

Programming Study

KY 22 from Owenton to I-75

Owen and Grant Counties

Item 6-8102.00

Prepared by

Kentucky Transportation Cabinet

Department of Highways

Division of Planning and District 6 Planning Office

MAY 2004

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Executive Summary

Funding for this Programming Study was included in the FY 2003-2008 Six-Year Highway Plan by the 2002 General Assembly. As such, the study is considered to be a legislative mandate. At the present time, no other phases of project development are scheduled.

The study was prepared to assist the Kentucky Transportation Cabinet (KYTC) in defining the scope and extent of improvements best suited to meet current, as well as future, needs of the KY 22 corridor between Owenton and I-75. The study was developed using a project team approach consisting of representatives from the KYTC central office, District 6, and the Northern Kentucky Area Development District. Public involvement was limited to the project team meeting and resource agency coordination.

Corridor issues and concerns were identified through discussions with KYTC officials, comments from local officials, traffic forecasting, vehicle crash data, and the project team meeting. Safety overshadowed all other issues, prompted by high vehicle crash rates and substandard roadway geometrics. Other corridor issues generally involved improved connectivity and access between Owenton and I-75, capacity, growth and economic development, environmental issues and the potential for a dam on Eagle Creek in Grant County.

Improvement options considered in the study include:

- Do Nothing – No action to improve the facility and involves only routine roadway maintenance. This option is not recommended because it does not address the corridor issues and concerns.
- Alternate A – Improve the corridor along existing location between Owenton and I-75.

- Alternate B – Improve the corridor along existing location in Owen County with a new KY 22 corridor to the Barnes Pike/I-75 interchange in Grant County.

The study recommends that Alternate A be considered for future programming and project development. Reconstruction of the corridor should proceed from I-75 westerly to Owenton as shown by construction sections A4, A3, A2, and A1 in the following table of estimated costs.

Estimated Costs

	From To	Length (miles)	Design	R/W	Util.	Const.	Total
A1	Owen County HS KY 845	4.7	\$1,500	\$1,600	\$850	\$18,600	\$22,550
A2	KY 845 KY 1993	3.5	1,100	1,200	400	11,400	14,100
A3	KY 1993 Baton Rouge Rd.	6.0	2,000	1,800	1,000	24,800	29,600
A4	Baton Rouge Rd. KY 467	4.1	1,200	1,600	1,000	17,600	21,400
Total A		18.3	\$5,800	\$6,200	\$3,250	\$72,400	\$87,650

All Costs are in \$1,000's

I. Purpose

The purpose of this study is to undertake tasks to (a) assist in determining possible upgrade segments and funding needs for KY 22 from Owenton to I-75 in Owen and Grant Counties, and (b) provide background information that can be utilized in future documentation for subsequent projects. These tasks include:

- Defining project goals
- Identifying project termini and potential corridors
- Initiating contacts with public officials and agencies
- Gathering information that can be utilized to develop a draft purpose and need statement for the project
- Identifying preliminary environmental and other concerns

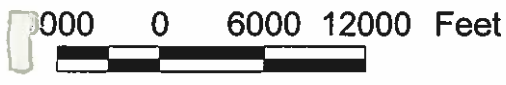
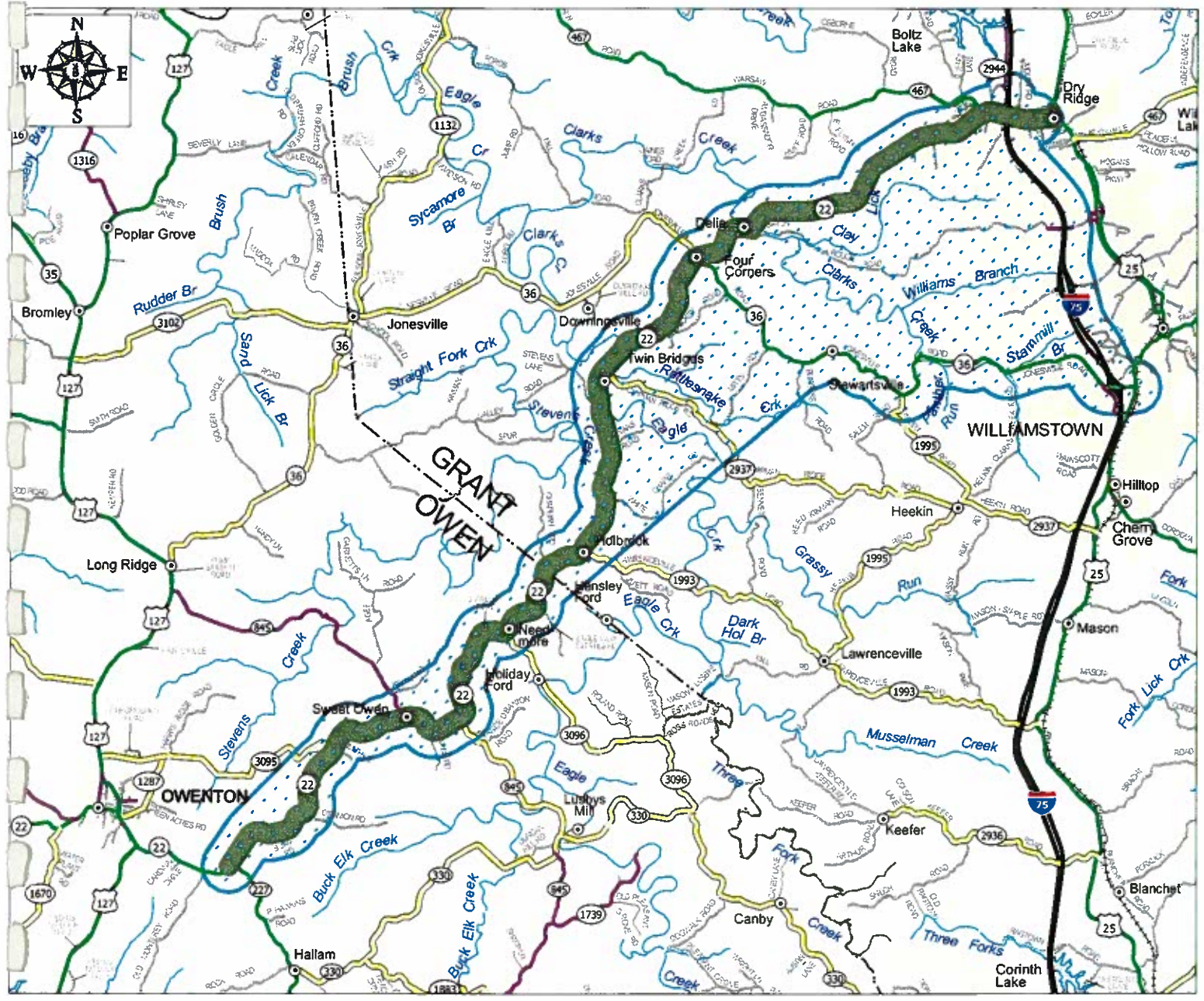
II. Project Location and Existing Conditions

Existing Conditions

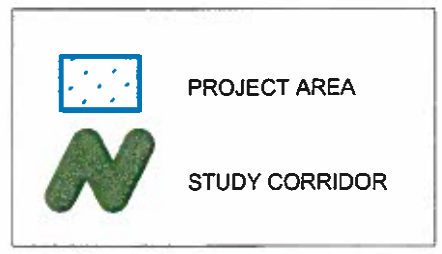
KY 22 is an east-west connection through Northern Kentucky, from Louisville in Jefferson County to Brooksville in Bracken County. KY 22 enters Owen County at Gratz and proceeds northeasterly to Owenton. The road passes through downtown Owenton, then northeasterly in front of the elementary, middle and high schools, and on to Dry Ridge. In Dry Ridge KY 22 converges with US 25 and runs concurrently south for 4 miles into Williamstown. KY 22 diverges from US 25 in Williamstown and proceeds east to Pendleton County.

KY 22 in the study area (Exhibit 1) is on the State Secondary system and is classified as a Rural Major Collector. KY 22 was constructed through Owen County in 1930 and in Grant County in 1932. Travel lanes are 11 feet wide and there are no improved shoulders. Multiple structures are along the route that would not meet current standards.

The study area has rolling terrain and contains many horizontal and vertical curves that are not adequate for a 55-mph travel speed. The statutory speed for the roadway is 55



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EXHIBIT 1
COUNTY MAP &
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mph with speed advisories on most curves. There are no passing zones on this segment of the roadway due to limited sight distance.

Highway Information System (HIS) data (Table 1) indicate that many segments of KY 22 through the study area are among the lowest rated segments of road in the state for the classification of Rural Major Collector. The HIS data takes into consideration pavement condition, accident history, and roadway geometry. Bridges along this route have Sufficiency Ratings ranging from 62.4 to 79.1 with the Clarks Creek/ Baton Rouge Road being classified as Functionally Obsolete (Table 2).

The truck classification for KY 22 is AAA, allowing a maximum weight of 80,000 pounds. There are no truck climbing lanes along this route. The section of KY 22 from KY 467 to US 25 was reconstructed in 1999 to a 5-lane urban typical section.

**TABLE 1
HIS Data**

County Name	Begin Milepoint	End Milepoint	Condition Index	Safety Index	Service Index	Composite Index	Percentile of Composite Index
<u>Owen</u>	9.351	9.463	24	50	14.25	88.25	82
<u>Owen</u>	9.463	18.444	21	39	15	75	18
<u>Grant</u>	0	10.943	22.5	19.4	14.25	56.15	3
<u>Grant</u>	10.943	11.322	15	27	13.5	55.5	3
<u>Grant</u>	11.322	11.361	15	47.6	11.25	73.85	15
<u>Grant</u>	11.361	11.761	15	22.4	0	37.4	0

**TABLE 2
Bridge Information**

	County	Mile Point	Crossing	Length	Width	Structural Function	Sufficiency Rating
B0011	Grant	6.603	Clarks Creek & Baton Rouge Road	240 ft	27.5 ft	Functionally Obsolete	62.4
B0013	Grant	3.496	Rattlesnake Creek	159 ft	27.5 ft		79.1
B0014	Grant	3.381	Eagle Creek	318 ft	27.5 ft		74.8

Traffic

Traffic has nearly tripled in this corridor over the last 20 years. With the projected population growth in Owen and Grant Counties, it can be assumed that traffic will greatly increase over the next 25 years. Table 3 shows the 2020 population projections for Owen and Grant Counties. These projections are from the Kentucky State Data Center (KSDC) located at the University of Louisville. Table 4 shows traffic growth history in the KY 22 corridor as well as current and projected growth. The 2028 projected traffic shown in Table 4 is reported under the “No Build” alternate in the Traffic Forecast Report included in Appendix A.

**TABLE 3
U.S. Census Data and Projections**

	1990 U.S. Census	2000 U.S. Census	2020 KSDC Projections
Owen County	9,035	10,547	14,911
Grant County	15,737	22,384	45,939

TABLE 4
Average Daily Traffic
(Vehicles per Day)

	1981	1993	2004	2028 Projections
KY 22				
From: KY 227 To: O'Banion Lane	830	1,320	1,300	3,000
From: O'Banion Lane To: KY 845	570	1,050	1,400	3,200
From: KY 845 To: Grant County Line	410	920	1,200	2,700
From: Grant County Line To: KY 1993	490	1,150	1,600	3,700
From: KY 1993 To: Chipman Ridge Road	590	1,300	1,800	4,100
From: Chipman Ridge Road To: KY 36	610	1,550	2,200	5,000
From: KY 36 To: Rutman Drive	1,070	2,390	3,700	8,500
From: Rutman Drive To: Improved Section	1,820	3,450	5,000	11,400

Vehicle Crashes

Over the past four years the vehicle crash rate on KY 22 between Owenton and Dry Ridge has been higher than average. The Kentucky average for two-lane rural major collectors is 250 crashes per 100 million vehicle miles (MVM). Table 5 shows vehicle crash data for the KY 22 Corridor from January 1, 2000 through January 1, 2004. Almost all of the reported crashes occurred at intersections or driveways where a speed differential is experienced or at places in the road where sight distance is very restrictive. One high crash location, the KY 22/KY 36 intersection, was reconstructed in the summer of 2002. No crashes have been credited to this intersection since the completion of the reconstruction.

The critical crash rate factor (Table 5) for most segments of road are under 1.00, except from KY 845 to the Grant County line and from Chipman Ridge Road to KY 36. The segment from Chipman Ridge Road to KY 36 contains the reconstructed intersection of

KY 36 and KY 22. See Exhibit 2 for the mapping of Vehicle Crash Information from January 1 2000 to January 1, 2004.

Active Projects

There are currently two active preconstruction projects in the study area in Grant County. Item 6-72.06 would reconstruct and widen I-75 through Dry Ridge and includes work on the I-75/KY 22 ramps. This project is currently scheduled for construction in November 2004. Item 6-165.00 is the relocation of KY 22 from US 25 to I-75 via the Barnes Road Corridor. This route would remove KY 22 from downtown Williamstown and create a northeastern bypass. This project and the rerouting of KY 22 was investigated in the May 1989 KY 22 – Grant & Pendleton Counties Williamstown to Falmouth Finding of No Significant Impacts. No construction schedule has been established for item 6-165.00.

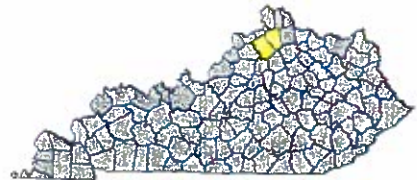
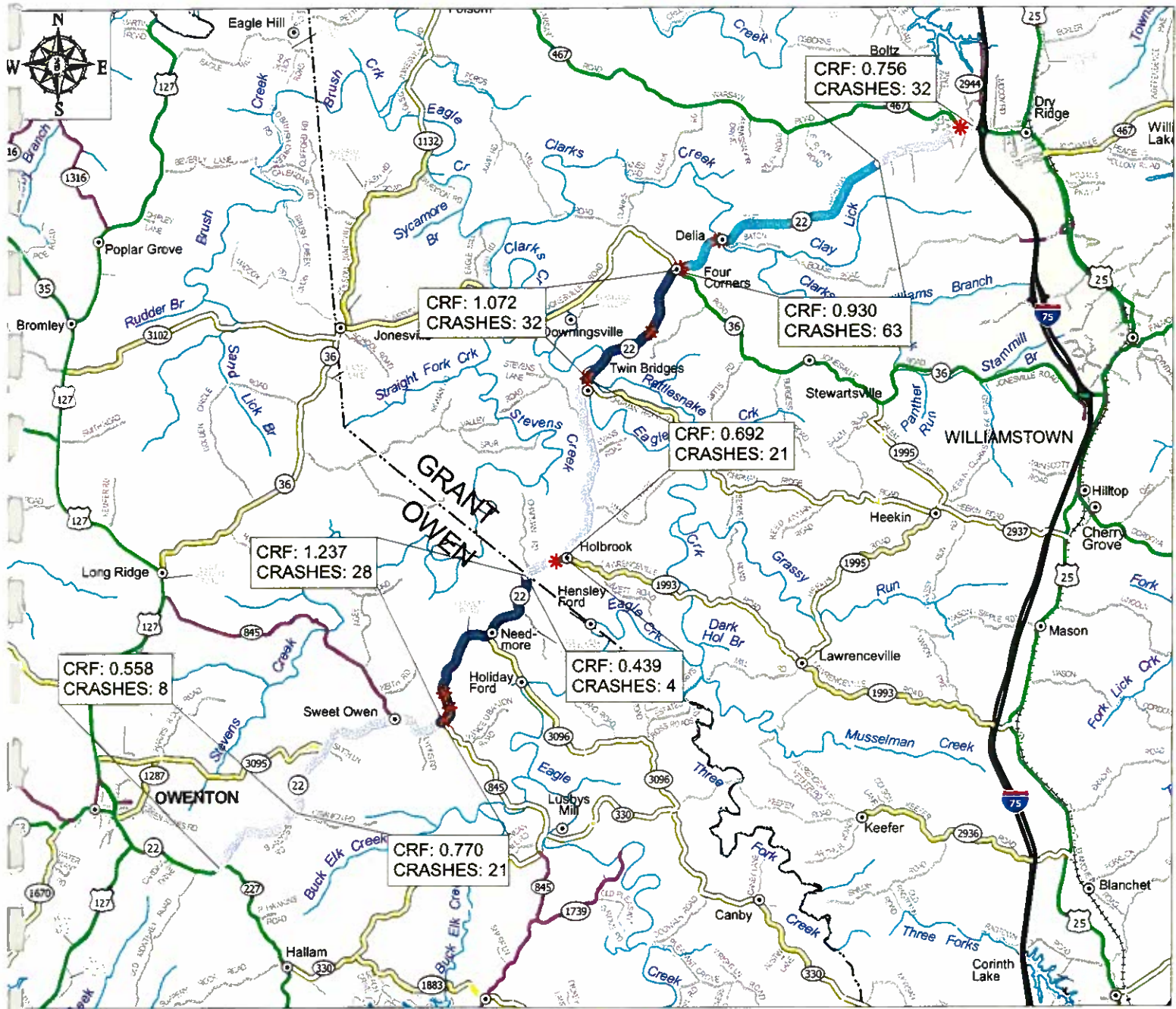
There are three projects in Owen County. Item 6-356.00, the reconstruction of KY 22 from US 127 to the new Owen County High School, was awarded to construction in March 2004. Item 6-963.00, the reconstruction of the KY 22/KY 845 intersection, and item 6-964.00, the reconstruction of the KY 22/KY 1982 intersection, are currently scheduled for construction in November 2004.

III. Goals

Through public discussion, and comment through resource agencies, the main objective for road improvements along the KY 22 corridor is to improve the safe and efficient movement of people, goods, and services to and from the city of Owenton, through Grant County, and ultimately utilizing I-75. Small spot improvements on this road would not address the deficiencies in typical section and horizontal and vertical alignment that prevent this route from being a preferred truck route. A major concern for this corridor is improving the ability for freight to travel this route, and in turn attract jobs.

IV. Project Team Meeting

A project team meeting for this study was held in April 2003. Minutes of the meeting are included in Appendix B. At this meeting, there was considerable discussion concerning



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EXHIBIT 2
VEHICLE CRASH INFORMATION
KY 22
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January 1, 2000 - January 1, 2004

*** HIGH CRASH LOCATION**
**CRASH SEGMENTS
 DISPLAYED BY CRITICAL
 RATE FACTOR (CRF)**

< 0.9
0.9 - 0.999
> = 1.00

**CRF:
 CRASHES:**



the crossing of Eagle Creek in Grant County. Officials from Grant County requested that the Kentucky Transportation Cabinet (KYTC) consider a dam on Eagle Creek, as opposed to a bridge crossing, to provide water for the community. At the present time, the KYTC is not considering a dam on Eagle Creek in connection with any future improvements to KY 22. Grant County must implement the following Action Plan before the KYTC can properly consider a dam at the Eagle Creek crossing.

Eagle Creek Action Plan

Under authority granted in KRS 150.625, the KYTC may consider the construction of combination roadway fills and dams. This authority, however, is subject to Section 230 of the Kentucky Constitution, which prohibits the expenditure of road funds for any purpose other than road purposes. A federal, state or local governmental agency (sponsor) with powers of eminent domain must justify the need for a lake from the standpoint of a public water supply or public recreation.

Should Grant County (and/or any other appropriate sponsor) wish to pursue a combination roadway fill and dam at Eagle Creek, the County is required to take the following actions:

- Grant County must assemble and retain the services of a qualified Consultant Team consisting (at a minimum) of a Water Resources Consultant, an Environmental Resources Consultant and a Geotechnical Consultant. All members of the Consultant Team should be prequalified with the KYTC and experienced with current KYTC pre-construction and construction practices.
- The Consultant Team will prepare a detailed lake feasibility study. The feasibility study should address the economic benefits of the proposed lake and measure potential benefits against expected costs. Additionally, the study should determine the proposed pool elevation of the lake and the associated property and environmental impacts. A geotechnical report will be required to address constructability issues associated with the dam and any potential for

landslides into the lake. An environmental report will be required to determine the environmental impacts of the proposed lake and recommend the appropriate mitigation measures. A plan addressing the flooding of all public roadways must also be developed and included in the study. The Consultant Team will assist Grant County with all necessary agency coordination activities and all required agency permits for the construction of a dam.

- Should future KY 22 programming emerge in the KYTC Six Year Highway Plan and pre-construction activities have been authorized, the Consultant Team will be required to coordinate design and scheduling activities with the KYTC. At the appropriate time, the cost of crossing Eagle Creek with a normal roadway fill or bridge as opposed to a roadway fill and dam will need to be determined. All costs in addition to a normal roadway crossing of Eagle Creek will be the responsibility of Grant County.
- Upon completion of the feasibility study, Grant County will present the study findings to the Secretary of Transportation and other KYTC management personnel. Should the Secretary accept the dam as an economically justifiable solution to the Eagle Creek crossing an agreement between the KYTC and Grant County will be negotiated. This agreement will detail all project development activities and responsibilities. An initial cost-sharing plan will be negotiated as well as future maintenance and associated costs of the dam. Grant County may be required to post a performance bond in an amount to be determined by the KYTC to insure that any future maintenance costs are secured.

Any future improvements to KY 22 would neither encourage, nor prohibit the construction of a dam on Eagle Creek.

VII. Resource Agency Coordination

All appropriate state and federal resource agencies were identified and contacted for their comments and concerns associated with the study area and possible KY 22 improvements. A sample letter, agency lists and responses received are included in Appendix C. These responses can be summarized as:

- KY State Nature Preserves Commission- Eagle Creek is among the best quality water bodies in the Blue Grass region of Kentucky and should not be impounded.
- United States Coast Guard- No Coast Guard permits are required.
- United States Department of the Interior, Fish and Wildlife Service- Concerned about sediment created with a construction project. Concerned about the loss of stream that would occur with the construction of a dam. Three federally endangered species may occur in this area, the Braun's rock cress, the Indiana bat, and the Gray bat.
- Commonwealth of Kentucky Natural Resources and Environmental Protection Cabinet- Concerns were expressed about the impact of this road improvement project and the Clean Air Act.
- National Department of Health and Human Services- Areas of concern were air quality, water quality, floodplains, hazardous materials, solid waste, noise, occupational health and safety, land use, and environmental justice.
- Appalachian Regional Commission- There is no adverse effect on the Appalachian Development Highway System.
- KYTC Permits Branch- Would like partial control of access and to be notified once a determination has been made about this road being placed on the National Highway System.
- Commonwealth of Kentucky Department of Fish and Wildlife Resources- Concerns about the streams this road would impact.
- U.S. Army Corps of Engineers- A permit would be required before any fill material could be placed in any waters of the United States, including wetlands.
- Grant County Judge Executive- Offers support for this project.
- Kentucky Cabinet of Workforce Development- Full support for the roadway improvement.

- US Department of Transportation, Federal Aviation Administration- No public use airport in the immediate vicinity.
- KYTC Multimodal Programs- Asking for bicycle and pedestrian consideration along this corridor.
- KYTC Division of Construction- Expressed concerns about the Eagle Creek crossing.
- KYTC Division of Operations- The Department should not be responsible for any maintenance along this corridor other than the roadway. Other parties should be responsible for the maintenance of any future dam.
- U.S. House of Representatives Committee of Transportation and Infrastructure- The Secretary of the Army is authorized to conduct a study of potential water resources for the Eagle Creek Basin.

VI. Environmental Overview

Wilbur Smith Associates, under contract with the Division of Planning, developed an Environmental Overview for this project. Issues identified that would likely require consideration during future phases of the project include:

- Water quality
- Wetlands and water ponding
- Public and private water sources
- Potential occurrences of faunal species
- Community sensitive locations
- Urban area developments
- Historic structures and archaeological sites
- Underground storage tanks, sewage treatment plants and oil\gas wells
- Agriculture and cattle operations and
- Low income populations.

These issues are discussed in more detail in the Environmental Overview included in Appendix D.

VII. Environmental Justice Study

The Northern Kentucky Area Development District developed an Environmental Justice Study for the KY 22 corridor. This Study is included in Appendix E. The Study concluded that the project would have no negative impact on minority population groups.

VIII. Geotechnical Overview

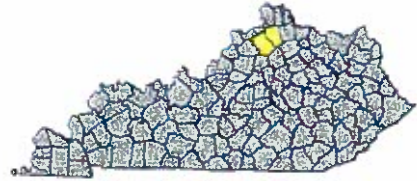
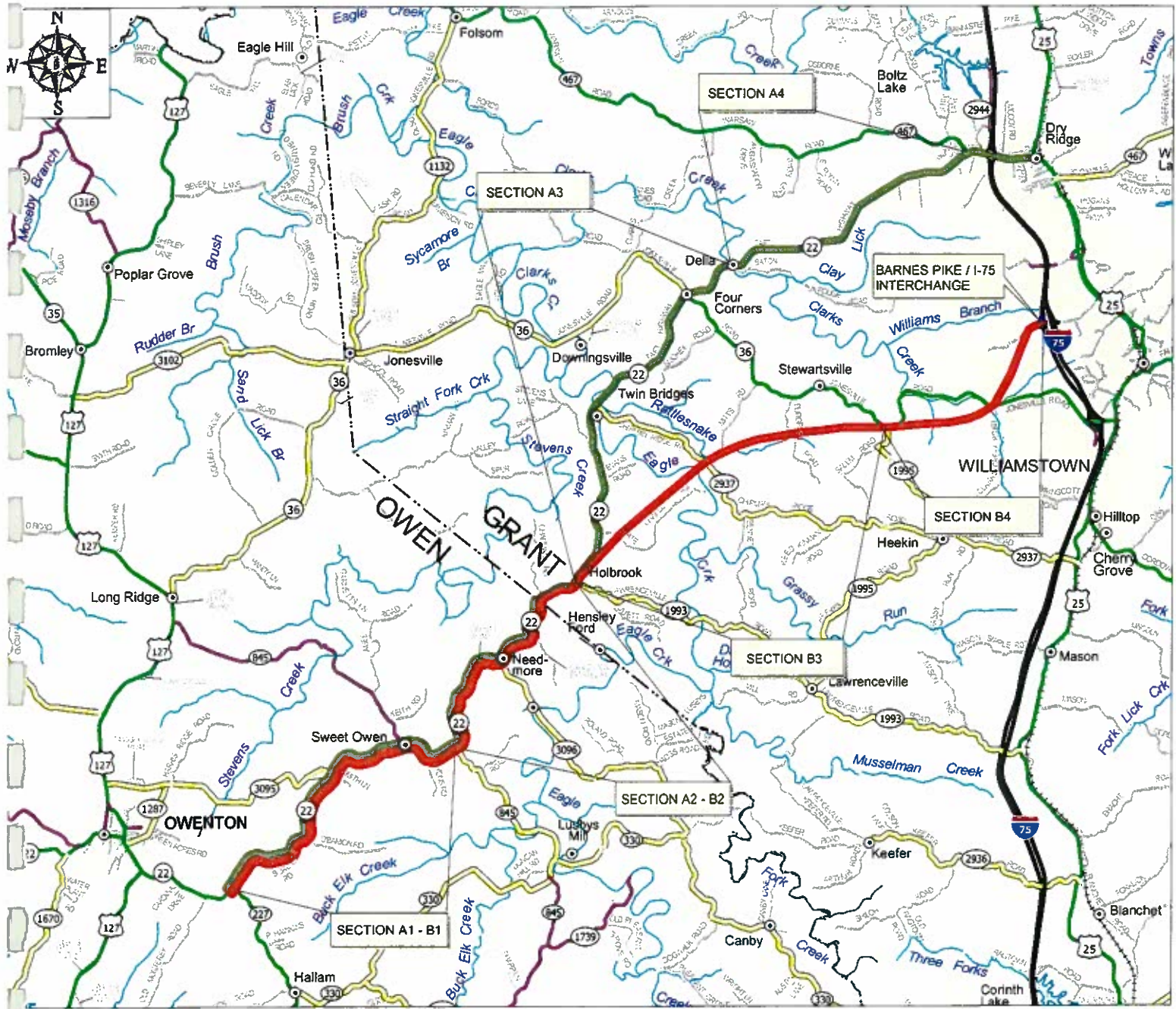
A Geotechnical Overview was prepared for this project by the Geotechnical Branch of the Division of Materials and is included in Appendix F. The Overview recommended the avoidance of side hill cuts and fills with 2:1 cut slopes and 3:1 fill slopes for rocks associated with the Fairview and Kope formations. Shale compacted in one foot lifts will also be required.

IX. Alternatives

In addition to the do nothing alternate, two other alternates were explored with this study (Exhibit 3). Alternate A would closely follow the existing route of KY 22 from Owenton to Dry Ridge. Alternate B would diverge from the existing route around the Grant County/Owen County line and connect to I-75 at the Barnes Pike Interchange. Both of these alternates would improve Owenton's access to I-75. Because of the active intersection reconstruction projects, and the recently completed KY 22\KY 36 intersection improvement, no other spot improvements were investigated with this study.



Alternate A can be broken into the following construction segments: (1) New Owen County High School to KY 845, (2) KY 845 to KY 1993, (3) KY 1993 to Baton Rouge Road, (4) Baton Rouge Road to KY 467.

Alternate B would have the first two segments of Alternate A, and would be further divided into: (3) KY 1993 to KY 36 and (4) KY 36 to I-75 at Barnes Pike.



PROGRAMMING STUDY
EXHIBIT 3
ALTERNATES MAP
KY 22
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Map is intended for graphic representation only.
 It is not intended to show the exact location of
 any future roadways.

	ALTERNATE A
	ALTERNATE B
	SECTION #



X. Estimated Costs

Cost estimates for Alternates A and B are shown in Table 6. The total cost of Alternate A is \$87,650,000. The total cost of Alternate B is \$78,950,000. These costs were based upon current project costs for similar projects in the area. No estimate was made for the construction of a dam on Eagle Creek. Grant County must implement the Eagle Creek Action Plan (page 11) to determine the cost of a dam.

TABLE 6
Estimated Costs

	From To	Length (miles)	Design	R/W	Util.	Const.	Total
A1	Owen County HS KY 845	4.7	\$1,500	\$1,600	\$850	\$18,600	\$22,550
A2	KY 845 KY 1993	3.5	1,100	1,200	400	11,400	14,100
A3	KY 1993 Baton Rouge Rd.	6.0	2,000	1,800	1,000	24,800	29,600
A4	Baton Rouge Rd. KY 467	4.1	1,200	1,600	1,000	17,600	21,400
Total A		18.3	\$5,800	\$6,200	\$3,250	\$72,400	\$87,650
B1	Owen County HS KY 845	3.5	1,100	1,500	500	13,300	16,400
B2	KY 845 KY 1993	4.4	1,500	1,300	750	16,700	20,250
B3	KY 1993 KY 36	5.1	1,800	1,000	500	21,400	24,700
B4	KY 36 I-75 @ Barnes Pike	3.8	1,500	1,200	500	14,400	17,600
Total B		16.8	\$5,900	\$5,000	\$2,250	\$65,800	\$78,950

All costs are in \$1,000's

XI. Recommendation

Study findings suggest that the KY 22 corridor be reconstructed as closely to the existing alignment as possible following Alternate A. The Traffic Forecast Report (Appendix A) indicates that Alternate B would not divert a significant amount of traffic from the existing corridor to mitigate the accident and safety issues that would remain. This new alignment would still allow the upgrades to KY 22 proposed in the 1989 FONSI to occur at the Barnes Pike interchange, and would not preclude a new corridor from the Barnes Pike Interchange east to KY 22, terminating near the Grant County line. Alternate A, though two miles longer, would provide a much-improved connection from Owenton to I-75 while correcting numerous roadway deficiencies. This corridor would be conducive to no net increase in state highway mileage. Alternate B would increase the state highway maintenance obligation and would not be correcting the highest accident locations located along existing KY 22. If the corridor were improved close to the existing alignment numerous high accident and safety deficient segments of road would be improved. With the growth that has occurred and will continue to occur around the existing KY 22 corridor in Grant County it is not foreseeable that this corridor would be removed from the state system with the construction of Alternate B to the Barnes Pike interchange. If Alternate B were constructed, traffic along the existing KY 22 corridor in Grant County would continue to be heavy enough to warrant improvements. A new corridor (Alternate B) from the Grant County line to the Barnes Pike interchange is a desired corridor, however, the traffic forecasts suggest that the timing of the need for this new corridor is closer to the design year of 2028. It is recommended that Alternate A construction segments begin at I-75 and proceed westerly to Owenton. Construction segments should be prioritized as A4, A3, A2, A1, (see Table 6).