope immediately north of roadway.	0.35	1.7
	11	Reconstruct the KY 90/KY 100 intersection. Existing intersection would be shifted west and KY 100 realigned to provide a more favorable geometry with KY 90. Turning lanes would be added to KY 90.	0.29	0.4
	14	Curve at Allen Creek. Reconstruct curve east of Allen Creek Road and near Grider to meet current design standards.	0.25	0.6
	18.1	Reconstruct the KY 90/KY 61 intersection in Burkesville. Add a right turn lane on KY 61 southbound.	0.17	0.3
	A-P	Passing lane only on this mainline section.	1.25	0.8
	C-P	Passing lane only on this mainline section.	1.36	1.1
	F-P	Passing lane only on this mainline section.	1.00	1.0
	H-P	Passing lane only on this mainline section.	1.22	0.9
Prioritized Mainline Road Reconstruction (priority order as indicated)				
1	Summer Shade Bypass: (1-1-P, 1-1, 1-2)			
	1-1-P	Summer Shade Bypass 1 with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 0.86 miles long, estimated construction cost is $0.6 million.	2.31	11.7
	1-1	Summer Shade Bypass 1. Begin west of Hill Top VW Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 east of Ernie Ferrell Road. This improvement is more expensive and longer than 1-2, and crosses more varying terrain features, but positions the roadway further from residential dwellings.	2.31	11.1
	1-2	Summer Shade Bypass 2. Begin east of Big Jack Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 about Ernie Ferrell Road. This improvement costs less and is shorter than 1-1, but locates the roadway closer to residential dwellings.	1.76	4.9
2	16 + 18	Reconstruct KY 90 from Burkesville Hill Road/Saw Mill Cut to the KY 90/KY 61 intersection. Begin east of the KY 90/KY 2276 intersection, follow the existing alignment east to the first curve, continue northeast on new alignment, curving east to reconnect with KY 90 near the hilltop and end near the county hospital. Continue by widening KY 90 to 3-lanes, and constructing curb, gutter and sidewalks from near the county hospital to the intersection; reconstructing the elementary school entrance and exit roads; and adding a right hand turn lane on KY 61 southbound.	1.29	9.1
3	15	Norris Branch Road to Owens Road. Relocate KY 90 on new alignment to eliminate curve at KY 691. Begin east of Norris Branch Road, proceed east on new alignment to reconnect with KY 90 in the vicinity of Owens Road.	0.92	10.3

Priority	Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
4	Waterview Bypass with a passing lane: (10-1-P, 10-1, 10-2)			
	10-1-P	Waterview Bypass 1 with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.15 miles long, estimated construction cost is $2.9 million.	2.15	10.6
	10-1	Waterview Bypass 1. Begin from the curve west of Waterview's limits, proceed northeast, curving east to bypass Waterview to the north on new alignment, then curving southeast to reconnect with KY 90 in the vicinity of Taylor Road.	2.15	7.7
	10-2	Waterview Bypass 2. Begin from the curve west of Waterview's limits, proceed in a more direct eastern alignment to bypass Waterview to the north and reconnect with KY 90 west of Dutch Creek Road. Improvement 10-2 crosses within the potential National Register Historic District boundaries.	1.52	5.1
5	A-P	Roadway section A with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.25 miles long, estimated construction cost is $0.8 million.	1.69	3.1
6	8	Reconstruct KY 90 through Marrowbone with curb, gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the KY 3115 intersection to more favorable geometrics.	0.72	0.6
7	J + K	Roadway section from Owens Road (end of item 15) to beginning of the Burkesville Bypass (item 17). Roadway section from the beginning of the Burkesville Bypass (item 17) to the beginning of the Burkesville Hill Road reconstruction (item 16).	0.88	1.5
8	I	Roadway section from the end of the curve at Allen Creek (item 14) to near Norris Branch Road (beginning of item 15).	0.63	1.1
9	H-P	Roadway section H with an eastbound passing lane beginning just east of Waterview (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane is 1.22 miles long, estimated construction cost is $0.9 million.	1.22	2.7
10	B	Roadway section from end of Summer Shade Bypass (item 1) to the scheduled KY 163 improvement.	1.32	2.2
11	G + 9	Roadway section from the end of the Marrowbone Bypass (item 7) to the beginning of the Waterview Bypass (item 10). Replace existing bridge over Wisdom Creek.	1.24	2.5
12	Beaumont Bypass: (4-1, 4-2)			
	4-1	Beaumont Bypass 1. Begin from the scheduled KY 163 improvement, proceed almost due east on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont. This improvement is more direct and slightly shorter than 4-2.	0.893	1.6
	4-2	Beaumont Bypass 2. Begin from the scheduled KY 163 improvement, curve southeast on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont.	0.916	2.0
13	F-P	Roadway section F with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.00 miles long, estimated construction cost is $1.0 million.	2.26	5.7
14	Burkesville Bypass: (17, 17-P)			
	17	Burkesville Bypass. Begin near KY 90/KY 2276 intersection, proceed southeasterly on new alignment to bypass Burkesville on the south, and reconnect with KY 90 at the KY 90/KY 61 intersection west of the Cumberland River Bridge. Includes reconstructing KY 90/KY 2276 intersection.	1.57	21.7
	17-P	Burkesville Bypass with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 0.73 miles long, estimated construction cost is $8.1 million.	1.57	29.8
15	C-P	Roadway section C with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows. Passing lane only is 1.36 miles long, estimated construction cost is $1.1 million.	5.67	10.3
16	Marrowbone Bypass: (7-1, 7-2)			
	7-1	Marrowbone Bypass 1. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496.	2.02	35.2
	7-2	Marrowbone Bypass 2. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496. 7-2 follows the same alignment as 7-1, except the mid-section curves south of 7-1 on new alignment.	2.03	39.0

* Estimated construction cost based upon 2006 estimated bid costs. Does not include utility and right-of-way costs.

Appendix A

Exhibits

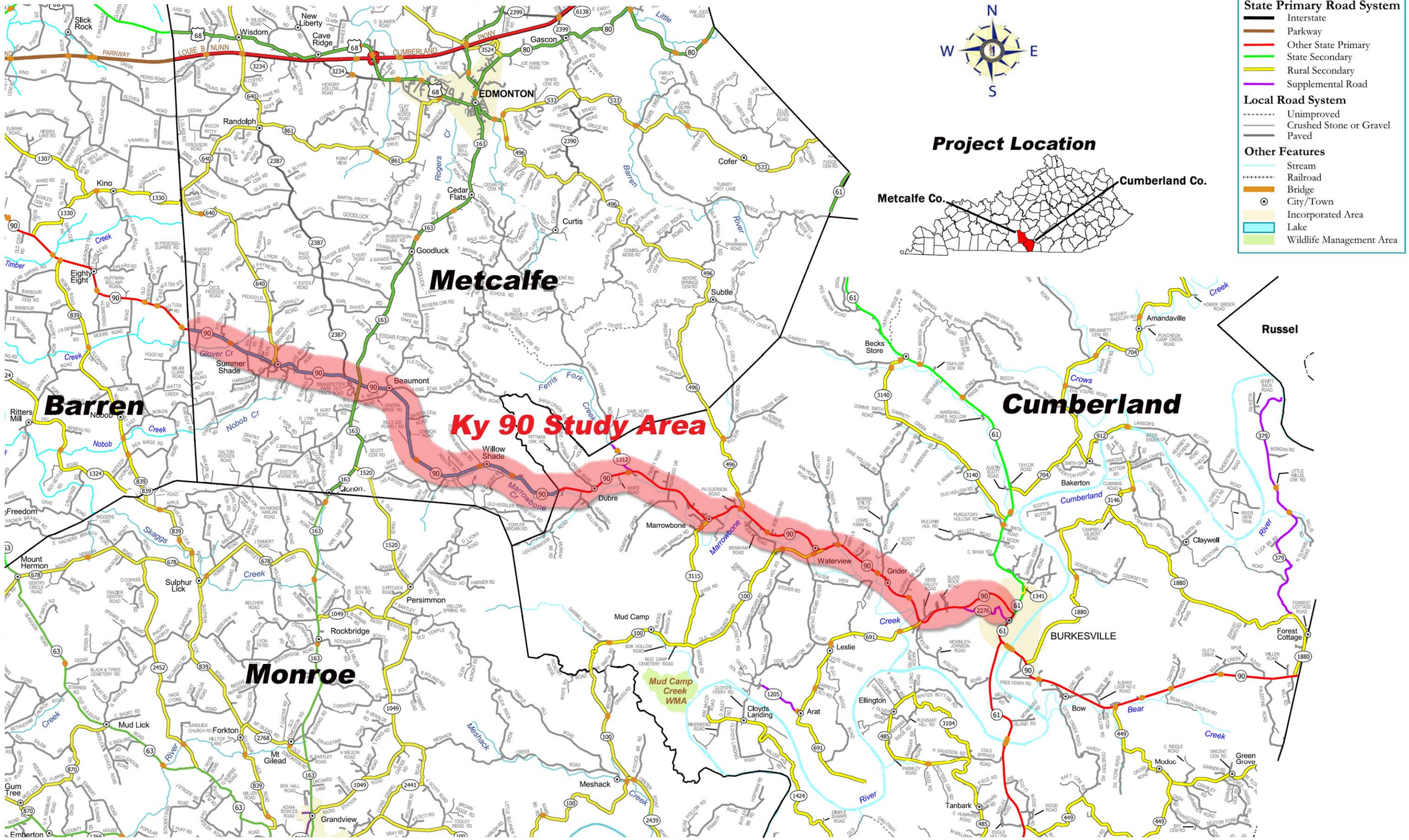


Exhibit 1

Ky 90 Study Area

Last map revision: June 2005

2 0 2 4 6 Miles

Kentucky UNBRIDLED SPIRIT

KENTUCKY TRANSPORTATION CABINET

Division of Planning

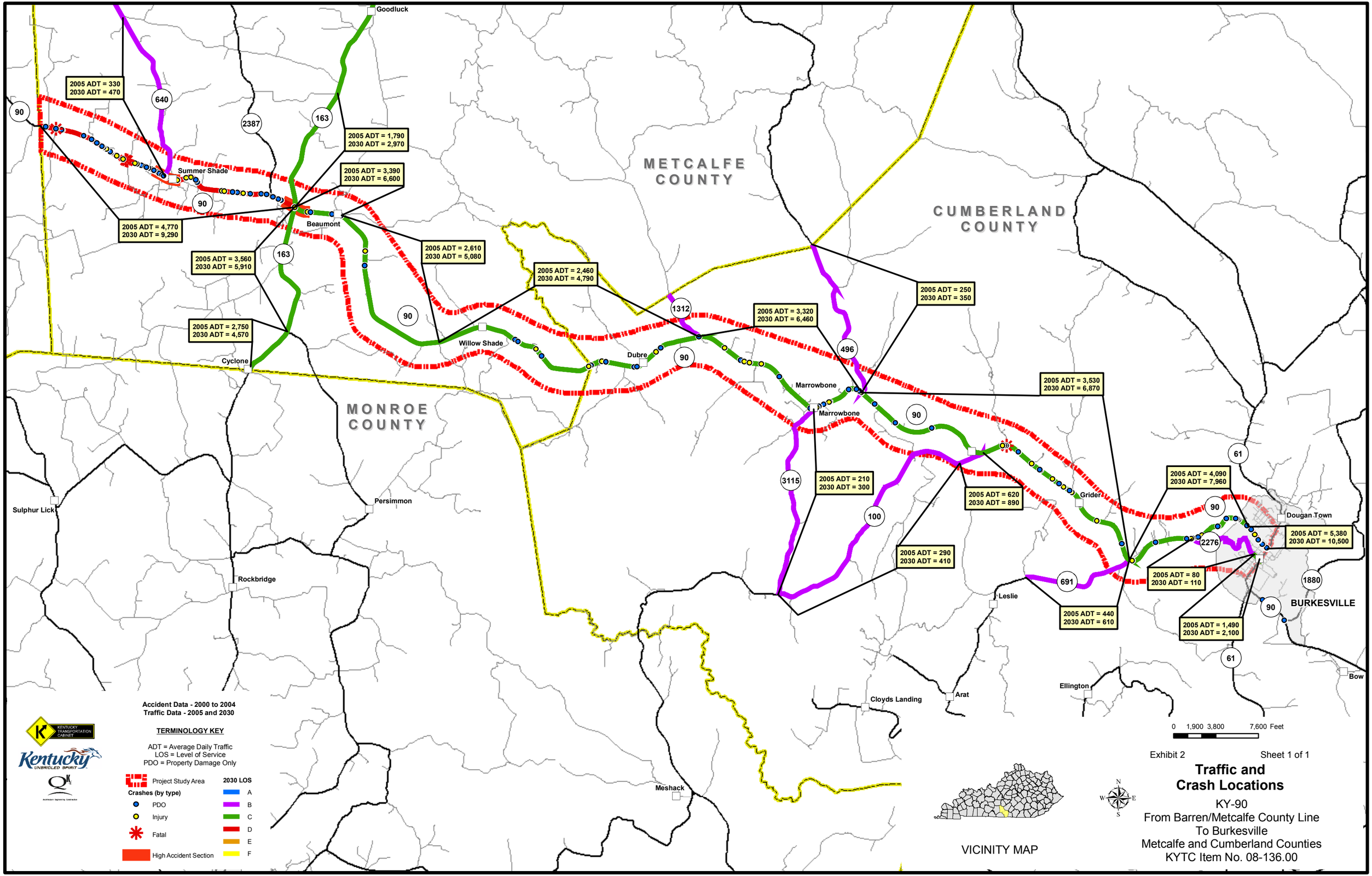
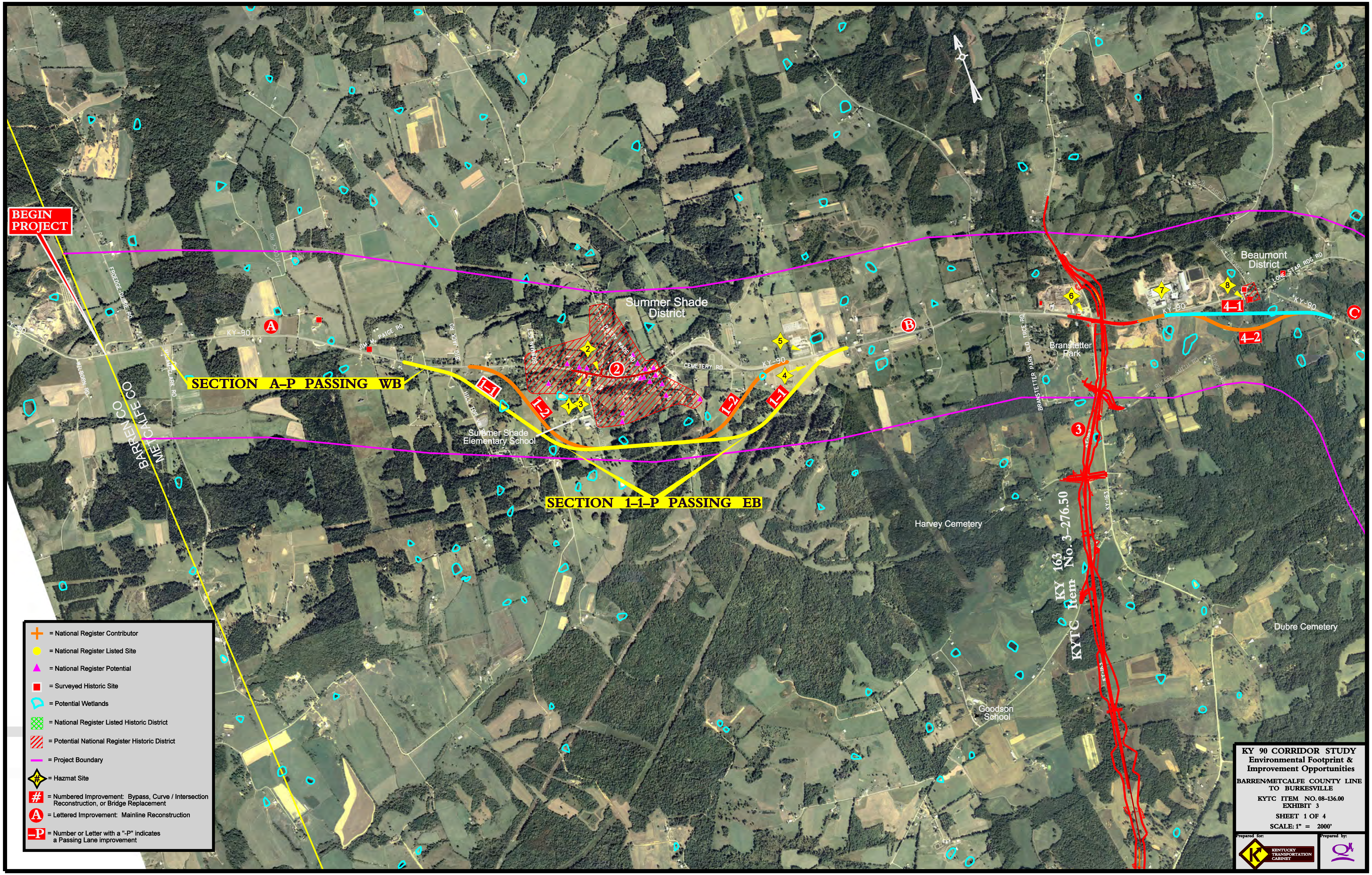
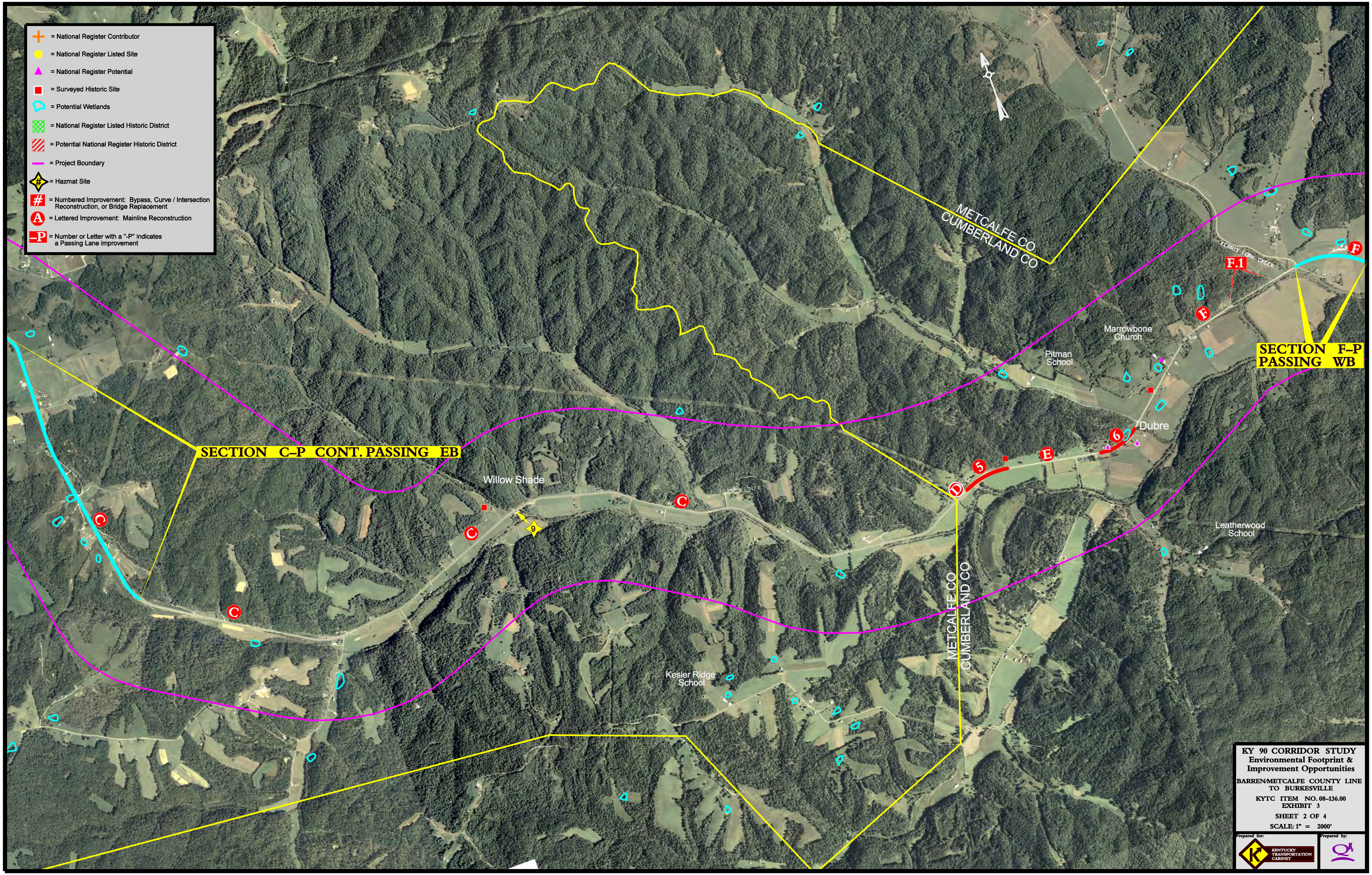


Exhibit 2 Sheet 1 of 1

Traffic and Crash Locations

KY-90
From Barren/Metcalfe County Line
To Burkesville
Metcalfe and Cumberland Counties
KYTC Item No. 08-136.00


BEGIN PROJECT
SECTION A–P PASSING WB
SECTION 1–1–P PASSING EB
Summer Shade District
Summer Shade Elementary School
Beaumont District
Branstetter Park
Harvey Cemetery
Dubre Cemetery
Goodson School
BARREN CO
METCALFE CO
KY-90
CEMETERY RD
KY 163
KYTC Item No. 3–276.50
1–1
1–2
4–1
4–2
= National Register Contributor
= National Register Listed Site
= National Register Potential
= Surveyed Historic Site
= Potential Wetlands
= National Register Listed Historic District
= Potential National Register Historic District
= Project Boundary
= Hazmat Site
= Numbered Improvement: Bypass, Curve / Intersection Reconstruction, or Bridge Replacement
= Lettered Improvement: Mainline Reconstruction
= Number or Letter with a "-P" indicates a Passing Lane improvement
KY 90 CORRIDOR STUDY
Environmental Footprint & Improvement Opportunities
BARREN/METCALFE COUNTY LINE TO BURKESVILLE
KYTC ITEM NO. 08-136.00
EXHIBIT 3
SHEET 1 OF 4
SCALE: 1" = 2000'
Prepared for:
KENTUCKY TRANSPORTATION CABINET
Prepared by:



= National Register Contributor
= National Register Listed Site
= National Register Potential
= Surveyed Historic Site
= Potential Wetlands
= National Register Listed Historic District
= Potential National Register Historic District
= Project Boundary
= Hazmat Site
= Numbered Improvement: Bypass, Curve / Intersection Reconstruction, or Bridge Replacement
= Lettered Improvement: Mainline Reconstruction
= Number or Letter with a "-P" indicates a Passing Lane improvement
METCALFE CO
CUMBERLAND CO
SECTION C–P CONT. PASSING EB
SECTION F–P PASSING WB
Willow Shade
Pitman School
Marrowbone Church
Dubre
Leatherwood School
Kesler Ridge School
F.1
F
E
D
C
5
6
9
KY 90 CORRIDOR STUDY
Environmental Footprint & Improvement Opportunities
BARREN/METCALFE COUNTY LINE TO BURKESVILLE
KYTC ITEM NO. 08–136.00
EXHIBIT 3
SHEET 2 OF 4
SCALE: 1" = 2000'
Prepared for:
KENTUCKY TRANSPORTATION CABINET
Prepared by:

SECTION 10–1–P PASSING WB

SECTION F–P CONT. PASSING WB

SECTION H–P PASSING EB

10–1

10–2

7–1

7–2

8.1

Marrowbone Historic District

Waterview District

Franklin Cemetery

Beech Grove School

Branham Cemetery

= National Register Contributor

= National Register Listed Site

= National Register Potential

= Surveyed Historic Site

= Potential Wetlands

= National Register Listed Historic District

= Potential National Register Historic District

= Project Boundary

= Hazmat Site

= Numbered Improvement: Bypass, Curve / Intersection Reconstruction, or Bridge Replacement

= Lettered Improvement: Mainline Reconstruction

= Number or Letter with a "-P" indicates a Passing Lane improvement

KY 90 CORRIDOR STUDY
Environmental Footprint & Improvement Opportunities

BARREN/METCALFE COUNTY LINE TO BURKESVILLE

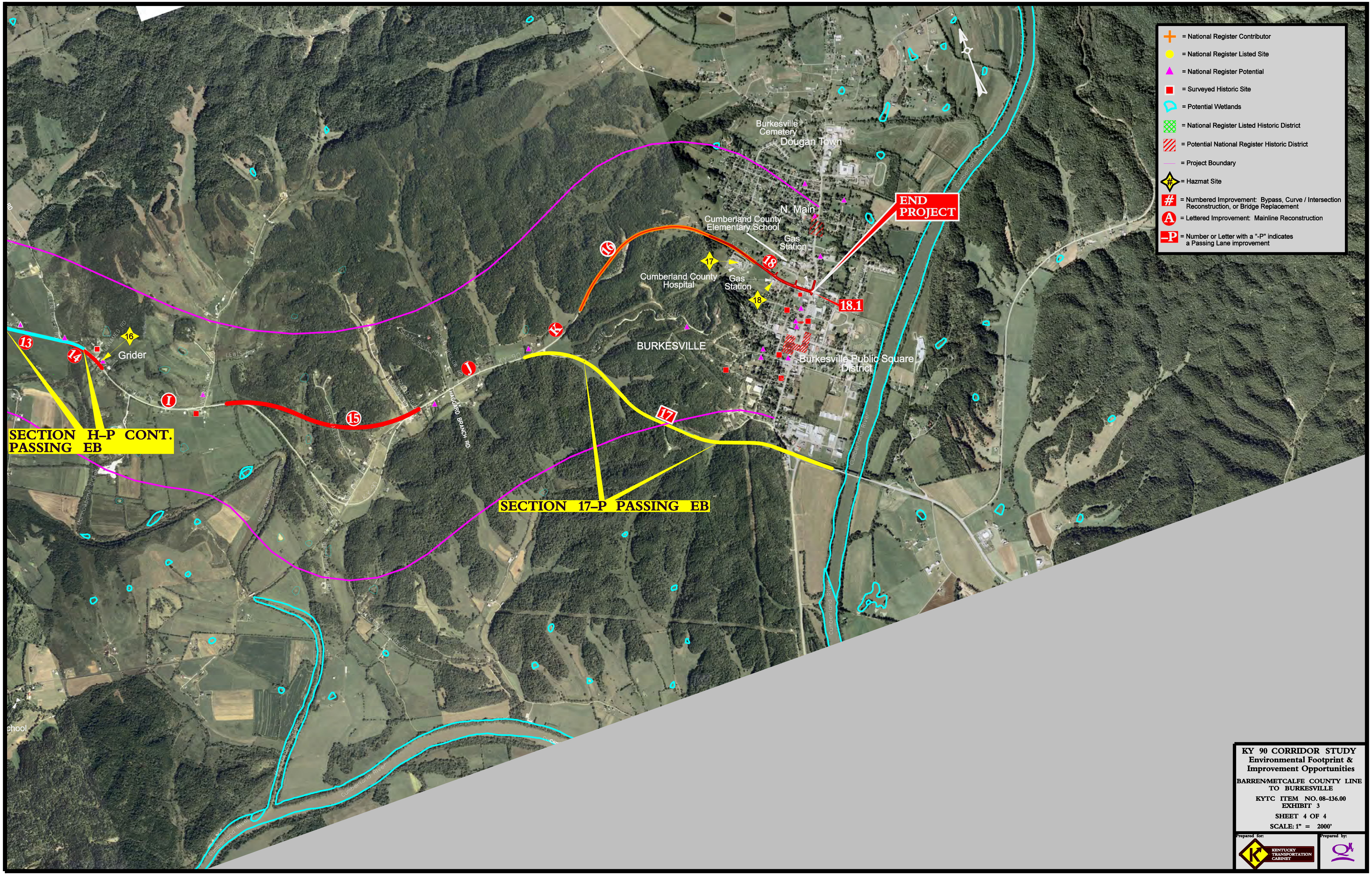
KYTC ITEM NO. 08-136.00
EXHIBIT 3

SHEET 3 OF 4

SCALE: 1" = 2000'

Prepared for: KENTUCKY TRANSPORTATION CABINET

Prepared by:


= National Register Contributor
= National Register Listed Site
= National Register Potential
= Surveyed Historic Site
= Potential Wetlands
= National Register Listed Historic District
= Potential National Register Historic District
= Project Boundary
= Hazmat Site
= Numbered Improvement: Bypass, Curve / Intersection Reconstruction, or Bridge Replacement
= Lettered Improvement: Mainline Reconstruction
= Number or Letter with a "-P" indicates a Passing Lane improvement
Burkesville Cemetery
Dougan Town
N. Main
Cumberland County Elementary School
Gas Station
END PROJECT
Cumberland County Hospital
Gas Station
18.1
BURKESVILLE
Burkesville Public Square District
Grider
SECTION H–P CONT.
PASSING EB
SECTION 17–P PASSING EB
13
14
16
I
15
J
K
16
17
18
17
18
chool

KY 90 CORRIDOR STUDY
Environmental Footprint &
Improvement Opportunities

BARREN/METCALFE COUNTY LINE
TO BURKESVILLE

KYTC ITEM NO. 08–136.00
EXHIBIT 3

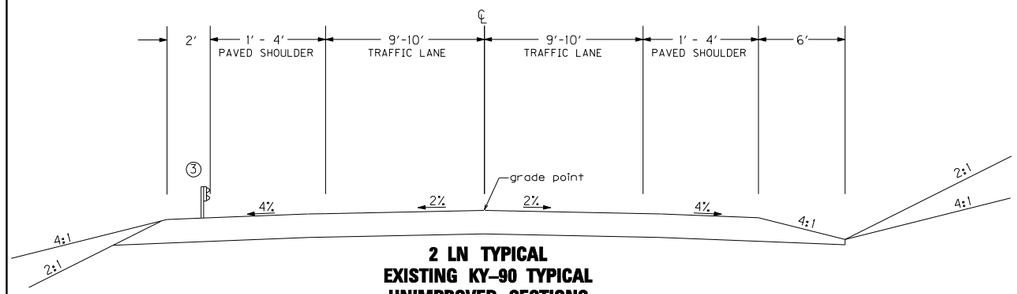
SHEET 4 OF 4

SCALE: 1” = 2000’

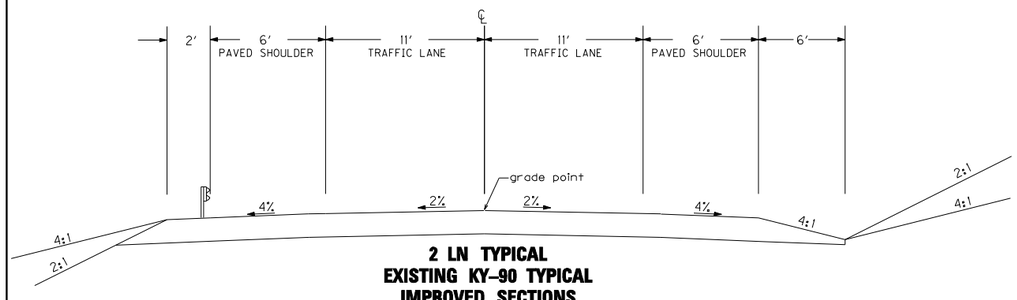
Prepared for: KENTUCKY TRANSPORTATION CABINET

Prepared by:

KY–90 EXISTING TYPICAL SECTIONS



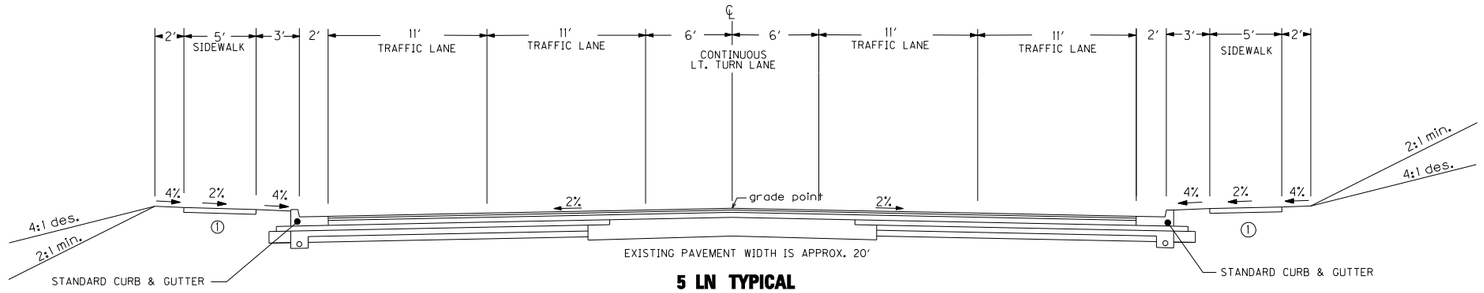
2 LN TYPICAL
EXISTING KY–90 TYPICAL
UNIMPROVED SECTIONS



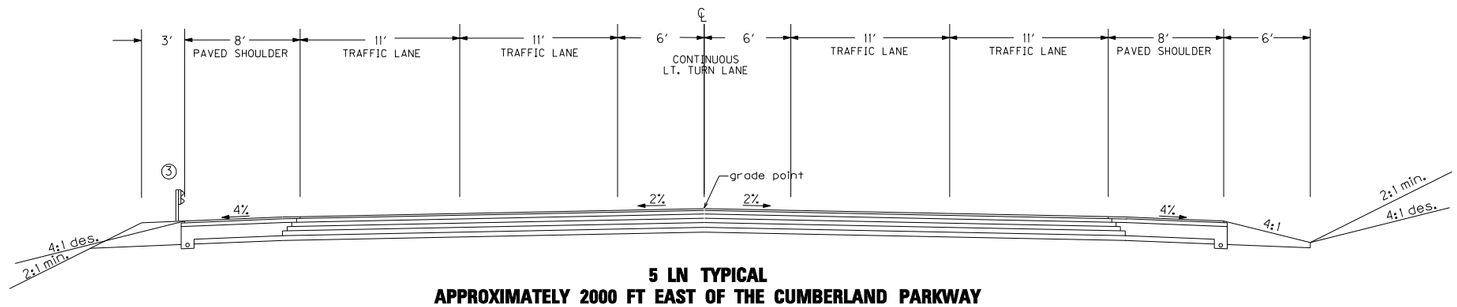
2 LN TYPICAL
EXISTING KY–90 TYPICAL
IMPROVED SECTIONS

BARREN COUNTY TYPICAL SECTIONS

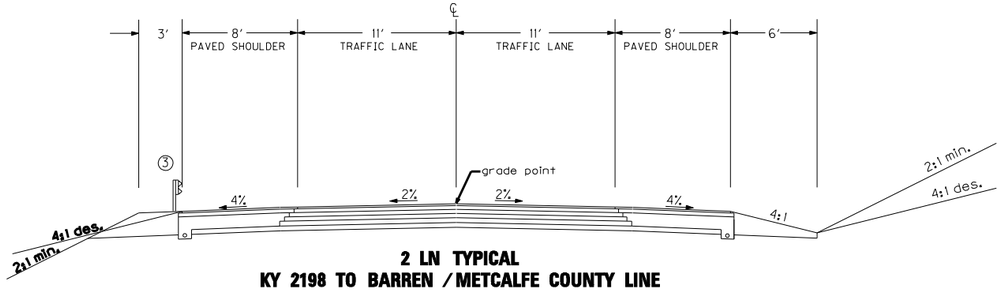
(IN DESIGN)



5 LN TYPICAL
LOUIE B. NUNN (CUMBERLAND) PARKWAY INTERCHANGE
TO APPROXIMATELY 2000 FT EAST OF THE LOUIE B. NUNN (CUMBERLAND) PARKWAY



5 LN TYPICAL
APPROXIMATELY 2000 FT EAST OF THE CUMBERLAND PARKWAY
TO KY 2198



2 LN TYPICAL
KY 2198 TO BARREN / METCALFE COUNTY LINE

Exhibit 4 Sheet 1 of 1

Appendix B

Photographs of Study Area

Photo 1

Typical section of KY 90 eastbound near Barren-Metcalfe County Line. Narrow lanes and shoulders, steep sides, limited visibility and passing opportunities.

Photo 2

Typical KY 90 pavement edge west of Summer Shade.

Photo 3

Eastbound KY 90 at Summer Shade town limits. Posted speed limit is 35 mph through town.

Photo 4

KY 90 in west Summer Shade with typical truck traffic.

Photo 5

KY 90 in west Summer Shade with exposed culvert near pavement edge.

Photo 6

Eastbound KY 90 approaching Summer Shade.

Photo 7

Eastbound KY 90 approaching KY 640 in Summer Shade.

Photo 8

Possible contamination site number 1 in Summer Shade.

Photo 9

Eastbound KY 90 at KY 640 intersection in Summer Shade.

Photo 10

Westbound KY 90 at KY 640 intersection in Summer Shade. Possible contamination site number 2 in northwest corner.

Photo 11

Westbound KY 90 near Summer Shade eastern limits.

Photo 12

Typical section of westbound KY 90 east of Summer Shade.

Photo 13

Electric substation (possible contamination site number 5) west of KY 163.

Photo 14

Eastbound KY 90 approaching KY 163 intersection.

Photo 15

Northbound KY 163 at KY 90 intersection. KY 163 has center left turn lane. Flashing overhead traffic lights at intersection, with stop signs for KY 163 traffic.

Photo 16

KY 90 / KY 163 intersection looking northwest. Possible contamination site number 6 in northwest corner.

Photo 17

KY 90 / KY 163 intersection looking north, showing flashing traffic lights.

Photo 18

KY 90 eastbound at KY 163 intersection. Westbound KY 90 has center left turn lane.

Photo 19

KY 90 / KY 163 intersection looking southwest. Possible contamination site number 6 in northwest corner.

Photo 20

Eastbound KY 90 at Lone Star Ridge Road in Beaumont showing curve and limited visibility. Small cemetery on right.

Photo 21

Westbound KY 90 east of Beaumont showing improved typical section with a passing lane.

Photo 22

Eastbound KY 90 west of Willow Shade showing improved typical section.

Photo 23

Eastbound KY 90 at the Metcalfe-Cumberland county line. Typical section with reduced speed curve in background.

Photo 24

Westbound KY 90 near Marrowbone western town limits. Marrowbone Creek on left, rock cut on right, reduced speed curves in background.

Photo 25

Quick Mart (possible contamination site number 10) in Marrowbone.

Photo 26

Eastbound KY 90 exiting Marrowbone. Area prone to flooding. Marrowbone Creek on right, sharp curve leading to Wisdom Creek Bridge in background.

Photo 27

Eastbound KY 90 exiting Marrowbone showing Marrowbone Creek and floodplain.

Photo 28

KY 90 at Wisdom Creek Bridge.

Photo 29

Wisdom Creek Bridge and KY 90.

Photo 30

Eastbound KY 90 approaching KY 100 intersection. Sharp curve, limited visibility, KY 100 intersects at an oblique angle.

Photo 31

Westbound KY 90 and KY 100 intersection. Sharp curve, limited visibility, KY 100 intersects at an oblique angle.

Photo 32

Westbound KY 90 at Dutch Creek Bridge.

Photo 33

Westbound KY 90 at Dutch Creek Bridge. Sharp curve, limited visibility.

Photo 34

Dutch Creek Bridge and KY 90.

Photo 35

KY 90 at Allen Creek Bridge.

Photo 36

Allen Creek Bridge and KY 90.

Photo 37

Typical section of eastbound KY 90 west of Grider. Sharp curve in background.

Photo 38

Westbound KY 90 east of Norris Branch Road. Sharp curve shows evidence of recent crash into guardrail. Left side drops off sharply to Marrowbone Creek floodplain.

Photo 39

Eastbound KY 90, looking uphill from site in Photo 37.

Photo 40

Eastbound KY 90 approach to KY 691 intersection. Sharp curve, downhill, limited visibility.

Photo 41

Westbound KY 90 approach to KY 691 intersection. Sharp curve, uphill, limited visibility.

Photo 42

Eastbound KY 90 approach to Burkesville Hill Road/Saw Mill Cut. Sharp curve, uphill, limited visibility.

Photo 43

Westbound KY 90 on Burkesville Hill.

Photo 44

Westbound KY 90 on Burkesville Hill.

Photo 45

Westbound KY 90 on Burkesville Hill.
Sharp curve, deep rock cuts.

Photo 46

Westbound KY 90 on Burkesville Hill. Deep rock cuts.

Photo 47

Westbound KY 90 on Burkesville Hill. Sharp curve, deep rock cuts.

Photo 48

Westbound KY 90 near KY 61 intersection in Burkesville.

Photo 49

Westbound KY 90 at elementary school entrance near KY 61 intersection at 4:00 pm. Traffic backup extends from school building main entrance, back along drive, and out onto KY 90.

Photo 50

Eastbound KY 90 at KY 61 intersection in Burkesville.

Photo 51

Southbound KY 61 at the KY 90 intersection in Burkesville.

Appendix C

KY 90 Crash Analysis

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
KY 90, Metcalfe County																		
0.000	**11.719**	**11.719**	**3,460**	**2**	**R**	**239.00**	**3**	**62**	**65**	**130**	**6.3145**	**0.740**	**4.05**	**83.78**	**87.84**	**175.68**	**285.97**	**0.61**
0.000	0.300	0.300	4,680	2	R	0.72	1	5	2	8	8.541	0.026	0.12	0.59	0.23	0.94	1.53	0.61
0.100	0.400	0.300	4,680	2	R	0.72	1	5	5	11	8.541	0.026	0.12	0.59	0.59	1.29	1.53	0.84
0.200	0.500	0.300	4,680	2	R	0.72	1	5	4	10	8.541	0.026	0.12	0.59	0.47	1.17	1.53	0.77
0.300	0.600	0.300	4,680	2	R	0.72	0	0	3	3	8.541	0.026	0.00	0.00	0.35	0.35	1.53	0.23
0.400	0.700	0.300	4,680	2	R	0.72	0	0	0	0	8.541	0.026	0.00	0.00	0.00	0.00	1.53	0.00
0.500	0.800	0.300	4,680	2	R	0.72	0	0	1	1	8.541	0.026	0.00	0.00	0.12	0.12	1.53	0.08
0.600	0.900	0.300	4,680	2	R	0.72	0	0	1	1	8.541	0.026	0.00	0.00	0.12	0.12	1.53	0.08
0.700	1.000	0.300	4,680	2	R	0.72	0	0	2	2	8.541	0.026	0.00	0.00	0.23	0.23	1.53	0.15
0.800	1.100	0.300	4,680	2	R	0.72	0	0	2	2	8.541	0.026	0.00	0.00	0.23	0.23	1.53	0.15
0.900	1.200	0.300	4,680	2	R	0.72	0	0	4	4	8.541	0.026	0.00	0.00	0.47	0.47	1.53	0.31
1.000	1.300	0.300	4,680	2	R	0.72	0	1	3	4	8.541	0.026	0.00	0.12	0.35	0.47	1.53	0.31
1.100	1.400	0.300	4,680	2	R	0.72	0	1	7	8	8.541	0.026	0.00	0.12	0.82	0.94	1.53	0.61
1.200	1.500	0.300	4,680	2	R	0.72	0	2	5	7	8.541	0.026	0.00	0.23	0.59	0.82	1.53	0.54
1.300	1.600	0.300	4,680	2	R	0.72	1	2	5	8	8.541	0.026	0.12	0.23	0.59	0.94	1.53	0.61
1.400	1.700	0.300	4,680	2	R	0.72	2	6	0	8	8.541	0.026	0.23	0.70	0.00	0.94	1.53	0.61
1.500	1.800	0.300	4,680	2	R	0.72	2	6	0	8	8.541	0.026	0.23	0.70	0.00	0.94	1.53	0.61
1.600	1.900	0.300	4,680	2	R	0.72	1	6	1	8	8.541	0.026	0.12	0.70	0.12	0.94	1.53	0.61
1.700	2.000	0.300	4,680	2	R	0.72	0	2	5	7	8.541	0.026	0.00	0.23	0.59	0.82	1.53	0.54
1.800	2.100	0.300	4,680	2	R	0.72	0	2	7	9	8.541	0.026	0.00	0.23	0.82	1.05	1.53	0.69
1.900	2.200	0.300	4,680	2	R	0.72	0	1	8	9	8.541	0.026	0.00	0.12	0.94	1.05	1.53	0.69
2.000	2.300	0.300	4,680	2	R	0.72	0	1	9	10	8.541	0.026	0.00	0.12	1.05	1.17	1.53	0.77
vicinity KY 640 at mp 2.312 in Summershade																		
2.100	2.400	0.300	4,680	2	R	0.72	0	2	12	14	8.541	0.026	0.00	0.23	1.40	1.64	1.53	**1.07**
2.200	2.500	0.300	4,680	2	R	0.72	0	2	11	13	8.541	0.026	0.00	0.23	1.29	1.52	1.53	**1.00**
2.300	2.600	0.300	4,680	2	R	0.72	0	9	9	18	8.541	0.026	0.00	1.05	1.05	2.11	1.53	**1.38**
2.400	2.700	0.300	4,680	2	R	0.72	0	7	4	11	8.541	0.026	0.00	0.82	0.47	1.29	1.53	0.84
2.500	2.800	0.300	4,680	2	R	0.72	0	8	3	11	8.541	0.026	0.00	0.94	0.35	1.29	1.53	0.84
2.600	2.900	0.300	4,680	2	R	0.72	0	3	0	3	8.541	0.026	0.00	0.35	0.00	0.35	1.53	0.23
2.700	3.000	0.300	4,680	2	R	0.72	0	3	2	5	8.541	0.026	0.00	0.35	0.23	0.59	1.53	0.38
2.800	3.100	0.300	4,680	2	R	0.72	0	2	2	4	8.541	0.026	0.00	0.23	0.23	0.47	1.53	0.31
2.900	3.200	0.300	4,680	2	R	0.72	0	0	2	2	8.541	0.026	0.00	0.00	0.23	0.23	1.53	0.15
3.000	3.300	0.300	4,680	2	R	0.72	0	0	0	0	8.541	0.026	0.00	0.00	0.00	0.00	1.53	0.00
3.100	3.400	0.300	4,680	2	R	0.72	0	0	0	0	8.541	0.026	0.00	0.00	0.00	0.00	1.53	0.00
3.200	3.500	0.300	4,680	2	R	0.72	0	5	0	5	8.541	0.026	0.00	0.59	0.00	0.59	1.53	0.38
3.300	3.600	0.300	4,680	2	R	0.72	0	5	0	5	8.541	0.026	0.00	0.59	0.00	0.59	1.53	0.38
3.400	3.700	0.300	4,680	2	R	0.72	0	5	1	6	8.541	0.026	0.00	0.59	0.12	0.70	1.53	0.46
3.500	3.800	0.300	4,680	2	R	0.72	0	0	2	2	8.541	0.026	0.00	0.00	0.23	0.23	1.53	0.15
3.600	3.900	0.300	4,680	2	R	0.72	0	2	2	4	8.541	0.026	0.00	0.23	0.23	0.47	1.53	0.31
3.700	4.000	0.300	4,680	2	R	0.72	0	2	2	4	8.541	0.026	0.00	0.23	0.23	0.47	1.53	0.31
3.800	4.100	0.300	4,680	2	R	0.72	0	2	1	3	8.541	0.026	0.00	0.23	0.12	0.35	1.53	0.23
3.900	4.200	0.300	4,680	2	R	0.72	0	0	2	2	8.541	0.026	0.00	0.00	0.23	0.23	1.53	0.15
4.000	4.300	0.300	4,680	2	R	0.72	0	0	3	3	8.541	0.026	0.00	0.00	0.35	0.35	1.53	0.23

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
4.100	4.400	0.300	4,680	2	R	0.72	0	0	7	7	8.541	0.026	0.00	0.00	0.82	0.82	1.53	0.54
4.200	4.500	0.300	4,680	2	R	0.72	0	0	8	8	8.541	0.026	0.00	0.00	0.94	0.94	1.53	0.61
4.300	4.600	0.300	4,680	2	R	0.72	0	0	6	6	8.541	0.026	0.00	0.00	0.70	0.70	1.53	0.46
4.400	4.700	0.300	4,680	2	R	0.72	0	0	2	2	8.541	0.026	0.00	0.00	0.23	0.23	1.53	0.15
vicinity KY 163 at mp 4.721																		
4.500	4.800	0.300	4,680	2	R	0.72	0	23	5	28	8.541	0.026	0.00	2.69	0.59	3.28	1.53	**2.15**
4.600	4.900	0.300	3,200	2	R	0.72	0	23	5	28	5.84	0.018	0.00	3.94	0.86	4.79	1.71	**2.80**
4.700	5.000	0.300	3,200	2	R	0.72	0	25	5	30	5.84	0.018	0.00	4.28	0.86	5.14	1.71	**3.00**
4.800	5.100	0.300	3,200	2	R	0.72	0	2	1	3	5.84	0.018	0.00	0.34	0.17	0.51	1.71	0.30
4.900	5.200	0.300	3,200	2	R	0.72	0	2	1	3	5.84	0.018	0.00	0.34	0.17	0.51	1.71	0.30
5.000	5.300	0.300	3,200	2	R	0.72	0	0	1	1	5.84	0.018	0.00	0.00	0.17	0.17	1.71	0.10
5.100	5.400	0.300	3,200	2	R	0.72	0	0	0	0	5.84	0.018	0.00	0.00	0.00	0.00	1.71	0.00
5.200	5.500	0.300	3,200	2	R	0.72	0	0	1	1	5.84	0.018	0.00	0.00	0.17	0.17	1.71	0.10
vicinity Lone Star Ridge Road at mp 5.554																		
5.300	5.600	0.300	3,200	2	R	0.72	0	0	3	3	5.84	0.018	0.00	0.00	0.51	0.51	1.71	0.30
5.400	5.700	0.300	3,200	2	R	0.72	0	0	3	3	5.84	0.018	0.00	0.00	0.51	0.51	1.71	0.30
5.500	5.800	0.300	3,200	2	R	0.72	0	0	2	2	5.84	0.018	0.00	0.00	0.34	0.34	1.71	0.20
5.600	5.900	0.300	3,200	2	R	0.72	0	0	0	0	5.84	0.018	0.00	0.00	0.00	0.00	1.71	0.00
5.700	6.000	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
5.800	6.100	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
5.900	6.200	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
6.000	6.300	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
6.100	6.400	0.300	2,620	2	R	0.72	0	1	0	1	4.7815	0.014	0.00	0.21	0.00	0.21	1.82	0.11
vicinity Martin Cemetery Road at mp 6.468																		
6.200	6.500	0.300	2,620	2	R	0.72	0	1	0	1	4.7815	0.014	0.00	0.21	0.00	0.21	1.82	0.11
6.300	6.600	0.300	2,620	2	R	0.72	0	1	1	2	4.7815	0.014	0.00	0.21	0.21	0.42	1.82	0.23
6.400	6.700	0.300	2,620	2	R	0.72	0	0	1	1	4.7815	0.014	0.00	0.00	0.21	0.21	1.82	0.11
6.500	6.800	0.300	2,620	2	R	0.72	0	0	1	1	4.7815	0.014	0.00	0.00	0.21	0.21	1.82	0.11
6.600	6.900	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
6.700	7.000	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
6.800	7.100	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
6.900	7.200	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.000	7.300	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.100	7.400	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.200	7.500	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.300	7.600	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.400	7.700	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.500	7.800	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.600	7.900	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.700	8.000	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.800	8.100	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
7.900	8.200	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.000	8.300	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.100	8.400	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
8.200	8.500	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.300	8.600	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.400	8.700	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.500	8.800	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.600	8.900	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.700	9.000	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.800	9.100	0.300	2,620	2	R	0.72	0	0	0	0	4.7815	0.014	0.00	0.00	0.00	0.00	1.82	0.00
8.900	9.200	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.000	9.300	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.100	9.400	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.200	9.500	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.300	9.600	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.400	9.700	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.500	9.800	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.600	9.900	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.700	10.000	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.800	10.100	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
9.900	10.200	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
vicinity Slate Creek Bridge at 10.258																		
10.000	10.300	0.300	2,500	2	R	0.72	0	0	2	2	4.5625	0.014	0.00	0.00	0.44	0.44	1.85	0.24
10.100	10.400	0.300	2,500	2	R	0.72	0	0	2	2	4.5625	0.014	0.00	0.00	0.44	0.44	1.85	0.24
10.200	10.500	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
10.300	10.600	0.300	2,500	2	R	0.72	0	1	0	1	4.5625	0.014	0.00	0.22	0.00	0.22	1.85	0.12
10.400	10.700	0.300	2,500	2	R	0.72	0	1	0	1	4.5625	0.014	0.00	0.22	0.00	0.22	1.85	0.12
10.500	10.800	0.300	2,500	2	R	0.72	0	1	1	2	4.5625	0.014	0.00	0.22	0.22	0.44	1.85	0.24
10.600	10.900	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
10.700	11.000	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
10.800	11.100	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
10.900	11.200	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
11.000	11.300	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
11.100	11.400	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
11.200	11.500	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
11.300	11.600	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
11.400	11.700	0.300	2,500	2	R	0.72	0	1	0	1	4.5625	0.014	0.00	0.22	0.00	0.22	1.85	0.12
11.500	11.800	0.300	2,500	2	R	0.72	0	1	0	1	4.5625	0.014	0.00	0.22	0.00	0.22	1.85	0.12

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
KY 90, Cumberland County																		
0.000	**15.000**	**15.000**	**3,760**	**2**	**R**	**239.00**	**1**	**48**	**58**	**107**	**6.862**	**1.029**	**0.97**	**46.63**	**56.35**	**103.95**	**278.74**	**0.37**
0.000	0.300	0.300	2,500	2	R	0.72	0	2	5	7	4.5625	0.014	0.00	0.44	1.10	1.53	1.85	0.83
0.100	0.400	0.300	2,500	2	R	0.72	0	2	1	3	4.5625	0.014	0.00	0.44	0.22	0.66	1.85	0.35
0.200	0.500	0.300	2,500	2	R	0.72	0	2	1	3	4.5625	0.014	0.00	0.44	0.22	0.66	1.85	0.35
0.300	0.600	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
0.400	0.700	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
0.500	0.800	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
0.600	0.900	0.300	2,500	2	R	0.72	0	0	2	2	4.5625	0.014	0.00	0.00	0.44	0.44	1.85	0.24
0.700	1.000	0.300	2,500	2	R	0.72	0	0	4	4	4.5625	0.014	0.00	0.00	0.88	0.88	1.85	0.47
0.800	1.100	0.300	2,500	2	R	0.72	0	0	3	3	4.5625	0.014	0.00	0.00	0.66	0.66	1.85	0.35
0.900	1.200	0.300	2,500	2	R	0.72	0	0	2	2	4.5625	0.014	0.00	0.00	0.44	0.44	1.85	0.24
1.000	1.300	0.300	2,500	2	R	0.72	0	2	0	2	4.5625	0.014	0.00	0.44	0.00	0.44	1.85	0.24
1.100	1.400	0.300	2,500	2	R	0.72	0	2	1	3	4.5625	0.014	0.00	0.44	0.22	0.66	1.85	0.35
1.200	1.500	0.300	2,500	2	R	0.72	0	2	1	3	4.5625	0.014	0.00	0.44	0.22	0.66	1.85	0.35
1.300	1.600	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
1.400	1.700	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
1.500	1.800	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
1.600	1.900	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
1.700	2.000	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
1.800	2.100	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
1.900	2.200	0.300	2,500	2	R	0.72	0	0	1	1	4.5625	0.014	0.00	0.00	0.22	0.22	1.85	0.12
2.000	2.300	0.300	2,500	2	R	0.72	0	0	0	0	4.5625	0.014	0.00	0.00	0.00	0.00	1.85	0.00
2.100	2.400	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
2.200	2.500	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
2.300	2.600	0.300	3,380	2	R	0.72	0	1	0	1	6.1685	0.019	0.00	0.16	0.00	0.16	1.68	0.10
2.400	2.700	0.300	3,380	2	R	0.72	0	1	0	1	6.1685	0.019	0.00	0.16	0.00	0.16	1.68	0.10
2.500	2.800	0.300	3,380	2	R	0.72	0	1	0	1	6.1685	0.019	0.00	0.16	0.00	0.16	1.68	0.10
2.600	2.900	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
vicinity Redwood Drive at mp 3.011 and Hominy Creek Road at mp 3.104																		
2.700	3.000	0.300	3,380	2	R	0.72	0	4	1	5	6.1685	0.019	0.00	0.65	0.16	0.81	1.68	0.48
2.800	3.100	0.300	3,380	2	R	0.72	0	7	2	9	6.1685	0.019	0.00	1.13	0.32	1.46	1.68	0.87
2.900	3.200	0.300	3,380	2	R	0.72	0	7	1	8	6.1685	0.019	0.00	1.13	0.16	1.30	1.68	0.77
3.000	3.300	0.300	3,380	2	R	0.72	0	4	1	5	6.1685	0.019	0.00	0.65	0.16	0.81	1.68	0.48
3.100	3.400	0.300	3,380	2	R	0.72	0	1	0	1	6.1685	0.019	0.00	0.16	0.00	0.16	1.68	0.10
3.200	3.500	0.300	3,380	2	R	0.72	0	1	0	1	6.1685	0.019	0.00	0.16	0.00	0.16	1.68	0.10
3.300	3.600	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
3.400	3.700	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
3.500	3.800	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
3.600	3.900	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
3.700	4.000	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
3.800	4.100	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
3.900	4.200	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
4.000	4.300	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
4.100	4.400	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
vicinity KY 3115 at mp 4.415 in Marrowbone																		
4.200	4.500	0.300	3,380	2	R	0.72	0	1	1	2	6.1685	0.019	0.00	0.16	0.16	0.32	1.68	0.19
4.300	4.600	0.300	3,380	2	R	0.72	0	1	2	3	6.1685	0.019	0.00	0.16	0.32	0.49	1.68	0.29
4.400	4.700	0.300	3,380	2	R	0.72	0	1	2	3	6.1685	0.019	0.00	0.16	0.32	0.49	1.68	0.29
4.500	4.800	0.300	3,380	2	R	0.72	0	1	3	4	6.1685	0.019	0.00	0.16	0.49	0.65	1.68	0.39
4.600	4.900	0.300	3,380	2	R	0.72	0	1	2	3	6.1685	0.019	0.00	0.16	0.32	0.49	1.68	0.29
4.700	5.000	0.300	3,380	2	R	0.72	0	1	1	2	6.1685	0.019	0.00	0.16	0.16	0.32	1.68	0.19
4.800	5.100	0.300	3,380	2	R	0.72	0	0	0	0	6.1685	0.019	0.00	0.00	0.00	0.00	1.68	0.00
4.900	5.200	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
vicinity Wisdom Creek Bridge at mp 5.314 and KY 496 at mp 5.337																		
5.000	5.300	0.300	3,380	2	R	0.72	0	0	3	3	6.1685	0.019	0.00	0.00	0.49	0.49	1.68	0.29
5.100	5.400	0.300	3,380	2	R	0.72	0	4	4	8	6.1685	0.019	0.00	0.65	0.65	1.30	1.68	0.77
5.200	5.500	0.300	3,380	2	R	0.72	0	4	3	7	6.1685	0.019	0.00	0.65	0.49	1.13	1.68	0.68
5.300	5.600	0.300	3,380	2	R	0.72	0	4	1	5	6.1685	0.019	0.00	0.65	0.16	0.81	1.68	0.48
5.400	5.700	0.300	3,380	2	R	0.72	0	0	1	1	6.1685	0.019	0.00	0.00	0.16	0.16	1.68	0.10
5.500	5.800	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
5.600	5.900	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
5.700	6.000	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
5.800	6.100	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
5.900	6.200	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
6.000	6.300	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
6.100	6.400	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
6.200	6.500	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
6.300	6.600	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
6.400	6.700	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
6.500	6.800	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
6.600	6.900	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
6.700	7.000	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
6.800	7.100	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
6.900	7.200	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.000	7.300	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.100	7.400	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.200	7.500	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.300	7.600	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.400	7.700	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.500	7.800	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
vicinity KY 100 at mp 7.839																		
7.600	7.900	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.700	8.000	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.800	8.100	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
7.900	8.200	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
vicinity Dutch Creek Bridge at mp 8.229																		
8.000	8.300	0.300	3,700	2	R	0.72	1	2	2	5	6.7525	0.020	0.15	0.30	0.30	0.74	1.64	0.45
8.100	8.400	0.300	3,700	2	R	0.72	1	2	2	5	6.7525	0.020	0.15	0.30	0.30	0.74	1.64	0.45
8.200	8.500	0.300	3,700	2	R	0.72	1	2	2	5	6.7525	0.020	0.15	0.30	0.30	0.74	1.64	0.45
8.300	8.600	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
8.400	8.700	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
8.500	8.800	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
8.600	8.900	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
8.700	9.000	0.300	3,700	2	R	0.72	0	1	2	3	6.7525	0.020	0.00	0.15	0.30	0.44	1.64	0.27
8.800	9.100	0.300	3,700	2	R	0.72	0	1	2	3	6.7525	0.020	0.00	0.15	0.30	0.44	1.64	0.27
8.900	9.200	0.300	3,700	2	R	0.72	0	0	2	2	6.7525	0.020	0.00	0.00	0.30	0.30	1.64	0.18
9.000	9.300	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
9.100	9.400	0.300	3,700	2	R	0.72	0	1	1	2	6.7525	0.020	0.00	0.15	0.15	0.30	1.64	0.18
vicinity Allen Creek Bridge at mp 9.481																		
9.200	9.500	0.300	3,700	2	R	0.72	0	2	1	3	6.7525	0.020	0.00	0.30	0.15	0.44	1.64	0.27
9.300	9.600	0.300	3,700	2	R	0.72	0	1	1	2	6.7525	0.020	0.00	0.15	0.15	0.30	1.64	0.18
9.400	9.700	0.300	3,700	2	R	0.72	0	3	1	4	6.7525	0.020	0.00	0.44	0.15	0.59	1.64	0.36
9.500	9.800	0.300	3,700	2	R	0.72	0	2	1	3	6.7525	0.020	0.00	0.30	0.15	0.44	1.64	0.27
9.600	9.900	0.300	3,700	2	R	0.72	0	2	1	3	6.7525	0.020	0.00	0.30	0.15	0.44	1.64	0.27
9.700	10.000	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
9.800	10.100	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
9.900	10.200	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
10.000	10.300	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
vicinity Norris Branch Road at mp 10.422																		
10.100	10.400	0.300	3,700	2	R	0.72	0	3	0	3	6.7525	0.020	0.00	0.44	0.00	0.44	1.64	0.27
10.200	10.500	0.300	3,700	2	R	0.72	0	3	0	3	6.7525	0.020	0.00	0.44	0.00	0.44	1.64	0.27
10.300	10.600	0.300	3,700	2	R	0.72	0	3	0	3	6.7525	0.020	0.00	0.44	0.00	0.44	1.64	0.27
10.400	10.700	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
10.500	10.800	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
10.600	10.900	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
10.700	11.000	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
10.800	11.100	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
10.900	11.200	0.300	3,700	2	R	0.72	0	0	1	1	6.7525	0.020	0.00	0.00	0.15	0.15	1.64	0.09
vicinity KY 691 at mp 11.273																		
11.000	11.300	0.300	3,700	2	R	0.72	0	0	0	0	6.7525	0.020	0.00	0.00	0.00	0.00	1.64	0.00
11.100	11.400	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
11.200	11.500	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
11.300	11.600	0.300	3,700	2	R	0.72	0	1	0	1	6.7525	0.020	0.00	0.15	0.00	0.15	1.64	0.09
11.400	11.700	0.300	4,430	2	R	0.72	0	0	0	0	8.0848	0.024	0.00	0.00	0.00	0.00	1.55	0.00
11.500	11.800	0.300	4,430	2	R	0.72	0	0	0	0	8.0848	0.024	0.00	0.00	0.00	0.00	1.55	0.00
11.600	11.900	0.300	4,430	2	R	0.72	0	0	1	1	8.0848	0.024	0.00	0.00	0.12	0.12	1.55	0.08
11.700	12.000	0.300	4,430	2	R	0.72	0	0	1	1	8.0848	0.024	0.00	0.00	0.12	0.12	1.55	0.08
11.800	12.100	0.300	4,430	2	R	0.72	0	0	1	1	8.0848	0.024	0.00	0.00	0.12	0.12	1.55	0.08
11.900	12.200	0.300	4,430	2	R	0.72	0	0	0	0	8.0848	0.024	0.00	0.00	0.00	0.00	1.55	0.00

KY 90 Crash Analysis, Metcalfe and Cumberland Counties

Begin MP	End MP	Length (miles)	Average ADT	Number Lanes	Rural / Urban	Functional Class Rate	Crashes				MV	HMVM	Rates per HMVM				Critical Rate	Critical Rate Factor[1]
							Fatal	Injury	PDO	Total			Fatal	Injury	PDO	Total		
12.000	12.300	0.300	4,430	2	R	0.72	0	0	0	0	8.0848	0.024	0.00	0.00	0.00	0.00	1.55	0.00
12.100	12.400	0.300	4,430	2	R	0.72	0	0	0	0	8.0848	0.024	0.00	0.00	0.00	0.00	1.55	0.00
vicinity KY 2276 at mp 12.477																		
12.200	12.500	0.300	4,430	2	R	0.72	0	2	1	3	8.0848	0.024	0.00	0.25	0.12	0.37	1.55	0.24
12.300	12.600	0.300	4,430	2	R	0.72	0	5	1	6	8.0848	0.024	0.00	0.62	0.12	0.74	1.55	0.48
12.400	12.700	0.300	4,430	2	R	0.72	0	8	2	10	8.0848	0.024	0.00	0.99	0.25	1.24	1.55	0.80
12.500	12.800	0.300	4,430	2	R	0.72	0	6	1	7	8.0848	0.024	0.00	0.74	0.12	0.87	1.55	0.56
12.600	12.900	0.300	4,430	2	R	0.72	0	3	1	4	8.0848	0.024	0.00	0.37	0.12	0.49	1.55	0.32
12.700	13.000	0.300	4,430	2	R	0.72	0	0	0	0	8.0848	0.024	0.00	0.00	0.00	0.00	1.55	0.00
12.800	13.100	0.300	4,430	2	R	0.72	0	0	1	1	8.0848	0.024	0.00	0.00	0.12	0.12	1.55	0.08
12.900	13.200	0.300	4,430	2	R	0.72	0	0	1	1	8.0848	0.024	0.00	0.00	0.12	0.12	1.55	0.08
13.000	13.300	0.300	4,430	2	R	0.72	0	0	2	2	8.0848	0.024	0.00	0.00	0.25	0.25	1.55	0.16
13.100	13.400	0.300	4,430	2	R	0.72	0	1	2	3	8.0848	0.024	0.00	0.12	0.25	0.37	1.55	0.24
13.200	13.500	0.300	4,430	2	R	0.72	0	1	5	6	8.0848	0.024	0.00	0.12	0.62	0.74	1.55	0.48
13.300	13.600	0.300	4,430	2	R	0.72	0	1	4	5	8.0848	0.024	0.00	0.12	0.49	0.62	1.55	0.40
13.400	13.700	0.300	4,430	2	R	0.72	0	0	4	4	8.0848	0.024	0.00	0.00	0.49	0.49	1.55	0.32
13.500	13.800	0.300	4,430	2	R	0.72	0	0	5	5	8.0848	0.024	0.00	0.00	0.62	0.62	1.55	0.40
13.600	13.900	0.300	4,430	2	R	0.72	0	1	5	6	8.0848	0.024	0.00	0.12	0.62	0.74	1.55	0.48
13.700	14.000	0.300	4,430	2	R	0.72	0	2	7	9	8.0848	0.024	0.00	0.25	0.87	1.11	1.55	0.72
13.800	14.100	0.300	6,100	2	R	0.72	0	2	6	8	11.133	0.033	0.00	0.18	0.54	0.72	1.42	0.51
vicinity KY 61 at mp 14.113																		
13.900	14.200	0.300	6,100	2	R	0.72	0	3	8	11	11.133	0.033	0.00	0.27	0.72	0.99	1.42	0.70
14.000	14.300	0.300	5,730	2	R	0.72	0	2	5	7	10.457	0.031	0.00	0.19	0.48	0.67	1.44	0.46
14.100	14.400	0.300	5,730	2	R	0.72	0	2	2	4	10.457	0.031	0.00	0.19	0.19	0.38	1.44	0.26
14.200	14.500	0.300	5,730	2	R	0.72	0	0	1	1	10.457	0.031	0.00	0.00	0.10	0.10	1.44	0.07
14.300	14.600	0.300	5,730	2	R	0.72	0	0	1	1	10.457	0.031	0.00	0.00	0.10	0.10	1.44	0.07
14.400	14.700	0.300	5,730	2	R	0.72	0	0	1	1	10.457	0.031	0.00	0.00	0.10	0.10	1.44	0.07
14.500	14.800	0.300	5,730	2	R	0.72	0	0	1	1	10.457	0.031	0.00	0.00	0.10	0.10	1.44	0.07
14.600	14.900	0.300	5,730	2	R	0.72	0	0	1	1	10.457	0.031	0.00	0.00	0.10	0.10	1.44	0.07
14.700	15.000	0.300	3,940	2	R	0.72	0	4	2	6	7.1905	0.022	0.00	0.56	0.28	0.83	1.60	0.52

Source: KYTC *Highway Information System* (HIS). Research period is January 2000 to December 2004.

[1] Critical Rate Factors that are statistically high are shaded as follows.

High crash locations (i.e., CRF equal to or greater than 1.00).

Potentially high crash locations (i.e., CRF equal to or greater than 0.90 and less than 1.00).

Appendix D

Project Team Meeting Minutes

MEETING MINUTES

Project:	Kentucky 90 Pre-Design Scoping Study, Item No. 8-136.00	
Purpose:	Project Team Meeting #1, Project Kick-off	
Place:	KYTC, District 8 Conference Room, Somerset	
Meeting Date:	July 17, 2003, 10:00 a.m.	
Prepared By:	Chad Snellen	
In Attendance:	David Martin	KYTC, Central Office, Division of Planning
	Danny Jewell	KYTC, District 8, Chief District Engineer
	Tom Clouse	KYTC, District 8, Planning
	Jeff Moore	KYTC, District 3, Planning
	Cathi Blair	KYTC, District 8, Environmental Coordinator
	Tammy Wilson	KYTC, District 8, Traffic
	Joe Cox	KYTC, District 8, Design
	David Beattie	KYTC, District 8, Preconstruction Engineer
	Russell Jones	KYTC, District 8, Operations
	Alvin Dodson	KYTC, District 8, Right of Way
	Alan Edwards	KYTC, District 8, Utilities
	Keirsten Jaggers	KYTC, District 3, Public Information Officer
	David Smith	Qk4, Vice President
	Bob Gustafson	Qk4, Senior Vice President
	Chad Snellen	Qk4, Transportation Engineer

To begin Mr. Smith, the facilitator of the project team meeting, asked all attendees to introduce themselves. Once the introductions concluded, Mr. Smith provided a brief description of the project. The proposed project, as described in the KYTC Six-Year involves studying the need for spot improvements to the section of KY 90 between Beaumont and Burkesville in Metcalfe (District 3) and Cumberland (District 8) Counties, a distance of approximately 25 miles. Improvements to this section of KY 90 could improve the east-west connection from Burkesville to Glasgow. Each attendee was given a folder that contained a meeting agenda, three handouts providing existing information pertaining to KY 90, and a paper copy of a PowerPoint presentation. Posted around the room were several graphics of the project study area, including a USGS map with the project corridor highlighted, a map depicting existing roadways with the corresponding traffic and accident data, and also an aerial photograph for the project area.

Following the project description, Mr. Smith used a PowerPoint presentation to conduct the meeting and generate open discussion of the agenda items (see attachment A).

Previous Studies. One general concern among the group was to find out who was responsible for pushing this project into the six-year plan and their expectations for this project. The consensus was no KY 90 specific studies have been conducted, however previous studies on other area roadways could provide helpful information on existing conditions and understanding transportation issues. Studies identified include:

- Improvements to KY 90 in District 3 west of the current project.
- KY 61 – Tom Clouse mentioned a section of KY 61 north of Burkesville.

Scope of Work. Mr. Smith went through the major elements of the Scope of Work, with a brief discussion of each:

1. Analyze Existing Highway Conditions
2. Prepare Environmental Overview/Footprint
3. Develop Project Goals
4. Identify Alternatives
5. Recommendations
6. Report
7. Public Involvement

Mr. Smith noted the Environmental Overview would consist primarily of a literature review, with limited fieldwork conducted. There was generally concern among the District 8 attendees, about possible historical districts along this section of KY 90 and how these properties may affect proposed improvements. Tom Clouse suggested that determining the boundaries of any historic properties would be helpful early in the design phase, in an attempt to reduce any unfeasible engineering efforts. David Beattie stated that a historic overview would not provide enough information. In some instances even widening may not be an option if historical boundaries are unknown. Tom Clouse asked what the additional cost would be for a study that included historical boundaries. Mr. Smith did not have that information available. District 8 and the Division of Planning continue to discuss what could be done concerning this issue.

Public involvement will be limited to two project team meetings, one local officials/stakeholders meeting, one public meeting and resource agency coordination.

Study Schedule. Mr. Smith presented the schedule, which is as follows:

- Environmental Overview Fall 2003
- Present Preliminary Alternatives Fall 2003
- Present Feasible Alternatives Winter 2003/2004
- Draft Report March 2004
- Final Report May 2004

Existing Conditions. Available HIS data, including traffic volumes, crashes, and the geometrics of major highways in Metcalfe and Cumberland Counties were presented in handouts. According to the Crash Analysis presented in Table 3 there is a high injury rate on KY 90 in Cumberland County, between mile points 5.15 and 5.337, as well as the KY 90 and KY 3115 intersection. All of KY 90 within the study area has sub-standard driving lanes and shoulder widths; and about 15 percent is rated at LOS B, 75 percent is rated LOS C, with the remainder at LOS E. Current traffic volumes range from 2,400 to 7,000 ADT, and are forecast to increase approximately 50 - 54 percent by the year 2030. Traffic volumes were forecasted by using the functional class of Rural Minor Arterial, a 20-year multiplier of 1.61, and an annual growth rate of 2.40%.

Issues, Problems/Needs. Mr. Smith led the group in a brainstorming exercise to identify project and planning issues, problems, needs, and opportunities using colored post-it notes. Mr. Smith re-iterated that input from team meeting attendees – especially those familiar with the area – was a critical source of information. The group's written comments generally fell into the following seven major categories:

- Geometric and Safety Issues
- Truck and Recreational Vehicles
- Historical and Environmental Issues
- Match Improvements West of Beaumont
- Community Impacts
- Expectations of Elected Officials and Community Leaders
- Economic Development

Mr. Smith commented that these categories and comments would be used to draft the study's first set of Goals and Objectives. The "safety" category generated the largest amount of responses, followed by "growth and economic development." He encouraged attendees to consult with their colleagues for additional issues, problems, and needs.

Alternatives. At this stage in the study it would be premature to propose any alternatives or potential solutions.

- Locations Identified for Further Study for Possible Spot Improvements:
    - Three to four narrow bridges that are in need of replacing. Water overtopping road at Wisdom Creek Bridge near KY 496 and Marrowbone Creek.
    - A review of the map plotting crash site locations indicated crash sites are not clustered together around specific high crash locations but, rather appear to be spaced along the roadway.
    - Reconstruct several curves that are currently signed for a 45 mph speed limit.
    - Cutting back high rock walls two miles East of Farris Fork Bridge, in Cumberland County.
    - Implement a solution to eliminate a high accident area around mile point 12.5 to 13.5 just past Old Burkesville Road.
    - Minimize impacts on possible historic districts around the small towns of Marrowbone and Summer Shade. Also consider impacts to local Amish Community and farms when considering possible alternatives.

- Bicycle/Pedestrian: It was noted that the typical section would accommodate bicycle facilities for cost estimation purposes. However, the planning study will not make a final determination of the cross-section of any recommended alternative. None of the attendees were immediately aware of any existing/designated bike paths/routes in the study area, however it was agreed additional research was warranted.

- Corridor Improvement

    - Some confusion about the extent or purpose of this project was also discovered because it is being referred to as a spot improvement project but money allocated is more closely related to that of a corridor improvement. Mr. Smith stated that Qk4 will study both spot improvements and corridor improvements, however the cost estimates for each will be on a per mile basis.

- Improvements to Existing Highways:
    - KY 90 West of Beaumont has recently been improved.

- No build alternative will also be investigated as a possible course of action.

Data Collection. Practical estimates for construction, utility, and right-of-way cost information for recent local projects will be used when compiling cost estimates when possible. David Martin will examine environmental justice, relocation, and real estate issues. Relocation and real estate issues will be addressed on the basis of countywide averages and general numbers.

Local Agency Coordination. It was agreed that local sheriffs, Clinton and Wayne County Judges as well as all other elected officials would be invited to the local officials meeting that is tentatively scheduled for August 28, 2003 at the community center (old school) in Marrowbone.

Follow-up and Next Steps. David Smith stated that the next Project Team Meeting (meeting #2) would be scheduled after the local officials meeting and public meeting, in an attempt to gather as much of the local communities expectations and comments as possible.

The meeting adjourned at approximately 11:45 am.

END OF MINUTES

File ID: 02403\KY 90\
File Name: \Meeting Minutes\KY 90 PTM #1 on 7-17-03.doc

ATTACHMENT A – AGENDA

Kentucky 90 Pre-Design Scoping Study
Project Team Meeting No. 1
Agenda

Date: **July 17, 2003**
Time: **10:00 AM**
Location: **KYTC District 8**
Somerset, KY

1. Introductions

2. Scope of Work
    a. Proposed Study Area
    b. Prior Studies/Reports
    c. Major Scope Elements
    d. Project Schedule

3. Existing Conditions (Preliminary Review)
    a. Highway Conditions
    b. Traffic Analysis
    c. Safety Analysis
    d. Environmental Footprint
    e. Environmental Justice Report

4. Project Issues and Goals
    a. Project Issues
    b. Project Problems/Needs

5. Alternative Development
    a. Do Nothing Beyond Existing and Committed
    b. Spot Improvements
    c. ITS Applications
    d. Bicycle/Pedestrian Considerations
    e. Improvements to Existing Highways
    f. New Road Construction
    g. Other

6. Data Collection
    a. Available Data
    b. New Data Collection
    c. Aerial Photography
    d. Real Estate/Relocation Information

7. Agency Coordination Needs

8. Follow-up and Next Steps

Architecture

Engineering

Construction

MEETING MINUTES

Project:	KY 90 Pre-Design Scoping Study	
Item Number	08-136.00	
Purpose:	Project Team Meeting	
Place:	Somerset, Kentucky, D8 Multi-Purpose Building	
Meeting Date:	April 17, 2006	
Prepared By:	William Crawford	
In Attendance:	Tom Clouse	KYTC, D8, Planning
	Jeff Moore	KYTC, D3, Planning
	Jim Wilson	KYTC, CO, Planning
	David Martin	KYTC, CO, Planning
	Rodney Little	KYTC, D8, Construction
	David Beattie	KYTC, D8, Pre-Construction
	Joe Cox	KYTC, D8, Design
	Russell Jones	KYTC, D8, Operations
	Jerry Gadberry	KYTC, D8, Traffic
	Cathi Blair	KYTC, D8, Environmental
	Gorman Shelley	KYTC, D8, Maintenance
	Michael W. Ballard	KYTC, D8, Maintenance
	Steve James	KYTC, D3, Design
	Ken Cox	KYTC, D3, Design
	Daryl Price	KYTC, D3, Permits
	Keirsten Jaggers	KYTC, D3, PIO
	David Smith	Qk4, Vice President
	Ben Brodbeck	Qk4, Transportation Engineer
	William Crawford	Qk4, Transportation Planner

Mr. Tom Clouse, KYTC, D8, welcomed everyone to the meeting, and requested all attendees introduce themselves. He then turned the meeting over to Mr. Smith, who facilitated the project team meeting.

The proposed project is a pre-design scoping study involving feasible alternatives to improve KY 90 from the Barren-Metcalfe County line (District 3) to the KY 90/KY 61 intersection in Cumberland County (District 8). The project is about 26 miles long, involves several small towns, and would improve the east-west connection between the project termini. The purpose of the meeting was to review the preliminary alternative improvements and construction estimates, and receive feedback. Available for review were large-scale aerial photographs depicting the preliminary improvement alternatives under consideration, which included the study area environmental overview (*i.e.*, potential archaeological sites, historic districts, individual historic sites, wetlands, ponds, surface waters); exhibits of crash data, existing and future traffic volumes, and Levels of Service (LOS); and a typical section exhibit. Attendees were provided a handout packet containing the meeting agenda, 11x17 map indicating the study area, a list of National Register of Historic Places (NRHP) and potential NRHP individual sites and districts, summary of comments from the two public information meetings, and the draft project goals (see Attachments).

Following the introductions, Mr. Smith used the handouts, aerial photos, and exhibits to conduct the meeting and generate open discussion of the agenda items (see Attachments).

Status of Study. Mr. Smith began with a review of the project's background (initial planning began in 2003, then was suspended), the previous team meeting, the purpose of this meeting, and a description of the study area. Mr. Smith reviewed the status of the study, noting it is now at the preliminary alternatives review stage.

Review Environmental Footprint. Mr. Smith reviewed the study area's environmental footprint referring to the aerial photographs and noting that all known environmental features were indicated, including:

- 1 NRHP district and an expansion of that district, 5 potential districts, 23 individual historic sites, and 19 survey only sites
- 7 previous archaeological surveys, 13 known sites, 9 considered not eligible, 4 not assessed
- up to 49 streams, and 108 potential wetlands and ponds
- threatened and endangered species known to occur in the area include the bald eagle, gray bat, 11 fresh water mussels, and 1 fish.

Review Traffic and Crash Information. Using the graphic exhibits, Mr. Smith reviewed the study area's existing and projected traffic volumes, LOS's, and crash analysis indicating only two high crash locations (*i.e.*, vicinity of KY 640 in Summer Shade, and the KY 90/KY 163 intersection). Available HIS data, including traffic, crashes, and highway geometrics of major roadways in the study area was available in the handout.

Review Public Information Meeting Comments. Mr. Crawford reviewed a summary of the public information meeting comments. Two hundred-two people attended the two meetings, and submitted 28 comment forms representing 37 individuals, all of whom agreed KY 90 had problem areas. The comments tended to fall within several common themes concerning KY 90: narrow driving lanes and narrow or no shoulders; too much commercial truck and recreational vehicle traffic; too many speeding vehicles, especially through the towns; few passing opportunities, and the on-coming traffic volume often prevented passing a slower moving vehicle. Several people suggested bypassing the towns as a means to remove trucks and speeding vehicles from the town roadway. Poultry/chicken trucks were specifically cited in terms of volume and speeding. Most people believed improving KY 90 would make the road safer, improve the local economies, and make it easier to attract businesses to the area. Some suggested a 4-lane highway with a median was the best solution. A few submitted hand-drawn maps of alternatives and bypasses, but on the whole agreed the areas most in need of improvement had already been identified on the study area maps.

Review Draft Project Goals. Mr. Smith presented the draft project goals developed from comments and concerns expressed during the previous project team, local officials, and stakeholder meetings, and at the two recent public information meetings. He noted that a purpose and need statement is not developed with a pre-design scoping study, but the project goals lead to a purpose and need statement.

A discussion concerning the need for a 4-lane highway developed. It was believed necessary to formally address the issue since a number of local citizens had expressed a desire for a 4-lane highway. A review of existing and projected traffic volumes indicated traffic volumes could not justify a 4-lane highway. Additionally, KY 90 in Barren County is already scheduled for improvement and has greater traffic volumes near Glasgow than experienced by KY 90 in the study area. A short section of KY 90 near Glasgow will have 4-lanes, however the majority will be 2-lanes, including the roadway leading up to the Metcalfe county line. Constructing passing lanes at periodic intervals was suggested, however, that requires a level of design not addressed at this stage of the scoping study. Roadway profiles and potential passing lane locations would be investigated next, after the preliminary alternative improvements were reviewed and agreed upon. The project team agreed it was more practical to design a roadway that was economically feasible, and would be more

compatible with the KY 90 improvements already scheduled for Barren County. Therefore, a 2-lane highway improvement would be considered for KY 90 in Metcalfe and Cumberland Counties. It was suggested, and agreed, to replace the word "continue" in the sixth project goal with the word "compliment."

The discussion continued with the typical section's lane and shoulder widths to use for preliminary design purposes (*i.e.*, the second project goal bullet concerning "current design standards"). Current design standards call for 12-foot lanes and 8-foot shoulders. However, in Barren County, KY 90 improvements use 11-foot lanes and 6-foot shoulders; and spot improvements generally involve the addition of passing lanes because alternatives on new alignment are not feasible due to residential development. It was noted that future economics may dictate a change in lane and shoulder widths to "betterment quality" (*i.e.*, 11-foot lanes, 6-foot shoulders). Since the future cannot be predicted, it was believed better for planning purposes to design for the wider lanes and shoulders throughout the study area, which would permit comparing all improvements considered by the same standard and provide a "most expensive" scenario. If future conditions dictate betterment quality improvements, then cost estimates can be adjusted accordingly. The project team agreed we wanted to "try to give the people the best improvement we can." Therefore, the bullet would remain as stated, and improvements designed for 12-foot driving lanes and 8-foot shoulders.

Discuss Preliminary Alternatives. Mr. Brodbeck presented and discussed the preliminary improvement alternatives using the aerial photo exhibit and a handout table listing KY 90 improvement opportunities, their length, and estimated construction cost (see Attachment). Improvement opportunities were identified through a windshield survey, and a consideration of previous meeting minutes and public meeting comments. Improvements were divided into two categories. Numbered items involved more extensive spot improvements such as bypasses, realignment of curves or intersections, bridge replacement, and curb and gutter through towns. Lettered items involved reconstructing the remaining KY 90 roadway sections located between the numbered improvements, with one exception. A windshield survey identified a KY 90 section east of Beaumont, between Martin Cemetery Road and the Metcalfe-Cumberland county line (a distance of about 5-miles), which appeared to have already been improved with a more favorable typical section consisting of 11-foot wide lanes and 6-foot shoulders. This section was considered to be less in need of improvement than other KY 90 sections, therefore a reconstruction cost estimate was not prepared for the section. Each proposed improvement alternative consists of a two lane, undivided roadway with a 60-mph design speed meeting current design standards (*i.e.*, 12-foot lanes, 8-foot shoulders). Curb and gutter improvements through the towns are within the existing right-of-way to avoid impacting historic or potentially historic property sites.

Some discussion and explanation of individual improvement opportunities occurred. The project team agreed with, and accepted, the proposed improvements. The project team requested a cost estimate be developed for improving the KY 90 section between Martin Cemetery Road and the county line to current design standards to maintain continuity with the other improvements, and to provide a total KY 90 reconstruction cost estimate.

Alternative Preferences. Mr. Smith conducted two "voting" exercises using post-it notes to determine project team members' preferences concerning the proposed improvements. Qk4 members abstained from voting.

1. The first exercise asked team members to take eight (8) post-it notes and place one post-it note on the eight improvement alternatives they believed were needed most.
2. The second exercise asked team members to take three (3) post-it notes, number them as 1, 2, and 3, and place the notes on the eight improvements identified in the first exercise in priority order, with one (1) being the highest priority, and three (3) the lowest.

The results of the voting exercises are summarized in the table below. Exercise 1 identified the eight proposed improvements the project team felt were the most important to implement in the study area. No other proposed improvements received a vote. The bypasses were clearly preferred over other improvement

alternatives, with Burkesville Bypass receiving the most votes, followed by a Summer Shade Bypass, and a Waterview Bypass.

Item	Improvement	Exercise 1	Exercise 2			
		Number of Votes	Priority 1 Votes	Priority 2 Votes	Priority 3 Votes	Cumulative Score
1	Summer Shade Bypass	17	4	3	3	21
4	Beaumont Bypass	13	0	2	0	4
5	Anderson Curve Reconst.	8	0	0	0	0
7	Marrowbone Bypass	14	0	4	4	12
10	Waterview Bypass	16	0	1	3	5
15	Norris Branch Rd to Owens Rd Relocation	15	0	4	5	13
16	Burkesville Hill Reconst.	4	0	0	0	0
17	Burkesville Bypass	20	12	2	0	40
18	KY 90/KY 61 Intersection Reconst.	1	0	0	0	0

In Exercise 2, the cumulative score column represents an attempt to prioritize the improvement alternatives based upon a weighting scale. Priority 1 votes were assigned a weight of 3, Priority 2 a weight of 2, and Priority 3 a weight of 1. The number of votes for each priority were multiplied by their assigned weight number, and then summed to obtain the cumulative score for that improvement alternative. Using Summer Shade Bypass as an example, the cumulative score is: (4 x 3) + (3 x 2) + (3 x 1) = 21. Based upon the project team members voting preferences in Exercise 2, improvement alternatives Burkesville Bypass, Summer Shade Bypass, and Norris Branch Road to Owens Road relocation were considered the top three most important to implement.

Resource Agency Coordination/Involvement. Mr. Smith initiated discussion concerning coordination letters to the resource agencies. The comment was made we could anticipate some agencies responding with useful comments, and others will provide a general response, or withhold comments until project specifics are provided. Central Office maintains a mailing list database for resource agency coordination letters. Central Office and District 8 will coordinate to mail the letters. Qk4 will develop and provide the exhibits to attach to the letters.

The environmental justice and community impacts section of the pre-design scoping study are to be provided by the respective Area Development Districts (*i.e.*, Lake Cumberland ADD and Barren River ADD). The District offices will request the environmental justice and community impacts analysis with a due date of June. Qk4 will develop and provide the study area exhibits to attach to the requests.

Follow-up and Next Steps. Mr. Smith concluded the meeting by discussing the remaining scope of work requirements, and the upcoming study phases and dates. According to the scope of work, the Districts are to provide utility and right-of-way costs. The estimated availability date is May-June. Qk4 will review the resource agency response letters, and continue preparation of the draft pre-design scoping study report for review by the KYTC by August 2006. Another project team meeting will be scheduled to review the final improvement alternatives and recommendations, probably in July.

The meeting adjourned at approximately 12:15 p.m.

END OF MINUTES

KY 90 Pre-Design Scoping Study
Project Team Meeting No. 1
Agenda

Date: April 17, 2006
Time: 10:00 A.M.
Location: KYTC District 8
Somerset, KY

1. Introductions
2. Status of Study
3. Review Environmental Footprint
4. Review Traffic and Crash Information
5. Review Public Information Meeting Comments
6. Review Draft Project Goals
7. Discuss Preliminary Alternatives
8. Agency Coordination
9. Follow-up and Next Steps
    a. Schedule
    b. Report

KY 90 Improvement Opportunities, Metcalfe-Cumberland Counties

(improvement opportunities are described in order from west to east in the study area)

Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
n/a	Curve just west of Barren-Metcalfe County line. Outside this project's scope of work. Included in KYTC Item No. 3-108.50, reconstruct KY 90 from east of Glasgow to Metcalfe County line.		
	Metcalfe County		
1	Bypass Summer Shade to the south:		
1-1 (yellow)	Summer Shade Bypass 1. Beginning west of Big Jack Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 east of Ernie Ferrell Road. This alternative is more expensive and longer than 1-2, but positions the roadway further from residential dwellings.	2.31	10.3
1-2 (orange)	Summer Shade Bypass 2. Beginning about Big Jack Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 about Ernie Ferrell Road. This alternative is less expensive and shorter than 1-1, but positions the roadway closer to residential dwellings.	1.76	3.6
2	Reconstruct KY 90 through Summer Shade with curb and gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the intersections at Bronston Howard Road (access road to Summer Shade Elementary School) and KY 640.	0.44	0.7
3	KY 90/KY 163 intersection. This intersection was identified as a high crash location and is scheduled for reconstruction with KYTC Item No. 3-276.50, relocate KY 163 from south of Cyclone Road in Monroe County extending north to KY 90 in Metcalfe County. Interim improvement opportunities include improved signing (*e.g.*, warn KY 163 drivers that intersection is not a 4-way stop; cross traffic does not stop.)	--	--
4	Bypass Beaumont to the south:		
4-1 (blue)	Beaumont Bypass 1. Beginning from the vicinity of the Kingsford Manufacturing Plant, proceed almost due east on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont. This alternative is more direct and shorter than 4-2.	0.792	1.2
4-2 (orange)	Beaumont Bypass 2. Beginning from the vicinity of the Kingsford Manufacturing Plant, curve southeast on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont.	0.794	1.4
	Cumberland County		
5	Curve at Anderson Lane. Reconstruct curve just east of the Metcalfe-Cumberland County line near Anderson Lane to meet current design standards.	0.221	0.3
6	Curve at Pitman Creek. Reconstruct curve west of Pittman Creek Road to meet current design standards.	0.203	0.3
7	Bypass Marrowbone to the north:		
7-1 (red)	Marrowbone Bypass 1. Beginning from east of Homing Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496.	2.02	21.0
7-2 (blue)	Marrowbone Bypass 2. Beginning from east of Homing Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496. 7-2 follows the same alignment as 7-1, except in the mid-section where it curves south of 7-1 on new alignment.	2.02	23.2
8	Reconstruct KY 90 through Marrowbone with curb and gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the KY 3115 intersection to more favorable geometrics.	0.72	1.1
9	Replace existing bridge over Wisdom Creek.		0.5
10	Bypass Waterview to the north:		
10-1 (orange)	Waterview Bypass 1. Beginning from the curve west of Waterview's limits, proceed northeast, curving east to bypass Waterview to the north on new alignment, then curving southeast to reconnect with KY 90 in the vicinity of Taylor Road.	2.15	5.3
10-2 (yellow)	Waterview Bypass 2. Beginning from the curve west of Waterview's limits, proceed in a more direct alignment to bypass Waterview to the north and reconnect with KY 90 in the vicinity of Abby Lane. Alternative 10-2 crosses within the potential national register historic district boundaries.	1.52	3.6
11	Reconstruct the KY 90/KY 100 intersection. The existing intersection would be shifted west and KY 100 realigned to provide a more favorable geometry with KY 90. Turning lanes would be added to KY 90.	0.38	0.5

Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
12	Replace existing bridge at Dutch Creek.		0.7
13	Replace existing bridge west of Allen Creek Road.		0.6
14	Curve at Allen Creek. Reconstruct curve east of Allen Creek Road (Grider) to meet current design standards.	0.25	0.4
15	Norris Branch Road to Owens Road. Relocate KY 90 on new alignment to eliminate curve at KY 691. Beginning east of Norris Branch Road, proceed east on new alignment to reconnect with KY 90 in the vicinity of Owens Road.	0.75	5.5
16	Reconstruct Burkesville Hill Road/Saw Mill Cut. Beginning just west of the KY 90/KY 2276 intersection and following the existing alignment east as much as possible. At the first curve, continue northeast on new alignment, curving east to reconnect with KY 90 near the hilltop and end near the county hospital. It includes reconstructing the existing KY 90/KY 2276 intersection.	1.03	5.4
17	Burkesville Bypass. Beginning just west of the KY 90/KY 2276 intersection, proceed southeasterly on new alignment to bypass Burkesville on the south, and reconnect with KY 90 at the KY 90/KY 61 intersection near the Cumberland River Bridge.	1.57	13.1
18	Reconstruct the KY 90/KY 61 intersection in Burkesville. It includes widening KY 90 to 3-lanes, and constructing curb and gutter and sidewalks from near the county hospital to the intersection; reconstructing the elementary school entrance and exit roads; and adding a right hand turn lane on KY 61 southbound.	0.36	0.6
	Reconstruct roadway to 12-foot wide lanes, 8-foot shoulders.		
A	Roadway section from the Barren-Metcalfe County line to the beginning of the Summer Shade Bypass (item 1).	1.69	2.0
B	Roadway section from the end of the Summer Shade Bypass (item 1) to the beginning of the Beaumont Bypass (item 4).	1.75	2.0
C	Roadway section from the end of the Beaumont Bypass (item 4) to Martin Cemetery Road.	0.57	0.7
D	Roadway section from the Metcalfe-Cumberland County line to the curve at Anderson Lane (item 5).	0.07	$80,000
E	Roadway section from the end of the curve at Anderson Lane (item 5) to the beginning of the curve at Pitman Creek (item 6).	0.43	0.5
F	Roadway section from the end of the curve at Pitman Creek (item 6) to the beginning of the Marrowbone Bypass (item 7).	2.26	2.6
G	Roadway section from the end of the Marrowbone Bypass (item 7) to the beginning of the Waterview Bypass (item 10).	1.24	1.5
H	Roadway section from the end of the Waterview Bypass (item 10) to the beginning of the curve at Allen Creek (item 14).	0.72	0.9
I	Roadway section from the end of the curve at Allen Creek (item 14) to Norris Branch Road (beginning of item 15).	0.63	0.8
J	Roadway section from Owens Road (end of item 15) to the beginning of the Burkesville Bypass (item 17).	0.54	0.7
K	Roadway section from the beginning of the Burkesville Bypass (item 17) to the beginning of the Burkesville Hill Road reconstruction (item 16).	0.34	0.4
L	Roadway section from Martin Cemetery Road to the Metcalfe-Cumberland C/L.	5.10	5.8

* Cost estimate is for construction only. It does not include utilities and right-of-way costs.

Architecture

Engineering

Construction

MEETING MINUTES

Project:	KY 90 Pre-Design Scoping Study	
Item Number	08-136.00	
Purpose:	Project Team Meeting #2	
Place:	Somerset, Kentucky, D8 Multi-Purpose Building	
Meeting Date:	October 17, 2006 10:00 a.m.	
Prepared By:	William Crawford	
In Attendance:	Tom Clouse	KYTC, D8, Planning
	Jeff Moore	KYTC, D3, Planning
	Jim Wilson	KYTC, CO, Planning
	David Beattie	KYTC, D8, Pre-Construction
	Joe Cox	KYTC, D8, Design
	Mark Robertson	KYTC, D8, Construction
	Tamra Wilson	KYTC, D8, Traffic
	Alan Edwards	KYTC, D8, Utilities
	Cathi Blair	KYTC, D8, Environmental
	Gorman Shelley	KYTC, D8, Maintenance
	Michael W. Ballard	KYTC, D8, Maintenance
	Keirsten Jaggers	KYTC, D3, PIO
	Amy Scott	Barren River ADD
	David Smith	Qk4, President
	Thomas Springer	Qk4, Transportation Planner
	Ben Brodbeck	Qk4, Transportation Engineer
	William Crawford	Qk4, Transportation Planner

Mr. Tom Clouse, KYTC, D8, welcomed everyone to the meeting, then turned the meeting over to Mr. Smith, who facilitated the project team meeting. He requested all attendees introduce themselves.

The proposed project is a pre-design scoping study involving feasible alternatives to improve KY 90 from the Barren-Metcalfe County line (District 3) to the KY 90/KY 61 intersection in Cumberland County (District 8). The project is about 26 miles long, involves several small towns, and would improve the east-west connection between the project termini. The purpose of the meeting was to review the project goals, new information received since the last project team meeting, the identified improvement options and construction estimates, and evaluate/prioritize the improvements. Available for review were large-scale aerial photographs depicting the improvement opportunities under consideration, including the environmental overview (*i.e.*, potential archaeological sites, historic districts, individual historic sites, wetlands, ponds, surface waters); an exhibit of crash data, existing and future traffic volumes, and Levels of Service (LOS); and a typical section exhibit. Attendees were provided a handout packet containing the meeting agenda, environmental justice report summary, resource agency responses summary, a table describing improvement opportunities, 11x17 exhibit maps (4) indicating the study area and improvement opportunities, and a comparison matrix table of construction cost estimates and potential environmental considerations for each improvement opportunity.

Status of Study. Mr. Crawford briefly reviewed the study's status in terms of the work accomplished thus far: documentation of existing conditions, base studies (*i.e.*, historic and archaeological resources overviews; terrestrial and aquatic ecological resources overviews; threatened and endangered species; hazardous materials sites; existing and projected traffic volumes, LOS's and a crash analysis), two public meetings, project team meetings, and a draft study report for review.

Review Project Goals. Mr. Crawford reviewed the project goals developed from comments and concerns expressed during the previous project team, local officials, and stakeholder meetings, and at the two recent public information meetings.

Review Environmental Justice Report. Mr. Crawford reviewed the EJ report prepared by the LCADD. The report concluded that several EJ population concentrations may exist in the study area, but no disproportionate impacts were anticipated. LCADD recommended another review after preferred alignments/alternatives were selected.

Review Resource Agency Responses. Mr. Crawford briefly reviewed the responses from the resource agency coordination mailing. About 100 letters were mailed, 24 responses received. Most agencies responded with "no comment/no concerns," or standard cautionary advisory guidance. DEA advised the John Hunt Morgan Trail (historic) was recently established between Marrowbone and Burkesville; and the potential for encountering Native American and other potentially significant archaeological sites existed. Law enforcement agencies believed the project would be beneficial for improving traffic flows and safety. Burkesville Hill was specifically cited for improvement due to the large number of accidents and fatalities.

Review Improvement Opportunities. Mr. Brodbeck presented and briefly described the 39 improvement opportunities from west to east along the study area using the aerial photo exhibits and a table describing KY 90 improvement opportunities, length, and estimated construction cost. Improvements were identified by either a number (*i.e.*, improvements involving bypasses, passing lanes, curve or intersection realignment, bridge replacement, and curb and gutter through towns); or letters (*i.e.*, reconstructing existing KY 90 roadway sections). Proposed improvements consist of 12-foot lanes and 8-foot shoulders. Curb and gutter improvements through the towns are within the existing right-of-way to avoid impacting historic or potentially historic property sites. Some confusion occurred concerning construction cost estimate differences between seemingly similar improvements. Qk4 was asked to verify the estimates. The Project Team also requested the length and cost of just the passing lane be included in the improvement description, where applicable.

[Note, subsequent to the meeting, the cost estimates provided were verified as essentially accurate based upon 2005 unit bid prices. The large cost difference between Summer Shade Bypasses 1-1 and 1-2 was attributable to terrain features crossed by 1-1 requiring more fill. A typographical error occurred with 1-1-P, Summer Shade Bypass with a passing lane, and should have been $10.8 million. Improvements were re-examined and new models run based upon the decisions made by the Project Team using 2006 estimated bid costs. Virtually all improvement cost estimates increased, some significantly. However, improvements generally maintained their relative comparison to one another; that is, higher cost improvements were still the higher cost improvements after cost updating. The "new"/recommended improvement opportunity costs are in the attached table.]

Discussion and Evaluation of Improvement Opportunities. Mr. Springer facilitated an open discussion of the various improvement opportunities and their relative merits in terms of satisfying project goals. Ultimately, the Project Team decided to categorize the projects into one of three types to facilitate implementation strategies, as described below.

- Bridge replacements would be one category, and selected for replacement as the District deemed appropriate.
- Operational improvement projects was the second category, which included lower cost improvements addressing immediate and short-term needs. The Project Team made no attempt to prioritize these improvement opportunities, believing it was best to allow the District to select the improvement(s) to implement based upon available funding and needs.
- Roadway reconstruction improvements was the third category, consisting of higher-cost, longer-term roadway section reconstruction and bypass improvements. The Project Team prioritized these improvements based upon considerations of safety, traffic volumes, passing opportunities, estimated construction costs, and local knowledge.

During the course of the discussion and evaluation of improvements opportunities, the Project Team made several changes to the initial set of improvement opportunities, as described below.

- Opportunities to pass on KY 90 are very limited, and considered an important safety issue. The existing topography and town locations restrict passing lane positions to those locations already identified as improvement opportunities. Therefore, it was decided to add "passing lane only" as stand-alone spot improvements to the improvement opportunities list. Additionally, it was decided to eliminate those lettered improvement opportunities involving mainline reconstruction without passing lanes (*i.e.*, A, C, F, H) because they did not satisfy the project goals. Mainline improvements would include a passing lane, if feasible, because the public wants and expects passing opportunities.

- Changed improvement 2 (reconstruct KY 90 through Summer Shade) to reconstructing the KY 90 intersection at Bronston Howard Road (provides access to Summer Shade Elementary School), which is in the vicinity of an identified high crash spot location. Improvement 2 is now considered an operational improvement.

- Improvements D and 5 are adjacent improvements and were combined to form one operational improvement. Number 5 is an accident-prone curve, especially for eastbound traffic. D is a relatively short roadway section that abruptly changes typical section at the county line, becoming more narrow in Cumberland Co.

- Improvements E and 6 are adjacent improvements and were combined to form one operational improvement. Their combined utility was considered an advantage.

- Part of improvement F, between White Road and Ferris Fork Creek, was identified as F.1, a separate operational improvement opportunity due to safety concerns. The location is characterized by Marrowbone Creek immediately south of KY 90, and a steep rock wall immediately north, which was also prone to rockslides. The narrow roadway had little to no shoulders, with a ditch adjacent the rock wall. The location was considered a safety issue in need of additional rock cutting to improve distances and slope.

- Added operational improvement 8.1 as an opportunity to improve the KY 90/KY 3115 intersection in Marrowbone.

- Changed improvement 11 (reconstructing KY 90 through Waterview) to be defined as reconstructing the intersection at KY 90/KY 100.

- Added operational improvement 18.1 in Burkesville at the KY 90/KY 61 intersection. The improvement opportunity adds a right-turn lane to southbound KY 61 at this heavily congested intersection located near a school.

Listed in the table below are the KY 90 improvement opportunities recommended by the Project Team.

Bridge Replacements	Operational Improvements	Roadway Reconstruction (prioritized list)
9	2	1. Summer Shade Bypass (1-1-P, 1-1, 1-2)
12	8.1	2. 16 + 18
13	D + 5	3. 15
	E + 6	4. Waterview Bypass with passing ln (10-1-P, 10-2)
	F.1	5. A-P (KY 90 reconstruction with passing ln)
	11	6. 8
	14	7. J + K
	18.1	8. I
	Passing lane only at:	9. H-P (KY 90 reconstruction with passing ln)
	A-P	10. B
	C-P	11. G + 9
	F-P	12. Beaumont Bypass (4-1, 4-2)
	H-P	13. F-P (KY 90 reconstruction with passing ln)
		14. Burkesville Bypass (17-P, 17)
		15. C-P (KY 90 reconstruction with passing ln)
		16. Marrowbone Bypass (7-1, 7-2)

Follow-up and Next Steps. Mr. Smith concluded the meeting by discussing the remaining steps to complete the study. Qk4 would re-examine the construction cost estimates, to include the changes made by the Project Team to the original list of improvement opportunities. Brief explanations of why a southern or northern bypass was developed would be added to the study report. Qk4 will complete the study's recommendations section incorporating the decisions and improvement opportunity changes, and provide it to project team members for review and comment. After receipt of comments, the final study report will be prepared and submitted.

The meeting adjourned at approximately 2:30 p.m.

END OF MINUTES

attachment: Recommended KY 90 Improvement Opportunities

KY 90 Pre-Design Scoping Study
Project Team Meeting No. 2
Agenda

Date: **October 17, 2006**
Time: **10:00 A.M. EDT**
Location: **KYTC District 8**
Somerset, KY

1. Introductions
2. Status of Study
3. Review Project Goals
4. Review Environmental Justice Report
5. Review Resource Agency Comments
6. Present / Discuss Improvement Opportunities
7. Review Improvement Opportunities Evaluation Criteria and Results
8. Follow-up and Next Steps
    a. Schedule
    b. Report

KY 90 Improvement Opportunities Description

Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
n/a	Curve just west of Barren-Metcalfe County line. Outside this project's scope of work, but included in KYTC Item No. 3-108.50, reconstruct KY 90 from east of Glasgow to Metcalfe County line.	--	--
	Metcalfe County		
1	Bypass Summer Shade to the south:		
1-1 (yellow)	Summer Shade Bypass 1. Begin west of Hill Top VW Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 east of Ernie Ferrell Road. This improvement is more expensive and longer than 1-2, but positions the roadway further from residential dwellings.	2.31	10.3
1-1-P	Summer Shade Bypass 1 with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	2.31	3.6
1-2 (orange)	Summer Shade Bypass 2. Begin east of Big Jack Road, curve southeast on new alignment to proceed east to bypass Summer Shade to the south, and reconnect with KY 90 about Ernie Ferrell Road. This improvement costs less and is shorter than 1-1, but locates the roadway closer to residential dwellings.	1.76	3.6
2	Reconstruct KY 90 through Summer Shade with curb and gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the intersections at Bronston Howard Road (access road to Summer Shade Elementary School) and KY 640.	0.44	0.7
3	KY 90/KY 163 intersection. Intersection was identified as a high crash location. It is scheduled for reconstruction with KYTC Item No. 3-276.50, relocate KY 163 from south of Cyclone Road in Monroe County north to KY 90 in Metcalfe County. Interim improvement opportunities include improved signing (*e.g.*, warn KY 163 drivers that intersection is not a 4-way stop; cross traffic does not stop.)	--	--
4	Bypass Beaumont to the south:		
4-1 (blue)	Beaumont Bypass 1. Begin from the vicinity of the Kingsford Manufacturing Plant, proceed almost due east on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont. This improvement is more direct and shorter than 4-2.	0.792	1.2
4-2 (orange)	Beaumont Bypass 2. Begin from the vicinity of the Kingsford Manufacturing Plant, curve southeast on new alignment to bypass Beaumont to the south, and rejoin KY 90 east of Beaumont.	0.794	1.4
	Cumberland County		
5	Curve at Anderson Lane. Reconstruct curve just east of the Metcalfe-Cumberland County line near Anderson Lane to meet current design standards.	0.221	0.3
6	Curve at Pitman Creek. Reconstruct curve west of Pittman Creek Road to meet current design standards.	0.203	0.3
7	Bypass Marrowbone to the north:		
7-1 (red)	Marrowbone Bypass 1. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496.	2.02	21.0
7-2 (blue)	Marrowbone Bypass 2. Begin east of Hominy Creek Road, proceed east to bypass Marrowbone to the north on new alignment, and curve southeast to reconnect with KY 90 in the vicinity of KY 496. 7-2 follows the same alignment as 7-1, except the mid-section curves south of 7-1 on new alignment.	2.02	23.2
8	Reconstruct KY 90 through Marrowbone with curb, gutter, and sidewalks, using the existing right-of-way. Includes reconstructing the KY 3115 intersection to more favorable geometrics.	0.72	1.1
9	Replace existing bridge over Wisdom Creek.	--	0.5
10	Bypass Waterview to the north:		
10-1 (orange)	Waterview Bypass 1. Begin from the curve west of Waterview's limits, proceed northeast, curving east to bypass Waterview to the north on new alignment, then curving southeast to reconnect with KY 90 in the vicinity of Taylor Road.	2.15	5.3
10-1-P	Waterview Bypass 1 with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	2.15	9.8
10-2 (yellow)	Waterview Bypass 2. Begin from the curve west of Waterview's limits, proceed in a more direct eastern alignment to bypass Waterview to the north and reconnect with KY 90 west of Dutch Creek Road. Improvement 10-2 crosses within the potential national register historic district boundaries.	1.52	3.6

Exhibit Item	Improvement Description	Length (miles)	Est. Cost* (million dollars)
11	Reconstruct the KY 90/KY 100 intersection. The existing intersection would be shifted west and KY 100 realigned to provide a more favorable geometry with KY 90. Turning lanes would be added to KY 90.	0.38	0.5
12	Replace existing bridge at Dutch Creek.	--	0.7
13	Replace existing bridge west of Allen Creek Road.	--	0.6
14	Curve at Allen Creek. Reconstruct curve east of Allen Creek Road and near Grider to meet current design standards.	0.25	0.4
15	Norris Branch Road to Owens Road. Relocate KY 90 on new alignment to eliminate curve at KY 691. Begin east of Norris Branch Road, proceed east on new alignment to reconnect with KY 90 in the vicinity of Owens Road.	0.75	5.5
16	Reconstruct Burkesville Hill Road/Saw Mill Cut. Begin just west of the KY 90/KY 2276 intersection and follow the existing alignment east as much as possible. At the first curve, continue northeast on new alignment, curving east to reconnect with KY 90 near the hilltop and end near the county hospital.	1.03	5.4
17	Burkesville Bypass. Begin near the KY 90/KY 2276 intersection, proceed southeasterly on new alignment to bypass Burkesville on the south, and reconnect with KY 90 at the KY 90/KY 61 intersection west of the Cumberland River Bridge. Includes reconstructing the KY 90/KY 2276 intersection.	1.57	13.1
17-P	Burkesville Bypass with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	1.57	17.8
18	Reconstruct the KY 90/KY 61 intersection in Burkesville. Includes widening KY 90 to 3-lanes, and constructing curb, gutter and sidewalks from near the county hospital to the intersection; reconstructing the elementary school entrance and exit roads; and adding a right hand turn lane on KY 61 southbound.	0.36	0.6
	Reconstruct existing KY 90 roadway to 12-foot wide lanes, 8-foot shoulders.		
A	Roadway section from the Barren-Metcalfe County line to the beginning of the Summer Shade Bypass (item 1).	1.69	2.0
A-P	Roadway section A with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	1.69	2.8
B	Roadway section from the end of the Summer Shade Bypass (item 1) to the scheduled KY 163 improvement.	1.75	2.4
C	Roadway section from the end of the Beaumont Bypass (item 4) to the Metcalfe-Cumberland C/L.	5.67	7.7
C-P	Roadway section C with an eastbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	5.67	8.7
D	Roadway section from the Metcalfe-Cumberland County line to the curve at Anderson Lane (item 5).	0.07	$95,000
E	Roadway section from the end of the curve at Anderson Lane (item 5) to the beginning of the curve near Pitman Creek (item 6).	0.43	0.6
F	Roadway section from the end of the curve near Pitman Creek (item 6) to the beginning of the Marrowbone Bypass (item 7).	2.26	3.7
F-P	Roadway section F with a westbound passing lane (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	2.26	4.5
G	Roadway section from the end of the Marrowbone Bypass (item 7) to the beginning of the Waterview Bypass (item 10).	1.24	1.7
H	Roadway section from the end of the Waterview Bypass (item 10) to the beginning of the curve near Allen Creek (item 14).	0.72	0.9
H-P	Roadway section H with an eastbound passing lane beginning just east of Waterview (*i.e.*, 3-lane typical section). Passing lanes are located only between the points indicated by the arrows.	1.22	2.4
I	Roadway section from the end of the curve at Allen Creek (item 14) to near Norris Branch Road (beginning of item 15).	0.63	0.9
J	Roadway section from Owens Road (end of item 15) to beginning of the Burkesville Bypass (item 17).	0.54	0.8
K	Roadway section from the beginning of the Burkesville Bypass (item 17) to the beginning of the Burkesville Hill Road reconstruction (item 16).	0.34	0.5

Appendix E

Local Officials / Stakeholders Meeting Minutes

MEETING MINUTES

Project:	Kentucky 90 Pre-Design Scoping Study, Item No. 8-136.00	
Purpose:	Local Officials Meeting	
Place:	Burkesville Fire Dept. Training Center, 200 Upper River Street, Burkesville, KY	
Meeting Date:	August 28, 2003, 10:00 a.m. (central time)	
Prepared By:	Chad Snellen	
In Attendance:	David Martin	KYTC, Central Office, Division of Planning
	Tom Clouse	KYTC, District 8, Planning
	Johnny Carter	Cumberland County Water District
	Edward Anderson	District 2 Magistrate
	Earl Branham	District 4 Magistrate
	J.V. Groce	District 3 Magistrate
	Ricky Melton	County Road Foreman
	Tim Hicks	Cumberland County Judge Executive
	Don M. Butler II	Metcalfe County Judge Executive
	Dean Rowe	Metcalfe
	Donnie McWhorter	Clinton
	David Smith	Qk4, Vice President
	Chad Snellen	Qk4, Transportation Engineer

To begin the KY 90 Local Officials Meeting Mr. Tom Clouse welcomed and thanked all attendees and asked them to introduce themselves. Once the introductions concluded Mr. David Smith, who conducted the meeting, provided a description of the project. The proposed project, as described in the KYTC Six-Year involves studying the need for spot improvements to the section of KY 90 between Beaumont and Burkesville in Metcalfe (District 3) and Cumberland (District 8) Counties, a distance of approximately 25 miles. Improvements to this section of KY 90 could improve the east-west connection from Burkesville to Glasgow. Each attendee was given a folder that contained a meeting agenda, three handouts providing existing information pertaining to KY 90, and a paper copy of a PowerPoint presentation. Posted around the room were several graphics of the project study area, including a USGS map with the project corridor highlighted, a map depicting existing roadways with the corresponding traffic and crash data, an exhibit representing possible historic sites, and also an aerial photograph for the project area.

Following the project description, Mr. Smith used a PowerPoint presentation to conduct the meeting and generate open discussion of the agenda items (see attachment A).

Previous Studies. Improvements to KY 90 in District 3 west of the current project area and a section of KY 61 north of Burkesville will be investigated as a possible source of information, concerning existing conditions of the proposed project area. Mr. Smith asked the audience if anyone knew of any other projects adjacent to the study area. A meeting attendee mentioned a section of KY 163 that is scheduled for reconstruction in the near future.

Scope of Work. Mr. Smith went through the major elements of the Scope of Work, with a brief discussion of each:

1. Analyze Existing Highway Conditions
2. Prepare Environmental Overview/Footprint
3. Develop Project Goals
4. Identify Alternatives
5. Recommendations
6. Report
7. Public Involvement

Study Schedule. Mr. Smith presented the schedule, which is as follows:

- Environmental Overview Fall 2003
- Present Preliminary Alternatives Fall 2003
- Present Feasible Alternatives Winter 2003/2004
- Draft Report March 2004
- Final Report May 2004

Existing Conditions. Available HIS data, including traffic volumes, crashes, and the geometrics of major highways in Metcalfe and Cumberland Counties were presented in three handouts. Table 1 which was entitled, "Existing Highway Systems" identifies the functional classification, the state system, and whether or not the roadway is part of the National Highway or National Truck Network. Table 2, "Geometric and Traffic Characteristics of Existing Highways" describes the geometry of existing highway segments such as lane width, shoulder width, speed limit, percent passing sight distance, and existing and future traffic information. Table 2 also assigns each highway segment with a Level of Service, which Mr. Smith compared to the grading system used in education, LOS "A" being the best and LOS "F" being the worst. Table 3, "Crash Analysis" makes available existing crash information that is reported by local and state law enforcement agencies.

Environmental Information. Mr. Smith presented Historical information provided by Helen Powell & Company, Inc. and explained how that information could limit what types of improvements could be proposed in specific areas. Widening of KY 90 in the historic districts mentioned below would be difficult without affecting some of the historic buildings or property. A possible solution to this, as a local official pointed out, would be a realignment of KY 90 to avoid any historic sites.

Historic

3	Historic Districts (2 Existing – Marrowbone and Burkesville, 1 Potential – Waterview)
3	National Register Sites
53	Potential & Contributing
21	Survey Sites

Archaeological

4	Previous Investigations
9	Recorded Sites
7	Cemeteries
100	Possible Historic Sites

Issues, Problems/Needs. Mr. Smith led the group in a brainstorming exercise to identify project and planning issues, problems, needs, and opportunities using colored post-it notes. Mr. Smith re-iterated that input from team meeting attendees – especially those familiar with the area – was a critical source of information. The group's written comments generally fell into the following five major categories:

- Geometric and Safety Issues
- Truck and Recreational Vehicles
- Historical and Environmental Issues
- Community Impacts (Amish)
- Economic Development

Alternatives.

Locations Identified by the Group for Further Study for Possible Spot Improvements:

- Flooding of KY 90 west of KY 496 and Marrowbone Creek.
- Reconstruct several curves that are currently signed for a 45 mph speed limit.
- Cutting back high rock walls two miles East of Farris Fork Bridge, in Cumberland County.
- Minimize impacts on possible historic districts around the small towns of Marrowbone and Willow Shade. Also consider impacts to local Amish Community and farms when considering possible alternatives.

- Improvements to Existing Highways:
  - KY 90 West of Beaumont was recently improved.

Data Collection.

- Available Data
- Construction Costs
- Right of Way & Utility Costs
- New Data
- Aerial Photography
- Real Estate Information

Local Agency Coordination.

- Special Concerns?
    - A general concern among the group was the historic district at the community of Marrowbone, one suggestion from the group was a re-alignment of KY 90 to completely avoid this area.
- Special Issues?
    - According to several members of the audience weekend traffic should be considered during the planning phase, and the use of turning and passing lanes would greatly improve the current situation.

The meeting adjourned at approximately 11:30 am.

END OF MINUTES

File ID: 02403\KY 90\
File Name: \Meeting Minutes\KY 90 Local Officials Mtg on 8-28-03.doc

ATTACHMENT A – AGENDA

Kentucky 90 Pre-Design Scoping Study
Local Officials Meeting
Agenda

Date: **August 28, 2003**
Time: **10:00 AM**
Location: **Burkesville Fire Dept. Training Center, 200 Upper River Street**
Burkesville, KY

1. Introductions

2. Scope of Work
    a. Proposed Study Area
    b. Prior Studies/Reports
    c. Major Scope Elements
    d. Project Schedule

3. Existing Conditions (Preliminary Review)
    a. Highway Conditions
    b. Traffic Analysis
    c. Safety Analysis
    d. Environmental Footprint
    e. Environmental Justice Report

4. Project Issues and Goals
    a. Project Issues
    b. Project Problems/Needs

5. Alternative Development
    a. Do Nothing Beyond Existing and Committed
    b. Spot Improvements
    c. ITS Applications
    d. Bicycle/Pedestrian Considerations
    e. Improvements to Existing Highways
    f. New Road Construction
    g. Other

6. Data Collection
    a. Available Data
    b. New Data Collection
    c. Aerial Photography
    d. Real Estate/Relocation Information

7. Agency Coordination Needs

8. Follow-up and Next Steps

MEETING MINUTES

Project:	Kentucky 90 Pre-Design Scoping Study, Item No. 8-136.00	
Purpose:	Stakeholders Meeting	
Place:	Burkesville Fire Dept. Training Center, 200 Upper River Street, Burkesville, KY	
Meeting Date:	August 28, 2003, 1:00 p.m. (central time)	
Prepared By:	Chad Snellen	
In Attendance:	David Martin	KYTC, Central Office, Division of Planning
	Tom Clouse	KYTC, District 8, Planning
	Jeff Moore	KYTC, District 3, Planning
	Keirsten Jaggers	KYTC, District 3, Public Information Officer
	John B. Matheney	Barren River Area Development District
	Tim Sparks	Metcalfe County Highway Department
	Cordell Flirty	Cumberland County
	Boyd Alexander	Cumberland County
	Preston Graves	Cumberland County
	Dorothy Anderson	Dubre
	Cyndi Pritchett	Cumberland County News
	Weldon Rocoe	Burkesville Fire Department
	Lesel Turner	Marrowbone
	David Smith	Qk4, Vice President
	Chad Snellen	Qk4, Transportation Engineer

To begin the KY 90 Stakeholders Meeting Mr. Tom Clouse welcomed and thanked all attendees and asked them to introduce themselves. Once the introductions concluded Mr. David Smith, who conducted the meeting, provided a description of the project. The proposed project, as described in the KYTC Six-Year involves studying the need for spot improvements to the section of KY 90 between Beaumont and Burkesville in Metcalfe (District 3) and Cumberland (District 8) Counties, a distance of approximately 25 miles. Improvements to this section of KY 90 could improve the east-west connection from Burkesville to Glasgow. Each attendee was given a folder that contained a meeting agenda, three handouts providing existing information pertaining to KY 90, and a paper copy of a PowerPoint presentation. Posted around the room were several graphics of the project study area, including a USGS map with the project corridor highlighted, a map depicting existing roadways with the corresponding traffic and crash data, an exhibit representing possible historic sites, and also an aerial photograph for the project area.

Following the project description, Mr. Smith used a PowerPoint presentation to conduct the meeting and generate open discussion of the agenda items (see attachment A).

Previous Studies. Improvements to KY 90 in District 3 west of the current project area and a section of KY 61 north of Burkesville will be investigated as a possible source of information, concerning existing conditions of the proposed project area.

Scope of Work. Mr. Smith went through the major elements of the Scope of Work, with a brief discussion of each:

1. Analyze Existing Highway Conditions
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4. Identify Alternatives
5. Recommendations
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Study Schedule. Mr. Smith presented the schedule, which is as follows:

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Environmental Information. Mr. Smith presented Historical information provided by Helen Powell & Company, Inc. and explained how that information could limit what types of improvements could be proposed in specific areas. Widening of KY 90 in the historic districts mentioned below would be difficult without affecting any of the historic buildings or property.

Historic

3	Historic Districts (2 Existing – Marrowbone and Burkesville, 1 Potential – Waterview)
3	National Register Sites
53	Potential & Contributing
21	Survey Sites

Archaeological

4	Previous Investigations
9	Recorded Sites
7	Cemeteries
100	Possible Historic Sites

Issues, Problems/Needs. Mr. Smith led the group in a brainstorming exercise to identify project and planning issues, problems, needs, and opportunities using colored post-it notes. Mr. Smith re-iterated that input from team meeting attendees – especially those familiar with the area – was a critical source of information. The group's written comments generally fell into the following nine major categories:

- Geometric and Safety Issues
- Truck and Recreational Vehicles
- Historical and Environmental Issues
- Community Impacts (Amish)
- Economic Development
- Need of Sidewalks in Marrowbone District
- Adding Shoulders and Widening of Lanes for Truck Traffic
- Passing and Truck Climbing Lanes
- Flooding at Marrowbone

On one of the posted graphics, Mr. Smith with the help of meeting attendees pointed out and circled four problem areas that should be considered when planning improvements to KY 90. The areas represented were a segment near the town of Dubre, a sharp curve and problem with flooding at Marrowbone, a portion of KY 90 at Dutch Creek and sharp curves with high rock walls at Sawmill Cut just West of Burkesville.

Alternatives.

Locations Identified by the Group for Further Study for Possible Spot Improvements:

- Flooding of KY 90 west of KY 496 and Marrowbone Creek.

  - Replacing Bridge at Casey Fork.
  - Providing Shoulders along KY 90.
  - Widening of Lanes East of Beaumont.
  - Cutting back high rock walls in Sawmill Pass just outside of Burkesville.
  - Minimize impacts on possible historic districts around the small towns of Marrowbone and Willow Shade. Also consider impacts to local Amish Community and farms when considering possible alternatives.

- Improvements to Existing Highways:
  - KY 90 West of Beaumont was recently improved.

Data Collection.

- Available Data
- Construction Costs
- Right of Way & Utility Costs
- New Data
- Aerial Photography
- Real Estate Information

Local Agency Coordination.

- Special Concerns?
  - Flooding of KY 90 near Marrowbone should be addressed when proposed alternates are being considered.
  - Recreational weekend traffic is also a problem to be considered.
  - Truck traffic is heavy as a result of drivers attempting to avoid scales.
- Special Issues?
  - The Amish community is generally located between Dutch Creek and KY 100 the community includes an Amish Church and School, which is located on Chism Road.

The meeting adjourned at approximately 2:30 pm.

END OF MINUTES

File ID: 02403\KY 90\
File Name: \Meeting Minutes\KY 90 Stakeholders Mtg on 8-28-03.doc

ATTACHMENT A – AGENDA

Kentucky 90 Pre-Design Scoping Study
Local Officials Meeting
Agenda

Date: **August 28, 2003**
Time: **1:00 PM**
Location: **Burkesville Fire Dept. Training Center, 200 Upper River Street**
Burkesville, KY

1. Introductions

2. Scope of Work
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    b. Prior Studies/Reports
    c. Major Scope Elements
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    b. Traffic Analysis
    c. Safety Analysis
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    e. Environmental Justice Report

4. Project Issues and Goals
    a. Project Issues
    b. Project Problems/Needs

5. Alternative Development
    a. Do Nothing Beyond Existing and Committed
    b. Spot Improvements
    c. ITS Applications
    d. Bicycle/Pedestrian Considerations
    e. Improvements to Existing Highways
    f. New Road Construction
    g. Other

6. Data Collection
    a. Available Data
    b. New Data Collection
    c. Aerial Photography
    d. Real Estate/Relocation Information

7. Agency Coordination Needs

8. Follow-up and Next Steps

Appendix F

Public Information Meeting Summary

SUMMARY OF COMMENT FORMS

Public Information Meetings

KY 90 Improvements

Metcalfe and Cumberland Counties

KYTC Item No. 8-136.00

Summer Shade Elementary School, February 28, 2006
Cumberland County Middle School, March 2, 2006

The public information meetings were conducted to (1) inform the public of the proposed KY 90 improvement project from the Metcalfe-Barren County line to KY 61 in Burkesville in Cumberland County, and (2) to receive their input/comments concerning issues to consider and problems to correct. Citizens were provided a handout containing: a map of the project study area; comment form; and a list of draft project goals, purpose of the study, scope of work, public involvement, study schedule, and the District 8 point of contact for additional information.

A staffed information table with a sign-in sheet was present at the entrance. Comment forms were sequentially numbered and color-coded for control purposes. The meetings were conducted in an informal format. No formal presentation was given. No formal oral comments were recorded or documented. An automated power-point slide presentation was in operation, along with the handouts and two sets of exhibits. Exhibits included the following: 1) aerial photograph of the study area with an environmental overview; 2) existing traffic volumes, level of service, and crash information; and 3) proposed typical section. Staff members from KYTC and Qk4 were available and circulated to offer assistance, elicit comments, and answer questions. All attendees were asked to complete a comment form and either submit it at the meeting, or return it in the provided postage-paid envelops. Two hundred two (202) citizens attended the meetings (106 at Summer Shade, 96 at Burkesville), and twenty-eight (28) comment forms were returned, representing 37 people. Summaries and representative statements of the public comments received are presented below, with the number of times stated in parentheses. Text in brackets was inserted for clarity.

1. How did you hear about this public meeting? (check all that apply)

Newspaper	14	TV	0	Friend/Family	5	Do Not Recall	0
Letter	2	Radio	6	Elected Official	2		
Flyer	1	Meeting	2	Other	9 (trailer billboard most frequent answer)		

2. Do you feel there are problem areas with KY 90 that should be addressed with this project?

Yes 37 No 0

If "yes", please describe any specific locations and types of improvements you feel are needed along KY 90. (Use attached map if necessary to clarify your response.)

- Dangerous road. (8x) Especially at night. No place to pull off roadway if have mechanical problems with vehicle; or when meet oncoming wide vehicle (*e.g.*, large semi-trucks, recreational vehicles and boats). (3x) Postal delivery vehicles can obstruct roadway at mailboxes because no shoulder to pull off road onto. Numerous accidents and fatalities. (5x) Heavily used by Cumberland Co workers commuting daily to work in Glasgow. Narrow road, narrow bridges. (2x) High crash sites at intersections of KY 90/KY 163, KY 90/KY 640 (Summer Shade). (4x) Exiting KY 90 onto driveway/side road causes traffic to slowdown and backup, increasing probability of rear-end crashes, or risky passing.
- Too many speeding vehicles [cars and trucks], especially through reduced speed zones [*i.e.*, towns]. (3x) Install traffic light at school road intersection in Summer Shade. (2x) Metcalfe Co school transportation official also cited excessive speed as a serious problem/safety issue.

- Large volume of commercial/semi truck traffic. (7x) "…big problem with chicken trucks traveling from/to Albany. …lots of spills."
- Large volume of tourist traffic and recreational vehicles (*e.g.*, RV's, boats and trailers, large house boats pulled by large trucks). (6x)
- Slow moving agricultural equipment frequently use roadway. (2x)
- KY 90 needs to be widened and wider shoulders. (6x)
- No/narrow shoulders. (10x) Uneven pavement surface between mainline and shoulder, especially west of Summer Shade. (10x) No/low shoulders with no supporting substrate. If wheels leave driving lane, then little chance of recovery and high probability of property damage/crash.
- Bypass the small towns: Summer Shade (8x), Beaumont (3x), Marrowbone (4x), Waterview (1x), Grider (1x), Burkesville (2x). [Comment was frequently made as a means of removing speeding trucks from the town streets.]
- Project is 40 years overdue; or, needed for many years. (3x)
- Sharp curve in Marrowbone. (3x)
- Sawmill Cut curve/Saw Mill Hill [*i.e.*, Burkesville Hill]. (4x) Straighten or change slope. Slippery when rains, fog, snow, ice; freezes quickly, before other roads. Several accidents and deaths in the area. (4x) One claimed more crashes and deaths than indicated on meeting graphic.
- Bypass Burkesville to the south. Would decrease traffic (especially freight truck) through Sawmill Cut/Burkesville Hill, and at the KY 90/KY 61 intersection in Burkesville, improving traffic turning movements at the only traffic light in Burkesville. Cutting back rock at Sawmill Cut would be ineffective because most crashes occur during inclement weather.
- Claylick curve [exact location unknown, west of Burkesville hill], straighten out curve.
- Widen narrow bridges and narrow road spots.
- "[KY 90] should be top priority for improvement."
- "I drive on KY 90 every day. I think it is very sad KY 90 is a bad road…. Why can't we have a good road from Burkesville to Glasgow … like other [roads out of Burkesville] and other adjoining counties? [provided examples of good roads from Burkesville to: Albany, Columbia, and Celina, TN]
- Improve signing, sight distance at KY 90/KY 163 intersection. KY 163 drivers frequently fail to stop and wait/yield right-of-way, incorrectly believing intersection is a 4-way stop. [intersection is scheduled for reconstruction as part of KY 163 reconstruction, KYTC item no. 3-276.50]
- Personal account of a crash, bodily injury, totaled car at KY 90/KY 163 intersection before caution light installed. Claimed they were one of many crashes at intersection. "How many people have to get killed or hurt before the road gets fixed? We need a 4-lane road from Burkesville to Glasgow to take care of all the traffic. But if we had a 2-lane wide road it would be very nice."
- "Road should be made into a 4-lane highway. If not possible, it should be widened, and passing [lanes] and shoulders should be built."
- Improvement should be a 4-lane highway, similar to SR 111 between Livingston and Cookeville in Tennessee, or KY 68 between Bowling Green and Russeville.
- Cumberland Co Water District official, employed since about 1980: "…all congested areas along KY 90 should be addressed. …I feel KY 90 is very dangerous. Traffic has become 4 times as heavy with all the trucks."
- Improve vertical geometry to increase sight distances [would improve passing safety].
- Replace Dutch Creek Bridge (3x) Bridge lanes and approach lanes are too narrow, especially when meeting oncoming truck traffic. Forced onto non-existent shoulders. Excessive vehicle speeds.
- Many frustrated drivers try to pass when they shouldn't. Examples: slower speed through towns, slow traffic entering KY 90 from side roads/driveways, farm machinery on narrow 2-lane

road, limited opportunities to pass, 3 or more semi-trucks grouped together on 2-lane road, heavy on-coming traffic volume frequently prevents passing in areas where passing is possible. (4x)

- "Dangerous curves [at Beaumont Cemetery] and we need extra lanes due to heavy traffic." (2x)
- Roadway/curve at Barren-Metcalfe County line needs repair and straightening. Dangerous area. Too many crashes and injuries/deaths. "Dead man curve." (9x)
- In Summer Shade business and school area, need turning lanes and much wider shoulders.
- "We are pleased with the work done several years ago near the Summer Shade Cemetery and TVA substation." [truck climbing lane added; driving lanes and shoulders widened, respectively]
- Increased law enforcement of speed limits. (5x)
- "Just widen the roads — straightening them will make it more dangerous."
- Spot improvements only.
- New route/alignment for KY 90 not needed; just widen existing roadway.
- Need passing lanes. Too much on-coming traffic to pass safely.

3. How would roadway improvements positively or negatively affect communities along KY 90?

- Better traffic flow if communities bypassed. (3x)
- Any improvements would be positive. (5x)
- One comment sheet claimed 95 percent of people would be willing to sell their property to improve safety of roadway. (submitter owns property at/near a curve; volunteered to sell lots)
- KY 90 heavily traveled by tourists. Improving road could improve local economies. (4x)
- Road would be safer. (7x) Fewer crashes, turnovers, injuries, fatalities, less property damage.
- Bypassing Summer Shade "would be devastating to the service stations and convenience stores," but it would also make the area safer from speeding drivers.
- Do not bypass Summer Shade. "We need these small businesses."
- "Cumberland County has no airport, no railroads, no water transportation. We need the best road system we can get to help our community to survive and prosper. …[then] we can attract more business, companies, and tourists … improve our job situation … and [retain] our younger population [upon] graduation from high school."
- An improved highway (especially a 4-lane) would tell people future improvements are not likely, and encourage them to invest in new homes and businesses along the highway.
- A new "4-lane highway would straighten and eliminate most curves [horizontal and vertical], the speed limit could be more constant, and more people would use the highway. …attract more freight trucks from I-65 to I-40 and bypass Nashville because the distance would be shorter and faster along KY 90 and [KY] 61 south into Tennessee." [negative affect?]
- Provide better access to health care/medical facilities, education, and employment opportunities in Glasgow.
- Potential residential displacements and right-of-way acquisitions.

4. Are there areas or sites in the study area we should avoid (*e.g.*, natural areas or habitats, recreational areas, historic or cultural sites, hazardous materials sites, scenic areas, viewsheds), or any additional environmental issues we need to address? Please identify and explain why.

- Cemeteries, churches.
- Historic Presbyterian Church in Marrowbone.
- Historic buildings in Summer Shade and Marrowbone.
- Unmarked cemetery, north side of KY 90, east of Barren-Metcalfe County line, just west of Froedge-Dubre Road. [included a small hand drawn map of location]

5. Please list any specific community groups or individuals who should be involved in this study.

- Several people submitted names of the various businesses located along KY 90, plus the generic terms of "farmers along KY 90," or anyone who lives or works on KY 90.
- County judges, magistrates, town officials schools.
- Burkesville-Cumberland County Chamber of Commerce
- State parks, Henderick Creek Resort, Sulphur Creek Resort. [Believe intention was to contact tourist/RV destination sites and provide information/educate.]
- Contact/canvas commercial establishments that are semi-tractor trailor/truck origination and destination points to inform/educate dispatchers and drivers.
- Dale Rowlett, fire chief (familiar with problem areas and crash sites), magistrate
- Kay Harbison (local historian)
- USPS carriers on the route.

6. Additional Comments.

- Spot repairs are not an efficient use of money, unless part of a total KY 90 reconstruction plan. (3x)
- Rebuild it now! (2x)
- Straightening/improving the most troubled spots would improve safety, save lives. (3x)
- Personal account of a stepdaughter killed, son permanently injured, on KY 90 in Grider, 1982. "I think any improvements to KY 90 would be good."
- Many people and students use KY 90 to commute to work or school in Glasgow, Bowling Green, and surrounding counties.
- "The speed and number of semi/tractor trailer and log trucks are a huge factor with accidents on highway 90 — AND poultry trucks more so than any other large truck!" [Note. Poultry trucks frequently cited as the most dangerous traffic/offenders in discussions with local citizens.]
- Difficult to slow or stop traffic when funeral processions depart McMurtrey Funeral Home [Summer Shade, north side KY 90, vicinity of road to elementary school]
- "Come on down and travel the road for about a week, during early morning (6-8 am) and evening (3-6 pm)."
- "KY 90 should not be moved. It only needs small improvements. It only need to be widen out in some places. A small shoulder would help greatly."
- "We have been neglected for many years considering the amount of traffic 90 carries."

Several submitted their own KY 90 alignment recommendations, hand drawn on the handout map, as generally described below.

- Essentially a straight line drawn from the KY 90/KY 163 intersection to the KY 90/KY 691 intersection west of Burkesville; then a southern bypass of Burkesville with a new bridge crossing the Cumberland River to reconnect with KY 90 just south of the KY 1880 intersection.
- One person submitted map indicating the locations and number of fatalities he had knowledge of, and some he had "been witness to". Time period not indicated, but sites appeared to sum to 14. [Two locations corresponded to already identified high crash sites.]
- Southern bypasses of Summer Shade, Beaumont, and Waterview to Burkesville. Northern bypass of Marrowbone.

KENTUCKY 90 STUDY

PUBLIC INFORMATION MEETING

February 28 & March 2, 2006

Draft KY 90 Project Goals:

- Improve Safety
- Meet Current Design Standards
- Improve Roadway to Accommodate Large Vehicles
- Minimize/Avoid Impacts to Potential Historic Districts
- Minimize/Avoid Impacts to Communities
- Improve Access to Recreational, Employment, Educational, and Health Care Facilities in South Central Kentucky

Public Involvement:

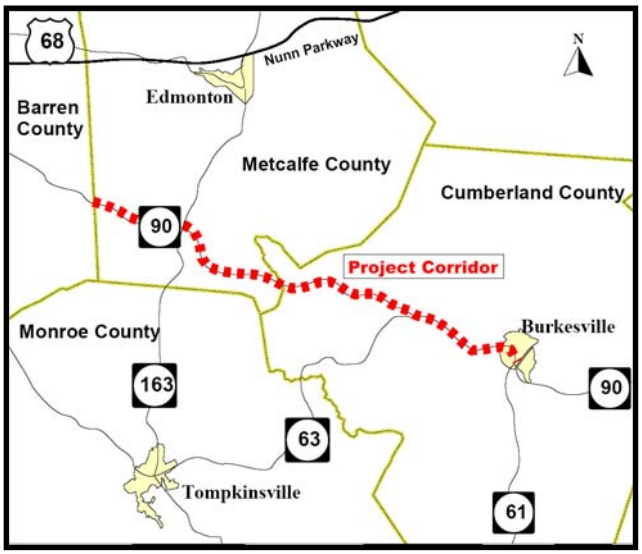
1. Project Team Meetings (2)
2. Public Meetings (2)
3. Resource Agency Coordination (1)
4. Website: http://transportation.ky.gov/planning/projects/dist_8.asp

Schedule:

- Public Meetings: Feb/March 2006
- Develop Feasible Alternatives: May 2006
- Draft Report: August 2006
- Final Report: November 2006

Purpose of Study:

- Identify Issues to be Addressed in this Highway Study
- Seek Input from Public
- Gather/Develop Data
- Develop Alternatives
- Evaluate all the Alternatives
- Make Recommendations



Your Role This Evening:

Help Identify:

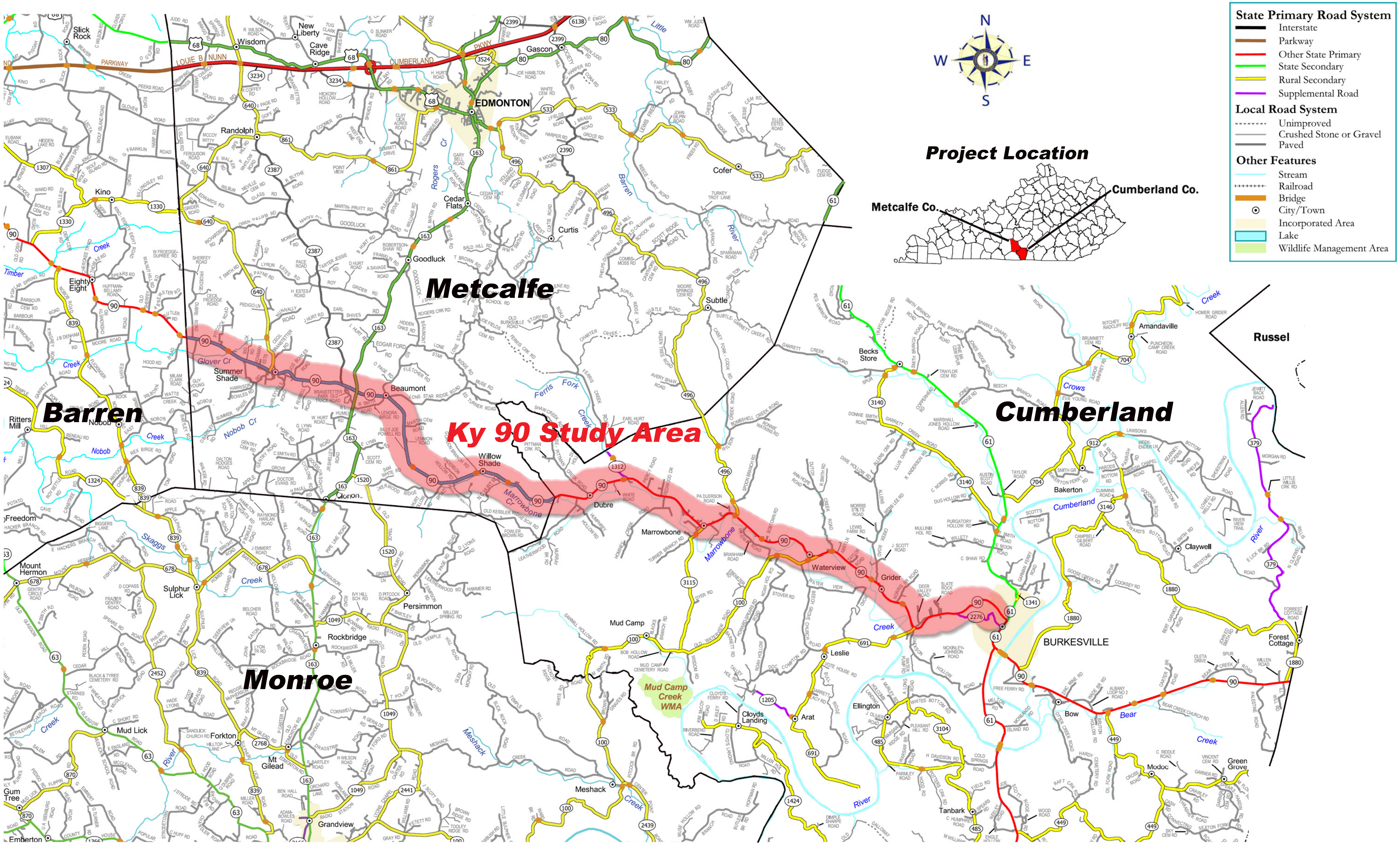
- Project Issues
- Goals for the project
- Possible Alternatives
  - Areas That are Dangerous
  - Areas That Should be Avoided
  - Areas That Should be Better Served

Scope of Work:

1. Analyze Existing Highway Conditions
2. Prepare Environmental Overview
3. Involve Public
4. Develop Project Goals
5. Identify Feasible Alternatives
6. Prepare Report

How to Contact Us:

- Mail Tom Clouse
  Kentucky Transportation Cabinet
  District 8
  1660 South Highway 27
  Somerset, KY 42502
- Phone (606) 677-4017
- Fax (606) 677-4013
- Email tom.clouse@ky.gov


State Primary Road System
Interstate
Parkway
Other State Primary
State Secondary
Rural Secondary
Supplemental Road
Local Road System
Unimproved
Crushed Stone or Gravel
Paved
Other Features
Stream
Railroad
Bridge
City/Town
Incorporated Area
Lake
Wildlife Management Area
Project Location
Metcalfe Co.
Cumberland Co.
N
S
E
W
Metcalfe
Barren
Cumberland
Monroe
Russel
Ky 90 Study Area
EDMONTON
BURKESVILLE
Mud Camp Creek WMA
Summer Shade
Beaumont
Willow Shade
Dubre
Marrowbone
Waterview
Grider
Goodluck
Cedar Flats
Curtis
Subtle
Cofer
Randolph
Kino
Eighty Eight
Sulphur Lick
Rockbridge
Persimmon
Mud Camp
Meshack
Leslie
Ellington
Arat
Cloyds Landing
Bakerton
Claywell
Amandaville
Forest Cottage
Bow
Modoc
Green Grove
Tanbark
Becks Store
Wisdom
Gascon
New Liberty
Cave Ridge
Slick Rock
Mud Lick
Forkton
Mt Gilead
Grandview
Gum Tree
Emberton
Mount Hermon
Freedom
Ritters Mill
Nobob
Gloyon
Tompkinsville road labels omitted

Last map revision: June 2005

2 0 2 4 6 Miles

Ky 90 Study Area

Kentucky UNBRIDLED SPIRIT

KENTUCKY TRANSPORTATION CABINET

Division of Planning

COMMENT FORM

Public Information Meeting

KY 90 Improvements
Metcalfe and Cumberland Counties
KYTC Item No. 8-136.00

We need your help! The Kentucky Transportation Cabinet is conducting a study of potential roadway improvements to KY 90 from the Metcalfe-Barren County line to KY 61 in Burkesville in Cumberland County. A map of the project study area is attached.

You can help us by completing this comment form. The information you provide will help us understand the transportation needs in your area, where problems might exist, determine what types of improvements are needed, the locations of those improvements, identify areas to be avoided, and what impacts any improvements would have on your community and region. Please complete this form and return it to Transportation Cabinet staff here tonight, or use the postage–paid envelope provided to submit your comments by Friday, March 17, 2006. We appreciate your participation and value your comments. Each person should complete a separate comment form.

Name: _____

Representing (title, agency, organization, if applicable): _____

Address: _____

_____

Phone (optional)**:** _____ **Date:** _____

All comments are welcome! We appreciate your participation!

1. How did you hear about this public meeting?

☐ Newspaper	☐ TV	☐ Friend/Family	☐ Do Not Recall
☐ Letter	☐ Radio	☐ Elected Official	
☐ Flyer	☐ Meeting	☐ Other	

2. Do you feel there are problem areas with KY 90 that should be addressed with this project?

___ Yes ___ No

If "yes", please describe any specific locations and types of improvements you feel are needed along KY 90. (Use attached map if necessary to clarify your response.)

_____

_____

_____

_____

_____

_____

_____

3. How would roadway improvements positively or negatively affect communities along KY 90?

4. Are there areas or sites in the study area we should avoid (*e.g.*, natural areas or habitats, recreational areas, historic or cultural sites, hazardous materials sites, scenic areas, viewsheds), or any additional environmental issues we need to address? Please identify and explain why.

5. Please list any specific community groups or individuals who should be involved in this study.

6. Additional Comments.

Thank you for your comments. Use additional pages if necessary.
For further information contact:

Tom Clouse
Kentucky Transportation Cabinet
District 8
1660 South Highway 27
Somerset, KY 42502

phone: (606) 677-4017
email: tom.clouse@ky.gov

Please note: Under KRS 516.030, falsely completing, making, or altering this document with the intent to defraud, deceive, or injure another is forgery in the second degree, a Class D felony.

Appendix G

Geotechnical Reports

UNIVERSITY OF KENTUCKY

Kentucky Geological Survey
Research
228 Mining & Mineral Resources Bldg.
Lexington, KY 40506-0107
Phone: (859) 257-5500
Fax: (859) 257-1147
www.uky.edu/kgs

June 8, 2006

Tom Clouse, P.E.
Kentucky Transportation Cabinet
P.O. Box 780
Somerset, KY 42502

Dear Mr. Clouse:

This letter is to summarize any geologic concerns for the pre-design scoping study:
Cumberland and Metcalfe Counties
Ky. 90 spot improvements
From Burkesville, Ky., to the Metcalfe/Barren County line
Item No. 8-136.00

Physiographic Region
This planning study is in the Mississippian Plateau (Pennyroyal or Pennyrile) Physiographic Region, which is underlain by limestones of varying degrees of purity, dolomites, siltstones, and black shale.

Karst Potential
This planning study might encounter karst features such as sinkholes and caves.

Landslide Potential
This planning study would not encounter any pre- or post-landslide hazard.

Unconsolidated Sediments
This planning study would encounter unconsolidated sediments, such as clay, silt, sand, gravel, and chert rubble in the streams.

Resource Conflicts
This planning study might encounter resource conflicts such as prior ownership of property for quarrying or mining. A pipeline crossing occurs by Stillhouse Branch and Marrowbone Creek in the Sulphur Lick quadrangle.

Materials Suitability

This planning study would encounter the St. Louis Limestone, Salem and Warsaw Limestone, Fort Payne Formation, and the Leipers Member any of which would be suitable for road aggregate. Caution needs to be taken for the St. Louis, Fort Payne, and Leipers Limestones that might contain shaley layers that would not be suitable for road aggregate because of the shale properties to expand when wet and break down.

Fault Potential

This planning study would not encounter faulted areas.

Earthquake Ground Motions

This planning study area has a probable peak ground acceleration (PGA) due to earthquake ground motion of 0.09g. There would be a very low potential for liquefaction or slope failure in the unconsolidated sediments at or near streams by bedrock ground motion.

Sincerely,

Richard A. Smath
Geologist

cc: Mike Blevins

M E M O R A N D U M **P-001-2006**

TO: Tom Clouse, PE
TEBM for Planning
District 8, Somerset

FROM: William Broyles, PE
Geotechnical Engineering
Branch Manager
Division of Structural Design

BY: Michael Blevins, PG
Geotechnical Branch

DATE: July 6, 2006

SUBJECT: Metcalfe/Cumberland County
FD04 085 0090 004-012 D
KY 90 Spot Improvements
Item # 08-136.0
Mars # 7796601D
Geotechnical Overview

The Geotechnical Branch has completed a review of the project and has the following comments and concerns:

The project is underlain by Alluvium and bedrock of the St. Louis Limestone, Salem and Warsaw Limestone, Fort Payne Formation, Chattanooga Shale, Brassfield Dolomite, Cumberland Formation, and Leipers Limestone.

Alluvium ranges in depth from 0 feet to 60 feet throughout the project and consists of clay, silt, sand and gravel and is found along the major streams. Structures constructed along Marrowbone Creek and Cumberland River may require deep foundations (Piles or Drill Shafts) due to the deep alluvium that may be encountered.

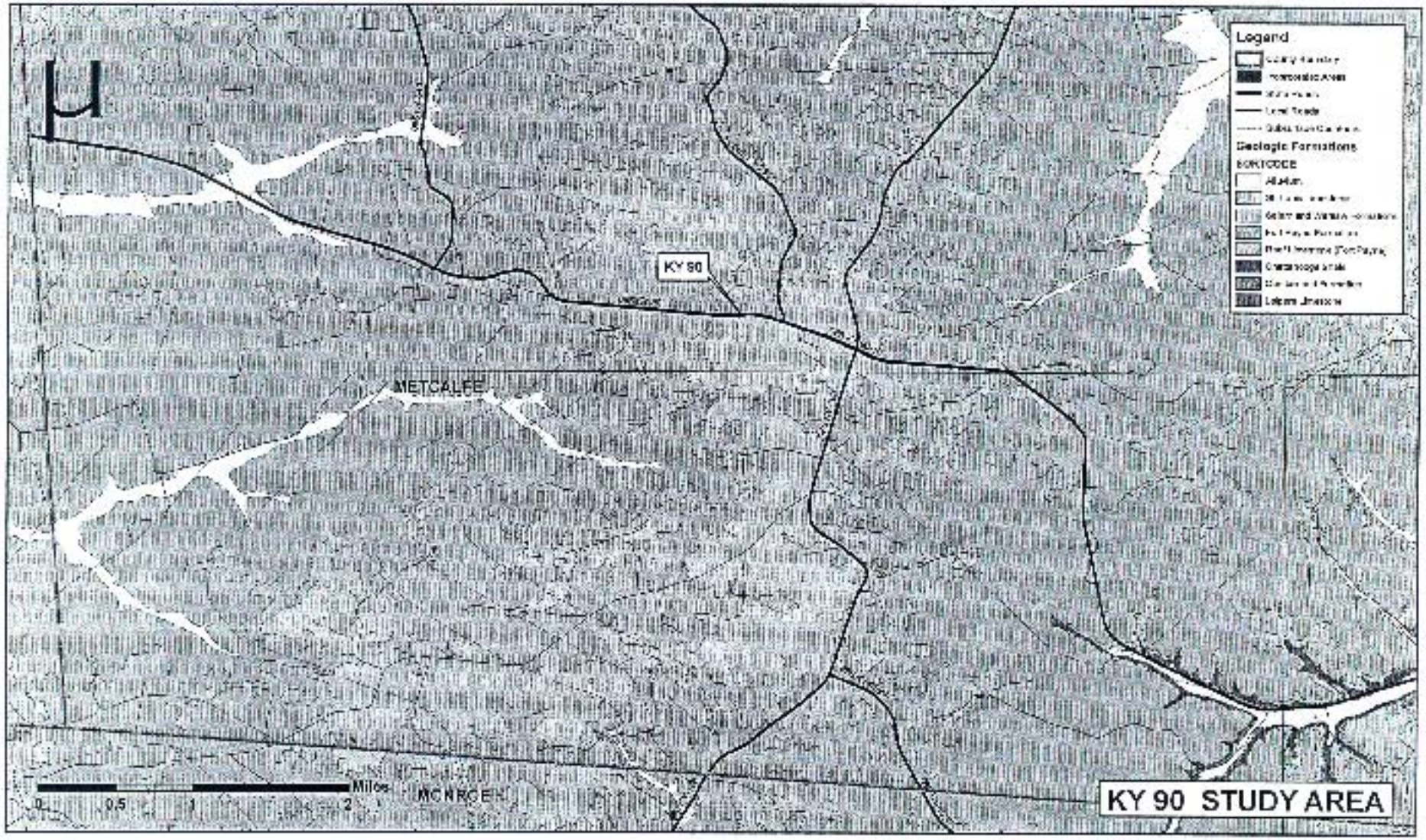
The St. Louis Limestone, Salem and Warsaw Limestone, Fort Payne Formation, Cumberland Formation, and Leipers Limestone contain Limestone, Dolomite and Siltstone suitable for rock roadbed.

Sinkholes are common in the St. Louis Limestone and Salem and Warsaw Limestone.

Talus deposits may be encountered in steep valleys in mountainous regions of the project.

The main concern of the Branch is the Chattanooga Shale. The shale contains Pyrite and Marcasite which when exposed to water and air can produce acidic runoff conditions. Currently in order to comply with DEP Environmental Performance Measures and to protect surface and groundwater, the Branch has on past projects usually recommended over excavating a serrated 2:1 cut slope and covering the shale with approximately 4 feet of clay shale and soil to prevent acidic runoff. When the shale is used in embankments, it is encased with clay shale and soil. The Chattanooga Shale, in most areas, can be avoided by shifting the alignment horizontally and vertically. The locations of the Chattanooga Shale are shown on the attached Geologic Maps indicated by **DC**.

If there are any questions, please advise.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Geologic Formations
KY 90
METCALFE
MONROE
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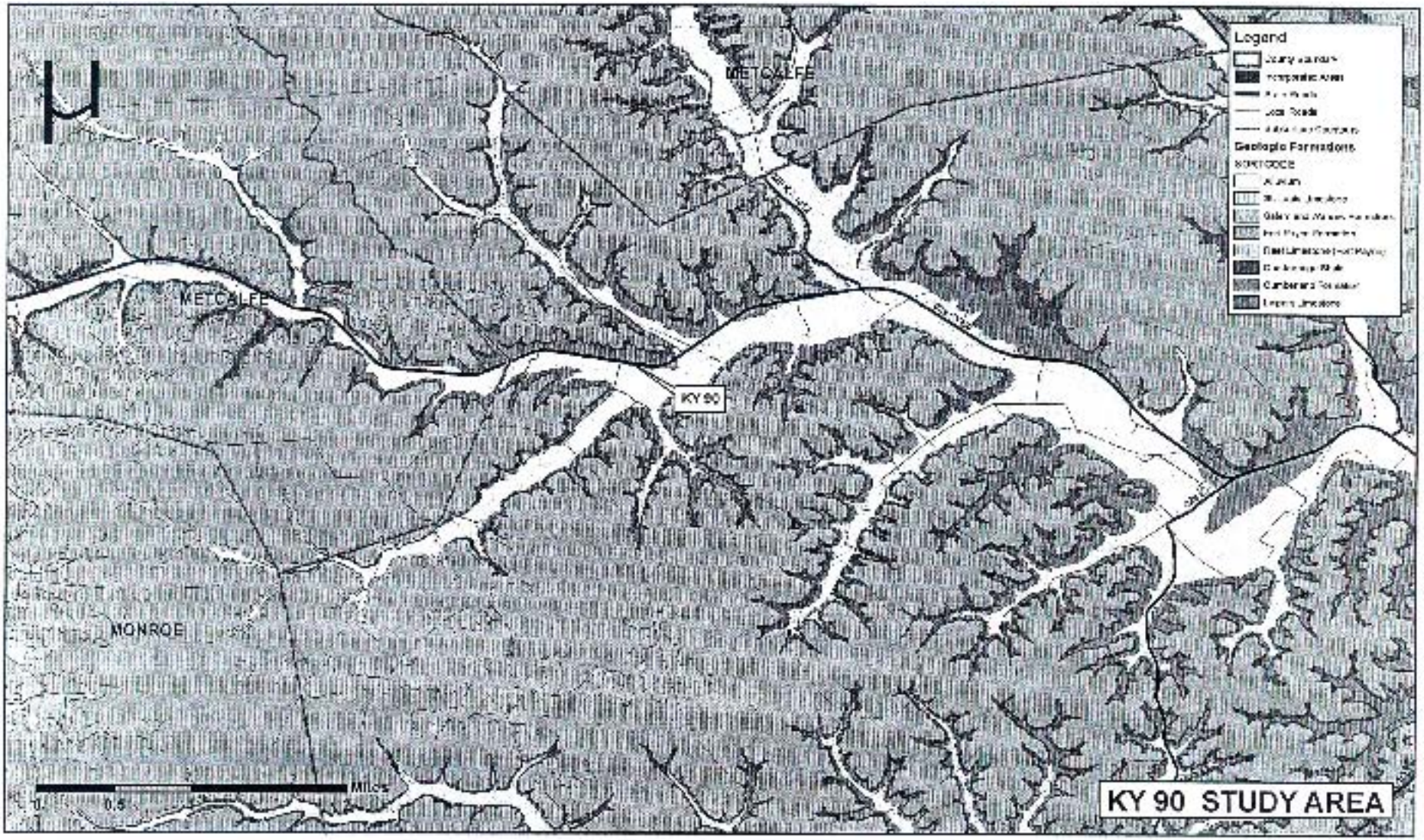
Miles
KY 90 STUDY AREA


METCALFE
METCALFE
KY 90
MONROE
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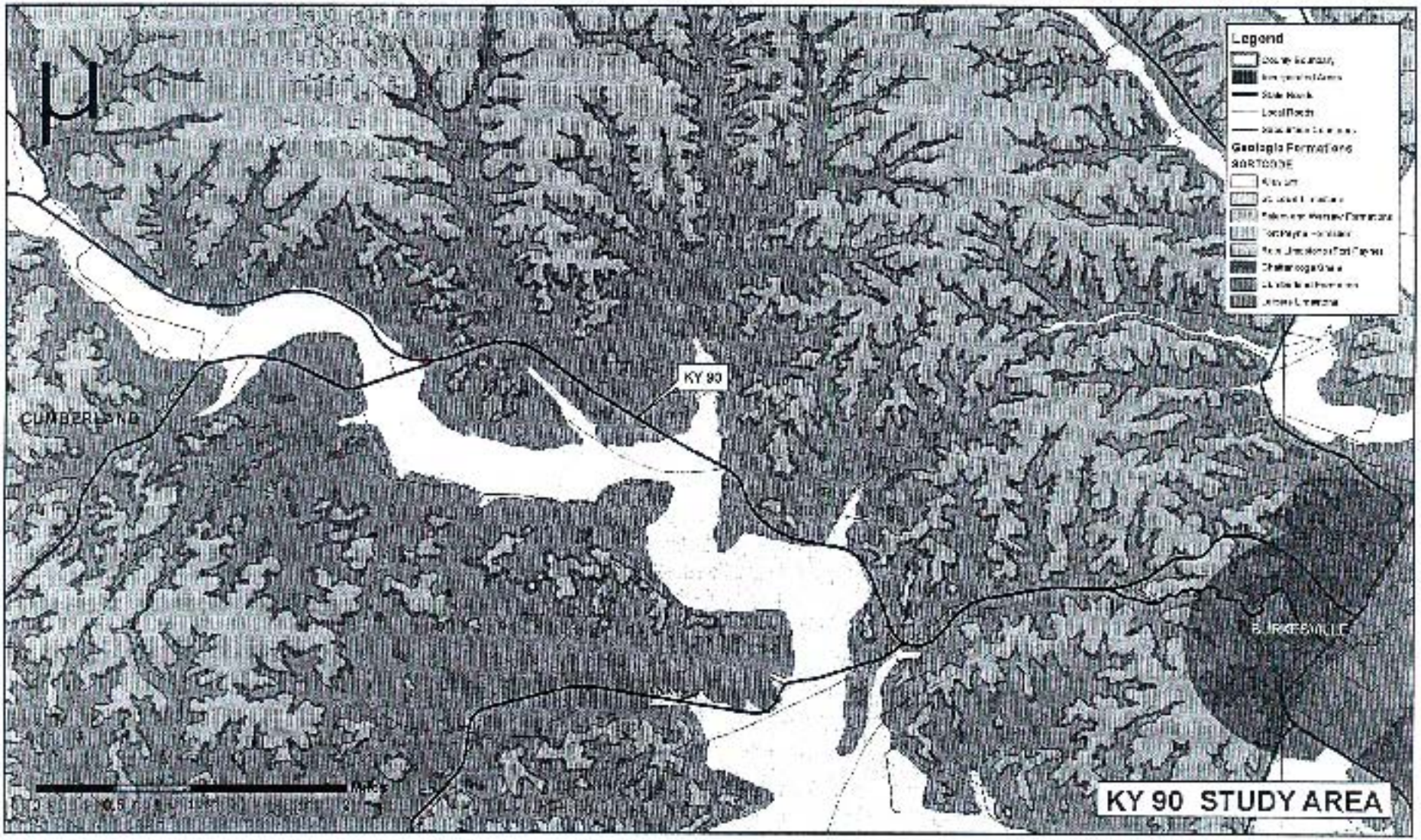
Geologic Formations
KY 90 STUDY AREA


Legend
Geologic Formations
KY 90
CUMBERLAND
BURKESVILLE
KY 90 STUDY AREA

Appendix H

Resource Agency Coordination Responses

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, LOUISVILLE
CORPS OF ENGINEERS
P.O. BOX 59
LOUISVILLE, KENTUCKY 40201-0059
FAX: (502) 315-6677
http://www.lrl.usace.army.mil/

June 22, 2006

Operations Division
Regulatory Branch (South)
ID no. LRL-2006-758-pmh

This is in response to your request for comments concerning:

Project No: 8-136.00

Description: Pre-Design Scoping Study, Cumberland-Metcalfe Counties, KY 90 Spot Improvements, From Burkesville to the Metcalfe/Barren County Line

Name of Organization requesting early coordination:
Kentucky Transporation Cabinet

We do not have any comments on the general environmental impacts of the proposed project(s). This agency is not funded or authorized to provide general environmental assessments for all federally related development proposals. Our lack of comments on specific potential environmental impacts should not be construed as concurrence that no significant environmental damage would result from the project.

1. The proposed improvement may impact the following waterway(s) under our jurisdiction:

Marrowbone Creek, Unnamed tributaries of Marrowbone Creek, Ferris Fork Creek, Casey Fork, Dutch Creek, Unnamed of Dutch Creek, Allen Creek, Baggard Branch, and Unnamed tributaries of Baggard Branch.

2. Current and/or future plans to develop the waterway(s) include:

None

3. The following Corps of Engineer's projects and/or studies are located within the area:

None

4. The depth or elevation of Ordinary High Water (OHW) is:

____ Feet mean sea level.

____ The OHW elevation is the line on the bank established by the changing water surface and indicated by physical characteristics such as a clear natural line impressed on the bank; shelving; changes in the character of the soil; destruction of terrestrial vegetation; and other indications as determined upon inspection of the area. If additional information is needed for the OHW you may contact our Hydrology & Hydraulics Branch by calling (502) 315-6456.

5. The project site is within flood elevations:

____ Flood plain information is available by writing this office directly and requesting a floodplain delineation for a specific area. However, we are required by law to collect a fee for this service. The fee varies with the scope and complexity of the request. If you are interested in receiving this service please re-submit this request to the above address, ATTN: CELRL-PMP or call (502) 315-6892 and we will provide information on the fee schedule. Otherwise you may be able to obtain this information from local agency sources such as planning commissions.

6. Wetlands:

____ are located on the site as indicated on the attached sheet.

__X__ To our knowledge, no wetland mapping of your proposed project site has been done, nor does the Corps of Engineers have any future plans to delineate and map jurisdictional wetlands for public or private use. If you suspect wetlands would be impacted by the discharge of dredged or fill material, a wetland delineation report conforming to the "Corps of Engineers Wetland Delineation Manual, Technical Report Y-87-1," would have to be submitted. Members of our regulatory staff having expertise in this area, would evaluate and verify the wetland delineation report as part of our review process. If you need assistance in preparing a wetland delineation, there are several environmental consultants in your geographic area having this expertise.

7. If based on your coordination with the State Historic Preservation Officer, it is determined that the project may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the Department of the Army permit application must include information stating which historic property may be affected by the proposed work and/or a vicinity map indicating the location of the historic property.

8. If your project would impact any "waters of the United States," including jurisdictional wetlands, then you should submit a Department of the Army (DA) permit application for review by this office. Copies of DA permit application forms can be obtained by writing to the above address ATTN: CELRL-OP-FN or by calling (502) 315-6733.

Phyllis Hockett

Phyllis Hockett
Project Manager
Regulatory Branch

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
Regulatory Branch
3701 Bell RD
Nashville, TN 37214
June 29, 2006

Regulatory Branch

SUBJECT: File No. 200601329; Pre-Design Scoping Study KY-90 Spot Improvements, From Burkesville to Metcalfe/Barren County Line (KTC Item No. 8-136.00)

Tom Clouse, P.E.
TEBM Planning
Kentucky Transportation Cabinet
1660 S. Highway 27
Somerset, Kentucky 42502

Dear Mr. Clouse:

This concerns your request for input and comments regarding the potential effects of the subject proposal on areas of interest or programs administered by our agency. Please reference File No. 200601329 in future communications with us about this work.

The regulatory authorities and responsibilities of the Corps of Engineers (Corps) are based mainly on two laws: Section 10 of the Rivers and Harbors Act of 1899 (33 USC 403) and Section 404 of the Clean Water Act (33 USC 1344). Section 10 prohibits the obstruction or alteration of navigable waters of the United States (NWUS) without a Corps permit. Section 404 requires a Corps permit for any discharge of dredged or fill material into waters of the United States (WUS).

Based on a review of the proposed study area on the Waterview, Dubre, Sulphur Lick, and Summer Shade U.S. Geological Survey Quadrangle maps, the highway improvements would likely involve stream construction activities in or over Marrowbone Creek and its tributaries and several other streams and wetlands in the Burkesville, Grider, Waterview, Marrowbone, Dubre, Willow Shade, Beaumont, and Summer Shade vicinities. The Commonwealth of Kentucky has classified Marrowbone Creek as an Outstanding Resource Water in the state. We strongly encourage your avoidance of impacts to this stream and its major tributaries. No NWUS exist within the study area.

Please note that our permit review includes application of the Section 404(b)(1) Guidelines. As such, the design of the project must avoid impacts or adverse modification to WUS (including wetlands) to the extent practicable. Constructing bridges or bottomless culverts that completely span streams,

limiting approach fills to areas above the ordinary high water mark, and avoiding stream relocations and wetland fills whenever practicable are options that must be considered. Documentation of avoidance, minimization, and mitigation efforts should be provided with the permit application package.

Thank you for including us in your scoping process. We are available to discuss our permit requirements in detail as well as efforts to avoid or minimize the project's aquatic resource impacts. I may be reached at the above address, telephone (615) 369-7519. My email address is jose.r.hernandez2@us.army.mil.

Sincerely,

J. Ruben Hernandez
Project Manager
Operations Division

United States Department of Agriculture

NRCS Natural Resources Conservation Service

771 Corporate Drive
Suite 210
Lexington, KY 40503-5479
(859) 224-7350

June 21, 2006

Mr. Tom Clouse
TEBM Planning, Kentucky Transportation Cabinet
PO Box 780
Somerset, KY 42502

Dear Mr. Clouse:

In regards to the Pre-Design Scoping Study, Cumberland and Metcalfe Counties, KY 90 Spot Improvements, the USDA-Natural Resources Conservation Service (NRCS) is concerned with potential impacts that the proposed highway project might have upon prime farmland soils and additional farmlands of statewide importance.

If federal dollars are to be used to convert important farmlands from agricultural uses to non-agricultural uses a Form AD-1006 (or Form NRCS-CPA-106 if the project is a corridor type project) must be submitted to the local NRCS office. These forms may be obtained from the local NRCS office and are also available as electronic forms on the web at http://www.nrcs.usda.gov/programs/fppa/pdf_files/AD1006.PDF and http://www.nrcs.usda.gov/programs/fppa/pdf_files/CPA106.pdf .

The NRCS contact persons are: James Dedmon, District Conservationist for Cumberland County at 270-864-2606 or james.dedmon@ky.usda.gov and Melinda Cave, District Conservationist for Metcalfe County at 270-432-3191 or melinda.cave@ky.usda.gov. These staff can help in identifying important farmlands in the proposed project area.

To further assist with the planning efforts, I am enclosing a CD containing ArcView GIS shapefiles of basic soils information for Cumberland County. A set of Arc View legend files are also included. You will want to symbolize the soils using the "farmland.classif.avl" legend file. Unfortunately, we do not have digital soils data for Metcalfe County; however, the Metcalfe NRCS office can provide you with further information regarding soils in Metcalfe County. If you have any questions regarding the digital data, please contact, Steve Crabtree, State GIS Coordinator, at #859-224-7400.

Sincerely,

DAVID G. SAWYER
State Conservationist

cc:
James D. Dedmon, District Conservationist, NRCS, Cumberland County
Melinda P. Cave, District Conservationist, NRCS, Metcalfe County

DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
and Prevention (CDC)
Atlanta GA 30333

June 22, 2006

Tom Clouse, P.E.
TEBM Planning
District 8 - Somerset
Kentucky Transportation Cabinet
P.O. Box 780
Somerset, Kentucky 42502

Dear Mr. Clouse:

This is in response to your letter of May 24, 2006 requesting our agency's input and comments on a planning study to determine the need for, and the potential impacts from possible improvements to KY 90 between Burkesville and Metcalf/Berren County line. We are responding on behalf of the Department of Health and Human Services (DHHS), U.S. Public Health Service.

While we have no project specific comments to offer at this time, we do recommend that the topics listed below be considered during the NEPA process along with other necessary topics, and addressed if appropriate. Mitigation plans which are protective of the environment and public health should be described in the DEIS wherever warranted.

AREAS OF POTENTIAL PUBLIC HEALTH CONCERN:

I. Air Quality
- dust control measures during project construction, and potential releases of air toxins potential process air emissions after project completion
- compliance with air quality standards

II. Water Quality/Quantity
- special consideration to private and public potable water supply, including ground and surface water resources
- compliance with water quality and waste water treatment standards
- ground and surface water contamination (e.g. runoff and erosion control)
- body contact recreation

III. Wetlands and Flood Plains
- potential contamination of underlying aquifers
- construction within flood plains which may endanger human health
- contamination of the food chain

IV. Hazardous Materials/Wastes
- identification and characterization of hazardous/contaminated sites
- safety plans/procedures, including use of pesticides/herbicides; worker training
- spill prevention, containment, and countermeasures plan

V. Non-Hazardous Solid Waste/Other Materials
- any unusual effects associated with solid waste disposal should be considered

VI. Noise
- identify projected elevated noise levels and sensitive receptors (i.e. residential, schools, hospitals) and appropriate mitigation plans during and after construction

VII. Occupational Health and Safety
- compliance with appropriate criteria and guidelines to ensure worker safety and health

VIII. Land Use and Housing
- special consideration and appropriate mitigation for necessary relocation and other potential adverse impacts to residential areas, community cohesion, community services
- demographic special considerations (e.g. hospitals, nursing homes, day care centers, schools
- consideration of beneficial and adverse long-term land use impacts, including the potential influx of people into the area as a result of a project and associated impacts
- potential impacts upon vector control should be considered

IX. Environmental Justice
- federal requirements emphasize the issue of environmental justice to ensure equitable environmental protection regardless of race, ethnicity, economic status or community, so that no segment of the population bears a disproportionate share of the consequences of environmental pollution attributable to a proposed project. (Executive Order 12898)

While this is not intended to be an exhaustive list of possible impact topics, it provides a guide for typical areas of potential public health concern which may be applicable to this project. Any health related topic which may be associated with the proposed project should receive consideration when developing the draft and final EISs. Please furnish us with one copy of the draft document when it becomes available for review.

Sincerely yours,

Paul Joe

Paul Joe, DO, MPH
Medical Officer
National Center for Environmental Health (F16)
Centers for Disease Control & Prevention

U. S. Department of Housing and Urban Development
Louisville Field Office, Region IV
601 West Broadway, Room 110
Louisville, Kentucky 40202

June 6, 2006

Mr. Tom Clouse, P.E
Kentucky Transportation Cabinet
PO Box 780
Somerset, Kentucky 42502

Subject: Pre-Design Scoping Study
Cumberland-Metcalfe Counties
KY 90 Spot Improvements
From Burkesville to the Metcalfe/Barren County Line
Item No. 8-136.00

Dear Mr. Clouse:

Thank you for your letter of May 24, 2006 regarding the subject improvements in Cumberland and Metcalfe counties. At this time, we do not have any issues or concerns that would affect the development of this project.

Please feel free to call me at 502-582-6163, extension 203, should you have any further inquires on this project.

Sincerely,

Krista Mills
Field Office Director

KENTUCKY COMMERCE CABINET

Ernie Fletcher
Governor

Capital Plaza Tower, 24th Floor
500 Mero Street
Frankfort, Kentucky 40601
Phone (502) 564-4270
Fax (502) 564-1512
www.commerce.ky.gov

George Ward
Secretary

June 5, 2006

Mr. Tom Clouse, P.E.
Kentucky Transportation Cabinet
P.O. Box 780
Somerset KY 42502

Re: Pre-Design Scoping Study
Cumberland-Metcalf Counties
KY 90 Spot Improvements
Item No. 8-136.00

Dear Mr. Clouse:

The Commerce Cabinet has reviewed your correspondence to me regarding the subject. The study will not directly impact any of our facilities. I would like to state in general that our agency's mission is protecting the environment associated with our facilities and we are certainly concerned about environmental impacts for the entire Commonwealth.

I appreciate you seeking our agency's comments on this project.

Sincerely,

George Ward
Secretary
Kentucky Commerce Cabinet

GW/jmd

cc: John Drake

JUSTICE AND PUBLIC SAFETY CABINET

Ernie Fletcher
Governor

Kentucky Vehicle Enforcement
Frankfort, Kentucky 40601

Lt. Gov. Stephen B. Pence
Secretary

Gregory G. Howard
Commissioner

June 13, 2006

Mr. Tom Clouse, P.E.
Kentucky Transportation Cabinet
PO Box 780
Somerset, KY 42502

Dear Mr. Clouse:

We are in receipt of your letter in regards to the Pre-Design Scoping Study of KY 90 in Cumberland and Metcalfe counties from Burkesville to the Metcalfe/Barren county line.

After having my staff research the information, we can see no issues that KVE would have with these road improvements. In fact, it appears the road would be widened in several spots that would help accommodate the large volume of truck traffic.

If you need any further information, please do not hesitate to contact us.

Sincerely,

Gregory G. Howard
Commissioner
Kentucky Vehicle Enforcement

ERNIE FLETCHER
GOVERNOR

CABINET FOR HEALTH AND FAMILY SERVICES

275 EAST MAIN STREET, HS1GWA
FRANKFORT, KENTUCKY 40621-0001
(502) 564-3970 (502) 564-9377 FAX

MARK D. BIRDWHISTELL
SECRETARY

June 12, 2006

Tom Clouse, P.E.
TEBM Planning
District 8 – Somerset
Somerset, KY 42502

RE: Your Ltr, pre-Design Scoping Study, May 24, 2006

Dear Mr Clouse,

On behalf of the Cabinet for Health & Family Services, thank you for the opportunity to comment on the pre-design scoping study related to KY 90 spot improvements. The following comments are provided for your consideration as you move forward with planning.

a. Attention should be given to existing installed septic systems, potential impact of activity in surrounding vicinity of septic systems, and the fact a plan for remedy should be in place if altered. Planning should include determination of whether grading and/or improvements will impact drainage, including existing septic lateral fields and wells.
b. Improvements will no doubt encourage growth. Please ensure planners provide attention to water and sewer needs.

We recommend use of local health departments to determine the location of existing septic systems and water sources. We wish you well with the project. If we can be of further assistance, please feel free to contact the Division of Public Health Protection & Safety at 502-564-7398.

Sincerely,

Clyde Bolton, Director
Division of Public Health Protection & Safety

Cc: William D. Hacker, MD, FAAP, CPE
Undersecretary for Health

Richie Farmer
Commissioner

Division of Food Distribution
107 Corporate Drive
Frankfort, KY 40601
Phone: (502) 573-0282
Fax: (502) 573-0304

Kentucky Department of Agriculture

A Consumer Protection And Service Agency

Tom Couse, P.E.
Kentucky Transportation Cabinet
P.O. Box 780
Somerset, KY 42502

SUBJECT: Pre-Design Scoping Study
Cumberland-Metcalf Counties
KY 90 Spot Improvements
From Burkesville to the Metcalfe/Barren County Line
Item No. 8-136.00

Dear Mr. Clouse:

Please be advised that the proposed project has no impact on agricultural operations in this area.

Sincerely,

Richie Farmer
Commissioner of Agriculture

KENTUCKY COMMERCE CABINET
KENTUCKY DEPARTMENT OF FISH & WILDLIFE RESOURCES

Ernie Fletcher
Governor

#1 Sportsman's Lane
Frankfort, Kentucky 40601
Phone (502) 564-3400
1-800-858-1549
Fax (502) 564-0506
fw.ky.gov

George Ward
Secretary

Dr. Jonathan W. Gassett
Commissioner

June 26, 2006

Tom Clouse, P. E.
Kentucky Transportation Cabinet
P. O. Box 780
Somerset, KY 42502

RE: Threatened/endangered species, critical habitat review, and potential environmental impacts associated with the proposed spot improvements to KY 90 from the Metcalfe/Barren County Line to Burkesville, Metcalfe/Cumberland County, Kentucky.
KYTC Item No. 8-136.00

Dear Mr. Clouse:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) have received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System indicates that federal/state threatened and/or endangered fish and wildlife species are known to occur within close proximity to the project area (see attached list). Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

- The Indiana bat utilizes a wide array of habitats, including riparian forests, upland forest, and fencerows for both summer foraging and roosting habitat. Indiana bats typically roost under exfoliating bark, in cavities of dead and live trees, and in snags (i.e., dead trees or dead portions of live trees). Trees in excess of 16 inches diameter at breast height (DBH) are considered optimal for maternity colony roosts, but trees in excess of 9 inches DBH appear to provide suitable maternity roosting habitat. Male Indiana bats have been observed roosting in trees as small as 3 inches DBH. Removal of suitable Indiana bat roost trees due to construction of the proposed project should be completed between October 15 and March 31 in order to avoid impacting summer roosting Indiana bats. However, if any Indiana bat hibernacula are identified on the project area or are known to occur within 10 miles of the project area, we recommend the applicant only remove trees between November 15 and March 31 in order to avoid impacting Indiana bat "swarming" behavior.
- In areas where bats are known to occur, cave entrances, mine portals, and/or rock shelters that exist within the project area should be surveyed for potential use by such species as gray bats, eastern small footed bats, Rafinesque's big-eared bats, and Indiana bats. KDFWR recommends avoiding those areas that provide adequate habitat for bats.
- To minimize impacts to aquatic resources strict erosion control measures should be developed and implemented prior to construction to minimize siltation into streams 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.

It appears that the proposed project has the potential to 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 impact streams:

- Channel changes located within the project area should incorporate natural stream channel design.
- If culverts are used, the culvert should be designed to allow the passage of aquatic organisms.
- Culverts should be designed so that degradation upstream and downstream of the culvert does not occur.
- Development/excavation during low flow period to minimize disturbances.
- Proper placement of erosion control structures below highly disturbed areas to minimize entry of silt into area streams.
- Replanting of disturbed areas after construction, including stream banks, with native vegetation for soil stabilization and enhancement of fish and wildlife populations. We recommend a 100 foot forested buffer along each stream bank.
- Return all disturbed instream habitat to its original condition upon completion of construction in the area.
- Preservation of any tree canopy overhanging any streams within the project area.

I hope this information proves helpful to you. If you have any questions or require additional information, please call me at (800) 852-0942 Extension 366.

Sincerely,

Doug Dawson

Doug Dawson
Wildlife Biologist III

Cc: Environmental Section File

State/Federally Listed Species that could be impacted by the proposed project.

Scientific Name	Common Name	Federal Status	KSNPC Status
Alasmidonta marginata	ELKTOE	N	T
Ammodramus henslowii	HENSLOW'S SPARROW	N	S
Anas discors	BLUE-WINGED TEAL	N	T
Ardea herodias	GREAT BLUE HERON	N	S
Circus cyaneus	NORTHERN HARRIER	N	T
Corynorhinus rafinesquii	RAFINESQUE'S BIG-EARED BAT	N	S
Cumberlandia monodonta	SPECTACLECASE	N	E
Cyprogenia stegaria	FANSHELL	LE	E
Elaphe guttata guttata	CORN SNAKE	N	S
Epioblasma brevidens	CUMBERLANDIAN COMBSHELL	LE	E
Epioblasma capsaeformis	OYSTER MUSSEL	LE	E
Epioblasma obliquata obliquata	CATSPAW	LE	E
Epioblasma triquetra	SNUFFBOX	N	E
Erimystax insignis	BLOTCHED CHUB	N	E
Etheostoma maculatum	SPOTTED DARTER	N	T
Eumeces inexpectatus	SOUTHEASTERN FIVE-LINED SKINK	N	S
Fulica americana	AMERICAN COOT	N	E
Fusconaia subrotunda	LONGSOLID	N	S
Lampsilis abrupta	PINK MUCKET	LE	E
Lampsilis ovata	POCKETBOOK	N	E
Myotis grisescens	GRAY MYOTIS	LE	T
Myotis leibii	EASTERN SMALL-FOOTED MYOTIS	N	T
Myotis sodalis	INDIANA BAT	LE	E
Notropis albizonatus	PALEZONE SHINER	LE	E
Obovaria retusa	RING PINK	LE	E
Percina macrocephala	LONGHEAD DARTER	N	E
Phenacobius uranops	STARGAZING MINNOW	N	S
Pituophis melanoleucus melanoleucus	NORTHERN PINE SNAKE	N	T
Plethobasus cooperianus	ORANGEFOOT PIMPLEBACK	LE	E
Plethobasus cyphyus	SHEEPNOSE	N	E
Pleurobema plenum	ROUGH PIGTOE	LE	E
Pleurobema rubrum	PYRAMID PIGTOE	N	E
Quadrula cylindrica cylindrica	RABBITSFOOT	N	T
Thoburnia atripinnis	BLACKFIN SUCKER	N	S

US Fish & Wildlife Service Status:

N = None
C = Candidate
LT = Listed as Threatened
LE = Listed as Endangered

KY State Nature Preserves Commission Status

N = None
E = Endangered
T = Threatened
S = Special Concern
H = Historic
X = Extirpated

Clouse, Tom (KYTC-D08)

From: Turner, Rebecca (KYTC)
Sent: Wednesday, June 14, 2006 8:42 AM
To: Shields, Carl (KYTC); Harmon, Dave (KYTC); Clouse, Tom (KYTC-D08)
Cc: Blair, Cathi (KYTC-D08); Hixon, James (KYTC)
Subject: RE: 8-136 Cumberland/Metcalfe KY 90

Historic comments: (hard copy to follow)

A topo is attached to the letter from Tom Clouse and indicates red and blue dots that denotes historic sites that have been surveyed in the project vicinity. These dots and other sites should be re-evaluated and evaluated respectively to determine the eligibility of the structures.

The area between Burkesville and Marrowbone was part of John Hunt Morgan's Last Raid through Kentucky in 1863. The Morgan Trail has been established since the last survey of historic structures and other structures may be located adjacent to the project that have not yet been identified.

A full baseline for cultural historic resources is recommended for the entire project. Although the project is for spot improvements, a full baseline for historic could be used as a tool by the project team to inform them of all challenges along KY 90.

Let me know if you have further questions.

Rebecca Horn Turner
Historic Preservation Coordinator
Kentucky Transportation Cabinet
Division of Environmental Analysis
200 Mero
Frankfort, Kentucky 40622
502-564-7250

-----Original Message-----
From: Shields, Carl (KYTC)
Sent: Tuesday, June 13, 2006 3:42 PM
To: Harmon, Dave (KYTC); Clouse, Tom (KYTC-D08)
Cc: Turner, Rebecca (KYTC); Blair, Cathi (KYTC-D08); Hixon, James (KYTC)
Subject: 8-136 Cumberland/Metcalfe KY 90

Archaeology comments for 8-136 (Cumberland-Metcalfe) Pre-Design scoping study:

Previous Archaeological Work:
Not much archaeological survey has been conducted within the corridor. Surveys include the proposed KY 90 relocation (1977), the KY 90 Slate Creek alignment (1979), the Wolf Creek Dam cargo lift area (1980), the realignment of KY 163 (1999), and the KY 100 bridge replacement over Marrowbone (2004). These surveys all recorded archaeological sites, but most were not examined sufficiently to determine eligibility to the National Register. Recorded archaeological sites within the overall corridor include historic homes and farmsteads, rock shelters, and Native American open-air habitation. However, none have been examined sufficiently to determine eligibility to the National Register, and none are listed on the National Register.

Archaeological Potential:
Additional prehistoric (Native American) sites can be expected within the corridor. Locations range from open-air habitations in upland settings and floodplains, and rock shelters. The age of sites within the

corridor range from the Early Archaic, through the Woodland, and into the Late Prehistoric. Paleo-Indian sites could also be expected. If present, significant prehistoric sites would likely be located in alluvial areas adjacent to Marrowbone Creek and Glover Creek, and in rock shelters, where proposed alternates cross deeply dissected uplands.

Additional historic sites can be expected within the corridor. The KY 90 corridor has been in existence since the early 1800's and early farmsteads and historic homes are likely. Civil War activities include both Union and Confederate camps at Marrowbone. Confederate General John Hunt Morgan's Great Raid into Kentucky began July 1, 1863, when he and some 2,500 troops crossed the Cumberland River into Burkesville. At that time, about 3000 Federal troops were encamped at Marrowbone. During the raid, a skirmish occurred along KY 90 in the vicinity of Norris Branch (July 2, 1863) http://www.10000trails.com/morgan/index.html. Remnants of Civil War activities may be present from Marrowbone to Burkesville. Significant historic archaeological sites would likely relate to early settlement and the Civil War.

Spot Improvements/Archaeological Concerns or Comments
1-1/Alluvial setting - potential for deeply buried sites
1-2/Alluvial setting - potential for deeply buried sites
3/Portions have been previously surveyed
7-1/Potential for rock shelters
7-2/Potential for rock shelters
8/Potential Civil War activities
9/Alluvial setting - potential for deeply buried sites
11/Portions have been previously surveyed
12/Alluvial setting - potential for deeply buried sites
13/Alluvial setting - potential for deeply buried sites
14/Potential Civil War activities
15/Potential for rock shelters and Civil War activities
16/Slight potential for rock shelters
17/Potential for rock shelters

Summary/Recommendations:
There are no known significant sites within the spot improvements or the corridor. Little work has been done in the corridor, but there is a potential for significant sites. At this stage no recommendations can be made for avoidance or alignment selection. Additional archival research may shed more light on specific Civil War activities and locations within the corridor. Once the project moves to Design, archaeological work will likely be required. An early focus on identifying significant rock shelters and deeply buried sites may allow for avoidance or minimization early in the process.

Carl

Carl R. Shields - Archaeologist
Kentucky Transportation Cabinet
Division of Environmental Analysis
200 Mero Street
Frankfort, Kentucky 40622
phone: (502) 564-7250 x3345
fax: (502) 564-5655
Carl.Shields@ky.gov

Clouse, Tom (KYTC-D08)

From: Shields, Carl (KYTC)
Sent: Tuesday, June 13, 2006 3:42 PM
To: Harmon, Dave (KYTC); Clouse, Tom (KYTC-D08)
Cc: Turner, Rebecca (KYTC); Blair, Cathi (KYTC-D08); Hixon, James (KYTC)
Subject: 8-136 Cumberland/Metcalfe KY 90

Archaeology comments for 8-136 (Cumberland-Metcalfe) Pre-Design scoping study:

Previous Archaeological Work:
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Archaeological Potential:
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Additional historic sites can be expected within the corridor. The KY 90 corridor has been in existence since the early 1800's and early farmsteads and historic homes are likely. Civil War activities include both Union and Confederate camps at Marrowbone. Confederate General John Hunt Morgan's Great Raid into Kentucky began July 1, 1863, when he and some 2,500 troops crossed the Cumberland River into Burkesville. At that time, about 3000 Federal troops were encamped at Marrowbone. During the raid, a skirmish occurred along KY 90 in the vicinity of Norris Branch (July 2, 1863) http://www.10000trails.com/morgan/index.html. Remnants of Civil War activities may be present from Marrowbone to Burkesville. Significant historic archaeological sites would likely relate to early settlement and the Civil War.

Spot Improvements/Archaeological Concerns or Comments
1-1/Alluvial setting - potential for deeply buried sites
1-2/Alluvial setting - potential for deeply buried sites
3/Portions have been previously surveyed
7-1/Potential for rock shelters
7-2/Potential for rock shelters
8/Potential Civil War activities
9/Alluvial setting - potential for deeply buried sites
11/Portions have been previously surveyed
12/Alluvial setting - potential for deeply buried sites
13/Alluvial setting - potential for deeply buried sites
14/Potential Civil War activities
15/Potential for rock shelters and Civil War activities
16/Slight potential for rock shelters
17/Potential for rock shelters

Summary/Recommendations:
There are no known significant sites within the spot improvements or the corridor. Little work has been done in the corridor, but there is a potential for significant sites. At this stage no recommendations can be made for avoidance or alignment selection. Additional archival research may shed more light on specific Civil War activities and locations within the corridor. Once the project moves to Design, archaeological work will likely be required. An early focus on identifying significant rock shelters and deeply buried sites may allow for avoidance or minimization early in the process.

Carl

Carl R. Shields - Archaeologist
Kentucky Transportation Cabinet
Division of Environmental Analysis
200 Mero Street
Frankfort, Kentucky 40622
phone: (502) 564-7250 x3345
fax: (502) 564-5655
Carl.Shields@ky.gov

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

Ernie Fletcher
Governor

Division of Conservation
375 Versailles Road
Frankfort, Kentucky 40601
Phone (502) 573-3080
Fax (502) 573-1692
www.conservation.ky.gov

LaJuana S. Wilcher
Secretary

Stephen A. Coleman
Director

June 27, 2006

Mr. Tom Clouse, P.E.
Kentucky Transportation Cabinet
P.O. Box 780
Somerset, KY 42502

Subject: Pre-Design Scoping Study for KY 90 Improvements in Cumberland-Metcalfe Counties

Dear Mr. Clouse:

As requested, the Division of Conservation has reviewed the proposed study for spot improvements along KY 90 between Burkesville and the Metcalfe/Barren County line. The following comments and concerns provided may be helpful in this initial data-gathering stage to minimize or avoid negative impacts.

There are no agricultural districts or agricultural conservation easements established in the project area, therefore land enrolled in the Agricultural District Program or PACE Program will not have to be mitigated by the Department of Transportation.

We would like to see the issue of the loss of farmland addressed. 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 three documents that could be utilized to identify these farmland designations: the *Soil Survey of Metcalfe County* (NRCS 1967), the *Soil Survey of Cumberland County* (NRCS 1998), and *Important Farmland Soils of Kentucky* (NRCS 1981). These documents are available through this office. The soil survey information can also be downloaded at 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. This would protect the water quality and aquatic habitat of the 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 Metcalfe or Cumberland County Conservation Districts, the Kentucky Division of Water, and 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/MD/aeh

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR NATURAL RESOURCES

Ernie Fletcher
Governor

2 Hudson Hollow
Frankfort, Kentucky 40601
Phone (502) 564-6940
Fax (502) 564-5698
www.naturalresources.ky.gov
www.kentucky.gov

LaJuana S. Wilcher
Secretary

Susan C. Bush
Commissioner

June 13, 2006

Tom Clouse, P.E.
Kentucky Transportation Cabinet
TEBM Planning
P.O. Box 780
Somerset, Kentucky 42502

RE: Pre-Design Scoping Study
Cumberland-Metcalfe Counties
KY 90 Spot Improvements
From Burkesville to the Metcalfe/Barren County Line
Item No. 8-136.00

Dear Mr. Clouse:

Thank you for the opportunity to comment on the proposed improvements on KY 90 in Metcalfe and Cumberland Counties, Kentucky. The Department for Natural Resources has examined the documentation for the above Pre-Design Scoping Study. The Kentucky Divisions of Forestry and Mine Reclamation and Enforcement offer the following comments.

Division of Forestry:

- Utilizing the map in Exhibit 2, the proposed changes in Sections 1-1 and 1-2 in the Summer Shade District will have a minimal impact on the forestland in this area. The proposed changes will primarily affect small patches of forest (2-5 acres in size), primarily fencerow trees. The small patches of forest affected have already been fragmented due to power/gas line rights of way. Essentially the affects on the forestland in this proposed area are negligible.

- Sections 4-1 and 4-2 in the Beaumont District will affect only a small-forested area. Nothing out of the ordinary was found in this area, thus impacts to the forestland will be slight.

- Sections 5 and 6 do not involve any forestland.

- Sections 7-1 and 7-2 in the Marrowbone Bypass area will have the greatest impact on timberland. The timber here is typical timber for the area, with no extraordinary features. This forestland has been harvested within the last twenty years and was burned extensively during the 1999 fire season. A large expanse of forestland would border this "bypass" area and fragmentation is not a concern.

- Section 9 involves no forestland.

- Sections 10-1 and 10-2 in the Waterview District: Section 10-1 will affect two small forestland areas as well as a couple of wooded fencerows. Section 10-2 would affect a smaller percentage of forestland than Section 10-1. The forestlands affected are very common for the area.

- Sections 11, 12, 13 and 14 do not involve any forestland changes.

- Section 15 will affect an area very similar to that of sections 7-1 and 7-2. A small percentage of woodland will be sectioned off the front of an expansive forestland. The timber on this property is very common for the area.

- Section 16 would affect a small portion of common timber.

- Section 17 will affect a significant portion of the hillsides in the proposed area. This land is very steep and suitable for little else than timber. The timber in this area is common as well.

- Section 18 will not affect the forested areas.

Division of Mine Reclamation and Enforcement:

This division regulates mining activities for the state. Review of the agency records indicates an active limestone quarry operating approximately ½ mile south of the community of Grider in Cumberland County. The specific details of the operation are outlined below and shown on the attached map.

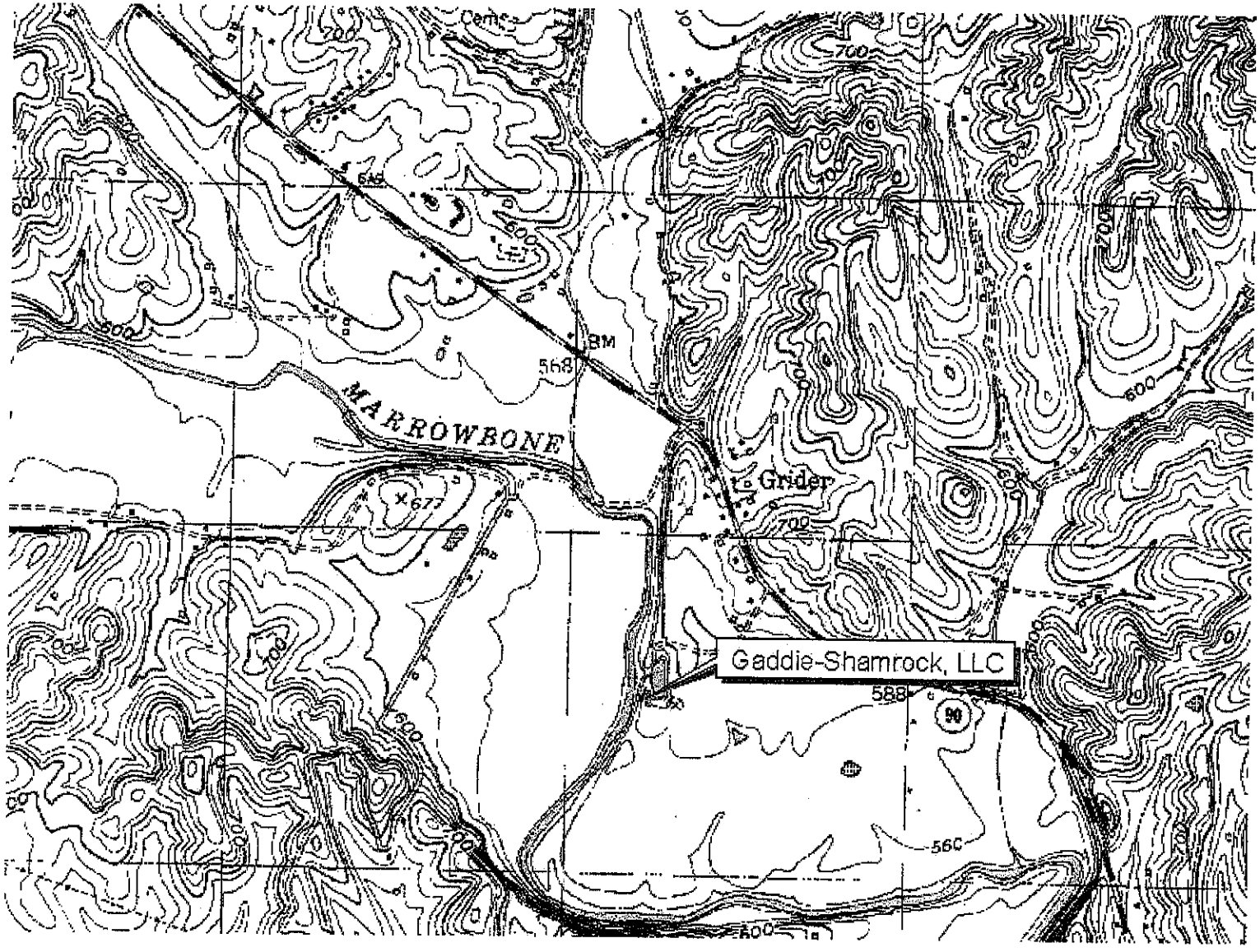
Gaddie-Shamrock LLC Permit # 029-9400
Latitude 36847'56.52"; Longitude -85825'41.47"
Permittee Address: PO Box 257
Columbia, KY 42728
Contact: Roy Beard
Phone: (502) 384-2451

Review of records associated with the 'mined' out coal beds in the footprint of your proposed project does not indicate the presence of any abandoned or active underground mines within the area of interest.

Please contact Linda Potter in the Commissioner's Office at (502) 564-6940 if you need additional information.

Sincerely,

Susan C. Bush
Commissioner
Kentucky Department for Natural Resources



Location Map for Gaddie-Shamrock Limestone Quarry, Noncoal Permit #029-9400.

ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

Ernie Fletcher
Governor

Department for Natural Resources
2 Hudson Hollow
Frankfort, Kentucky 40601
Phone: (502) 564-6940
Fax: (502) 564-5698
www.naturalresources.ky.gov
www.kentucky.gov

LaJuana S. Wilcher
Secretary

Susan C. Bush
Commissioner

May 31, 2006

Tom Clouse, P. E.
Kentucky Transportation Cabinet
P. O, Box 780
Somerset, KY 42502

SUBJECT: Pre-Design Scoping Study
Cumberland-Metcalfe Counties
KY 90 Spot Improvements
From Burkesville to the Metcalfe/Barren County Line
Item No. 8-136.00

Dear Mr. Clouse:

Thank you for the opportunity to comment on the proposed road improvement projects on KY 90 in Metcalfe and Cumberland Counties, Kentucky.

Our agency regulates mining activities for the state. Review of our division records indicates an active limestone quarry operating approximately ½ mile south of the community of Grider in Cumberland County. The specific details of the operation are outlined below and on the attached map.

Gaddie-Shamrock LLC Permit # 029-9400
Latitude 36°47'56.52"; Longitude -85°25'41.47"
Permittee Address: PO Box 257
Columbia, KY 42728
Contact: Roy Beard
Phone: (502) 384-2451

Review of records associated with the 'mined' out coal beds in the footprint of your proposed project does not indicate the presence of any abandoned or active underground mines within the area of interest.

I appreciate the notification and the opportunity to comment on the proposed project. If you have any questions regarding this correspondence, please feel free to contact Jim McKenzie or Pam Carew at (502) 564-2340.

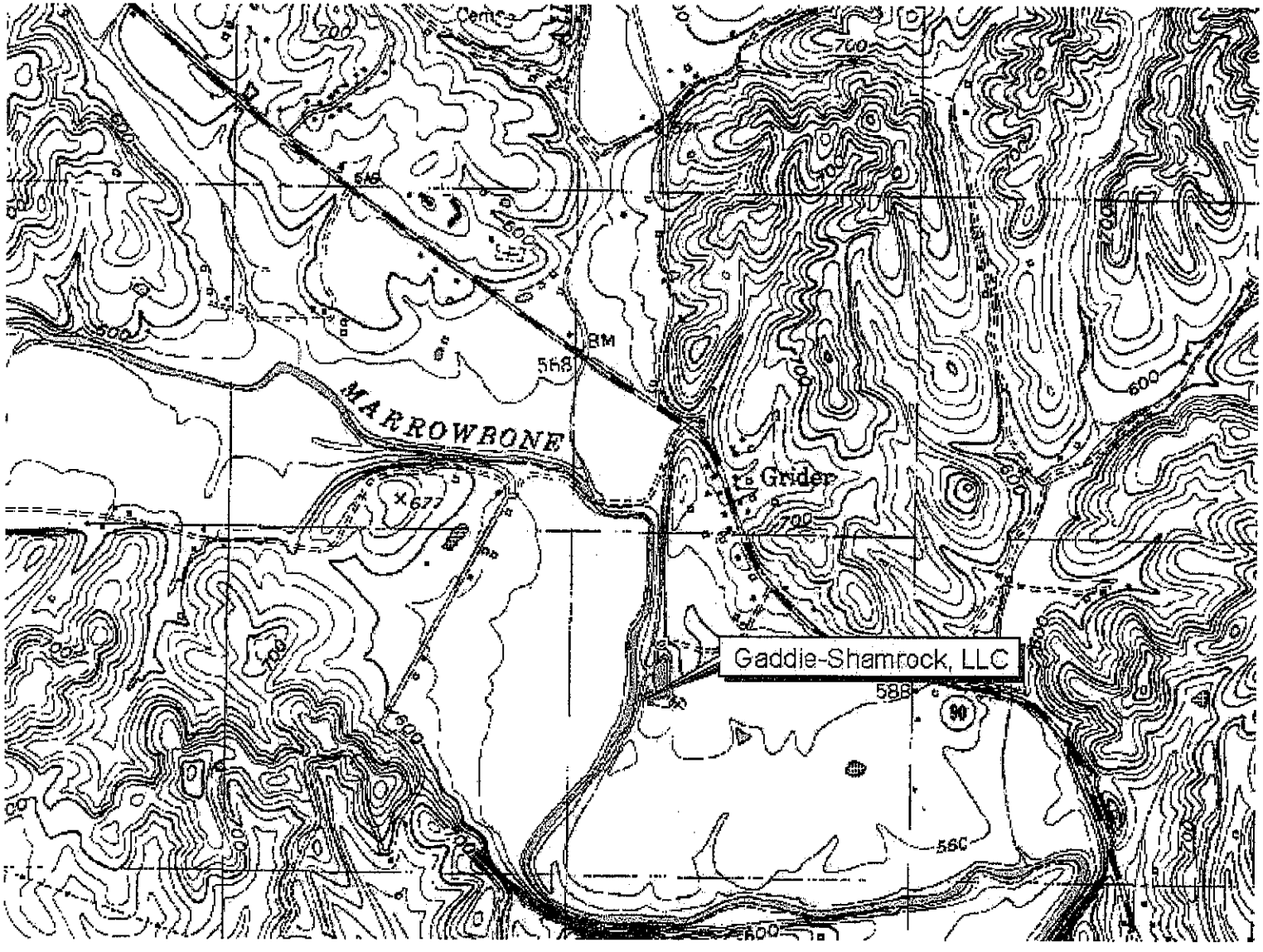
Sincerely,

Paul Rothman, Director
Division of Mine Reclamation and Enforcement

PR/pbc

Attachment

cc: Jim McKenzie



Location Map for Gaddie-Shamrock Limestone Quarry, Noncoal Permit #029-9400.

ERNIE FLETCHER
GOVERNOR

LAJUANA S. WILCHER
SECRETARY

COMMONWEALTH OF KENTUCKY
ENVIRONMENTAL AND PUBLIC PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION FOR AIR QUALITY
803 SCHENKEL LN
FRANKFORT, KY 40601-1403

June 29, 2006

Mr. Tom Clouse, P.E.
Kentucky Transportation Cabinet
P.O. Box 780
Somerset, Kentucky 42502

Dear Mr. Clouse,

The Division has reviewed the pre-design scoping study for evaluating proposed "spot improvements" along KY 90 between Burkesville and the Metcalfe/Barren County line, Item Number 08-136.00. 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.

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

Clouse, Tom (KYTC-D08)

From: Winsett, Robert (KSP)
Sent: Thursday, June 29, 2006 12:45 AM
To: Clouse, Tom (KYTC-D08)
Cc: Speck, Greg (KSP); Hancock, Jeff (KSP)
Subject: Pre-Design Scoping Study Item No. 8-136.00

RE: Pre-Design Scoping Study
Cumberland-Metcalfe Counties
KY 90 Spot Improvements
From Burkesville to the Metcalfe/Barren County Line
Item No. 8-136.00

Dear Mr. Clouse,
I have conducted a survey with the troopers in my squad that work the area of KY 90 in Cumberland County and Metcalfe County, and obtained the following recommendations. Some of these may have already been addressed in your study. The recommendations are for the current route of KY 90.

Cumberland County:
1. Area commonly called Sawmill Cuts (S curves just out of Burkesville) are very slick when wet.
2. Junction of 691 - This intersection is in the curve. This has caused several wrecks and complaints.
3. Claylick Hill - Sharp left curve as westbound that motorist over steer.
4. Junction of Allen's Creek - Blind pullout onto KY 90.
5. Dutch Creek Bridge - Vehicles loose traction when approaching the bridge.
6. Junction of KY 100 - There is a blind spot pulling out onto KY 90.
7. Hadley Stretch - Vehicles passing causing head on collisions. Passing lane needed.
8. Curve west at KY 969 - Vehicles enter too fast and loose control.
9. Dubree Store area - There is a sharp curve where several accidents have occurred.
10. Cumberland/Metcalfe County line - There is a sharp curve that should be eliminated.

Metclafe County:
1. Intersection of KY 163 - There is a hillcrest that should be eliminated. Limited traffic view.

Should you need any additional information or assistance, please don't hesitate to contact Captain Speck, Lieutenant Roper of myself at Post 15.

Sincerely,

Sergeant Robert Winsett
For
Captain Greg Speck

Sgt. Robert W. Winsett
Post 15 Columbia
Kentucky State Police
(270) 384-4796
Robert.Winsett@ky.gov

Clouse, Tom (KYTC-D08)

From: Houlihan, John (KYTC)
Sent: Wednesday, May 31, 2006 2:26 PM
To: Clouse, Tom (KYTC-D08)
Subject: Pre-Design Scoping Study Item No. 8-136.00

Mr. Clouse,

I have reviewed the proposed route for the KY 90 Spot Improvements and have found the proposed construction will have no adverse effect on air navigation. However, if any structure or construction equipment exceeds 200 feet above ground level, it will require a permit from the KY Airport Zoning Commission. If you have any questions, please let me know.

Kentucky Airport Zoning Commission
John Houlihan, Administrator
200 Mero Street
Frankfort KY 40622
502.564.9900 Ext. 3854
Fax 502.564.7953
www.transportation.ky.gov/aviation/zoning.htm

Mark your calendar:
The 2006 Kentucky Aviation Conference
September 13-15
Crowne Plaza (The Campbell House) Lexington, KY
www.transportation.ky.gov/aviation

Clouse, Tom (KYTC-D08)

From: Palmer-Ball, Brainard (EPPC OOS KNPC)
Sent: Monday, July 03, 2006 9:51 AM
To: Clouse, Tom (KYTC-D08)
Cc: Phil DeGarmo (E-mail)
Subject: KY 90 Scoping Study, Metcalfe/Cumberland cos

Mr. Clouse,

We have reviewed the KY 90 spot improvements pre-design scoping study for Metcalfe/Cumberland counties. There may be issues concerning Gray bat (Myotis grisescens) and several rare aquatic species (mussels and fish) within the project area that should be addressed. Most can likely be mitigated for by assuring that strict erosion and sediment control measures are enforced and that stream crossings be conducted in the most environmentally sensitive manner as is possible.

Brainard Palmer-Ball, Jr.
KSNPC -- Environmental Review Coordinator

Clouse, Tom (KYTC-D08)

From: Cathy Nunn [cnunn@scrtc.com]
Sent: Wednesday, May 31, 2006 7:35 AM
To: Clouse, Tom (KYTC-D08)
Subject: KY 90 SPOT IMPROVEMENTS

This project would be a asset to our community because it would complete the connection for the scenic byway . This could give us the next step to National Scenic Byway development, without this connection it will be impossible.
This could lead to economic growth for our county. The cross road has always been a dangerous stop, would love to see something good happen there.

Cathy Nunn
Tourism Director
Metcalfe County

MAGISTRATES:
Dist. 1 Thomas Brown
Dist. 2 Edward Anderson
Dist. 3 J.V. Groce
Dist. 4 Earl Branham

Cumberland County Judge Executive

TIM HICKS

P.O. BOX 826 • BURKESVILLE, KY 42717-0826
OFFICE: 270-864-3444 • FAX: 270-864-1757 • HOME: 270/433-6477

DEPUTY JUDGE
Eugenia Ferguson

COUNTY TREASURER
Stacey Thrasher

June 23, 2006

Mr. Tom Clouse, P. E.
Kentucky Transportation Cabinet
P.O. Box 780
Somerset, KY 42502

Dear Mr. Clouse,

My recommendation as Deputy Judge Executive, would be for the team to look at Highway 90 West approximately one half mile from city of Burkesville (called the Saw Mill Cut). Personally, I have lived within 2 miles of the Saw Mill Cut for 40 years, and within that 40 years, there have been an unbelievable amount of accidents, and numerous deaths as a result.

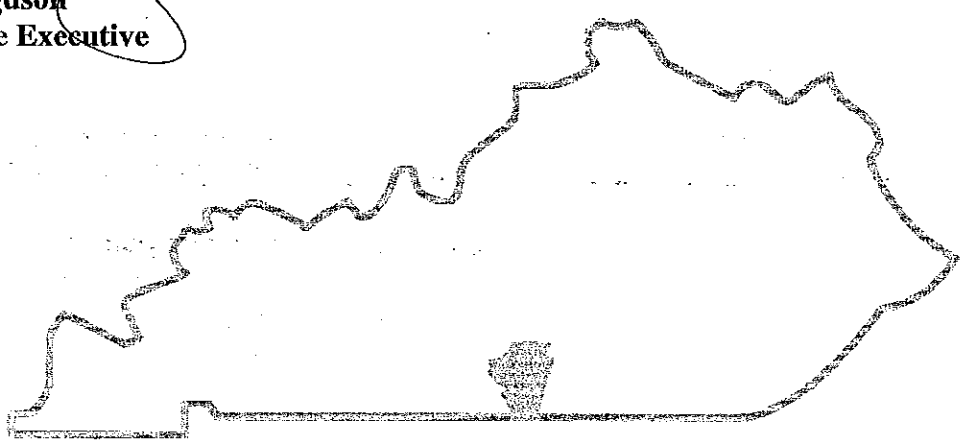
As I stated above, speaking from experience living on Highway 90, the traffic is astronomical. With Cagle Industry semi-trucks, and visitor's to Dale Hollow State Resort Park, etc.... it is a 24-7 heavily traveled highway.

It would be greatly appreciated is you would consider this particular stretch of Highway 90 West.

Sincerely,

Eugenia Ferguson

Eugenia Ferguson
Deputy Judge Executive



CUMBERLAND COUNTY

Burkesville Police Department

P.O. Box 250
Burkesville, Kentucky 42717

Phone 270-864-4141
Fax 270-864-1795
TDD 270-864-4141

June 23, 2006

Stevie Wheat
Chief of Police
Burkesville Police Department
P.O. Box 250
Burkesville, Kentucky 42717

Mr Clouse:

Thank you for asking for our input and comments on Item # 8-136-00. We have an area here locally known as the Sawmill Cut. It is located within the city limits and between point 18 and point 16 on the map that you sent us. We are very concerned about this stretch of roadway due to the number of accidents including fatalities that occur there. Any consideration that you could give to this area would be greatly appreciated.

Stevie Wheat
Chief of Police
Burkesville Police Department

Appendix I

Environmental Justice and Community Impacts

Lake Cumberland Area Development District

KY 90 CORRIDOR STUDY
Environmental Justice Report
Item No. 8-136.00

TABLE OF CONTENTS

1.0 INTRODUCTION

This document is an assessment of the community characteristics for the proposed improvements outlined in the KY 90 Corridor Study from the Barren/Metcalfe County Line east to Burkesville, Kentucky (Appendix 3). 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. The information and results are intended to assist the Kentucky Transportation Cabinet in making informed and prudent transportation decisions in the project area, especially with regard to the requirements of Executive Order 12898[1], to ensure equal environmental protection to all groups potentially impacted by this project.

The following report outlines Census 2000 statistics for the KY 90 Corridor Study in Cumberland County and Metcalfe County using data tables and maps.

Census data was also compiled for Census divisions directly in and around the portion of the study area located in Cumberland County and Metcalfe County. Statistics are provided for minority, low-income, and elderly populations for the project area, nation, state, region, census 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 socio-economic 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."

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.

[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…"

2.1 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 USOT Order 5610.2 do not address consideration of the elderly 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.

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".

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 KY 90 Corridor Study.

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."
- Census Block (CB) – "An area bounded on all sides by visible and/or invisible features shown on a map prepared by the Census Bureau. A CB is the smallest geographic entity for which the Census Bureau tabulates decennial census data."

The project and comparison area analysis include the percentages for minorities, low-income and elderly population levels for the census tract block group, Cumberland County, Metcalfe County, the Commonwealth of Kentucky and the United States.

5.0 STUDY FINDINGS

This Environmental Justice and Community Impact Report is to be used as a component of a Planning Study for highway transportation improvements to KY 90 between Burkesville and the Metcalfe/Barron County line. 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 3 Census Tracts in this study area. These tracts are listed below by county and are illustrated in Appendix 4.

Cumberland County – 1 tract

Metcalfe County – 2 tracts

6.0 STUDY FINDINGS / POPULATION BY RACE

6.1 Cumberland County

The defined study area in Cumberland County encompasses portions of the following Census Tract: 9501. Following the compilation of pertinent information, LCADD 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 this Environmental Justice Report.

The methodology used to determine minority concentrations was to compare the percentages for the Census Tracts and Block Groups in the study area to the state and national averages. If they were with in 3% of the state and national averages, we considered it to be comparable.

The majority of Census Tracts and 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 particular Block Groups in the study area that warrant further discussion.

Census Tract 9501 has a percentage of black population of 5.77%, which exceeds the county average of 3.64%, but is considerably less than the national average and is comparable with the state average. Block Group 3 in Tract 9501 contains a percentage of black population of 22.31%, Block Group 5 in Tract 9501 contains a percentage of black population of 8.59%, while the other Block Groups in Tract 9501 located in the study area have percentages well below the county average. Although the percentage of black population in Block Group 5 is higher than the county they are comparable with the state averages. Block Group 3 having a 22.31% black population is almost double the nation's average of 12.21%. The minority population in Block group 3 is entirely within the city limits of Burkesville. Reconstruction of the existing road would have no adverse affect.

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. LCADD 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 Metcalfe County

The defined study area within Metcalfe County encompasses portions of the following Census Tracts: 9602 and 9603. The population by race percentages for Metcalfe County is comparable to those of the counties in the study area and considerably lower than the national and state averages. Based on the census data, there appears to be no concentrations of minorities in this specific study area.

7.0 STUDY FINDINGS / POPULATION BY POVERTY LEVEL

7.1 Cumberland County

The percentage of the population below the poverty level for Cumberland County and all Census Tracts in the study area are significantly higher than national averages and are at or higher than the state averages. Percentages of population below the poverty level in these Tracts range from a low of 19.24% to a high of 36.97%. A review of additional data shows that all Block Groups in the study area are at or exceed the state and national averages for the percentage of population below the poverty level, and these percentages range from 14.52% to 38.23%. The State average is 15.37 % and the national average is 12.05 %.

It is evident that a high percentage of population below the poverty level is a universal issue that occurs throughout the entire county, as well as the other counties in this study area, and that the chance of encountering significant concentrations of populations falling under this distinction is very likely. It should also be noted that these percentages are indeed comparable to many surrounding counties in this particular section of southeastern Kentucky. All of the counties within this study area are often identified as economically distressed due to high unemployment rates that can be attributed to the unavailability of quality employment opportunities.

The improvement of the KY 90 Corridor route is viewed by many local officials and community members as a project that could potentially be beneficial for further economic growth and development; thereby improving conditions for the population of the county that currently fall below the poverty level. Following the selection of a preferred alternate for this proposed roadway, LCADD 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 be undertaken to insure that these groups are not disproportionately affected by the project.

7.2 Metcalfe County

The defined study area within Metcalfe County encompasses portions of the following Census Tracts: 9602 and 9603. Census Tract 9603 has a percentage of 24.20%, the highest percentage of the population below the poverty level in Metcalfe County, which is twice that of the national average. Census Tract 9602, having percentage of persons below poverty level at 19.16%, is significantly higher than the state average of 15.37% and well above the national average at 12.05%. This is not totally unexpected considering the entire study area and the percentages of all the Block Groups.

Again, a subsequent review of poverty data within the affected census tracts should be undertaken to determine if particular concentrations of population might be adversely affected.

8.0 STUDY FINDINGS / POPULATION BY AGE GROUP

8.1 Cumberland County

Aging characteristics in the overall population of Cumberland County are slightly higher percentage of persons age 65 and over than the state and national averages, Census Tract 9501 has a percentage of persons age 65 and over of 17.83%. Block Group 5, which is not in the study area but is adjacent to the study area, has a percentage of 26.60% which increases the percentage of the entire tract. Local officials and community members stated that there is mostly commercial land, as well as a nursing home and very little residential land within this Block Group, which explains the high concentration of the elderly.

The percentage of persons age 65 and over residing in Tract 9502 is 15.90%. Local officials and community members expressed that there was no significant concentration of individuals in this age group located in either of these Block Groups.

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 study area; therefore, it is anticipated that the implementation of this project would not have a disproportionate effect on the population of persons age 65 and over residing in the proposed study area.

8.2 Metcalfe County

The defined study area within Metcalfe County encompasses Census Tracts 9602 and portions of Census Tract 9603. Census Tracts 9602 percentages for the aging population are consistent with those of the state, and the nation. Census Tracts 9603 has a higher percent of persons 65 and over at 17.02%, upon further study of data, only Block Groups: 3 and 4 are in the study area, which have percent persons 65 and over of 13.35% and 13.11% respectively. Based on the census data and other discussions, there seem to be no significant concentration of a specific age group in this study area.

9.0 CONCLUSION

Based on data obtained from the U.S. Census Bureau for income, race and age, discussions with local officials, and field observations, there appear to be several small concentrations of populations by age in Cumberland and Metcalfe counties. The concentrations identified in Cumberland and Metcalfe counties should not be affected by a new route considering their proximity and previous discussions about possible routes. The elevated percentages in the populations below poverty level might be indicative of concentrations throughout the study area. However, based on the economic status of these rural depressed counties, these percentages are not uncommon for this area.

Analysis of the minority population data showed several of the block groups as having an identified concentration of some sort. Some were significant, some were only minor. The more significant concentrations identified were noted in the narrative analysis of that county.

Again, the improvement of KY 90 Corridor from The Barren/Metcalfe County Line extending east to Burkesville, BRADD and LCADD staff recommends that a subsequent review of the data be performed. Efforts were made to identify any high concentrations of a specific population. Community citizens, other ADD planners, local officials, and statistical data were all used in this process.

APPENDIX 1

PLANNING STUDY CONTACT LIST

Mayor Mike Irby
Burkesville City Hall
PO Box 250
Burkesville, KY 41702

Judge Tim Hicks
Cumberland Co. Courthouse
P.O. Box 826
Burkesville, KY 42717

Steve Wheat
Chief of Police
PO Box 250
Burkesville, KY 42717

Donald Butler
Metcalfe County Judge Exec.
P.O. Box 149
Edmonton, KY 42129

Harold Stilts
City Superintendent
City Hall Box 374
Edmonton, KY 42129

Tom Clouse
DEPT. OF HIGHWAYS
DISTRICT 8
1660 S. Highway 27
Somerset, KY 42501

Mayor Howard D. Garrett
City Hall Box 374
Edmonton, KY 42129

Sheriff Ronald Shirley
Metcalfe County Courthouse
Edmonton, KY 42129

APPENDIX 2

Methodology for Assessing Potential Environmental Justice Concerns for KYTC Planning Studies

Updated: February 1, 2002

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

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

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

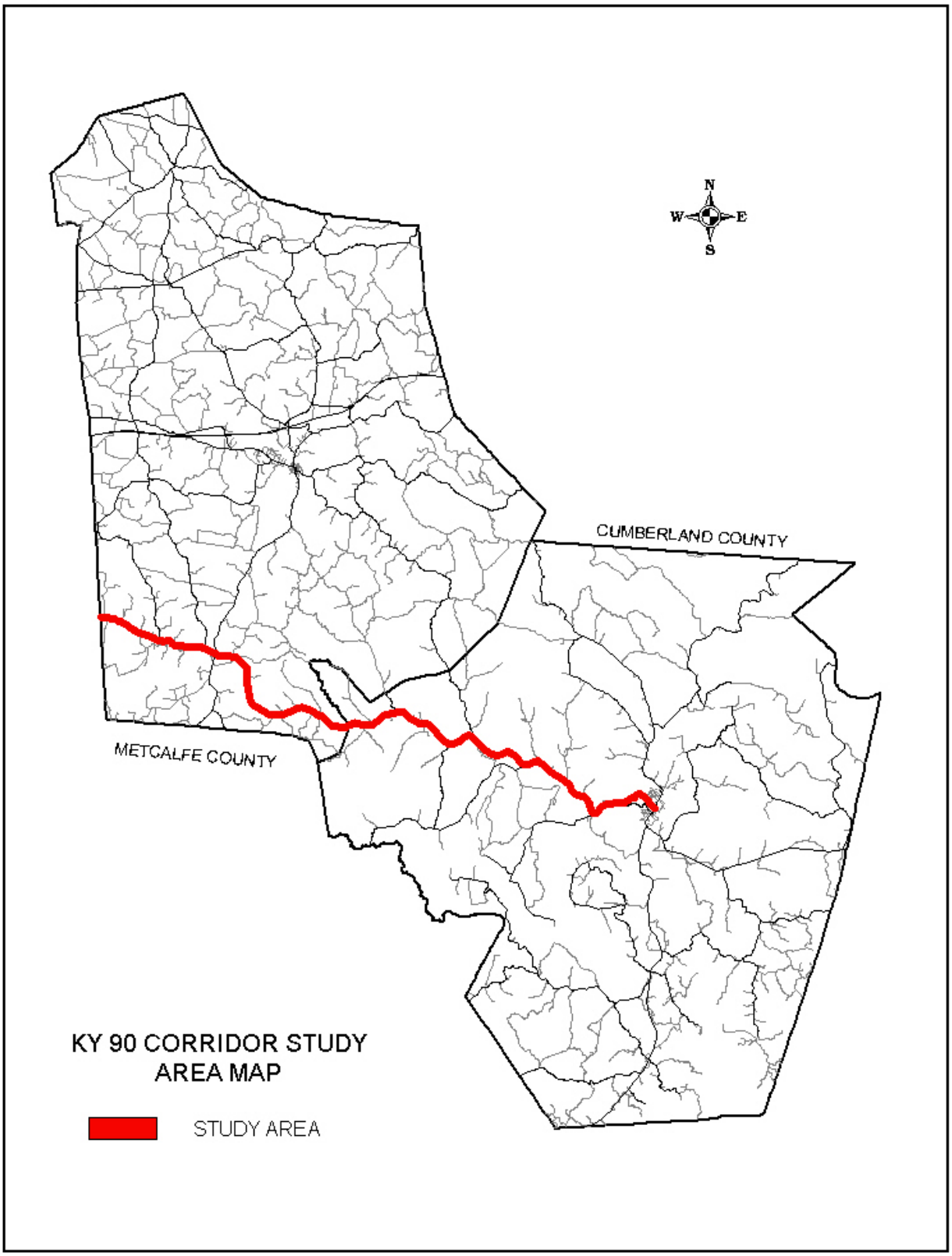
- Identification of community leaders or other contacts who may be able to represent these population groups and through which coordination efforts can be made.
- Comparison of the Census tracts and block groups encompassing the project area to other nearby Census tracts and block groups, county, state,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

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

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

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

APPENDIX 3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W
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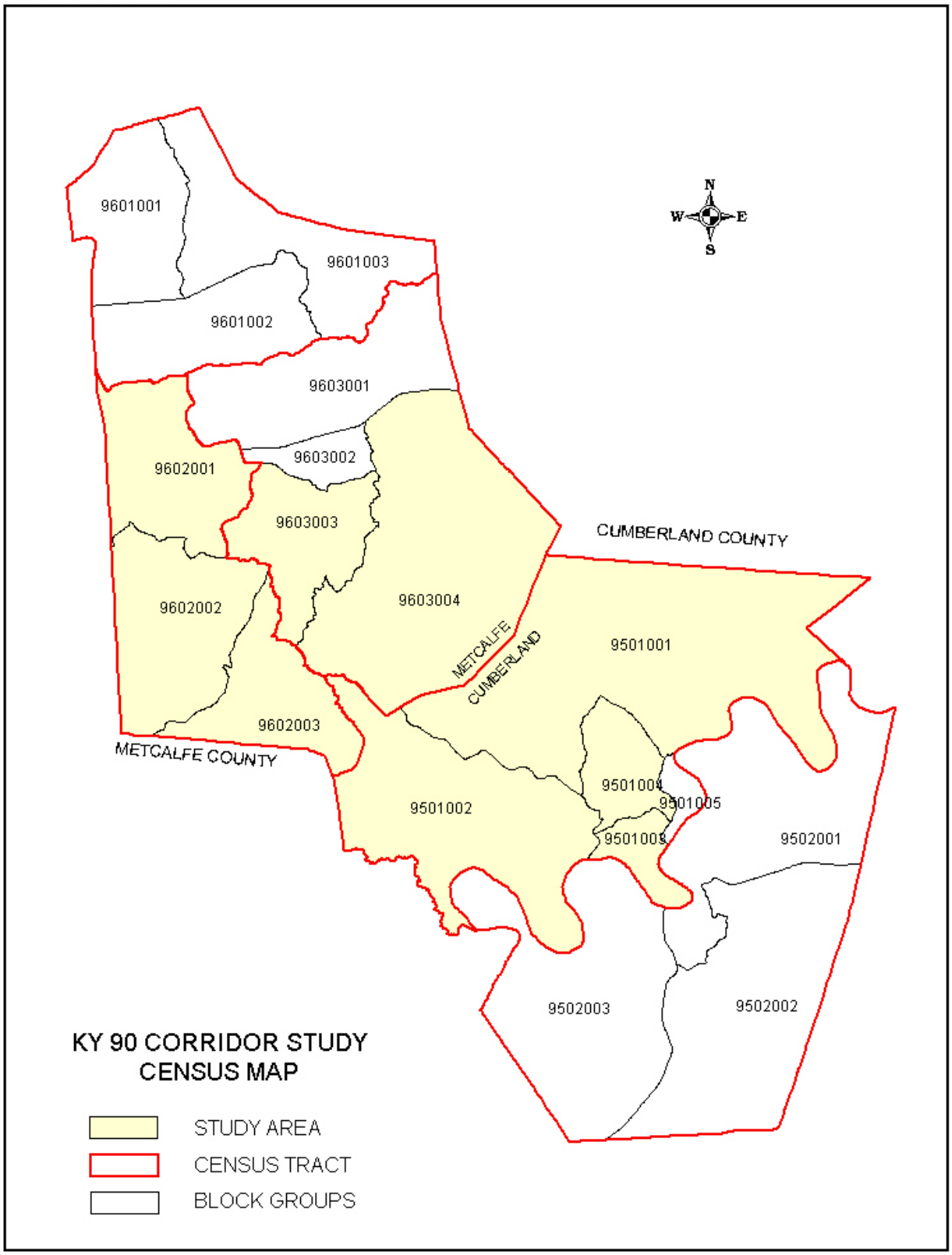
CUMBERLAND COUNTY
METCALFE COUNTY
KY 90 CORRIDOR STUDY
AREA MAP
STUDY AREA

APPENDIX 4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KY 90 CORRIDOR STUDY
CENSUS MAP
STUDY AREA
CENSUS TRACT
BLOCK GROUPS

APPENDIX 5: CUMBERLAND COUNTY CENSUS DATA

CUMBERLAND COUNTY											
REGION	TOTAL POPULATION	WHITE ALONE	PERCENT WHITE ALONE	BLACK OR AFRICAN AMERICAN ALONE	PERCENT BLACK OR AFRICAN AMERICAN ALONE	AMERICAN INDIAN AND ALASKA NATIVE ALONE	PERCENT AMERICAN INDIAN AND ALASKA NATIVE ALONE	ASIAN ALONE	PERCENT ASIAN ALONE	NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE	PERCENT NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE
United States	281,421,906	211,353,725	75.10%	34,361,740	12.21%	2,447,989	0.87%	10,171,820	3.61%	378,782	0.13%
Kentucky	4,041,769	3,639,168	90.04%	293,915	7.27%	9,080	0.22%	28,994	0.72%	1,155	0.03%
Cumberland Co.	7,147	6,806	95.23%	260	3.64%	2	0.03%	8	0.11%	0	0.00%
Census Tract 9501	4,418	4,082	92.39%	255	5.77%	2	0.05%	8	0.18%	0	0.00%
Block Group 1	1,156	1,147	99.22%	5	0.43%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	941	912	96.92%	23	2.44%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	641	472	73.63%	143	22.31%	0	0.00%	4	0.62%	0	0.00%
Block Group 4	853	814	95.43%	13	1.52%	0	0.00%	0	0.00%	0	0.00%
Block Group 5	827	737	89.12%	71	8.59%	2	0.24%	4	0.48%	0	0.00%
Census Tract 9502	2,729	2,724	99.82%	5	0.18%	0	0.00%	0	0.00%	0	0.00%
Block Group 1	661	661	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	1,134	1,129	99.56%	5	0.44%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	934	934	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%

Source: www.census.gov

Summary File 3 (SF3)

Detailed Tables: P.6-Race, P.8-Sex by Age, P.87-Poverty Status in 1999 by Age

Summary File 3 (SF3)

Hispanic or Latino Origin was found on Table: P7. Hispanic or Latino by Race

APPENDIX 5: CUMBERLAND COUNTY CENSUS DATA (Continued)

CUMBERLAND COUNTY										
REGION	SOME OTHER RACE ALONE	PERCENT SOME OTHER RACE ALONE	TWO OR MORE RACES	PERCENT TWO OR MORE RACES	HISPANIC OR LATINO ORIGIN	PRECENT HISPANIC OR LATINO ORIGIN	PERSONS 65 AND OVER	PERCENT PERSONS 65 AND OVER	PERSONS BELOW POVERTY LEVEL	PERCENT PERSONS BELOW POVERTY LEVEL
United States	15,436,924	5.49%	7,270,926	2.58%	35,238,481	12.52%	34,978,972	12.43%	33,899,812	12.05%
Kentucky	22,116	0.55%	47,341	1.17%	59,939	1.48%	488,248	12.08%	621,096	15.37%
Cumberland Co.	0	0.00%	71	0.99%	43	0.60%	1,274	17.83%	1,672	23.39%
Census Tract 9501	0	0.00%	71	1.61%	32	0.72%	840	19.01%	1,169	26.46%
Block Group 1	0	0.00%	4	0.35%	6	0.52%	171	14.79%	227	19.64%
Block Group 2	0	0.00%	6	0.64%	5	0.53%	170	18.07%	228	24.23%
Block Group 3	0	0.00%	22	3.43%	5	0.78%	117	18.25%	237	36.97%
Block Group 4	0	0.00%	26	3.05%	1	0.12%	162	18.99%	193	22.63%
Block Group 5	0	0.00%	13	1.57%	15	1.81%	220	26.60%	284	34.34%
Census Tract 9502	0	0.00%	0	0.00%	11	0.40%	434	15.90%	503	18.43%
Block Group 1	0	0.00%	0	0.00%	1	0.15%	128	19.36%	96	14.52%
Block Group 2	0	0.00%	0	0.00%	8	0.71%	193	17.02%	184	16.23%
Block Group 3	0	0.00%	0	0.00%	2	0.21%	113	12.10%	223	23.88%

Source: www.census.gov

Summary File 3 (SF3)

Detailed Tables: P.6-Race, P.8-Sex by Age, P.87-Poverty Status in 1999 by Age

Summary File 3 (SF3)

Hispanic or Latino Origin was found on Table: P7. Hispanic or Latino by Race

APPENDIX 6: METCALFE COUNTY CENSUS DATA

METCALFE COUNTY											
REGION	TOTAL POPULATION	WHITE ALONE	PERCENT WHITE ALONE	BLACK OR AFRICAN AMERICAN ALONE	PERCENT BLACK OR AFRICAN AMERICAN ALONE	AMERICAN INDIAN AND ALASKA NATIVE ALONE	PERCENT AMERICAN INDIAN AND ALASKA NATIVE ALONE	ASIAN ALONE	PERCENT ASIAN ALONE	NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE	PERCENT NATIVE HAWAIIAN AND OTHER PACIFIC ISLANDER ALONE
United States	281,421,906	211,353,725	75.10%	34,361,740	12.21%	2,447,989	0.87%	10,171,820	3.61%	378,782	0.13%
Kentucky	4,041,769	3,639,168	90.04%	293,915	7.27%	9,080	0.22%	28,994	0.72%	1,155	0.03%
Metcalfe Co.	10,037	9,690	96.54%	112	1.12%	54	0.54%	0	0.00%	0	0.00%
Census Tract 9601	2,477	2,368	95.60%	43	1.74%	0	0.00%	0	0.00%	0	0.00%
Block Group 1	754	754	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	810	763	94.20%	43	5.31%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	913	851	93.21%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Census Tract 9602	2,970	2,914	98.11%	32	1.08%	0	0.00%	0	0.00%	0	0.00%
Block Group 1	1,097	1,091	99.45%	6	0.55%	0	0.00%	0	0.00%	0	0.00%
Block Group 2	1,147	1,097	95.64%	26	2.27%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	726	726	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Census Tract 9603	4,590	4,408	96.03%	37	0.81%	54	1.18%	0	0.00%	0	0.00%
Block Group 1	811	770	94.94%	0	0.00%	25	3.08%	0	0.00%	0	0.00%
Block Group 2	1,182	1,140	96.45%	23	1.95%	0	0.00%	0	0.00%	0	0.00%
Block Group 3	1,491	1,432	96.04%	14	0.94%	2	0.13%	0	0.00%	0	0.00%
Blcok Group 4	1,106	1,066	96.38%	0	0.00%	27	2.44%	0	0.00%	0	0.00%

Source: www.census.gov

Summary File 3 (SF3)

Detailed Tables: P.6-Race, P.8-Sex by Age, P.87-Poverty Status in 1999 by Age

Summary File 3 (SF3)

Hispanic or Latino Origin was found on Table: P7. Hispanic or Latino by Race

APPENDIX 6: METCALFE COUNTY CENSUS DATA (Continued)

METCALFE COUNTY										
REGION	SOME OTHER RACE ALONE	PERCENT SOME OTHER RACE ALONE	TWO OR MORE RACES	PERCENT TWO OR MORE RACES	HISPANIC OR LATINO ORIGIN	PRECENT HISPANIC OR LATINO ORIGIN	PERSONS 65 AND OVER	PERCENT PERSONS 65 AND OVER	PERSONS BELOW POVERTY LEVEL	PERCENT PERSONS BELOW POVERTY LEVEL
United States	15,436,924	5.49%	7,270,926	2.58%	35,238,481	12.52%	34,978,972	12.43%	33,899,812	12.05%
Kentucky	22,116	0.55%	47,341	1.17%	59,939	1.48%	488,248	12.08%	621,096	15.37%
Metcalfe Co.	40	0.40%	141	1.40%	57	0.57%	1,504	14.98%	2,335	23.26%
Census Tract 9601	25	1.01%	41	1.66%	30	1.21%	364	14.70%	655	26.44%
Block Group 1	0	0.00%	0	0.00%	0	0.00%	197	26.13%	143	18.97%
Block Group 2	4	0.49%	0	0.00%	4	0.49%	106	13.09%	163	20.12%
Block Group 3	21	2.30%	41	4.49%	26	2.85%	61	6.68%	349	38.23%
Census Tract 9602	0	0.00%	24	0.81%	0	0.00%	359	12.09%	569	19.16%
Block Group 1	0	0.00%	0	0.00%	0	0.00%	109	9.94%	203	18.51%
Block Group 2	0	0.00%	24	2.09%	0	0.00%	143	12.47%	220	19.18%
Block Group 3	0	0.00%	0	0.00%	0	0.00%	107	14.74%	146	20.11%
Census Tract 9603	15	0.33%	76	1.66%	27	0.59%	781	17.02%	1,111	24.20%
Block Group 1	0	0.00%	16	1.97%	0	0.00%	97	11.96%	214	26.39%
Block Group 2	0	0.00%	19	1.61%	7	0.59%	340	28.76%	310	26.23%
Block Group 3	15	1.01%	28	1.88%	20	1.34%	199	13.35%	310	20.79%
Blcok Group 4	0	0.00%	13	1.18%	0	0.00%	145	13.11%	277	25.05%

Source: www.census.gov

Summary File 3 (SF3)

Detailed Tables: P.6-Race, P.8-Sex by Age, P.87-Poverty Status in 1999 by Age

Summary File 3 (SF3)

Hispanic or Latino Origin was found on Table: P7. Hispanic or Latino by Race