

KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County



Kentucky
Transportation Cabinet
Six Year Highway Plan
Item No. 2-313.00

Prepared for:
Kentucky Transportation Cabinet
Division of Planning
Frankfort, Kentucky

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EXECUTIVE SUMMARY

The KY 181 Scoping Study has been prepared to assist the Kentucky Transportation Cabinet (KYTC) in defining the scope and extent of improvements that would best suit the immediate as well as the future needs of this facility between KY 189 and the Wendell H. Ford Western Kentucky Parkway. The study limits are from the intersection of KY 181 and KY 189 northwest of Greenville to the entrance to the Wendell H. Ford National Guard Training Center north of the Western Kentucky Parkway.

Establishment of the goals for the project included an active public involvement process. This action engaged a variety of project stakeholders, such as local public officials, residents, Transportation Cabinet staff from both the Central Office and District 2, and planning personnel from the Pennyriple Area Development District. Jointly, the project stakeholders formulated the following **project goals**:

- **Reduce the number of crashes along the route by improving shoulder and lane widths, and by providing recovery areas for vehicles that may leave the roadway**
- **Provide adequate sight distance by improving vertical and horizontal alignments**
- **Improve truck, school bus and emergency vehicle access**
- **Provide improved connectivity to the City of Greenville from the Western Kentucky Parkway**
- **Provide adequate capacity to support Design Year 2025 traffic volumes**

A review of the existing conditions confirmed that the types of crashes occurring along the corridor were typical given the sight distance conditions. There were most rear end and side swipe crashes along KY 181. Existing roadway features offer few options for any type of safety improvement that would avoid substantial right-of-way impact on neighborhood homes. The traffic capacity of the route was not a major concern, as traffic forecasts and analyses show that the facility would still meet capacity requirements in the year 2025. Since the study process determined that capacity was not a problem, it was determined that providing adequate capacity was not longer a needed goal and the recommended alternative was not selected based on this goal.

Based upon project goals established by the project stakeholders, several alternative actions were considered. The **alternatives** were divided into two categories:

- **Do Nothing/No Build** – The Do Nothing/No Build alternative did not address all of the project goals.
- **Reconstruction of KY 181** – The reconstruction alternative involves rebuilding KY 181 basically within its existing corridor to improve the roadway geometry. Several options were considered, all of which use design standards for 55 MPH. The options included two-lane, three-lane, and four-lane facilities, all using a rural typical section with paved shoulders.

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Recommendations

The Project Team recommended a two-lane facility as the preferred alternative. It will provide an improved gateway to the City of Greenville from the Western Kentucky Parkway while improving vehicle safety and accessibility along the route. This alternative includes the complete reconstruction of KY 181 from the intersection of KY 189 to the Western Kentucky Parkway, using the parameters for a two-lane, 55-MPH highway. Turning lanes are anticipated at KY 2533, at Henderson Lane, and at the entrance to Muhlenberg North High School. The recommendation also includes modifications to the KY 181/KY 601 intersection that make KY 181 the continuous through-route from KY 189, eliminating the stop condition on southbound KY 181 at KY 601.

Maintenance of traffic will provide some difficulty during the construction process. Due to the length and degree of grade changes that are to be made, the road will most certainly require closure to through traffic during construction.

The total cost for this alternative is estimated to be \$15,900,000. The breakdown of costs, by phase, is shown below.

PHASE	COSTS
DESIGN	\$1,000,000
RIGHT-OF-WAY	\$1,900,000
UTILITIES	\$800,000
CONSTRUCTION	\$12,200,000
TOTAL	\$15,900,000

The *Approved 2000-2002 Biennial Highway Construction Program and Identified Preconstruction Program Plan for FY 2003 Through 2006*, also known as the 2000 Six-Year Highway Plan identified funds for the study phase of the project only. The 2003 Six-Year Highway Plan does not include any future phases of this project.

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1.0 INTRODUCTION

The KY 181 Scoping Study, initiated by the Kentucky Transportation Cabinet (KYTC) Division of Planning, was developed to determine improvement strategies that address both the current and future needs of the facility between KY 189 and the Wendell H. Ford Western Kentucky Parkway. Located in the southwestern part of the state, KY 181 connects the community of Greenville in Muhlenberg County to the Western Kentucky Parkway. The study limits are from the intersection of KY 181 and KY 189 northwest of Greenville to the entrance to the Wendell H. Ford National Guard Training Center north of the Western Kentucky Parkway. **Figure 1** depicts these project limits.

A Scoping Study for this route was included in the KYTC *Approved 2000-2002 Biennial Highway Construction Program and Identified Preconstruction Program Plan for FY 2003 Through 2006*, also known as the 2000 Six-Year Highway Plan (SYP). The study was budgeted for FY 2002, and there are no further phases programmed for this project. It should be noted that improvement to the study portion of KY 181 is currently ranked among the Top Ten Priority projects for the Pennyriple Area Development District (ADD).

In April 2001, HNTB initiated the study with an assessment of existing conditions. This included the following:

- a review of existing reports and plans
- an analysis of the existing and future year 2025 traffic conditions
- an analysis of the accident history of the road
- an environmental review/footprint highlighting known environmental resources

1.1 Purpose of the Study

The purpose of this Scoping Study is to identify and gather critical information about the project corridor prior to the initiation of the Design Phase, and to help define possible improvements that might better serve the residents of Muhlenberg County and the City of Greenville. It will also aid KYTC in addressing the federal requirements regarding consideration of environmental issues, as defined in the National Environmental Policy Act (NEPA). The ultimate objectives of this study are:

- Defining project needs and goals
- Identifying the beginning and ending points of the project, as well as potential improvements and concepts
- Discussing project needs and issues with public officials, government agencies, concerned citizens, and other groups with interest in the project
- Identifying known environmental concerns
- Exchanging information with the public

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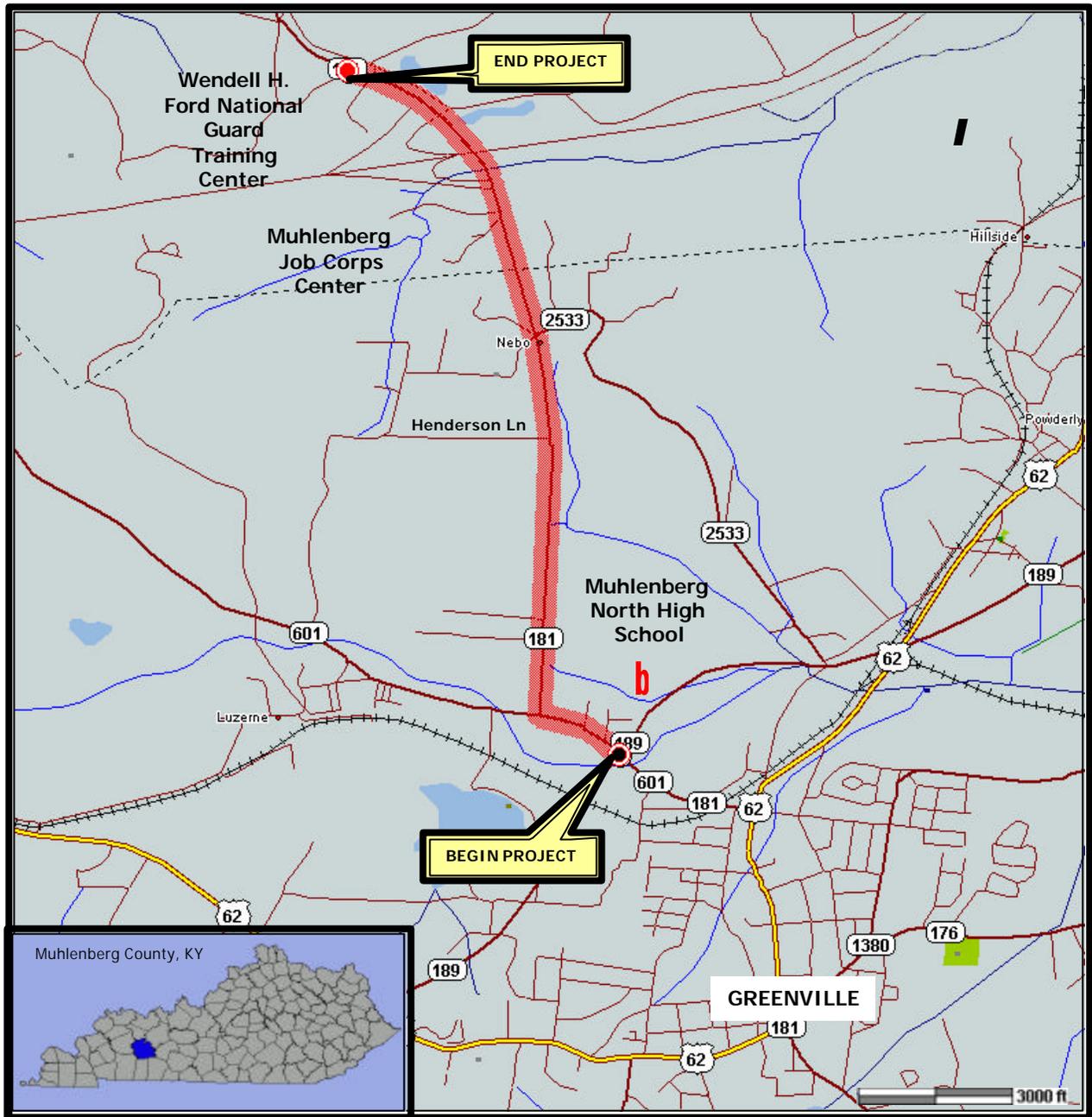


FIGURE 1- PROJECT STUDY AREA

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1.2 Project Evolution

The development of the KY 181 Scoping Study encompassed many project goals. The initial corridor issues and a draft Statement of Project Goals were agreed upon at the first Project Team Meeting on September 24, 2001. The corridor issues were identified as follows:

- KY 181 is a major link between the Western Kentucky Parkway and the City of Greenville.
- Traffic within the corridor is moderate and expected to grow.
- The existing road is on rolling terrain, and many of the intersections are located at the top or the bottom of the hills, tending to restrict sight distance.
- Turning lanes may be needed at intersections to provide safe storage for drivers wanting to make left turns, and to lessen the possibility of rear end collisions as drivers turn onto the side roads.
- Poor soil conditions at the interchange may impact improvement options.
- Conflicts at the intersections between coal trucks and passenger vehicles are problematic, particularly with the poor sight distance at KY 2533.
- Environmental concerns include the possibility of an underground storage tank (UST) around an old gas station site at KY 2533 on the northeast quadrant (although no evidence of a UST was found) and numerous coal airshafts located within the corridor.
- Major sources of recent traffic increases in the corridor are from the Wendell H. Ford National Guard Training Center, Industrial Park, Muhlenberg Job Corps Center, and a new subdivision on Henderson Lane.
- The old coal road (running under the Western Kentucky Parkway overpass east toward the community of Hillside) may be used by Muhlenberg County to provide an alternative connection to KY 189.

These initial corridor issues led to the draft Statement of Project Goals, which was developed by the Project Team (consisting of KYTC Division of Planning, Division of Highway Design, Division of Operations, the Pennyriile ADD, KYTC District 2, and HNTB personnel) in an effort to address the issues. The draft project goals include the following:

- Reduce the number of crashes along the route by improving shoulder and lane widths, and by providing recovery areas for vehicles that may leave the roadway.
- Provide adequate sight distance by improving vertical and horizontal alignments.
- Improve truck, school bus and emergency vehicle access.
- Provide improved connectivity to the City of Greenville from the Western Kentucky Parkway.

The Project Team discussed and agreed upon preliminary design criteria necessary for developing alternatives. The following three roadway cross-section designs were discussed: a three-lane section (2 driving lanes with a continuous two-way turn lane), a four-lane section (2 driving lanes in each direction) and a five-lane section (2 driving lanes in each direction plus a continuous two-way left turn lane). To address the potential need for bicycle and/or pedestrian facilities, the Project Team decided that an eight to ten foot shoulder should be considered with each design. The Team also discussed whether the reconstruction would follow geometric requirements for 45 or 55 mile-per-hour (MPH) design speeds. The team decided that a 55-MPH design speed would be the most practical, but would not be appropriate for either the five-lane alternative or the three-lane section, due to safety concerns.

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To provide an accurate analysis of current and future traffic volumes and Level of Service (LOS), new traffic counts were obtained by KYTC at several locations along the route. To address LOS concerns the following was added to the draft Statement of Project Goals:

- Provide adequate capacity to support design year 2025 traffic volumes.

During initial Project Team discussions, the Team decided that the study should include KY 181 from KY 189 to KY 601, to assess the viability of reconstructing the KY 601 intersection with KY 181 in a manner that would make KY 181 the through route, with KY 601 becoming the intersecting facility. Currently, the junction of KY 181 and KY 601 is a stop-controlled T-intersection, with the north approach of KY 181 controlled by a stop sign and the east (KY 181) and west (KY 601) approaches uncontrolled. In addition, the project limits were extended north beyond the Western Kentucky Parkway interchange to the entrance to the Wendell H. Ford National Guard Training Center, to determine the Center's impact on the corridor and on operation of the interchange.

The subsequent steps in the study process included the public involvement process, development of alternatives and cost estimates, and finalization of project goals and recommendations. On December 19, 2001, the Team met for the final time to discuss these items and to review the Environmental Overview, Geotechnical Considerations, Possible Priority Sections, Crash Analysis, and Traffic Analysis. The final project goals, project corridor, and preferred alternatives were determined at this meeting.

1.3 Public Involvement

After reviewing the existing conditions along the corridor, the Project Team held a joint meeting with local officials and stakeholders on November 7, 2001. The purpose of this meeting was to present the draft corridor issues and project goals and to solicit input concerning the study area. During this meeting, it was determined that although there is currently no gas station in the northeast quadrant of the KY 181/KY 2533 intersection, there may be an abandoned underground storage tank (UST) at that location. (Subsequent research has not found evidence of any UST.) However, in the field review (**Section 3.7**) no evidence of a UST was found. It was also determined that the County would not use the old coal haul road as a new alternative connection to KY 189, and that Muhlenberg North High School should be added to the list of sites that are contributing to increasing traffic in the corridor. Both groups agreed that improvements are needed, as this section of KY 181 has perceived safety problems and provides a vital connection to the Western Kentucky Parkway that is critical to economic development.

These Corridor Issues and Draft Statement of Project Goals were presented to the public on November 26, 2001, at a meeting hosted by the Project Team in the cafeteria of Muhlenberg North High School. The public was encouraged to comment on the corridor issues and/or the project goals. The Project Team hosted the meeting. The purpose of this meeting was to accomplish the following:

- To seek input from the community
- To identify and address community concerns and issues
- To identify sensitive areas that should be avoided
- To explore alternatives and discuss impacts
- To create a project that benefits the community and gains its support

Local officials and area residents attended the meeting. The groups participated in the study development process by discussing options with the Project Team and by submitting written comments on the provided questionnaires. Their efforts included confirmation of existing conditions and participation in the development of potential improvement options. These options included various

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alternatives for the reconstruction of the facility to current design standards, as well as the No-Build alternative.

The comments received from the public supported those of local officials and stakeholders in that each group expressed a desire to see improvements to the existing roadway to promote safe travel on KY 181. Additionally, each group stressed the importance of KY 181 to the future growth of the community. Specific comments included the desire to see improvements to the intersections of KY 181 with KY 2533 (Old Country House Road) and Henderson Lane. Henderson Lane, shown on **Figure 1**, serves as the entrance to a residential development and meets KY 181 at a steep grade. KY 2533 is problematic because the intersection occurs near the crest of a vertical curve on KY 181, resulting in decreased sight distance approaching the intersection.

Meeting minutes from the Team Meetings, Local Officials and Stakeholders meetings, and the Public Information meeting are in **Appendix A, B, and C**, respectively.

1.4 Resource Agency Coordination

The Division of Planning sent letters to several agencies asking for input and comments on the KY 181 Scoping Study, in order to address their concerns early in the project development process. Fifteen (15) agencies responded and their responses are included in **Appendix D**. The agencies responding to this request, as well as their general comments, are as follows:

- Natural Resources and Environmental Protection Cabinet:
 - Division of Water – consult U.S. Army Corps of Engineers prior to construction to determine if a water quality certification or dredge or fill material permit will be required
 - Division of Waste Management – potential for either exposing or generating for disposal different forms of hazardous waste
 - Department of Surface Mining and Reclamation – no comments
 - Department of Parks – no comments
 - Nature Preserves Commission – no comments
 - Division of Conservation – would like to see the issue of loss of Prime Farmland and Farmland of Statewide Importance addressed; recommended Best Management Practices (BMPs) be used during construction
 - Department of Fish and Wildlife Resources – determined that potential negative impacts to aquatic resources are possible; recommended construction in or near streams during low flow periods, proper placement of erosion control structures, and replanting of disturbed areas
 - Department for Military Affairs – no comments
- KY Transportation Cabinet
 - Division of Environmental Analysis – will potentially impact two known archaeological sites (location not discussed)
 - Division of Materials, Geotechnical Branch – if underground mine is unavoidable stabilization of the mine voids is recommended
 - Division of Multimodal Programs – sidewalks or a shared use path should be considered
 - Division of Traffic, Permits Branch – urges project to be classified as partially controlled access
- United States Department of the Interior – concerns over erosion control during construction and U.S. Army Corps of Engineers permitting issues; recommended that Best Management Practices (BMPs) be used during construction
- KY Cabinet for Workforce Development – no comments
- Federal Aviation Administration – no comments

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2.0 EXISTING CONDITIONS

The study portion of KY 181 is functionally classified as a Rural Minor Collector, linking the City of Greenville and the surrounding region to the Western Kentucky Parkway. The only committed transportation project in the area that could have an impact on KY 181 is the improvement of US 62 in Greenville. That project, scheduled with allocated funding for design in FY 2003, includes the possible reconstruction of US 62 from its intersection with KY 181 in Greenville to KY 189. Improvement to KY 2533 (Old Country House Road) is currently on the KYTC Unscheduled Needs List. As for KY 181, there are no further phases scheduled in the current Six-Year Highway Plan beyond this scoping study.

2.1 Roadway Characteristics

Table 2.1.1 presents the existing roadway characteristics for the study portion of KY 181, as indicated in the KYTC Highway Information System (HIS) database. The project limits are from the intersection of KY 181/KY 189 (MP 12.479) to the entrance to the Wendell H. Ford National Guard Training Center (approximately MP 15.79), north of the Western Kentucky Parkway. Listed as a Rural Secondary Road in the State Maintained Highway System, the study corridor is approximately 3.31 miles in length.

TABLE 2.1.1 - ROADWAY CHARACTERISTICS

Type of Roadway	Functional Classification	Minor Collector
	State System Class	Rural Secondary
	Type Road	Undivided Highway (MP12.48-MP14.97, MP15.10-MP15.48), Divided (MP14.97-MP15.10, MP15.48-MP15.80)
	Coal Haul (Annual Tons)	2,318,316 (MP 15.2-MP18.8)
	Scenic Byway System	No
	National Highway System	No
	National Truck Network	No
	Defense Highway	No
	Truck Weight Class	AA (62,000 pounds gross weight)
	Extended Weight System	No
Geometrics	Corridor Length (miles)	3.31
	Average Right-of-Way Width (Feet)	50 (MP12.48-MP14.97, MP15.48-MP15.80), 60 (MP14.97-MP15.48)
	Lane Width (Feet)	10 (MP12.80-MP13.60), 9 (MP13.60-MP14.97, MP15.48- MP15.80) & 11 (MP14.97-MP15.48)
	Median Width (Feet)	11 (MP14.97-MP15.10), 12 (MP15.10-MP15.48)
	Driving Lanes	2
	Shoulder Type	Paved
	Shoulder Width (Feet)	2 (MP12.48-MP14.97, MP15.48-15.80), 8 (MP14.97-MP15.48)
	Percent Passing Sight Distance	0
	Type of Terrain	Rolling
Traffic Volumes	Number of Bridges	3
	2001 Volume (Vehicles per Day)	7,950 (MP12.479-12.767), 4,250 (MP12.767-14.421), 3,780 (MP14.421-MP15.234), 2,400 (MP15.234-MP15.789)
Speeds	Speed Limit (Miles per Hour)	35 (12.479-13.31), 55 (13.31-15.789)
	Pavement	Surface Type
Last Year Surfaced		N/A

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This portion of KY 181 traverses rolling terrain through the majority of the study area, as demonstrated in **Figure 2**. Vertical curvature significantly decreases sight distance along portions of the roadway. The intersection of KY 181 with KY 2533 (Old Country House Road) has insufficient sight distance due to its location near the crest of a vertical curve, as seen in **Figure 3**. Lane and shoulder widths vary throughout the study corridor, with lanes ranging from nine to eleven-feet and shoulders from two to eight-feet wide.



FIGURE 2– APPROACHING WESTERN KENTUCKY PARKWAY FROM SOUTH

KY 181 is in the AA weight class (62,000 pound gross weight) and has a relatively high amount of truck traffic. Traffic counts conducted in October 2001, indicate traffic composition is approximately 8.5% trucks between KY 189 and KY 601, 11.4% between KY 601 and the Western Kentucky Parkway, and over 19% north of the Parkway. Several notable facilities utilize KY 181 for access to the Western Kentucky Parkway and the City of Greenville, including Muhlenberg North High School, Wendell H. Ford National Guard Training Center, an industrial park, and the Muhlenberg Job Corps Center.

There are three traffic control devices along the study corridor. These include the following:

- Traffic signal at the KY 181/KY 189 intersection
- Stop sign at the KY 181/KY 601 intersection
- School speed limit sign caution light at Muhlenberg North High School
- Flashing caution light at the KY 181/KY 2533 intersection

The KYTC Division of Traffic noted that the school speed limit sign caution light serves the KY 181 entrance to Muhlenberg North High School and may require replacement if the roadway is to be reconstructed.

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FIGURE 3– KY 181 AT KY 2533 (OLD COUNTRYHOUSE ROAD)

The flashing caution light at KY 181 and KY 2533 is in place due to the restricted sight distance at the intersection. Correction of the sight distance deficiency could allow for the removal of the beacon.

2.2 Crash Analysis

A primary goal of any highway improvement process is to provide a safe and efficient roadway. The recent KY 181 crash history (between January 1, 1996, and June 30, 2001) was investigated to determine if there are currently safety-related problems along the route. The frequency of crashes at different segments of the roadway, as well as the types of crashes (injury or non-injury) are shown on **Figure 4**.

There were a total of 53 crashes reported in the five-and-a-half year survey period. Examination of the crashes revealed that KY 181 experiences a relatively high percentage of injury crashes (30%) compared to total crashes. In order to determine how the crash rate along KY 181 compares to similar roads, Critical Rate Factors (CRFs) were analyzed. The CRF is calculated by dividing the actual crash rate along a particular roadway segment by the critical rate, which is the maximum accident rate for which it can be said that crashes are occurring randomly based on roadway characteristics and traffic. A CRF less than 1.0 indicates that crashes occur at random, and greater than 1.0 suggests that conditions may exist that contribute to non-random occurrences.

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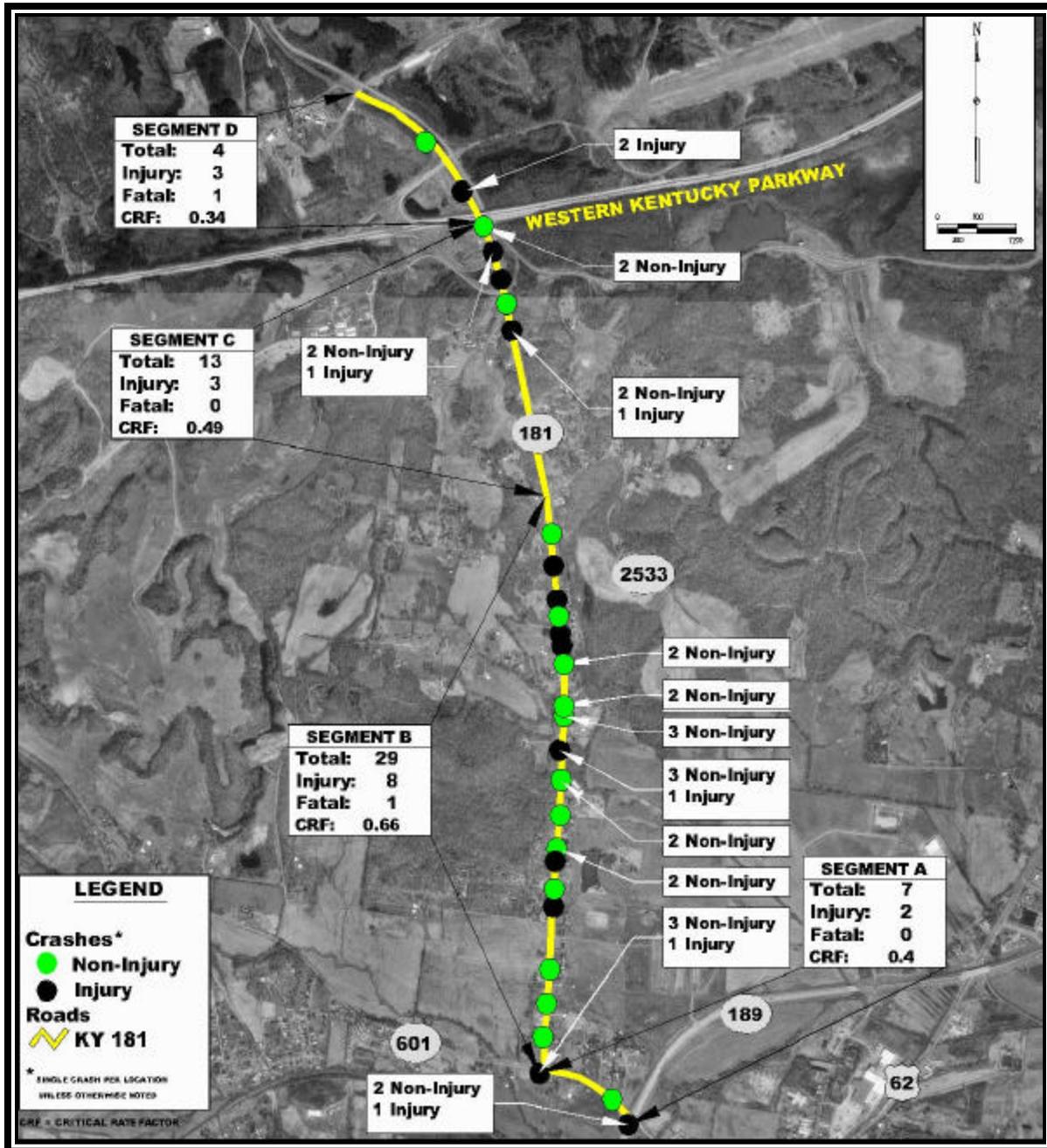


FIGURE 4 – CRASH HISTORY (January 1, 1996 – June 30, 2001)

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The results of the CRF analysis indicate that the overall crash rate is lower on KY 181 than the critical rate for a similar facility (CRF less than 1.0), suggesting that crashes along the corridor are random occurrences. The segment from KY 601 to KY 2533 had the highest CRF of 0.66, with the majority of crashes on this segment occurring near the entrance to Muhlenberg North High School. There is a noticeable lack of crashes near the KY 181/KY 2533 intersection. This may be due, at least in part, to the flashing caution light found at the intersection. However, without knowledge of the crash history prior to the installation of the caution light, its impact is unclear. In general, the crash history shows the majority of crashes on KY 181 involved driver's rear-ending or sideswiping other vehicles. Additionally, many crashes have involved vehicles running off the road. The CRF findings however, indicate that roadway geometry (including lane width and lack of adequate shoulder) are not contributing factors in the crashes on KY 181, but that perhaps travel speed is the major contributing factor.

2.3 Traffic Volume and Level of Service

KY 181 was divided into four segments based on the HIS data for the purpose of evaluating existing and Design Year 2025 traffic volumes. These segments are defined in the first column of **Table 2.3.1**. Several data sources were used, including HIS data and traffic counts. According to October 2001 traffic counts, the road currently carries approximately 6,250 vehicles per day (VPD) from KY 189 to KY 601, and approximately 3,800 VPD near the Western Kentucky Parkway. Traffic volumes decrease north of the parkway with an average of 2,500 VPD between the interchange and the entrance to the National Guard Training Center.

Table 2.31 shows the existing (for the year 2001) traffic volumes and truck percentages, as well as the results of the traffic forecasting process used for the segment of KY 181 between KY 189 and the Wendell H. Ford National Guard Training Center. **Figure 5** shows traffic volumes and Levels of Service (LOS) for each segment of KY 181 for both existing and Design Year 2025 conditions.

TABLE 2.3.1 TRAFFIC VOLUME FORECASTS

Segment	1990 Actual Count	2001 Actual Count	2001 Percent Trucks	2025 Forecasts
KY 189 – KY 601	5,955	6,250	8.5	8,400
KY 601 – KY 2533 (Old Country House Rd)	3,360	3,550	11.4	5,600
KY 2533 – Western Kentucky Parkway	3,185	3,860	11.4	5,400
Western Kentucky Parkway – National Guard Training Center	N/A	2,500	19.4	4,000

Source: KYTC, HNTB

The methodology used to determine the 2025 traffic volumes involved comparing a linear regression technique to the results obtained by utilizing the statewide average traffic growth rate of 1.25% for Rural Minor Collectors. The regression technique relies on observed historical data for a set of variables to predict future values for the same or other variables. The last three traffic counts were performed in 1984, 1990, and 2001. This information was obtained from the Cabinet's Traffic Count System (CTS).

The regression analysis reflects a growth rate ranging from 1.12 percent to 1.69 percent. As anticipated, the largest growth is occurring between KY 601 and the Western Kentucky Parkway, where new residences are being built and where Muhlenberg North High School is located. The remainder of the

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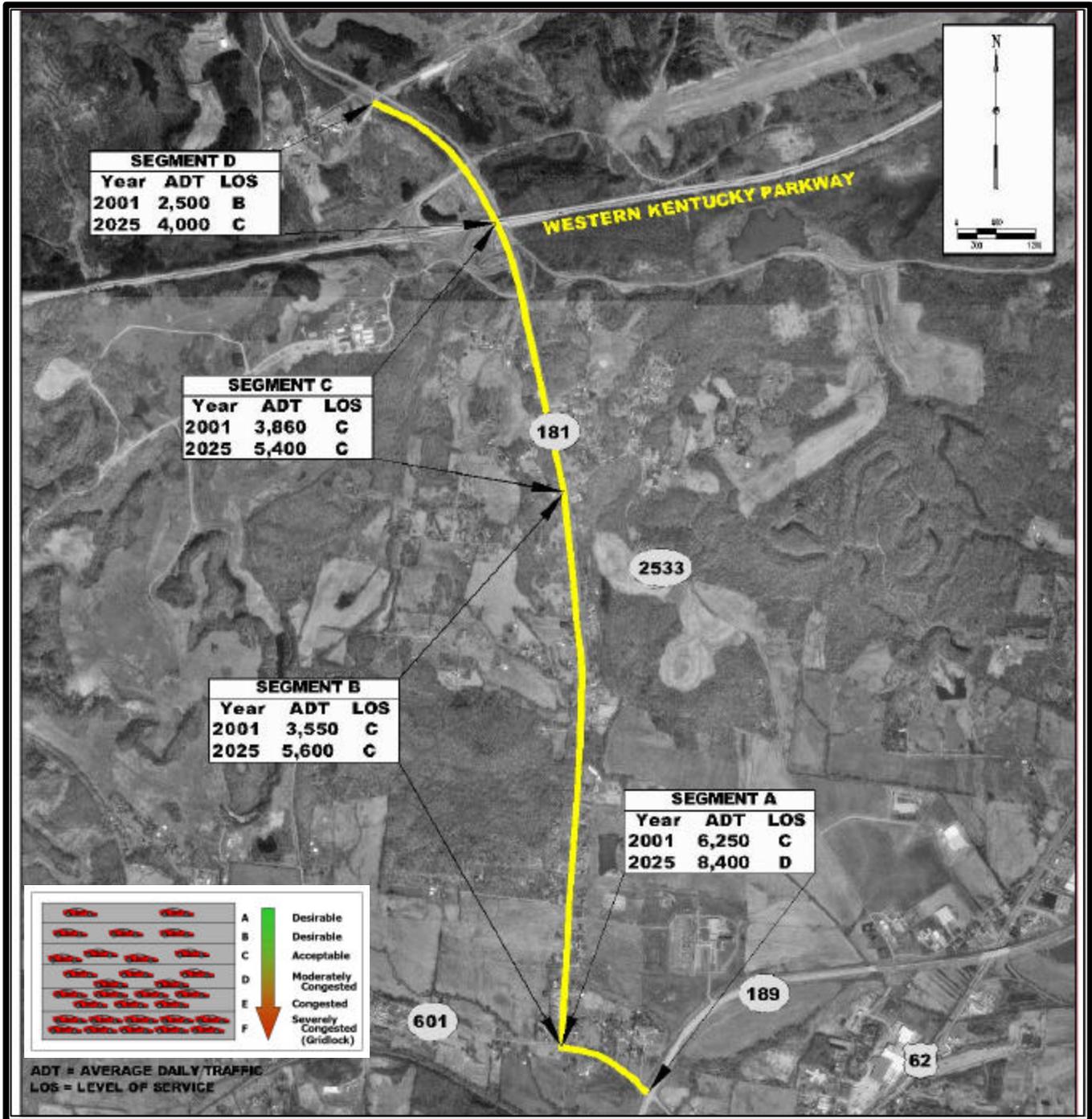


FIGURE 5 – EXISTING AND DESIGN YEAR (2025) TRAFFIC AND LOS

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corridor is primarily residential, with the exception of the Wendell H. Ford Kentucky National Guard Training Center north of the Western Kentucky Parkway. A minimal amount of additional traffic has resulted from the growth occurring at the Wendell H. Ford National Guard Training Center, although the estimated increase in stationed personnel was unavailable for use in modeling.

The highest Design Year 2025 traffic levels on KY 181 are expected for the segments between KY 189 and KY 601. This segment is forecast to increase by 2,150 vehicles, an increase of 34.4%. The segment between the Western Kentucky Parkway and the Wendell H. Ford National Guard training center is expected to see the highest growth percentage of 60%, from 3,550 vehicles per day in 2001 to 5,600 in 2025. The segment between KY 601 and KY 2533 (Old Country House Road) is forecast to increase by 2,050 vehicles per day (an increase of 57.7%), and the segment between KY 2533 and the Western Kentucky Parkway is forecast to increase by 1,540 vehicles per day (an increase of 39.9%). The 2025 forecasts listed in the table take into account the most recent traffic counts observed for KY 181. This includes a new count station north of the Western Kentucky Parkway near the entrance to the Wendell H. Ford National Guard Training Center, as well as Station 541 (between KY 601 and Old Country House Road) and 549 (between KY 189 and KY 601). The traffic counts were completed during the first week of October 2001, while school was in session. Truck data were included in those counts. However, coal trucks are banned from using KY 181 south of the Western Kentucky Parkway, and no major generators are located along the route. School bus traffic is also present.

Existing and future Levels of Service (LOS) were calculated using Highway Capacity Software (Version 4.1b), the Design Year 2025 traffic forecasts, and the 2001 traffic volumes. LOS is an alphabetical description of the traffic flow for a roadway segment. Similar to school letter grades, calculated values range from LOS A with completely free flowing traffic, to LOS F with severely congested traffic. The results of the LOS analysis indicate that the existing roadway operates at LOS C between KY 189 and the Western Kentucky Parkway, and at LOS B north of the Parkway. This suggests that the roadway is not congested on a recurrent basis. With respect to Design Year 2025 LOS without improvements, the segment from KY 189 to KY 601 would operate at LOS D and the remainder of the study corridor would operate at LOS C. LOS D describes roadways that have adequate capacity with delays being a rarity. Therefore, congestion should not be a significant issue for the Design Year 2025.

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3.0 ENVIRONMENTAL OVERVIEW

The environmental overview provides a general summary of the social, economic, and environmental composition of the project area. A map highlighting key environmental features is shown in **Figure 6**. These findings were used to evaluate the impact that improvement options might have on the environmental resources in the study area. The environmental review area is generally 1000 feet each side of the existing centerline of KY 181, beginning at the intersection of KY 189 to just north of the Wendell H. Ford National Guard Training Center entrance. A detailed Environmental Overview Report dated December 2001, which includes resource agency letters and contacts, has been prepared and submitted to the Cabinet under separate cover.

3.1 Socioeconomics

The project area is basically rural in nature. It is predominantly developed residentially, with scattered farmlands and structures along KY 181. There does not appear to be any neighborhoods or community units within the corridor that have a cohesive structure or display the type of characteristics represented by similarities in design, style, age, ethnicity, race, culture, incomes, family composition, education, religion, or usage. Therefore, any relocation activities would not be complicated by the necessity to maintain cultural groups or extended family units. It is also expected that most displaced residents would be able to relocate their homes and structures on the same property, and to maintain existing social groups. Most of the right-of-way purchased would be frontage strips along KY 181.

There are two churches along the corridor, First Baptist Church and Duvall's Chapel General Baptist Church, neither of which are expected to be adversely affected. There are currently no community assets in the corridor, such as airports or hospitals, that would be affected. Also, since the proposed project is an expansion of KY 181, no long-term impacts to any business in the project area would occur. Muhlenberg North High School would not have any long-term impacts, though a secondary entrance to the school may be affected during the construction phase.

3.2 Air Quality

The corridor area has been designated as an Attainment Area for all transportation-related pollutants as per 1990 Clean Air Act Amendments. As a result, KY 181 improvement plans will not require transportation control measures, nor will they require adherence to the Conformity Guidelines issued by the U.S. Environmental Protection Agency and the U.S. Department of Transportation. With the location of the corridor being in an Attainment Area and with the relatively low traffic volume projections for the Design Year 2025, it is anticipated that a microscale analysis specified in Air Quality Guidance for Project Level Analysis will be required for this project.

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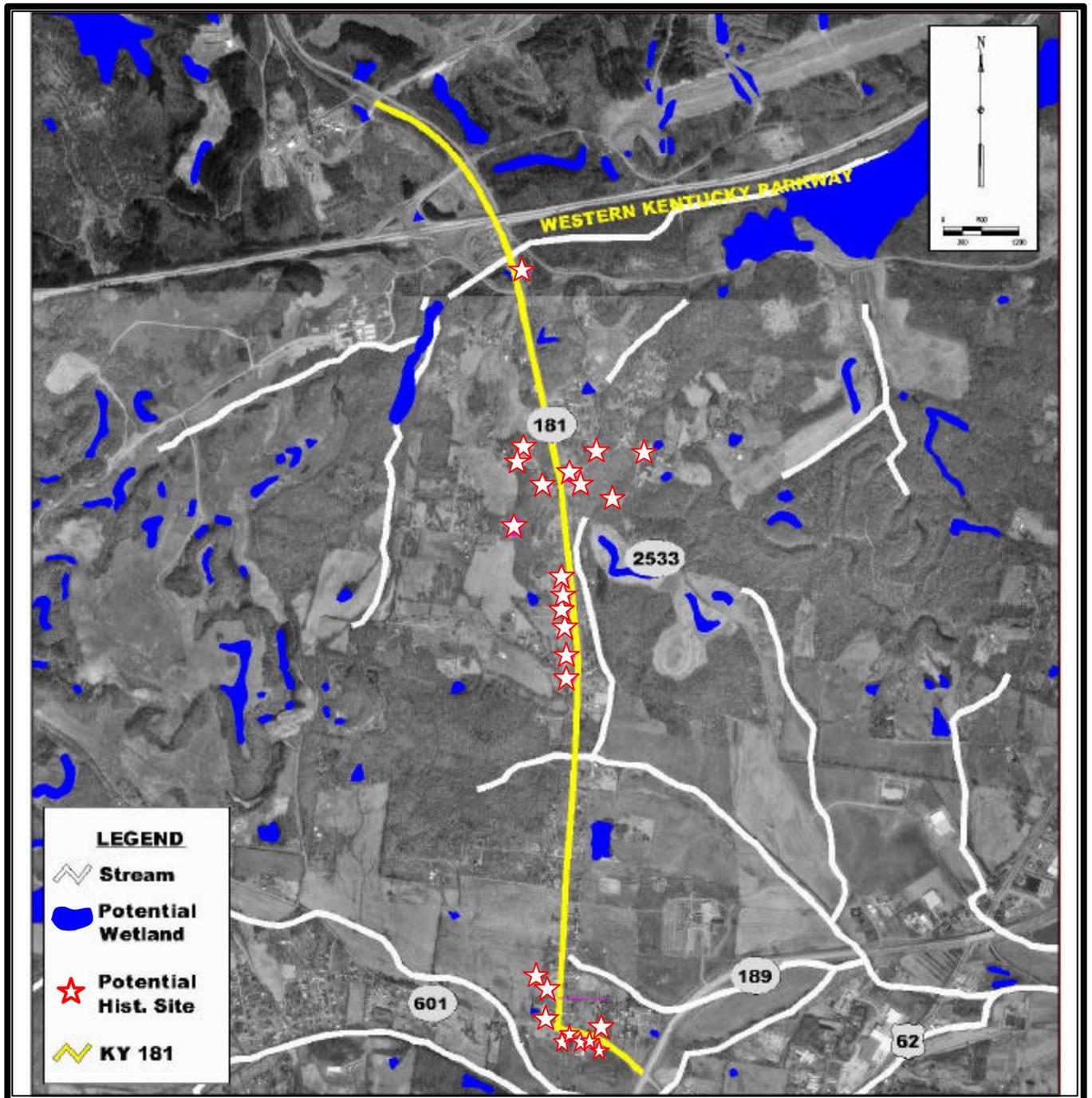


FIGURE 6 – ENVIRONMENTAL OVERVIEW

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3.3 Highway Noise

Given the rural context of the area, highway noise levels are not expected to be a major concern on this project. The majority of the adjacent land is undeveloped farmland. However, a project specific noise impact analysis will be required to verify noise impact conditions using procedures based on FHWA requirements and the KYTC Noise Abatement Policy.

3.4 Aquatic and Terrestrial Ecology

Two small perennial springs and several unnamed, intermittent headwater tributaries of Little Cyprus and Caney Creek are in the project area and may be impacted. Thirteen (13) National Wetland Inventory (NWI) sites were mapped within the study area. Five (5) were diked ponds that are part of farming operations, five (5) were the result of strip-mining activities, and the remaining three (3) appear to be natural in origin. Wetlands need to be field validated in subsequent project phases, if any, to determine their presence or jurisdictional status.

The project falls within the potential habitat of several federally listed endangered and threatened species. The federally threatened Bald Eagle has been sighted in Muhlenberg County, but their preferred habitats (large rivers and impoundments) are not located within the corridor. Suitable habitats for the Indiana Bat are found in four separate areas of the project corridor. In addition, suitable habitat for Running Buffalo Clover occurs in at least one place within the project corridor, west of Nebo and KY 181. The Kentucky State Nature Preserves Commission (KSNPC) lists the presence of Henslow's Sparrow and Lark Sparrow as possibly being of concern in the project corridor, based on other data from Muhlenberg County. These sites must be further examined in subsequent project phases, to determine any adverse impacts.

3.5 Cultural Historic Resources Evaluation

There are no recorded cultural historic resources located within the project corridor. However, there are forty (40) potential cultural historic properties (properties that appear to be 50 years or older) located along the KY 181 roadway. A final determination of eligibility and National Register boundaries cannot be made until each site has been examined more closely, and site-specific archival research has been completed.

3.6 Archaeological Resources Evaluation

There are no recorded or documented archaeological resources located within the project corridor. However, two surveys that have been conducted within or adjacent to the corridor have discovered two (2) possible archaeological sites. Since the possibility exists of encountering archaeological sites during the implementation of any of the alternatives, the Native American Coordination process should be initiated, and the KYTC Division of Environmental Analysis should be consulted for appropriate action in subsequent project phases.

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3.7 UST/Hazmat Considerations

A search of government records and a preliminary screening/windshield survey were done to locate any sites or facilities that may harbor potentially hazardous substances or underground storage tanks. No underground storage tank (UST) locations or above ground storage/heating oil tanks were encountered during the initial survey of the project corridor. In addition, no significant hazardous materials or underground storage tank issues are anticipated for this project, regardless of alternative selected. During the project meetings the possibility of a UST around an old gas station site at KY 181/KY 2533 was mentioned. However, upon further investigation no evidence of a UST was found.

3.8 Environmental Justice

With respect to Environmental Justice considerations, there do not appear to be any identifiable low income, minority neighborhoods, or community units located in the project corridor. Relocation requirements may be significant, although the number and intensity of relocations is dependent on the alternative chosen. Relocation activities would be limited to twenty (20) residences located along the sides of KY 181 if the five lane (55 MPH) options were chosen. More specific information related to Environmental Justice is located in **Appendix E**.

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4.0 GEOTECHNICAL OVERVIEW

The project area is located within the south-central portion of the Ohio River Hills and Lowlands Subsection, Shawnee Hills Section of the Interior Low Plateau Province. It is mostly rugged topography with steep-sided stream valleys and some vertical cliffs. Within the corridor, the Carbondale Formation of the Middle Pennsylvanian period, consisting of sandstone, siltstone, shale, coal and underclay, underlies the majority of the soils. The two soil associations existing in the project corridor, both weathered from the Carbondale Formation, are Udorthents-Zanesville-Wellston and Sadler-Zanesville-Wellston. Both of these soil types have good potential as wildlife habitat, but only the former has agricultural potential.

The Greenville Geologic Quadrangle Map indicates that the Kentucky Number 9 and 11 coal seams are present in the vicinity of KY 181, and both seams were strip mined and underground mined. The locations of the mines are shown in **Figure 7**. The figure also shows an airshaft located at (approximately) MP 14.3 on KY 181, or 1.5 miles north of KY 601. The existence of the airshaft indicates that subsidence is possible throughout the area. The shaft caused a roadway cave-in several years ago, creating a six-foot wide hole, fifteen feet deep. KYTC District 2 Maintenance Staff indicated that the hole has been capped with stone and paved over. However, there is noticeable subsidence in the pavement at that location. Thus, a series of borings is recommended prior to the design phase of future projects. Embankment and cut slopes of 2:1 are recommended.

KYTC's Division of Geotechnical Engineering recommends that the underground mine west of Nebo be avoided if possible. If avoidance is not possible, then mine voids should be stabilized. In addition, KYTC noted that the project is in Seismic Risk Zone 3, indicating that this is an area with a propensity for high damage due to earthquake activity.

More detailed information about the existing geotechnical conditions along the study corridor, as well as recommendations concerning future construction on KY 181, are found in **Appendix F**.

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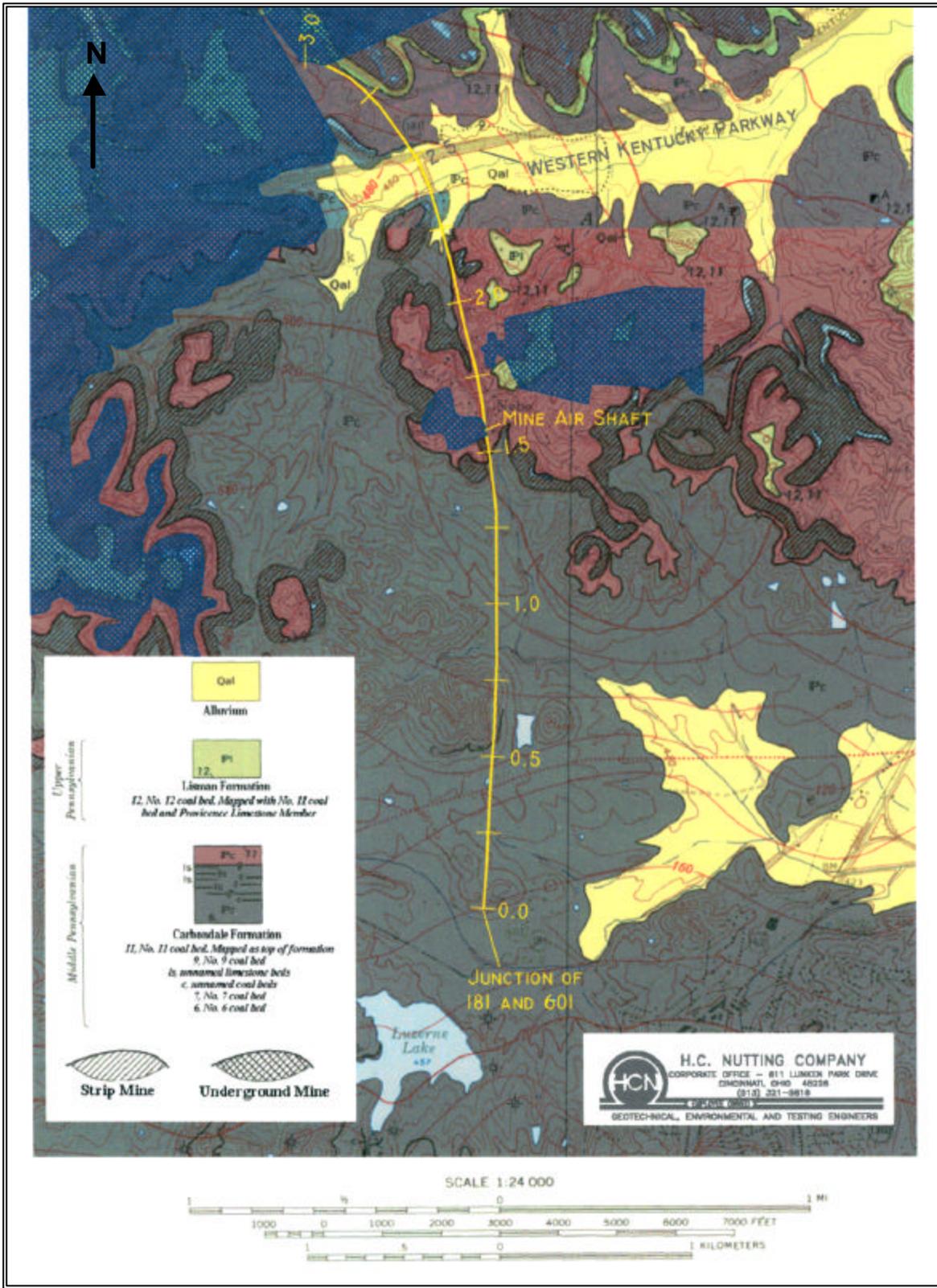


FIGURE 7 – MINE AND AIR SHAFT LOCATIONS

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5.0 STUDY ALTERNATIVES/IMPROVEMENT OPTIONS

The Project Team developed potential improvement alternatives to address the goals and objectives established through the study process. All alternatives include ten-foot paved shoulders (with an additional two feet unpaved for twelve feet total) which would also serve to accommodate bicycles and/or pedestrians. All improvement options will eliminate the need for the flashing caution light at the intersection of KY 181 and KY 2533, due to the improved sight distance at that location. Also, from discussions held during the first two Team Meetings, no improvements are deemed necessary at this time to the segment from the Western Kentucky Parkway to the Wendell H. Ford National Guard Training Center entrance.

5.1 Proposed Geometrics

Typical cross-sections for each alternative were developed at the onset of this study for use in cost estimating. Any decision or recommendation about the final geometrics of any future improvements will be decided during future project phases, if any. As for the concerns raised at the Public Meeting, the deficient grade on the Henderson Lane approach of the KY 181/Henderson Lane intersection should be improved with all alternatives, as the grade on KY 181 will be raised in that area. The crest vertical curve at KY 2533 should be cut down, improving the sight distance at that intersection thereby eliminating the need for the flashing caution light.

A potential typical section for each alternative is discussed in the applicable sections that follow.

5.2 Alternative One – Do Nothing/No Build

Alternative One involves no action to improve the facility other than routine maintenance such as resurfacing and re-striping the roadway. It was presented to and discussed among the Project Team and project stakeholders, and was not recommended because it does not address all the project goals although there would be sufficient capacity through 2025.

5.3 Alternative Two – Rebuild KY 181 with a 55-MPH design speed from KY 189 to the Western Kentucky Parkway (improved two-lane)

Alternative Two involves the reconstruction of KY 181 from the intersection of KY 189 to the Western Kentucky Parkway utilizing a 55 MPH design speed and an improved two-lane cross section, including two driving lanes with ten-foot paved shoulders (see typical section in **Figure 8**). The proposed cross section upgrades the existing facility, which consists of nine to ten-foot lanes and no shoulders. Turn lanes are to be included at the KY 2533 and Henderson Lane intersections, as well as at the entrance to Muhlenberg North High School. As previously discussed, the segment of roadway from the Western Kentucky Parkway to the Wendell H. Ford National Guard Training Center will remain unchanged.

Utilizing a 55-MPH design speed with current highway standards and specifications will improve sight distance throughout the corridor. However, because of the rolling terrain, large earthwork quantities can be expected in order to correct vertical deficiencies throughout the corridor.

The resulting Design Year 2025 LOS with this two-lane section will be LOS C from KY 189 to the Western Kentucky Parkway, with a volume-to-capacity ratio of 0.34, indicating that the roadway will operate below capacity. This alternative will likely reduce accidents due to the improved geometrics, will provide improved connectivity to the City of Greenville, and will provide improved truck, bus, and emergency vehicle access.

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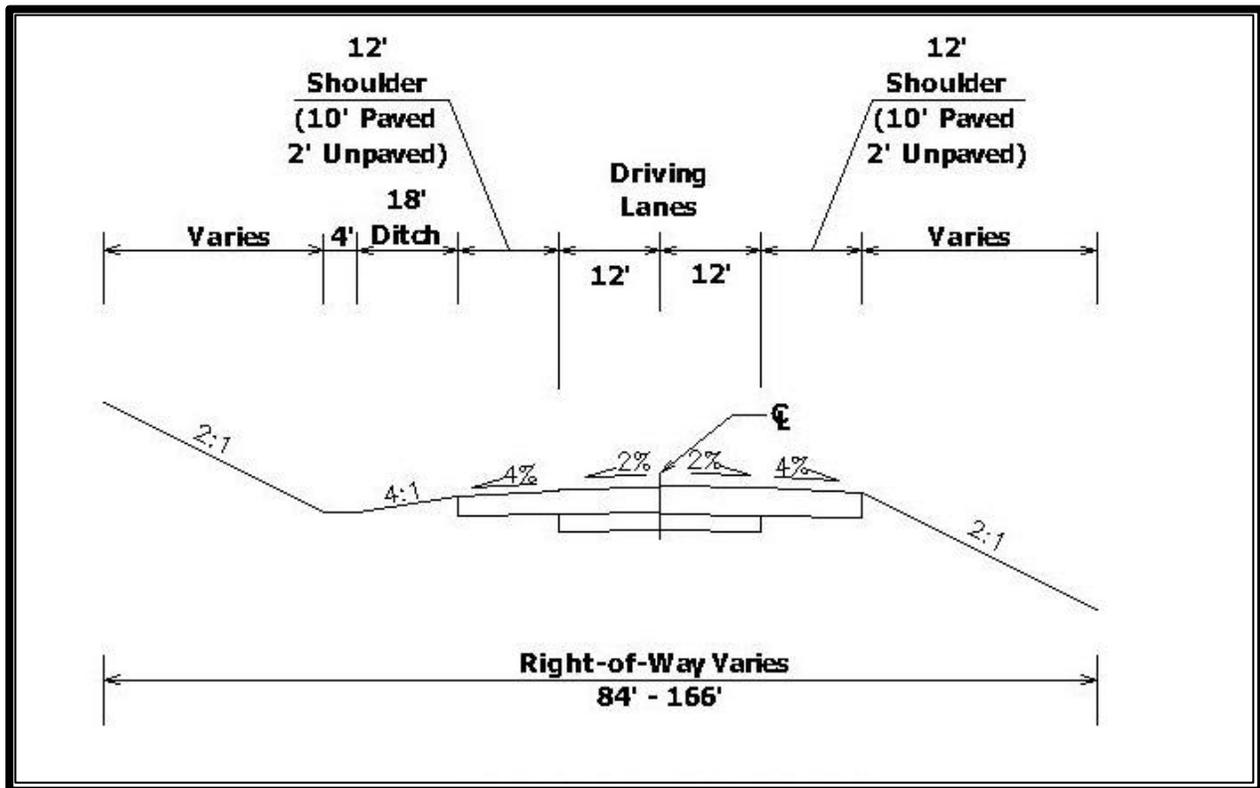


FIGURE 8 – Alternative Two – Two-Lane Improved Section

5.4 Alternative Three - Rebuild KY 181 with a 55 MPH design speed from KY 601 to the Western Kentucky Parkway (three-lane rural)

Alternative Three examines the reconstruction of KY 181 from the intersection of KY 601 to the Western Kentucky Parkway utilizing a 55 MPH design speed and a three-lane rural cross section. This section consists of two driving lanes with a continuous center two-way left turn lane (see typical section in **Figure 9**). The segment of roadway from KY 189 to KY 601 and from the Western Kentucky Parkway to the Wendell H. Ford National Guard Training Center will remain unchanged.

Utilizing a 55-MPH design speed with current highway standards and specifications will improve sight distance throughout the corridor. However, because of the rolling terrain, large earthwork quantities can be expected in order to correct vertical deficiencies throughout the corridor. Additionally, the construction of a continuous two-way left turn lane would require that the speed limit be posted at 45 MPH or less, even though it would be designed for 55 MPH travel speeds.

Constructing this three-lane rural section will result in a LOS of C from KY 601 to the Western Kentucky Parkway. This alternative will likely reduce crashes due to the improved geometrics, will improve the connectivity to the City of Greenville, and will provide for better truck, bus, and emergency vehicle access.

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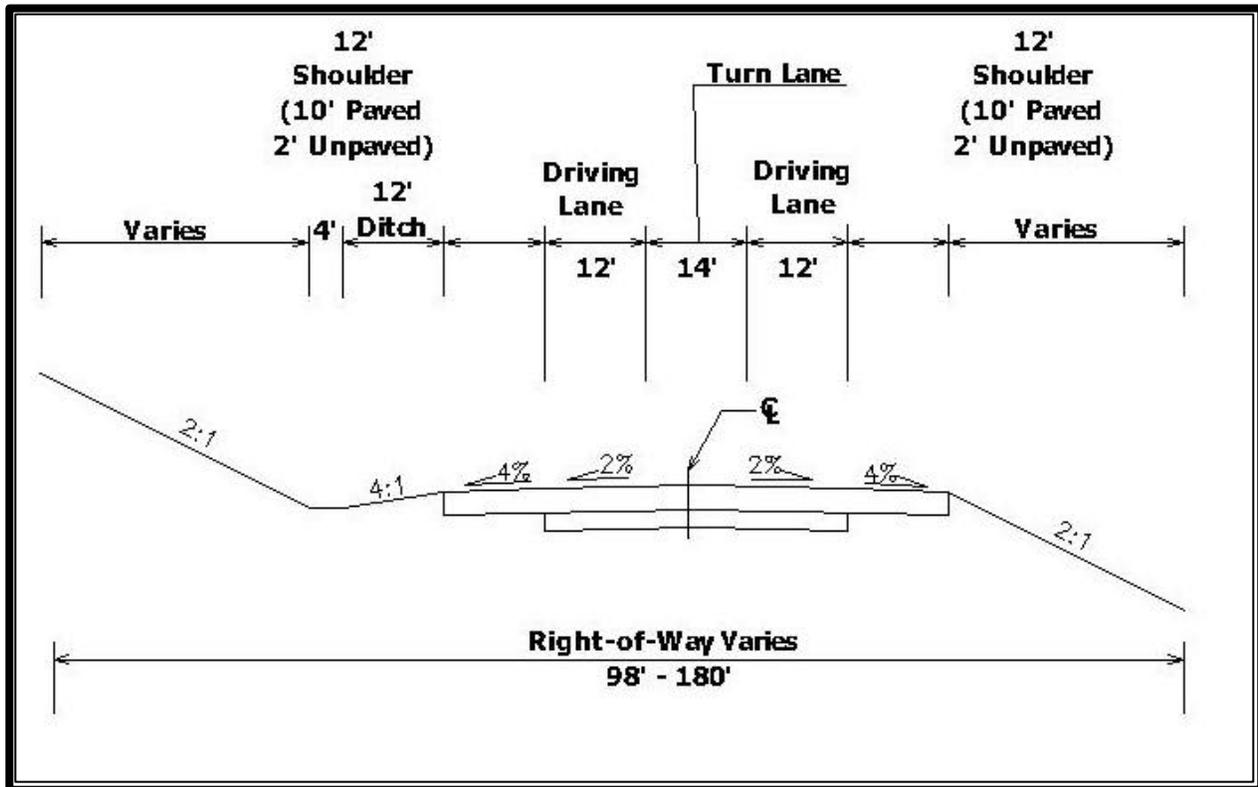


FIGURE 9 – Alternatives Three and Four – Three-Lane Rural Section with Continuous Left Turn Lane

5.5 Alternative Four - Rebuild KY 181 with a 55 MPH design speed from KY 189 to the Western Kentucky Parkway (three-lane rural)

Alternative Four examines the complete reconstruction of KY 181 from KY 189 to the Western Kentucky Parkway utilizing a 55 MPH design speed and a three-lane rural cross section, including two driving lanes with a continuous center two-way left turn lane, as discussed in Alternative Three. In this alternative, the KY 181/KY 601 intersection will be modified to make KY 181 a continuous through route to KY 189 by adding a horizontal curve on KY 181 to replace the existing intersection of KY 181 and KY 601. KY 601 will be reconstructed with a 45-MPH design speed, and will intersect KY 181 in the midpoint of the new horizontal curve. This allows sight distance improvement at the intersection, and gives through traffic the right-of-way during turning operations.

Utilizing a 55-MPH design speed with current highway standards and specifications will improve sight distance throughout the corridor. However, large earthwork quantities may be expected in order to correct vertical deficiencies throughout the corridor. Additionally, the construction of a continuous two-way left-turn lane would require the roadway to be posted at 45 MPH or less, even though it would be designed for 55-MPH travel speeds.

Constructing this three-lane rural section will result in a LOS of C from KY 189 to the Parkway and a LOS of B from the Western Kentucky Parkway to the Wendell H. Ford National Guard Training Center. This alternative will likely reduce crashes due to the improved geometrics, will improve the connectivity to the City of Greenville, and will provide for better truck, bus, and emergency vehicle access.

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5.6 Alternative Five - Rebuild KY 181 with a 55 MPH design speed from KY 601 to the Western Kentucky Parkway (four-lane rural)

This alternative is similar to Alternative Two in that it examines the reconstruction of KY 181 from the intersection of KY 601 to the Western Kentucky Parkway utilizing a 55-MPH design speed. However, Alternative Five utilizes a four-lane rural cross section, including two driving lanes in each direction with 12-foot shoulders on both sides (See cross section in **Figure 10**). The segment of roadway from KY 189 to KY 601 and from the Western Kentucky Parkway to the Wendell H. Ford National Guard Training Center will remain unchanged.

Again, utilizing a 55-MPH design speed with current highway standards and specifications will improve sight distance throughout the corridor. However, because of the rolling terrain, large earthwork quantities can be expected in order to correct vertical deficiencies throughout the corridor. The entire corridor should be posted at 45-MPH.

This four-lane rural section will result in a LOS of A from KY 601 to the Western Kentucky Parkway. This alternative will likely reduce crashes due to the improved geometrics, will improve the connectivity to the City of Greenville, and will provide for better truck, bus, and emergency vehicle access.

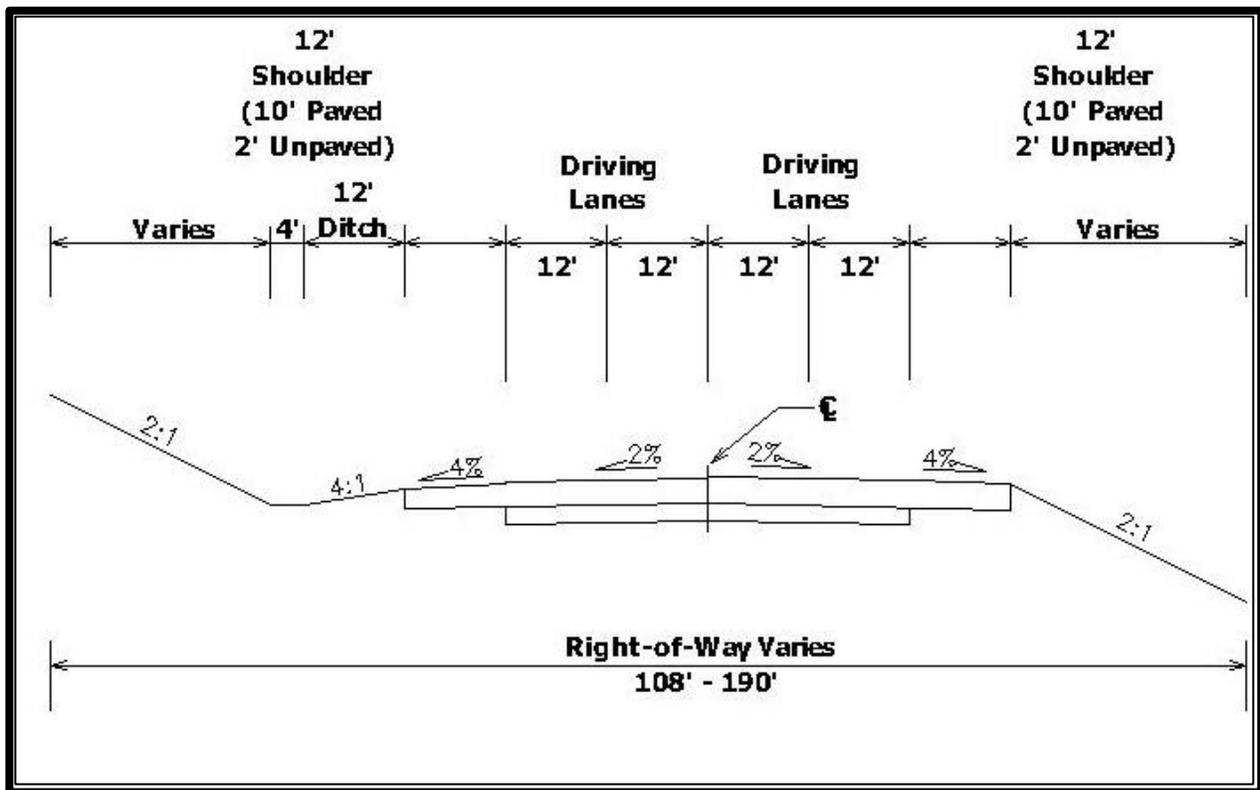


FIGURE 10 – Alternatives Five and Six – Four-Lane Rural Section

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5.7 Alternative Six - Rebuild KY 181 with a 55 MPH design speed from KY 189 to the Western Kentucky Parkway (four-lane rural)

Alternative Six, similar to Alternative Five, examines the complete reconstruction of KY 181 from KY 189 to the Western Kentucky Parkway utilizing a 55-MPH design speed. Alternative Six utilizes a four-lane rural cross section, including two driving lanes in each direction with 12-foot shoulders on both sides. The KY 181/KY 601 intersection will be modified to make KY 181 a continuous, through route to KY 189 by adding a horizontal curve on KY 181 to replace the intersection of KY 181 and KY 601. KY 601 will be reconstructed with a 45-MPH design speed, intersecting KY 181 in the midpoint of the new horizontal curve. This allows sight distance improvement at the intersection, and gives through traffic the right of way during turning movements. The entire corridor should be posted at 45-MPH.

As with the other alternatives, sight distance will be improved throughout the corridor by using the 55-MPH design speed with current highway standards and specifications. Again, large earthwork quantities may be expected in order to correct vertical deficiencies throughout the corridor.

This four-lane rural section will result in a LOS of A from KY 189 to the Western Kentucky Parkway. This alternative will likely reduce crashes due to the improved geometrics, will improve the connectivity to the City of Greenville, and will provide for better truck, bus, and emergency vehicle access.

5.8 Estimated Costs

Engineering cost estimates were developed for each of the alternatives. These are shown in **Appendix G**. The itemized costs were developed using 2001 average unit bid prices from the Kentucky Transportation Cabinet, Division of Construction. **Table 5.7.1** shows the potential impacts and costs by phase associated with each alternative studied.

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TABLE 5.7.1 - POTENTIAL IMPACTS AND COST COMPARISON OF ALTERNATIVES

Alternatives	1	2	3	4	5	6
Description	Do Nothing / No Build	Rebuild KY 181 with a 55 MPH design speed from KY 189 to the Western Kentucky Parkway (two-lane improved)	Rebuild KY 181 with a 55 MPH design speed from KY 601 to the Western Kentucky Parkway (three-lane rural)	Rebuild KY 181 with a 55 MPH design speed from KY 189 to the Western Kentucky Parkway (three-lane rural)	Rebuild KY 181 with a 55 MPH design speed from KY 601 to the Western Kentucky Parkway (four-lane rural)	Rebuild KY 181 with a 55 MPH design speed from KY 189 to the Western Kentucky Parkway (four-lane rural)
Length (miles)	3.31	3.31	3.26	3.31	3.26	3.31
Relocation Impacts	None	17 Homes (84 Parcels impacted)	17 Homes (75 Parcels impacted)	17 Homes (84 Parcels impacted)	20 Homes (75 Parcels impacted)	20 Homes (84 Parcels impacted)
Geotechnical Impacts	None	Abandoned mines, major cut and fill quantities anticipated to meet 2:1 cut slopes and 2:1 fill slopes	Abandoned mines, major cut and fill quantities anticipated to meet 2:1 cut slopes and 2:1 fill slopes	Abandoned mines, major cut and fill quantities anticipated to meet 2:1 cut slopes and 2:1 fill slopes	Abandoned mines, major cut and fill quantities anticipated to meet 2:1 cut slopes and 2:1 fill slopes	Abandoned mines, major cut and fill quantities anticipated to meet 2:1 cut slopes and 2:1 fill slopes
Environmental Impacts	None	Could impact 18 potential historic sites, 2 potential archeological sites, 1 wetland	Could impact 12 potential historic sites, 2 potential archeological sites, 1 wetland	Could impact 18 potential historic sites, 2 potential archeological sites, 1 wetland	Could impact 12 potential historic sites, 2 potential archeological sites, 1 wetland	Could impact 18 potential historic sites, 2 potential archeological sites, 1 wetland
Future Level of Service						
Segment A: KY 189 – KY 601	D	C	C	C	A	A
Segment B: KY 601 – KY 2533	C	C	C	C	A	A
Segment C: KY 2533 – W.K. Pkwy	C	C	C	C	A	A
Segment D: W.K. Pkwy-Nat'l Guard	B	B	B	B	B	B
Conceptual Cost Estimate	\$0	\$15,900,000	\$17,200,000	\$17,600,000	\$19,100,000	\$19,500,000
Relation to Project Goals	1. May not reduce number of crashes along the route. 2. Does not provide adequate sight distance. 3. Does not improve truck, school bus and emergency vehicle access. 4. Does not improve connectivity to the City of Greenville. 5. Provides adequate capacity for 2025.	1. May reduce number of crashes along the route. 2. Provides adequate sight distance. 3. Improves truck, school bus and emergency vehicle access. 4. Provides improved connectivity to the City of Greenville. 5. Provides adequate capacity for 2025.	1. May reduce number of crashes along the route. 2. Provides adequate sight distance. 3. Improves truck, school bus and emergency vehicle access. 4. Provides improved connectivity to the City of Greenville. 5. Provides adequate capacity for 2025.	1. May reduce number of crashes along the route. 2. Provides adequate sight distance. 3. Improves truck, school bus and emergency vehicle access. 4. Provides improved connectivity to the City of Greenville. 5. Provides adequate capacity for 2025.	1. May reduce number of crashes along the route. 2. Provides adequate sight distance. 3. Improves truck, school bus and emergency vehicle access. 4. Provides improved connectivity to the City of Greenville. 5. Provides adequate capacity for 2025.	1. May reduce number of crashes along the route. 2. Provides adequate sight distance. 3. Improves truck, school bus and emergency vehicle access. 4. Provides improved connectivity to the City of Greenville. 5. Provides adequate capacity for 2025.

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6.0 FINAL RECOMMENDATION

The study alternatives were presented by HNTB at the final Project Team meeting in December of 2001. At that meeting, the alternatives were discussed and a recommended alternative was selected by the study team using the information found in **Table 5.7.1**.

No overwhelming environmental or geotechnical facts were present to significantly differentiate between the alternatives. Therefore, the geotechnical and environmental impacts, while important, were not critical decision factors. The no-build alternative (Alternative One) did not meet all the study goals. As discussed at the final Team Meeting, KY 181 is currently on the Rural Secondary System, but will likely be classified as State Secondary or State Primary following reconstruction. Given that the stated preference was for the roadway to remain posted at 55 MPH, the use of a continuous two-way left turn lane was not recommended.

The Project Team recommended Alternative Two as the preferred alternative, providing an improved gateway to the City of Greenville from the Western Kentucky Parkway while also improving vehicle safety and accessibility along the route. This alternative includes the complete reconstruction of KY 181 from the intersection of KY 189 to the Western Kentucky Parkway, using the parameters for a two-lane, 55-MPH highway. For purposes of cost estimating, locations and lengths of turn lanes were approximated. Critical intersections where turning lanes might be anticipated are KY 181 at KY 2533, at Henderson Lane, and at the entrance to Muhlenberg North High School. This alternative provides improved traffic flow with a lower cost than Alternative Five. The safety of motorists on KY 181 will be greatly improved with the addition of clear zones (recovery areas), twelve (12) foot shoulders (ten-foot paved), and turning lanes along the route. Also, these changes will provide adequate capacity to meet the growing demands of the City of Greenville and the surrounding region.

The total cost for this alternative is estimated to be \$15,900,000. The breakdown of costs, by phase, is shown below.

PHASE	COSTS
DESIGN	\$1,000,000
RIGHT-OF-WAY	\$1,900,000
UTILITIES	\$800,000
CONSTRUCTION	\$12,200,000
TOTAL	\$15,900,000

Maintenance of traffic will provide some difficulty during the construction process. Due to the length and degree of grade changes that are to be made, the road will most certainly require closure to through traffic during construction. An alternative to road closure would be to construct detour routes off-alignment that bypass the areas where grade changes will occur. Considering the cost of additional right-of-way and the impacts to homes/properties along the corridor, these detour routes adjacent to the existing roadway are cost prohibitive.

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The possibility exists for subsidence in the area due to the existence of an airshaft in the project area phase and therefore, a series of borings is recommended prior to the design phase of future projects. Additionally, embankment and cut slopes of 2:1 are recommended. No other significant issues were discovered during the course of the study and no commitments were made regarding future phase of the project.

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Appendix A - Team Meeting Minutes

STATEWIDE CORRIDOR PLANNING SERVICES
KY 181 – PROJECT TEAM MEETING #1

TO: Annette Coffey, P.E.
Director
KYTC Division of Planning

FROM: Larry D. Chaney, P.E.
Director of Transportation
HNTB-Louisville

DATE: September 24, 2001

SUBJECT: Statewide Corridor Planning
Muhlenberg County
KY 181 from WK Pkwy. To KY 601
Item No. 2-313.00

The first Project Team Meeting on the KY 181 Scoping Study was held in the District 2 Conference room at 10:00 a.m. CDT on September 24, 2001. Those in attendance were:

Bruce Siria	Division of Planning
David Martin	Division of Planning
Daryl Greer	Division of Planning
Stephen Hoefler	Division of Highway Design
Shari Greenwell	Division of Operations
Nick Hall	District 2 Planning
Everett Green	District 2 Design
Kevin McClearn	District 2 Design
Joe Plunk	District 2 Design
Melvin Hicklin	District 2 Design
Doug Taylor	District 2 Environmental
Mark Allen	District 2 Utilities
Kenny Potts	District 2 Traffic
T. C. Chambers	District 2 Construction
Bryon Johnson	District 2 Construction
Jeff Skaggs	District 2 Operations
Craig Morris	Pennyrile ADD
Karen Mohammadi	HNTB Corporation
Larry Chaney	HNTB Corporation

Daryl Greer opened the meeting with introductions. He then went on to explain that the purpose of this meeting was to discuss the project, get collective knowledge on needs, and determine what range of alternatives could be explored. This process should help improve the flow from the planning phase to the design phase design.

Karen Mohammadi then reviewed the project handouts. The District staff offered to check on the latest traffic counts, vehicle classifications, and turning movement counts at KY 601 and at the Western Kentucky Parkway interchange.

A discussion was held as to whether the project termini should be at KY 601 or KY 189. It was decided that the termini should be taken to KY 189 on the south end, and taken just past the main entrance to the National Guard facility on the north end.

Some problems identified were bad soils at the interchange, conflicts at the intersection between coal trucks and passenger vehicles, and poor sight distance at KY 2533 at the location of the flashing beacon.

Environmental concerns include the possibility of a gas station at KY 2533 on the northeast quadrant and numerous coal airshafts. Locations of the latter will be obtained from Peabody Coal Company.

Some of the benefits to be gained by the project are increased safety, less congestion, improved truck access, possibly a more attractive entrance into Greenville, improved school traffic access, and improved emergency vehicle access to the hospital in Madisonville.

It was questioned as to whether there was any benefit to relocating KY 601. There had been some discussion of an additional connection to KY 189/US 62 north of the high school, but that does not currently appear to be an issue. The team preferred to have no new at-grade intersections on the bypass. KY 2533 is on the Unscheduled Needs List, and would supersede the need for a new connector from KY 181 to KY 189.

The WK Parkway interchange operates well today, and most likely would not require improvement in the foreseeable future. However, the access road under the Parkway to the coal facility is no longer used, and that facility appears to have been the primary reason for the flopped-diamond interchange at his location. Operation of the interchange will be addressed in the study.

The Job Corps Center, located just south of the interchange, was identified as a major traffic generator. Other sources include Greenville-bound traffic from the Parkway and traffic to/from the National Guard facility.

The Division of Planning will provide HNTB with accident data up to June 2001. The District will provide traffic counts for the KY 2533, KY 601, and the KY 189 Interchanges.

The District would like to see the road removed from the Rural Secondary System. Daryl suggested that District 2 start discussions with Jay Hoskins in the Division of Planning about getting this accomplished.

Not only does the District favor an improvement to KY 181, it feels that it would be an aesthetic improvement to the entrance of the City of Greenville. It also has potential to become a connector for the National Truck Network, and would meet standards for such a facility after the upgrade.

Everett Green stated that someone should redefine the project limits in the Oracle project database. He wants the design year traffic counts included in the study effort, and would like to see the effects of widening the road to either three or four lanes. Daryl responded that the project recommendation will include a proposed typical section, and that traffic projections would be made. The project is either near to, or is one of, the top ten projects on the ADD's current priority list.

The Environmental Footprint area that HNTB proposed is a total of 500' feet. The District 2 staff felt that this would be sufficient, since the corridor is mostly rural residential, although it may spread out around the interchange of KY 601 and KY 2533. Also, there may be a need to relocate the roads that tie into KY 2533 close to KY 181.

Design criteria were discussed. The road will most likely be classified as either a State Secondary or a State Primary route following reconstruction, and should be considered as such for purposes of this study.

If the design year traffic volume is near 6000 vehicles per day, it may only need to be a two-lane, or possibly a three-lane, section. The initial reaction of the team was that three lanes may not be needed, except for turning lanes at the school, at KY 2533 and at KY 601. The corridor should be posted at 55 mph, except in the vicinity of a school.

Problems with turning vehicles along the route are not apparently severe. To address the need for sidewalks or a bike trail, it was suggested that the design utilize 8' to 10' shoulders.

Agency coordination on the project will consist of letters being sent to agencies to allow comment on the proposal. Some of the local groups to be included are as follows: the school board, the National Guard, the US Department of Labor, the Greenville Historical Society, the Volunteer Fire Department, other emergency response (Gary Andrews- 911 system), and the utilities companies, such as BellSouth and KU. These groups will also be involved in the Stakeholders meeting.

To enhance public involvement and input, it was suggested that the local newspapers be asked to publish a survey form. The District said that the service would most likely be free, and that two weekly papers in the area could be approached. After the Stakeholders Meeting, the newspapers should be contacted to see if an article concerning the project could be published. The article could explain the scope of the project, give the expected time frame, and explain that only planning money is currently available for the project.

The introductory public meeting needs to be held soon after the Stakeholders Meeting. The school or the convention facility would be logical places to consider for the meeting. The public meeting will be in November for both KY 181 and KY 62. Both newspapers need to be contacted, and both apparently have good circulation. Thursday meetings can be posted in the Tuesday and Wednesday newspapers. Another way of letting the public know of the meeting is through the local radio station and the media should be invited to the meeting. Another idea was to see if a weekly call-in show was available.

The final documentation for this study should be complete enough to allow the District to easily proceed to the Design phase of the project. It was suggested that the report also include a paragraph or two concerning utility impacts. HNTB will make the utility relocation and right-of-way estimates, with assistance from the District 2 staff.

**STATEWIDE CORRIDOR PLANNING SERVICES
KY 181
TEAM MEETING #2**

TO: Annette Coffey, P.E.
Director
KYTC Division of Planning

FROM: Larry D. Chaney, P.E.
Director of Transportation
HNTB-Louisville

DATE: January 14, 2002

SUBJECT: Statewide Corridor Planning
Muhlenberg County
KY 181 from WK Pkwy. To KY 601
Item No. 2-313.00

Team Meeting #2 on the KY 181 Scoping Study was held on Wednesday, December 19, 2001, at the new Muhlenberg County Career Advancement Center. The attendees gathered to discuss this project, as well as the US 62 Intermediate Planning Study (see separate minutes). Those in attendance were:

David Martin	Division of Planning
Jim Simpson	Division of Planning
Stephen Hoefler	Division of Highway Design
Kevin McClearn	District 2 Planning
Everett Green	District 2 Pre-Construction
Doug Taylor	District 2 Environmental
Nick Hall	District 2 Planning
Craig Morris	Pennyrile ADD
Carl Dixon	Division of Planning
Doug Smith	HC Nutting Company
Larry Chaney	HNTB Corporation
Susan Rich	HNTB Corporation

The meeting was opened with the distribution of handouts containing the study purpose, corridor issues, a draft statement of project goals, and miscellaneous project exhibits. A review of public comments noted that only three surveys have been received. Areas of public concern are at the KY 2533 and Henderson Lane intersections.

Two (2) alternates were considered for the KY 181 Scoping Study, both utilizing a 55 mph design speed. The alternates include a 3-lane rural section and a 4-lane rural section. A 5-lane section was not considered, simply because it is undesirable to have a center turning lane when using a 55 mph design speed. The correction of vertical alignment deficiencies to meet this criterion will require approximately 15 to 20 feet of cut in some areas of the corridor.

Cost estimates for the 3-lane and 4-lane alternates were distributed to the group. Utility costs were estimated at 8% of the total construction cost of each alternate. Kevin McClearn stated that District 2 will review the right of way and utility costs. Mr. McClearn stated that he feels the 3-lane costs are a good approach to the KY 181 Scoping Study, and that maybe a 'super' 2-lane section with turning lanes should be considered. Stephen Hoefler requested that the cost estimates be calculated using the existing project limits, and the additional study areas (north of the Western Kentucky Parkway interchange and from KY 601 to KY 189) should be presented separately.

Craig Morris asked if a new route is being considered north of the high school connecting KY 181 and KY 189. That is not being considered as part of this scoping study.

Doug Taylor asked how retaining walls, etc. would help to minimize relocations and right of way acquisitions. The elimination of five (5) acquisitions may be possible using retaining walls.

Carl Dixon asked what happens at the Western Kentucky Parkway with possible grade modifications required to correct vertical deficiencies. The study has not indicated that grade modifications are needed in the area of the interchange.

The environmental investigation has determined that there are no known archaeological or hazardous material sites in the project area.

The attendees were asked if KY 181 should be modified at KY 601 to become the through route, or if the horizontal alignment should be left in its existing state. Mr. Morris stated that he feels KY 181 should be the through route. Mr. Green stated that the Cabinet reworked the intersection a few years ago, and any improvements or changes to the current alignment would result in acquiring at least a couple of homes.

A discussion of project limits, project costs and making KY 181 the through route ensued. The following was decided:

- Costs will be prepared using the original scope as listed in the Six-Year Plan, with additional study areas calculated separately.
- Revised and separated costs will be sent to the Cabinet for review prior to submission of the draft report.
- KY 181 will be the through route at the KY 601 intersection.
- The design speed of KY 601 approaching KY 181 will be 45 mph.

Jim Simpson inquired about maintenance of traffic along the roadway during construction. Costs will increase over those presented if through traffic is maintained on the roadway during construction. Mr. Green stated that he does not see how traffic can be maintained throughout construction, considering the amount of excavation required along certain areas. It is also very unlikely that KY 181 could be built in stages. Mr. Dixon requested that HNTB discuss maintenance of traffic issues in the report.

The attendees were asked if they had a preferred typical section for the study. Future traffic is not an issue, and the accident rate and traffic counts are low at the interchange. After discussion, it was decided that a 3-lane section is preferred.

The draft statement of project goals was reviewed to determine if any changes are necessary. The following change will be made:

“Provide improved connectivity and a more attractive entrance to the City of Greenville from the Western Kentucky Parkway” will be changed to read “Provide improved connectivity to the City of Greenville from the Western Kentucky Parkway.”

Doug Smith presented the geotechnical concerns at the conclusion of the meeting. He stated that there are several coal mines in the area. There is also an airshaft under the east side of the roadway, just south of the KY 2533 intersection. State Maintenance crews have previously placed stone at this location because of roadway collapse.

KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County , Item No. 2-313.00

Appendix B - Local Officials and Stakeholders Meeting Minutes

**STATEWIDE CORRIDOR PLANNING SERVICES
KY 181
LOCAL OFFICIALS MEETING**

TO: Annette Coffey, P.E.
Director
KYTC Division of Planning

FROM: Larry D. Chaney, P.E.
Director of Transportation
HNTB-Louisville

DATE: November 7, 2001

SUBJECT: Statewide Corridor Planning
Muhlenberg County
KY 181 from WK Pkwy to KY 601
Item No. 2-313.00

A Local Officials meeting on the KY 181 Scoping Study was held on Wednesday, November 7, 2001, at the Muhlenberg County Career Advancement Center. The attendees had gathered to discuss this project, as well as the US 62 Intermediate Planning Study (see separate minutes). Those in attendance were:

Daniel Bowles	Muhlenberg County Fiscal Court
Phil O'Neal	Muhlenberg County Fiscal Court
Rodney Kirtley	Muhlenberg County Judge Executive
Harold Sumner	Greenville City Administration
Brent Yonts	State Representative
Barbara Williams	Muhlenberg Economic Enterprises
Nick Hall	District 2 Planning
Everett Green	District 2 Design
Doug Taylor	District 2 Environmental
Bruce Siria	Division of Planning
David Martin	Division of Planning
Jim Simpson	Division of Planning
Craig Morris	Pennyrile ADD
Karen Mohammadi	HNTB Corporation
Susan Rich	HNTB Corporation
Larry Chaney	HNTB Corporation

Bruce Siria opened the meeting by explaining that even though the KY 181 and US 62 projects were separate projects, the local officials were being given the opportunity to discuss both at this meeting. Mr. Siria then turned the meeting over to HNTB to explain the handouts.

Karen Mohammadi explained that the project termini were currently KY 189 on the south and the entrance to the National Guard Training Center on the north end. Initially, the limits of the project had been KY 601 and the Western Kentucky Parkway. The reason for this adjustment was to study the possibility of making KY 181 the through route to KY 189 rather than KY 601,

and to examine operation of the Parkway interchange. Ms. Mohammadi then explained the Highway Information System Data, traffic volumes and accident history. The existing Levels of Service (LOS) on KY 181 range from a LOS of C on the northern end to a LOS of E on the southern end. With the new development occurring in the area, the LOS is expected to worsen by year 2025. The accident critical rate factors (CRF) on the road were all less than 1.0, indicating that the number of accidents is less than or similar to what would be expected on a road of this type in Kentucky.

The last item on the agenda was discussion of the Study Purpose, Corridor Issues and Project Goals. Some additional issues raised were the increased traffic from the National Guard facility, the Industrial Park, the Job Corps, and the new subdivision on Henderson Lane. The National Guard over the last three years has added \$27 million in improvements to their facility, and the personnel stationed there has increased traffic in and around Greenville. The new subdivision still has about 25 lots on which to build. The Job Corps has about 400 students and staff.

Judge Executive Kirtley stated that a new road using the approximate route of the old coal haul road between KY 181 and KY 189 should be considered. The County has secured the property for this purpose. Harold Sumner stated that he felt an improvement to KY 2533 could take a considerable amount of traffic off of KY 181. He also felt that the intersection with KY 601 should be widened to provide better sight distance.

Both the Judge and Mr. Sumner felt that there would be no opposition to the project, nor would there be problems obtaining right of way due to the setback of the homes.

The meeting ended with Mr. Siria informing the attendees that the next step would be a public meeting on the project. The Judge suggested that the meeting be held concurrently with the US 62 meeting. He was informed that this would be considered. North Muhlenberg County High School was named as a potential site for the meeting.

**STATEWIDE CORRIDOR PLANNING SERVICES
KY 181
STAKEHOLDERS AND MEDIA MEETING**

TO: Annette Coffey, P.E.
Director
KYTC Division of Planning

FROM: Larry D. Chaney, P.E.
Director of Transportation
HNTB-Louisville

DATE: November 24, 2001

SUBJECT: Statewide Corridor Planning
Muhlenberg County
KY 181 from WK Pkwy. To KY 601
Item No. 2-313.00

A joint meeting for the Stakeholders and Media on the KY 181 Scoping Study was held on Wednesday, November 7, 2001, at the Muhlenberg County Career Advancement Center. The attendees had gathered to discuss this project as well as the US 62 Intermediate Planning Study (see separate minutes). Those in attendance were:

Jerry Southhard	Road Builders, Inc.
Jody Hawkins	Muhlenberg County Government
Deanna Nolfinger	Muhlenberg County Board of Education
Barbara Williams	Muhlenberg County Enterprises
John Stovall	Road Builders, Inc.
Tom Hensen	Leader-News
David Blackburn	Owensboro Messenger-Inquirer
Mark Stone	Times-Argus
Nick Hall	District 2 Planning
Everett Green	District 2 Design
Doug Taylor	District 2 Environmental
Bruce Siria	Division of Planning
David Martin	Division of Planning
Jim Simpson	Division of Planning
Craig Morris	Pennyrile ADD
Karen Mohammadi	HNTB Corporation
Susan Rich	HNTB Corporation
Larry Chaney	HNTB Corporation

Bruce Siria opened the meeting by explaining that even though the KY 181 and US 62 projects were separate projects, the local officials were being given the opportunity to discuss both at this meeting. Mr. Siria then turned the meeting over to HNTB to explain the handouts.

Karen Mohammadi explained that the project termini were currently KY 189 on the south and the entrance to the National Guard Training Center on the north end. Initially, the limits of the

project had been KY 601 and the Western Kentucky Parkway. The reason for this adjustment was to study the possibility of making KY 181 the through route to KY 189 rather than KY 601, Ms. Mohammadi then explained the Highway Information System Data, traffic volumes and accident history. The existing Levels of Service (LOS) on KY 181 range from a LOS of C on the northern end to a LOS of E on the southern end. With the new development occurring in the area, the LOS is expected to worsen by year 2025. The accident critical rate factors (CRF) on the road were all less than 1.0, indicating that the number of accidents is less than or similar to what would be expected on a road of this type in Kentucky. It was noted that one fatal accident had occurred just north of KY 2533 at the concrete culvert. Ms. Mohammadi stated that HNTB would get additional information about this accident.

The last item on the agenda was discussion of the Study Purpose, Corridor Issues and Project Goals. Ms. Mohammadi explained some changes to the Corridor Issues that came as a result of the earlier meeting with Local Officials. No additional changes were suggested by the attendees.

Jody Hawkins remarked that if KY 181 were improved, he would expect a large increase in traffic. He noted that the community needs an attractive road to Greenville. John Stovall stated that truck traffic between the quarry south of Greenville and the asphalt plant in Madisonville moves about 1000 tons daily. He added that this often results in accidents involving contract truckers. The trucks use this route at the same time as school buses, resulting in a very congested area. Mr. Siria noted that the Cabinet was aware of the interest in turning the old coal haul road that runs along the Parkway into a connector to KY 189. If this project were built, it could relieve some of that traffic.

The meeting ended with Mr. Siria informing the attendees that the next step would be a public meeting on the project. It was suggested that the meeting would take place at the North Muhlenburg Middle School, if available. Craig Morris asked the members of the media if they would be willing to print a copy of a survey form in the newspaper to increase public input on the project. All reporters indicated that this would be possible.

KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County , Item No. 2-313.00

Appendix C - Public Information Meeting Summaries

**STATEWIDE CORRIDOR PLANNING SERVICES
KY 181
PUBLIC MEETING**

TO: Annette Coffey, P.E.
Director
KYTC Division of Planning

FROM: Larry D. Chaney, P.E.
Director of Transportation
HNTB-Louisville

DATE: November 29, 2001

SUBJECT: Statewide Corridor Planning
Item No. 2-313.00
KY 181

A public information meeting was held Monday, November 26, 2001, at the Muhlenberg North High School concerning the study of possible improvements to KY 181 between KY 189 and the Wendell Ford Army National Guard Training Center. Approximately 17 people attended the meeting, and a list of those in attendance is attached.

The purpose of the meeting was to let the community know about the project, to identify and address community concerns and issues, to identify sensitive areas that should be considered, and to assist the Cabinet in creating a project that would benefit the community and gain its support.

The meeting began at 4:00 p.m. CST, and included a video/audio presentation that ran on a continuous loop in the rear area of the school cafeteria. A public meeting for the US 62 Intermediate Planning Study was held concurrently and separately in the other half of the cafeteria. The presentation discussed such items as the road building process, a typical project timeline, existing roadway conditions, and issues that the study will address. Funding has not been identified in the State's current Six-Year Highway Plan for any phases for the KY 181 project beyond the Planning Study.

Preliminary project goals for the KY 181 study were presented, and include the following:

- ◇ Provide adequate sight distance by improving vertical and horizontal alignments.
- ◇ Reduce the number of accidents along the route.
- ◇ Provide improved connectivity and enhance the entrance to the City of Greenville from the Western Kentucky Parkway.
- ◇ Provide adequate capacity to support Design Year 2025 traffic volume.
- ◇ Improve truck, school bus, and emergency vehicle access.

The meeting was held in an "open" format, and attendees were directed to an exhibit area where maps of the project area, accident data, traffic volumes, and levels of service were on display. Thirteen representatives from the Cabinet, the Pennyriple Area Development District, and HNTB were on hand to answer questions and to receive input from the attendees. They were encouraged to provide input by writing comments on flipcharts and by completing the questionnaires included in the handout.

KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County , Item No. 2-313.00

Appendix D - Resource Agency Responses

JAMES E. BICKFORD
SECRETARY



PAUL E. PATTON
GOVERNOR

COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

March 11, 2002

MAR 13 2002

Annette Coffey, P. E.
Director, Division of Planning
Kentucky Transportation Cabinet
Frankfort KY 40622

Re: Scoping Study on reconstruction of KY 181 from KY 189 to the Wendell H Ford Parkway (Western Kentucky Parkway) in Muhlenberg County, Kentucky. (SERO 2001-117)

Dear Ms. Coffey:

The Natural Resources and Environmental Protection Cabinet (NREPC) serves as the state clearinghouse for review of environmental documents generated pursuant to the National Environmental Policy Act (NEPA). Within the Cabinet, the Commissioner's Office in the Department for Environmental Protection coordinates the review for Kentucky State Agencies.

The Kentucky agencies listed on the attached sheet have been provided an opportunity to review the above referenced report. Responses were received from 7 (also marked on attached sheet) of the agencies that were forwarded a copy of the document. Attached are the comments from the Kentucky Divisions of Water and Conservation, and the Department of Fish and Wildlife Resources.

The Division of Waste Management expresses concern that this project has potential for either exposing or generating for disposal different forms of hazardous waste. The Division also notes that the Transportation Cabinet has some outstanding issues with hazardous waste generated at DOT facilities, etc. that need to be remediated. The Division, therefore, would like to be assured that all appropriate measures and activities would be used to observe, detect, and handle any hazardous waste that may be discovered or generated from this project.

If you should have any questions, please contact me at (502) 564-2150, ext. 112.

Sincerely,

Alex Barber
State Environmental Review officer

Enclosure

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DIVISION OF PLANNING
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**NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION
CABINET
ENVIRONMENTAL REVIEW**

Scoping Study on reconstruction of KY 181 from KY 189 to the Wendell H Ford Parkway
(Western Kentucky Parkway) in Muhlenberg County, Kentucky.

The following agencies were asked to review the above referenced project. Each agency that returned a response will appear below with their comments and the date the project response was returned.

**C denotes Comments
NC denotes No Comment
IR denotes Information Request
NR denotes No Response
NS denotes Not Sent for Review**

REVIEWING AGENCIES:

Division of Water _____	comments
Division of Waste Management _____	Comments
Division for Air Quality _____	
Department of Health Services _____	
Economic Development Cabinet _____	ns
Division of Forestry _____	
Department of Surface Mining Reclamation & Enforcement _____	nc
Department of Parks _____	nc
Department of Agriculture _____	
Nature Preserves Commission _____	nc
Kentucky Heritage Council _____	
Division of Conservation _____	comments
Department for Natural Resources _____	ns
Department of Fish & Wildlife Resources _____	comments
Transportation Cabinet _____	ns
Department for Military Affairs _____	nc



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
FRANKFORT OFFICE PARK
14 REILLY RD
FRANKFORT KY 40601

MEMORANDUM

TO: Alex Barber
State Environmental Review Officer
Department for Environmental Protection

FROM: Timothy Kuryla *TK*
EIS Coordinator
Division of Water

DATE: September 28, 2001

SUBJECT: SN, KY181, W Ky Pky to KY189, Greenville (Muhlenberg County), SERO
011228-117

IN GENERAL

The Division of Water has reviewed the Scoping Notice prepared by the Transportation Cabinet regarding the construction of KY181, Western Kentucky Parkway to KY189, Greenville (Muhlenberg County). The Division comments on matters the Division desires considered in the Environmental Assessment.

The applicant needs to consult, before construction can begin, with the U.S. Army Corps of Engineers to ascertain if a 33 USC § 1341 ("401") water quality certification by the Division of Water, or a 33 USC § 1344 ("404") dredge or fill material permit, or both, are required. Any impact to 200 linear feet or more of any stream or stream bank (below ordinary highwater) (as shown on U.S. Geological Survey 7.5 minute topographical maps for the project area) or one acre or more of any wetland, will require a "401" water quality certification. This includes excavations and impoundments. Thus, impacts to streams and wetlands must be considered in the EA.

Stream crossings except for Outstanding Resource Waters (ORWs), Cold water Aquatic Habitats (CAHs), and high quality waters are covered by a general certification. ORW, CAH, and high quality water stream crossings require an individual water quality certification and mitigation.

The Division of Water will require mitigation for stream loss (if more than 250 acres are involved above the construction impact) and for wetland loss (if more than 1 acre).



If a floodplain outside the right of way is involved, prior approval must be obtained from the Division of Water before construction may begin. The EA needs to address the impacts on flooding of each stream crossing, all fills in floodplains, and any channel relocation or alteration.

The submitted data are general. With specific data as are found in the Transportation Cabinet Land and Water Ecology Section "404" checklist, plus Corps of Engineers or Coast Guard Public Notice, the Division of Water may find a problem relating to floodplain construction and water quality. Therefore, the Division requests an opportunity to review, at the Preliminary Design stage, the land and water ecology checklist for the proposed project should it be funded. (If a Public Notice is prepared for the proposed project, the Division will review it).

The Division of Water notes the relevant portions of the Transportation Cabinet's Standard Specifications for Road and Bridge Construction are Sections 212 and 213. Section 212 governs the protection and stabilization of those areas exposed to erosion as the result of construction practices. Section 213 protects water quality by governing construction practices that can result in nonpoint source pollution.

The Division of Water finds that these guidelines adequately address possible highway construction impacts on aquatic habitat and propose appropriate mitigation measures that insure minimal sediment and other damage to water quality. These sections need to be cited in the EA.

The Division of Water recommends that the Transportation Cabinet use the Groundwater Sensitivity Regions of Kentucky map published by the Kentucky Geological Survey (KGS) to determine sensitive groundwater areas. These areas must be considered in the EA.

If sinkholes are modified for drainage, the Division of Water notes U.S. Environmental Protection Agency (EPA) requires an Underground Injection Control Permit (40 CFR §§ 144.11, 144.25, 146.51). The activity is classified as a Class V well (40 CFR § 144.6).

The Division of Water has data and maps regarding wellhead protection areas located throughout the Commonwealth. The EA and highway design must take into account these areas.

Owners of onsite wastewater disposal systems must have Groundwater Protection Plans (GPP). Purchasing right of way lands on which these systems are located means assuming the obligations imposed by 401 KAR 5:037.

Deep road cuts can act as "French" drains. These cuts could drain aquifers that are used as domestic and public water supply sources. Highway design needs to take into account the location of these aquifers. The Division of Water maintains data on wells drilled since 1985 and of all wells it inspects. The EA needs to consider the effect on domestic and public water supplies.



COMMONWEALTH OF KENTUCKY
NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION CABINET
DEPARTMENT FOR NATURAL RESOURCES
DIVISION OF CONSERVATION
663 TETON TRAIL
FRANKFORT, KENTUCKY 40601

MEMORANDUM

TO: Alex Barber
Department of Environmental Protection

FROM: Mark Davis *mo*
Division of Conservation

DATE: January 28, 2002

SUBJECT: Environmental Review of Project #SERO2001-117

As requested, the Division of Conservation has reviewed the scoping study on reconstruction of KY 181 from KY 189 to the Wendell H. Ford Parkway (Western Kentucky Parkway) in Muhlenburg County, Kentucky.

There are no agricultural districts established within or adjacent to the project area. Therefore, impacts to land enrolled in the Agricultural District Program will not have to be mitigated by the Department of Transportation.

We would, however, like to see the issue of loss of Prime Farmland and Farmland of Statewide Importance addressed in the planning study. There are two publications that could be utilized to identify these farmland designations: *The Soil Survey of McLean and Muhlenberg Counties* (NRCS 1980), and *Important Farmland Soils of Kentucky* (NRCS 1985). Both publications are available through this office.

One other concern we would like to comment on is that of controlling erosion and sedimentation during and after earth-disturbing activities once this project begins. We strongly recommend best management practices (BMPs) be utilized to prevent nonpoint source water pollution. The manual, *Best Management Practices for Construction Activities*, contains information on BMPs appropriate for this project and is available through the Muhlenberg County Conservation District, the Division of Water, or this office.

We appreciate the opportunity to comment on this project. If you have any questions please contact this office anytime.

MJD



FISH & WILDLIFE COMMISSION

Mike Boatwright, Paducah
Tom Baker, Bowling Green, Chairman
Allen K. Gailor, Louisville
Charles E. Bale, Hodgenville
Dr. James R. Rich, Taylor Mill
Ben Frank Brown, Richmond
Doug Hensley, Hazard
Dr. Robert C. Webb, Grayson
David H. Godby, Somerset



**COMMONWEALTH OF KENTUCKY
DEPARTMENT OF FISH AND WILDLIFE RESOURCES
C. THOMAS BENNETT, COMMISSIONER**

January 8, 2002

Alex Barber
Commissioner's Office
Department for Environmental Protection
14 Reilly Road
Frankfort, KY 40601

RE: Scoping Study on Reconstruction of KY 181
from KY 189 to the Wendell H. Ford Parkway,
Muhlenberg County, Kentucky

Dear Mr. Barber:

The Kentucky Department of Fish and Wildlife Resources (KDFWR) has received your request for the above-referenced information. The Kentucky Fish and Wildlife Information System indicates that no federally threatened or endangered species are known to occur in the Greenville 7.5 minute USGS quadrangle(s). Please be aware that our database system is a dynamic one that only represents our current knowledge of the various species distributions.

KDFWR has determined that potential negative impacts to the aquatic resources can occur in the project area and offers the following recommendations:

- 1) development in or near streams only during low flow periods to minimize disturbances;
- 2) proper placement of erosion control structures below disturbed areas to minimize entry of silt to stream, and;
- 3) replanting of disturbed areas after construction, including stream banks and right-of-ways, with native vegetation for soil stabilization and enhancement of fish and wildlife populations.

Additionally, if the applicant is going to relocate/realign portions of any streams, KDFWR request the stream channel be put back to original stream profile with placement of instream habitat such as riffles, runs, and pools, etc. The recontoured stream banks should have a well defined riparian area, including herbaceous species, shrubs and trees. The plantings should consist of native vegetation indigenous to the area and be a minimum of 100 feet in width on each side of the channel.



Arnold L. Mitchell Bldg. #1 Game Farm Road Frankfort, Ky 40601
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Page Two
Alex Barber
January 8, 2002

I hope this information will be helpful to you. Should you require additional information, please contact me at (502) 564-7109, ext 367.

Sincerely,

A handwritten signature in black ink that reads "Marla T. Barbour". The signature is written in a cursive style with a long horizontal line extending to the right.

Marla T. Barbour
Fisheries Biologist III

cc: Environmental Section File

A-2



Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

James C. Codell, III
Secretary of Transportation

Paul E. Patton
Governor

Clifford C. Linkes, P.E.
Deputy Secretary

MEMORANDUM

MEMO TO: Tony Vinegar, Environmental Project Manager
Division of Environmental Analysis

FROM: James Lee Hixon, Archaeologist Coordinator
Division of Environmental Analysis *JLH*

DATE: January 8, 2002

SUBJECT: Kentucky 181 Scoping Study
Muhlenburg County, Kentucky
Item Number 2-313.00

The subject project has received an archaeological overview based on the Kentucky Archaeological Data Base. The proposed project, will potentially impact two known sites within the corridor. In addition, there are over 30 other known sites within 5 kilometers of the proposed project area. This area has an extremely high potential for archaeology sites. Please be advised that even though this is a State Funded Project, a full phase I archaeological survey will be required for the final alternate since the project will require Federal Permits and impact potential known sites. If you have any other questions, please advise.

c. Annette Coffey, P.E.



17 Geotech
Wilson

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DIVISION OF PLANNING

MEMORANDUM

P-2-2002

JAN 15 9 43 AM '02

TO: Annette Coffey, P.E.
Director
Division of Planning

FROM: William Broyles, P.E.
Geotechnical Engineering
Branch Manager
Division of Materials

BY: R.T. Wilson, P.G. *R.T. Wilson*
Geotechnical Branch

DATE: January 3, 2002

SUBJECT: Muhlenberg County
Mars No. 7002901D
KY 181 From the Western KY Parkway to KY 601 North of Greenville
Intermediate Planning Study
Item No. 2-313.00

At your request, personnel from the branch have completed a preliminary office review of the subject project.

Pennsylvanian age rocks of the Carbondale Formation consist of an alternating series of sandstone, shales, and coals. Sandstones are generally characterized as brown in color, fine to medium grain size, in beds from 1 inch to greater than 30 feet in thickness and friable. Friable sandstones are not suitable for rock roadbed and lift heights of 1 foot for embankment construction is recommended for stable fills. Non-durable shale or clay shales are present throughout the project. Subgrade constructed from non-durable shales can be improved using type III filter fabric and aggregate in urban areas and cement stabilization in rural areas.

The Kentucky number 9 coal seam is a commercial seam present in this corridor near the Nebo community. A review of available mine maps indicates the proposed corridor has strip-mines and one abandon underground mine west of Nebo. The road alignment should avoid the underground mine if possible. If the underground mine is unavoidable stabilization of the mine voids are recommended. A mineral evaluation study will be required after a preferred alignment is selected.

If active underground coal mines are present at the time of construction, special safety regulations will be necessary for construction activities when crossing mains or active sections of coal mines. These can include temporary suspension of mine production and evacuation of personnel from the mine. The mining companies may request compensation for reduced production during roadway construction blasting activities.

The proposed road alignments are crossing both reclaimed and unreclaimed strip mines. Unreclaimed strip mines generally predate 1977 and foundation materials have consolidated making settlement problems less severe. Strip mines completed after 1977 are generally reclaimed and contain unconsolidated materials, making settlement in the foundation of fills very likely. In order to minimize fill settlement removal of the top 5 feet of strip mine waste and recompaction in 1.0-foot lifts is recommended. Dynamic compaction may be considered as another alternate. Cut slopes in strip mine wastes will generally be 3:1 extending to the disturbed limit.

Embankment benches will be necessary in sidehill conditions. Limestone or sandstone (2.0' minimum) should be placed on the benches for drainage.

Regional dip is from the south to the north, making saturated soil condition possible on the south side of hollows. Wet embankment foundations can be corrected using type III filter fabric and 2-3 feet of aggregate.

This project is in a classified Seismic Risk Zone 3, which is defined as an area of high damage due to earthquake activity.

If there are questions please advise.

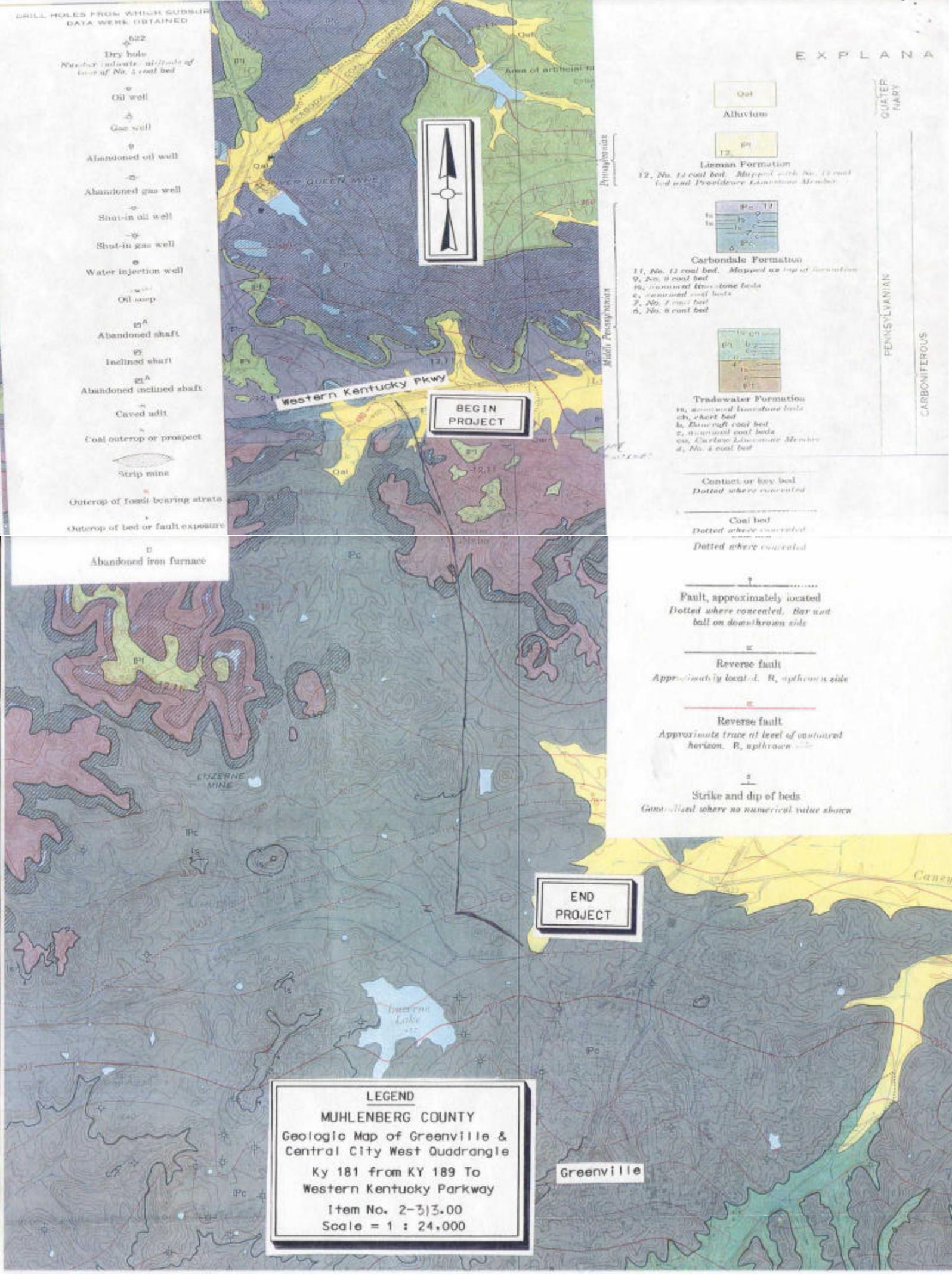
DRILL HOLES FROM WHICH SUBSURFACE DATA WERE OBTAINED

- 622
Dry hole
Number indicates mile/kilometer of base of No. 1 coal bed
- Oil well
- Gas well
- Abandoned oil well
- Abandoned gas well
- Shut-in oil well
- Shut-in gas well
- Water injection well
- Oil pump
- Abandoned shaft
- Inclined shaft
- Abandoned inclined shaft
- Caved adit
- Coal outcrop or prospect
- Strip mine
- Outcrop of fossil-bearing strata
- Outcrop of bed or fault exposure
- Abandoned iron furnace

EXPLANATION

- Qal
Alluvium
- PI
Lisman Formation
12, No. 12 coal bed. Mapped with No. 11 coal bed and Providence limestone Member
- IPc
Carbondale Formation
11, No. 11 coal bed. Mapped as top of formation
9, No. 9 coal bed
10, massive limestone beds
8, concretion coal beds
7, No. 7 coal bed
6, No. 6 coal bed
- IPt
Tradewater Formation
10, massive limestone beds
ch, chert bed
10, lower coal bed
7, massive coal beds
6a, Clarke Limestone Member
4, No. 4 coal bed
- Contact or key bed
Dotted where concealed
- Coal bed
Dotted where concealed
Dotted where concealed
- Fault, approximately located
Dotted where concealed. Bar and ball on downthrown side
- Reverse fault
Approximately located. R, upthrown side
- Reverse fault
Approximate trace at level of contour interval. R, upthrown
- Strike and dip of beds
Generalized where no numerical value shown

LEGEND
MUHLENBERG COUNTY
 Geologic Map of Greenville & Central City West Quadrangle
 Ky 181 from KY 189 To
 Western Kentucky Parkway
 Item No. 2-313.00
 Scale = 1 : 24,000





RECEIVED
TRANSPORTATION CABINET
DIVISION OF PLANNING

JAN 24 9:16 AM '02

James C. Codell, III
Secretary of Transportation

Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

Paul E. Patton
Governor

Clifford C. Linkes, P.E.
Deputy Secretary

MEMORANDUM

TO: Annette Coffey, Director
Division of Planning

FROM: Michael L. Hill, Director *MLH*
Division of Multimodal Programs

DATE: January 23, 2002

SUBJECT: Item No. 2-313.00
KY 181 Scoping Study
Muhlenberg County

Thank you for the opportunity to comment on this Muhlenberg County project.

The coordination and connectivity of bicycle and pedestrian facilities is important in the early planning and design stages of projects. Design Guidance from the United States Department of Transportation in February, 2000, states "bicycling and walking facilities will be incorporated into all transportation projects unless exceptional circumstances exist."

Sidewalks or a shared use path should be considered in the reconstruction of KY 181 between the Western Kentucky Parkway and KY 189 in Greenville. The section of KY 181 that is of particular concern extends from milepoint 12.767 to milepoint 12.479; from where KY 181 enters the city limits of Greenville to the intersection with KY 189. It is important to provide connectivity of pedestrian facilities, especially within city limits.

Please contact Paula Nye of this Division, at (502) 564-7686, for information or questions about bicycle and pedestrian concerns.

We look forward to working with your Division to facilitate your study efforts in our SUA and MPO areas, and by increasing awareness of bicycle and pedestrian issues.

MLH/LJS/PEN/AJT





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TRANSPORTATION CABINET
DIVISION OF PLANNING

FEB 6 9 53 AM '02

Commonwealth of Kentucky
Transportation Cabinet
Frankfort, Kentucky 40622

Paul E. Patton
Governor

James C. Codell, III
Secretary of Transportation

Clifford C. Linkes, P.E.
Deputy Secretary

MEMORANDUM

TO: Annette Coffey, P.E.
Director
Division of Planning

FROM: Edward Sue Perkins, P.E. *Sue*
Branch Manager
Permits Branch

DATE: February 5, 2002

RE: Muhlenburg County Study Team of KY 181 from KY 189 to Western KY Parkway

The Permits Branch has reviewed the data provided for subject study site and wish to offer the following.

1. We urge the Cabinet to classify this project and all new projects as partially controlled access facilities.
2. Assuming the project is partial control access, we encourage all possible access points be set on the plans in accordance with 603 KAR 5:120, even if they are not to be constructed at that time.
3. When buying R/W for this and all reconstruction routes, assuming the access control is partial control, new deed for all adjoining property owners need to be executed to identify the access control even if no new R/W is acquired,
4. In addition, we would like to make every effort possible to have the design speed to be the same as anticipated posted speed when the project is complete.
5. We would like to see access control fence installed with the project.
6. If the proposed roadway is to be on the N. H. S., early notification of the final line and grade is needed. This enables us to monitor outdoor advertising devices prior to road construction being completed.
7. Please notify this office if the proposed roadway is to be placed on the National Highway System. This information is needed to assist this office in regulating the installation of any outdoor advertising device.

Thank you for the opportunity to verbalize our concerns.

ESP/elc





United States Department of the Interior

FISH AND WILDLIFE SERVICE

446 Neal Street
Cookeville, TN 38501

January 7, 2002

RECEIVED
TRANSPORTATION CABINET
DIVISION OF PLANNING
JAN 10 10 38 AM '02

Ms. Annette Coffey
Director, Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, Kentucky 40622

Re: FWS# 02-0635

Dear Ms. Coffey:

Thank you for your letter and enclosures of December 12, 2001, concerning the widening and reconstruction of KY 181, between KY 189 and the Western Kentucky Parkway, in Muhlenberg County, Kentucky. Fish and Wildlife Service personnel have reviewed the information submitted and we provide the following comments in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et seq.) and the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.).

We are concerned that highway projects accelerate erosion and sedimentation in streams, resulting in adverse effects to the aquatic environment. The use of heavy equipment to move earth and existing vegetation disrupts natural drainage patterns and exposes large areas of disturbed soil to erosion. Lack of suitable sediment and erosion controls and/or infrequent maintenance of sediment control structures can lead to excessive sedimentation and impact fish habitat, degrade water quality, and increase flooding.

Prevention of excessive sedimentation can occur only through application of Best Management Practices during daily construction activities. Rigid application of the Kentucky Transportation Cabinet's construction erosion control standards can preclude most sedimentation problems; however, in some cases additional measures will need to be taken by on-site inspectors and construction representatives.

Because wetlands and streams may be present along the project corridor, U.S. Army Corps of Engineers permits could be required. Since permit applications could more thoroughly reveal the extent of construction activities affecting aquatic resources, we may provide additional comments during the Section 404 review process should the project necessitate Corps' permits. However, we would likely have no objection to the issuance of permits if any necessary stream channel work is held to a minimum; if wetland impacts are mitigated; and if Best Management Practices are utilized

and enforced, effectively controlling erosion, sedimentation, and other potential hazards. The following conditions are specifically recommended:

1. Erosion and sediment control measures, including but not limited to the following, should be implemented on all vegetatively denuded areas:
 - a. Preventive planning: A well-developed erosion control plan which entails a preliminary investigation, detailed contract plans and specifications, and final erosion and sediment control contingency measures should be formulated and made a part of the contract.
 - b. Diversion channels: Channels should be constructed around the construction site to keep the work site free of flow-through water, and should be lined with plastic or plastic filter fabric to minimize soil erosion.
 - c. Silt barriers: Appropriate use should be made of silt fences, hay bale and brush barriers, and silt basins in areas susceptible to erosion. These structures should be regularly maintained (sediment removal) to prevent undermining.
 - d. Temporary seeding and mulching: All cuts and fill slopes, including those in waste sites and borrow pits, should be seeded and mulched as soon as possible.
 - e. Limitation of instream activities: Instream activities, including temporary fills and equipment crossings, should be limited to those absolutely necessary.
2. Concrete box culverts or other drainage structures should be placed in a manner that prevents any impediment to low flows or to movement of indigenous aquatic species (e.g., native fish) and should be appropriately sized for the drainage area. We recommend that drainage structures be designed to accommodate bankfull discharge and that overflow or "equalizer" pipes be placed in the floodplain to accommodate flood events. We recommend that larger streams be crossed using bridges instead of pipes and culverts.
3. Channel excavations required for pier placement should be restricted to the minimum necessary for that purpose. Overflow channel excavations should be confined to one side of the channel, leaving the opposite bank and its riparian vegetation intact.
4. All fill should be stabilized immediately upon placement.
5. Streambanks should be stabilized with riprap or other accepted bioengineering technique(s).
6. Existing transportation corridors should be used in lieu of temporary crossings where possible.

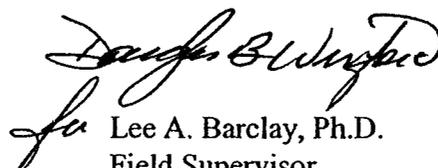
Efficient management practices can minimize adverse impacts associated with construction. It is important that these and other erosion and sedimentation control measures be monitored and stringently enforced. This will aid in preserving the quality of the natural environment and in minimizing impacts to aquatic resources.

Endangered species collection records available to the Service do not indicate that federally listed or proposed endangered or threatened species occur within the impact area of the project. We note, however, that collection records available to the Service may not be all-inclusive. Our data base is a compilation of collection records made available by various individuals and resource agencies. This information is seldom based on comprehensive surveys of all potential habitat and thus does not necessarily provide conclusive evidence that protected species are present or absent at a specific locality. However, based on the best information available at this time, we believe that the requirements of Section 7 of the Endangered Species Act of 1973, as amended, are fulfilled. Obligations under Section 7 of the Act must be reconsidered if (1) new information reveals impacts of the proposed action that may affect listed species or critical habitat in a manner not previously considered, (2) the proposed action is subsequently modified to include activities which were not considered during this consultation, or (3) new species are listed or critical habitat designated that might be affected by the proposed action.

A federal "Species of Management Concern," the copperbelly water snake (*Nerodia erythrogaster neglecta*), is known from Muhlenberg County. This rare subspecies of the redbelly water snake inhabits permanently or semi-permanently inundated wetlands and also uses adjacent floodplain and upland areas. This subspecies was proposed for listing as threatened under the Endangered Species Act. However, listing of the copperbelly water snake has been avoided in Kentucky through implementation of the Copperbelly Water Snake Conservation Plan. The strategy involves maintenance of existing wetlands and wooded corridors that link these important habitats. With cooperation between various development and natural resource interests, future listing of the copperbelly water snake as threatened hopefully will be precluded. We would appreciate your cooperation in implementing conservation measures that benefit this rare subspecies, as well as your assistance by avoiding impact to this rare subspecies and its habitat.

Thank you for giving us the opportunity to comment on this action. If you have any questions, please contact Rob Tawes of my staff at 931/528-6481, ext. 213.

Sincerely,


Lee A. Barclay, Ph.D.
Field Supervisor

xc: Wayne Davis, KDFWR, Frankfort

RECEIVED
TRANSPORTATION CABINET
DIVISION OF PLANNING



JAN 2 2002

JAN 16 9 37 AM '02

PAUL E. PATTON
GOVERNOR

CABINET FOR WORKFORCE DEVELOPMENT
OFFICE OF THE SECRETARY
CAPITAL PLAZA TOWER, 2nd FLOOR
500 MERO STREET
FRANKFORT, KENTUCKY 40601
PHONE (502) 564-6606 FAX (502) 564-7967

ALLEN D. ROSE
SECRETARY

January 14, 2002

Ms. Annette Coffey, P.E.
Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, Kentucky 40601

Dear Ms. Coffey:

The Cabinet for Workforce Development appreciates the opportunity to comment on the possible reconstruction of US 62 from KY 189 to KY 181 in Greenville; reconstruction of KY 181 from KY 189 to the Western Kentucky Parkway in Muhlenberg County; and reconstruction of KY 30 from US 421 near Tyner to KY 11 in Booneville. At this time, the proposed projects do not affect the Cabinet and its agencies.

Again, thank you for the opportunity to comment.

Sincerely,

A handwritten signature in cursive script that reads "Allen D. Rose".

Allen D. Rose
Secretary

ADR/SGS



EQUAL EDUCATION AND EMPLOYMENT OPPORTUNITIES M/F/D



U.S. Department
of Transportation
Federal Aviation
Administration

RECEIVED
TRANSPORTATION CABINET
DIVISION OF PLANNING

JAN 15 9 45 AM '02

Airports District Office, FAA
3385 Airways Blvd., Suite 302
Memphis, Tennessee 38116-3841
(901) 544-3495 FAX: (901) 544-4243
Email: 9.aso-mem-ado@faa.gov

January 8, 2002

Ms. Annette Coffey, P. E., Director
Division of Planning
Kentucky Transportation Cabinet
125 Holmes Street
Frankfort, KY 40622

JAN 2 2002

Dear Ms. Coffey:

This is in response to your letter to Ms. LaVerne Reid of this office dated December 12, 2001 requesting information on any impacts to Federal Aviation Administration (FAA) facilities or public use airports resulting from the reconstruction of KY 181 from KY 189 to the Wendell H. Ford Parkway in Muhlenberg, KY.

There are no public use airports in the immediate vicinity of this proposed project. As long as construction activities do not exceed 200 feet in height above ground level, there will be no impacts on FAA programs and no Notice of Proposed Construction will be required.

Thank you for the opportunity to review the proposal.

Sincerely,

Michael L. Thompson
Program Manager

KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County , Item No. 2-313.00

Appendix E - Environmental Justice

ENVIRONMENTAL JUSTICE REPORT FOR KY 181 – MUHLENBERG COUNTY

INTRODUCTION

This report presents a review of the community and environmental conditions existing in and around the proposed KY 181 improvements in Muhlenberg County, Kentucky. The data in this report was collected from a number of sources, including the U.S. Census Bureau, local elected officials, local stakeholders, and local residents. The information and data in this report is intended to aid the Kentucky Transportation Cabinet (KYTC) and others in engaging all groups potentially impacted by this project.

According to the U.S. Environmental Protection Agency (EPA), “the goal of environmental justice is to ensure that all people, regardless of race, national origin or income, are protected from disproportionate impacts of environmental hazards.” Environmental justice communities include minorities and/or low-income groups.

METHODOLOGY

Data was collected by reviewing the Census Data, conducting interviews, and conducting field reviews. All data was then compiled and analyzed to develop this report. The population and race Census Data used in this report were taken from the following sources:

- Profiles of General Demographic Characteristics 2000 Census of Population and Housing Kentucky
- Census 2000 Population by Race and Hispanic Origin for Census Blocks
- U.S. Census State and County Quick Facts

For the purposes of income analysis, 1990 data was used since 2000 data was unavailable. Interviews and field surveys did not reveal any minority or low-income groups in the project area. That information was substantiated by the findings from the Census data, and is discussed in the Census Data section.

INITIAL FINDINGS

Businesses/Organizations

There is a Job Corps Center located in the KY 181 study area. North Muhlenberg County High School is also located within the study area, however, there were no specific complaints received regarding bus/student travel during peak travel times. There are also two (2) churches and a National Guard Center located within the area. No complaints were received regarding traffic problems in those areas, nor are any of these facilities expected to be negatively impacted by potential roadway improvements along KY 181.

Residences

Approximately 70 residences are located in the corridor. Through careful location selection and use of retaining walls, taking many of these residences for construction might be avoided.

Communities

No other communities, towns, neighborhoods and associated facilities, or community centers are within the project area.

CENSUS DATA

In reviewing U.S. Census Data, there were several items of note concerning Muhlenberg County. Muhlenberg County is divided into two Census Tracts, and the project area is composed of 25 Census Blocks. The KY 181 improvement project is located almost entirely in one tract (9604). One block is located in Census Tract 9605. See the **Figure 1**, for location of these tracts.

The data on minorities, poverty rates, and age are shown in **Tables 1, 2, and 3**, respectively. Census data on minorities was available at the Census Tract and Census Block levels. However, Census data for poverty rates and age were only available at the county level. Key characteristics from the 1990 Census data for Muhlenberg County are as follows:

Population by Race

- Muhlenberg County is predominantly a white community (over 94%). There are very few members of other races and no concentration of members of any race, including Hispanics, in the study area.
- The percentages of all other minority groups in the county were below the Commonwealth percentages except for Hispanics, which were about 70% higher than the state average. However, no person of Hispanic origin lives in the project corridor.

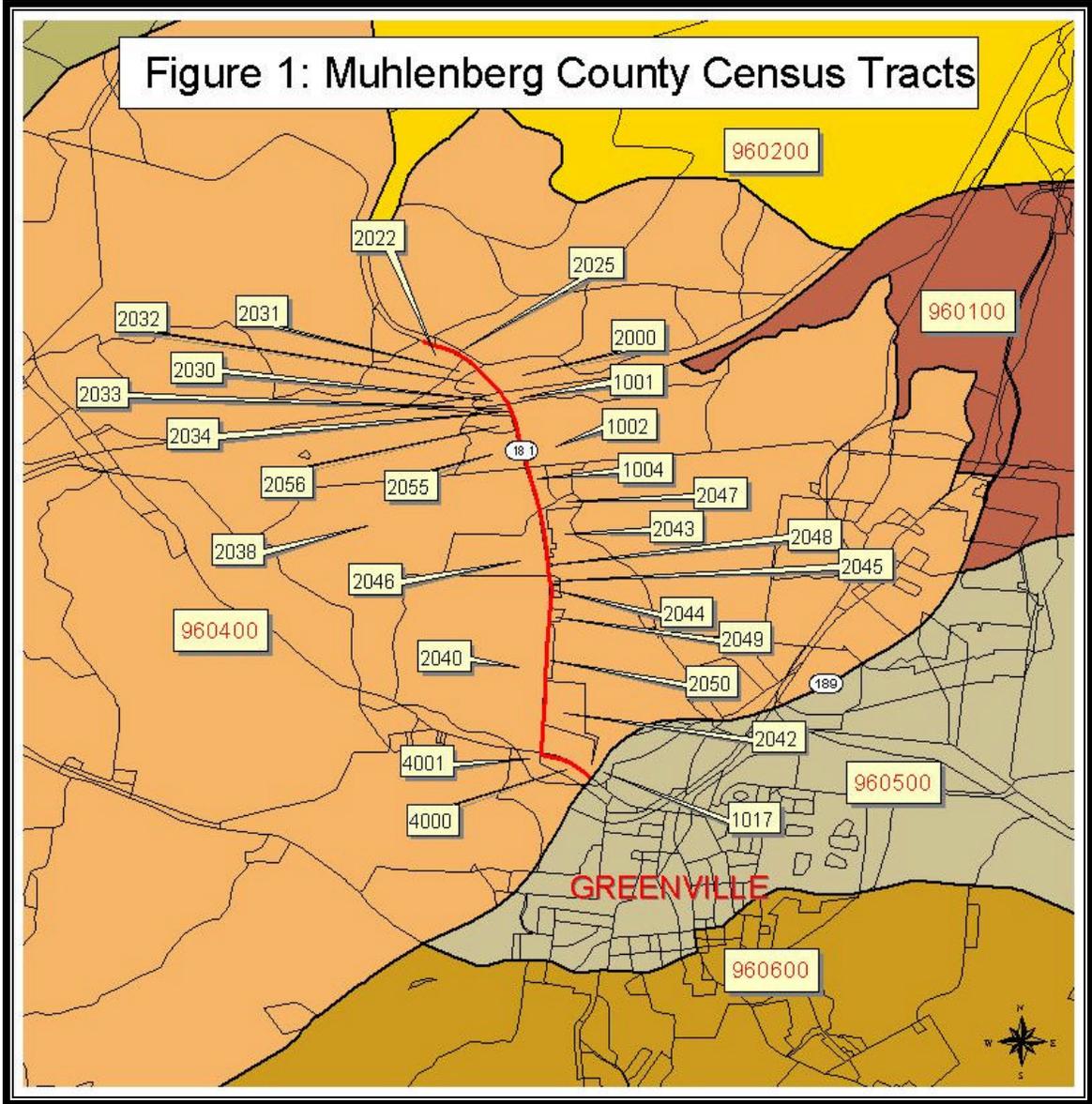
Poverty Rate and Age Groups

- Poverty rates for the county were 0.72% above those for the Commonwealth.
- Children in poverty were 0.23% higher for the county than the Commonwealth and female headed households in poverty were 5.72% lower than the Commonwealth.
- Muhlenberg County has a 3% greater percentage of population of persons over 65 years of age than the Commonwealth, but persons over 65 in poverty were 2.85% lower than those for the Commonwealth.
- Muhlenberg County is a rural county with the major employment centers near the corridor being the National Guard and the mining operations north of the project area.

CONCLUSION

No concentrations of minority or low-income groups are present within the project area. However, it is recommended that the construction on KY 181 consider the use of retaining walls where possible to avoid the relocation of residents.

Figure 1: Muhlenberg County Census Tracts



MUHLENBERG COUNTY

YEAR 2000 POPULATION BY RACE COMPARISON CHART

TABLE 1	Total Population	White Alone	% of Population	Black or African-American only	% of Population	American Indian or Alaska Native Alone	% of Population	Asian Alone	% of Population	Native Hawaiian & Other Pacific Islander Alone	% of Population	Hispanic or Latino Alone	% of Population	Some Other Race(s)	% of Population
TRACT 9604, BLOCK 1001	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 1002	19	19	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 1004	16	16	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2000	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2022	63	63	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2025	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2030	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2031	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2032	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2033	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2034	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2038	81	80	98.77%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	1	1.23%
TRACT 9604, BLOCK 2040	115	112	97.39%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	3	2.61%
TRACT 9604, BLOCK 2042	26	26	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2043	55	49	89.09%	0	0.00%	1	1.82%	0	0.00%	0	0.00%	0	0.00%	5	9.09%
TRACT 9604, BLOCK 2044	9	9	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2045	2	2	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2046	46	46	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2047	13	13	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2048	2	2	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2049	3	3	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 2050	11	11	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 4000	10	10	100.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9604, BLOCK 4001	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
TRACT 9605, BLOCK 1017	0	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Muhlenberg County	31,839	29,989	94.19%	1,480	4.65%	40	0.13%	40	0.13%	1	0.00%	232	0.73%	57	0.18%
KENTUCKY	4,041,769	3,640,889	90.08%	295,994	7.32%	8,616	0.21%	29,744	0.74%	1,460	0.04%	22,623	0.56%	22,623	0.56%

YEAR 1990 POVERTY RATE COMPARISON CHART

TABLE 2	Total Persons in Poverty*	Total Persons in Poverty**	Children 0-17	Children 0-17 in Poverty	% of Children 0-17 in Poverty	Female Headed Households	Female Headed Households in Poverty	% of Female Headed Households in Poverty	Persons 65+	Persons 65+ in Poverty	% of Persons 65+ in Poverty
Muhlenberg County	5,323	16.72%	7,790	1,923	24.69%	753	406	53.92%	4,431	787	17.76%
KENTUCKY	681,827	16.00%	938,325	229,530	24.46%	86,390	51,519	59.64%	441,885	91,091	20.61%

* 1989 numbers

** 1997 model based estimate

YEAR 2000 AGE GROUP COMPARISON CHART

TABLE 3	Population	0-18	% of Population	19-64	% of Population	65-older	% of Population
Muhlenberg County	31,839	8,066	25.33%	18,847	59.19%	4,926	15.47%
KENTUCKY	4,041,769	994,818	24.60%	2,542,158	62.90%	504,793	12.50%

KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County , Item No. 2-313.00

Appendix F - Summary of the Geotechnical Findings

GEOTECHNICAL OVERVIEW

STATEWIDE CORRIDOR PLANNING

MUHLENBURG COUNTY

KENTUCKY 181
SCOPING STUDY

ITEM NO. 2-313.00

FOR
HNTB CORPORATION
DECEMBER 2001

INVESTIGATION BY
H.C. NUTTING COMPANY
W.O. # 71287.008

INTRODUCTION

The H.C. Nutting Company is pleased to team with HNTB to provide the Geotechnical Overview on this KY 181 Highway widening study for the Kentucky Transportation Cabinet. Henry Mathis, P.E., Senior Consultant, Doug Smith, P.G., Senior Geologist, and Sarah Johnson, Engineering Geologist, and others in the H.C. Nutting Company assisted in the preparation of this overview. This study originally was to begin at the junction of KY. 181 and KY 601, just northwest of Greenville and end approximately at the Western Kentucky Parkway (WKP). The study was extended approximately one half mile north of the Western Kentucky Parkway to the entrance of the Wendell H. Ford National Guard Training Center. Stationing for the proposed study was not available; therefore, the road log is based on odometer readings beginning at the junction of KY 181 and KY 601.

The report format and outline follows the requirements described in the Kentucky Transportation Cabinet's Geotechnical Manual, section GT-801, page 1. The primary focus of this study is to identify geological conditions that could adversely affect the design and construction of this project. Where adverse geological conditions are noted, site-specific recommendations for construction and general recommendations for cut and embankment slope design is provided.

In preparation of this report, Doug Smith and Sarah Johnson reviewed the alignment in the field on December 6, 2001. Information from the geotechnical investigation for the KY 181 and WKP interchange (Report # R-7-83) prepared by the KYTC Geotechnical Branch, along with the Greenville and Central City West U.S.G.S. 7.5 minute geologic and topographic quadrangles, and mine location maps, copies of which were provided by the Kentucky Department of Mines and Minerals, were used. Several local residents, Doug Scaggs, Thurman Wright, and B. A. Mercer, who had worked in the coalmines, provided information regarding mining activities in the immediate vicinity of the project. One of the primary concerns of this study was to determine if and where mine subsidence had occurred. Discussions were held with the KYTC District 2 Maintenance Engineer, Jeff Skaggs, about present and past maintenance problems. Subsurface investigations, laboratory and engineering analyses were not part of this study.

This Geotechnical Overview includes a description of the geology, recommendations for cut and embankment slope design, general geotechnical recommendations, and Geological Quadrangle Map in the back of this overview.

GEOLOGY

KY 181 is located in the Western Coal Field Physiographic Region of Kentucky and strip mining and underground mining activities have significantly affected the land in the vicinity of the alignment. Coal has been mined in the area since about 1890. While most of the larger mines have been abandoned since 1969, there are still some active strip mines in the area.

The Middle Pennsylvanian-aged Carbondale Formation underlies the bulk of the KY 181 alignment. On the Greenville and Central City West geologic quadrangles, the formation is mapped as two units, with the base of the No. 9 coal bed forming the boundary between the two units. The lower unit of the Carbondale Formation, mapped in gray on the geologic map, consists of sandstone, siltstone, shale, coal and underclay. According to the Greenville Quadrangle, the sandstones are light to medium gray, fine to medium grained, and friable where weathered. The sandstone occurs as lenses or tongues near the top of the unit. The siltstone is light to dark gray, and is locally sandy and interbedded with sandstone. The clay shale is gray to reddish brown. The shale is dark gray to black, and is locally carbonaceous. The limestone is light gray to yellow brown, and fine to coarsely crystalline.

The upper unit of the Carbondale Formation, mapped in a rose color on the geologic map, is bounded by the No. 9 coal bed at its base and by the No. 11 coal bed at its top. In addition to the coal, the unit consists of sandstone, siltstone, shale and underclay. The sandstone is light to medium gray, weathering brown to yellow brown. It is fine to medium grained, locally cross-bedded, and locally weathers to a friable sandstone. There is a sandstone dike as much as 2 ft. thick, which is light yellow brown, fine grained, and micaceous, which extends downward to approximately 10 ft. above the No. 9 coal bed. The siltstone is light to dark gray with limonite nodules up to 1 ft. in diameter. The shale is light gray to black, and interbedded with sandstone. The shale above No. 9 coal bed is dark gray to black, carbonaceous, and weathers to platy fragments. The No. 9 coal bed is a high quality, persistent bed about 5 ft. thick. The underclay is light to dark gray.

The overburden soils along the alignment consist primarily of mine spoils up to 40 feet thick, according to a geotechnical report performed for the ramps for the Western Kentucky Parkway. It is expected that residual and colluvial soils, on the order to 5 to 10 ft. thick may be found in upland areas that have not been strip-mined. In addition, quaternary alluvial deposits consisting of cobbles, gravel, sand, silt and clay may be expected in the vicinity of Little Cypress Creek.

This region of Kentucky has a regional dip to the north, generally on the order of 1 ft. per 70 to 100 ft. in the study area. The elevation of the base of the No. 9 coal bed is mapped on the geologic quadrangle. Its elevation ranges from approximately 560 ft at milepost 0.5, and at approximate elevation 480 at milepost 2.0.

In the vicinity of KY 181, the No. 9 and No. 11 coal seams were both strip mined and underground mined. The approximate boundaries of the strip mines have been mapped on the geologic quadrangles. In addition, there are at least three underground mines near the road. The Kentucky Department of Mines and Minerals provided this underground data at the request of the KYTC; the approximate boundaries of these mines are included on the accompanying map.

A relatively small mine is located at approximate milepost 1.6 on the west side of KY 181. In this area, the No. 9 coal seam has been strip mined at the lower elevations on the hillside, and has been underground mined in portions of the higher ground. According to the local residents, there is an air duct to the underground mine located directly under the road near the mailbox for the resident of Doug Scaggs. Several years ago, the paving over this opening caved in, creating a 6 ft. diameter and approximate 15 ft. deep hole. Jeff Skaggs, District 2 Maintenance Engineer, indicated this opening was filled with large stone, and repaved. Currently, there is a slight dip in the road at this location.

On the east side of the road, at approximate milepost 1.8, there is another, somewhat larger mine. A local resident described a collapse of part of the mine by the road. However, according to the mining map, this would still be over 100 feet east of the current roadway alignment. From this section of the road and to the north, from approximate mileposts 1.75 to 2.3, mining spoils are evident.

West of KY 181 and north of the Western Kentucky Parkway lies the Luzerne mine, a large underground mining complex. According to the mining map, a section of this underground mine underlies KY 181, beginning at approximate milepost 2.9.

ROAD LOG OF DETRIMENTAL GEOTECHNICAL CONDITIONS

Milepost	Condition	Recommendation
0	junction of KY 181 & KY 601, approx. 10 foot cut, no rock exposed	2:1 slope
0.1- 0.3	small swale, wet area	refer to site-specific note 1
0.2	culvert	refer to general note 4
0.3	natural gas service line extends north on right side	possible relocation
0.65	embankment failure on right side extends to center of right lane and cross drain under roadway is clogged.	refer to site-specific notes 5 & 6
0.8	wet area on right side, left side floods, pipes appear to be too small	refer to site-specific note 1 larger pipes
0.8 -1.0	wet area right and left sides, poor	refer to site-specific note 1

	drainage	improve drainage
1.0 – 1.2	possible cut	2:1 slope
1.2 – 1.3	wet area right side	refer to site-specific note 1
1.5	air shaft to underground mine under right lane	refer to site-specific note 3 & 4 possible concrete seal
1.6	cross road	
1.65	wet area on left	refer to site-specific note 1
1.75 – 2.3	mining spoils on right	may be beyond new proposed roadway
1.80 – 1.9	wet area on left	refer to site-specific note 1
2.1	ponds on right	refer to site-specific note 2
2.15 – 2.2	wet, swampy area, right and left sides	refer to site-specific note 1
2.30 – 2.35	wet, swampy area, right and left sides	refer to site-specific note 1
2.35	culvert for Little Cypress Creek	refer to general note 4
2.45	sandstone outcrop in cut area on right side of roadway	possible use as durable rock fill material
2.5	WKP overpass	
3.0	Wendell H. Ford National Guard Training Center	

GENERAL RECOMMENDATIONS

- Soil depths in the cuts along the existing alignment vary from 5 to 10 feet deep with an estimated average stripping depth of 6". The geotechnical report (R-7-83) for the WKP interchange indicates overburden depths of 40 feet of mined out spoils at the entrance of the Muhlenberg County Job Corps access road. The samples taken of the spoil indicated mainly soil, soil-like shales, and minor amounts of sandstone fragments. Coal fragments were negligible; therefore no testing was performed on the coal for checking potential combustion properties, which could prevent the material from being used in embankment construction. A soil shrinkage factor of 2 percent is suggested for the project. This value should be applied as outlined in the current edition of the Design Guidance Manual. The base of the rock disintegration zone (RDZ) is estimated to be 10 to 25 feet below the top of ground in undisturbed areas and deeper in surface mined areas as indicated previously. The rock swell factor is estimated at five percent for any durable rock that may be encountered below the rock disintegration zone. Material in the RDZ should have a 0 percent swell.

2. A CBR design value of 2.0 is suggested for the subgrade, if the subgrade consists of soil, shale and limestone rock, which is anticipated. If there is sufficient soil free of limestone floaters and rock fragments existing in the cuts, chemical stabilization (lime) should be utilized for the subgrade with a conservative estimated CBR design value of 9.5 assigned to the stabilized soil subgrade.
3. The project is located on the border between Seismic Risk Zone 2 and 3, which is defined as an area of some damage to probable damage due to earthquake activity.
4. Rock outcrop was not present in any drainage or stream crossings; therefore, any culverts probably will be designed for a yielding foundation. Yielding foundations were recommended for all culverts at the WKP interchange. No bridges are anticipated on the project.
5. No springs were observed in the field review and are not anticipated, however if encountered it is very important to control the drainage using spring boxes and perforated pipe underdrains especially in areas of side hill cut and fill situations.
6. Embankments constructed of non-durable shales (SDI < 95) shall be placed and compacted as specified in the current edition of KYTC Standard Specifications for Road and Bridge Construction.
7. Embankments shall be constructed on 2 horizontal and 1 vertical slopes or flatter. Cut slopes shall be constructed on 2 horizontal and 1 vertical slopes.

SITE- SPECIFIC RECOMMENDATIONS

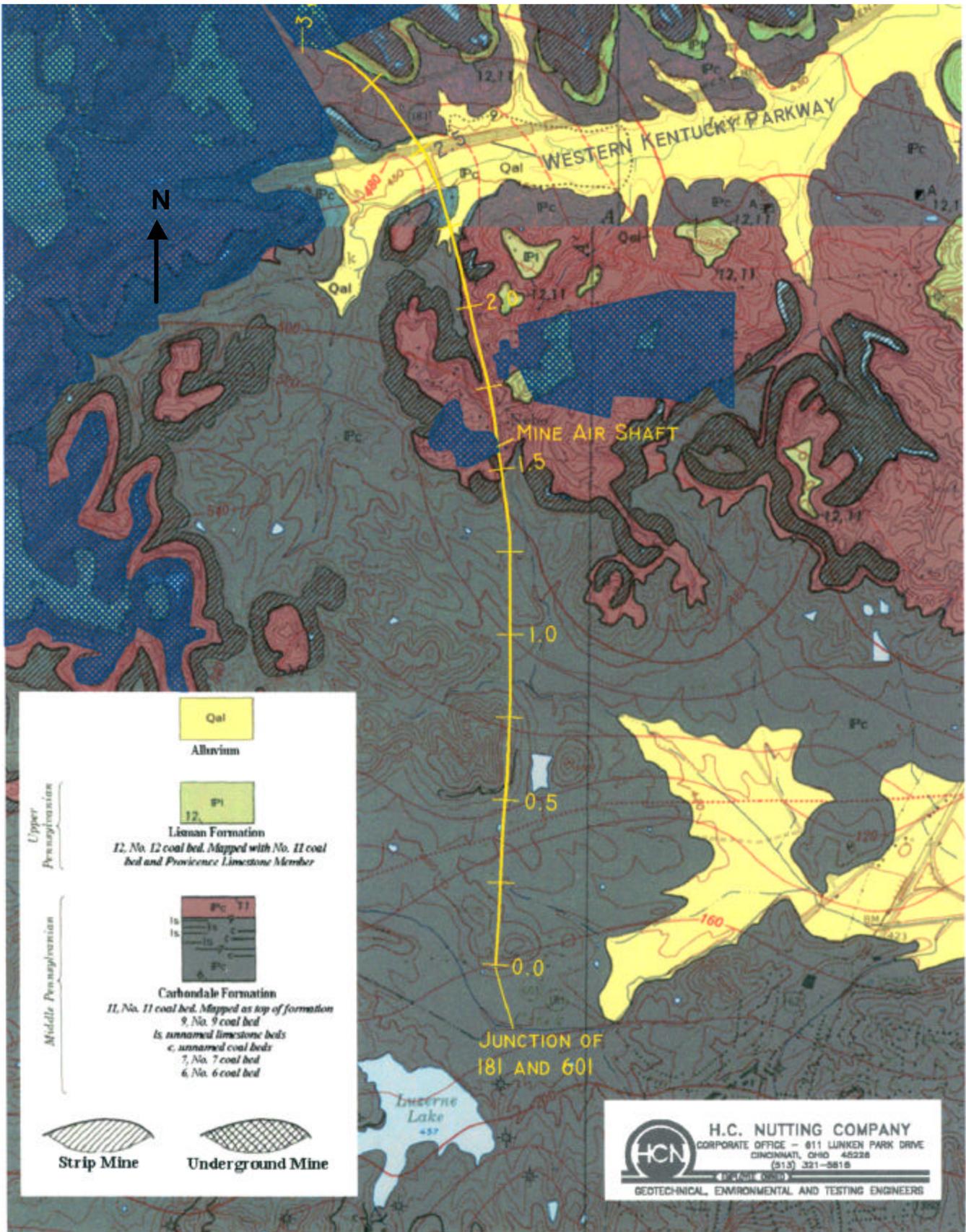
1. In order to provide a good working platform, soft, saturated, unstable material encountered in existing creek beds, drainage swales within embankment foundation limits shall be stabilized with a minimum of 2 feet of "Granular Embankment" in accordance with the current edition of Section 805 of the KYTC Standard Specifications for Road and Bridge Construction and shall be classified as non-erodible as directed by the Engineer. The 2 ½ " maximum size may be waived. This granular material shall be underlain with Type III Geotextile Fabric meeting the requirements of Section 843 of the current standard specifications.
2. Ponds shall be drained and any soft, saturated, unstable material within the embankment limits shall be stabilized with a minimum of 2 feet of "Granular Embankment" in accordance with the current edition of Section 805 of the KYTC Standard Specifications for Road and Bridge Construction, and shall be

classified as non-erodible as directed by the Engineer. The 2 ½ " maximum size may be waived. This granular material shall be underlain with Type III Geotextile Fabric meeting the requirements of Section 843 of the current standard specifications. In those cases where a small part of the embankment is located in a pond or lake, construct the portion of the embankment in the water with fabric and rock, if it is not feasible to drain the pond or lake.

3. Any mine tunnels or horizontal auger openings in mined-out areas, whether shown on the plans or not, shall be thoroughly investigated at the direction of the engineer by probing or other means to determine if adequate roof thickness exists between the top of the tunnel or openings and subgrade elevation. If the roof thickness is not adequate, the roof shall be collapsed and the material consolidated prior to construction of the subgrade. Positive drainage of the tunnels or openings shall be provided through the use of pipe underdrains or other suitable drainage facilities.
4. Any mine tunnels of horizontal auger openings in mined-out areas, whether shown on the plans or not, which are exposed in cut slopes shall be sealed with material from roadway excavation at the direction of the Engineer. Positive drainage of the tunnels or openings shall be provided through the use of pipe underdrains, surface ditches, or other suitable drainage facilities.
5. Foundation embankment benching and longitudinal perforated pipe underdrains shall be placed in accordance with the current edition of Standard Drawing RGX-010 and RDP-006 and / or as directed by the Engineer. One foot of Coarse Aggregate for Rock Drainage Blanket meeting the requirements of Section 805 of the KYTC Standard Specifications for Road and Bridge Construction shall be placed on all benches. This drainage blanket shall be wrapped with Type IV Geotextile Fabric meeting the requirements of Section 214 and 843 of the current standard specifications.
6. In the areas where side hill fill is to be placed over unstable hillsides or existing embankments, the unstable material shall be removed to rock or stable material if rock is not encountered, and embankment benches, longitudinal perforated pipe underdrains and rock drainage blankets constructed as specified in note 5.

SUMMARY

The major concern from a geotechnical viewpoint is the underground mines in the vicinity of the project. The presence of the airshaft located at milepost 1.5 indicates the potential for subsidence from mines beneath the existing roadway though not shown on the mining maps. Therefore, we recommend a series of borings be extended to the base of the No. 9 coal bed along the proposed alignment as part of the geotechnical investigation in the design phase.



KY 181 Scoping Study

from KY 189 to Western Kentucky Parkway, Muhlenberg County , Item No. 2-313.00

Appendix G - Engineering Cost Estimates

COUNTY: Muhlenberg
 UPN: FED. NO.:
 ROAD NAME: KY 181
 DESCRIPTION: Rebuild KY 189 with 2-lane KY 181 through route

Class of Road:
 Type of Construction: Grade, Drain, and Surfacing
 Net Length, Miles: 3.309

Bid Item	Item	Quantity	Unit	Unit Price	Amount
<u>GRADE & DRAIN</u>					
0445	ENTRANCE PIPE-30 INCH	2325	LIN FT	\$35.45	\$82,421.25
0466	CULVERT PIPE-30 INCH	2420	LIN FT	\$49.81	\$120,540.20
1452	S & F BOX INLET-OUTLET-30 INCH	13	EACH	\$2,977.00	\$38,701.00
2200	ROADWAY EXCAVATION	640000	CU YD	\$8.00	\$5,120,000.00
SUB - TOTAL GRADE & DRAIN:					\$5,361,662.45
<u>SURFACING</u>					
0297	CL1 ASPH SURF 0.38E PG64-22	16100	TON	\$37.21	\$599,081.00
9007	ROCK SUB BASE	97250	TON	\$10.75	\$1,045,437.50
0001	D G A BASE	42500	TON	\$15.64	\$664,700.00
0214	CL3 ASPH BASE 1.00D PG64-22	32100	TON	\$35.74	\$1,147,254.00
SUB - TOTAL SURFACING:					\$3,456,472.50
SUB - TOTAL GRADE, & DRAIN & SURFACING:					\$8,818,134.95
<u>MISCELLANEOUS</u>					
2568	MOBILIZATION	1	LP SUM	\$264,544.05	\$264,544.05
2569	DEMOBILIZATION	1	LP SUM	\$132,272.02	\$132,272.02
2650	MAINTAIN AND CONTROL TRAFFIC	1	LP SUM	\$150,000.00	\$150,000.00
SUB - TOTAL:					\$9,364,951.02
30% CONTG:					\$2,809,485.31
GRAND TOTAL:					\$12,174,436.33

Cost Per Mile Grade & Drain: \$1,620,327.12
 Cost Per Mile G & D & Surf: \$3,679,188.98

Last Revision:
 Estimated By: HNTB DATE: 4/11/02 TIME: 2:25:06 PM

COUNTY: Muhlenberg
 UPN:
 ROAD NAME: KY 181
 DESCRIPTION: 3-lane KY 181 from KY 601 north

FED. NO.:

Class of Road:
 Type of Construction: Grade, Drain, and Surfacing
 Net Length, Miles: 3.263

Bid Item	Item	Quantity	Unit	Unit Price	Amount
<u>GRADE & DRAIN</u>					
0445	ENTRANCE PIPE-30 INCH	1860	LIN FT	\$35.45	\$65,937.00
0466	CULVERT PIPE-30 INCH	2000	LIN FT	\$49.81	\$99,620.00
1452	S & F BOX INLET-OUTLET-30 INCH	10	EACH	\$2,977.00	\$29,770.00
2200	ROADWAY EXCAVATION	704000	CU YD	\$8.00	\$5,632,000.00
SUB - TOTAL GRADE & DRAIN:					\$5,827,327.00
<u>SURFACING</u>					
0297	CL1 ASPH SURF 0.38E PG64-22	18200	TON	\$37.21	\$677,222.00
9007	ROCK SUB BASE	110000	TON	\$10.75	\$1,182,500.00
0001	D G A BASE	47900	TON	\$15.64	\$749,156.00
0214	CL3 ASPH BASE 1.00D PG64-22	36300	TON	\$35.74	\$1,297,362.00
SUB - TOTAL SURFACING:					\$3,906,240.00
SUB - TOTAL GRADE, & DRAIN & SURFACING:					\$9,733,567.00
<u>MISCELLANEOUS</u>					
2568	MOBILIZATION	1	LP SUM	\$292,007.01	\$292,007.01
2569	DEMOBILIZATION	1	LP SUM	\$146,003.51	\$146,003.51
2650	MAINTAIN AND CONTROL TRAFFIC	1	LP SUM	\$150,000.00	\$150,000.00
SUB - TOTAL:					\$10,321,577.52
30% ENGR. & CONTG:					\$3,096,473.26
GRAND TOTAL:					\$13,418,050.78
Cost Per Mile Grade & Drain:					\$1,785,880.17
Cost Per Mile G & D & Surf:					\$4,112,182.28

Last Revision:

Estimated By: HNTB

DATE: 4/11/02

TIME: 2:12:15 PM

COUNTY: Muhlenberg
UPN: FED. NO.:
ROAD NAME: KY 181
DESCRIPTION: Rebuild KY 601 with 3-lane KY 181 through route

Class of Road:
Type of Construction: Grade, Drain, and Surfacing
Net Length, Miles: 3.309

Bid Item	Item	Quantity	Unit	Unit Price	Amount
GRADE & DRAIN					
0445	ENTRANCE PIPE-30 INCH	2325	LIN FT	\$35.45	\$82,421.25
0466	CULVERT PIPE-30 INCH	2600	LIN FT	\$49.81	\$129,506.00
1452	S & F BOX INLET-OUTLET-30 INCH	13	EACH	\$2,977.00	\$38,701.00
2200	ROADWAY EXCAVATION	714000	CU YD	\$8.00	\$5,712,000.00

SUB - TOTAL GRADE & DRAIN: \$5,962,628.25

SURFACING					
0297	CL1 ASPH SURF 0.38E PG64-22	18400	TON	\$37.21	\$684,664.00
9007	ROCK SUB BASE	111500	TON	\$10.75	\$1,198,625.00
0001	D G A BASE	48600	TON	\$15.64	\$760,104.00
0214	CL3 ASPH BASE 1.00D PG64-22	36800	TON	\$35.74	\$1,315,232.00

SUB - TOTAL SURFACING: \$3,958,625.00

SUB - TOTAL GRADE, & DRAIN & SURFACING: \$9,921,253.25

MISCELLANEOUS					
2568	MOBILIZATION	1	LP SUM	\$297,637.60	\$297,637.60
2569	DEMOBILIZATION	1	LP SUM	\$148,818.80	\$148,818.80
2650	MAINTAIN AND CONTROL TRAFFIC	1	LP SUM	\$150,000.00	\$150,000.00

SUB - TOTAL: \$10,517,709.65
30% ENGR. & CONTG: \$3,155,312.90
GRAND TOTAL: \$13,673,022.55

Cost Per Mile Grade & Drain: \$1,801,942.66
Cost Per Mile G & D & Surf: \$4,132,070.88

Last Revision:
Estimated By: HNTB DATE: 4/11/02 TIME: 2:25:06 PM

COUNTY: Muhlenberg
UPN:
ROAD NAME: KY 181
DESCRIPTION: 4-lane KY 181 from KY 601 north

FED. NO.:

Class of Road:
Type of Construction: Grade, Drain, and Surfacing
Net Length, Miles: 3.263

Bid Item	Item	Quantity	Unit	Unit Price	Amount
GRADE & DRAIN					
0445	ENTRANCE PIPE-30 INCH	1860	LIN FT	\$35.45	\$65,937.00
0466	CULVERT PIPE-30 INCH	2100	LIN FT	\$49.81	\$104,601.00
1452	S & F BOX INLET-OUTLET-30 INCH	10	EACH	\$2,977.00	\$29,770.00
2200	ROADWAY EXCAVATION	752000	CU YD	\$8.00	\$6,016,000.00
SUB - TOTAL GRADE & DRAIN:					\$6,216,308.00
SURFACING					
0297	CL1 ASPH SURF 0.38E PG64-22	21300	TON	\$37.21	\$792,573.00
9007	ROCK SUB BASE	128900	TON	\$10.75	\$1,385,675.00
0001	D G A BASE	56200	TON	\$15.64	\$878,968.00
0214	CL3 ASPH BASE 1.00D PG64-22	42500	TON	\$35.74	\$1,518,950.00
SUB - TOTAL SURFACING:					\$4,576,166.00
SUB - TOTAL GRADE, & DRAIN & SURFACING:					\$10,792,474.00
MISCELLANEOUS					
2568	MOBILIZATION	1	LP SUM	\$323,774.22	\$323,774.22
2569	DEMOBILIZATION	1	LP SUM	\$161,887.11	\$161,887.11
2650	MAINTAIN AND CONTROL TRAFFIC	1	LP SUM	\$150,000.00	\$150,000.00
SUB - TOTAL:					\$11,428,135.33
30% ENGR. & CONTG:					\$3,428,440.60
GRAND TOTAL:					\$14,856,575.93
Cost Per Mile Grade & Drain:					\$1,905,089.79
Cost Per Mile G & D & Surf:					\$4,553,041.96

Last Revision:

Estimated By: HNTB

DATE: 4/11/02

TIME: 2:52:46 PM

COUNTY: Muhlenberg
 UPN:
 ROAD NAME: KY 181
 DESCRIPTION: Rebuild KY 601 with 4-lane KY 181 through route

FED. NO.:

Class of Road:
 Type of Construction: Grade, Drain, and Surfacing
 Net Length, Miles: 3.309

Bid Item	Item	Quantity	Unit	Unit Price	Amount
GRADE & DRAIN					
0445	ENTRANCE PIPE-30 INCH	2325	LIN FT	\$35.45	\$82,421.25
0466	CULVERT PIPE-30 INCH	2730	LIN FT	\$49.81	\$135,981.30
1452	S & F BOX INLET-OUTLET-30 INCH	13	EACH	\$2,977.00	\$38,701.00
2200	ROADWAY EXCAVATION	762600	CU YD	\$8.00	\$6,100,800.00
SUB - TOTAL GRADE & DRAIN:					\$6,357,903.55
SURFACING					
0297	CL1 ASPH SURF 0.38E PG64-22	21600	TON	\$37.21	\$803,736.00
9007	ROCK SUB BASE	130700	TON	\$10.75	\$1,405,025.00
0001	D G A BASE	57000	TON	\$15.64	\$891,480.00
0214	CL3 ASPH BASE 1.00D PG64-22	43100	TON	\$35.74	\$1,540,394.00
SUB - TOTAL SURFACING:					\$4,640,635.00
SUB - TOTAL GRADE, & DRAIN & SURFACING:					\$10,998,538.55
MISCELLANEOUS					
2568	MOBILIZATION	1	LP SUM	\$329,956.16	\$329,956.16
2569	DEMOBILIZATION	1	LP SUM	\$164,978.08	\$164,978.08
2650	MAINTAIN AND CONTROL TRAFFIC	1	LP SUM	\$150,000.00	\$150,000.00
SUB - TOTAL:					\$11,643,472.79
30% ENGR. & CONTG:					\$3,493,041.84
GRAND TOTAL:					\$15,136,514.63
Cost Per Mile Grade & Drain:					\$1,921,397.27
Cost Per Mile G & D & Surf:					\$4,574,347.12
Last Revision:					
Estimated By: HNTB		DATE:	4/11/02	TIME:	3:08:57 PM

