

I-66

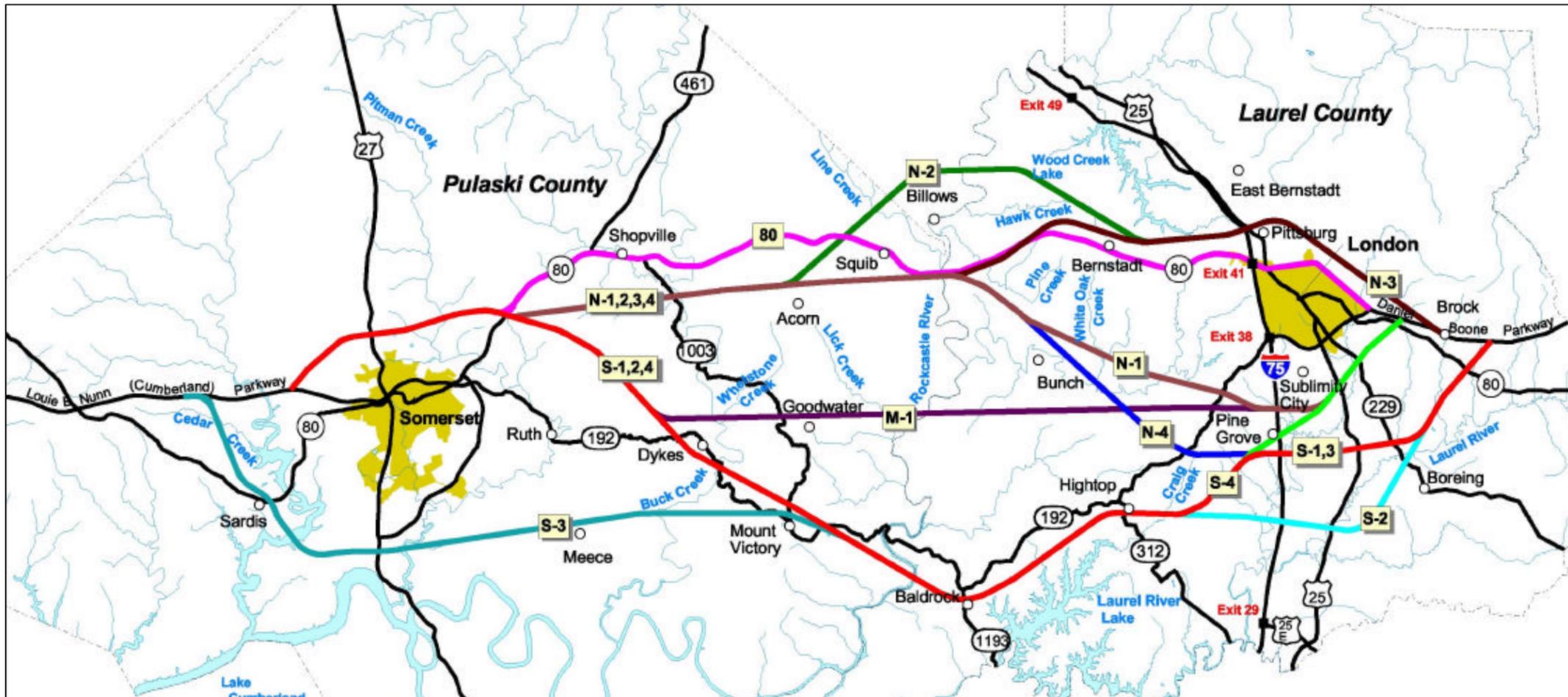
Southern Kentucky Corridor

between the
Louie B. Nunn (Cumberland) and Daniel Boone Parkways
Pulaski and Laurel Counties

Kentucky Transportation Cabinet
Six Year Highway Plan
Item # 11-66.00

Prepared for:

Kentucky Transportation Cabinet
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Frankfort, Kentucky



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**SOUTHERN KENTUCKY CORRIDOR (I-66)
Somerset to London
Planning Study**

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EXECUTIVE SUMMARY

SOUTHERN KENTUCKY CORRIDOR (I-66) PLANNING STUDY – SOMERSET TO LONDON

The Southern Kentucky Corridor (I-66) Planning Study is a planning study of a proposed interstate corridor between Somerset and London in Southern Kentucky. This priority segment of the I-66 corridor would serve as a linkage between the termination of the Louie B. Nunn (Cumberland) Parkway west of Somerset and the Daniel Boone Parkway east of London.

Project Background

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) identified high priority corridors on the National Highway System. The East–West Transamerica Corridor (I-66) was one of these high priority corridors, generally located between and parallel to I-70 and I-40 with an eastern terminus in Virginia and a western terminus in southern California, as shown in **Exhibit S.1**. Based on Federal transportation legislation, the portion of the corridor through Kentucky is represented as a 50-mile wide band that is centered on the cities of Pikeville, Jenkins, Hazard, London, Somerset, Columbia, Bowling Green, Hopkinsville, Benton and Paducah.

The Transportation Equity Act for the 21st Century (TEA-21) established funding for initial studies for the Somerset to London segment of the I-66 corridor as a high priority corridor. Part of the high priority corridor initiative involves the improvement of depressed or impoverished regions by increasing access and mobility. The southeastern region of Kentucky has been traditionally known for its below-average income rates. **Exhibit S.2** shows poverty rates as a percentage of population for each county in Kentucky. As shown, the identified corridor for the proposed I-66 route crosses portions of Kentucky with some of the highest poverty rates.

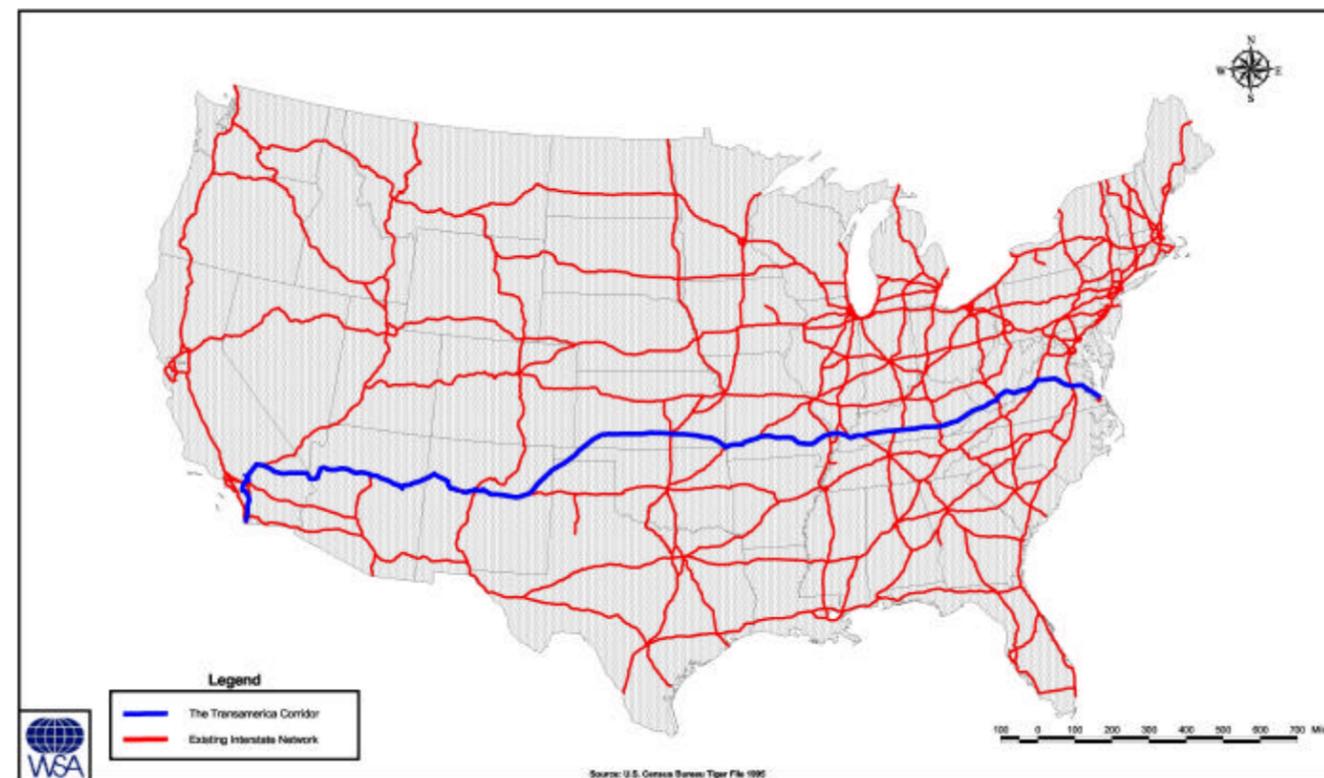


Exhibit S.1 Proposed Transamerica Corridor (I-66)

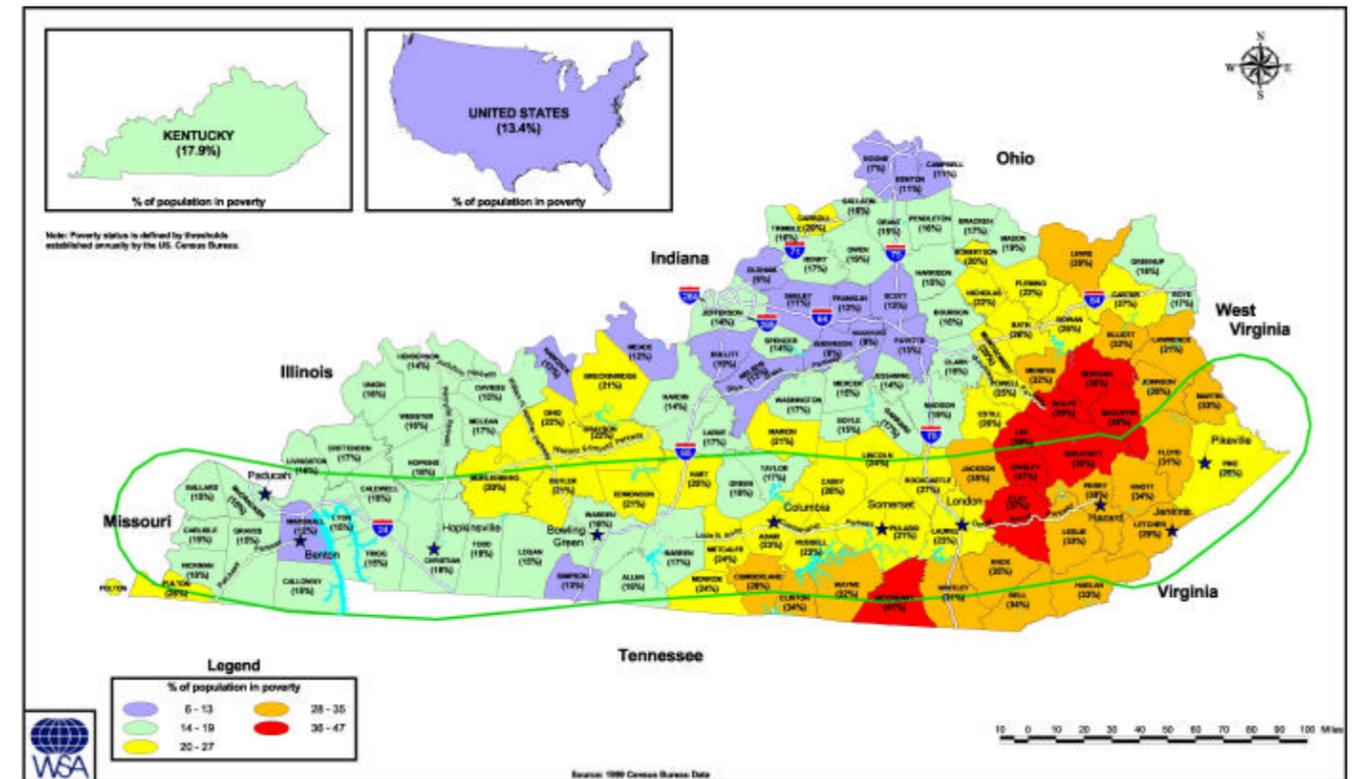


Exhibit S.2 Proposed Southern Kentucky Corridor (I-66)

Purpose

The purpose of this study is to identify areas of concern, benefits of such a project, public input, and an environmental footprint from known documentation; to evaluate corridor alternates; and to provide recommendations based upon the aforementioned and more specific evaluation criteria for future project development activities for the I-66 corridor project between Somerset and London. This study is intended to develop recommendations at a corridor level, based on existing topography (i.e., contours, streams, subdivisions, cemeteries, highway crossings, etc.), environmental features, traffic needs, socioeconomics, estimated costs, and engineering judgment.

The identified goal of this project is to provide an interstate transportation corridor extending from the Louie B. Nunn (Cumberland) Parkway, west of Somerset, to the Daniel Boone Parkway, east of London. The proposed facility from Somerset to London is expected to:

- Improve accessibility and traffic flow to the cities of Somerset, Corbin and London;
- Maximize connectivity to other major roads in the region;
- Improve accessibility to tourism and recreational facilities in the immediate vicinity of the corridor and the region;

- Improve highway access to enhance economic development potential for counties throughout southeast Kentucky;
- Improve access and mobility in depressed or impoverished regions;
- Accommodate increasing traffic and truck volumes by diverting traffic to an interstate facility;
- Improve travel safety by providing a safer travel route; and
- Fulfill enacted TEA-21 legislation.

Additionally, this study is intended to be used for the evaluation of projects with respect to their merit for inclusion in future Cabinet programs. The conclusions of this study are representative of the most accurate analysis possible based on current available information and the time allotted for evaluation. Later additional studies may reveal other needs or solutions, which are not readily apparent at this time.

Study Area Conditions

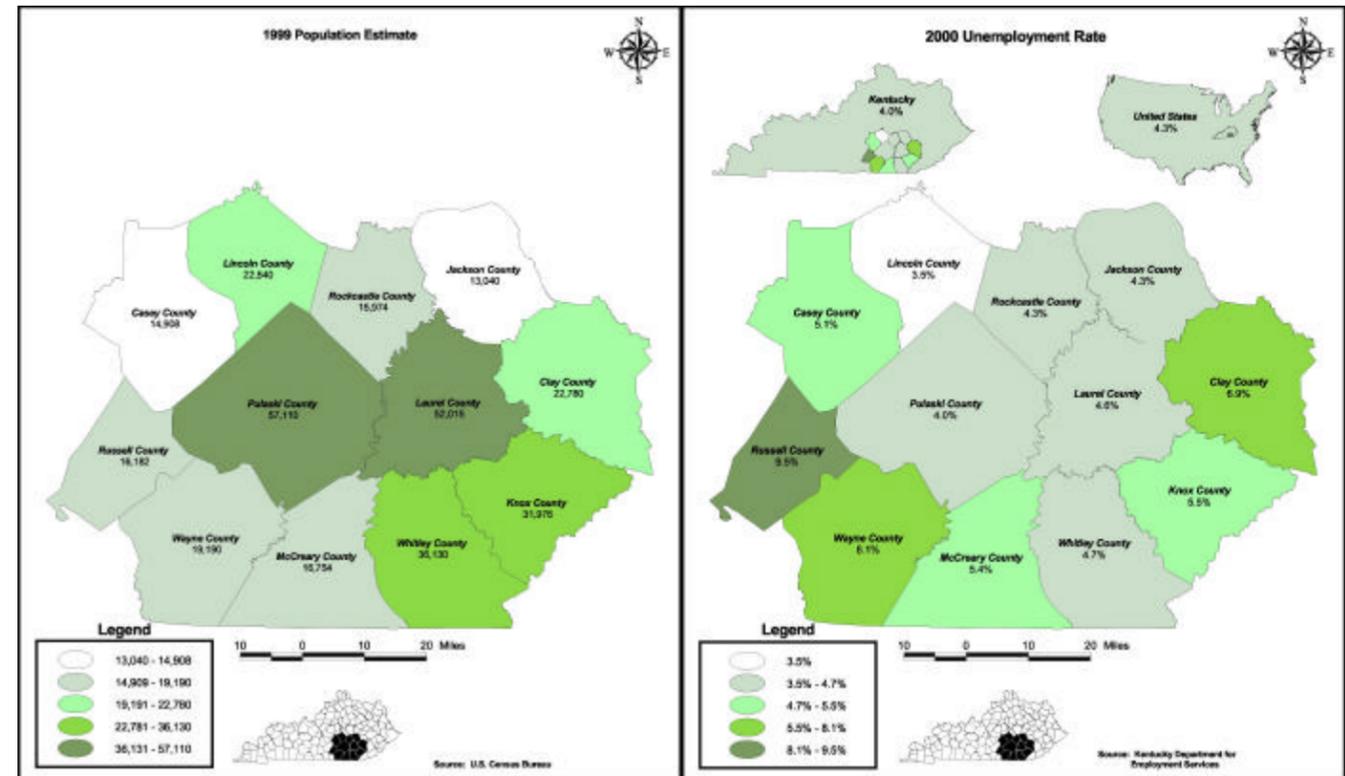
While providing an initial priority segment for the Southern Kentucky I-66 Corridor, the implementation of the Somerset to London segment will allow for a linkage between the Louie B. Nunn (Cumberland) and Daniel Boone Parkways. The development of this facility is intended to support the economic vitality of a broad region of southern Kentucky and Appalachia. It will benefit the region through improved travel safety, increased accessibility, enhanced mobility and reduced congestion. These benefits will also result in social, economic and land use impacts within the region.

In comparison to surrounding counties within the south-central Kentucky region, Pulaski and Laurel counties, through which this section of the corridor passes, are population and employment centers for the region. These counties lead the region in terms of both total population and population growth, as shown in **Exhibit S.3**. Pulaski and Laurel counties also have lower unemployment rates, as shown in **Exhibit S.4**, and higher per capita income levels than most of the surrounding counties.

According to the 1997 Economic Feasibility Study of I-66 prepared by the Kentucky Transportation Center, many economic advantages are anticipated to come from the implementation of I-66. Area businesses are expected to have an increase in trade due to the construction of the highway. Economic impacts will come from reduced travel costs and improved accessibility, which will in turn improve the competitive position of the region and foster economic development. The retail trade and manufacturing businesses could have better interstate connections while the service industry (i.e., motels, gas stations, convenience marts, etc.) could see an increase in locations for potential business development near the I-66 interchanges.

Although the impacts of a new interstate facility could be very beneficial to the economy by stimulating job growth and increasing each county’s tax base, communities will have to plan for additional infrastructure and community services to serve the potential increases in businesses, future population growth and community needs. Because of projected population increases, potential areas of concern include noise and air quality issues, roadway congestion, and the need for additional infrastructure improvements to serve these demands. These are some of the items that will require additional coordinated and comprehensive planning with appropriate local and state agencies as the I-66 project continues through the development process.

Exhibit S.3 (Population) and S.4 (Unemployment)



In addition, the impacts of developing the proposed highway corridor could potentially alter land use patterns by increasing the amount of land used for new development. In turn, these developments could create an increase in the need for more infrastructure (i.e., water, sewer, schools, housing, etc.). Existing and potential land use effects should be considered in selecting a recommended corridor and in the future development of highway alignment options. While this consideration is being afforded at the earliest practical stages of highway planning, such considerations should continue through design, right-of-way acquisition and construction. Highway development options to minimize land use impacts consist of visual aesthetics, land use buffers, transition zones, and other important environmental considerations. Aesthetics and viewsheds are especially important near existing tourism and recreational areas, such as the Daniel Boone National Forest and other scenic natural areas.

Traffic and Operational Conditions

Implementation of the I-66 corridor is anticipated to provide travel benefits to the region that will improve safety, reduce future congestion, and offer more efficient travel service. Under future conditions without implementation of I-66, traffic volumes in the design year of 2030 on existing roadways are estimated to range from 2,200 vpd along KY 192 near the Pulaski/Laurel County line to about 86,000 vpd along the US 27 corridor near KY 80 in Pulaski County. Other high-volume routes in the design year include KY 80 near I-75 (53,400 vpd), KY 192 near I-75 (65,000 vpd), I-75 near KY 192 (73,600 vpd), and US 25 near KY 192 (57,300). Future highway improvements are planned along many of these routes, including major widening of I-75 and US

27, relocation of KY 30, and new routes between the Louie B. Nunn (Cumberland) Parkway and KY 80 and between US 27 and the Louie B. Nunn (Cumberland) Parkway.

Level of Service (LOS) is a qualitative measure used to describe traffic conditions. A number of routes in the study area are expected to fall below acceptable LOS levels by the design year of 2030. With committed highway improvements, but excluding construction of I-66, major sections of a number of routes will be operating at LOS F, including US 25 and US 27. LOS F conditions are also expected along sections of KY 80, KY 192 and KY 229 near the urban areas of London and Somerset.

Accident data for selected routes (US 25, US 27, KY 80, KY 192, and KY 461) in the study area were analyzed for a 36-month period from January 1, 1995 to December 31, 1997. It was determined that high-accident locations account for about 48 percent of the total mileage of US 25 in the project area; 37 percent of US 27; 28 percent of KY 80; and 59 percent of KY 192. It is expected that future traffic volume increases on these routes will add more vehicles (and vehicle-miles) and create the potential for additional high-accident locations.

The TEA-21 legislation emphasizes the consideration of all transportation modes and intermodal connections in the planning, building and operation of transportation systems. There are two main railroad lines located within the project study area. In Pulaski County, the *Norfolk-Southern Corporation* rail line lies between Somerset and US 27 and in Laurel County, the *CSX* line lies east of London, between US 25 and the Daniel Boone Parkway. In addition to the railroad facilities that service the study area, airports and trucking facilities are also included in this region of the state. One general aviation (public) airport is located in each of the two study area counties. The Somerset-Pulaski County – J.T. Wilson Field Airport is located in Pulaski County and the London-Corbin Airport, Magee Field, is located south of London in Laurel County. Other facilities in the study area include 21 trucking companies that provide goods to the Pulaski County region and 22 trucking companies that deliver to Laurel County.

General Environmental Considerations

This study will serve as background for the forthcoming National Environmental Policy Act of 1969 (NEPA) process. Through the pre-NEPA planning process, a number of primary environmental issues have been identified. These include natural areas, sensitive plant and animal species, karst geology, historic sites, archaeological sites and other important areas. Vital to the determination of these issues was the consideration of input from a variety of environmental resource agencies, key stakeholder groups and the general public. These groups provided input to the determination of an “environmental footprint” for the project area, resulting in a better understanding of potential environmental consequences.

The study counties are home to many natural, scenic and sensitive areas, such as the Daniel Boone National Forest, the Wild River portion of the Rockcastle River, Cane Creek Wildlife Management Area, Levi Jackson Wilderness Road State Park, and the Sheltopee Trace National Recreation Trail. These areas are not only known for their scenic beauty, but also for the diversity of species they harbor. Threatened and endangered species in the study area include the Red Cockaded Woodpecker, Indiana Bat, Pearly Mussel, Cumberland Bean, Ashy Darter, Oyster Mussel, White Snakeroot and Wood Lily, among others. Natural wetland areas and blue-line streams are found throughout the study area, with particular concentrations near Wood Creek Lake, Laurel River Lake and Lake Cumberland. The study area is also known for its unique

geologic structure, including an extensive cave system throughout the western portion of the study area.

Other Considerations

In addition to the traffic and environmental issues discussed above, several other considerations were given in the initial identification of a preferred set of corridor alternatives. Access points and opportunities to serve existing highway facilities and to ensure the adequate spacing of interchanges along I-75 were one area of consideration. Additionally, the location of crossings of the Rockcastle River and limiting the number of corridors that introduced new crossings within the designated Wild River section was important. Certain engineering challenges, such as avoiding steep grades and reducing cut and fill sections, are factors that would influence future costs for project development. A final and critical consideration was outside input from the U.S. Forest Service, other agencies and the public on corridor alternatives. Throughout the course of this study, many individuals and groups expressed preferences and recommendations on corridor alternatives. All of these factors were collectively considered and used to identify a series of proposed corridor alternatives to be further evaluated.

Proposed Corridors

In order to provide a basis for preparing recommendations for I-66 within the designated study area, a series of alternates were identified that would serve to address the purposes defined for this project. There is a broad range of issues that are considered in identifying potential study corridors for the future development of I-66. These issues include geometry, access control factors, I-75 interchange location options, major areas of avoidance and road user benefits.

Subsequently, a series of improvement alternates were considered that would offer improved transportation service for the region and address the requirements set forth in the federal legislation. Improvements to upgrade existing KY 80 to interstate standards were identified as one alternate. The existing KY 80 corridor is made up of two- and four-lane sections, with four-lane right-of-way along the entire corridor.

Based upon the consideration of the corridor development issues previously discussed, nine (9) corridor alternates, in addition to KY 80, were developed for additional study. These study corridors utilize north, middle and south sectors of the study area. There are four (4) variations each of both south and north corridors and one (1) middle corridor. The corridors traverse through portions of three Kentucky counties, Pulaski, Rockcastle and Laurel. The location of each proposed new route corridor, along with the proposed KY 80 corridor, is shown on **Exhibit S.5**.

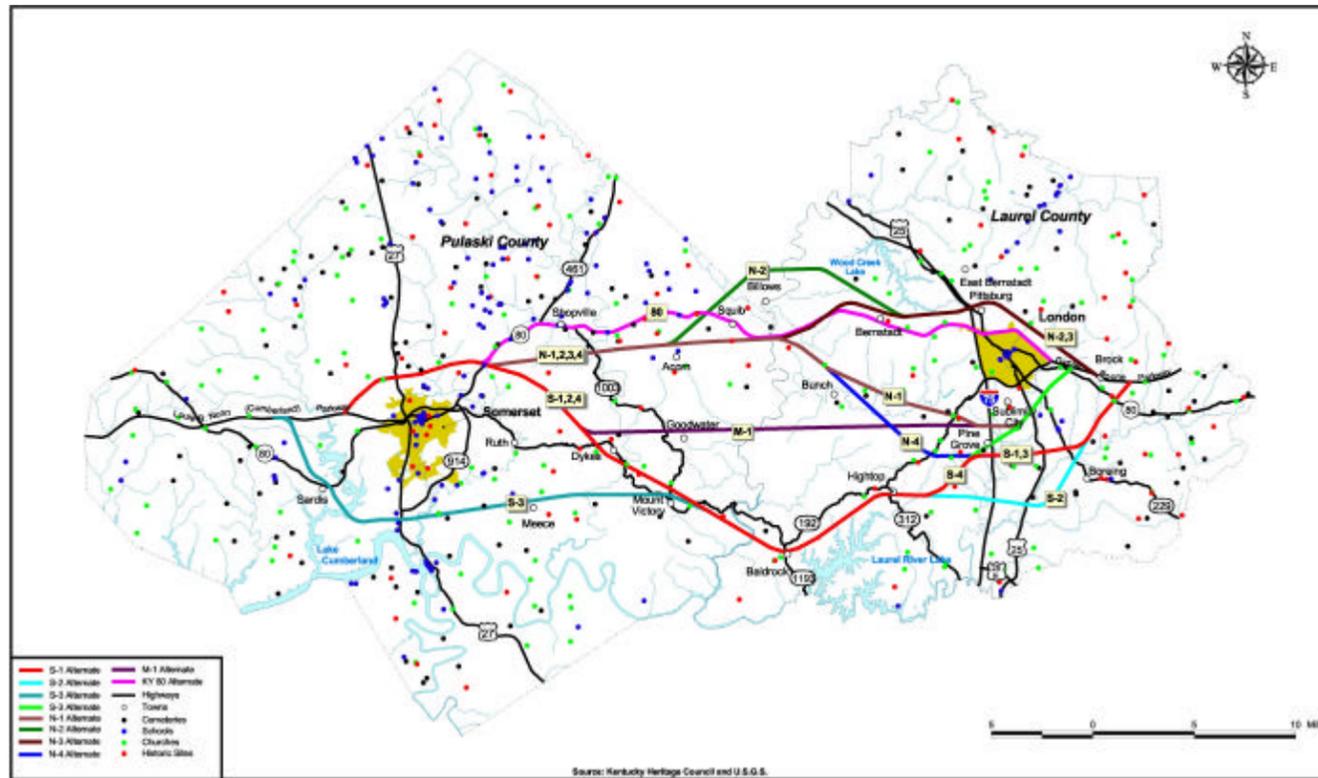


Exhibit S.6 Cemeteries, Churches, Schools and Historic Sites

- Lakes, Rivers and Stream Crossings – Lake Cumberland, Laurel River Lake and Wood Creek Lake could all be affected by various alternates located near to these features. Many individuals, along with representatives with the Daniel Boone National Forest, expressed particular concern with potential increases in recreational traffic at these facilities. Much of the Rockcastle River within the study area is a state designated Wild River resource. Streams throughout the region are home to sensitive plant and animal species.
- Plant and Animal Species – A wide range of sensitive species of plants and animals exist within the region, with many known locations of threatened or potentially threatened and endangered species existing within proximity to the study corridors. The south and middle alternates were shown to have a higher degree of potential impacts to these species.

Environmental implications can be anticipated with highway development within any of the alternate corridors. More detailed assessments will be required on future alignment alternates. A summary of findings related to environmental issues and the proposed corridor alternates are as follows:

KY 80 Alternate: Because it seeks to reconstruct and widen an existing highway corridor, the KY 80 alternate is expected to have the least impacts to natural areas than any of the other options. Typical for a developed corridor, the KY 80 alternate is expected to have greater impacts to cultural sites, archeological sites and developed land uses.

North Alternates: The north alternates are expected to provide lesser impacts to natural areas, threatened/endangered species and historic structures than any alternates that require the development of new highway corridors. All of the north alternates either avoid the Wild River area of the Rockcastle River or cross at the existing KY 80 bridge. The N-2 and N-3 alternates present concerns due to their close proximity to Wood Creek Lake. As for cultural sites, mixed impacts are seen with the north alternates, with generally higher than average impacts to potential archeological sites.

Middle Alternate: This corridor provides the least anticipated impact to cultural and social land uses but may have some of the highest impacts to forested and sensitive areas among all of the corridor alternates. In particular, this corridor would pass through the largest portion of the Daniel Boone National Forest and would create a new crossing of the Rockcastle Wild River area. This issue alone might make the middle alternate environmentally prohibitive.

South Alternates: The south alternates are anticipated to create lesser impacts to archaeological sites and historic structures but may have some of the highest impacts to natural areas, threatened/endangered species and area lakes. All of the alternates pass in close proximity to Laurel River Lake and the S-3 alternate also creates a new crossing of Lake Cumberland. These alternates fall in close proximity to the Cane Creek Wildlife Management Area and pass through some sensitive and pristine areas of the Daniel Boone National Forest.

Engineering and Construction Issues

The initial step in the evaluation of engineering and cost impacts was to develop preliminary layouts of a generalized interstate highway constructed within each alternate corridor based upon assumed typical sections. Standard geometric criteria for the proposed improvements include:

- 70 mph design speed;
- Moderate horizontal and vertical curvature;
- Access available at interchanges only;
- Four lanes, twelve-foot wide each; and
- Approximately 125 to 500-foot wide right-of-way depending on terrain and area.

Engineering and construction issues, along with overall costs for each alternate were evaluated based upon these standard criteria, using basic unit cost estimates formulated by the Kentucky Transportation Center as part of the 1997 Economic Feasibility Study of the I-66 corridor. Cost components for design, right-of-way, utilities, bridges, interchanges and construction were calculated based upon the cost factors outlined in the report. Cost estimates were calculated based on the previously noted geometric criteria.

The KY 80 alternate is estimated to have the most expensive overall costs and per-mile costs of all the alternates. While a number of sections along KY 80 could be efficiently widened and reconstructed, other sections would prove very difficult. Two options were included for the KY 80 alternate. One option included frontage roads. The other option excluded frontage roads but required higher relocation costs. Although varying significantly within individual cost categories, the total project costs for the two KY 80 options are very close, with the option utilizing frontage roads being slightly higher than the option without frontage roads.

For corridor alternates, the north alternates generally provide lower overall and per-mile costs; however, alternates N-2 and N-3, which pass north of London, entail high interchange costs because of the I-66/I-75 interchange north of London. It would be located near the community of Pittsburg where I-75, the CSX railroad, and US 25 all fall in close proximity, requiring additional elevated bridge structures to cross this location. The middle alternate offered the least expensive overall costs. This alternate provided the shortest and most direct routing and had a limited number of interchanges, due to the lack of crossroads between Somerset and London. The south alternates generally provide higher overall costs due to the length of their construction. However, these alternates provide the least expensive per-mile cost with the exception of S-3, which requires additional bridge construction at Lake Cumberland and additional right-of-way costs in the vicinity of Somerset.

Analysis Data Summary

A summary of data compiled for the alternative corridors is provided in **Table S.1**. This summary offers a comparison of many of the traffic and socioeconomic, environmental, and engineering/construction issues discussed in the preceding sections. Relative advantages and disadvantages of alternatives can be illustrated with this summary; however, it should be emphasized that this summary is a purely quantitative analysis. The final recommendation for a preferred corridor considers these quantitative results, but also accounts for many qualitative factors, including public input, in drawing conclusions.

Public and Agency Input

Throughout the course of the I-66 Corridor Planning Study, local citizens, public officials and representatives from government resource agencies were given the opportunity to provide input on the proposed corridors and issues of relevance to the study. A general consensus of findings is included in the following sections. This includes questionnaires, public comments and reviews by the general public, public interest groups and local, state and federal agencies, including the Cumberland Valley Area Development District, the Lake Cumberland Area Development District, U. S. Forest Service, Federal Highway Administration (FHWA) and KYTC officials.

Public Participation

An initial set of public meetings was held for this study on June 15, 1999 in Somerset and on June 17, 1999 in London. Attendees were allowed to ask questions and express their opinions through public comments or written questionnaires. Generally, those in favor of the project cited economic improvements, travel benefits and safety enhancements for the region. However, many citizens were opposed to a recommended corridor proposed along a south alignment. Most of the opposition focused on potential damage to the environment in relation to the Daniel Boone National Forest, the area's rivers and streams, and endangered species.

Because of general concern for the recommended alternate corridor presented in the initial meetings, the alternatives considered for I-66 were expanded to ten corridors. Included in these corridor alternates was an option for using KY 80. Data and analysis results were assembled on each of the corridor alternatives that described traffic benefits and socioeconomic factors, potential environmental impacts, and issues related to engineering and construction costs. A second set of public meetings was held for this study on March 21, 2000 in Somerset and March 23, 2000 in London. Registered attendance at these meetings included 335 individuals in

Somerset and 200 individuals in London. The purpose of these meetings was to present the data on the alternative corridors and to allow attendees to comment on the corridor alternatives and analysis results.

Legal advertisements were run in local newspapers, flyers were posted at locations around the communities, and notices were shown on television cable access channels. Cabinet officials also spoke with reporters from newspaper, radio and television prior to the meetings. Information packets, maps and public input questionnaires were made available prior to the public meeting at the Area Development District office in London, the Highway District Office in Somerset, and on the Cabinet's Internet web site. Following the meetings, questionnaires were posted on the Cabinet's web site along with the presentation slides used at the public meetings. Citizens who could not attend the public meetings were also able to mail or e-mail questionnaire responses directly to the KYTC for inclusion into the meeting results.

Many of the same questions and concerns, both in favor and opposed to the corridors, were expressed at the second series of public meetings. The questionnaires distributed at the meetings posed three basic questions, with summaries provided in **Exhibit S.7**. The first question asked which corridor evaluation issues were most important to the respondents. Traffic and socioeconomic issues were cited by approximately 39 percent of the responses, environmental issues by 30 percent and engineering and costs issues by twelve percent. Lesser percentages of respondents identified combinations of the issues cited above. The second question asked if the respondent was in favor of the construction of the I-66 corridor. Of the respondents, approximately two-thirds were in favor of the construction of I-66 and these generally cited economic growth, improved access and congestion relief as reasons for their support. Those who were generally opposed to the corridor expressed feelings that the route was not justified or may cause negative environmental impacts. The third question asked for the respondents' preferred route(s) and approximately 35 percent of these respondents identified KY 80 as the most preferable corridor, 29 percent preferred the north corridor alternates, 25 percent preferred the south corridor alternates, and eleven percent preferred the middle alternate.

Exhibit S.7 Questionnaire Responses (resulting from input following March 2000 meetings)

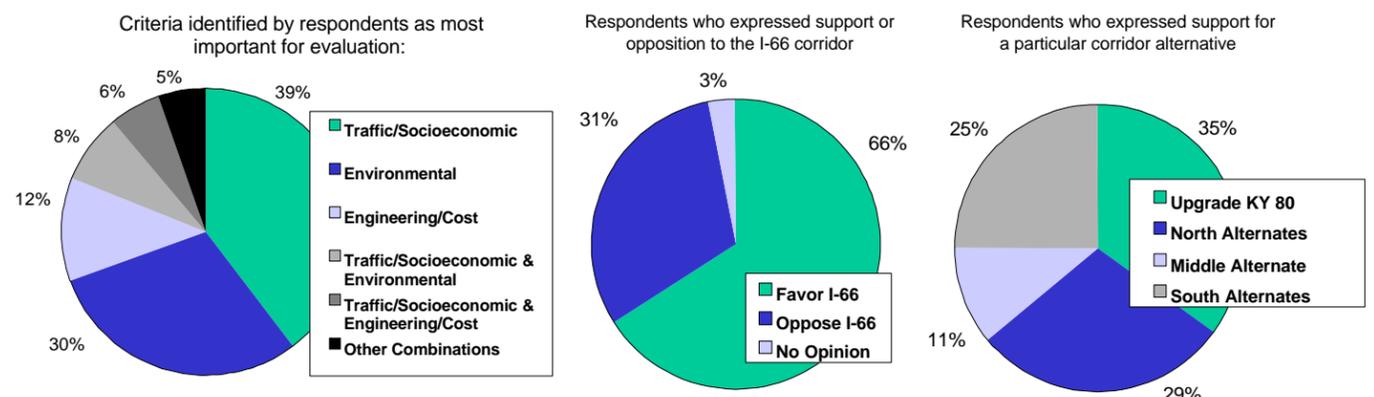


Table S.1 Analysis Data Summary

Alternate	* Key Traffic/Socioeconomic Features *									
	Projected Traffic Volumes	Time Savings	Distance Savings	Daily VMT Served	Daily VHT Saved	Accident Re- ductions	Displace- ments ¹	Rec- reational Facilities	Industrial Service- ability	Environ- mental Justice
	VPD	M:S	Miles	VMT	VHT	Number	Number	Miles	Miles	Percent
KY 80	20,300	11:00	3.7	936,000	3720	482	480	36.0	5.2	23
N-1	20,400	11:26	4.1	930,000	3890	479	300	33.1	5.6	30
N-2	14,600	10:48	3.4	674,000	2560	348	240	36.3	5.7	13
N-3	18,500	12:04	4.8	834,000	3730	430	270	36.1	5.7	15
N-4	19,900	10:26	3.1	932,000	3470	480	330	31.8	5.7	29
M-1	15,500	11:20	4.0	707,000	2920	365	140	32.5	5.4	23
S-1	15,800	8:18	0.7	774,000	2180	399	300	27.7	5.9	15
S-2	15,500	7:27	-0.2	775,000	1920	399	280	27.7	6.2	14
S-3	15,000	8:24	0.8	736,000	2110	379	380	27.3	6.6	17
S-4	16,600	7:49	0.2	820,000	2160	423	310	27.9	5.4	16

¹ Indicates the number of primary structures contained within a 500-foot corridor.

Alternate	* Key Cost Features *							
	Length ¹	Cost Items					Total Cost	
		Miles	Construction (million \$)	Bridges ² (million \$)	Inter- changes ³ (million \$)	Design (million \$)	Right-of-Way and Utilities (million \$)	Project (million \$)
KY 80-1 ⁴	38.4	308.1	103.0	121.4	116.8	519.1	1,168.4	30.5
KY 80-2 ⁵	38.4	564.0	103.0	121.4	117.6	269.7	1,175.7	30.7
N-1	39.0	387.5	88.4	121.4	88.7	200.9	886.9	22.7
N-2	41.5	412.2	84.0	136.4	94.3	215.9	942.8	22.7
N-3	40.1	398.5	84.0	136.4	92.2	210.7	921.8	23.0
N-4	43.2	429.7	86.2	121.4	95.0	217.1	949.4	22.0
M-1	39.1	388.4	88.4	108.2	86.8	196.2	868.0	22.2
S-1	45.6	443.9	99.4	114.8	97.6	220.7	976.4	21.4
S-2	46.5	461.9	92.8	114.8	99.6	227.3	996.4	21.4
S-3	48.9	486.3	148.5	121.4	111.0	242.5	1,109.7	22.7
S-4	42.9	426.2	95.0	114.8	94.4	213.6	944.0	22.0

¹ Miles

² Includes Overpasses and Railroad Structures

³ Includes One Rest Area per Alternate

⁴ Includes Purchase of 1798 Parcels @ \$155,000 Each & No Frontage Roads

⁵ Includes Approximately 52.2 Miles of Frontage Roads

Alternate	* Key Environmental Features within a 2,000-foot Corridor (unless noted as 500-foot) *														
	Archaeology Sites	Cemeteries	Churches	Historic Structures	Schools	DBNF Property ¹	Threatened & Endangered Species	Potential Threatened & Endangered Species	Known Cave Routes ¹	Cliff Lines ¹	Stream Crossings	Wetland Sites	Wild River Crossing	Oil & Gas Wells ²	Hazardous Sites (EPA & USTs) ³
	Each	Each	Each	Each	Each	Acres	Each	Each	Feet	Feet	Each	Acres		Each	Each
KY 80	30	9	4	7	5	190	9	1	1,440	7,500	43	50	Yes	28	17
N-1	21	8	13	1	6	310	2	2	0	11,800	41	101	Yes	20	5
N-2	16	4	7	1	0	180	0	0	0	10,200	52	87	No	19	0
N-3	22	4	8	1	3	180	2	1	0	8,800	48	93	Yes	20	0
N-4	26	6	9	1	4	390	2	1	0	9,000	53	90	Yes	23	0
M-1	9	5	3	1	0	500	16	16	810	25,000	51	70	Yes	24	4
S-1	6	7	8	1	4	390	14	23	1,740	25,200	63	110	No	19	0
S-2	6	6	11	1	5	390	16	23	1,740	25,200	58	110	No	20	0
S-3	10	9	7	1	2	380	7	22	2,900	28,200	69	220	No	3	0
S-4	6	9	10	1	4	390	14	23	1,740	25,200	57	90	No	19	4

¹ Within a 500' corridor.

² Includes abandoned sites.

³ Environmental Protection Agency (EPA) and Underground Storage Tank (UST) sites.

Resource Agency Input

Numerous resource agencies were included in the public involvement process including representatives from the following agencies:

- U.S. Forest Service, Daniel Boone National Forest (DBNF)
- Kentucky Department of Fish and Wildlife (KDFWR)
- U.S. Fish and Wildlife Service (USFW)
- Federal Highway Administration (FHWA)
- Kentucky Workforce Development Cabinet (KWDC)
- Kentucky Cabinet for Economic Development (KCED)
- Kentucky Heritage Council (KHC)
- Kentucky Tourism Development Cabinet (KTDC)
- Local Emergency Management Services (EMS)
- West Virginia Division of Highways, Planning Division (WVDOH)
- Kentucky Transportation Cabinet (KYTC)

Attendees at two resource agency meetings held in conjunction with the study were provided with information detailing the evaluation process, corridors considered, project challenges and areas of study focus. During the meetings, questions were raised regarding the relationship of the current study to subsequent NEPA documentation. Further questions were raised and comments offered about several specific environmental areas including wetlands, threatened and endangered species, historic structures and area lakes. Attendees identified a need and opportunities to share data among project sponsors and resource agencies.

In regard to the Laurel River Lake area, it was noted that negative impacts may result from the interstate's close proximity to the lake. According to user surveys collected by the U.S. Forest Service, the lake is already over-used and providing better access to the lake would only worsen the problem. Further items addressed include a potential interchange location with I-75, Native American input, and KY 80 cost estimating. It was noted that this study is an early planning document that would require several further studies.

Evaluation Conclusions

Evaluation of the study corridors identified a number of advantages and disadvantages for each of the alternates, listed in **Table S.2**. In short, the evaluation results indicated the following:

- KY 80 Alternate
 - Generally good in most traffic and socioeconomic areas
 - Slightly below average in environmental categories
 - More expensive project costs
 - Many access control and right-of-way issues
 - Geometric, design and operational issues
- North Alternates
 - Generally good in most traffic and socioeconomic, environmental and cost categories

- Alternates passing between London and Corbin offer better traffic service
- Middle Alternate
 - Modest traffic service
 - May require additional highway service infrastructure
 - Impacts to undisturbed natural areas
 - Potentially prohibitive impacts to the Wild River portion of the Rockcastle River
 - Least expensive costs
- South Alternates
 - Generally below average in traffic and environmental categories
 - Particular concerns relative to impacts to the Daniel Boone National Forest
 - Greater impacts to threatened and endangered species
 - Potential negative impacts to Laurel River Lake
 - Average overall costs

Recommended Alternate

On April 26, 2000, an Interdisciplinary Team (IDT) meeting was held with representatives from throughout the Transportation Cabinet. Included in the meeting were representatives from the Office of the Secretary, Office of the State Highway Engineer, Districts 8 and 11, Program Management, Design, Bridges, Construction, Environmental, Materials/ Geotechnical, Operations and Right-of-Way/Utilities. Also included in the meeting were representatives from the Lake Cumberland and Cumberland Valley Area Development Districts and the Federal Highway Administration. The meeting included a review of the background of the study and prior project activities, a review of project goals, a presentation of alternative corridors, discussion of advantages and disadvantages within each alternative corridor, the analysis methodology, a summary of public input and the development of study recommendations.

Based upon all of the concerns expressed, meeting participants were able to proceed through the corridor alternatives and arrive at a consensus recommendation for the project. Consensus was reached among meeting attendees on the recommendation of a corridor alternative that would be largely representative of the N-4 alternate. It was suggested, however, that the study recommendations permit future consideration of the following issues relative to potential alignment options:

- North of Somerset, consider opportunities to adjust the corridor northward to better avoid new subdivisions in the area;
- From Somerset to east of the Rockcastle River, the recommended corridor should include portions of the KY 80 corridor to the maximum extent possible;
- West of I-75, the corridor should seek to reduce the number of crossings of Sinking Creek in order to minimize potential impacts to threatened and endangered species habitats; and
- More detailed studies will be required in the design phase to finalized the location of the I-66/I-75 interchange. The interchange is expected to be located in a section that is at least one to one and a half miles north of the southbound weigh stations.

Exhibit S.8 provides a map showing the recommended corridor for I-66.

Table S.2 Evaluation Matrix

Alternate	Advantages	Disadvantages
KY 80	Provides above average traffic service	Most expensive project costs
	Improves system connectivity	Difficult I-75 interchange issues at Pittsburg
	Minimal impacts to DB National Forest	Extensive maintenance of traffic
	Avoids cliff lines, streams and wetland sites	May require frontage roads or major ROW acquisition
	Improves an existing corridor	Major impacts to cultural and sensitive land uses
		Crosses the Wild River area
		Poor recreational access
		Requires the most number of displacements
N-1	Provides best traffic service	I-75 crossing could impact airport
	Avoids areas of disadvantaged populations	Poor accessibility between KY 80 and I-75
	Offers service to London and Corbin	I-75 interchange may affect more homes and businesses
	Avoids many natural and environmentally sensitive areas	May impact more churches, schools and cemeteries
	Provides good service to industrial areas	Provides below average system connectivity
	Has lower than average project costs	Impacts the Wild River Area
	Can potentially use strip-mined lands	
	DB Parkway tie closer to London	
N-2	No impact to Wild River boundary	Constructibility difficult in areas of rugged terrain
	Avoids most natural and environmentally sensitive areas	Provides below average traffic service
	Avoids the most threatened and endangered species	Most likely to impact disadvantaged populations
	Offers good industrial and system serviceability	Does not access lake and recreational areas
	Avoids many cultural land uses	May potentially impact Wood Creek Lake
	Has lower than average costs	
N-3	Avoids many natural and environmentally sensitive areas	Presents construction challenges at I-75
	Impacts the least amount of DBNF	Carries less traffic around London
	Avoids known cave routes	Potentially disturbs more disadvantaged populations
	Provides best travel time and distance savings	
	Provides below average costs	
N-4	Carries higher than average traffic volumes	Impacts the Wild River area
	Offers high accident reduction	Potentially impacts more cultural land use areas
	Offers service to both London and Corbin	Provides below average system connectivity
	Avoids pristine areas of the DBNF	Construction challenges in rough terrain and basins
	Avoids many natural and environmentally sensitive areas	
	May offer best I-75 interchange location	
	Likely impacts fewer areas of disadvantaged populations	
Extends the corridor further east than other alignments		

Alternate	Advantages	Disadvantages
M-1	Provides shortest distance	Provides below average traffic service
	Provides the lowest overall project cost	Provides poor system connectivity
	Causes the least number of displacements	May cause significant impact to DBNF
	Requires low maintenance of traffic during construction	Likely impacts many threatened and endangered species
	Provides above average industrial serviceability	Direct impact to the Wild River area
	Causes minimal impact to cultural land uses	
	Avoids many wetland sites and cave routes	
S-1	Improves an existing corridor	Provides below average traffic service
	Provides average system and industrial connectivity	Likely to impact disadvantaged populations
	Avoids known archaeological and historic sites	Significant impacts to the DBNF
	Avoids the Wild River area	Many environmental impacts overall
	Provides low per-mile project costs	Likely to affect many threatened/endangered species
	Provides access to communities south of London	
S-2	Crosses I-75 in less-populated area	Impacts existing weight stations
	Potential tie to US 25E possible	Provides below average traffic service
	Provides average system and industrial connectivity	Likely to impact disadvantaged populations
	Avoids known archaeological and historic sites	Significant impacts to the DBNF
	Avoids the Wild River area	Many environmental impacts overall
	Provides low per-mile project costs	Likely to affect many threatened/endangered species
S-3	Provides access south of Somerset	Large bridge structures required
	Provides average system and industrial connectivity	Interchange at US 27 not feasible
	Avoids known archaeological and historic sites	Significant impact to cave systems
	Avoids the Wild River area	Provides below average traffic service
	Provides low per-mile project costs	Likely to impact disadvantaged populations
	Provides access to communities south of London	Significant impacts to the DBNF
		Many environmental impacts overall
	Likely to affect many threatened/endangered species	
S-4	DB Parkway tie closer to London	I-75 crossing could impact airport
	Provides average system and industrial connectivity	Provides below average traffic service
	Avoids known archaeological and historic sites	Likely to impact disadvantaged populations
	Avoids the Wild River area	Significant impacts to the DBNF
	Provides low per-mile project costs	Many environmental impacts overall
	Provides access to communities south of London	Likely to affect many threatened/endangered species

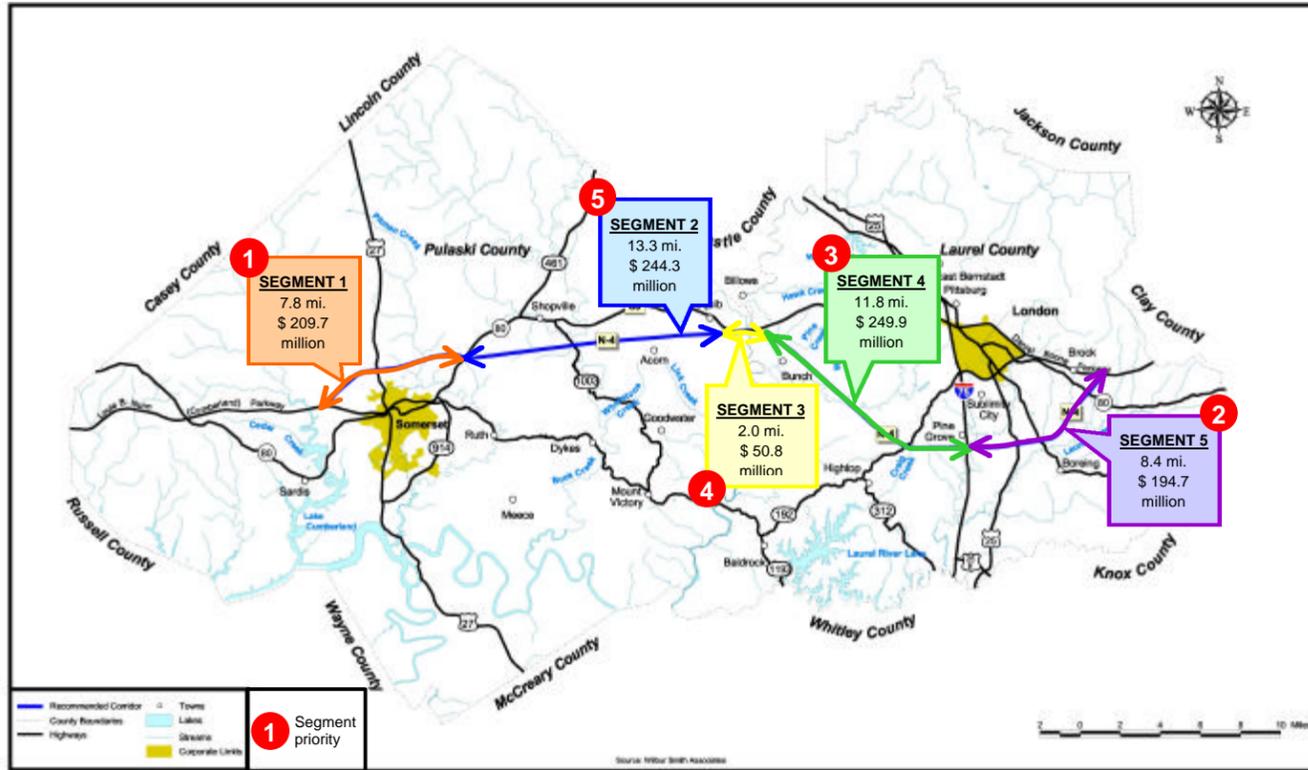


Exhibit S.8 Recommended Corridor for I-66

Recommended Costs, Priority Segments and Implementation

For the consideration of cost estimates and priority segments for the proposed I-66 corridor, the recommended alternate was divided into five basic sections. These segments are shown in Exhibit S.8. The section endpoints were chosen to represent logical termini for segments during the planning, funding, design and construction processes. It is important to note that the segment names do not represent the recommended phasing order for the corridor – they are only intended for identification purposes.

Using the unit costs identified for this project’s geometric criteria, total project costs were estimated for the recommended corridor. Cost components calculated for each segment of the route include design, right-of-way, utilities, bridges, interchanges, rest areas and construction activities. As shown in **Table S.3**, total estimated costs for the recommended corridor are approximately \$949 million.

In order to continue existing Somerset Bypass efforts and provide a complete bypass facility, Segment 1 is recommended to be the first priority for the I-66 project. Segment 5, the London Bypass, is situated in an area with on-going development activities. In order to acquire contiguous right-of-way for the design and construction of this portion of the route, Segment 5 is recommended to be the second priority. This section will also become more critical as traffic and safety concerns continue to increase along existing facilities on the north side of London.

Table S.3 Recommended Corridor Cost Estimates

Segment	Length (miles)	Cost Items (million \$) ¹					Total Cost (million \$) ¹	
		Construction	Bridges ²	Interchanges ³	Design	Right-of-Way and Utilities	Project	Per Mile
1	7.7	77.2	25.5	39.6	21.0	46.4	209.7	
2	13.3	131.8	18.0	13.2	24.4	56.9	244.3	
3	2.0	19.9	11.9	4.0	5.1	9.9	50.8	
4	11.8	117.5	8.8	38.2	25.0	60.4	249.9	
5	8.4	83.3	22.0	26.4	19.5	43.5	194.7	
Total	43.2	429.7	86.2	121.4	95.0	217.1	949.4	22.0

¹ Items have been rounded.
² Includes overpasses and railroad structures.
³ Includes one rest area per alternate.

For the remaining segments, it is important to consider that the facility will not be continuous without the completion of Segment 4, from the Rockcastle River’s eastern approach to I-75. Also, traffic model projections indicate that volumes between Somerset and the Rockcastle River will be largely dependent upon the routing of the corridor between the River and London. Until Segment 4 is completed, the amount of new traffic drawn to the corridor is expected to be limited. Therefore, it is recommended that Segment 4 be the third priority, followed by Segment 3 and Segment 2, respectively. In this way, linkages will be created to maximize the use of this facility.

Using these identified segments, recommended priorities are as follows:

- Priority 1: Somerset Northern Bypass, Louie B. Nunn (Cumberland) Parkway to KY 80 (Segment 1)
- Priority 2: London Bypass, I-75 to the Daniel Boone Parkway (Segment 5)
- Priority 3: Eastern approach to the Rockcastle River Bridge to I-75 (Segment 4)
- Priority 4: Rockcastle River Bridge and approaches (Segment 3)
- Priority 5: KY 80 to the western approaches of the Rockcastle River Bridge (Segment 2)

Costs for the I-66 project are expected to be expensive and special funding sources will be required through the federal government. Approximately \$25 million in dedicated funding has been contributed to the project. It is possible that Federal funds for interstate improvements could also be set aside and used for I-66. A predetermined, yearly funding structure could possibly be made part of a budget plan and amortized over time to achieve the necessary funding for all of the priority segments.

CHAPTER 1 – INTRODUCTION

The Southern Kentucky Corridor (I-66) Planning Study is a planning study of a proposed interstate corridor between Somerset and London in Southern Kentucky. This study report documents the existing transportation, socioeconomic and environmental conditions along the study corridors; analyzes future traffic demand; and evaluates corridor alternatives based on traffic and socioeconomic data, environmental issues and engineering and construction costs. The study corridors are one-half-mile to one-mile bands within which ultimate roadway alignment options will be considered in future studies under the process set forth by the National Environmental Policy Act of 1969 (NEPA). For analysis purposes, this study examines corridor alternatives that are generally 2,000 feet in width.

A. PROJECT BACKGROUND

The 1991 Intermodal Surface Transportation Efficiency Act (ISTEA) identified high priority corridors on the National Highway System. The East–West Transamerica Corridor (I-66) was one of these high priority corridors, generally located between and parallel to I-70 and I-40 with an eastern terminus in Virginia and a western terminus in southern California, as shown in **Exhibit 1.1**. Based on Federal transportation legislation, the portion of the corridor through Kentucky is represented as a 50-mile wide band width centered on the cities of Pikeville, Jenkins, Hazard, London, Somerset, Columbia, Bowling Green, Hopkinsville, Benton and Paducah, as shown in **Exhibit 1.2**.

The Transportation Equity Act for the 21st Century (TEA-21) also established funding for the Somerset to London segment of the I-66 corridor as a high priority corridor. Existing routes within the project area are increasingly less safe to travel with growing traffic volumes and projected decreases in existing levels of service. Truck traffic in the area also adds to safety concerns, since many of the two-lane routes have substandard geometrics, such as narrow lane and shoulder widths and insufficient passing zones.

Part of the high priority corridor initiative involves the improvement of depressed or impoverished regions by increasing access and mobilization. The southeastern region of Kentucky has been traditionally known for its below-average income rates. **Exhibit 1.3** shows poverty rates as a percentage of population for each county in the Commonwealth of Kentucky. As shown, the identified corridor for the proposed I-66 route crosses portions of Kentucky with some of the highest poverty rates. An average poverty rate was calculated for the counties (and portions of partial counties) included within the identified I-66 corridor. The average rate, 23.3%, is more than five percent higher than the statewide average rate of 17.9%. For counties in Kentucky through which an existing interstate passes, the poverty rate falls to 14.7%, lower than the statewide average.

B. PREVIOUS STUDIES

As a result of the ISTEA legislation, consultants Wilbur Smith Associates (WSA) and Howard, Needles, Tammen and Bergendoff (HNTB) were selected in 1992 to conduct a national East-West Transamerica Corridor Feasibility Study. In this study, indicators of feasibility for the corridor included:

- Engineering feasibility (constructability and cost);
- Economic feasibility (efficiency, productivity and development);
- Financial feasibility (costs, revenues and funding);

- Implications (environmental, energy, safety and demographic);
- Need (passenger and freight utilization); and
- Institutional feasibility (legal, legislative and public policy).

A Steering Committee consisting of representatives of eleven states and the Federal Highway Administration (FHWA) provided technical direction to the study while the Missouri Highway and Transportation Department served as administrative agent. This study, titled the “Transamerica Transportation Corridor Feasibility Study,” was completed in 1994. While this study concluded that the entire coast-to-coast corridor did not meet the economic feasibility criteria established for the study, it did conclude that further analysis could find some segments of the corridor feasible from a state or regional perspective.

In 1997, the Kentucky Transportation Center (KTC) completed a study for the Kentucky Transportation Cabinet (KYTC), concluding that the Southern Kentucky Corridor (I-66) through Kentucky was indeed feasible. Titled the “Southern Kentucky Corridor (I-66) Economic Justification and Financial Feasibility Final Report,” this study identified the Somerset to London segment of the I-66 corridor as a priority segment. Results indicated that such a corridor could provide economic development benefits, quality of life benefits, and additional employment opportunities for the corridor area counties. The study included public participation through an advisory committee, public meetings, and newsletters sent to all parties who expressed an interest in the project.

A number of benefits can often be directly attributed to a new interstate route. According to the KTC’s Feasibility Study, benefits include:

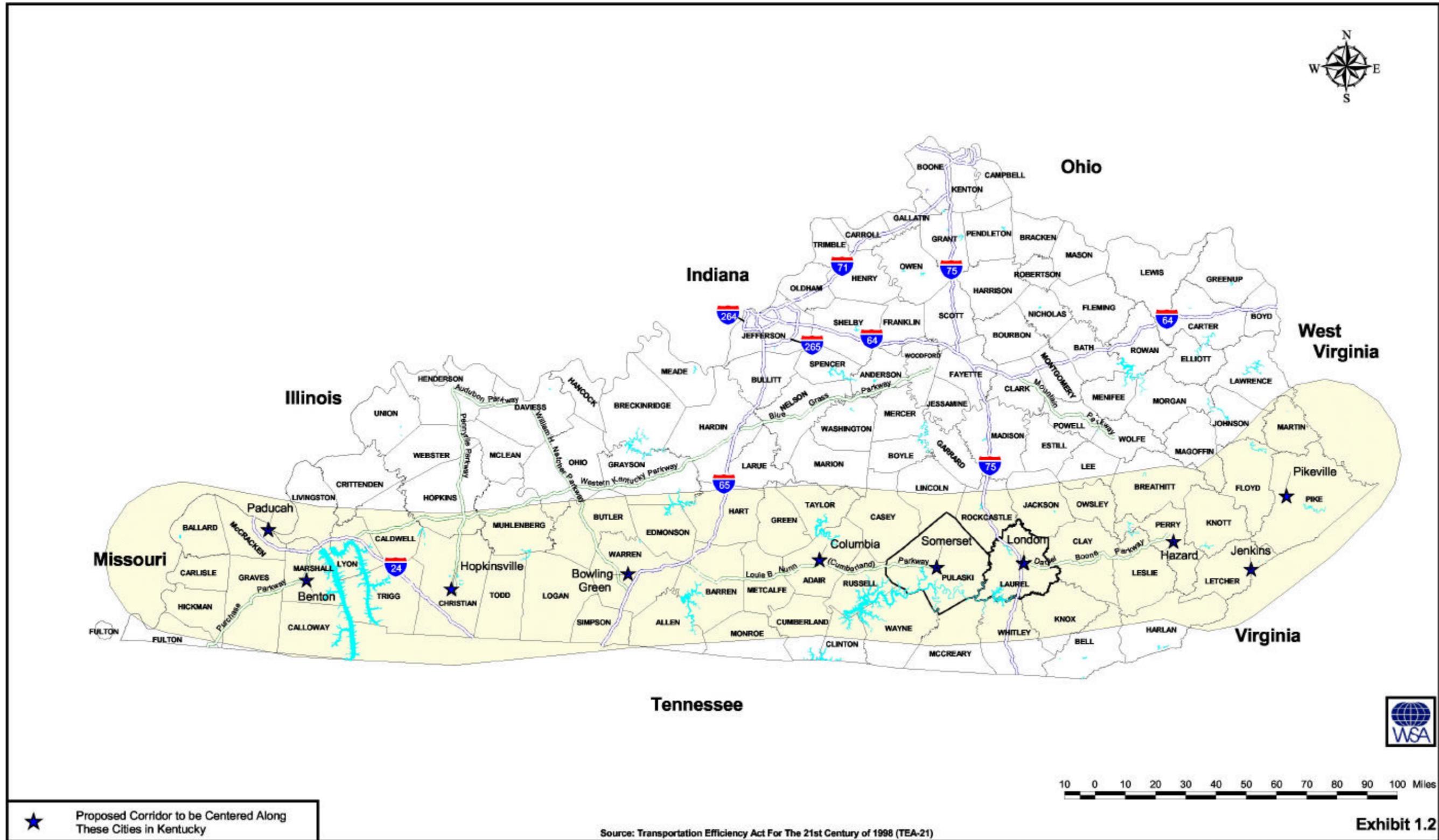
- Increased regional transportation system efficiency;
- Improved personal and urban mobility;
- Reduction in travel-times and vehicle operation costs;
- Reductions in accident rates, severity and costs;
- Improved employment opportunities;
- Reductions in freight costs;
- Increased manufacturing efficiency;
- Increased economic development opportunities;
- Improved access to health care facilities; and
- Improved air quality with consistent speed.

C. PURPOSE

The purpose of this study is to identify areas of concern, benefits of such a project, public input, and an environmental footprint from known documentation; to evaluate corridor alternatives; and to provide recommendations based upon the aforementioned and more specific evaluation criteria for future project development activities for the I-66 corridor project between Somerset and London. This study is intended to develop recommendations at a corridor level, based on existing topography (i.e., contours, streams, subdivisions, cemeteries, highway crossings, etc.), environmental features, traffic needs, socioeconomics, estimated costs, and engineering judgment.



Corridor 3-The Transamerica Corridor (Interstate 66)



Source: Transportation Efficiency Act For The 21st Century of 1998 (TEA-21)

Proposed I-66 Corridor Through Kentucky (50 Mile Corridor Width)

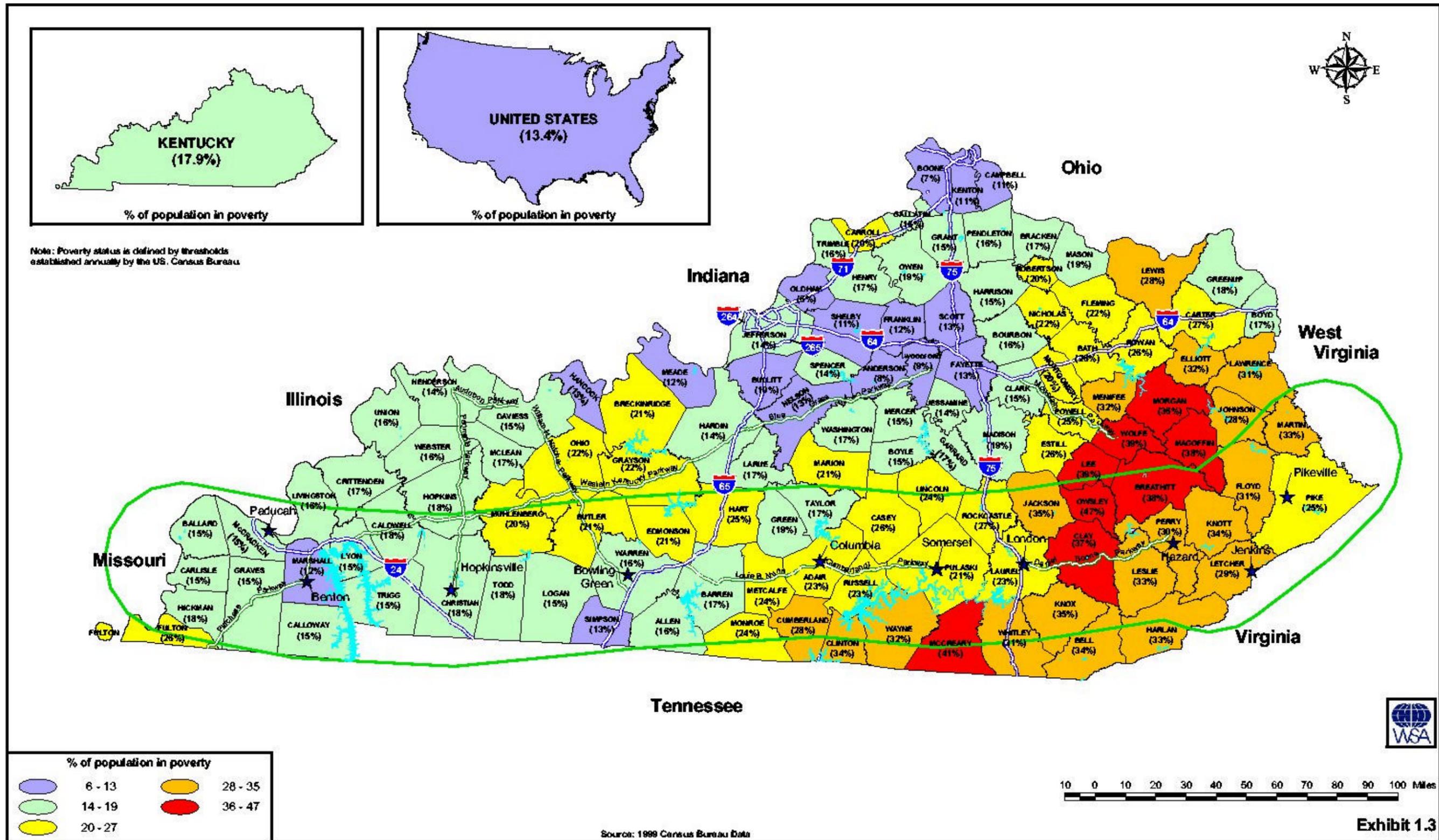


Exhibit 1.3
1995 Estimates of Persons in Poverty

The identified goal of this project is to provide an interstate transportation corridor extending from the Louie B. Nunn (Cumberland) Parkway, west of Somerset, to the Daniel Boone Parkway, east of London. The proposed facility from Somerset to London is expected to:

- Improve accessibility and traffic flow to the cities of Somerset, Corbin and London;
- Maximize connectivity to other major roads in the region;
- Improve accessibility to tourism and recreational facilities in the immediate vicinity of the corridor and the region;
- Improve highway access to enhance economic development potential for counties throughout southeast Kentucky;
- Improve access and mobility in depressed or impoverished regions;
- Accommodate increasing traffic and truck volumes by diverting traffic to an interstate facility;
- Improve travel safety by providing a safer travel route; and
- Fulfill enacted TEA-21 legislation.

Additionally, this study is intended to be used for the evaluation of projects with respect to their merit for inclusion in future Cabinet programs. The conclusions of this study are representative of the most accurate analysis possible based on current available information and the time allotted for evaluation. Later additional studies may reveal other needs or solutions, which are not readily apparent at this time.

D. PROJECT STUDY AREA

The project study area is located in south-central Kentucky and includes Pulaski and Laurel counties and the population centers of Somerset and London. Alternative corridors evaluated in this study are west-east corridors, providing connections between the Louie B. Nunn (Cumberland) and Daniel Boone Parkways. Some of the key existing routes within the corridor include Interstate 75, Louie B. Nunn (Cumberland) Parkway, Daniel Boone Parkway, US 27, US 25, KY 80, and KY 192.

The approximate limits of the study area boundary are as follows: two miles west of Fishing Creek on the Louie B. Nunn (Cumberland) Parkway near Somerset on the west; KY 80 on the north; near Brock on the Daniel Boone Parkway on the east; and a line between Burnside and Corbin on the south. All of the study corridors begin at the Louie B. Nunn (Cumberland) Parkway, west of Somerset, and end at the Daniel Boone Parkway, east of London. A location and vicinity map of the project area is shown in **Exhibit 1.4**.

E. REPORT CONTENTS

The remaining chapters of this report include Chapter 2 – Study Area Conditions, Chapter 3 – Proposed Corridors, Chapter 4 – Analysis of Alternatives, Chapter 5 – Public and Agency Involvement, and Chapter 6 – Recommendations/Conclusions. Further data, information and documentation on analyses and input to the study are identified in the appendices. These include Appendix A – Public Airport Facilities, Appendix B – Planned and Programmed Improvements, Appendix C – Critical Accident Rates, Appendix D – Federal and State Threatened and Endangered Species in Pulaski and Laurel Counties, Appendix E – Kentucky Geologic Survey

Report, Appendix F – Typical Section/Proposed Design Criteria and Appendix G – Public and Agency Involvement Materials.

CHAPTER 2 – STUDY AREA CONDITIONS

Existing and historic conditions within the study area were examined as part of this study, including socioeconomic information, existing transportation infrastructure, traffic and operational characteristics, and environmental issues.

A. SOCIOECONOMICS AND LAND USE

The socioeconomic overview outlines information related to the characteristics and features that serve to define the travel patterns within the I-66 study corridor from Somerset to London and the surrounding region. While providing an initial priority segment for the Southern Kentucky I-66 Corridor, the implementation of the Somerset to London segment will allow for a linkage between the Louie B. Nunn (Cumberland) and Daniel Boone Parkways. The development of this facility is intended to support the economic vitality of a broad region of southern Kentucky and Appalachia. It is also intended to improve travel safety, increase accessibility, enhance mobility and reduced congestion. These benefits will also result in the social, economic and land use impacts within the region. This section addresses population levels, labor force and employment characteristics, and land uses within the region, along with potential impacts related to the proposed I-66 corridor development.

1. Population

The study corridor from Somerset to London includes Pulaski and Laurel counties in south-central Kentucky. The estimated population levels of these counties for 1990 and 1999, and the projected population levels through 2020 are provided in **Table 2.1**. Predictions for historic population growth are obtained from the U.S. Bureau of the Census *1990 Census of Population and Housing*. Estimates of existing and future population levels are obtained from the Kentucky State Data Center at the University of Louisville.

Table 2.1 Population Estimates

Year	Pulaski	Laurel
1990	49,489	43,438
1999	57,110	52,015
2000	58,226	52,792
2010	63,712	59,710
2020	66,629	65,122

As shown, Pulaski and Laurel counties have experienced significant growth levels since 1990, with the population of Pulaski County increasing by 15 percent and the population of Laurel County increasing by nearly 20 percent.

Using the U.S. Census Bureau counts of population by census block group, the concentration of population within Pulaski and Laurel counties is illustrated in **Exhibit 2.1**. Much of the population within these counties is centered along north-south corridors in the region, with

the heaviest concentrations occurring within the cities of Somerset and London. In Pulaski County, population is concentrated north and south of Somerset along the U.S. 27 corridor. In Laurel County, population is generally concentrated south of London along the I-75 and US 25 highway corridors.

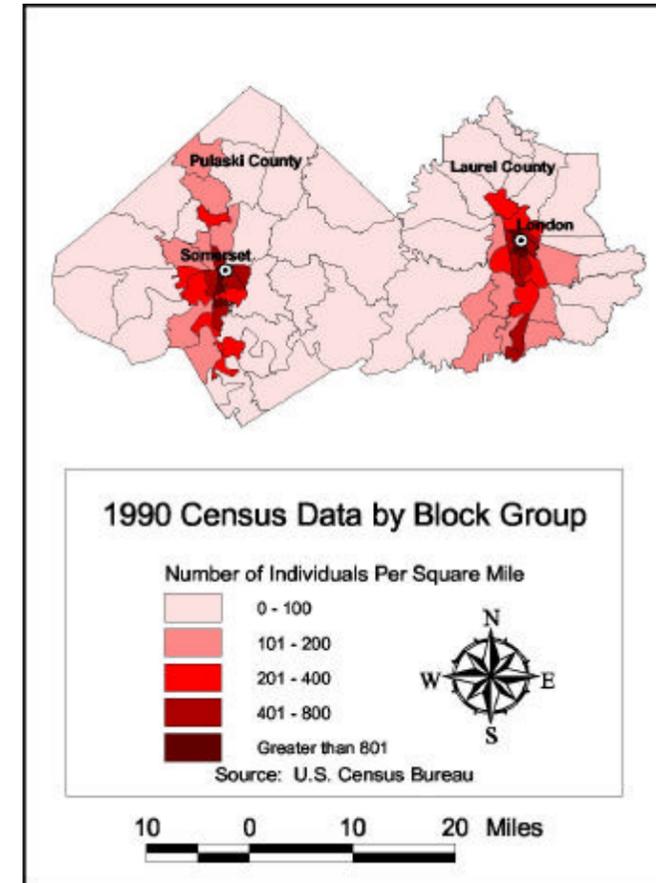


Exhibit 2.1 Block Group Population

In comparison to surrounding counties within the south-central Kentucky region, Pulaski and Laurel counties are clearly the population centers for the region in terms of both total population and population growth. Shown in **Exhibit 2.2** are 1999 population estimates for Pulaski and Laurel counties as well as the ten counties that surround these two counties. In addition to Somerset and London, other population centers in the surrounding area include:

- Corbin, Whitley County (8,000)¹
- Williamsburg, Whitley County (6,008)
- Monticello, Wayne County (5,720)
- Barbourville, Knox County (3,973)
- Stanford, Lincoln County (2,989)
- Mt. Vernon, Rockcastle County (2,603)
- Liberty, Casey County (2,003)
- Jamestown, Russell County (1,732)
- Manchester, Clay County (1,776)

Also shown in Exhibit 2.2 are population growth rates from 1990 to 1999 for the region. A number of the counties adjacent to the study area have experienced higher population

growth in the last ten years than the Kentucky average rate of 7.4%, including Lincoln (12.2%), Russell (10.0%), Wayne (9.9%), Jackson (9.1%), Whitley (8.4%), Rockcastle (7.9%), and Knox (7.8%) counties.

The implementation of the I-66 corridor through Pulaski and Laurel counties as well as through the entire southern Kentucky region could help to support population growth within this area. Improved access to the region would support existing populations and facilitate ever-increasing traffic flow between Somerset and London. Future project development activities should consider the impact that this potential population growth may have on the region in terms of compatible land uses and development issues.

¹ Population data is based on the U.S. Census Bureau 1998 census data and is shown in parentheses in terms of persons within each population center.

CHAPTER 2 – STUDY AREA CONDITIONS

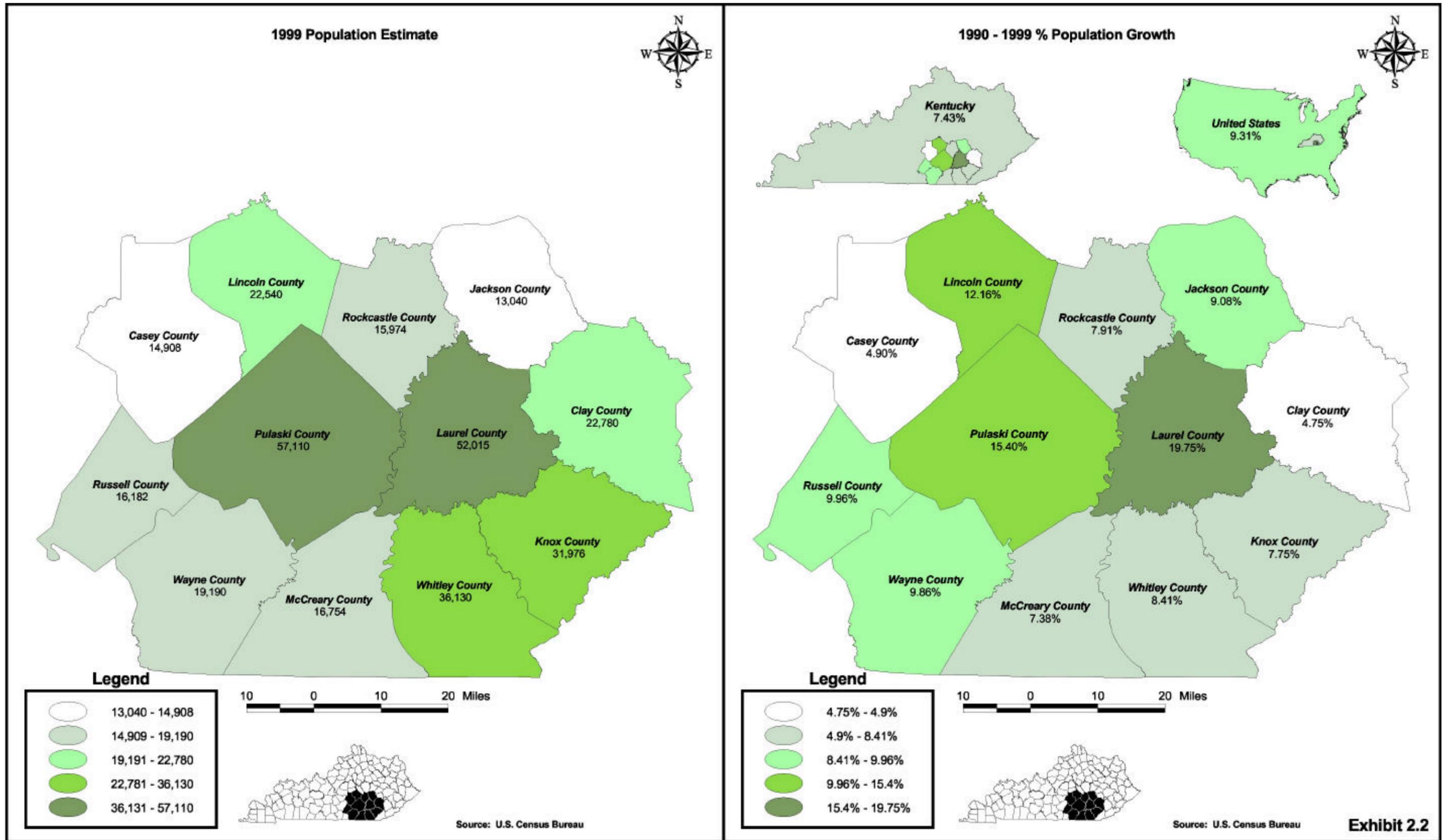


Exhibit 2.2

Population Characteristics

CHAPTER 2 – STUDY AREA CONDITIONS

2. Labor Force and Employment Characteristics

This section examines the labor force characteristics for the region, considering issues by place of residence of the workers. The section also examines employment characteristics, examining issues by place of employment of the workers. As of the year 2000, Pulaski County has an estimated total civilian labor force of 25,245, with an unemployment rate of 4.0 percent. Laurel County has a total estimated civilian labor force of 23,157, with an unemployment rate of 4.6 percent. As shown in **Exhibit 2.3**, the Pulaski and Laurel County unemployment rates are slightly lower than the rates in most of the surrounding counties. On the other hand, the Laurel County rate is higher than the state average unemployment rate of 4.0 percent.

Based on 1997 data, as shown in **Exhibit 2.4**, the per capita personal income (pcpi) for Pulaski County was \$17,470. This number is 85 percent of the state average pcpi (\$20,570) and 69 percent of the national average of \$25,288. For Laurel County, the 1997 pcpi was \$16,478, which is 80 percent of the state average and 65 percent of the national average. 1995 poverty estimates for the area indicate that 21.2 to 41.4 percent of the population in the study area counties is at or below poverty level. These rates are higher than the statewide poverty average of 17.9 percent. As of 1997, full and part time jobs totaled 30,872 in Pulaski County and 27,173 in Laurel County. Both of these figures are significantly higher than those for surrounding counties, as shown in **Exhibit 2.5**. Average earnings per job for the study area counties indicate that earnings in Pulaski and Laurel counties are higher than most of the surrounding counties, but quite similar to those in Clay, Knox and Whitley Counties.

Based on a 1992 breakdown of labor force characteristics in the I-66 corridor region, the components of employment in the study counties are listed in **Table 2.2**. Shown in **Table 2.3** are major businesses and industries that are located within the study area as of March, 2000. Agriculture also plays a large part in the local economies. The Kentucky Agricultural Statistics Service reported Pulaski County's 1997 total cash receipts as just over \$41 million dollars, ranking it 21st of the 120 counties in Kentucky. Laurel County, ranked 66th, had \$2.9 million in total cash receipts reported.

Table 2.2 Labor Force Characteristics

Type of Labor	Percent of Labor Force	
	Pulaski	Laurel
Wholesale and Retail Trade	32	28
Manufacturing	23	22
Services	19	20
State and Local Government	11	16
Contract Construction	7	4
Other	8	10

Potential benefits were identified through the results of the "Southern Kentucky Corridor (I-66) Economic Justification and Financial Feasibility" report completed for the corridor. Many area businesses, along with others within the categories listed in Table 2.2, are expected to have

an increase in trade due to the construction of the I-66 corridor. The retail trade and manufacturing businesses could have better interstate connections while the service industry (i.e., motels, gas stations, convenience marts, etc.) could see an increase in locations for potential business development near the I-66 interchanges. New jobs would be created to construct the I-66 corridor and to serve the development that accompanies a limited access highway, bringing an additional influx of people to the area. Furthermore, the contract construction business could increase as new developments are built, along with the construction of I-66. Both the state and local governments may need to provide more services in order to keep up with the demand of the additional business generated by I-66. In short, the implementation of the I-66 corridor through the study region could potentially decrease the unemployment rate and increase the pcpi.

Table 2.3 Study Area Industry

Pulaski	Employees	Laurel	Employees
CDR Manufacturing	100	Aisin Automotive Casting Inc	275
Crane Plumbing LLC	300	American Greetings Corp	950
Crane/FIAT/Sanymetal	135	Begley Lumber Co.	250
Mid-State Automotive Industries	100	CTA Acoustics	500
General Electric Co	180	Flav-O-Rich	250
Glen Oak Lumber & Millings Inc	100	Kern Earthgrains	300
Hartco Flooring Co.	285	Laurel Cookie Factory	300
Hayes Lemmerz Intl. Inc.	400	Leeco, Inc.	350
Kingsford Manufacturing Co	125	Mrs. Smith's Bakery of London	425
Lake Cumberland Regional Hospital	1500	Phoenix Manufacturing Co	100
Plaid Clothing	500	Thermo-Disc, Inc.	300
Somerset Refining, Inc.	178		
Southern Belle Dairy Co., Inc.	175		
Somerset Houseboats	200		
Techumseh Products Co.	750		
Toyotetsu America Inc.	230		

The proximity of a new route in the study area could also benefit businesses, employment opportunities and income levels in the surrounding counties. It is important to note that Clinton and Wayne Counties are designated U.S. Empowerment Zones, areas targeted for growth and revitalization through improved economic opportunities and community development. Likewise, Knox County (Corbin) is a Kentucky Enterprise Zone, encouraging development through tax incentives and eased regulations for new businesses.

CHAPTER 2 – STUDY AREA CONDITIONS

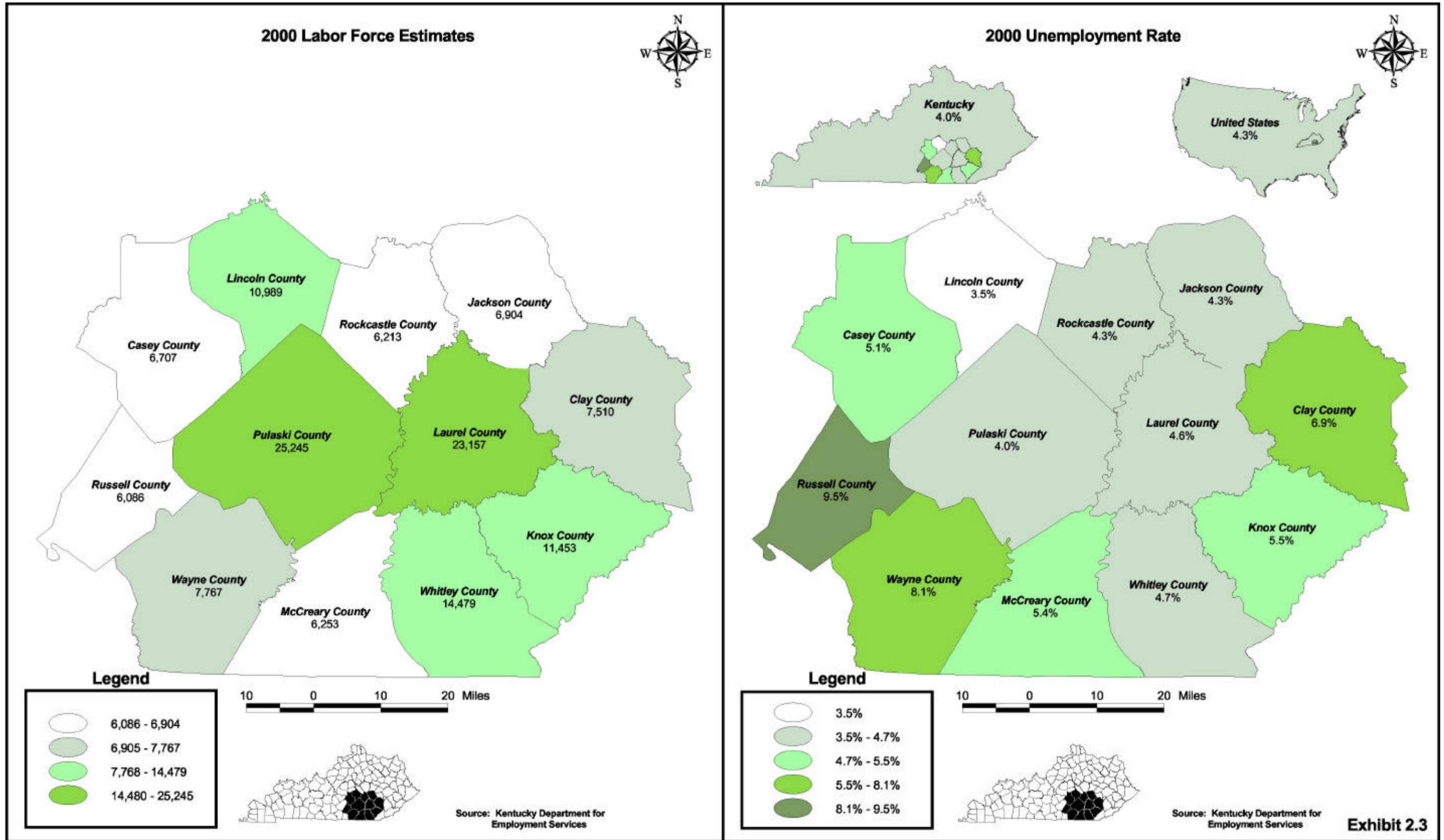


Exhibit 2.3
Labor Force Characteristics

CHAPTER 2 – STUDY AREA CONDITIONS

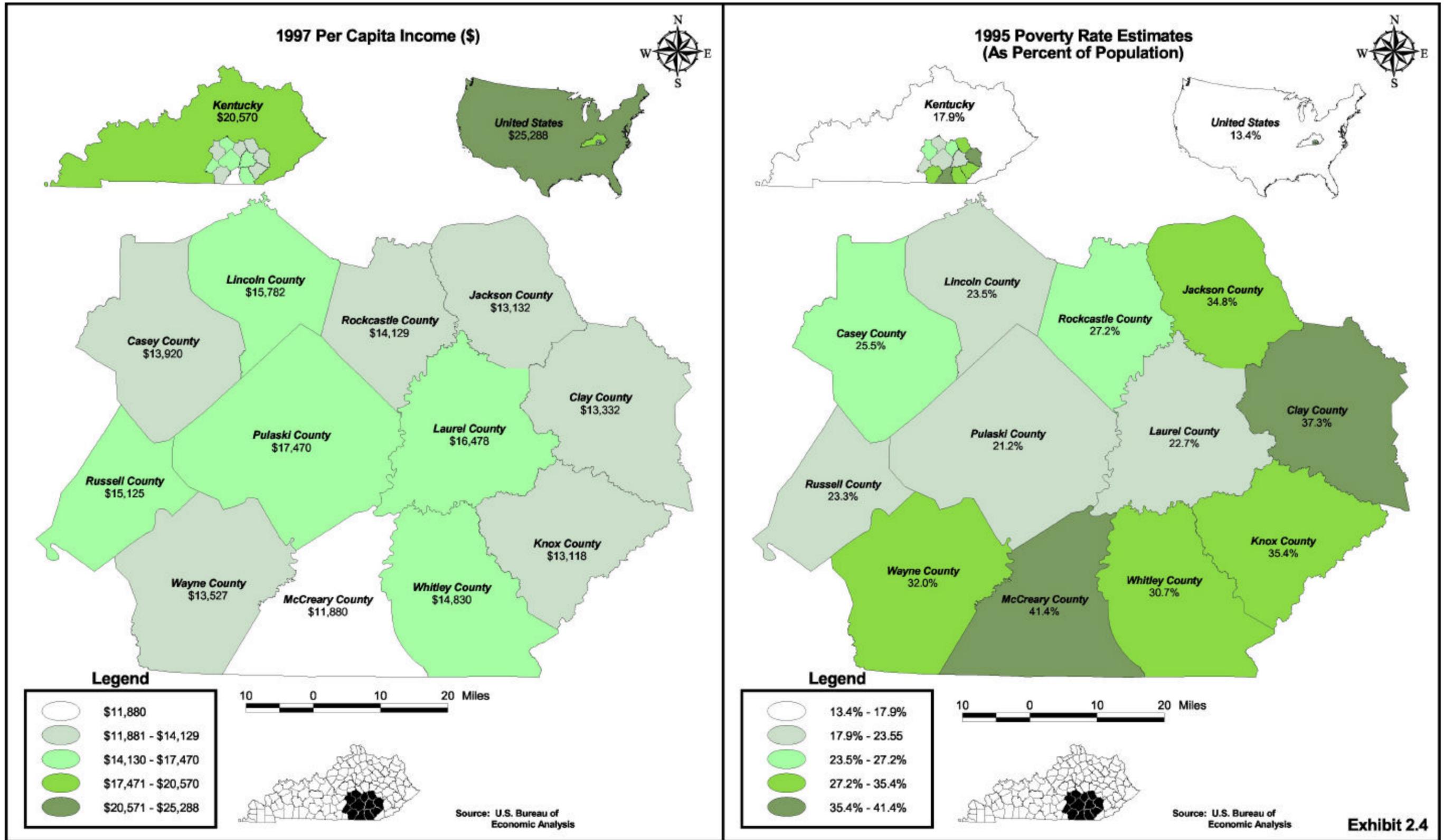


Exhibit 2.4
Earnings Information

CHAPTER 2 – STUDY AREA CONDITIONS

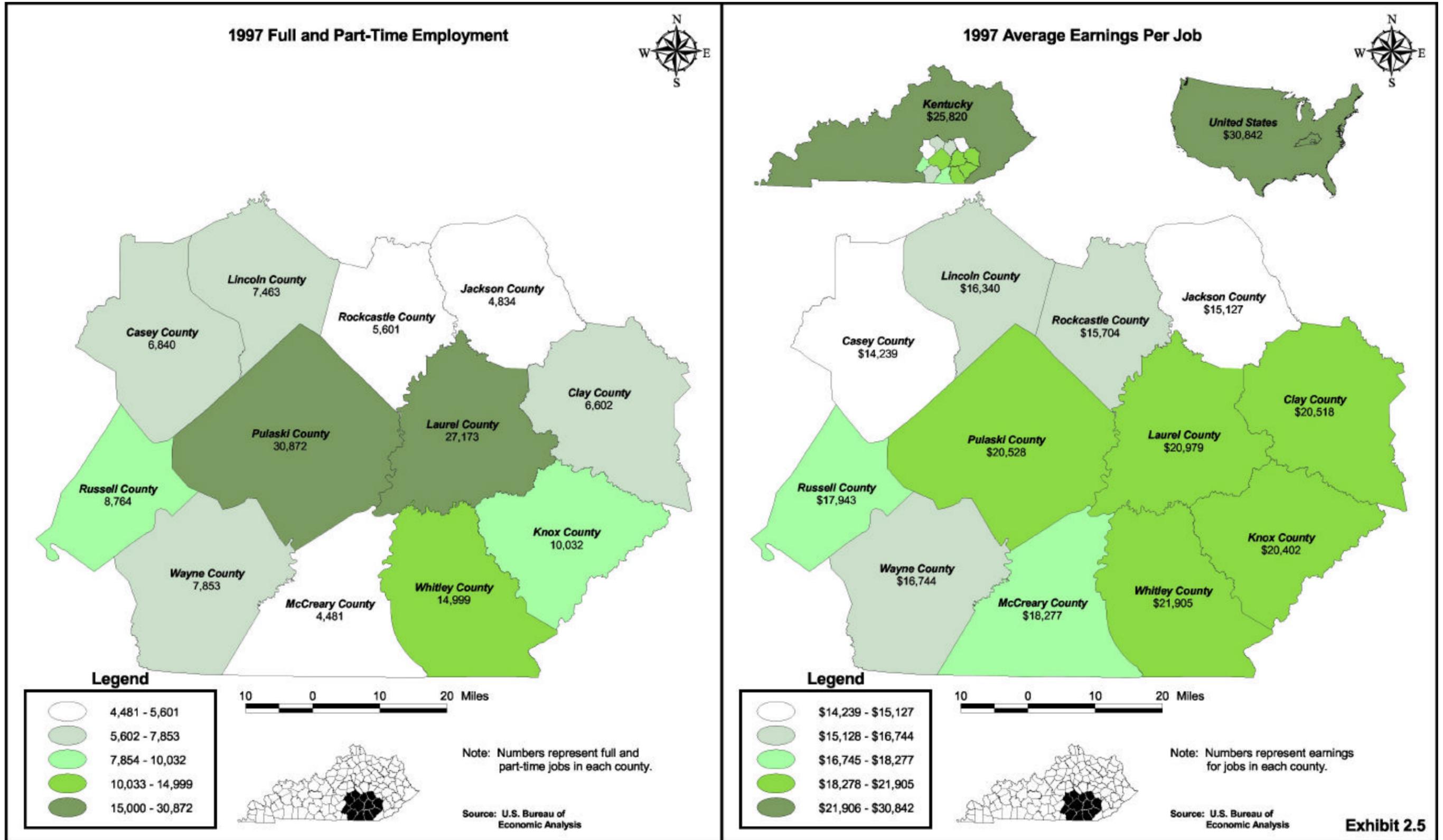


Exhibit 2.5
Employment Characteristics

CHAPTER 2 – STUDY AREA CONDITIONS

In addition to the possible increases in the employment sectors listed above, the tourism industry could experience substantial growth due to the improved access to the region from I-66. Lake Cumberland, Laurel River Lake, the Daniel Boone National Forest and Levi Jackson Wilderness Road State Park are a few of the major attractions located within the I-66 corridor. In 1994, Pulaski County had over 1,600 persons employed in travel and tourism-related enterprises, while Laurel County had over 1,800 persons involved in this type of employment. The potential growth in tourism could cause an increase in needed employment in the travel and tourism-related industry. Furthermore, the additional summer population generated by the tourism industry could put more dollars into the local economy, which could benefit the non-tourist businesses as well. Some of the regional tourism attractions are shown on **Exhibit 2.6**.

Although the impacts of a new interstate facility could be very beneficial to the economy by stimulating job growth and increasing each county's tax base, communities will have to plan for additional infrastructure and community services to serve the potential increases in businesses, future population growth and community needs. Because of projected population increases, potential areas of concern include noise and air quality issues, roadway congestion, and the need for additional infrastructure improvements to serve these demands. These are some of the items that will require additional coordinated and comprehensive planning with appropriate local and state agencies as the I-66 project continues through the development process.

3. Land Use

The I-66 study corridor features many types of rural and urban land uses. These include agricultural and woodland operations, commercial, residential, industrial, tourism, public/semi-public and transportation facilities (i.e., air, rail and highway). Urban land uses around Somerset and London and rural land uses for the remainder of the corridor characterize the study area. A generalized illustration of land uses within Pulaski and Laurel counties is provided in **Exhibit 2.7**.

Urban land uses include residential, public and semi-public, commercial, retail trade and personal service businesses and various types of manufacturing activities. Urban area boundaries are defined for cities where the population is 5,000 persons or greater. Within the corridor, there are two urban area boundaries – Somerset in Pulaski County and London in Laurel County. According to the U.S. Census, 1995 population figures estimate 6,629 people in London and 10,769 people in Somerset. The urban area that may be affected by the corridor near Somerset is generally located west of the KY 192 and KY 80 intersection. In London, the affected area is generally located between I-75 and the Daniel Boone Parkway. The city of Corbin, an urban area with a 1995 population of 7,932 persons, is situated south of the study area in Knox County and may also be impacted by a new interstate corridor.

Rural areas consist of a mixture of residential, agricultural and federally and state-owned forest property. Much of the rural land between Somerset and London is characterized by a mix of deciduous, evergreen and mixed forest lands of the Daniel Boone National Forest and other areas. Rural areas in the proximity of Somerset and London are characterized by a large amount of crop and pasturelands. Major crops and farm production within the study area include corn, soybeans, wheat, burley tobacco, alfalfa hay and other hays. The chief livestock in the study area includes cattle, hogs and pigs.

The impacts of developing the proposed highway corridor could potentially alter land use patterns by increasing the amount of land used for new development. In turn, these

developments could create an increase in the need for more infrastructure (i.e., water, sewer, schools, housing, etc.). Existing and potential land use effects should be considered in selecting a recommended corridor and in the future development of highway alignment options. While this consideration is being afforded at the earliest practical stages of highway planning, such considerations should continue through design, right-of-way acquisition and construction.

Highway development options to minimize land use impacts consist of visual aesthetics, land use buffers, transition zones, and other important environmental considerations. Aesthetics and viewsheds are especially important near existing tourism and recreational areas, such as the Daniel Boone National Forest, Cane Creek Wildlife Management Area and other scenic natural areas.

B. EXISTING STUDY AREA CHARACTERISTICS

The major characteristics of the study area were identified with respect to the existing transportation network system data, geometric roadway conditions, bridge data, major crossroads, intermodal information, and planned highway improvements.

1. Highway Systems

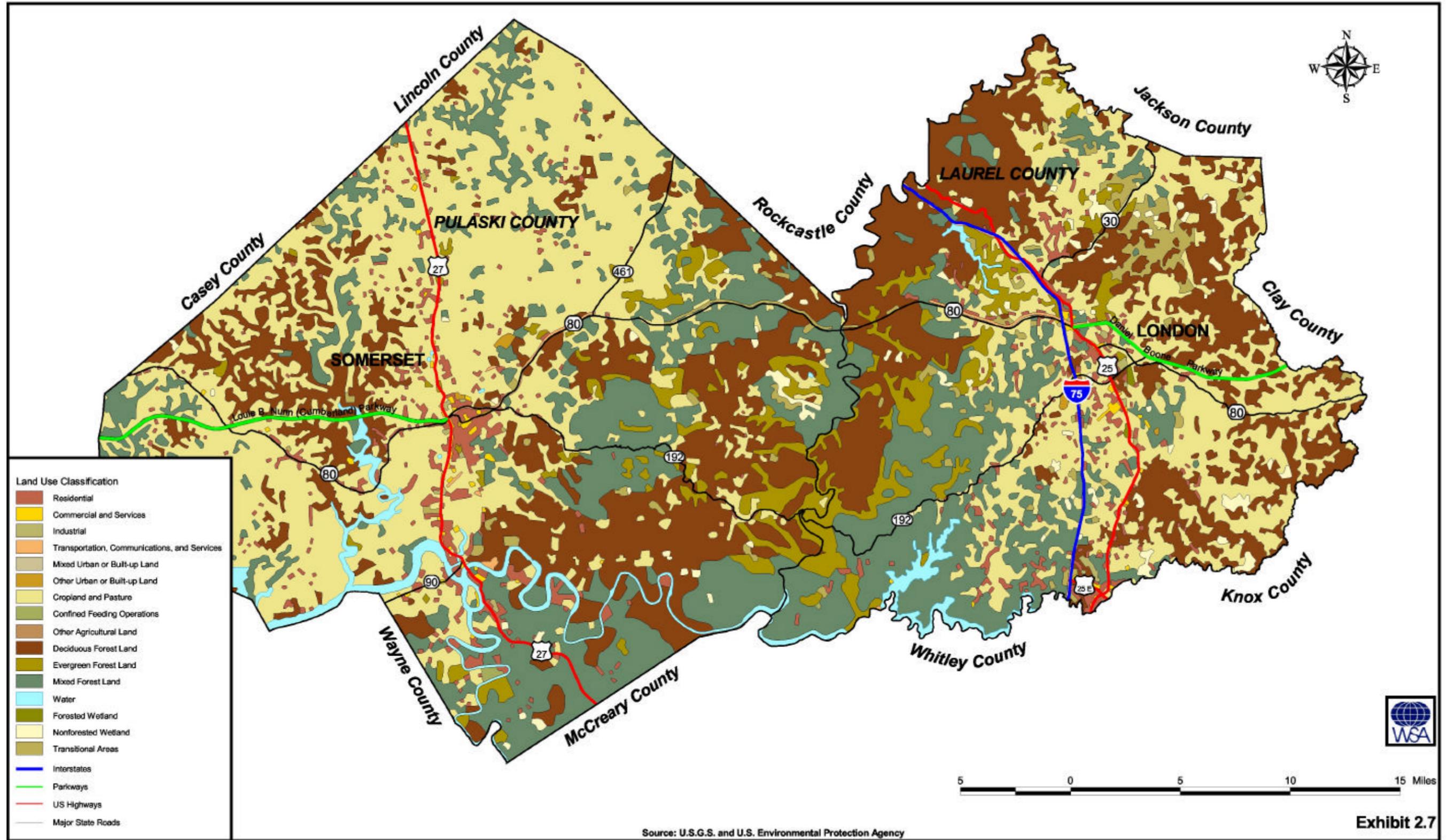
To gain information on the existing features of the study area highways, data from the KYTC Highway Information System (HIS) computer database were accessed and summarized. Existing roadway system information for the major routes in the area is included in **Table 2.4**. Important east-west links across Pulaski and Laurel counties include the KY 80 and KY 192 corridors. At the US 27 intersection on the west side of Somerset, the Louie B. Nunn (Cumberland) Parkway transitions into the KY 80 corridor. At the US 25 intersection on the northwest side of London, the Daniel Boone Parkway also becomes KY 80. North-south routes include US 27 through Somerset as well as the US 25 and I-75 corridors through the London area.

Most of the routes listed in Table 2.4 are on the State Primary or State Secondary system, with a functional classification of either Principal Arterial or Major Collector. Several of these routes provide access to the National Highway System (NHS), AAA highways and the National Truck Network (NTN). **Exhibit 2.8** shows the existing truck route designations for Pulaski, Laurel and the surrounding counties.

Except for those highways otherwise designated by the KYTC, basic legal truck dimensions are 13.5 feet in height, 8 feet in width, with an overall length of 65 feet including tractor and trailer. Also permitted on non-designated highways are trucks with basic dimensions of 8.5 feet in width with a single trailer of 28 feet in length. Weight restrictions for the roadways are classified as "A" (44,000 pound gross limit), "AA" (62,000 pound gross limit) or "AAA" (80,000 pound gross limit).

On designated National Truck Network highways, shown in blue on Exhibit 2.8, increased dimensions of 8.5 feet in width, with a single trailer up to 53 feet in length, or two trailers each up to 28 feet per truck tractor, can be accommodated. Routes crossing the I-66 corridor are an important consideration for trucking movements. Potential interchanges should be designed to accommodate these trucks. In accordance with the 603 KAR 5:070, in reference to the designated National Truck Network "102-inch wide trucks shall be allowed five (5) driving miles on state maintained highways from the highway segments designated as such, for the purpose of attaining reasonable access to terminals, facilities for food, fuel, repairs and rest. In addition to state-maintained highways, these trucks are allowed one (1) driving mile on non-state maintained public use highways."

CHAPTER 2 – STUDY AREA CONDITIONS



CHAPTER 2 – STUDY AREA CONDITIONS

Table 2.4 Existing Route Inventory

County	Route	No. Lanes	Lane Width	¹ Functional Classification	² State System	³ NHS	⁴ Truck Route Designation	⁵ Natl. Truck Network
Pulaski	Louie B. Nunn (Cumberland) Pkwy.	4	12'	PA	PKWY	Yes	"AAA"	Yes
	US 27	2-6	12'	PA	PRIM	Yes	"AAA"	Yes
	KY 80	2-4	10'-15'	PA	PRIM	Yes	"AAA"	Yes
	KY 80 Bypass	4	12'	PA	PRIM	Yes	"AAA"	Yes
	KY 192	2	9'	MJC	SSEC	No	"AAA"	No
	KY 461	2	12'	MNA	SSEC	No	"AAA"	Yes
Laurel	⁶ I-75	4	12'	INT	INT	Yes	"AAA"	Yes
	Daniel Boone Pkwy.	2	12'	PA	PKWY	Yes	"AAA"	Yes
	US 25	2-4	11'-12'	MJC	SSEC	No	"AAA"	No
	US 25E	4	12'	PA	PRIM	Yes	"AAA"	Yes
	US 25W	2	12'	PA	PRIM	No	"AAA"	No
	KY 80	2-4	10'-12'	PA	PRIM	Yes	"AAA"	Yes
	KY 192	2-4	9'-12'	MJC	SSEC	No	"AA"	⁷ No
	KY 229	2	10'-12'	MJC	SSEC	No	"AA"	No
	KY 312	2	9'-10'	MJC	SSEC	No	"A"	No
KY 1193	2	10'	MJC	SSEC	No	"A"	No	

Note: Data represent major characteristics of area routes.

¹ INT=Interstate, PA=Principal Arterial, MJC=Major Collector, MNA=Minor Arterial

² INT=Interstate, PKWY=Parkway, PRIM=Primary, SSEC=State Secondary

³ National Highway System

⁴ "AAA"=80,000 Lb. Gross Load Limit, "AA"=62,000 Lb. Gross Load Limit, "A"=44,000 Lb. Gross Load Limit

⁵ Designated routes where 102" wide vehicles are allowed access

⁶ I-75 is currently under construction to 6-8 lanes

⁷ Segment between I-75 and Daniel Boone Parkway is on network

2. Roadway Geometrics

Geometric characteristics for major existing routes in the study area are listed in **Table 2.5**. This highway information focuses on lane and shoulder information, adequacy ratings and route speed limits. Such data helps to identify the extent of necessary highway and interchange improvements for routes intersecting with I-66.

Lane widths along these corridors average between 10-feet and 12-feet, with 9-foot sections found along portions of KY 192 in Pulaski and Laurel counties. Narrow shoulders are present along portions of KY 80, KY 192, and KY 229. Highway adequacy, or sufficiency ratings are numerical indices that provide a composite representation of the physical condition, safety, service and efficiency of operation of roadway sections throughout Kentucky. Adequacy ratings range from zero to 100, where a score from 92 to 100 is very good; 85 to 91.9 is good; 75 to 84.9 is fair; and any number less than 75 is considered to be a poor rating. Ratings below 75 are found along sections of KY 80, US 27, the Daniel Boone Parkway, US 25 and KY 229.

Table 2.5 Highway Characteristics

Route	County	Description	Mile-points	# Lanes	Lane Width (ft.)	Shoulder Width (ft.)	¹ Adequacy Rating	Speed Limit (mph)
KY 80	Pulaski	Sardis to KY 1248	13.5 - 16.2	2	10	8	88	55
		KY 1248 to US 27	16.2 - 17.8	2	10 - 12	8	86 - 91	45 - 55
		US 27 to KY 192	17.8 - 21.5	2	10 - 20	3 - 10	57 - 93	25 - 45
		KY 192 to KY 1317	21.5 - 25.9	2 - 4	12	8 - 12	81 - 90	45 - 55
	Laurel	KY 1317 to Laurel Co.	25.9 - 40.0	4 - 2	12	10 - 12	85 - 92	55
		Pulaski Co. to KY 1535	0.0 - 7.5	2 - 4	12	0 - 10	69 - 87	55
		KY 1535 to I-75	7.5 - 10.6	4	12	10	87 - 90	45 - 55
		I-75 to US 25	10.6 - 11.1	4	12	10	57 - 82	45
		US 25 to KY 192	11.1 - 13.2	2	11	10	82	45 - 55
KY 192 to KY 830	13.2 - 17.2	2	10	2	82	45 - 55		
Louie B. Nunn (Cumberland) Parkway	Pulaski	Exit 78 to US 27	78.0 - 88.0	4	12	10	94	65
US 27	Pulaski	Sloans Valley to KY 90	0.0 - 9.8	2	12	8 - 10	60 - 89	35 - 55
		KY 90 to KY 2299	9.8 - 15.4	2 - 6	12	8 - 10	57 - 89	35 - 45
		KY 2299 to KY 80	15.4 - 16.8	6	12	10	64	45
		KY 80 to KY 1247 North	16.8 - 20.8	6 - 2	12	10 - 12	70 - 84	45 - 55
		KY 1247 North to KY 70	20.8 - 30.7	2	12	10	83	55
KY 192	Pulaski	KY 80 to Blaze Valley Rd.	0.0 - 3.0	2	9	2	75	45 - 55
		Blaze Valley Rd. to Laurel Co.	3.0 - 18.6	2	9	2 - 3	75 - 85	55
	Laurel	Pulaski Co. to Marsh Br. Rd.	0.0 - 7.3	2	9	2	79 - 81	55
		Marsh Br. Rd. to KY 552	7.3 - 12.6	2	9 - 10	1 - 2	79	55
		KY 552 to I-75	12.6 - 18.2	2	10	1	79 - 84	55
		I-75 to US 25	18.2 - 20.1	4	12	10	79 - 84	55
US 25 to DB Pkwy.	20.1 - 22.0	4	12	10	81	55		
DB Pkwy.	Laurel	I-75 to KY 354	0 - 1.7	4 - 2	12	10	56 - 75	55
		KY 354 to KY 192	1.7 - 4.1	2	12	10	56 - 84	55
		KY 192 to Clay Co.	4.1 - 10.6	2	12	10	83 - 91	55
² I-75	Laurel	Exit 29 to KY 192	29.0 - 38.2	4	12	10	86-89	65
		KY 192 to KY 80	38.2 - 40.7	4	12	10	88	65
		KY 80 to Exit 48	40.7 - 49.0	4	12	10	87	65
US 25	Laurel	US 25E to KY 3431	0.0 - 2.0	4 - 2	12	10	93	55
		KY 3431 to KY 1006	2.0 - 9.0	2	12	10	93	45 - 55
		KY 1006 to KY 192	9.0 - 10.4	2	11	10	70	45
		KY 192 to KY 80/DB Pkwy.	10.4 - 13.6	2 - 4	11 - 12	2	61 - 83	25 - 45
		KY 80/DB Pkwy to Pittsburg Overpass	13.6 - 14.4	4 - 2	12	10	81 - 93	45
		Pitts. Overpass to KY 490	14.4 - 16.3	2	12	-	90	45
		KY 490 to Rockcastle Co.	16.3 - 23.9	2	11	-	90 - 95	55
KY 229	Laurel	KY 1023 to KY1189	4.3 - 7.7	2	10	1	72	55
		KY 1189 to KY 1006	7.7 - 8.8	2	10	1	72	55
		KY 1006 to US 25	8.8 - 12.3	2	10 - 12	1	80 - 83	45 - 55
KY 461	Pulaski	Sardis to KY 1248	0.00-2.20	2	12	10	91	55
		KY 1248 to US 27	2.20-7.02	2	12	10	91	55
		US 27 to KY 1317	7.02-8.44	2	12	10	91	55

¹ 92 - 100 = Very Good; 85 - 91.9 = Good; 75 - 84.9 = Fair; less than 75 = Poor

² I-75 is currently under construction to 6-8 lanes

3. Bridge Inventory

Exhibit 2.9 shows the locations of bridges and their proximity to the corridors. It is important to note that some crossroads and access routes, to and from the proposed I-66 corridor, may need to be upgraded to sufficient design standards to handle truck traffic. This will include replacement or rehabilitation of some existing bridge structures along those routes. Improvement costs for potential widening or replacement options will depend on the class of roadway and the adequacy of the existing bridge structure.

Throughout the course of this study, particular interest has been expressed concerning the existing bridge along KY 80 at the Rockcastle River which falls within a Wild River boundary. Administered by the Division of Water in the Department for Environmental Protection, the Kentucky Wild River program protects designated rivers from developments which could cause long-term harm to the river's resources. According to the Division of Water, eligible rivers "must have good to excellent water quality, be essentially wild and undeveloped and have no impoundments; there is no minimum size or length requirement." Investigation of the Kentucky Wild River statutes (KRS 146) indicates that relocation of the KY 80 corridor from Billows to its current location was not prohibited, and that an additional bridge at this new location would be allowed. However, continuing considerations should include items such as buffer zones, erosion control, viewsheds, and potential enhancement projects which may accompany any bridge improvements at this important location.

4. Major Crossroads

The access points selected for the I-66 corridor will be based on the concept of moving traffic through the region so it can reach its final destination safely and efficiently. The majority of west-to-east traffic through the region is traveling between Somerset and London, or to access I-75, the parkway corridors, and the recreational facilities located in Pulaski and Laurel counties. The access points will serve all major roadway facilities and help to alleviate congestion on the surrounding roadway network.

Major crossroads within the corridor study area include key arterials and collectors, such as US 27, KY 80 and KY 192 in Pulaski County. In Laurel County, key crossroads include KY 80, KY 192 and the US 25 corridor (see Table 2.4 and Table 2.5). Major interchanges are also anticipated at the Louie B. Nunn (Cumberland) Parkway in Somerset, as well as the I-75 and the Daniel Boone Parkway corridors near London.

5. Multimodal Facilities

The TEA-21 legislation emphasizes the consideration of all transportation modes and intermodal connections in the planning, building and operation of transportation systems. In addition to the railroad facilities that service the study area, such facilities include airports, trucking facilities and industrial parks in this region of the state.

There are two main railroad lines located within the project study area, as shown on **Exhibit 2.10**. In Pulaski County, the *Norfolk-Southern Corporation* rail line lies between Somerset and US 27. In Laurel County, the *CSX* line lies east of London, between US 25 and the Daniel Boone Parkway. Both of these rail lines provide north-south service throughout this area. Approximately 30 to 40 CSX trains pass through London every week. The main types of freight include coal, coke and iron ore. Additional freight consists of paper, chemicals, wood, automobile components and finished automobile parts. The Norfolk-Southern freight through Somerset

typically includes coal, coke, lumber, iron ore, paper, chemicals and automobile parts. Coal tipple facilities are concentrated primarily in the easternmost counties of the Commonwealth, as well as in Hopkins and Webster counties in western Kentucky.

One general aviation (public) airport is located in each of the two study area counties. These airports provide no commercial airline service. The nearest commercial airline facilities are located in Lexington, Kentucky (Blue Grass Airport) and Knoxville, Tennessee (Magee-Tyson Airport). Both of these commercial airports are approximately 75 miles from the I-66 corridor.

The Somerset-Pulaski County – J.T. Wilson Field Airport is located about three miles south of Somerset. The elevation is 927 feet above mean sea level (msl), and Runway 04-22 is paved, 5000 feet long and 100 feet wide. According to 1999 figures, this airport has an average of 77 aircraft operations per day. The 1998 Kentucky Aviation Systems Plan includes recommendations for a total of \$5.6 million in improvements to the Somerset-Pulaski Airport through the year 2002. Improvement projects include:

- Non-directional beacon and localizer (1998);
- Overlay for Runway 04-22 (1998);
- Site preparation for a new terminal complex (1999);
- Precision approach path indicator (2000);
- Parallel taxiway pavement and medium intensity runway lights (2000);
- Master plan preparation (2001); and
- Apron and access road pavement (2001).

In addition to Pulaski County's general aviation airport, it should be noted that there is one private airport facility (Boss Field) near Burnside, south of Somerset.

The London-Corbin Airport, Magee Field, is located three miles south of London and handles an average of 37 operations per day. The elevation is 1212 feet above msl with one paved runway, 05-23, 6002 feet long and 150 feet wide. The 1998 Kentucky Aviation Systems Plan includes recommendations for a total of \$2.7 million in improvements to the London-Corbin Airport through the year 2002. Improvement projects include:

- Medium intensity runway lights (1998);
- Completion of a parallel taxiway (2000);
- Omni-directional approach lighting system (2001);
- Ten-unit T-hangar (2001);
- Medium intensity taxiway lights (2002);
- Taxiway extension – 4,000' by 35' (2002); and
- Apron expansion – 10,000 square yards.

More information for each of these area airports can be found in **Appendix A**. A private, unnamed airstrip is also located about 1.5 miles northeast of Bunch, providing access for coal companies mining in the area. Exhibit 2.10 details multimodal facilities for the entire Commonwealth of Kentucky.

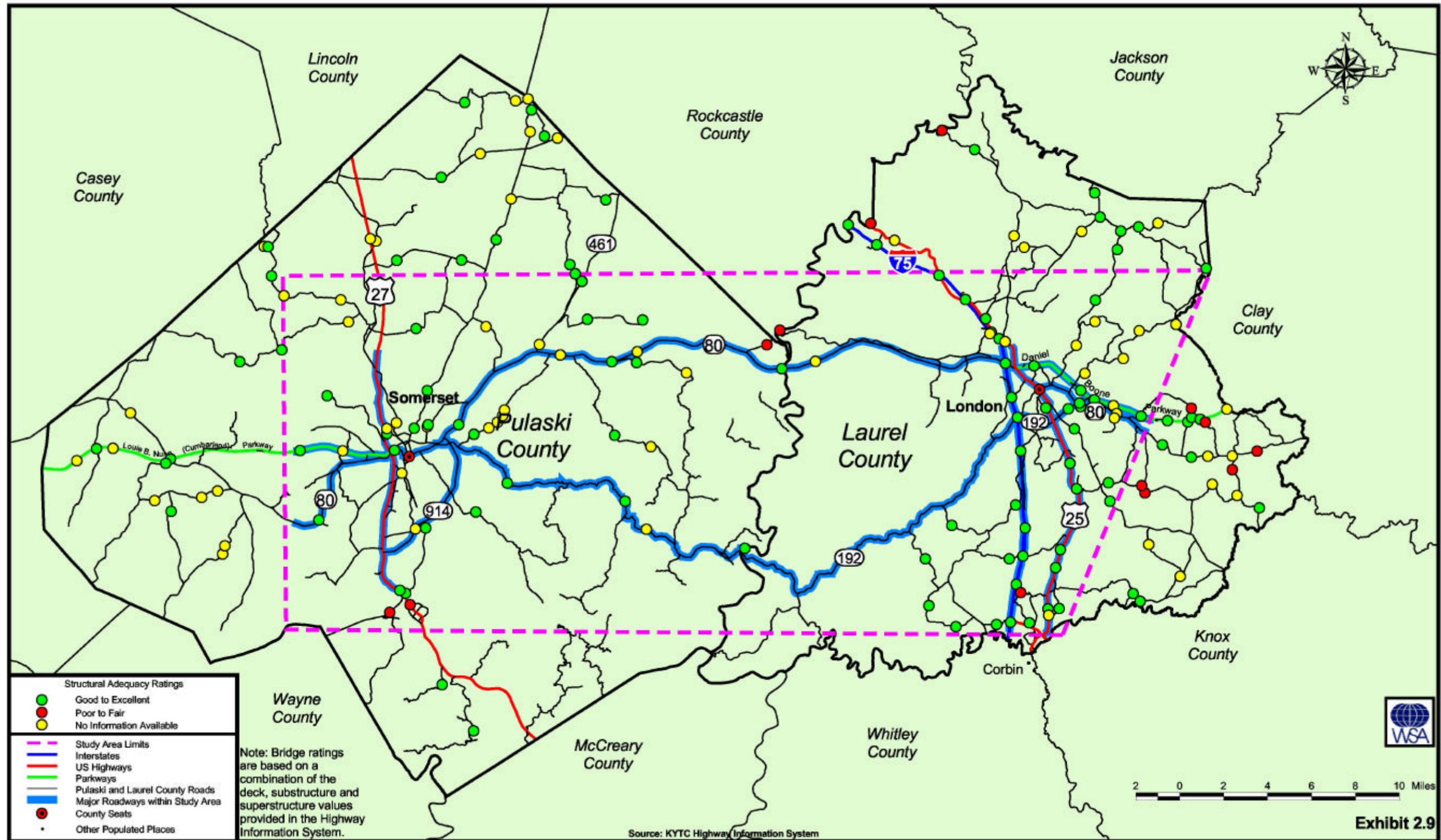


Exhibit 2.9 Existing Bridge Inventory

CHAPTER 2 – STUDY AREA CONDITIONS

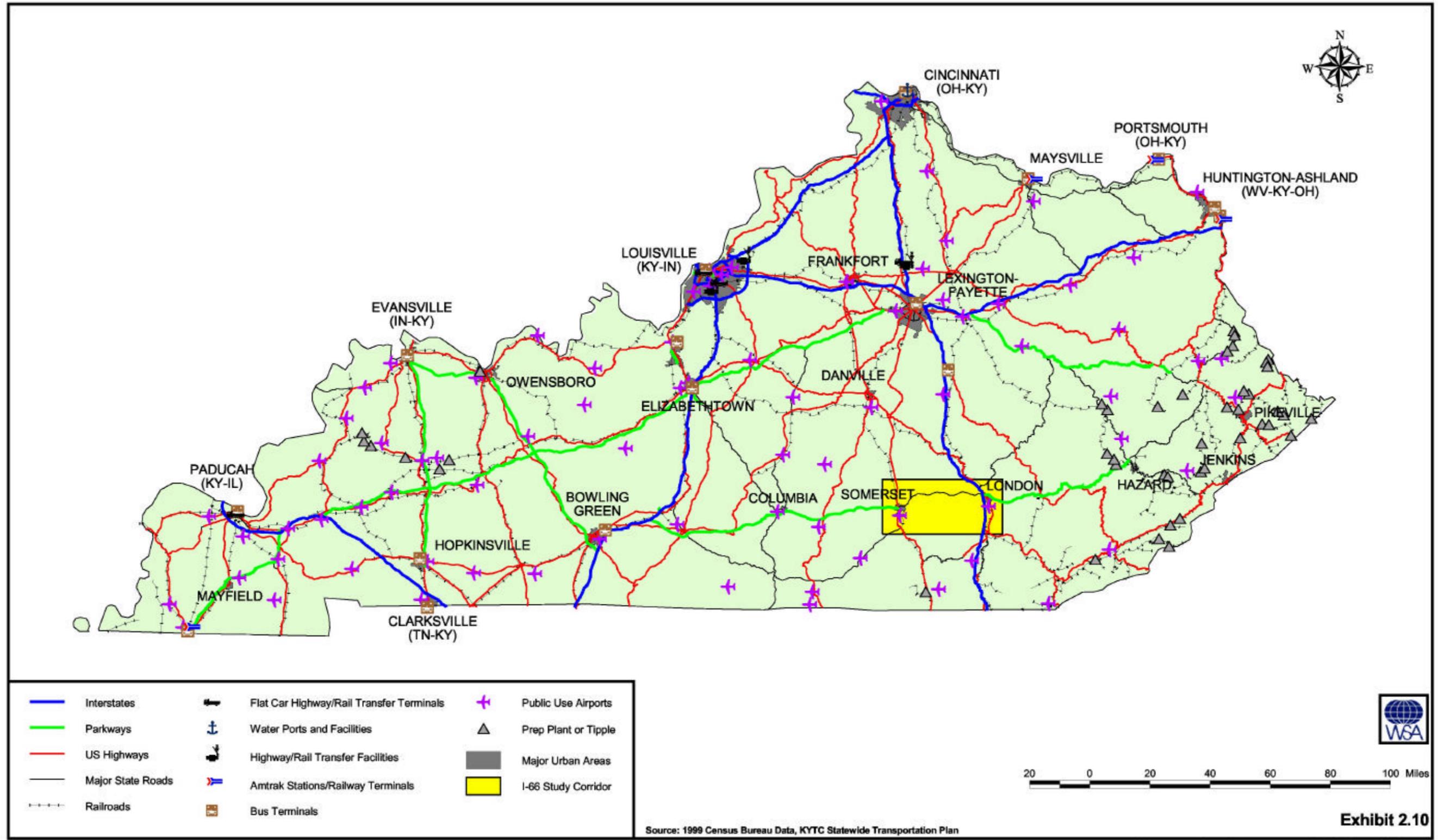


Exhibit 2.10
Kentucky Intermodal Facilities

CHAPTER 2 – STUDY AREA CONDITIONS

Other facilities in the study area include 21 trucking companies that provide goods to the Pulaski County region as well as 22 trucking companies that deliver to Laurel County. Somerset is in the process of planning local bus service through a private transit company called RTEC. Transit service is not currently available in the London area, although local taxi service is provided. Greyhound bus service is available in both London and Corbin. Listed in **Table 2.6** are a number of industrial park facilities also located in the study counties and the region. As shown, some of the larger industrial facilities are located in Knox County, with a county total of 1,045 acres dedicated to industrial sites.

Table 2.6 Area Industrial Park Facilities

County	Site ID	Name of Park	Total Acres
Casey	045-001	Liberty Industrial Park Site 2	7.0
Clay	051-001	Clay/Leslie County Industrial Park	54.3
Jackson	109-001	Jackson County Regional Industrial Park	32.0
Knox	121-001	Barbourville	153.0
	198	Corbin Tri-County Industrial Park	276.6
	121-003	Southeast Kentucky Regional Industrial Park	615.8
Laurel	125-001	London	176.9
Lincoln	137-001	Stanford/Lincoln County Industrial Park	16.2
McCreary	198	Pine Knot Potential Site	47.6
	147-002	Stearns	9.0
	147-003	Chewford Industrial Park	170.0
	147-004	Meadows Grove Industrial Park	100.0
	147-005	Strunk Industrial Park	45.0
Pulaski	199-001	Valley Oak Commerce Complex East	73.6
	199-002	Valley Oak Commerce Complex West	158.0
		Lake Cumberland Commerce Complex	70.0
Rockcastle	203-002	Rockcastle Industrial Park South	52.7
Russell	207-001	Russell County Business Park	81.0
	207-002	Jamestown Industrial Park	34.7
Wayne	231-001	Wayne County Potential Site	71.3
		Monticello Industrial Park	100.0
		Wayne County Industrial Park 1	59.0
		Wayne County Industrial Park 2	70.0

6. Planned and Programmed Improvements

The KYTC's *Statewide Transportation Plan (STP)*² identifies programmed and planned short-term and long-term improvements over a twenty-year period. Programmed short-term improvements are those projects that have been specifically defined and have some commitment of funding. The KYTC's *Six Year Highway Plan (FY 2001-2006)*³ comprises the short-term component of the STP. Short-term improvements within Pulaski and Laurel counties are summarized in **Appendix B**. A number of projects exist within both Pulaski and Laurel counties. In Laurel County, the most significant projects are the major widening of I-75 and relocation of KY 30. In Pulaski County, major projects are the widening of US 27 and new routes between the Louie B. Nunn (Cumberland) Parkway and KY 80 and the Somerset Southwest Bypass between US 27 and the Louie B. Nunn (Cumberland) Parkway. Programmed short-term funding also exists for further design and development of the I-66 corridor within Pulaski and Laurel counties.

Long-term improvements are those improvements that have been identified as needed but do not have a commitment of funding. These improvements are contained in the STP as part of the 1999 Long-Range Highway Plan. The Long-Range Highway Plan comprises the years 7 through 20 of the Statewide Transportation Plan. Long-range improvements within Pulaski and Laurel counties are also summarized in Appendix B. The projects listed as long-range improvements are generally a continued effort from the short-term plan including widening of I-75 and US 27, relocation of KY 30 and providing a new southwest bypass for Somerset. Several long-range improvements are identified for the I-66 corridor within Pulaski and Laurel counties, as well as other counties statewide, as "illustrative" projects. Illustrative highway projects are a special category of needed highway system improvements that are unlikely to move forward until and unless, project-specific funding is identified at the federal level. Approximately \$2.6 billion of projects involving I-66 segments within Pulaski and Laurel counties are identified.

C. TRAFFIC AND OPERATIONAL CONDITIONS

The study area's traffic and operational conditions were identified with respect to general traffic conditions, levels of service, accident analysis, and access needs. It is important to note that the following analyses include committed improvement projects, but do not take the potential I-66 corridor into consideration.

1. Existing Traffic Conditions

The annual average daily traffic (AADT) is the average number of vehicles that travel a roadway each day. AADT is typically adjusted to account for seasonal, monthly and daily traffic variations throughout the year. The KYTC Highway Information System (HIS) database was used to provide the existing traffic volumes (Year 1998) for segments of the major study area routes. The existing traffic volumes, shown in **Table 2.7**, range from 1,000 vehicles per day (vpd) along KY 192 near the Pulaski and Laurel County Line to just over 42,000 vpd along US 27 near KY 80. Existing truck percentages are also shown in the table, ranging from 2.3% along KY 229 in Laurel County to 29.0% along I-75 in Laurel County.

² Statewide Transportation Plan (FY 1999-2018), Kentucky Transportation Cabinet, December 1999.

³ Approved 2000-2002 Biennial Highway Construction Program and Identified Preconstruction Program Plan for FY 2003-FY 2006, Kentucky Transportation Cabinet, June 2000.

Table 2.7 Traffic Characteristics

Highway	County	Description	% Trucks ¹	1998 AADT ¹	2010 AADT ²	2030 AADT ²	1998 LOS	2010 LOS	2030 LOS
KY 80	Pulaski	Sardis to KY 1248	3.9	6,100	7,200	9,700	D	D	E
		KY 1248 to US 27	-	10,400	12,300	16,500	E	E	F
		US 27 to KY 192	3.5	9,600	11,300	15,200	C	D	D
		KY 192 to KY 1317	-	13,800	18,100	28,600	B	B	D
	Laurel	KY 1317 to Laurel Co.	16.0	6,400	8,700	14,200	B	B	D
		Pulaski Co. to KY 1535	27.7	6,600	9,000	14,700	B	B	D
		KY 1535 to I-75	11.8	15,400	21,600	37,300	B	C	F
		I-75 to US 25	9.4	22,000	30,900	53,400	B	C	F
		US 25 to KY 192	3.6	5,100	7,100	12,400	B	B	D
		KY 192 to KY 830	-	3,600	5,000	8,700	C	C	E
Louie B. Nunn (Cumberland) Pkwy.	Pulaski	Exit 78 to US 27	10.7	10,200	13,500	21,500	A	A	B
US 27	Pulaski	Sloans Valley to KY 90	4.1	11,200	14,600	22,700	C	E	F
		KY 90 to KY 2299 (2-lane)	5.0	30,600	40,000	62,300	F	F	F
		KY 90 to KY 2299 (4-lane)	5.0	30,600	40,000	62,300	C	E	F
		KY 90 to KY 2299 (6-lane)	5.0	30,600	40,000	62,300	B	C	E
		KY 2299 to KY 80	5.0	42,200	55,200	86,000	C	D	F
		KY 80 to KY 1247 (6-lane)	6.6	17,500	22,700	34,700	A	B	B
		KY 80 to KY 1247 (2-lane)	6.6	17,500	22,700	34,700	D	E	F
		KY 1247 to KY 70	8.8	8,400	10,800	16,600	E	E	F
KY 192	Pulaski	KY 80 to Blaze Valley Rd.	-	4,300	5,700	9,200	D	D	E
		Blaze Valley Rd. to Laurel Co.	-	1,000	1,400	2,200	B	B	B
	Laurel	Pulaski Co. to Marsh Br. Rd.	-	1,000	1,400	2,500	B	B	B
		Marsh Br. Rd. to KY 552	-	3,300	4,700	8,500	C	C	E
		KY 552 to I-75	3.8	8,900	12,700	22,600	E	E	F
		I-75 to US 25	-	25,500	36,400	65,000	C	F	F
		US 25 to DB Pkwy.	-	16,300	23,300	41,600	B	C	F
Daniel Boone Pkwy.	Laurel	I-75 to KY 354	11.1	12,600	16,700	26,400	C	D	F
		KY 354 to KY 192	12.3	10,800	14,300	22,600	B	C	F
		KY 192 to Clay Co.	-	7,700	10,300	16,900	B	C	E
I-75	Laurel	Exit 29 to KY 192	29.0	35,700	46,900	73,600	C	C	D
		KY 192 to KY 80	29.0	33,700	43,500	66,400	C	B	C
		KY 80 to Exit 48	29.0	30,600	39,900	61,700	B	B	C
US 25	Laurel	US 25E to KY 3431	-	13,000	18,200	31,700	E	F	F
		KY 3431 to KY 1006	-	10,200	15,400	30,100	E	F	F
		KY 1006 to KY 192	-	19,400	29,300	57,300	F	F	F
		KY 192 to KY 80/DB Pkwy.	2.7	15,800	22,700	40,700	D	E	F
		KY 80/DB Pkwy to Pittsburg Overpass	6.3	16,000	22,400	38,600	E	F	F
		Pitts. Overpass to KY 490	-	9,000	13,000	23,900	E	E	F
KY 229	Laurel	KY 490 to Rockcastle Co.	8.0	2,000	2,900	5,000	B	C	D
		KY 1023 to KY1189	2.3	3,100	4,400	8,000	C	C	D
		KY 1189 to KY 1006	2.3	6,600	9,600	17,400	D	E	F
KY 461	Pulaski	KY 1006 to US 25	-	10,200	14,700	26,700	E	F	F
		Sardis to KY 1248	-	5,980	7,814	12,203	D	E	E
		KY 1248 to US 27	-	5,800	7,579	11,836	D	D	E
		US 27 to KY 1317	-	5,380	7,030	10,979	D	D	E

¹ Source: KYTC's Highway Information System Database

² Source: Kentucky Statewide Traffic Model projections

2. Future Traffic Conditions

The use of mathematical models capable of simulating existing traffic patterns and estimating future travel demand is an important phase of the transportation planning process. For the I-66 Corridor Planning Study, a set of traffic forecasting models was constructed from the Kentucky Statewide Traffic Model (KYSTM) prepared by Wilbur Smith Associates for the Kentucky Transportation Cabinet and the Kentucky Transportation Center. The development and calibration of the KYSTM has been documented in the *Kentucky Statewide Traffic Model Calibration Report*, dated February 1997.

Using the statewide model, traffic volumes through the Year 2025 can be predicted by applying variables, including projections of future population, employment and traffic growth. The future projections were prepared assuming the completion of existing projects under construction and those projects committed for construction within the Kentucky Transportation Cabinet's *Six-Year Highway Plan*. Highway projects are typically designed to handle estimated traffic volumes for a designated future year, called the "design year." Since the Year 2030 is the design year for this study, the Year 2025 traffic volumes predicted by the KYSTM were factored up to Year 2030 volumes. The Year 2010 and 2030 traffic volumes predicted by the model are shown in Table 2.7, where they can be compared against existing volumes on the highway network within the study area. Future volumes shown in the Table do not include any considerations for the I-66 corridor.

As shown in the table, design year (2030) traffic volumes are estimated to range from 2,200 vpd along KY 192 near the Pulaski/Laurel County line to about 86,000 vpd along the US 27 corridor near KY 80 in Pulaski County. Other high-volume routes in the design year include I-75 near KY 192 (73,600 vpd), US 25 near KY 192 (57,300), KY 80 near I-75 (53,400 vpd), and KY 192 near I-75 (65,000 vpd). The KYSTM was also used to predict Year 2030 traffic volumes for I-66 and the surrounding highway network based on the same variables discussed previously. Different I-66 corridor alternatives were coded into the KYSTM, along with access points to existing roadways. Results of this analysis are discussed in later sections of this report.

3. Level of Service

Level of Service (LOS) is a qualitative measure defined in the Highway Capacity Manual and used to describe traffic conditions. Individual levels of service characterize these conditions in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined. They are given letter designations, from A to F, with LOS A representing the best conditions and LOS F representing the worst. A minimum of LOS D is acceptable in urban areas and LOS C in rural areas. Each level of service represents a range of operating conditions and is described in general terms in **Table 2.8**.

Table 2.7 includes the calculated levels of service for existing (1998) and future (2010 and 2030) traffic conditions for routes within the I-66 study area. These figures indicate that the existing traffic congestion is concentrated along a few corridors in the study area. Short sections of KY 80 and KY 192 are currently operating at LOS E near the urban areas of Somerset and London, respectively. Significant portions of the US 25 corridor are currently operating at LOS E and LOS F. It should be noted that such areas of congestion may be reduced with the addition of the I-66 corridor; however, the effects of an additional interstate corridor in this area are not considered for the analysis presented in Table 2.6. Most of the other surrounding routes are within acceptable levels (LOS C or better) for existing traffic volumes; however, some rural spot locations with LOS D occur.

Table 2.8 Level of Service Definitions

Level of Service	Traffic Flow Along Arterial
A	Free flow operations at average travel speeds. Vehicles are completely unimpeded in their ability to maneuver within the traffic stream.
B	Reasonably unimpeded operations at average travel speeds. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome.
C	Stable operations causing some tension for motorists. The ability to maneuver and change lanes in midblock locations is restricted along with noticeable queues at intersections.
D	Small increases in flow cause substantial increases in delay and decreases in arterial speed. The ability to maneuver along the arterial is severely restricted.
E	Significant delays and average travel speeds of less than one-third the free-flow speed are experienced along the arterial segment.
F	Intersection congestion, long delays and extensive queuing along the arterial cause for extremely low free-flow speeds and stand-still conditions for motorists.

As indicated in the table, a number of routes in the study area are expected to fall below acceptable LOS levels by the design year of 2030. Even with committed highway improvements, it is expected that major sections of a number of routes will be operating at LOS F, including US 25 and US 27. LOS F conditions are also expected along sections of KY 80, KY 192 and KY 229 near the urban areas of London and Somerset. Traffic volume and LOS data are shown for study area routes for the years 1998, 2010 and 2030 in **Exhibits 2.11, 2.12 and 2.13**, respectively.

4. Accident Analysis

Accident data for selected routes (US 27, US 25, KY 80 and KY 192) in the study area were analyzed for a 36-month period from January 1, 1995 to December 31, 1997. The location of accidents, recorded in the HIS database, with valid milepoint designations are shown by corridor segment in **Appendix C** to aid in the determination of possible high accident locations. A spot or section of roadway is considered to have a high accident rate when the actual annual accident rate (accidents per 100 million vehicle miles) is higher than the critical accident rate. **Table 2.9** includes a listing of accident data for segments of highways within the study area.

The critical accident rate (or number) is the maximum accident rate (or number of accidents) one might expect to occur on a road given the average statewide accident rates, type of roadway, length of section and average annual daily traffic (AADT) volume. The ratio of these two rates (the actual annual accident rate to the critical accident rate) produces a critical rate factor or measure of accident frequency for each segment or spot. Any portion of the corridor with a critical rate factor greater than 1.0 is considered to be a high accident location. This process is based on the methodology described in *Analysis of Traffic Accident Data in Kentucky (1993-1997)*.⁴ The accident location is treated as a spot rather than a section (and the accident rate is expressed in accidents per year) when its length is less than 0.30 miles.

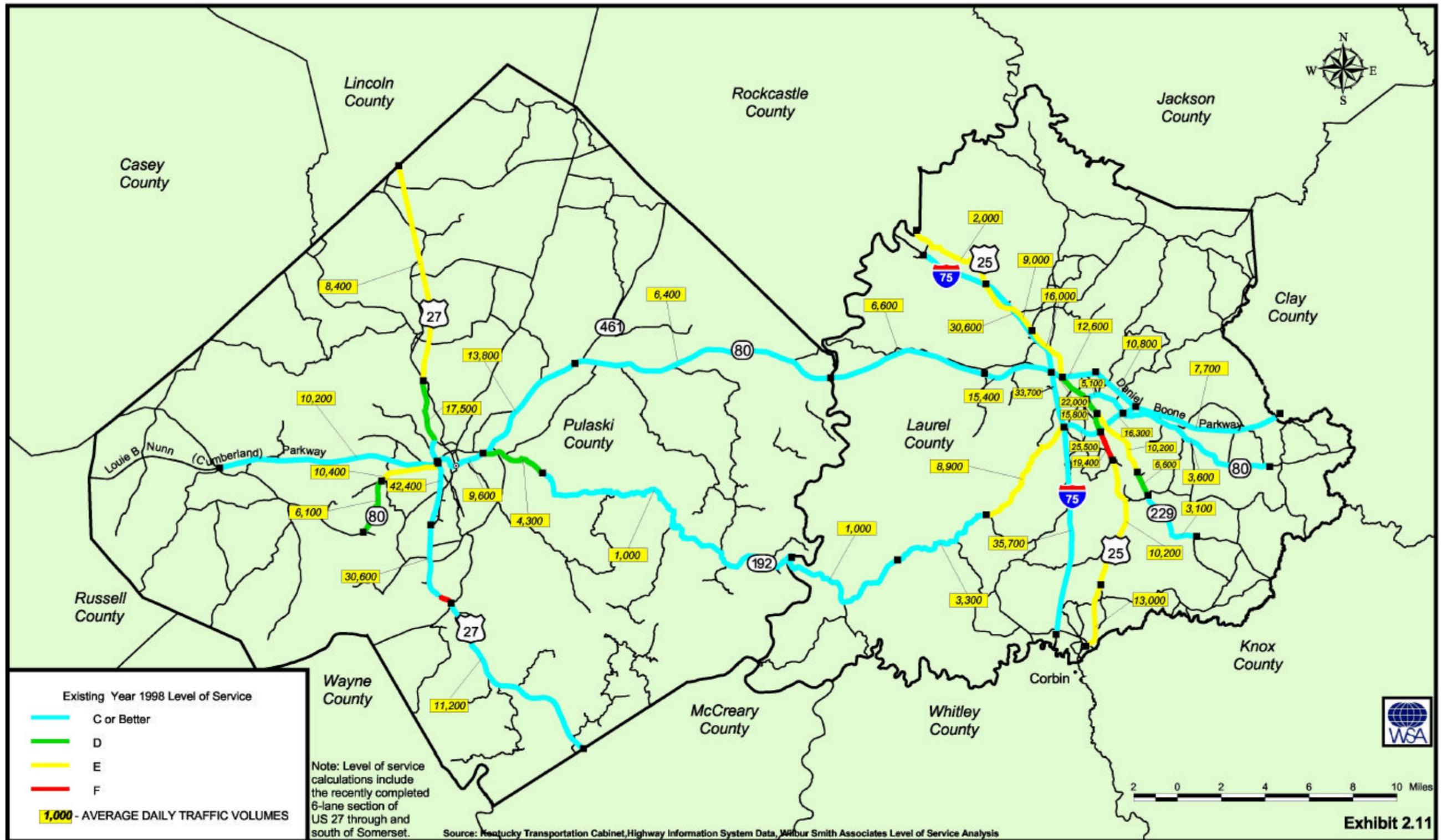
Using the calculated critical accident rates along with the actual annual accident rates for the selected corridors, critical rate factors are determined for spots or segments of each corridor. These factors are presented in the final column of the Appendix C tables and those greater than 1.0 indicate high accident locations. In summation, high-accident locations account for about 37 percent of the total mileage of US 27 in the project area; 28 percent of KY 80; 48 percent of US

25; and 59 percent of KY 192. It is expected that future traffic volume increases on these routes will add more vehicles (and vehicle-miles) and create the potential for additional high-accident locations.

Table 2.9 Critical Accident Rates

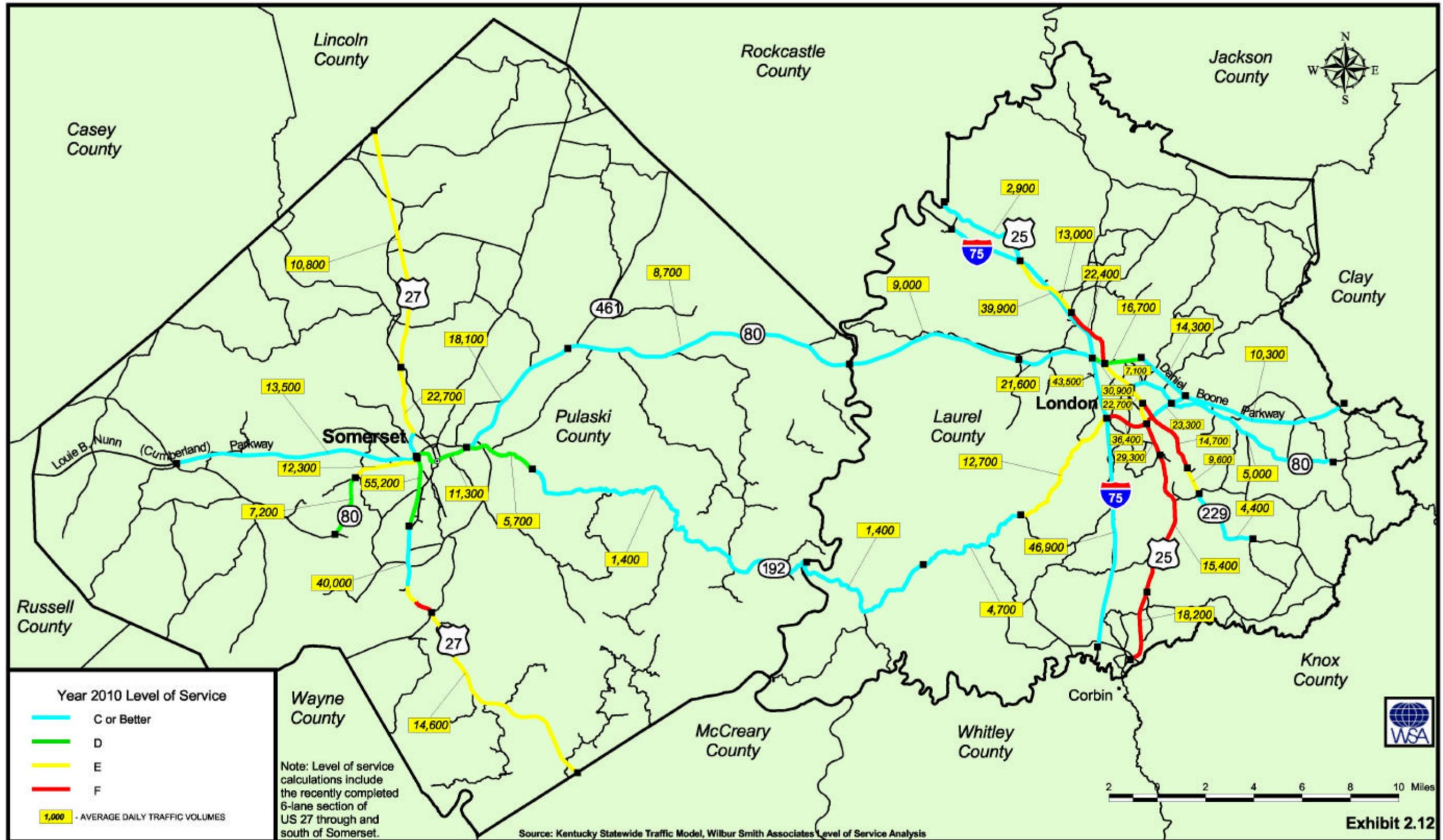
Route	County	Begin MP	End MP	Critical Acc. Rate	Rates per HMVM or MV				Critical Rate Factor
					Fatal	Injury	PDO	Total	
US 27	Pulaski	0.000	5.134	313.00	0.00	146.09	266.39	412.48	1.318
		11.374	12.360	378.50	3.06	119.22	229.26	351.53	0.929
		12.360	13.727	366.10	0.00	90.18	257.66	347.83	0.950
		13.727	14.326	395.70	0.00	97.61	385.80	483.41	1.222
		15.461	15.840	400.00	0.00	135.30	573.41	708.71	1.772
		15.840	16.214	389.00	0.00	143.34	660.37	803.70	2.066
		16.214	16.520	1.30	0.00	0.51	2.63	3.14	2.421
		16.520	16.782	1.23	0.00	0.27	1.32	1.59	1.298
		16.782	16.854	1.40	0.00	0.14	1.70	1.85	1.319
		16.854	17.030	1.44	0.00	0.29	3.03	3.31	2.305
		20.759	22.515	296.80	0.00	89.28	195.31	284.59	0.959
KY 80	Pulaski	0.000	1.796	394.00	0.00	382.73	1804.31	2187.04	5.551
		1.796	2.315	514.00	76.17	228.52	609.39	914.09	1.778
		7.491	9.256	379.00	0.00	160.97	183.97	344.95	0.910
		13.575	16.205	301.00	11.67	140.06	140.06	291.80	0.969
		16.205	17.248	323.00	0.00	105.75	243.22	348.97	1.080
		18.850	19.016	1.94	0.00	0.15	1.98	2.13	1.098
		19.016	19.350	610.00	0.00	128.97	748.05	877.03	1.438
		20.318	20.710	615.00	0.00	168.30	601.06	769.35	1.251
	Laurel	20.710	21.521	619.00	0.00	110.76	461.50	572.26	0.924
		28.177	28.377	1.49	0.00	0.75	0.62	1.37	0.925
		11.380	11.680	2.25	0.00	0.64	1.61	2.25	1.000
		13.150	20.522	282.00	0.00	113.26	159.27	272.54	0.966
		20.522	21.225	453.00	0.00	234.49	468.98	703.46	1.553
US 25	Laurel	0.000	0.170	1.22	0.00	1.30	0.90	2.19	1.798
		0.170	2.080	273.00	7.53	150.59	286.13	444.25	1.627
		2.080	4.069	289.70	0.00	127.00	161.19	288.19	0.995
		8.432	9.041	346.70	0.00	45.26	331.90	377.16	1.088
		9.473	10.350	224.60	0.00	92.89	161.33	254.22	1.132
		10.484	10.940	559.00	0.00	173.21	573.75	746.96	1.336
		11.000	11.382	588.00	0.00	197.73	539.25	736.98	1.253
		11.900	12.141	1.99	0.00	1.57	5.08	6.65	3.341
		16.258	17.346	511.00	0.00	524.61	1049.22	1573.83	3.080
19.350	23.102	455.20	43.86	350.85	570.13	964.83	2.120		
KY 192	Laurel	7.288	12.570	325.00	0.00	78.08	278.87	356.95	1.098
		15.300	16.372	407.00	0.00	280.85	187.23	468.08	1.150
		16.372	18.190	295.00	5.74	91.86	177.97	275.57	0.934
		18.657	19.320	403.00	0.00	237.87	492.34	730.21	1.812
		19.320	20.411	400.00	0.00	112.98	287.58	400.56	1.001
		0.320	1.006	374.00	0.00	89.35	268.04	357.38	0.956
		3.091	7.178	348.00	0.00	211.91	259.00	470.92	1.353
		7.178	14.407	289.00	0.00	128.78	218.92	347.70	1.203

⁴ Kentucky Transportation Center Research Report KTC-98-16



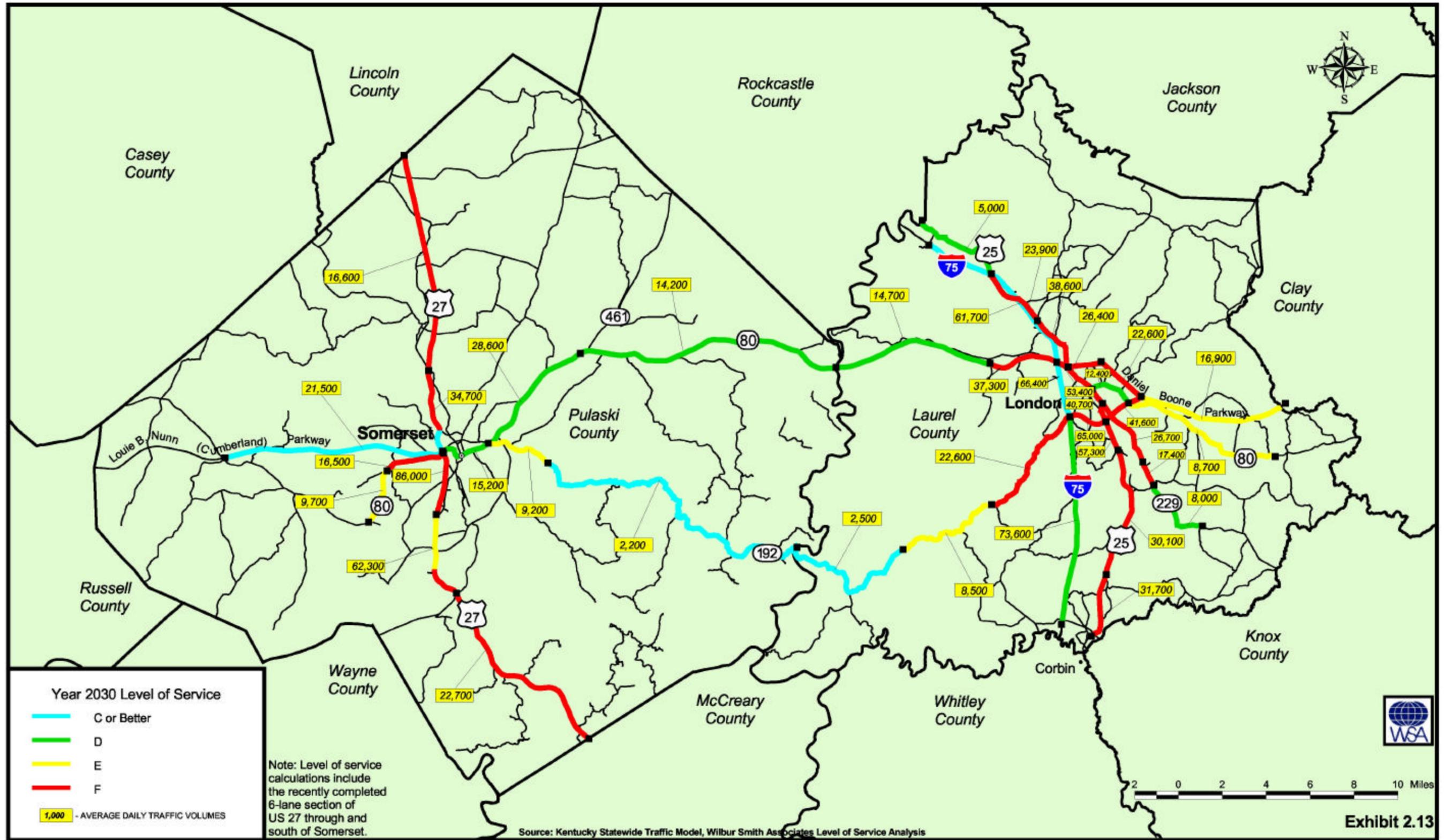
Year 1998 Level of Service and Average Daily Traffic Volumes

CHAPTER 2 – STUDY AREA CONDITIONS



Year 2010 Level of Service and Average Daily Traffic Volumes

CHAPTER 2 – STUDY AREA CONDITIONS



Year 2030 Level of Service and Average Daily Traffic Volumes

CHAPTER 2 – STUDY AREA CONDITIONS

D. PLANNING LEVEL ENVIRONMENTAL CONSIDERATIONS

The consideration of environmental factors along the proposed I-66 corridor is of primary importance. In order for the decision-making process to best reflect the overall public interest, a balance must be achieved between transportation and economic needs and environmental responsibilities. To accomplish this in the planning phase of project development, this study has undertaken a process to integrate a comprehensive set of available environmental information, along with early agency coordination and public involvement.

1. Environmental Process

The scope of environmental efforts undertaken as part of this study for I-66 serves to fine-tune the interest and focus of the project prior to fully engaging in the forthcoming NEPA process. Recognizing the corridor-level basis for this study, the current environmental efforts are intended to identify known or potential environmental effects and values in adequate detail to allow for a corridor evaluation process that will best minimize environmental consequences while also achieving the project goals. Further discussion of environmental issues is presented in Chapter 4 of this report.

It should be recognized that a recommended corridor does not represent a specific alternative, but instead defines an area within which design alternatives will be developed. Subsequent project activities will involve a formal analysis within the recommended corridor that will consider specific alignment options and other appropriate alternatives. During the NEPA process, environmental base studies will be performed along with the preparation of appropriate environmental document(s).

2. Primary Issues

Through the pre-NEPA planning process, a number of primary environmental issues have been identified. These include natural areas, sensitive plant and animal species, karst geology, historic sites, archaeological sites and other important areas. Vital to the determination of these issues was the consideration of input from a variety of environmental resource agencies, key stakeholder groups and the general public. These groups provided input to the determination of an “environmental footprint” for the project area, resulting in a better understanding of potential environmental consequences. Subsequent sections of this report will detail the activities involved with agency coordination and public involvement.

The study counties are home to many natural, scenic and sensitive areas, such as the Daniel Boone National Forest, the Wild River portion of the Rockcastle River, Cane Creek Wildlife Management Area, Levi Jackson Wilderness Road State Park, and the Sheltoewee Trace National Recreation Trail. These areas are not only known for their scenic beauty, but also for the diversity of species they harbor. Threatened and endangered species in the study area include the Red Cockaded Woodpecker, Indiana Bat, Pearly Mussel, Cumberland Bean, Ashy Darter, Oyster Mussel, White Snakeroot and Wood Lily, among others. A full listing of these species is included in **Appendix D**. Natural wetland areas and blue-line streams are found throughout the study area, with particular concentrations near Wood Creek Lake, Laurel River Lake and Lake Cumberland.

The study area is also known for its unique geologic structure, including an extensive cave system throughout the western portion of the study area. Scenic cascades and cliff lines are present in the central and eastern portions of the study area. Many prehistoric archaeological

sites have been identified in the study counties, and it is likely that some occur within the project corridor, particularly in areas where sandstone escarpments are exposed.

A diversity of social and economic considerations is present within the study area that reflects areas of potential impact on individuals, population groups, businesses and communities. Developed corridors in the area have concentrations of homes, businesses, schools, churches and other features which highway construction would have difficulty avoiding. Undeveloped corridors are home to isolated communities with unique cultures and social characteristics that could be impacted by the development of a major highway corridor in close proximity to their location.

3. Data Sources

A spatial analysis of environmental data has been completed for the study area. Using information from state, federal and private resources along with Geographic Information System (GIS) technology, environmental issues have been identified within Pulaski and Laurel counties and the surrounding region. More specifically, any environmental concerns falling within 2000 feet (500-foot zones were used for some evaluation elements) of the identified study corridors have been documented and used in comparing the potential environmental consequences associated with each corridor. Results of this environmental analysis are presented in Chapter 4 of this report. Data categories considered for this analysis include:

- Archaeology Sites
- Churches, Cemeteries and Schools
- Historic Structures
- Daniel Boone National Forest Property
- Threatened and Endangered Species
- Potential Threatened and Endangered Species
- Cave Routes and Cliff Lines
- Stream Crossings
- Wetland Sites
- Wild River Areas
- Oil and Gas Wells
- Hazardous Sites

The environmental data used in this analysis were collected from a wide range of sources. Participating agencies and groups and their respective contributions include:

- Kentucky Heritage Council: historic and archaeological sites
- United States Geological Survey: cemeteries, churches and schools
- Kentucky Natural Resources and Environmental Protection Cabinet: wildlife management areas and Wild River boundaries
- Daniel Boone National Forest: National Forest boundaries and property, threatened and endangered species, potential threatened and endangered species, cave routes and cliff lines
- Kentucky State Nature Preserves Commission: threatened and endangered species, and potential threatened and endangered species
- Department of Natural Resources: blue-line stream crossings
- Kentucky Department of Fish and Wildlife: wetland locations
- Kentucky Geological Survey: wells and underground storage tanks, geologic features
- U.S. Environmental Protection Agency: hazardous waste data, toxics release inventory, water discharge permits, and superfund sites
- Local Cave Society: cave routes and cliff lines
- National Speleological Society: karst and cave data

CHAPTER 3 – PROPOSED CORRIDORS

A series of alternative corridors were identified to address the purposes defined for this project. This chapter describes the issues considered in identifying alternative potential routings through the study area, and also describes proposed alternative corridors developed for further consideration as part of this study. The proposed alternatives include upgrading KY 80 to accommodate an interstate facility, and the development of new corridor options. The alternatives serve as 2,000-foot wide corridors, within which future design efforts could locate multiple alignments for consideration.

A. KEY CORRIDOR DEVELOPMENT ISSUES

A broad range of issues must be considered in identifying potential study corridors for the future development of I-66. The following sections describe some of the geometric issues, access control factors, I-75 interchange location options, major areas of avoidance and road user considerations involved in this effort.

1. Geometric Criteria

The geometric criteria for the proposed I-66 route is proposed as a four-lane, interstate-type highway. The corridor alternatives and cost estimates are based on interstate-type design standards and a design speed of 70 miles per hour. Horizontal curvature is limited to a 1,910-foot minimum radius and grades should fall within a range of plus or minus 4 percent.

Currently, there are no existing highways within the study area that meet the geometric criteria established for the corridor. The existing KY 80 facility between Somerset and London has right-of-way for an ultimate construction of 4 lanes with a 60-foot median. Four-lane sections are currently in place from the Somerset Bypass to approximately 1000 feet east of KY 461 in Pulaski County. In Laurel County, the four-lane section extends from about four (4) miles east of the Rockcastle River to Exit 41 on I-75. The remainder of existing KY 80 is a two-lane facility, approximately 15.5 miles in length. The major issues which limit the use of the existing KY 80 roadway are the horizontal and vertical curves that do not meet interstate criteria along portions of the route. Specifically, horizontal curves near Shopville and Squib would require a larger radius to meet design standards for 70 mph. Also, existing vertical curves approaching and departing the Rockcastle River have 6 percent grades, which exceed the design standard of 4 percent.

2. Access Control and Interchanges

Access for the highway is proposed to be fully-controlled and provided only at designated interchange locations. Interchange locations will be determined using several factors, including traffic volumes within the network, existing or potential area development, spacing limitations and public needs. The desired minimum spacing for interchanges is one (1) mile in urban areas and three (3) miles in rural areas.

Partial access control or access by permit is in place along most existing highway facilities within the study area, including KY 80. The only highways that currently provide for full access control are I-75, the Louie B. Nunn (Cumberland) Parkway, and portions of the Daniel Boone Parkway. Because existing routes do not have full control of access, reconstruction efforts to provide full access control would lead to the elimination of most existing access points. New access would only be provided at interchanges, requiring a considerable amount of frontage road construction or the relocation of many residents and businesses that are adjacent to existing routes, such as KY 80.

Access controls also impact the development of alternatives within new highway corridors. Alternative corridors are selected to insure that interchanges at major crossroads can be adequately spaced, or additional costs may be incurred to offset the interchanges to meet the desired spacing requirements or to construct service roads between major crossroad facilities.

3. Interchange Locations with Interstate 75

A critical issue with respect to the identification and consideration of alternative corridors involves the identification of potential interchange locations with I-75. A detailed discussion concerning interchange location constraints is provided in Chapter 6 of this document. Because I-75 is also an interstate highway, it too must meet the spacing requirements for interstate facilities. There are four (4) existing interchanges on I-75 in Laurel County (Exits 29, 38, 41 and 49). All of these interchanges are diamond-type configurations. Given the minimum spacing requirements for interstate facilities and other controls, an analysis of the entire 23-mile section of I-75 within Laurel County identified two sections within which alternative I-66 corridors could be optimally located. These areas are shown in **Exhibit 3.1** and are located between Milepoint (MP) 30 and MP 36 as well as between MP 42 and MP 43. Areas north of MP 43 conflict with Wood Creek Lake and areas between MP 36 and MP 42 conflict with urban buildup and spacing restrictions.

The section between MP 30-36 affords a stretch of I-75 that is relatively free of existing highway and railroad conflicts. However, there could be concerns with the landfill near Lily and the new weigh stations near MP 35. The section between MP 42 and 43 also provides an opportunity for an interchange location; however, the close proximity of I-75, US 25 and the CSX railroad within this area create difficult construction issues associated with bridging these facilities and providing access to both I-75 and US 25.

It is possible to consider the use of existing interchanges; however, these interchanges would require a significant degree of reconstruction to convert them from their current diamond configurations to a configuration with directional ramps between I-66 and I-75. Additionally, the existing local access provided by those interchanges would be completely eliminated as the new interchange would only afford access between I-75 and I-66. Based upon these considerations, the use of an existing interchange that could provide for an interchange between I-66 and I-75 would be difficult.

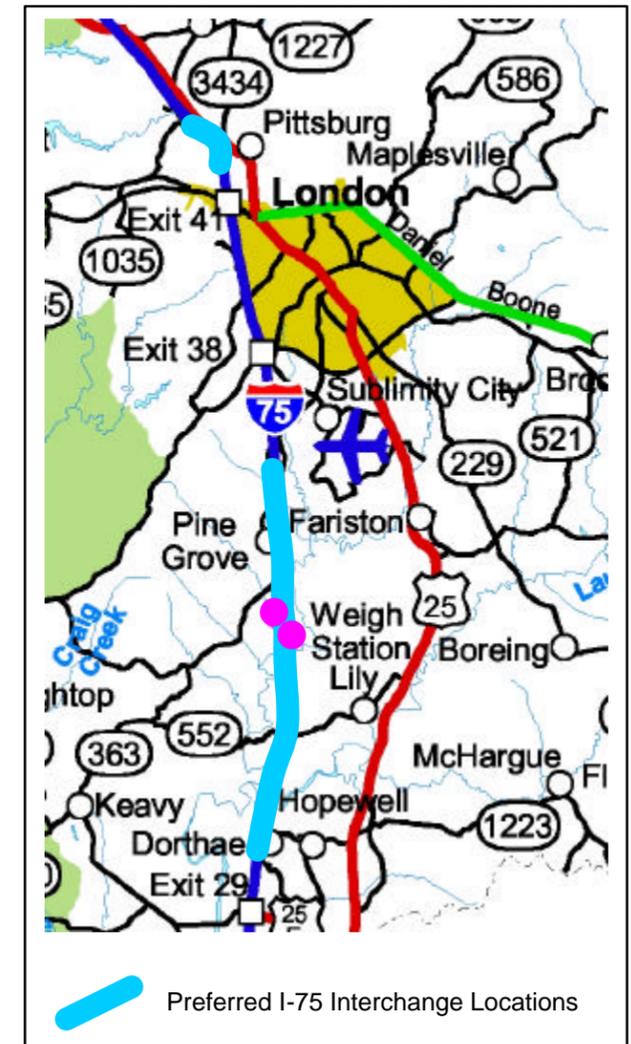


Exhibit 3.1 Potential Interchange Sites

Shown in **Exhibit 3.2** are aerial photographs of Exits 38 and 41 along I-75. These exits respectively, represent connection points to KY 192 and KY 80. These interchanges also provide local access to the significant amount of development in the area as well as to the surrounding community. Reconstruction of these interchanges would be very costly and would potentially result in significant local business and community disruption. Further discussion concerning these interchange issues will be provided throughout the report.

4. Major Areas of Avoidance

Within the study area, there are a number of areas that should be avoided with the construction of a new highway corridor. Subsequent chapters of this report will consider many of these areas in much greater detail. At this initial level, and as part of the process of identifying alternative corridors, several major areas of avoidance were considered. These areas represent large features around which most alternatives should generally be routed due to environmental concerns, construction costs, or significant social impacts. Illustrated in **Exhibit 3.3** are some of these major areas of avoidance within the study area.

Significant population centers, such as London and Somerset, represent locations through which the construction of a new highway corridor could prove to be prohibitive from a number of standpoints. Corridor alternates going through large populated areas are costly and generate adverse social and environmental impacts. Beyond these two major population centers, there are numerous small communities within the study area that should also be considered for avoidance at a corridor level.

Lakes and rivers exist throughout the study area and clearly, corridor alternates have been considered that would cross or come into close proximity to many of these features. However, many of the large lakes and river areas represent locations across which highway construction could be prohibitive from an environmental and construction standpoint. Lake Cumberland exists to the southwest of Somerset; Laurel River Lake is located to the southwest of London; and Wood Creek Lake is located to the northwest of London. All of these lakes are large water bodies and are home to a number of wildlife, recreational attractions, homes and businesses. The Rockcastle River bisects the study area and would be crossed by any of the proposed corridor alternates. The portion of the Rockcastle River within most of the study area is a state-designated Wild River, with certain restrictions imposed on new river crossings within this area. Crossings of the Rockcastle River would be preferable north or south of the designated Wild River area or at existing bridge crossings such as KY 80.

Other major areas of avoidance include parks, forests and wildlife management areas. Two major state parks exist within the study area. These include General Burnside State Park in Pulaski County, southeast of Somerset, and Levi Jackson Wilderness Road State Park in Laurel County southeast of London. The Daniel Boone National Forest extends through the study area and would be crossed by all corridor alternates. Sensitive and undisturbed areas of the forest should be avoided wherever possible; therefore, it would be more desirable for alternative corridors to be developed in proximity to existing highway corridors or through areas of the forest that have been previously impacted by logging or mining activities.



Exhibit 3.2 Existing Exits 38 and 41

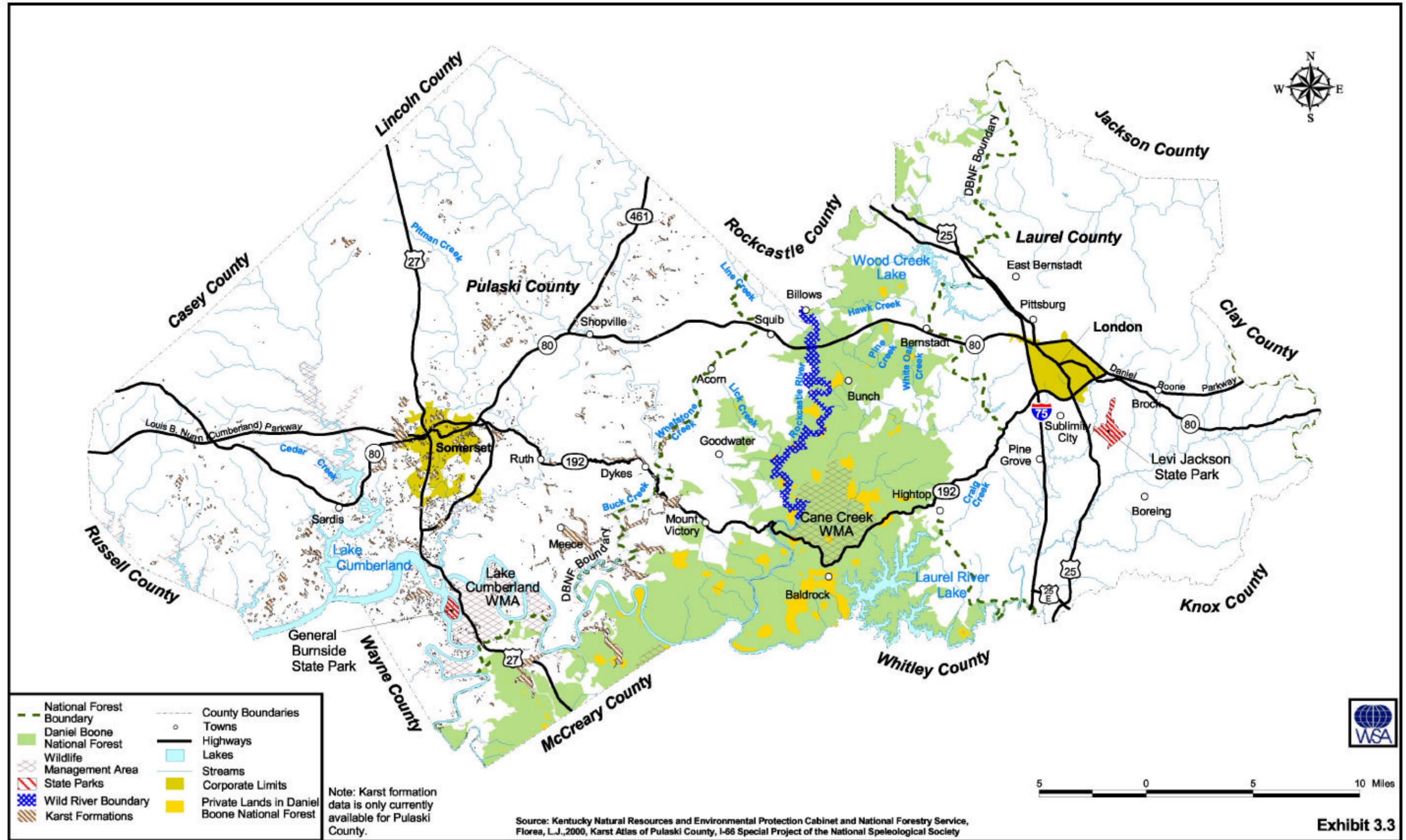


Exhibit 3.3

Major Areas of Avoidance

Limestone formations within the region also represent important areas of avoidance, particularly within Pulaski County and the Somerset area. Valley bottoms within this area underlain by St. Louis, St. Genevieve or Kidder limestone formations are karstic and contain significant sinkhole and cave features that should be avoided in order to minimize environmental and construction difficulties. Structural impacts associated with crossing these features should be avoided through route alignments and mitigation measures. Drainage issues need to also be addressed, as karst and cave features and the associated biological communities within them are sensitive to changes in water flow and the introduction of groundwater contaminants. Addressing these issues will be an important part of forthcoming NEPA investigations of design alternatives.

5. Travel Benefits

The study objectives for the I-66 corridor include offering improved travel benefits for motorists. These benefits will come in the form of improved safety, decreased travel time, and lower vehicle operating costs. Many of these improvements are a function of the geometric design requirements established for the facility. As a divided facility that provides a constant travel speed, access controls and other features, I-66 is anticipated to offer safety, timesaving and operational benefits. To better achieve these benefits, the routes selected for corridor development should, to the greatest degree possible, offer a direct route for motorists traveling through the corridor. As such, alternative corridors that could provide the most direct routing through the study area would help to achieve these objectives.

An additional consideration relative to travel benefits concerns traffic service. By carrying a greater volume of traffic, travel benefits can be realized by a greater number of motorists. The largest number of motorists are likely to be attracted by routes that provide good connections between key destination points, such as major crossroads; accessibility to population centers like Somerset, London and Corbin; and service to business, commercial and recreational complexes in the area.

B. PROPOSED CORRIDOR OPTIONS

Based upon the goals of this study and the key corridor development issues previously described, a series of alternates for proposed corridors were identified for consideration. General descriptions of these options include upgrading existing KY 80 and developing new corridors for highway development through the study area. Again, a corridor is considered to be a path of study at least 2,000 feet wide. A discussion of these options is provided in the following sections.

1. Upgrade KY 80

The existing KY 80 corridor is made up of two- and four-lane sections, with four-lane right-of-way along the entire corridor.

The study alternate for an improved KY 80 corridor begins in Pulaski County at a new interchange with the Louie B. Nunn (Cumberland) Parkway, approximately 7000 feet east of Fishing Creek (or about three (3) miles west of US 27). The corridor proceeds to a new interchange with US 27 (which is being realigned west of the existing route) north of Somerset, then southeasterly to another new interchange with KY 80, near Sugar Hill. The corridor would then follow the existing 4-lane section of KY 80 to KY 461, where a new interchange would also be needed. From KY 461, the existing alignment of KY 80 can be followed to the Daniel Boone Parkway at KY 192 in Laurel County. However, horizontal and vertical alignment changes would be needed at several locations along the existing route to meet interstate criteria. Additionally, an

independent centerline may be required near the Rockcastle River in order to complete construction and maintain traffic. The length of this option is approximately 38.4 miles.

There are several issues that must be addressed in any evaluation of reconstructing the existing KY 80 corridor to comply with interstate standards. These particular issues are discussed below, as follows:

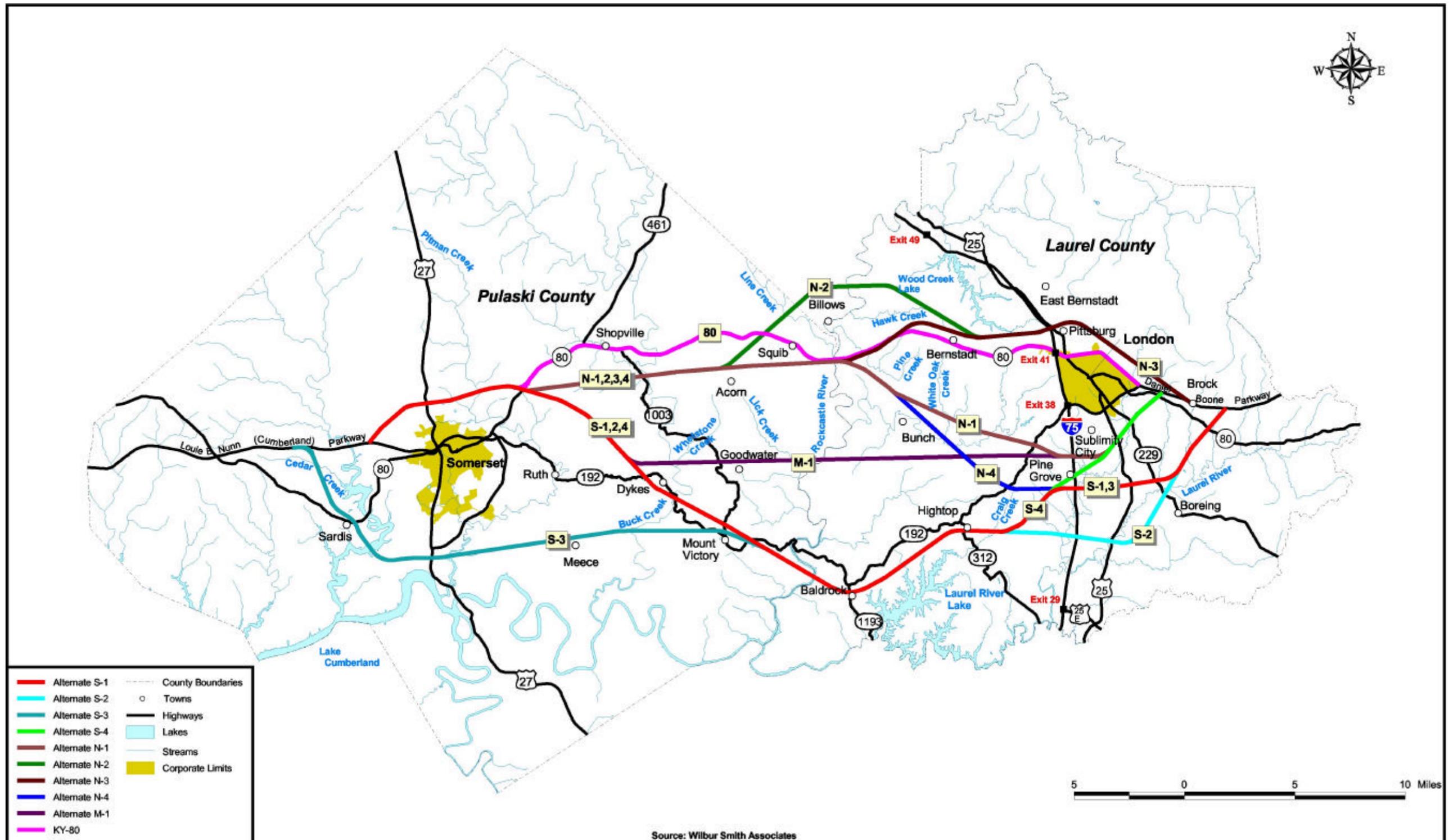
- Access is currently provided only at designated locations. Minimum spacing requirements for partial control of access are 1200 feet in rural areas and 600 feet in urban areas. In Pulaski County there are approximately 55 separate entrances and approximately 51 entrances in Laurel County. Additionally, according to county PVA mapping, there could be about 540 parcels of land in Pulaski County and 1260 parcels in Laurel County that may be affected (within a 500-foot corridor) by using full control of access associated with an interstate-type system.
- During construction, the maintenance of traffic would be very difficult along the existing alignment of KY 80 wherever horizontal or vertical curvature changes are required.
- Interchange locations will be needed at key crossroads to maximize their placement and maintain safety and capacity of the existing network.
- Overpass or underpass structures will also be necessary when crossing routes that do not meet interchange criteria. Some of the existing routes will be cut off from interstate access.
- Without the use of frontage roads along the entire KY 80 corridor, right-of-way acquisition will be extremely expensive in order to maintain fully controlled access. Conversely, the use of frontage roads would require a wider typical highway cross-section (increased right-of-way limits), more road maintenance, additional construction and increased potential for more interchanges.

2. Corridor Alternates

Based upon the consideration of the corridor development issues previously discussed, nine (9) corridor alternates, in addition to KY 80, were developed for additional study. These study corridors utilize north, middle and south sectors of the study area. There are four (4) variations each of both south and north corridors and one (1) middle corridor. The corridors traverse through portions of three Kentucky counties, Pulaski, Rockcastle and Laurel. The location of each proposed new route corridor, along with the proposed KY 80 corridor, is shown on **Exhibit 3.4**. A specific description of each corridor follows.

For analysis purposes, all of the new route corridors are assumed to be 2,000 feet in width. Subsequent design and environmental studies will consider alignment options within a corridor based upon the results of this corridor-level evaluation.

All of the proposed corridor alternates begin with a new interchange at the Louie B. Nunn (Cumberland) Parkway, west of Somerset. The north, middle and south alternates S-1, S-2 and S-4 are routed north of Somerset and share common segments with KY 80, east of Somerset. The S-3 corridor begins west of Somerset and proceeds to the south side of Somerset until it becomes common with S-1, near Mt. Victory. The north alternates tend to parallel KY 80; the middle alternate is a direct link from Somerset to London; and the south alternates closely follow the existing KY 192 highway corridor.



Study Corridors

CHAPTER 3 – PROPOSED CORRIDORS

N-1 and M-1 cross I-75 south of London near the London-Corbin Airport and end at the Daniel Boone Parkway, approximately 1.5 miles east of KY 192. The N-2 and N-3 corridors cross I-75 and US 25 approximately one mile north of Exit 41, north of London. S-1 and S-3, along with N-4, cross I-75 approximately one mile north of the existing weigh stations and continue northeasterly to the Daniel Boone Parkway ending at KY 488, approximately 1.5 miles east of the London Toll Plaza. The S-2 corridor crosses I-75 south of the existing weigh stations and ends at the Daniel Boone Parkway near KY 488. S-4 crosses I-75 near Pine Grove and becomes common with both the north and middle alternates near the London-Corbin Airport.

The following are general descriptions of each corridor alternative:

- *North Alternate Corridor No. 1 (N-1)*

The N-1 alternate is approximately 39.0 miles in length. It begins at the Louie B. Nunn (Cumberland) Parkway and ends at the Daniel Boone Parkway east of KY 192. N-1 is common with all the corridors except S-3 until intersecting with KY 80. Moving eastward, this corridor crosses the Rockcastle River at the existing KY 80 location and then crosses KY 192, I-75, US 25, KY 229 and KY 80.

- *North Alternate Corridor No. 2 (N-2)*

About 41.5 miles in length, N-2 is common with N-1 to a point near the community of Acorn. The corridor proceeds in a northeasterly direction, crossing both old and new KY 80, I-75 north of Pittsburg, and KY 1225. N-2 ends at the Daniel Boone Parkway east of KY 192. Note that about three miles of this corridor is in Rockcastle County. This corridor provides access around the north side of London and avoids directly crossing within the state-designated Wild River boundary of the Rockcastle River.

- *North Alternate Corridor No. 3 (N-3)*

The N-3 alternate is approximately 40.0 miles in length. It begins at the Louie B. Nunn (Cumberland) Parkway and ends at the Daniel Boone Parkway east of KY 192. The N-3 alternate is common with N-1 to a point just east of the Rockcastle River where it parallels the existing KY 80 route and then turns east near Bernstadt. N-3 also crosses the I-75 and US 25 corridors.

- *North Alternate Corridor No. 4 (N-4)*

Approximately 43.2 miles in length, the N-4 corridor is common with N-1 and N-3 to the east side of the Rockcastle River. At this point, the corridor then continues southeast toward Pine Grove, crossing KY 192, I-75, US 25, KY 229 and KY 80 before ending at the Daniel Boone Parkway east of Brock.

- *Middle Alternate Corridor No. 1 (M-1)*

The M-1 alternate is about 39.1 miles in length. It begins at the Louie B. Nunn (Cumberland) Parkway, following the north alternates to the first intersection with KY 80. At this point, the corridor continues south and east across the study area, passing north of the communities of Dykes, Goodwater and Pine Grove. M-1 crosses the KY 1003, KY 192, I-75, US 25, KY 229 and KY 80 corridors before meeting the Daniel Boone Parkway west of Brock.

- *South Alternate Corridor No. 1 (S-1)*

About 45.6 miles in length, the S-1 alternate begins at the Louie B. Nunn (Cumberland) Parkway, and is common with the north alternates to the first intersection with KY 80. The corridor then proceeds southeast and crosses the KY 192 corridor several times. S-1 also crosses KY 1193 near Baldrock, KY 312 near Hightop, and KY 192 just south of Pine Grove. After crossing I-75, US 25, KY 229 and KY 80, S-1 ends at the Daniel Boone Parkway near KY 488, about 1.5 miles east of the London Toll Plaza.

- *South Alternate Corridor No. 2 (S-2)*

The S-2 corridor is approximately 46.5 miles in length and is common with S-1 to Cane Branch in Laurel County. S-2 then crosses I-75 south of the existing weigh stations. The alternate then proceeds east, crossing the Little Laurel River and I-75, between the Laurel Ridge Landfill, near Lily. S-2 continues easterly over the CSX railroad, Laurel River and US 25, and then proceeds northerly, from Robinson Creek, to just west of Boreing. This alternate becomes common with S-1 again at Lesbas.

- *South Alternate Alignment No. 3 (S-3)*

The S-3 alternate is about 48.9 miles in length. It begins farther west on the Louie B. Nunn (Cumberland) Parkway than the other corridors, approximately 2.5 miles west of Fishing Creek. S-3 proceeds southeast around Somerset, crossing KY 80 and US 27 and then joins the S-1 corridor just north of Mount Victory.

- *South Alternate Alignment No. 4 (S-4)*

About 42.9 miles in length, the S-4 corridor is common with S-1 to a point approximately 5000 feet west of Pine Grove, near I-75. The corridor turns northeast to become common with the N-1 and M-1 corridors, terminating at the Daniel Boone Parkway, about 1.5 miles east of the KY 192 intersection.

The study alternates identified for evaluation in this report are intended to represent approximate locations of 2,000-foot corridors. Further discussion and analysis of these corridors is included in the remaining chapters of this report.

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

This chapter defines and discusses the criteria used to evaluate the ten corridor alternates described in Chapter 3. Evaluation criteria have been constructed to meet the identified goal of this planning study: to evaluate options for an interstate transportation corridor while seeking to balance socioeconomic and traffic needs against environmental concerns and project costs. The evaluation is divided into three basic categories: traffic and socioeconomic analyses, environmental issues, and engineering and construction cost analyses.

A. TRAFFIC AND SOCIOECONOMICS

The following section provides an analysis of several traffic and socioeconomic issues related to travel benefits as well as social and economic considerations.

1. Travel Benefits

Travel benefits reflect the ability of corridor alternates to efficiently and safely serve travelers and to be effectively integrated with other transportation system components.

- Projected Traffic Volumes*

Projected traffic volumes were derived for each study alternate by segment using the Statewide Traffic Model as modified for the study area. **Table 4.1** shows the weighted (based on segment length) average annual daily traffic (AADT) for each alternate corridor in the design year 2030. **Table 4.2** (see next page) shows the anticipated volumes by corridor segment for the years 2010 and 2030. **Exhibits 4.1 and 4.2** graphically display the volumes for the same years. As shown, KY 80, N-1 and N-4 are expected to carry the largest average volumes with about 20,000 vehicles per day (vpd) for the design year 2030. Volumes along KY 80 are expected to be highest near the KY 461 intersection in Pulaski County and along the northern edge of London. Lower average traffic volumes, between 14,000 and 16,000 vpd, are expected along the middle and south corridors (M-1, S-1, S-2, S-3 and S-4), as well as the N-2 corridor. Worth noting is that new corridors passing south of London generally would carry 30 to 40 percent more traffic between I-75 and the Daniel Boone Parkway than do new corridors passing north of London.

Table 4.1 Average Traffic Volumes

Alternate	Year 2030 Volume (vpd)
KY 80	20,300
N-1	20,400
N-2	14,600
N-3	18,500
N-4	19,900
M-1	15,500
S-1	15,800
S-2	15,500
S-3	15,000
S-4	16,600

Using traffic model output for the north, middle and south corridors, traffic volumes along the I-75 corridor were averaged, shown on Exhibits 4.1 and 4.2. Year 2030 volumes are expected to reach a maximum of about 66,000 vpd on the south side of London. When considered separately, the south alternates tend to increase volumes along I-75 by about 4,000 vpd. The estimated average volumes along I-75 are slightly lower than those projected for the route without the I-66 corridor.

- Time and Distance Savings*

The most-traveled existing east-west route in the project area is KY 80. Therefore, time and distance savings can be approximated by comparing travel to and from the same terminus points for each alternate corridor and KY 80 (i.e., KY 80 is the benchmark for travel studies).

The western limit of travel would begin at the Louie B. Nunn (Cumberland) Parkway interchange, where S-3 begins. The eastern terminus is at the proposed Daniel Boone Parkway interchange, where the S-1, S-2, S-3 and N-4 corridors end. Time savings represent the total travel time saved on a one-way trip along each alternate corridor (at 65 mph) when compared with travel along existing KY 80. Distance savings is the total distance saved on a one-way trip along each alternate corridor when compared with travel along existing KY 80.

KY 80, as it exists today, is 49.8 miles in length between termini with an approximate driving time of 53 minutes and 30 seconds. As shown in **Table 4.3**, this driving time would be reduced by all of the alternate corridors. Except for the S-2 corridor, all of the alternates would also reduce the total driving distance compared to the existing KY 80 route. The greatest time and distance savings can be expected for the KY 80, N-1, N-3 and M-1 corridors, ranging from 11 to 12 minutes. The greatest distance savings is anticipated for the same corridors, ranging from 3.7 to 4.8 miles. Overall, the south alternates result in the least time and distance savings, averaging 8 minutes in time savings and 0.4 miles in distance savings. It should be noted that the KY 80 alternate includes some corridor realignment and a northern Somerset bypass, which contribute to the time and distance savings provided by the KY 80 alternate relative to existing KY 80.

Table 4.3 Time and Distance Savings for Year 2030

Alternate	Time Savings (M:S)	Distance Savings (miles)
KY 80	11:00	3.7
N-1	11:26	4.1
N-2	10:48	3.4
N-3	12:04	4.8
N-4	10:26	3.1
M-1	11:20	4.0
S-1	8:18	0.7
S-2	7:27	-0.2
S-3	8:24	0.8
S-4	7:49	0.2

- Daily VMT Served and VHT Saved*

Typical output from a travel demand model includes Measures of Effectiveness (MOEs), used to identify regional traffic impacts. MOEs considered for this study include Vehicle Miles of Travel (VMT) and Vehicle Hours of Travel (VHT). The "Daily VMT Served" provides a measure of the total number of vehicle-miles (segment length x segment AADT) traveled along each alternate alignment by the Year 2030. The "Daily VHT Saved" represents the total number of vehicle-hours (average time savings x daily VMT) saved by each alternate by Year 2030.

Shown in **Table 4.4**, KY 80, N-1 and N-4 serve the highest average VMT for the design year 2030, around 930,000. The N-1 corridor saves the highest average VHT for the design year 2030, followed by N-3, KY 80 and N-4. Overall, N-2 and M-1 have the lowest VMT served and the south corridors have the lowest VHT saved.

Table 4.4 Daily VMT and VHT for Year 2030

Alternate	Daily VMT Served (veh-miles)	Daily VHT Saved (veh-hours)
KY 80	936,000	3,720
N-1	930,000	3,890
N-2	674,000	2,560
N-3	834,000	3,730
N-4	932,000	3,470
M-1	707,000	2,920
S-1	774,000	2,180
S-2	775,000	1,920
S-3	736,000	2,110
S-4	820,000	2,160

Table 4.2 Projected Traffic Volumes for the Years 2010 and 2030

KY 80 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,300	13,600	18
New US 27* to KY 80*	10,900	17,900	16
KY 80* to KY 461*	16,200	26,500	21
KY 461* to Buck Creek*	15,000	24,600	21
Buck Creek* to County Line*	14,200	23,200	28
County Line* to CR 1454**	12,300	20,200	18
CR 1454** to I-75**	13,400	22,000	26
I-75** to Daniel Boone Pkwy**	16,500	27,000	26

N-1 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,300	13,600	18
New US 27* to KY 80*	10,900	17,900	16
KY 80* to Buck Creek*	13,600	22,300	22
Buck Creek* to County Line*	13,600	22,300	22
County Line* to CR 1475**	12,600	20,600	21
CR 1475** to KY 192**	12,600	20,600	21
KY 192** to I-75**	13,300	21,800	21
I-75** to US 25**	12,900	21,200	20
US 25** to Daniel Boone Pkwy**	8,700	14,300	20

N-2 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,600	14,200	18
New US 27* to KY 80*	10,900	17,900	16
KY 80* to Buck Creek*	8,400	13,800	22
Buck Creek* to KY 80*	8,400	13,800	22
KY 80* to County Line*	8,400	13,800	22
County Line* to County Line***	8,400	13,800	22
County Line*** to CR 1454**	8,400	13,800	24
CR 1454** to I-75**	8,400	13,800	28
I-75** to Daniel Boone Pkwy**	6,500	10,700	26

N-3 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,300	13,600	18
New US 27* to KY 80*	10,900	17,900	16
KY 80* to Buck Creek*	13,600	22,300	16
Buck Creek* to County Line*	13,600	22,300	23
County Line* to KY 80**	11,900	19,400	20
KY 80** to I-75**	11,100	18,200	20
I-75** to Daniel Boone Pkwy**	7,300	11,900	26

N-4 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,300	13,600	18
New US 27* to KY 80*	10,900	17,900	16
KY 80* to Buck Creek*	13,600	22,300	23
Buck Creek* to County Line*	13,600	22,300	23
County Line* to FS 781**	13,500	22,100	21
FS 781** to KY 192**	13,500	22,100	21
KY 192** to I-75**	13,300	21,800	24
I-75** to US 25**	12,700	20,800	20
US 25** to Daniel Boone Pkwy**	8,500	13,900	20

M-1 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	7,100	11,600	18
New US 27* to KY 80*	9,600	15,700	16
KY 80* to Buck Creek*	7,900	13,000	21
Buck Creek* to County Line*	7,300	12,000	21
County Line* to CR 1340**	7,300	12,000	21
CR 1340** to KY 192**	10,400	17,000	21
KY 192** to I-75**	10,400	17,000	20
I-75** to US 25**	12,900	21,200	20
US 25** to Daniel Boone Pkwy**	8,700	14,300	20

S-1 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,500	13,900	18
New US 27* to KY 80*	11,600	18,900	16
KY 80* to Buck Creek*	7,800	12,800	20
Buck Creek* to County Line*	8,200	13,400	21
County Line* to KY 312**	8,200	13,400	21
KY 312** to I-75**	13,300	21,800	21
I-75** to US 25**	12,700	20,800	20
US 25** to Daniel Boone Pkwy**	8,500	13,900	20

S-2 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to US 27*	8,500	13,900	18
New US 27* to KY 80*	11,600	18,900	16
KY 80* to Buck Creek*	7,800	12,800	20
Buck Creek* to County Line*	8,200	13,400	21
County Line* to KY 312**	8,200	13,400	21
KY 312** to I-75**	13,300	21,800	21
I-75** to US 25**	12,700	20,800	20
US 25** to Daniel Boone Pkwy**	8,500	13,900	20

S-3 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy* to KY 80*	6,900	11,400	23
KY 80* to US 27*	6,900	11,400	23
US 27* to KY 769*	7,600	12,500	23
KY 769* to Buck Creek*	7,600	12,500	23
Buck Creek* to County Line*	9,200	15,000	23
County Line* to KY 312**	9,200	15,000	21
KY 312* to I-75**	14,400	23,600	21
I-75** to US 25**	12,800	20,900	20
US 25** to Daniel Boone Pkwy**	8,500	13,900	20

S-4 Corridor			
Description	2010 AADT ¹	2030 AADT ¹	% Trucks
Louie B. Nunn (Cumb.) Pkwy to US 27*	8,500	13,900	18
New US 27* to KY 80*	11,600	18,900	16
KY 80* to Buck Creek*	7,800	12,800	20
Buck Creek* to County Line*	8,200	13,400	21
County Line* to KY 312**	8,200	13,400	21
KY 312** to I-75**	13,300	21,800	21
I-75** to US 25**	12,900	21,200	20
US 25** to Daniel Boone Pkwy**	8,700	14,300	20

Notes: * Pulaski County ** Laurel County *** Rockcastle County ¹ Annual Average Daily Traffic

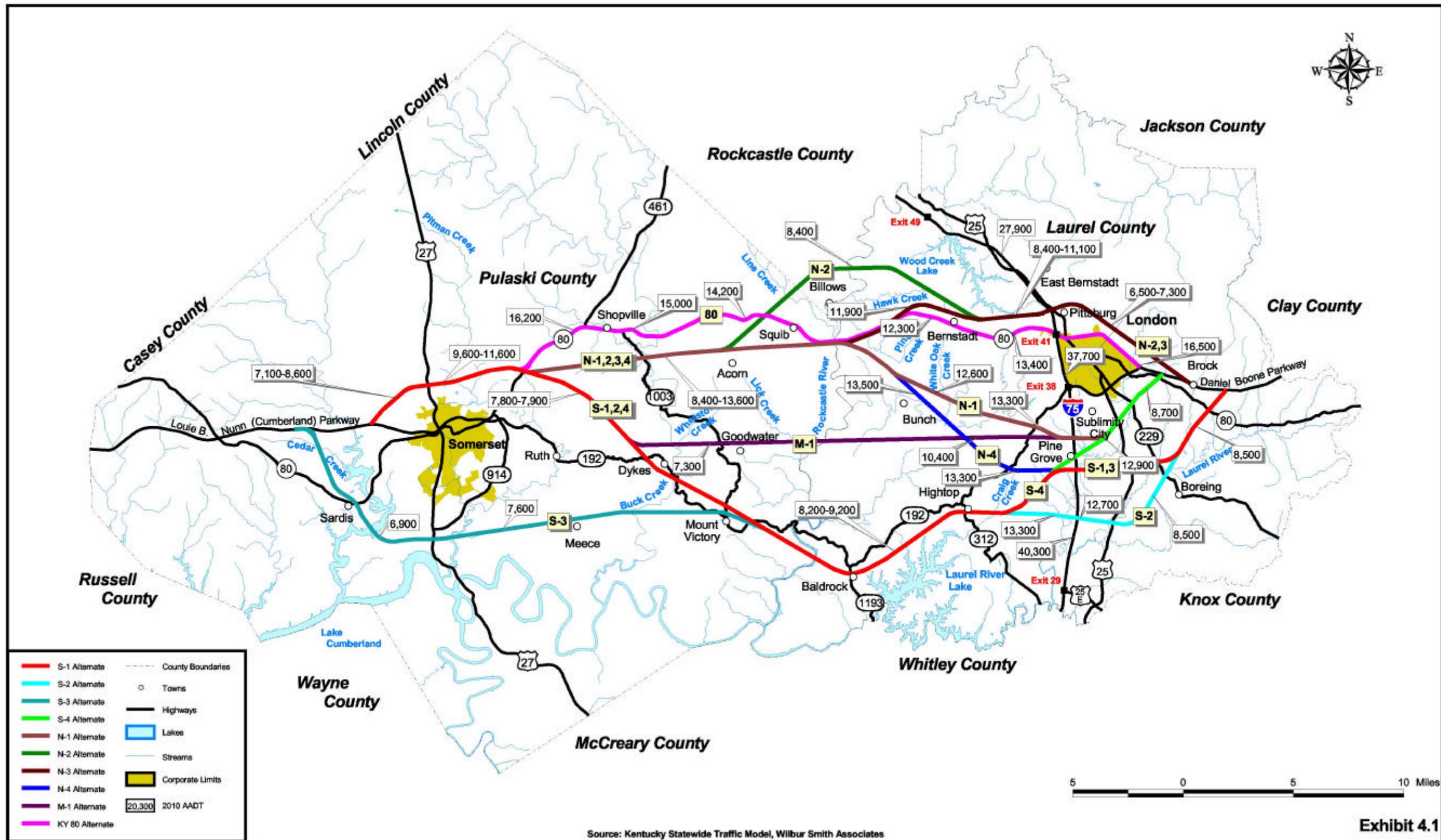


Exhibit 4.1
Projected Traffic Volumes for Year 2010

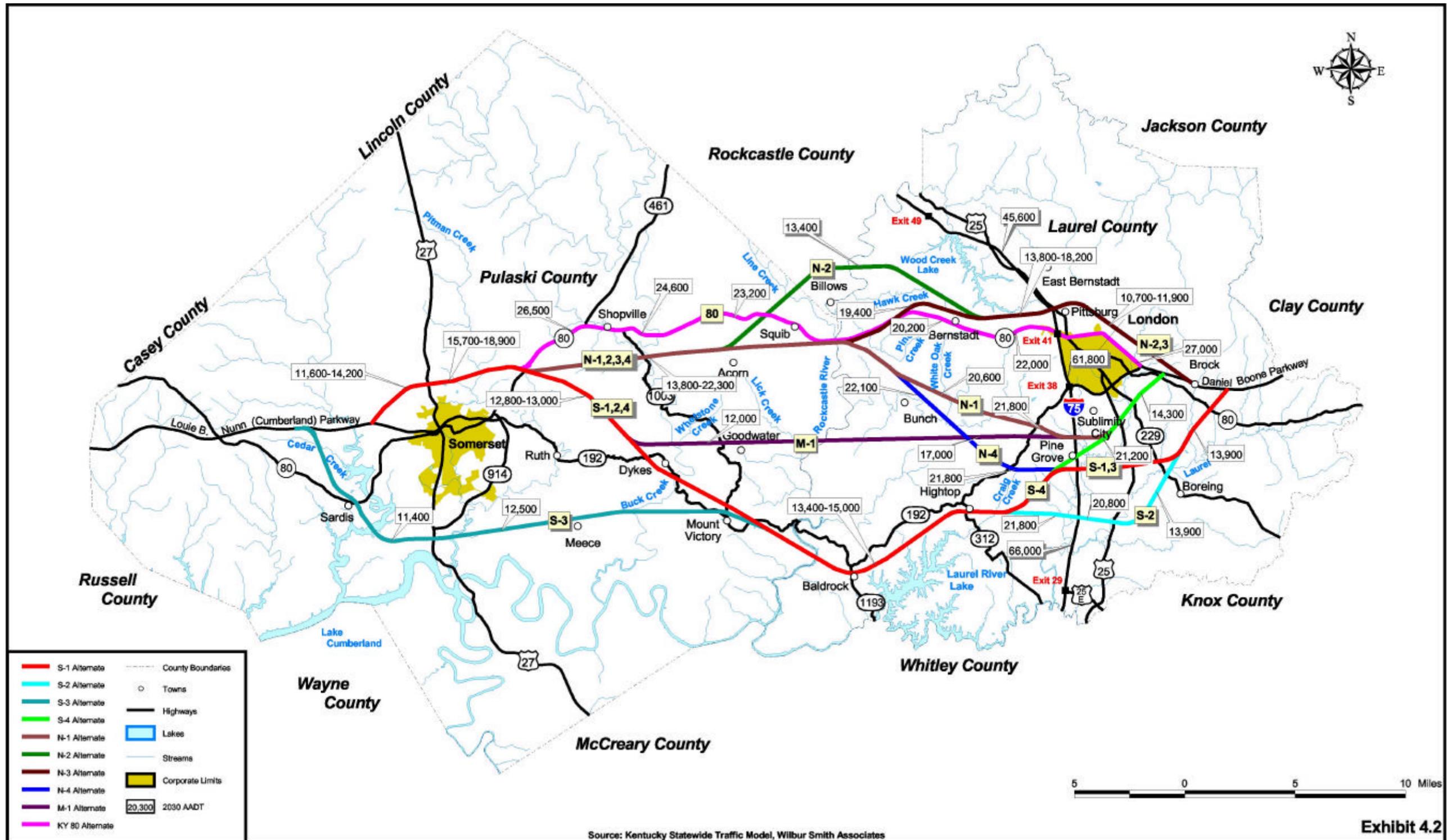


Exhibit 4.2
Projected Traffic Volumes for Year 2030

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

- *Accident Reductions*

Considering the corridor alternates, an analysis of each roadway section was completed to determine the potential annual accident reduction and associated cost savings based on the daily vehicle miles traveled (VMT). For the analysis, it was assumed that the proposed improvements were completed for the Year 2010 and 2030 scenarios, with accident and cost reductions expected for the improved segments. Reduction factors for this analysis were derived from the Kentucky Transportation Center's *Analysis of Traffic Accident Data*¹ and the Kentucky State Police's *Traffic Accident Facts*². The expected annual accident and cost savings for these years are shown in **Table 4.5** (see next page).

Based on accident data presented in the KTC's report, interstate facilities have fewer accidents per vehicle-mile of travel than minor and major arterial and collector facilities in the Commonwealth of Kentucky. By diverting some of the existing area traffic to a new interstate corridor, all of the corridor alternates would provide significant accident reductions and cost savings on an annual basis. Based on the average accident rate per mile for interstates and the projected traffic volumes, corridor alternates KY 80, N-1 and N-4 would provide the greatest savings by the Year 2030, with about 500 fewer accidents and approximately \$26 million less in total accident costs.

- *Transportation System Connectivity*

System connectivity considers the relative accessibility of each alternate corridor to other transportation facilities in the region. Currently, there is not a controlled access facility across the study region that connects major routes in the Somerset and London/Corbin areas. Recognizing that each corridor provides access to I-75 as well as the Louie B. Nunn (Cumberland) and Daniel Boone Parkways, other facilities in the area are also considered, including the regional airports in Somerset and London.

In the Somerset area, US 27 and KY 80 represent primary highway facilities north of town while US 27 and the Somerset Southeast Bypass (KY 914) represent primary facilities south of town. Additionally, the Somerset airport lies south of town. Considering these facilities, a transportation system connectivity advantage is provided by taking the corridor south of Somerset. This area will, however, be serviced by the Somerset southwest and southeast bypasses.

Between Somerset and London, KY 80 and KY 461 represent primary highway facilities along the northern portion of the study area. Along the southern portion of the study area, several secondary facilities such as KY 192 exist. However, these south routes carry significantly less traffic and have a lower functional classification than the north routes. As a result, a system connectivity advantage exists for those alternate corridors passing through the northern portion of the study area near KY 80.

In the London area, a number of highway facilities extend to the south of town, including US 25, which is a heavily traveled route between London and Corbin. US 25 also exists north of London, along with an additional secondary facility, KY 472. South of London, the London-

Corbin airport and the City of Corbin present several important system connection issues. US 25E passes through Corbin and provides a key regional highway connection to the Cumberland Gap tunnel. Corbin is also home to a CSX TransFloSM bulk transfer terminal for rail-to-truck self-service. Based upon these serviceability issues and the lack of a circumferential connection between I-75 and the Daniel Boone Parkway on the south side of London, a system connectivity advantage is provided by those corridors passing south of London.

In summary, advantages for transportation system connectivity are provided for corridors passing north or south of Somerset, following a northern alignment between Somerset and London, and passing south of London. The following corridors meet some or all of these criteria as areas of transportation system advantages:

- N-1: Passes north of Somerset, serves the KY 80 corridor between Somerset and London, connects between London and Corbin
- N-4: Passes north of Somerset, serves the KY 80 corridor between Somerset and London, connects between London and Corbin
- S-3: Connects south of Somerset and between London and Corbin

2. Social and Economic Issues

Social and economic issues account for the ability of corridor alternates to provide positive enhancements and minimize adverse impacts to people and economic resources within the study area.

- *Displacements*

The displacement measure represents the number of primary structures (homes, businesses and other buildings) with the potential to be displaced for each corridor alternate and is estimated based on a general 500-foot zone within each corridor. This measure represents only approximate displacements and structure locations were estimated based on aerial photography.

Based on the identified corridor zone, the M-1 alternate provides the least number of potential displacements, with approximately 140 structures impacted. As shown in **Table 4.6**, the KY 80 corridor would provide the greatest number of displacements with 480 structures, about 100 more potential displacements than the closest alternate, the S-3 corridor. Because KY 80 is an existing facility, commercial and residential development is considerably higher in certain areas, especially closer to the urban areas of Somerset and London.

Table 4.6 Potential Displacements

Alternate	Number of Structures (within a 500-foot corridor zone)
KY 80	480
N-1	300
N-2	240
N-3	270
N-4	330
M-1	140
S-1	300
S-2	280
S-3	380
S-4	310

¹ *Analysis of Traffic Accident Data in Kentucky (1993-1997)*, Kentucky Transportation Center, Research Report KTC-98-16, September 1998.

² *Kentucky Traffic Accident Facts 1998*, Kentucky State Police, prepared by the Kentucky Transportation Center.

Table 4.5 Accident Reduction and Cost Savings for Proposed Corridors

Corridor Alternate	Daily VMT Served	Annual Accident Reduction					Annual Accident Cost Savings				
		Fatal	Serious Injury	Minor Injury	PDO ¹	Total	Fatal	Serious Injury	Minor Injury	PDO ¹	Total
S-1 (Year 2010)	472,747	1.9	7	77	158	244	\$6,168,763	\$5,148,113	\$1,820,691	\$299,327	\$13,436,894
S-1 (Year 2030)	773,651	3.1	11	127	258	399	\$10,095,176	\$8,424,883	\$2,979,559	\$489,849	\$21,989,467
S-2 (Year 2010)	473,487	1.9	7	78	158	244	\$6,178,417	\$5,156,170	\$1,823,540	\$299,796	\$13,457,924
S-2 (Year 2030)	774,798	3.1	11	127	258	399	\$10,110,151	\$8,437,380	\$2,983,979	\$490,576	\$22,022,086
S-3 (Year 2010)	449,368	1.8	6.4	74	150	232	\$5,863,684	\$4,893,511	\$1,730,648	\$284,524	\$12,772,367
S-3 (Year 2030)	736,033	3.0	10	121	245	379	\$9,604,311	\$8,015,234	\$2,834,682	\$466,031	\$20,920,257
S-4 (Year 2010)	500,835	2.0	7	82	167	258	\$6,535,271	\$5,453,980	\$1,928,865	\$317,111	\$14,235,227
S-4 (Year 2030)	820,250	3.3	12	134	273	423	\$10,703,232	\$8,932,334	\$3,159,025	\$519,354	\$23,313,945
M-1 (Year 2010)	431,170	1.7	6	71	144	222	\$5,626,235	\$4,695,349	\$1,660,565	\$273,002	\$12,255,151
M-1 (Year 2030)	707,360	2.8	10	116	236	365	\$9,230,161	\$7,702,989	\$2,724,253	\$447,876	\$20,105,279
N-1 (Year 2010)	567,082	2.3	8	93	189	292	\$7,399,706	\$6,175,391	\$2,184,000	\$359,057	\$16,118,154
N-1 (Year 2030)	929,710	3.7	13	152	310	479	\$12,131,556	\$10,124,335	\$3,580,591	\$588,660	\$26,425,142
N-2 (Year 2010)	410,276	1.6	6	67	137	211	\$5,353,582	\$4,467,808	\$1,580,093	\$259,772	\$11,661,256
N-2 (Year 2030)	674,288	2.7	10	111	225	348	\$8,798,609	\$7,342,839	\$2,596,882	\$426,936	\$19,165,266
N-3 (Year 2010)	508,822	2.0	7	83	170	262	\$6,639,487	\$5,540,954	\$1,959,624	\$322,168	\$14,462,233
N-3 (Year 2030)	833,723	3.3	12	137	278	430	\$10,879,048	\$9,079,060	\$3,210,917	\$527,885	\$23,696,910
N-4 (Year 2010)	568,506	2.3	8	93	189	293	\$7,418,287	\$6,190,898	\$2,189,484	\$359,958	\$16,158,628
N-4 (Year 2030)	931,741	3.7	13	153	310	480	\$12,158,058	\$10,146,452	\$3,588,413	\$589,946	\$26,482,869
KY 80 (Year 2010)	571,256	2.3	8	94	190	294	\$7,454,173	\$6,220,846	\$2,200,076	\$361,699	\$16,236,794
KY 80 (Year 2030)	935,933	3.8	13	153	312	482	\$12,212,758	\$10,192,102	\$3,604,557	\$592,601	\$26,602,018

Factors²:

1.1	3.9	44.9	91.3
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\$3,250,000	\$765,000	\$23,500	\$1,900
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¹Property Damage Only

²Factors derived from *Analysis of Traffic Accident Data in Kentucky (1993-1997)*, Kentucky Transportation Center, Research Report KTC-98-16 and *Kentucky Traffic Accident Facts, 1998 Report*, Kentucky State Police and represent accidents reduced per 100 million vehicle miles of travel (VMT).

• *Recreational Facilities*

Proximity to local recreational facilities was measured for each of the corridor alternates, and defined as the average distance (in miles) from the nearest proposed interchange along each corridor alternate to 116 recreational facilities in the two study counties and ten surrounding counties. The average distances are presented for each of the corridors in **Table 4.7**.

As noted on Exhibit 2.6, Regional Tourism, most of the area's tourism and recreational facilities are located in the southern half of the study area, including boat ramps, campgrounds, trails, and parks. For this reason, all of the south alternates have lower average proximity measurements. On the other hand, the north routes of KY 80, N-2, and N-3 are situated farther from recreational facilities, resulting in greater proximity distances.

Table 4.7 Recreational Proximity

Alternate	Average Distance to Recreational Facilities (miles)
KY 80	36.0
N-1	33.1
N-2	36.3
N-3	36.1
N-4	31.8
M-1	32.5
S-1	27.7
S-2	27.7
S-3	27.3
S-4	27.9

• *Industrial Serviceability*

Similar to the measurement for recreational facilities, industrial serviceability was measured by determining the average distance (in miles) from each corridor alternate to 203 industrial facilities in the study area. The largest concentration of facilities occurs close to the urban areas of Somerset and London. **Table 4.8** summarizes the average distance to industrial facilities for each corridor alternate.

Due to its developed character and its existing service to many of the area industries, the KY 80 corridor provides the least average distance to industry. The M-1 and S-4 corridors share common segments north of Somerset and south of London, also providing good serviceability to local industry. The S-3 corridor has the greatest average distance to industrial facilities, partly due to its southern routing around Somerset. The difference in mileage between the best and worst in this category is relatively small.

Table 4.8 Industrial Serviceability

Alternate	Average Distance to Industrial Facilities (miles)
KY 80	5.2
N-1	5.6
N-2	5.7
N-3	5.7
N-4	5.7
M-1	5.4
S-1	5.9
S-2	6.2
S-3	6.6
S-4	5.4

• *Environmental Justice*

An important consideration for highway reconstruction or new development is environmental justice. For this study, environmental justice is addressed by calculating the percentage of minority, elderly and low-income persons along the alternate corridors using 1990 U.S. Census block-level population counts. Values above zero (0) indicate the alternate is more favorable than the regional average, potentially causing fewer negative impacts to these population groups. The environmental justice measure is shown for each alignment in **Table 4.9**.

As shown in the table, all of the alternates are estimated to have fewer environmental justice concerns than the regional average, ranging between 13 and 30 percent. The N-1 and N-4 corridors have the lowest concentration of minority, elderly and low-income persons. On the other hand, the south corridors along with N-2 and N-3 appear to have the highest percentage of these sensitive population groups.

Table 4.9 Environmental Justice

Alternate	Percent Fewer than Regional Average
KY 80	23
N-1	30
N-2	13
N-3	15
N-4	29
M-1	23
S-1	15
S-2	14
S-3	17
S-4	16

3. Summary of Traffic and Socioeconomics

In the areas of travel benefits and social/economic issues, each of the alternates has different strengths and weaknesses. A summary of the traffic and socioeconomic issues related to each corridor are as follows:

• *KY 80 Alternate*

Because of its use of an existing highway corridor, the KY 80 corridor provides some variation in the advantages and disadvantages it offers in comparison to the other alternatives that generally follow new corridors. KY 80 offers high traffic service levels, accident reductions, and serviceability. However, widening the KY 80 corridor is likely to cause more property displacements and create more social disruption to developed areas along the corridor. If the properties are not displaced by the reconstructed highway, many businesses and properties could still lose their existing access points along KY 80 due to the need to develop the I-66 corridor as a controlled access highway. A summary of the key findings related to this alternate include:

- High traffic service levels, accident reduction and serviceability;
- More property displacements; and,
- Disruption to existing highway access points.

- *North Alternates*

Most of the north alternates, with the exception of N-2, provide for high traffic service levels, time savings and accident reductions. The N-1 alternate is the best corridor alternate relative to the travel benefits. Key findings related to these alternates include:

- High traffic service levels, time savings and accident reductions for the N-1, N-3 and N-4 alternates;
- Traffic and highway system service advantages for north alternates passing south of London (N-1 and N-4);
- Lowest concentration of minority, elderly and low-income persons for N-1 and N-4 corridors;
- Indirect routing between Somerset and London makes N-2 less desirable; and,
- Relatively average social and economic issues for all alternates.

- *Middle Alternate*

The M-1 corridor provides the most direct routing of all the alternates and therefore offers good time and distance savings. Because it passes through a relatively unpopulated area between London and Somerset, the corridor has minimal property displacements, but it also has lower traffic service levels and connectivity advantages. A summary of key findings related to this alternate include:

- Good time and distance savings;
- Minimal property displacements;
- Lower traffic service levels; and,
- Less transportation system and community access.

- *South Alternates*

The south alternates provide for improved service connections to recreational facilities and the S-3 corridor offers good transportation system connectivity. Drawbacks to these alternates are that they generally have lower traffic service levels, less proximity to industrial facilities and increased potential for environmental justice issues. A summary of key findings related to these alternates include the following:

- Good proximity to recreational facilities;
- Lower traffic service levels;
- Less proximity to industrial facilities; and,
- Increased potential for adverse social and environmental justice impacts.

B. ENVIRONMENTAL ISSUES

An environmental overview of each corridor alternate was completed using Geographic Information System (GIS) databases and other technical resources available in-house and through various agency and private resources. The overview is intended to provide known and potential environmental issues that can be reasonably identified to allow a conservative analysis of corridors. Appropriate detailed environmental work will be conducted during subsequent phases of project development that will entail, where appropriate, NEPA evaluation of alignment alternatives. These future study efforts will provide for more detail and site-specific field evaluations of the environmental issues identified in this study, along with consideration of other important environmental concerns not known or documented at this planning phase.

The following analyses identify "potential" issues within buffer zones of either 500 or 2,000 feet in width, along each of the defined corridors. All items identified in this analysis will not necessarily be impacted if an alignment is ultimately designed within one of these corridors. These identified issues will be avoided as much as possible during future design phases. Environmental issues considered for this study include cultural and historic features, native species, natural areas and other issues. Data for this analysis was provided by:

- Kentucky Heritage Council: historic and archaeological sites
- United States Geological Survey: cemeteries, churches and schools
- Kentucky Natural Resources and Environmental Protection Cabinet: wildlife management areas and Wild River boundaries
- Daniel Boone National Forest: National Forest boundaries and property, threatened and endangered species, potential threatened and endangered species, cave routes and cliff lines
- Kentucky State Nature Preserves Commission: threatened and endangered species, and potential threatened and endangered species
- Department of Natural Resources: blue-line stream crossings
- Kentucky Department of Fish and Wildlife: wetland locations
- Kentucky Geological Survey: wells and underground storage tanks, geologic features
- U.S. Environmental Protection Agency: hazardous waste data, toxics release inventory, water discharge permits, and superfund sites
- Local Cave Society: cave routes and cliff lines
- National Speleological Society: karst and cave data

Many of these contributing agencies have volunteered services for future phases of this study.

1. Cultural / Historic Features

When this project advances into the NEPA process, historic and cultural resources likely to require further consideration include prehistoric and historic period archaeology sites and historic buildings. Such resources require identification and evaluation to determine their significance in terms of the National Register of Historic Places. Non-historic cultural resources such as schools, cemeteries and churches are also issues that must be considered. Information about the historic and non-historic cultural resources within Pulaski and Laurel counties generally, and within specific corridors, was compiled from the Kentucky Heritage Council (KHC) site files, historic and modern

Table 4.10 Identified Cultural and Historic Features (within a 2,000-foot corridor)

Alternate	Archaeology Sites	Historic Sites	Cemeteries	Churches	Schools
KY 80	30	7	9	4	5
N-1	21	1	8	13	6
N-2	16	1	4	7	0
N-3	22	1	4	8	3
N-4	26	1	6	9	4
M-1	9	1	5	3	0
S-1	6	1	7	8	4
S-2	6	1	6	11	5
S-3	10	1	9	7	2
S-4	6	1	9	10	4

Source: Kentucky Heritage Council, U.S. Geological Survey

county maps, and local and regional histories. These data were entered into the project GIS, then used to identify the frequency and types of resources that have been documented within each of the ten corridors. The resulting occurrences by resource type are shown in **Table 4.10**, and their locations mapped in associated exhibits.

The documented sites represent a portion of the total cultural resources likely to be present within each corridor. Other sites may be discovered when base studies are conducted. The discovery of additional archaeological sites and the documentation of historic structures may result from further studies. The number of resources documented within a region is strongly related to the number of detailed studies that have been conducted and documented. The enumeration of archaeological sites shown in Table 4.10 reflects the total count of recorded sites, not the number that are still extant, as the Kentucky Heritage Council does not remove destroyed sites from its registry. It is difficult to use existing records to determine if all of the 30 sites documented on KY 80 are still present.

- *Archaeology Sites*

Analysis of the available data demonstrate significant variation in the frequency of recorded historic cultural resources within each of the 2,000-foot corridors. KY 80 has the greatest number of recorded archaeological sites, while alternates S-1, S-2 and S-4 have the smallest number. These differences among corridors reflect the amount of cultural resource survey that has been conducted within the area of each corridor. While archaeological sites were considered during the study process, they are not mapped in the report in order to protect sensitive locations.

A cultural resource survey will likely be needed to assess the type and frequency of different resources within a preferred corridor. The existing data are insufficient to accurately model the likely locations of cultural resources. A review of the KHC data files indicates that Pulaski and

Laurel counties have a total of 670 recorded archaeological sites. Of these, only 23 are on the National Register of Historic Places, and only five additional sites are considered potentially eligible. The remaining sites were either not evaluated for the National Register or are of unknown potential.

Given the diversity of resource types already recorded in the two counties as a whole, any of the ten corridors is likely to contain prehistoric camp sites, villages, burial mounds and rock shelters. Historic archaeological sites are also likely to be present, but so few are documented it is not currently possible to assess their likely type. At the present time, no petroglyph sites are documented in Pulaski or Laurel County, although numerous examples are reported elsewhere in the Daniel Boone National Forest. It is likely that some occur within the project corridor, particularly in areas where sandstone escarpments are exposed. Prehistoric petroglyph sites present unique problems in terms of management, as they are immovable cultural features of likely religious significance and under the terms of the National Register are linked indelibly to their location. Careful planning to avoid such sites is likely to be needed.

- *Historic Structures*

A total of 129 known historic buildings are presently reported in the two-county area, and 17 are considered potentially eligible. As shown in Table 4.10 and illustrated in **Exhibit 4.3**, the number of historical structures in proximity to each alternate is limited, with the exception of KY 80. This alternate could potentially involve 7 structures, only one of which is determined to be eligible for the National Register of Historic Places. The other alternates could involve as few as one structure each.

In a previous study conducted by Wilbur Smith Associates for the Kentucky Transportation Cabinet, the state-maintained highway bridges were evaluated to determine their National Register significance. Bridges currently maintained by the Kentucky Transportation Cabinet were included in the assessment for Pulaski and Laurel County. An initial review of these findings indicates that there are no historically significant bridges in the project corridor within Pulaski or Laurel County. Since the state records only include actively maintained highway bridges, additional research may have to be conducted to assess if any National Register eligible, non-maintained bridges are within the project corridor.

- *Cemeteries*

Although historic cemeteries are cultural resources, at the present time the Kentucky Transportation Cabinet does not consider them to be archaeological sites; however, they are considered to be sensitive in nature and present a right-of-way issue. Federal legislation is unclear on appropriate treatments. These resources may require documentation as cultural resources, and any adverse effects to them may require mitigation measures or realignment. There are also likely to be unmarked or poorly recorded family cemeteries within the project corridor. During subsequent studies of design and alignment options, additional research should be conducted to identify all potential cemetery sites using old maps, state records, local historic records or informants. Further archaeological surveys may also result in their discovery.

As shown in Table 4.10 and Exhibit 4.3, the alternates that could potentially affect the greatest number of known cemeteries would be the KY 80, S-3 and S-4 alternates, passing through or near 9 documented cemeteries. The N- 2 and N-3 alternates would potentially affect the least number (4) of cemeteries.

- *Churches*

Each alternate was evaluated to determine the number of known church facilities within a 2,000-foot wide corridor. According to Table 4.10 and Exhibit 4.3, the N-1 corridor contains 13 churches followed closely by the S-2 and S-4 corridors, with 11 and 10 churches, respectively. The KY 80 and M-1 corridors potentially impact the least number of churches, with 4 and 3 facilities, respectively.

- *Schools*

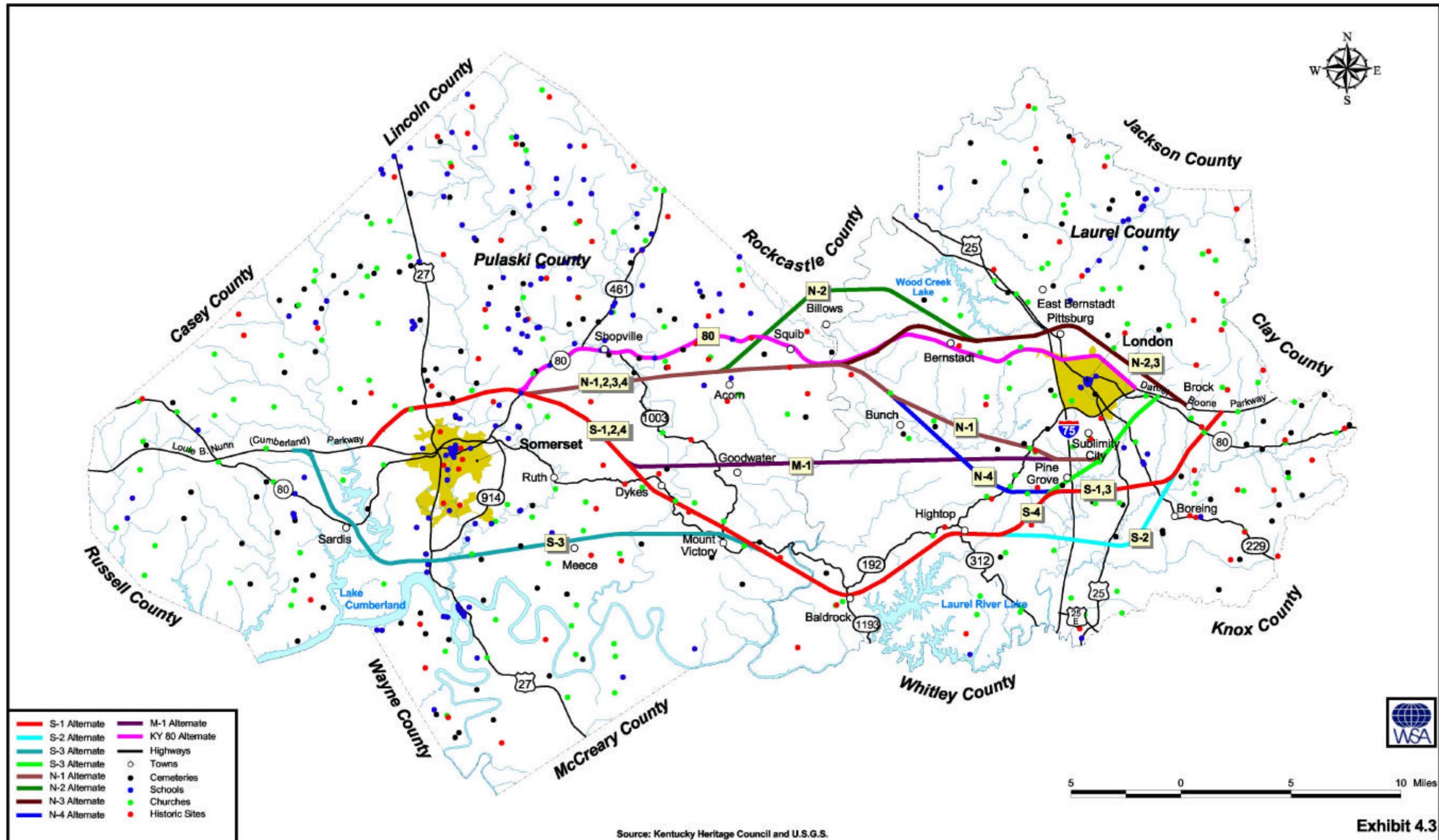
Shown in Table 4.10 and illustrated on Exhibit 4.3, the number of known schools contained in the 2,000-foot study corridors ranges between zero and 6. The N-2 and M-1 corridors do not contain any identified school facilities. The N-1 corridor could potentially impact the greatest number of schools (6), followed by KY 80 and S-2, with 5 schools each.

2. Native Species

The data summarized in this analysis represents known occurrences of federal and state species within the defined corridors. This allows for a generalized comparison to be made of the advantages or disadvantages of corridors relative to each other. It does not necessarily imply that a specific number of impacts would occur within a corridor. The ultimate number of threatened or endangered species impacted could be more or less than the reported number of known occurrences. In such cases as stream crossings, species downstream of the crossing could fall outside of the designated corridors but would still require consideration for environmental impacts.

- *Threatened and Endangered Species*

The potential number of threatened and endangered species in each 2,000-foot corridor was estimated based on state and federal GIS data, along with information provided by local resource agencies. As shown in **Table 4.11**, the south and middle alternate corridors encompass the greatest number of known species locations with the exception of the S-3 corridor. The north corridors are expected to have the least degree of potential impact, with zero to two known native species; however, according to local specialists, the Cumberland Bean and Pearly Mussel are inherent throughout the corridor, although locations may not be specifically mapped. Threatened and endangered species data are not mapped in this report in order to protect their locations. A full listing of the identified species in Pulaski and Laurel counties is located in Appendix D.



Historic Sites, Cemeteries, Churches & Schools

Table 4.11 Identified Native Species

Alternate	Number of Identified Occurrences (within a 2,000-foot corridor)	
	Threatened and Endangered Species	Potential Threatened and Endangered Species
KY 80	9	1
N-1	2	2
N-2	0	0
N-3	2	1
N-4	2	1
M-1	16	16
S-1	14	23
S-2	16	23
S-3	7	22
S-4	14	23

Source: Kentucky State Nature Preserves Commission, Daniel Boone National Forest

- *Potential Threatened and Endangered Species*

Similar to threatened and endangered species, the south and middle alternates encompass the greatest number of known locations of potential threatened and endangered species. This data is provided by the Daniel Boone National Forest. The south alternates potentially include more than 22 known locations of species and M-1 contains 16 known locations of species within its corridor. The north corridors were identified as having two or fewer areas of occurrence of potentially threatened and endangered species. The number of identified occurrences of potential threatened and endangered species is summarized for each alternate in Table 4.11.

3. Natural Areas

Natural areas encompass a broad range of features within the study area. These areas include National Forest property, geologic and cave features, cliff lines, streams, wetlands, lakes and rivers.

- *Daniel Boone National Forest Property*

The Daniel Boone National Forest (known as the Cumberland National Forest prior to 1966) comprises over 692,000 acres within a 2 million-acre proclamation boundary in 21 counties of Kentucky. Within the project area, there are approximately 37,000 acres of forest land in Pulaski County; 62,000 acres in Laurel County; and 14,000 acres in Rockcastle County. The Forest offers a variety of opportunities for outdoor recreation. Notable activities include camping, picnicking, hiking, nature study, fishing, boating and swimming. In addition, logging activities are managed for upland hardwood, cove hardwood and yellow pine.

The Forest also has many varieties of wildlife. There are more than 100 species of birds, 46 kinds of mammals, and 67 types of reptiles and amphibians. Endangered species, including plants, are resident in the Forest. The Forest is comprised of both public and private land, as illustrated in **Exhibit 4.4**. It should be noted that the National Forest land involved with these corridor alternates would not qualify as Section 4(f) property because of the Forest's multi-purpose usage.

One area of impact to the Daniel Boone National Forest (DBNF) is measured in the number of acres of property owned by the DBNF located within a generalized, 500-foot zone within each

corridor alternate. As shown in **Table 4.12**, the KY 80, N-2 and N-3 corridors encompass the least number of acres, crossing less than 200 acres each. Because the N-1 and N-4 corridors cross the forest at an angle, they impact a much greater acreage. The south alternates impact between 380 acres and 390 acres, similar to the N-4 corridor. Because the M-1 corridor crosses one of the wider sections of the DBNF, it impacts the largest area, about 500 acres.

While the number of acres of national forest property potentially impacted by the alternate corridors provides one means of assessment, this measure does not account for some of the qualitative character of the forest property that is being encompassed. Much of the national forest property along the south and middle alternatives is a more pristine area of the forest with a greater concentration of areas with older and taller trees, sensitive animal and plant habitats, and recreational facilities.

Conversely, the KY 80 and north alternatives have a lesser degree of these features and a greater number of areas where mining and logging activities have occurred. Permit locations were obtained from the Kentucky Division of Surface Mining with Pulaski and Laurel Counties and these locations are illustrated on **Exhibit 4.5**. As shown, alternates such as N-1 and N-4 pass along these areas within the National Forest that have been impacted by previous surface mining activities. Given these factors, the U.S. Forest Service has noted that the KY 80 corridor alternate would likely have the least degree of impact to the forest, followed by N-2, N-1 and N-4.

Every alternate will impact the Forest and it will be necessary to implement guidelines and other prudent measures in order to comply with all of the potential impacts to National Forest land associated with various highway construction methods. This could include items such as clearing and grubbing, blasting, erosion control and waste disposal sites.

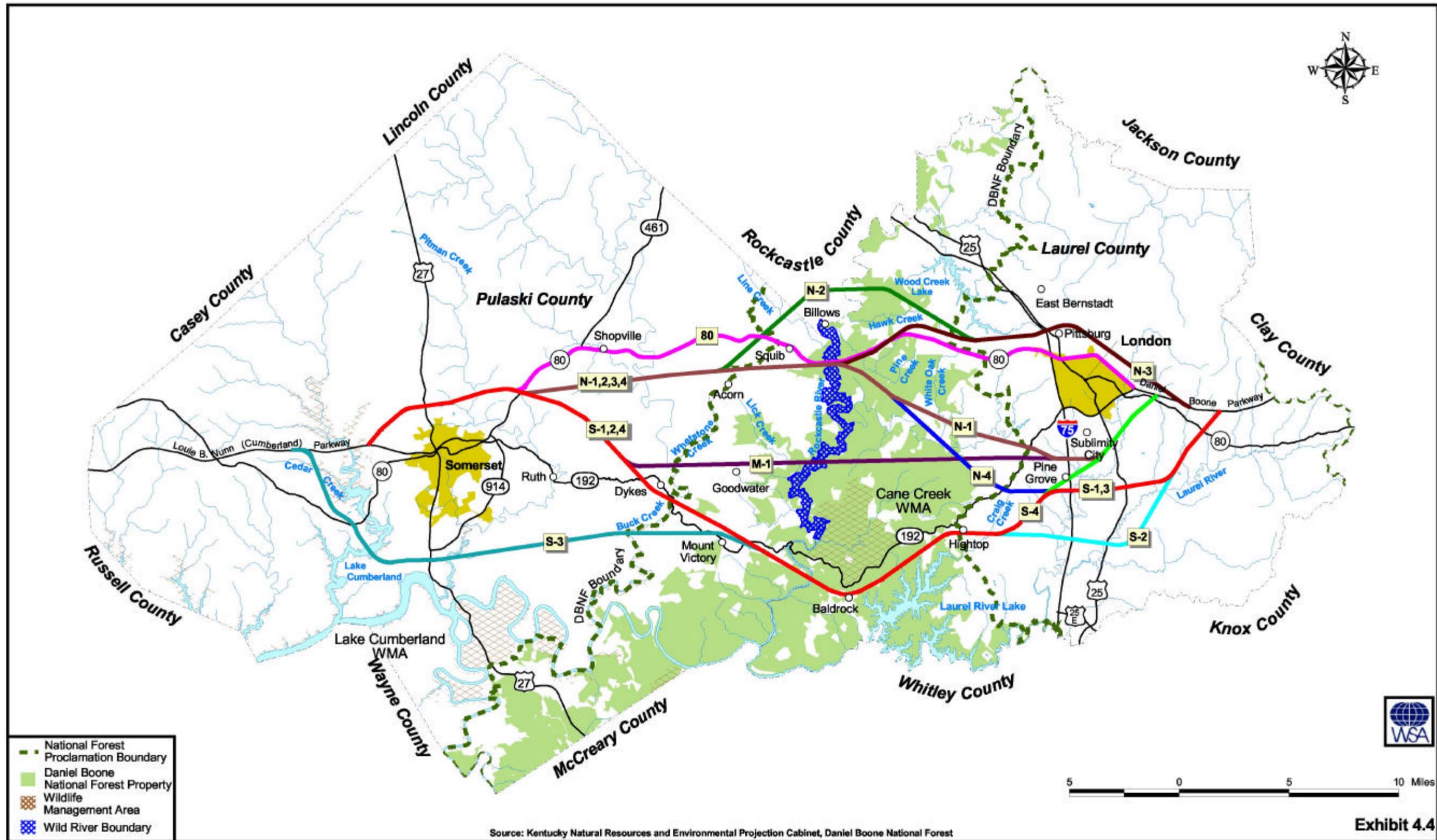
Forest service officials and citizens have also expressed a desire to seek opportunities to incorporate or enhance desired recreational activities through the accommodation of bike and pedestrian facilities as part of the highway construction process. While bicycle and pedestrian facilities are not permitted along the interstate highway right-of-way, bridges and other linkages to these types of facilities should be examined where practical.

Table 4.12 Daniel Boone National Forest Property

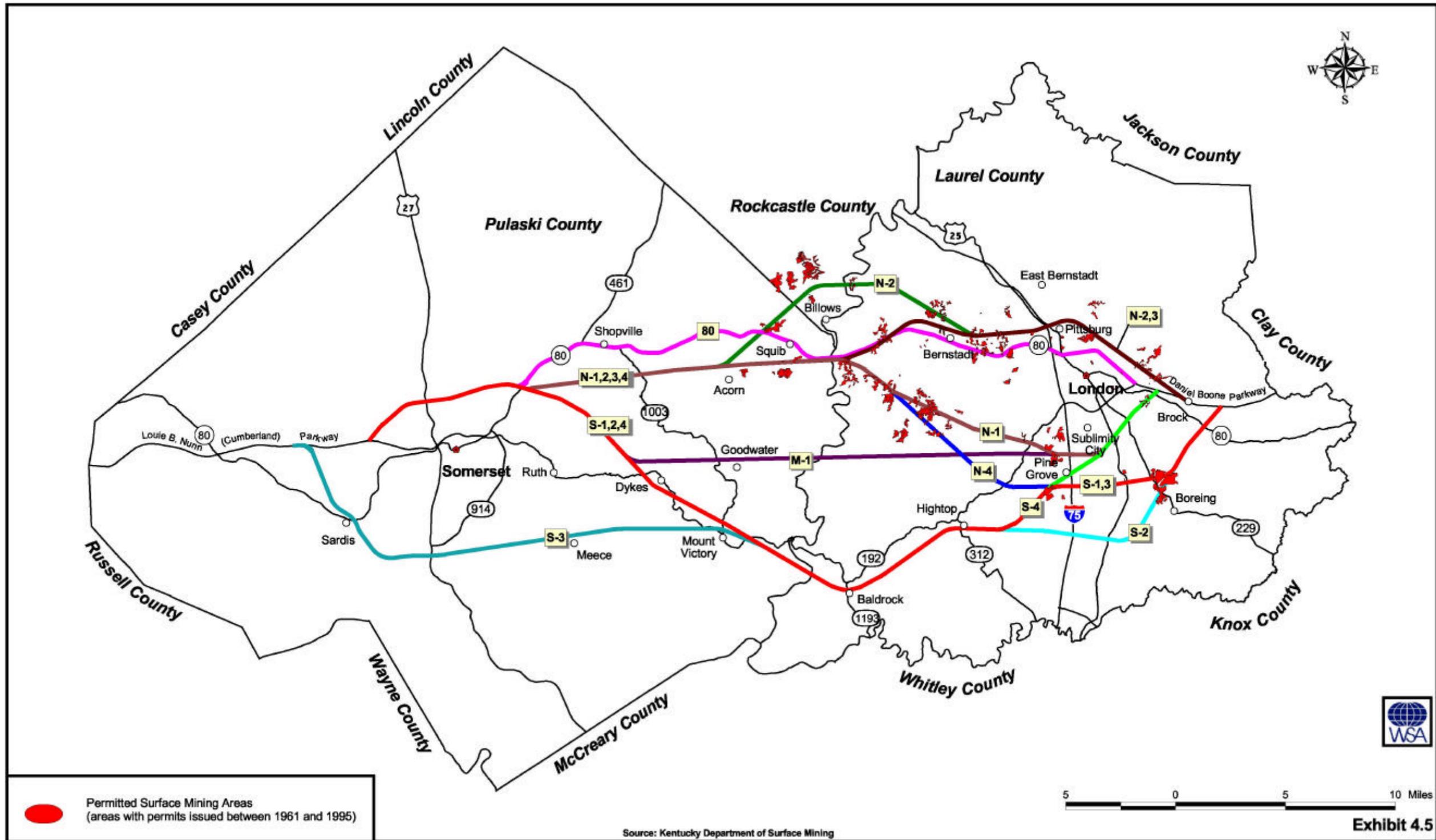
Alternate	DBNF Property (acres) (within a 500-foot corridor)
KY 80	190
N-1	310
N-2	180
N-3	180
N-4	390
M-1	500
S-1	390
S-2	390
S-3	380
S-4	390

Source: Kentucky Natural Resources and Environmental Protection Cabinet, Daniel Boone National Forest

CHAPTER 4 – ANALYSIS OF ALTERNATIVES



National Forest Issues



Source: Kentucky Department of Surface Mining

Exhibit 4.5
Permitted Surface Mining Areas

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

- *Geotechnical and Geologic Features*

A review of the geology of the region indicates a diversity of formations and features that support a preference for certain corridor alternates and present design considerations for future project development activities. This review includes input and recommendations received from the Kentucky Geological Survey (KGS), with a copy of the KGS report provided in **Appendix E**. Input was also received from other geologic experts, who offered comments through the public involvement phase of study. The following discussion summarizes considerations related to the geotechnical and geologic features and issues of the area.

General Topography and Geologic Structure - The eastern part of the study area is located along the western edge of the Eastern Kentucky coalfields, while the western part of the study area is located along the eastern edge of the Mississippi plateau. Topography in the area consists of ridges and valleys with the vertical relief varying from 100 to 450 feet above mean sea level. **Exhibit 4.6** provides a generalized relief map illustrating the topographic elevations throughout the area. The KGS noted that the overall geologic structure of the area dips gently to the southeast. High-dip zones are present within the area and may be associated with subsurface faults or fracture zones, requiring additional geotechnical studies to verify the presence of these features.

Geologic Formations - The geologic formations within the area are generally composed of limestone, dolomite or shale with beds of coal, sandstone and conglomerates, as illustrated in **Exhibit 4.7**. The KGS reported several items of consideration relative to geologic formations of the area and future design considerations for alignment options within the corridors. Alignment adjustments should be provided to take advantage of sandstone ridges and to avoid multiple crossings of steep valleys and hollows adjacent to these ridges. Alignments should minimize crossing units of Grundy and Lee sandstone formations due to their resistance to cliff formers. Road cuts in the Paragon shale formations should be minimized in areas of steep slope or where there will be overlying ledges of hard sandstone.

Karst and Cave Considerations - A specific concern involves limestone formations within the region, particularly within Pulaski County and the Somerset area. Valley bottoms within this area underlain by St. Louis, St. Genevieve or Kidder limestone formations are karstic and contain significant sinkhole and cave features that should be avoided in order to minimize environmental and construction difficulties. Throughout the public involvement process, several citizens with interest and expertise in cave and geologic issues offered comments and input to this issue. These citizens included members of the National Speleological Society (NSS), who expressed broad concerns relative to corridor impacts on karst and cave features of the area.

An NSS representative submitted data to KYTC identifying digitized sink holes and known cave conduit areas within Pulaski County.³ While it is noted that this data is not all inclusive and only represents known features, it is valuable in comparing the relative merits of the proposed corridor alternates. The NSS documentation appears to substantiate the KGS information that the north alternates would likely have the least adverse impact on the active

karst/cave systems of the area. Significant concerns were expressed relative to the potential cave impacts of the south and middle alternatives.

Regardless of the corridor ultimately recommended for I-66, further design and environmental considerations will need to be provided related to the karst and cave impacts of project development. Structural impacts associated with crossing these features should be minimized through route alignments and mitigation measures. Drainage issues also need to be addressed, as karst and cave features and the associated biological communities within them are sensitive to changes in water flow and the introduction of groundwater contaminants. Addressing these issues will be an important part of subsequent investigations of design alternatives.

Mineral Resources and Mining - Mineral resources of the region are confined mainly to coal, clay shale, sandstone and limestone. The KGS reports that coal beds in the Pikeville and Grundy formations are usually thin and of poor quality with minimal economic value and also with the potential for acid production in unmined beds. Springs are common at coal and shale contacts. Strip mines and underground mines exist throughout the study area. The KGS also notes that many of these mines are abandoned, as active coal mining in the area is insignificant; but abandoned underground mines could be present along the eastern end of the alignments passing north of London.

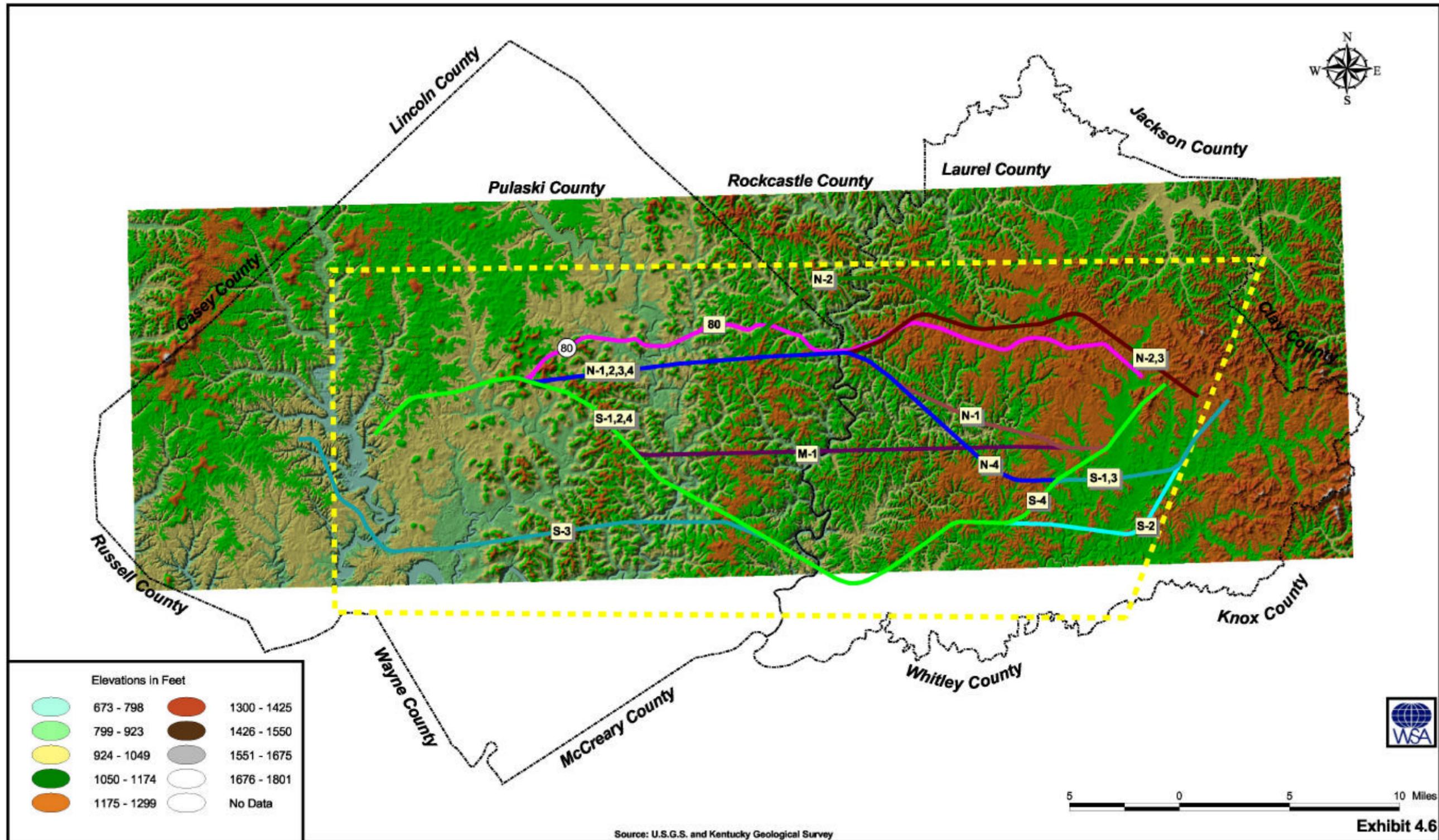
Within the KGS analysis, no specific reference was made to advantages or disadvantages of any of the corridor alternatives. Among all of the alternates, the KGS analysis suggested that future adjustments could be made to alignments within each corridor to take advantage of positive geologic features, such as sandstone ridges and limestone areas less prone to karst formations, and to minimize undesirable geologic features, such as crossing different geologic units and problematic karst areas with sinkhole and cave features.

- *Cliff Lines*

Documentation on the length and location of cliff lines through the Daniel Boone National Forest is available. Cliff lines are prevalent throughout the project area and dependent upon the terrain and geology, represent areas where rock overhangs or ridges form. In addition to their aesthetic qualities, cliff lines often provide shelter and habitation for various species of plant and animal life. Future design and development of highway alignments should be developed to minimize adverse aesthetic and structural impacts to cliff lines.

Cliff line areas are predominantly located in the southern end of Laurel County between the Rockcastle River and Laurel River Lake. Additional concentrations are located on upper Sinking Creek in Laurel County and within the Cane Creek Wildlife Management Area. Within Pulaski County, cliff lines are located between Buck Creek and the Rockcastle River. Quantifying the length of cliff lines that fall within a generalized 500-foot buffer zone within each corridor alternate indicates the potential length of cliff lines that may be crossed by a highway developed within each corridor. The length of cliff lines estimated to be encompassed by each alternate corridor is summarized in **Table 4.13**. As represented by this summary, the middle and south alternates are anticipated to cross a far greater length of cliff lines within the region than are the KY 80 or north alternates.

³ Florea, L.J., 2000, Karst Atlas of Pulaski County, I-66 Special Project of the National Speleological Society, GIS CD, Copyright pending, All Rights Reserved.



Digital Elevation Model of the Study Area

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

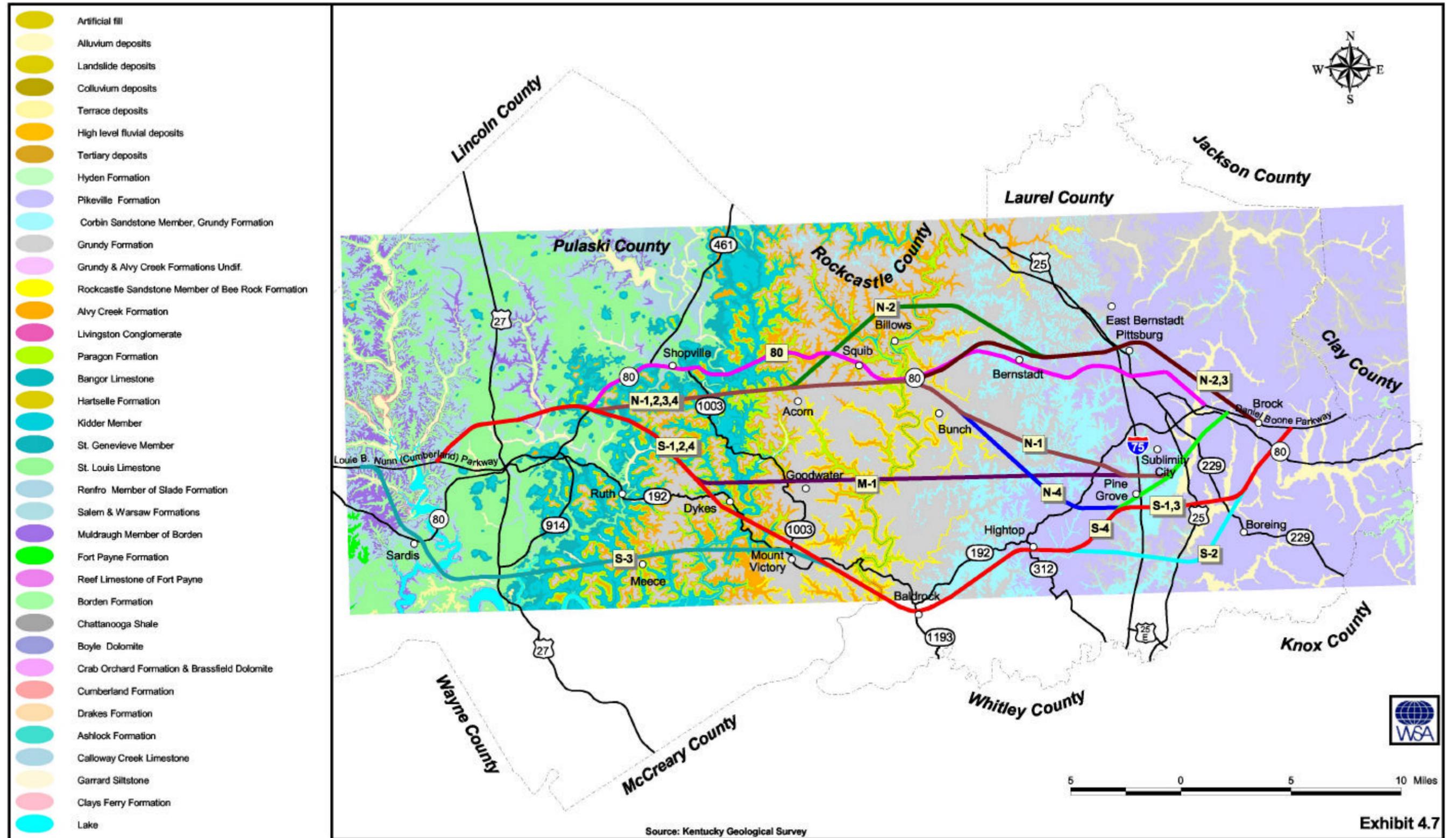


Exhibit 4.7
Geology of the Study Area

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

Table 4.13 Cliff Lines Locations

Alternate	Length of Cliff Lines (feet) (within a 500-foot corridor)
KY 80	7,500
N-1	11,800
N-2	10,200
N-3	8,800
N-4	9,000
M-1	25,000
S-1	25,200
S-2	25,200
S-3	28,200
S-4	25,200

Source: Local Cave Society, Daniel Boone National Forest

- Lakes and Stream Crossings**

All of the corridor alternates will involve potential issues related to water quality and other environmental considerations associated with impacts to rivers and streams throughout the study area. Construction activities and accidental spills or releases related to highway and related facilities pose areas of potential impacts to rivers and streams. Bridges, culverts and structural supports associated with water crossings may involve construction impacts, potentially alter water drainage patterns, and affect plant and animal species. As such, it is desirable that the potential alternatives for I-66 are situated in locations that would not adversely impact area lakes and rivers and minimize the required number of stream crossings. Water resources, including lakes, rivers and blue-line streams are illustrated in **Exhibit 4.8**.

Several large lake and river systems are located with the study area, and these serve as recreational resources, offer plant and animal habitats, and provide sources for drinking water. Lake Cumberland and the Cumberland River are located south and west of Somerset and are crossed or near to the S-3 corridor. The Laurel River and Laurel River Lake are located in southern Laurel County and fall within the Daniel Boone National Forest. All of the south corridors fall in close proximity to this lake, and citizens and Forest Service officials have indicated concerns over adverse impacts to this feature. Wood Creek Lake also lies within the Daniel Boone National Forest and is situated in Laurel County north of London. The N-2, N-3 and KY 80 corridors fall within proximity to this lake. Citizens have expressed concerns related to corridor locations in proximity to this lake. The Rockcastle River is a state-designated Wild River and bisects the study area from north to south. Further discussion of alternative impacts to this water resource is provided in the *Wild River Systems* section of this report.

Blue-line stream crossings are located throughout the study area with the greatest concentration in the southern areas of Pulaski and Laurel counties. These streams feed the vast waterway system within the study area. As shown in **Table 4.14**, the south corridors contain the greatest number of streams, ranging from 57 to 69 stream crossings. The north alternates, KY 80 and the M-1 corridor contain a fewer number of blue-line streams, ranging between 41 and 53 stream crossings.

- Wetland Sites**

For the scope of this project, the type and size of waters and wetlands within the project area were identified to provide information needed to evaluate the potential impacts of I-66 corridor alternates. A Geographic Information System (GIS) database of the National Wetlands

Inventory (NWI) for Pulaski and Laurel Counties was used to account for designated areas within the corridor alternates, including both "shallow" and "deepwater" wetlands sites.

The GIS database indicates the greatest concentration of wetland sites along the S-3 corridor with 220 acres, double the size of any other alternate. KY 80 and the M-1 corridor have potential impacts to the least number of acres, with 50 and 70 acres, respectively. As seen in Table 4.14, the remaining alternate alignments range between 87 and 110 acres impacted. Wetland sites in the study area are illustrated on **Exhibit 4.9**. If the wetlands identified are indeed affected, alternative alignments within a corridor will have to be examined to avoid these wetlands. If avoidance is not possible, there must be identification of practical measures to minimize harm to waters and wetlands.

- Wild River Systems**

The Rockcastle River, the boundary line for Pulaski and Laurel counties, is one of nine rivers in Kentucky that is included in the state's Wild River system. Part of the Wild Rivers Act of 1972, the Wild River system recognizes those rivers that retain many of their natural attributes and protects them from unwise use and development. This designation applies to the Rockcastle River, from just north of the KY 192 bridge, near Bee Rock Campground, to the Old KY 80 bridge at Billows. The total length between Bee Rock and Billows is 15.9 miles. Approximately 3,550 acres of land are included within the lateral boundaries of this corridor, and the entire Wild River stream segment is within the proclamation boundary of the Daniel Boone National Forest.

Of the corridor alternates studied, the KY 80, N-1, N-3, N-4 and M-1 corridors intersect the Rockcastle River within the designated Wild River area, shown in Exhibit 4.4. Investigation of the Kentucky Wild River statutes (KRS 146) indicates that relocation of the KY 80 corridor from Billows to its current location was not prohibited, and that an additional bridge at this new location would be allowed. However, there are continuing considerations that should include items such as buffer zones, erosion control, view sheds, and potential enhancement projects, which may accompany any bridge improvements at this important location.

Table 4.14 Water Resources (within a 2,000-foot corridor)

Alternate	Number of Stream Crossings	Wetland Areas (acres)
KY 80	43	50
N-1	41	101
N-2	52	87
N-3	48	93
N-4	53	90
M-1	51	70
S-1	63	110
S-2	58	110
S-3	69	220
S-4	57	90

Source: Department of Natural Resources, Kentucky Department of Fish and Wildlife

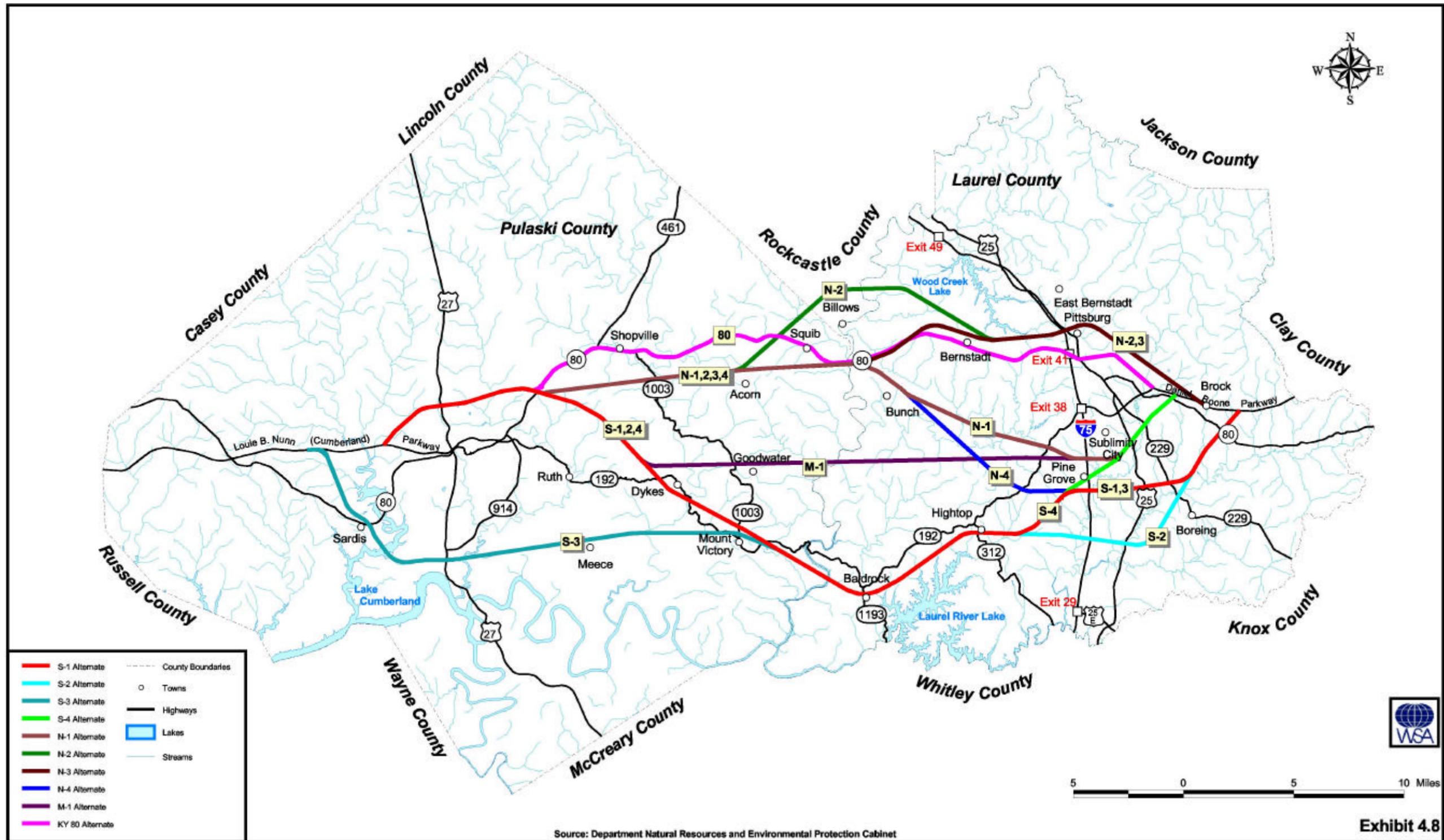


Exhibit 4.8

Blue-Line Stream Crossings

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

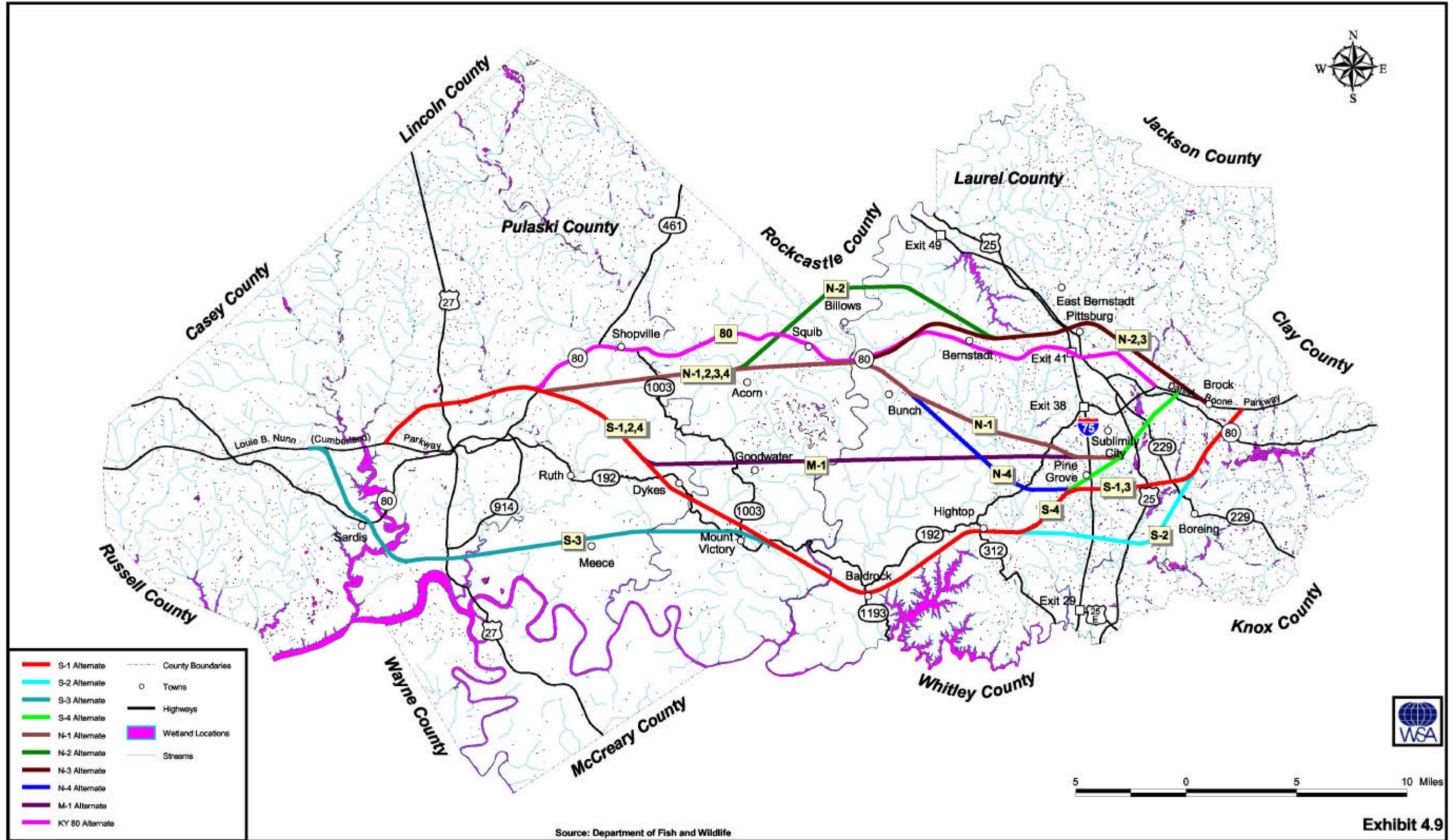


Exhibit 4.9

Wetlands Locations

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

4. Other Issues

Other issues of concern for the analysis of study corridor alternates include oil and gas well sites and hazardous site locations, as well as noise and air quality issues.

- *Oil and Gas Wells*

Oil and gas well locations are prevalent throughout both counties. Most of these wells can probably be avoided with alignment modifications in the future design process and further environmental documents should outline any possible mitigation for these locations. The number of known well locations within a 2,000-foot corridor is shown for each corridor alternate in **Table 4.15**. As shown, the S-3 corridor contains the least number of known occurrences, with 3 oil and gas wells. The KY 80 and M-1 corridors have the potential to impact the greatest number of wells, with 28 and 24 known locations, respectively. Countywide oil and gas well locations are illustrated in **Exhibit 4.10**

Table 4.15 Wells and Hazardous Sites (within a 2,000-foot corridor)

Alternate	Oil and Gas Wells	EPA and UST Sites
KY 80	28	17
N-1	20	5
N-2	19	0
N-3	20	0
N-4	23	0
M-1	24	4
S-1	19	0
S-2	20	0
S-3	3	0
S-4	19	4

Source: Kentucky Geological Survey, U.S. Environmental Protection Agency

- *Hazardous Sites*

Hazardous waste sites and landfills are known to exist within the two-county area. The Laurel Ridge landfill is located near Lily in Laurel County, approximately one (1) mile northwest of Lily and just east of I-75. There are no Superfund sites within either county; however, there are three (3) Superfund NFA (No Further Action) sites in Pulaski County and four (4) of these sites in Laurel County. Underground storage tanks (USTs) are more likely within the urban sections of Somerset and London, where existing and abandoned gas stations and storage facilities are more prevalent. Future alignment modifications and design options should probably avoid this hazard altogether.

The number of known Environmental Protection Agency (EPA) monitored sites and UST sites within a 2,000-foot zone is shown for each corridor alternate in Table 4.15. As shown in the table, the KY 80 corridor contains the greatest number of known hazardous sites, more than the other alternates combined. Countywide EPA and UST locations are illustrated in Exhibit 4.12.

- *Air and Noise Quality*

Air and noise quality concerns routinely exist for most types of highway improvements. For the I-66 corridor alternates, air and noise quality issues are of particular concern relative to where alternates fall in close proximity to sensitive land uses, such as population centers, natural areas, recreational facilities, and cultural sites. Sensitive areas exist within the vicinity of all the alternate corridors and future examination of alignment alternatives will require more detailed, site-specific analyses.

For air quality, both Pulaski and Laurel Counties are designated as in attainment for all transportation-related pollutants (i.e., carbon monoxide, hydrocarbons, oxides of nitrogen and inhalable particulates). In future studies of alignment alternatives, receptors should be modeled at sensitive locations that could have potential air quality impacts, such as schools, churches, parks, recreation areas, historic buildings, subdivisions, motels, and intersections or interchanges.

Projected traffic volumes for the Year 2030 along existing routes in the study area range from 2,200 vpd along KY 192 to 86,000 vpd on US 27 near KY 80. For the I-66 corridor alternates, maximum future traffic volumes are expected to reach 27,000 vpd along the KY 80 alternate near I-75. These traffic volumes are not expected to cause carbon monoxide concentrations to exceed the one-hour standard of 35 parts per million (ppm) or the eight-hour standard of 9 ppm. Future levels of transportation-related pollutants are not expected to impact the attainment status of either Pulaski or Laurel counties.

From a population standpoint, the middle alternate is believed to offer the greatest potential of minimizing direct noise and air quality impacts on concentrations of people or other sensitive sites. However, the M-1 alternate does raise concerns related to air and noise impacts on a large amount of undisturbed forest area. As an existing highway corridor, the KY 80 alternate would produce incremental impacts related to air and noise, but this corridor has the highest direct concentration of people and sites potentially impacted. All of the south alternates and several of the north alternates are in close proximity to lake areas that would be impacted by the increased noise levels.

5. Summary of Environmental Issues

Environmental implications can be anticipated with highway development within any of the alternate corridors. More detailed assessments will be required on future alignment alternatives. A summary of findings related to environmental issues and the proposed corridor alternates are as follows:

- *KY 80 Alternate*

Because it seeks to reconstruct and widen an existing highway corridor, the KY 80 alternate is expected to have the least impacts to natural areas than any of the other options. Typical for a developed corridor, the KY 80 alternate is expected to have greater impacts to cultural sites, archeological sites and developed land uses. A summary of the key findings related to this alternate include:

- The least impacts to the natural environment and wildlife; but,
- Greater potential impacts to cultural sites and sensitive land uses.

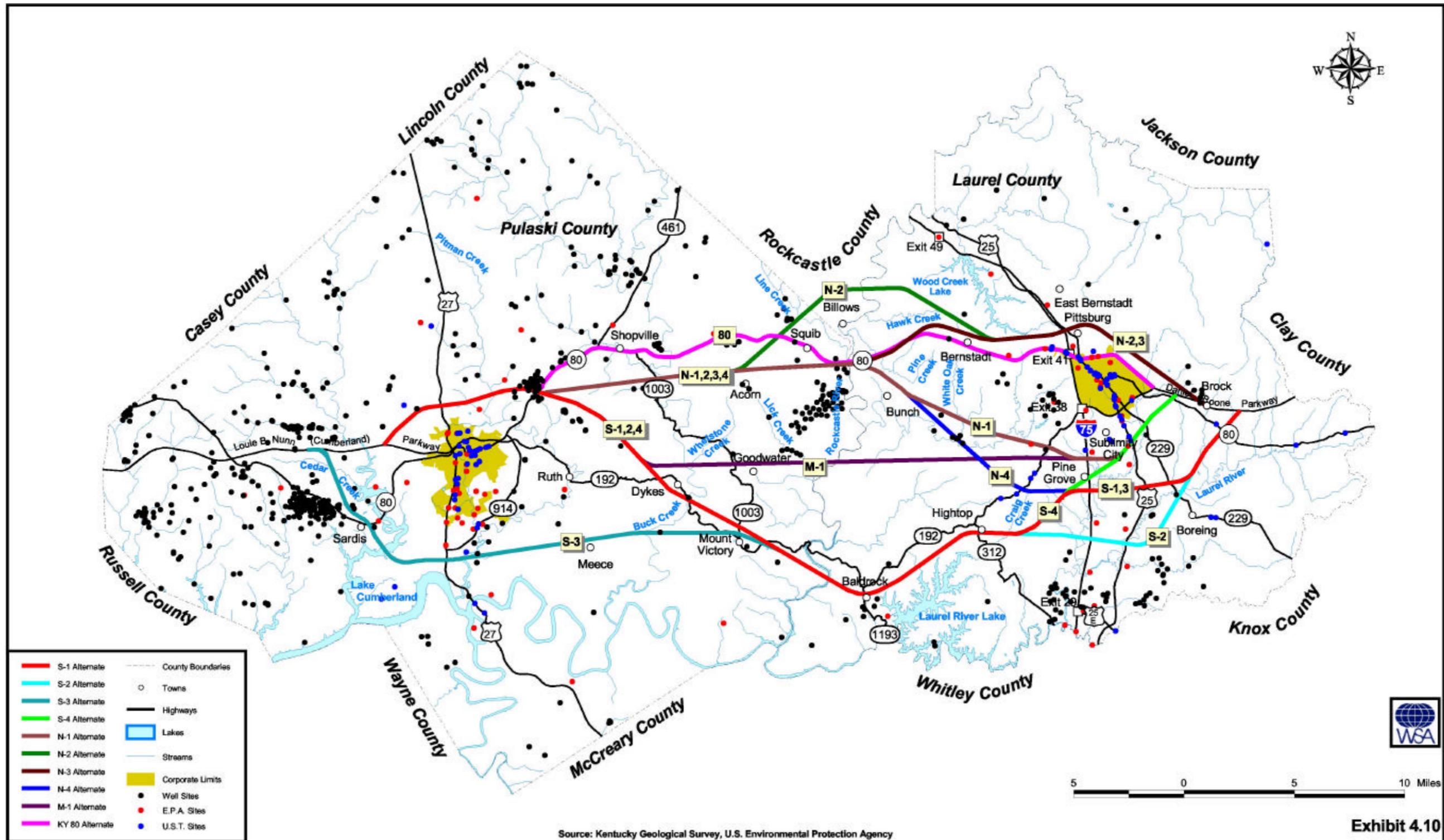


Exhibit 4.10

Well and Hazardous Sites

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

- *North Alternates*

The north alternates are expected to result in fewer impacts to natural areas, threatened/endangered species and historic structures than any of the alternates that require the development of new highway corridors. All of the north alternates either avoid the Wild River area of the Rockcastle River or cross at the existing KY 80 bridge. The N-2 and N-3 alternates present concerns due to their close proximity to Wood Creek Lake. As for cultural sites, mixed impacts are seen with the north alternates, with generally higher than average impacts to potential archeological sites. A summary of the key findings related to these alternates include:

- The least impacts to natural areas and wildlife among new corridor alternates;
- Fewer impacts to caves;
- Potential impacts to Wood Creek Lake by the N-2 and N-3 alternates; and,
- Mixed impacts to cultural sites for all alternates.

- *Middle Alternate*

This corridor provides the least anticipated impact to known cultural and social land uses but may have some of the highest impacts to forested and sensitive areas among all of the corridor alternates. In particular, this corridor would pass through the largest portion of National Forest property and would create a new crossing of the Wild River portion of the Rockcastle River. This issue alone could make the middle alternate environmentally prohibitive. A summary of the key findings related to this alternate include:

- Lesser impacts to cultural and social land uses;
- Greater impacts to caves and karst features;
- Greater impacts to National Forest areas; and,
- Potentially environmentally prohibitive crossing of the Rockcastle River.

- *South Alternates*

The south alternates are anticipated to create lesser impacts to archaeological sites and historic structures but show potential for the highest impacts to natural areas, threatened/endangered species, and area lakes. All of the alternates pass in close proximity to Laurel River Lake and the S-3 alternate also creates a new crossing of Lake Cumberland. These alternates fall in close proximity to the Cane Creek Wildlife Management Area and pass through some sensitive and pristine areas of the National Forest. A summary of the key findings related to these alternates include:

- Lesser potential impacts to archaeological sites and historic structures;
- Greater impacts to caves and karst features;
- Greater impacts to natural areas and threatened/endangered species;
- Greater impacts to more pristine areas of the National Forest; and,
- Potential concerns related to close proximity to Cane Creek Wildlife Management Area and Laurel River Lake.

C. ENGINEERING AND CONSTRUCTION COSTS

The initial step in the evaluation of engineering and cost impacts was to develop preliminary layouts of a generalized interstate highway within each alternate corridor based upon assumed typical sections (see **Appendix F**). Geometrics for the I-66 route are based on interstate-type highway design standards for a 4-lane facility. All geometric criteria used in the preparation of this project is in accordance with the American Association of State Highway and Transportation Officials (AASHTO) "Green Book," *A Policy on Geometric Design of Highways and Streets, 1990*; AASHTO's *Roadside Design Guide, 1989*; and AASHTO's *A Policy on Design Standards – Interstate System, July 1991*. Standard geometric criteria utilized for cost estimation comparisons for the proposed improvements include:

- 70 mph design speed;
- Moderate horizontal and vertical curvature;
- Access available at interchanges only; and,
- Four lanes, twelve-feet wide each.

However, due to the sensitive nature of the study area, it may be possible to utilize flexible design standards in future phases of the I-66 project to facilitate environmental concerns while maintaining safety.

Access will be provided only at designated interchange locations. Interchange locations will be determined using several factors, including traffic volumes within the network, existing or potential area development, spacing limitations and public needs. The preferred minimum spacing for interchanges is one mile in urban areas and three miles in rural areas. Horizontal curvature is limited to a 1,910-foot minimum radius. Vertical grade is proposed to be within a range of plus or minus 4 percent. Approximately 125 to 500-foot wide right-of-way is expected depending on the area terrain.

Rural and urban typical sections are considered for the interstate-type design of the I-66 corridor. It is anticipated that two basic sections would be utilized for the purpose of cost estimation. A four-lane depressed median section, consisting of 12-foot lanes with a 60-foot median, is considered for rural sections. For the urban sections, a four-lane, flush median section with a barrier wall consisting of 12-foot lanes is utilized. An example of such a section is provided in **Exhibit 4.11**.

Future phases of the I-66 corridor project may involve further geometric criteria and issues, at which point it would be appropriate to begin consideration of potential flexible design components. The purpose of flexible design methods is to aid designers in the design and construction of a roadway while preserving or enhancing scenic, historic, environmental and community resources in the vicinity of the project. In recent years, flexible highway design methods have been encouraged through federal legislation (ISTEA and TEA-21), as well as research and publications, such as the Federal Highway Administration's *Flexibility in Highway Design* guidebook⁴. The guidebook works as a supplement to AASHTO's Green Book, showing readers how to expand on traditional design methods while maintaining the safety and mobility of the roadway.

⁴ *Flexibility in Highway Design*, Federal Highway Administration, Publication # FHWA-PD-97-0062.

Potential engineering and construction issues, along with overall costs for each alternate are evaluated based upon these standard criteria. The following sections detail the engineering and construction considerations and cost estimate components considered for each alternate.

1. Engineering Challenges

A wide range of engineering challenges exist within the study area and along each of the alternate corridors related to both new highway construction or reconstruction of existing highway facilities to provide an interstate highway. The following summary highlights some of the general study area challenges associated with both new corridor construction and reconstruction of existing highway facilities such as KY 80.

- *General Study Area Engineering Challenges*
 - Topography
 - Cave and Karst Issues
 - Access Points and Interchange Challenges
 - I-66/I-75 Interchange Location
 - Right-of-way Acquisition
 - Natural/Sensitive Areas
 - Water Crossings
 - Threatened/Endangered Species

North alternates N-2 and N-3 that pass north of London would present particular challenges with respect to the construction of the proposed interchange between I-66 and I-75, illustrated in **Exhibit 4.12**. As shown, a number of bridge sections would be required to not only cross I-75, but to also cross the CSX railroad and US 25. Because of the close proximity of US 25 to this interchange, a separate, direct interchange with US 25 could not be provided. Engineering challenges also exist for the I-66/I-75 interchange location associated with the alternate corridors passing south of London. Airspace restrictions associated with the London-Corbin Airport's runway approach and spacing requirements associated with the new I-75 weigh stations are two particular challenges for interchanges in this area.



Exhibit 4.11 Divided Highway Section



Exhibit 4.12 I-66/I-75 Interchange for N-2 and N-3

Engineering and construction issues associated with reconstruction to upgrade an existing highway to interstate standards would be facilitated in many sections with available right-of-way and highway sections that could be efficiently upgraded. However, many other sections present serious engineering challenges, as identified below:

- *Highway Reconstruction Challenges (KY 80)*
 - Approximately 100 existing access points along KY 80 could be altered or eliminated;
 - Numerous (1800) property parcels could be affected:
 - 540 in Pulaski County, and
 - 1260 in Laurel County;
 - Difficulty with interchange reconstruction of Exit 41 to accommodate new interchange between I-66 and I-75;
 - Many sections would require major reconstruction efforts to moderate grades and curves if geometric criteria are to be achieved:
 - Vertical grade changes from $\pm 4\%$ to $\pm 6\%$, and
 - Horizontal curve changes from 3° to 4° (near Shopville and Squib); and,
 - Maintenance of traffic during reconstruction activities will be complicated and costly.

Exhibits 4.13 and **4.14** are provided to illustrate some of the challenges associated with reconstructing KY 80. The existing properties and roadways in the vicinity of the KY 80 interchange with I-75 (Exit 41) are illustrated in Exhibit 4.13. If KY 80 were reconstructed as I-66, this interchange would be completely reconstructed to only permit direct access between the two interstate facilities. Access to all of the properties in the area would either be eliminated or severely affected and some properties would have to be acquired. Exhibit 4.14 illustrates how

frontage roads and additional interchanges would be required in the vicinity of KY 1675 and an existing rock quarry in Pulaski County to accommodate access to roadways and property in this area.



Exhibit 4.13. Existing KY 80 and I-75 Interchange (Exit 41)

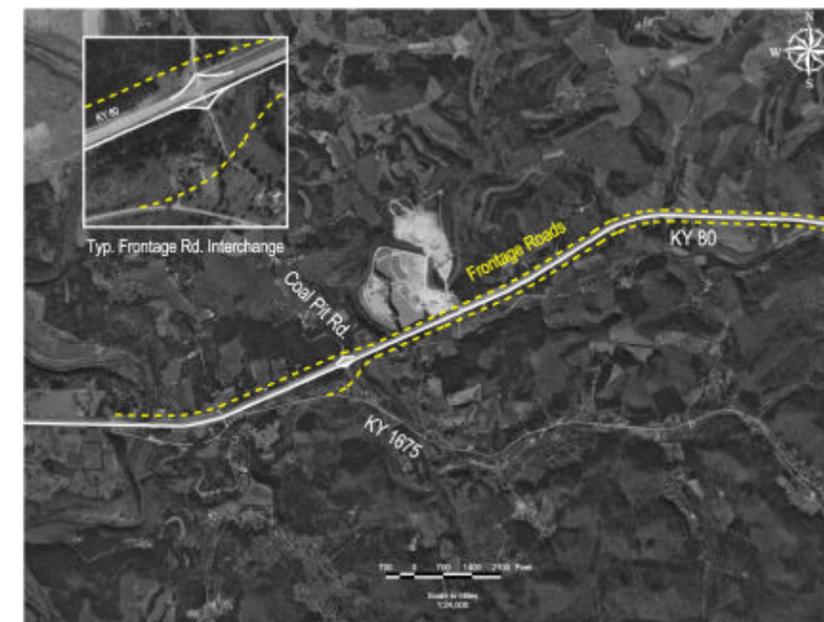


Exhibit 4.14. Potential Frontage Roads and Interchange along KY 80

2. Cost Estimates

Costs for each alternate were evaluated using basic unit cost estimates formulated by the Kentucky Transportation Center as part of the 1997 Economic Feasibility Study of the I-66 corridor. Cost components for design, right-of-way, utilities, bridges, interchanges and construction were calculated based upon the cost factors outlined in the report. The report's 1995 unit costs were increased by 10 percent to account for inflation, and to more closely match Year 2000 dollars.

For KY 80, alternate cost estimates were based upon two generalized options. The first option involves the acquisition of approximately 1800 parcels on property along the entire route. This additional property is required since current access to the proposed interstate will be either eliminated or severely restricted. Property Valuation Administration (PVA) maps were used to estimate the number of affected parcels. It should be noted that some of these parcels would be located near an interchange and would not require purchase. An estimated cost per parcel of \$155,000 was given by the KYTC's Division of Right-of-Way. Costs for various businesses, especially near Exit 41 at London, would only include the property value. The second KY 80 option would use frontage roads to minimize property purchases. Frontage roads would provide parallel access routes along the interstate corridor where needed. These roads would terminate at each interchange location. An estimate of approximately 52.2 miles was used to arrive at this cost (\$7.5 million per mile).

For the remaining nine alternates, cost estimates were calculated based on the previously noted design criteria. Illustrated in **Exhibit 4.15** is a generalized comparison of the proportion of overall construction costs that are represented by each cost component for each alternate. Estimated costs by component for the study corridors are presented in **Table 4.16** and discussed for each of the prescribed cost components. The discussion also provides additional information regarding the assumptions and methods used to estimate costs for each of these factors.

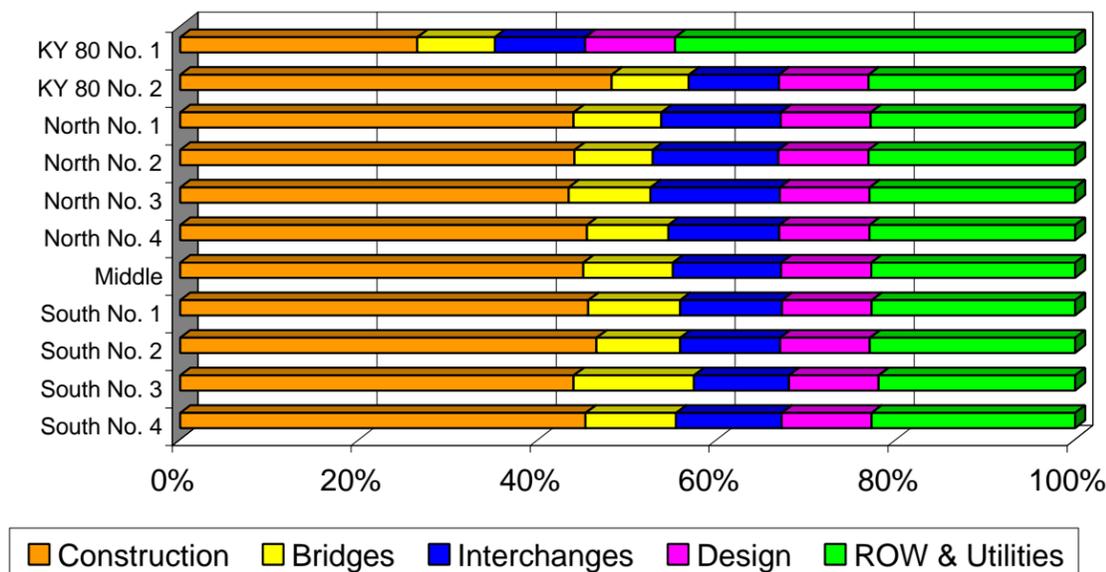


Exhibit 4.15. Estimated Construction Cost Components

Table 4.16 Cost Estimates

Alternate	Length (miles)	Cost Items (million \$) ¹					Total Cost (million \$) ¹	
		Construction	Bridges ²	Interchanges ⁵	Design	Right-of-Way and Utilities	Project	Per Mile
KY 80 ³	38.4	308.1	103.0	121.4	116.8	519.1	1,168.4	30.5
KY 80 ⁴	38.4	564.0	103.0	121.4	117.6	269.7	1,175.7	30.7
N-1	39.0	387.5	88.4	121.4	88.7	200.9	886.9	22.7
N-2	41.5	412.2	84.0	136.4	94.3	215.9	942.8	22.7
N-3	40.1	398.5	84.0	136.4	92.2	210.7	921.8	23.0
N-4	43.2	429.7	86.2	121.4	95.0	217.1	949.4	22.0
M-1	39.1	388.4	88.4	108.2	86.8	196.2	868.0	22.2
S-1	45.6	443.9	99.4	114.8	97.6	220.7	976.4	21.4
S-2	46.5	461.9	92.8	114.8	99.6	227.3	996.4	21.4
S-3	48.9	486.3	148.5	121.4	110.0	242.5	1,109.7	22.7
S-4	42.9	426.2	95.0	114.8	94.4	213.6	944.0	22.0

¹ Items have been rounded.

² Includes overpasses and railroad structures.

³ Includes purchase of 1800 parcels @ \$155,000 each and no frontage roads.

⁴ Includes approximately 52.2 miles of frontage roads.

⁵ Includes one rest area per alternate.

- Construction**

Digital terrain modeling (DTM) for each corridor, using digital USGS 7.5 minute quadrangle sheets and terrain modeling software, determined profile grades and excavation quantities. Use of this method allowed assessment of the alternate corridors for excavation quantities and estimated costs. Furthermore, profile grades were evaluated for balances of material throughout the corridor. An objective of the process is to minimize the amount of waste or borrow material that would be necessary to complete the project.

Earthwork quantities and costs for each alternate corridor alignment were derived from the digital terrain model using a cost of \$4.00 per cubic yard. Next, the square yards of pavement were determined for each alternate. A unit price of \$45 per square yard was used based on historical data from previous KYTC projects within the region. This region is comprised of District 8 in Somerset and District 11 in Manchester.

It was assumed that the summation of the earthwork and pavement were approximately 70 percent of the total highway construction cost of the project. Again, this is based on assessment of past data and trends from construction projects throughout the region.

The estimated construction costs include earthwork, pavement, structures, traffic control, and contingencies. Generally, projects of longer length and greater complexity tend to have

increased costs associated with changes in equipment, labor and materials. Estimated construction costs for the corridor alternates range between \$308.1 million and \$564.0 million, both for KY 80. The first and lower value represents the construction costs if no frontage roads were built while the latter figure represents the cost to construct the interstate and necessary frontage roads. Outside of the KY 80 alternatives, N-1 and M-1 would be the least costly to construct. S-2 and S-3 would be the most expensive to build.

- *Bridges*

Structures over "major" stream crossings (i.e., over 600 feet in length) were estimated at \$150 per square foot. Structures over "average" stream crossings (i.e., under 600 feet in length) were estimated at \$100 per square foot.

Bridge cost estimates take into consideration interstate bridges, overpasses, and railroad structures. The S-3 alternate is the only alternate to go south of Somerset. Because of this route selection, Lake Cumberland and other collector rivers and creeks would need to be crossed, creating higher costs for this alternate estimated at \$148.5 million. In general, there are more water crossings for the south routes than the north and middle alternates. As a result, the least expensive alternates would be N-2 and N-3, the two most northern routes, incurring bridge costs of \$84.0 million each.

- *Interchanges*

Interchanges were located at critical crossroad and route termination points, as illustrated in **Exhibit 4.16**. For cost estimation purposes, interchanges were classified as either "major" or "minor" types. Major interchanges are ones that connect major highways such as I-75 and the Louie B. Nunn (Cumberland) and Daniel Boone Parkways. These interchanges are likely to involve a *directional*, *cloverleaf* or *trumpet-type* design. Costs are estimated at \$13.2 million each, except at I-75 where the estimated cost is \$25 million. Minor interchanges are required at all of the remaining crossings over average routes. Interchanges of this type include a *diamond-type* design, estimated at \$6.6 million each.

Other minor roadways would have to pass over or under the I-66 corridor since I-66 is designed to be a fully-controlled access facility. These overpasses were estimated at \$2.2 million for each structure. Also, it is assumed that the I-66 corridor will bridge existing railroad systems with structures estimated at \$2.2 million each or \$4.4 million for two structures.

Criteria for this evaluation are based on the number of interchanges and overpasses present on each alternate corridor. Most of the alternates have approximately the same number of interchanges or access points. The M-1 corridor is planned for eight interchanges similar to other routes but would incur the least cost because it would interchange with fewer major facilities. The associated interchange cost totals \$108.2 million. N-2 and N-3 would incur the greatest expense (\$136.4 million). These two alternates incur the largest cost because of the difficulty in connecting with I-75 at such a congested area. The estimated cost for the I-75 interchange would be \$40 million instead of the \$25 million for the other alternate corridors.

- *Design*

As discussed previously, the design cost is calculated as a percentage (10%) of the total project costs. The cost for design should range between \$86.8 million and \$117.6 million. The least expensive alternate would be M-1 while the most costly would be the two KY 80 alternates.

- *Right-of-Way and Utilities*

Utilities within the region include gas lines, overhead power lines, overhead telephone and cable television lines, underground fiber optic lines and water lines. Because the corridors pass through urban areas as well as rural areas, right-of-way and utility relocation will be higher due to greater population densities and increased development.

Right-of-way and utility cost items were evaluated using the potential amount of utility relocation, based upon the proposed construction of each alternate and how that alternate would impact the surrounding developed and undeveloped land areas. The respective costs associated with adjustment, relocation or removal of existing utilities or the costs incurred with the potential construction of new utilities to maintain the level of service currently in place were considered. All of the alternates are located within zones of high development throughout the urbanized portions of Somerset and London. Relocations will include high-transmission power lines, water lines, gas lines and telephone lines.

The KY 80 alternative without frontage roads has cost estimates that double all other alternatives except the KY 80 alternate with frontage roads. The cost for the KY 80 alternative without frontage roads would be \$519.1 million, while the KY 80 alternate with frontage roads would cost \$269.7 million. The remaining alternatives have cost estimates ranging between \$196.2 million and \$242.5 million with the M-1 being the least expensive.

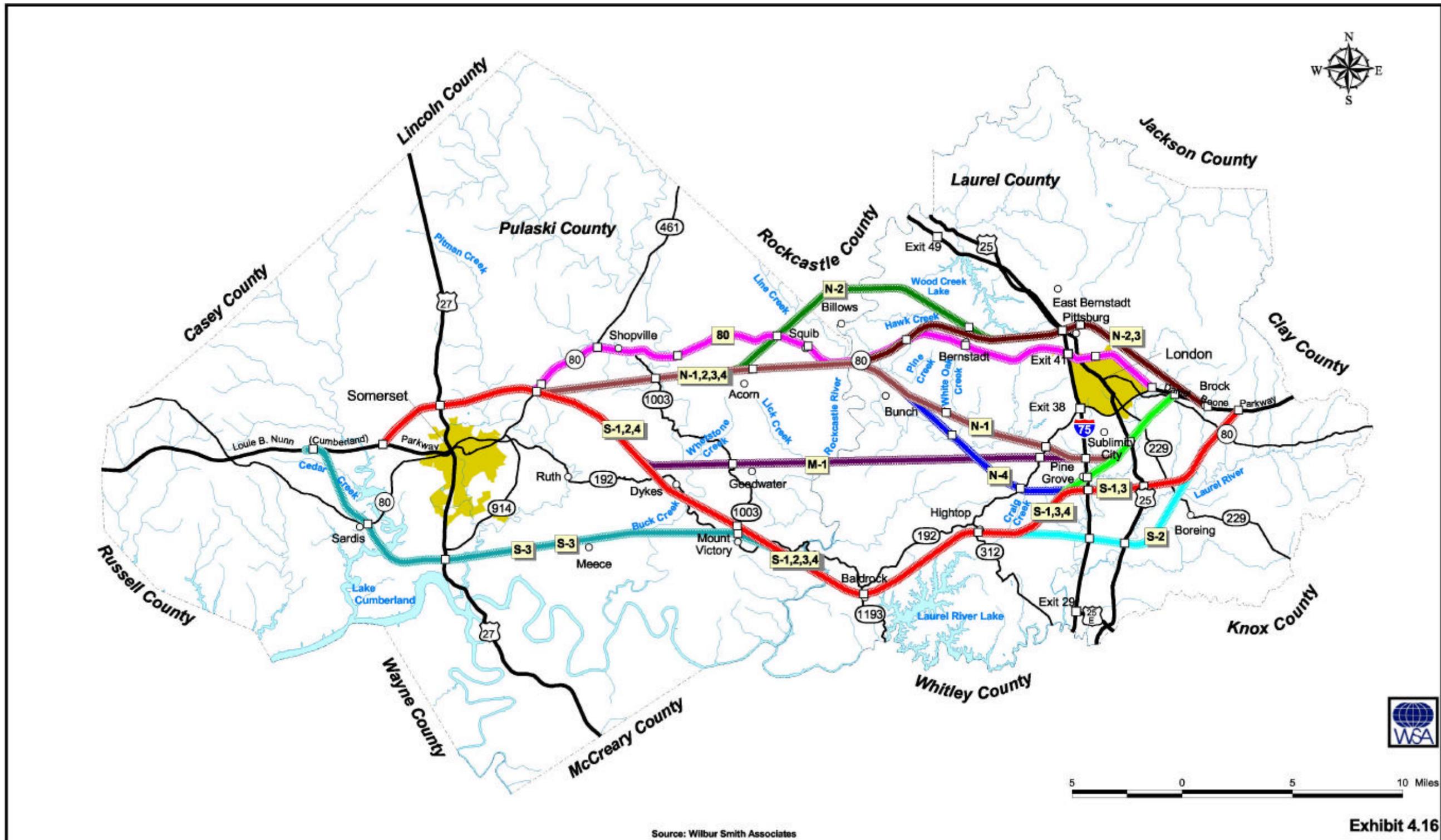
- *Total Project Costs*

The total costs for the project combined the costs for construction, bridges, interchanges, design, right-of-way and utility relocation. The KY 80 alternatives would incur the largest total project costs at \$1,168.4 million without frontage roads and \$1,175.7 million with frontage roads. The only other alternate estimated to cost more than a billion dollars would be S-3 at \$1,109.7 million. The least costly alternate would be M-1 at a total project cost of \$868.0 million.

- *Project Costs Per Mile*

Although the alternate lengths vary by as much as 10 miles, the total cost per mile figures are close to one another with the exception of the KY 80 alternates. The total cost per mile for KY 80 would be about \$30.6 million while the other alternates range between \$21.4 and \$23.0 million.

These cost estimates are planning-level estimates and are based upon USGS topographic maps. As detailed mapping is developed, both the cost estimates and the corridors will be refined. Modifications that affect the typical highway cross-section or the number of interchanges, bridges or overpasses could increase or decrease the total cost of the project.



Source: Wilbur Smith Associates

Exhibit 4.16

Potential Interchange Locations

CHAPTER 4 – ANALYSIS OF ALTERNATIVES

3. Summary of Engineering and Construction Costs

The following discussion summarizes the findings related to engineering challenges and construction costs for each of the corridor alternates.

- *KY 80 Alternative*

The KY 80 Alternate is estimated to have the most expensive overall costs and per-mile costs of all the alternates. While a number of sections along KY 80 could be efficiently widened and reconstructed, other sections would prove very difficult. Options with and without frontage roads were considered for the KY 80 alternate, and although varying significantly within categories, the total project costs for the two KY 80 options are very close, with the alternate utilizing frontage roads being slightly higher. Access to local areas may be reduced depending on which KY 80 option is considered. A summary of findings associated with the KY 80 alternate include the following:

- Most expensive overall costs;
- Most expensive per-mile costs;
- Numerous property impacts, particularly with I-66/I-75 interchange; and,
- Options with and without frontage roads are comparable relative to total costs.

- *North Alternates*

The north alternates generally provide lower overall and per-mile costs; however, alternates N-2 and N-3, which pass north of London, entail the highest interchange costs because of the I-66/I-75 interchange north of London. A summary of findings associated with the north alternatives include the following:

- Lower overall and per-mile costs; and,
- Highest interchange costs and construction difficulty for N-2 and N-3.

- *Middle Alternate*

Of the alternates considered, the middle alternate offered the least expensive overall costs. This alternate provided the shortest and most direct routing and had a limited number of interchanges, due to the lack of crossroads between Somerset and London. Construction segmentation may be difficult with this option because of the lack of crossroads in the area that could carry traffic as the highway is partially constructed. A summary of findings associated with the middle alternate include the following:

- Least expensive overall costs;
- Lowest number of interchanges; and,
- Shortest length.

- *South Alternates*

The south alternates generally provide higher overall costs due to the length of their construction. However, these alternates provide the least expensive per-mile cost with the exception of S-3, which requires additional bridge construction at Lake Cumberland and additional right-of-way costs in the vicinity of Somerset. A summary of findings associated with the south alternates include the following:

- More expensive overall costs;

- Longer construction lengths; and,
- Least expensive per-mile costs, except for S-3.

CHAPTER 5 – PUBLIC AND AGENCY INVOLVEMENT

Throughout the course of the I-66 Corridor Planning Study, local citizens, public officials and representatives from government resource agencies were given the opportunity to provide input on the proposed corridors and issues of relevance to the study. This chapter describes the public and agency involvement activities that occurred throughout the study process and describes the comments and input received as a result of these efforts. In addition to the information presented in this chapter, material related to the public and agency involvement process is included in **Appendix G**. This material includes public meeting notices, meeting minutes, questionnaires, meeting summaries and agency letters.

This chapter along with Appendix G includes materials from the general public, public interest groups and local, state and federal agencies, including the Cumberland Valley Area Development District, the Lake Cumberland Area Development District, U.S. Forest Service, Federal Highway Administration (FHWA) and KYTC.

A. PUBLIC MEETINGS

As part of the public involvement segment of this study, two sets of public meetings were held in London and Somerset. Information related to these meetings is provided below and in Appendix G.

1. Summer 1999 Public Meetings

An initial set of public meetings was held for this study on June 15, 1999 in Somerset and on June 17, 1999 in London. At these meetings, the KYTC presented an initially preferred corridor for I-66 between Somerset and London. The preferred corridor, illustrated in **Exhibit 5.1**, generally followed the KY 192 corridor through southern Pulaski and Laurel counties. While many meeting attendees expressed support for the I-66 project and for the preferred corridor, many others expressed strong concerns and opposition to these same items.

Comment sheets were distributed to attendees, who were encouraged to express their views on the project and the corridors evaluated, including the preferred corridor. Attendees were also encouraged to publicly ask questions and express their opinions about the I-66 corridor. Generally, those in favor of the project cited economic improvements, travel benefits and safety enhancements for the region. Many citizens in favor of the preferred corridor expressed concerns about less than desirable highway conditions along KY 192 and needs for improved accessibility to the area.

Many of the comments publicly voiced throughout the meetings were in opposition to I-66 and to the preferred corridor. The opposition focused on the potential damage the corridor may pose to a broad range of environmental issues. These issues included impacts to the Daniel Boone National Forest, the Cane Creek Wildlife Management Area, the Wild River portion of the Rockcastle River, Laurel River Lake, other area rivers and streams, threatened and endangered species, and other wildlife within the corridor. Many questions were asked about the possibility of utilizing the existing KY 80 corridor as an alternate.

In meetings with the public, interest groups, and resource agencies, it was emphasized that this study and its related activities were a pre-NEPA planning effort and that future NEPA work will follow.

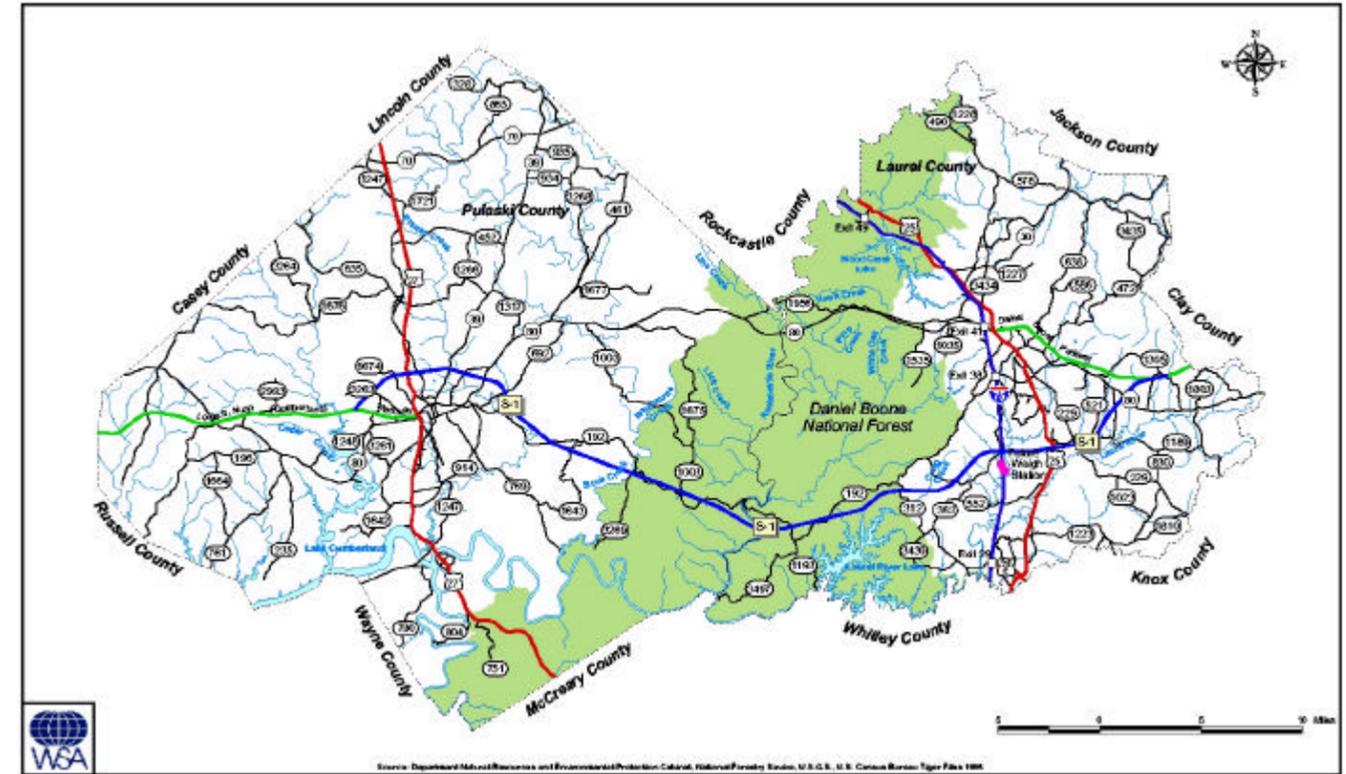


Exhibit 5.1. Initially Preferred Corridor (as presented in June, 1999)

A number of written comments were received during and following the public meetings, using public input questionnaires to solicit input on the preferred corridor at that time. A total of 292 responses were received, the results of which are summarized in **Exhibit 5.2**. Of these responses, approximately 67 percent favored the I-66 project and 30 percent opposed the project. Approximately four percent of respondents had no opinion on a proposed I-66 corridor. Among the 216 respondents who expressed support for a particular corridor alternative, as shown in Exhibit 5.2, approximately 53 percent supported the preferred alternate, 37 percent supported an alternate to upgrade KY 80, nine percent supported a north alternate and the remaining one percent supported the middle alternate. Conversely, approximately 74 respondents indicated that they were directly opposed to the preferred alternate corridor. Reasons cited for this opposition include several environmental concerns and the lack of time to review the documents and exhibits that were discussed at the public meetings.

KYTC determined that further study on a KY 80 corridor alternative should be performed. This conclusion was largely in consideration of the environmental concerns raised throughout the first series of public meetings, including concerns voiced by the U.S. Forest Service. The KYTC advised meeting attendees that they would instruct their consultant to review the analysis of all the corridor alternatives and to expand their analysis to consider options to potentially utilize KY 80 as a corridor alternate for I-66.

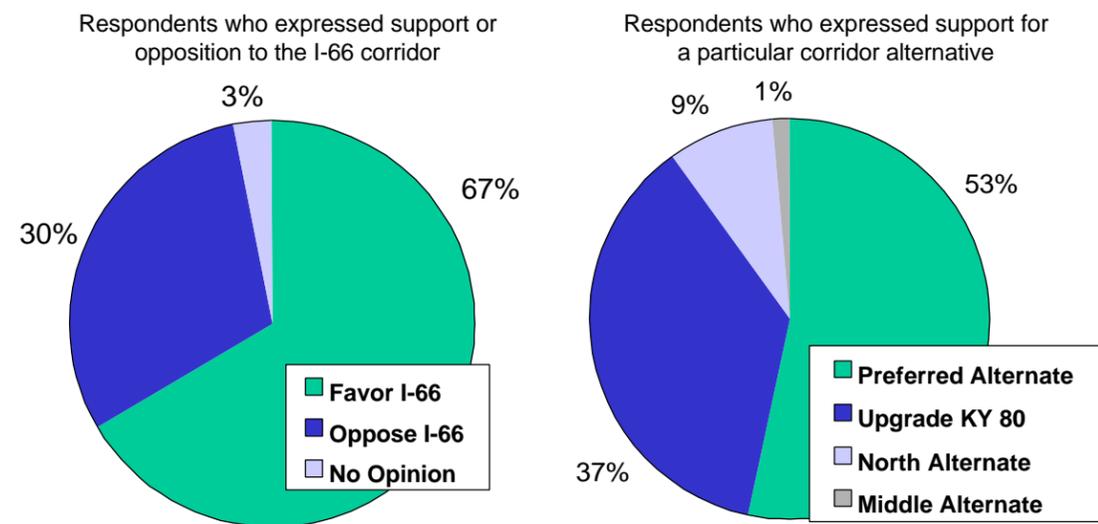


Exhibit 5.2. Summer 1999 Public Input Questionnaire Summaries

2. Spring 2000 Public Meetings

Because of general concern for the recommended alternate corridor presented in the initial meetings, the alternatives considered for I-66 were expanded to ten corridors. Included in these corridor alternates was an option for using KY 80. Data and analysis results were assembled on each of the corridor alternatives that described traffic benefits and socioeconomic factors, potential environmental impacts, and issues related to engineering and construction costs. A second set of public meetings was held for this study on March 21, 2000 in Somerset and March 23, 2000 in London. Registered attendance at these meetings included 335 individuals in Somerset and 200 individuals in London. The purpose of these meetings was to present the data on the alternative corridors and to allow attendees to comment on the corridor alternatives and analysis results.

In order to maximize attendance, legal advertisements were run in local newspapers, flyers were posted at locations around the communities, and notices placed on television cable access channels. Cabinet officials also spoke with reporters from newspaper, radio and television prior to the meetings. Information packets, maps and public input questionnaires were made available prior to the public meeting at the Area Development District office in London, the Highway District Office in Somerset, and on the Cabinet's Internet web site.

Meeting attendees were encouraged to ask questions and provide comments. Cabinet officials and representatives of the consultant were present to answer questions regarding the alternate corridors prior to, during and after the meetings. At both meetings, a wide range of oral comments were received, both opposed to and supporting the project. At the Somerset meeting respondents opposed to the project cited a lack of justification for the project, needs for road improvements in other areas of the region, an absence of qualitative environmental data, a lack of public input and information, adverse social and community impacts from interstate highways, air and water pollution, and wildlife impacts as general reasons for their opposition. Respondents in

favor of the project cited jobs, economic development and good transportation as reasons for their support. Additional comments raised issues related to continued consideration of options for KY 80, evaluation of other north alternatives, the time-frame for starting property acquisition, as well as the accuracy and sources of the data used in the analysis.

In London, many of the same comments raised in the Somerset meeting were once again expressed both in opposition to and support of the I-66 corridors. Additional concerns were raised related to sinkholes and the potential pollution effect upon them, potential impacts to Native American burial areas along the south corridor alternatives, a lack of quality growth initiatives to preserve land, impacts to the Cane Creek Wildlife Management Area, and a lack of funding for existing highway projects. Supporters expressed comments in favor of the continued development of I-66 across the Commonwealth, the need to relieve traffic bottlenecks in the area, and concerns regarding safety and accident issues along KY 192. Many comments at the London meeting were directed at specific groups of corridor alternatives under consideration. Many individuals were particularly opposed to the south corridor alternatives due to perceived greater impacts on the environment and the Daniel Boone National Forest. Still, some individuals voiced support for the south corridor alternatives, while others offered support for the north and KY 80 options.

Following the meetings, questionnaires were posted on the Cabinet's web site along with the presentation slides used at the public meetings. The aerial photograph composite showing the corridor alternatives was provided at both the Somerset and Manchester District Offices for the public to view. Citizens who could not attend the public meetings were also able to mail or e-mail their questionnaire directly to the KYTC for inclusion into the meeting results.

A total of 234 questionnaires were collected during and after the second round of public meetings in Somerset and London or received by mail at the Kentucky Transportation Cabinet. Three basic questions were addressed on the questionnaire form. General summaries of the responses provided through the questionnaires are illustrated in **Exhibit 5.3**. The first question asked which corridor evaluation issues were most important to the respondents. A total of 207 persons responded to the first question. Traffic and socioeconomic issues were cited by approximately 39 percent of the responses, 30 percent felt environmental issues were most important, and twelve percent indicated engineering and costs to be the most significant issue. Lesser percentages of respondents identified combinations of the issues cited above.

The second question asked if the respondent was in favor of the construction of the I-66 corridor. Of the 227 individuals who answered this question, approximately two-thirds of respondents were in favor of the construction of I-66. These persons generally cited economic growth, improved access and congestion relief as reasons for supporting the corridor. In contrast, respondents who were generally opposed to the corridor expressed feelings that the route was not justified or may cause negative environmental impacts.

The third question looked at the respondents' preferred route(s) and a total of 217 respondents provided answers. Of these, 152 respondents ranked a single corridor as the most preferable. Approximately 35 percent of these respondents identified KY 80 as the most preferable corridor, 29 percent preferred the north corridor alternates, 25 percent preferred the south corridor alternates, and eleven percent preferred the middle alternate.

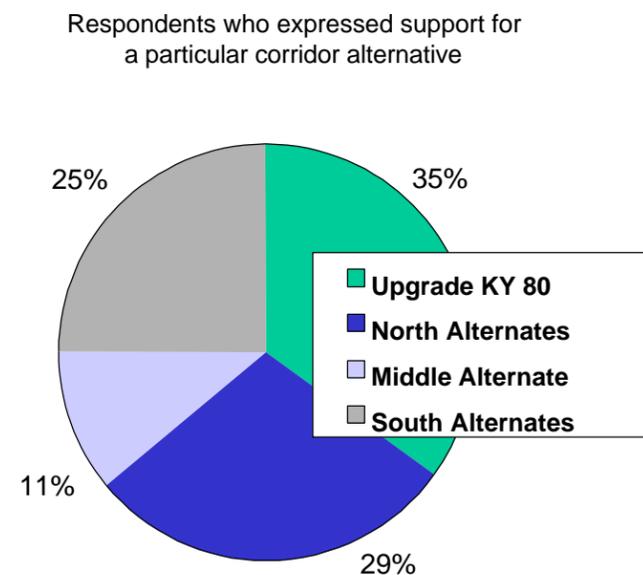
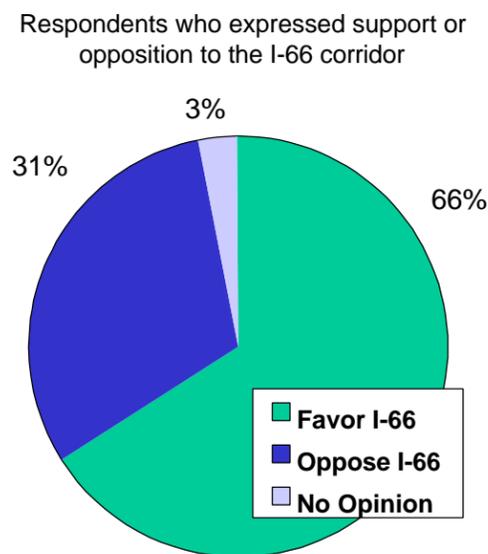
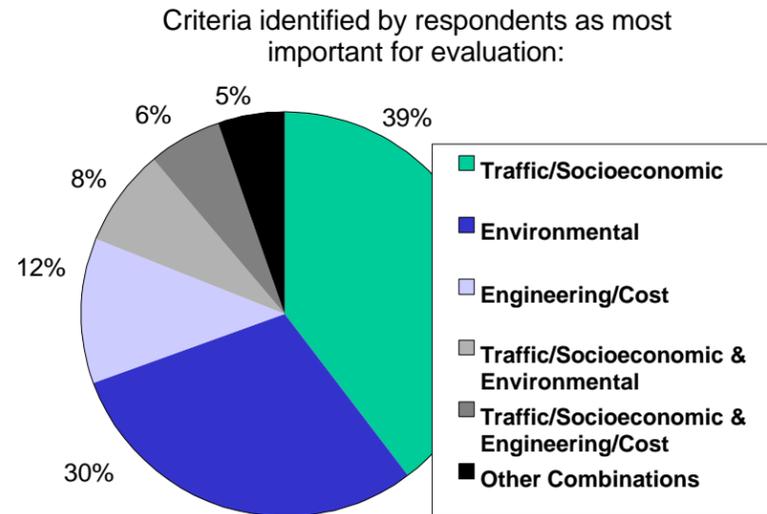


Exhibit 5.3. Spring 2000 Public Input Questionnaire Summaries

In addition to questionnaires received by mail, several packages of materials and letters were received from citizens and public interest groups. A summary of responses received from these groups is detailed in the following section.

B. OTHER PUBLIC INPUT

Throughout the course of the study, local planning agencies, several public interest groups and other citizens were provided with information or submitted inquiries, commentaries and information related to the I-66 Corridor Planning Study. On numerous occasions, the KYTC and its consultants met or corresponded with these groups and individuals to discuss the project, the study process and to receive input. KYTC explained to each group that the Transportation Cabinet is proactively seeking input early from various groups with an interest in the project and this was breaking new ground for the Transportation Cabinet. The following describes the public input activities that occurred with these various groups and additional information is provided in Appendix G.

1. Area Development Districts

Two of the first organizations to be afforded an opportunity to hear about the I-66 Corridor Planning Study and to offer public input to the process were the two Area Development Districts (ADDs) with jurisdiction over portions of the study area. Fifteen Area Development Districts exist throughout Kentucky and serve as regional planning and coordination agencies for a variety of services, including transportation planning activities. Standing committees on transportation planning exist within each ADD. For Pulaski County, the Lake Cumberland ADD has jurisdictional responsibilities. For Laurel County, the Cumberland Valley ADD has jurisdictional responsibilities. The KYTC and its consultants met with the transportation planning committees for each of these ADDs to discuss the I-66 corridor study and the analysis of alternative corridors. These meetings were conducted during the Summer of 1999 and the Spring of 2000. Representatives from the ADDs were also included in other related project meetings through the course of the study and offered input on recommendations for the study. The following sections summarize the recommendations expressed by ADD representatives relative to the evaluation of corridor alternatives.

- *Lake Cumberland Area Development District* – Representatives noted that from their perspective, there was general consensus on the need for and importance of the corridor. It was felt that, due to environmental concerns, the south and middle alternatives would be difficult. As a result, the north and KY 80 alternatives would likely offer the best opportunities. The north alternative N-1 was identified as being the best corridor alternative and the importance of going south of the London area to facilitate accessibility and improved highway connections was noted, particularly a better connection to the Corbin area.
- *Cumberland Valley Area Development District*– Representatives advised that their committee had not formally endorsed a particular corridor alternative but generally preferred an alignment that would pass between London and Corbin in order to provide service to both of these communities. Concern was expressed with respect to the KY 80 alternative relative to local traffic service and access issues. It was noted that the north portion of the study area was already served by a high-quality four-lane roadway, but the south portion was not. Therefore, there was a need to provide a similar facility to provide better access for the south portion of the study area.

2. Kentuckians for the Commonwealth

Kentuckians for the Commonwealth (KFC), based in London, Kentucky, is a grassroots organization of approximately 3,000 members with chapters statewide that is involved in areas of

social, economic and environmental concerns. KYTC representatives and consultants for the I-66 corridor study met with members of the organization on March 10, 2000 to discuss the current planning effort and to receive input from members of KFC. Meeting attendees were provided with a preview of the information and data proposed for presentation at the upcoming public meetings. Members of KFC expressed concern over the south corridors cutting through unique and fragile areas of the Daniel Boone National Forest. In opposing the south corridors, KFC identified issues such as damage to the wildlife and the scenic nature of the area; disruption to families, homes and communities; impacts on endangered species; and adverse effects on Laurel River Lake and the associated tourism industry of the area. KYTC and consultant staff described the approach and data being used to evaluate the corridor alternatives. At this meeting, a flyer completely opposing I-66 was given to KYTC with cited reasons.

At the public meeting in London in June 2000, KFC distributed a revised statement expressly opposing the south corridor alternatives because these alternatives would be:

- Cutting through a unique and fragile natural area that is home to endangered species, underground caves, and scenic sites that will be permanently damaged;
- Unnecessarily disrupting families, homes and communities;
- Providing fewer opportunities for local business and industry along the route because so much of the land is owned by the national forest;
- Not utilizing the existing KY 80 corridor;
- Changing the character of rural areas;
- Adversely impacting the tourism industry of Laurel River Lake that is already at 100 percent of capacity; and,
- Destroying the character of many Laurel County attractions that will also hurt tourism.

3. KICK 66

KICK 66 was formed in response to the KYTC planning efforts for the I-66 corridor throughout the Commonwealth and is a coalition of groups, businesses and concerned citizens who are opposed to I-66. The organization maintained an internet web site to provide information related to their position on the project and actively solicited input and support from interested groups. On March 14, 2000 a meeting was held between the KYTC, its consultants, and members of KICK 66. During this meeting, KICK 66 was provided with an overview of the current planning study for the I-66 corridor between Somerset and London and a preview of the analysis results to be presented at the second round of public meetings. Following presentations by the KYTC and the consultants, KICK 66 members were afforded the opportunity to provide comments and ask questions. Topics raised by members of the organization included:

- Overriding concerns of the organization about the I-66 project on both a national and state level and that the organization would be working to stop the project;
- Need for further review time to consider the information being presented and developed for the study;
- General concerns over adverse impacts from the development of the interstate highway system and related cultural problems;

- Feelings that research studies have been done which suggest that the construction of interstate highways have little economic impact on rural areas;
- Need for considering a "no-build" alternative as part of the analysis options;
- Drainage impacts to cave and karst features and the use and interpretation of data regarding these issues; and,
- Numerous issues related to impacts upon natural areas, wildlife, recreational facilities, and potential Native American burial areas.

Many members of KICK 66 were present at the public meetings for the I-66 corridor. Following the second round of public meetings, the group presented a package of material stating their position on the project. Their position as stated in a two-page executive summary is as follows:

- They opposed the creation of any new highway corridors through the south and middle portions of the study area;
- They find it unnecessary to create any new highway corridor, instead preferring the KY 80 corridor to be upgraded to an interstate facility; and,
- They find it unnecessary to construct any interstate corridor through the study area or State of Kentucky.

In addition to the executive summary, numerous materials were included in their submittal including the following: expert opinions; local comments, statewide comments and considerations; cave and karst information; species and environmental data and reports; letters of endorsement and supporting organizations; and a petition opposing the I-66 corridor as proposed. The KICK 66 group in their document summary found the corridor alternatives to be deficient for the following reasons:

- Alignments cut through undeveloped land;
- Routes cross the Rockcastle River (registered as a state Wild River);
- Alternatives do not use existing road grades;
- Area is highly sensitive to environmental change;
- All alignments cross areas of karst topography; and
- Routes will not relieve traffic congestion into Lake Cumberland region from KY 461.

The KICK 66 organization also provided petition signatures from what it identified as 1500 individuals and letters of endorsement from 30 state and national organizations that it also identified as supporting their position.

4. Other Groups and Citizens

Many other citizens, organizations, and interest groups wrote or otherwise contacted the KYTC to express input related to the I-66 project and the proposed corridor alternatives. Many citizens wrote to express opposition to the corridor as a whole or to cite specific concerns related to possible impacts to features along the corridors. Areas of citizen concerns principally identified impacts to the forest; however, other concerns related to effects upon caves and karst features,

wildlife, and wasting tax dollars. Other citizens wrote to express support for the project, encourage the KYTC to consider certain needs in the development of the route, or express their feelings that environmental groups were making misleading statements. Corridor needs expressed by citizens in support of the project included interchange locations, access requirements, and preferences for various routing options.

The National Speleological Society (NSS) is an organization founded for advancing the study, conservation, exploration and knowledge of caves. The NSS protested the handling of the I-66 decision-making process, including citing what it believed to be NEPA violations and poorly organized public information meetings. The organization expressed its opposition to any further development of the interstate project. Still, NSS representatives offered very useful material and information on karst geology and caves, with specific reference to areas within Pulaski County that could be affected by the corridor alternatives.

The Kentucky Heartwood organization, an advocacy group for preserving public forest areas within Kentucky, wrote to express concerns related to the inadequacy of public involvement, project scope and study process. Members of the organization stated that none of the current corridors were acceptable, full analysis of the need and justification of the I-66 corridor was lacking, and feasibility studies should be redone to account for environmental, social and cultural factors.

The Sierra Club Cumberland Chapter were pleased to see that consideration was being given to the KY 80 alternate but stated that the need had not been demonstrated for an interstate level of service between the Louie B. Nunn (Cumberland) and Daniel Boone Parkways. The chapter presented several reasons for not supporting the project, most notably "sprawl" development and the lack of need for an interstate facility. The Sierra Club expressed its support for "smart growth" and "sustainable development".

C. RESOURCE AGENCY INPUT

Many local, state and federal resource agencies, with diverse areas of public responsibility, were included in the process of evaluating the corridor alternatives for I-66. Because all of the proposed corridors crossed portions of the Daniel Boone National Forest, input from representatives of the U.S. Forest Service (USFS), Daniel Boone National Forest (DBNF), were solicited at various junctures throughout the project. Additional input from other resource agencies was solicited through meetings with these agencies or through written requests for input. The following sections describe the input received from these organizations.

1. U.S. Forest Service, Daniel Boone National Forest

Correspondence and meetings between USFS representatives, the KYTC and the I-66 consultants occurred throughout the planning study and members of the USFS were present at all resource agency and public meetings. The USFS was initially contacted in May of 1998 to advise them of the scope of the study and representatives from the agency provided the consultant with a map of potential corridor options. On June 8, 1999, the USFS submitted a letter to the KYTC to provide the Cabinet with several comments and observations related to the study and the project. The USFS noted their understanding of the need for the project but emphasized their desire that the recommended corridor be developed so that the forest resources were impacted as little as possible. The USFS suggested that the KY 80 corridor be provided with further consideration as

an alternative and that the USFS be afforded additional opportunity for input to the project. A number of areas of concerns were presented by the USFS, and these included the following:

- Need for greater consideration of sensitive aquatic and terrestrial species;
- Negative impacts from increased activity on Laurel River Lake;
- Land use concerns related to the unique character and features of the forest;
- Problems related to geotechnical and geologic features for the area;
- Issues pertaining to noise and water quality; and,
- Disagreement with the rating system and procedure used to arrive at an initially preferred alternative.

In their letter, the USFS concluded by requesting further and more involved coordination between themselves and the KYTC throughout future project development efforts and offered their resources in forthcoming environmental and design activities.

In a meeting with the USFS on February 16, 2000, KYTC representatives briefed the organization on the revised evaluation of the corridor alternatives, including the KY 80 corridor and the planned program of public involvement activities. The USFS noted that the additional planning efforts were more beneficial in affording an analysis of corridors and suggested that the public should be better able to understand the impacts and effects of the alternatives.

In its letter to the KYTC dated March 21, 2000, the USFS offered several comments relative to the project's purpose and need. Specific concerns were noted in reference to a continued emphasis upon improving access to tourism and recreational facilities. Members of the USFS felt that increased traffic to Laurel River Lake would be a significant detriment to this facility. The USFS provided a survey of lake users that indicated a general feeling that recreational use of the lake was already over-capacity. With respect to environmental issues, the USFS suggested separate consideration of those issues pertaining to only national forest land and to the evaluation of more qualitative impacts upon the environment and recreational facilities.

The USFS did provide a comprehensive review of all the corridor alternatives and data related to park property boundaries, cliff lines and habitat areas for threatened and endangered species. The south corridor alternatives were of particular concern due to their proximity to many forest service facilities, potentially greater impacts to plant and animal species, potential effects upon karst areas and cliff lines, and effects upon lakes and recreational facilities. The middle corridor alternate was considered to be problematic due to its impacts upon the Rockcastle River Wild River corridor. Related Wild River statute documentation is located in Appendix G. The north corridor alternates had fewer impacts to the Wild River area, but individual north corridors crossed recreational trails or crossed watersheds and streams that are associated with threatened and endangered or sensitive species habitats.

Considering the existing impacts to national forest service property and the potential number of acres taken from their property, USFS representatives identified the KY 80 corridor as posing the least adverse impacts, followed by alternatives N-2, N-1, N-4 and N-3. The M-1 corridor and all of the south corridors were considered to have the greatest degree of potentially adverse impacts to the forest and associated environmental features.

2. Resource Agency Meetings

Two group meetings were held through the course of study to allow representatives from state and federal resource agencies to have an opportunity to hear about the study, evaluate data and analysis results, and to provide input to the study process. Resource agencies who sent representatives to attend the meetings included the following:

- U.S. Forest Service, Daniel Boone National Forest (DBNF)
- Kentucky Department of Fish and Wildlife (KDFWR)
- U.S. Fish and Wildlife Service (USFW)
- Federal Highway Administration (FHWA)
- Kentucky Workforce Development Cabinet (KWDC)
- Kentucky Cabinet for Economic Development (KCED)
- Kentucky Heritage Council (KHC)
- Kentucky Tourism Development Cabinet (KTDC)
- Local Emergency Management Services (EMS)
- West Virginia Division of Highways, Planning Division (WVDOH); and
- Kentucky Transportation Cabinet (KYTC)

The first of two agency meetings was held December 14, 1999. In this meeting, elements of the I-66 project were presented to agency representatives, including the scoping study between Somerset and London, detailing the evaluation process, corridors considered, project challenges and areas of study focus. Project specific and generalized comments and questions were addressed following the presentations. Comments included during the meeting included:

- Questions regarding the relationship of the current study to subsequent NEPA documentation;
- Consideration of economic impacts to distressed counties;
- Concerns regarding impacts to crossroads within the corridor;
- Opportunities to share data among project sponsors and resource agencies; and,
- Coordination with on-going studies in West Virginia.

The second agency meeting took place on March 14, 2000 and looked specifically at the I-66 Southern Kentucky Corridor Study from Somerset to London. Attendees included representatives from the U.S. Forest Service DBNF, U.S. Department of Housing and Urban Development, U.S. Department of Agriculture, Kentucky Department of Fish and Wildlife, FHWA and the KYTC. The purpose of the meeting was to discuss the current evaluation of the ten corridor alternatives. One important point addressed the further evaluation of the KY 80 corridor and re-evaluating other corridor alternatives. Questions were raised about several environmental areas including wetlands, threatened and endangered species, historic structures and the lakes. In regard to the Laurel River Lake area, it was noted that negative impacts may result from the interstate's close proximity to the lake. According to user surveys collected by the U.S. Forest Service, the lake is already over-used and providing better access to the lake would only

aggravate the problem. Further items addressed include a potential interchange location with I-75, Native American input, and KY 80 cost estimating. It was noted that this study is an early planning document that would require further studies. In addition, no recommended corridor was presented at the meeting and it was suggested that more than one corridor could become the recommendation of the scoping study.

3. Other Resource Agency Input

In addition to the meetings with USFS officials and the two resource agency meetings, a number of letters were received by the KYTC from a number of local agencies. Comments received are briefly summarized by agency below:

- *United States Department of Agriculture* – Karst topography, steep slopes, and threatened and endangered species in the study area must be considered. The economic benefits of building a new road versus the expansion of an existing road should be weighed.
- *Russell County Judge-Executive* – The project would enhance local tourism and economic/industrial development.
- *Office of State Archaeology* – Much of the study area has not been surveyed for sites and nearby surveys have indicated the presence of sites. Archaeological investigations in the study area should be completed to determine local impacts.
- *Cincinnati Department of Environmental Health* – Recent decisions by the President of the United States and the U.S. Congress indicate a national priority to preserve forested areas. Any new corridor between Somerset and London should be opposed for environmental reasons.
- *Kentucky State Police* – Comments expressed concerns with the future interchange at I-66 and I-75. If the interchange is placed within or close to London, the local system could not withstand the traffic increases and provide the necessary facilities. It was suggested that the interchange be located north or south of London to avoid presently congested areas.
- *Somerset/Pulaski County Chamber of Commerce* – The Chamber's Board of Directors supports the construction of I-66 and endorses the construction of a north corridor.

D. KYTC INTRADEPARTMENTAL INPUT

Although the Southern Kentucky (I-66) Corridor Planning Study was conducted under the direction of the KYTC's Division of Planning, staff members throughout many areas of the Transportation Cabinet were involved in the study process and provided input regarding the evaluation of alternatives and the development of study recommendations.

1. Comments from Local District Offices

Local district offices of the KYTC's Department of Highways included District 8 in Somerset, which has jurisdiction in Pulaski County, and District 11 in Manchester, which has jurisdiction in Laurel County. Representatives from these districts participated in project and public meetings and provided insight in regard to various project issues and future project development activities.

Comments offered by District 8 staff advised that the S-3 alternative passing south of Somerset would not be viable due to the need for providing a large number of bridge crossings

and also due to the environmental concerns inherent in all of the south and middle corridor alternatives. Concern was expressed relative to access and traffic issues associated with the KY 80 alternative. Specifically, it was noted that KY 80 currently provides for some local traffic functions that could not be easily provided with an interstate -type facility. The district did not think that building I-66 directly over KY 80 was an acceptable option due to difficulties that would be encountered throughout the construction process and that existing KY 80 served a local highway need that would not be fulfilled with an interstate highway. The District 8 staff also noted that the current corridor assumed north of Somerset might require adjustments northward during subsequent design phases in order to minimize impacts to homes and new development in the area.

Comments offered by District 11 staff expressed concerns about the environmental challenges posed by the south and middle corridor alternatives. The district also added that the proposed interchange with I-75 and the corridors passing north of London (N-2, N-3) would be particularly challenging due to the need to cross the Interstate, US 25 and the CSX railroad as part of that single interchange configuration. District 11 representatives were also involved in speaking with local citizens and community groups regarding the project and noted that, through their discussions, the general sentiment has been in favor of an alignment south of London, although some individuals have supported a north alignment.

2. Interdisciplinary Team Meeting

On April 26, 2000, an Interdisciplinary Team (IDT) meeting was held with representatives from throughout the Transportation Cabinet. Minutes of this meeting are included in Appendix G. Included in the meeting were representatives from Office of the Secretary, Office of the State Highway Engineer, Districts 8 and 11, Program Management, Design, Bridges, Construction, Environmental, Materials/ Geotechnical, Operations and Right-of-Way/Utilities. Also included in the meeting were representatives from the Cumberland River and Cumberland Valley Area Development Districts and the Federal Highway Administration. The meeting included a review of the background of the study and prior project activities, a review of project goals, a presentation of alternative corridors, discussion of advantages and disadvantages within each alternative corridor, the analysis methodology, a summary of public input and the development of study recommendations.

An extensive amount of comments and discussion were offered on the study and the analyses. Based upon all of the concerns expressed, meeting participants were able to proceed through the corridor alternatives and thereby arrive at a consensus recommendation for the project. Meeting participants concurred that, due to serious environmental concerns, input from the U.S. Forest Service, public opposition and low traffic service levels, the south and middle alternatives would not be preferred. The N-2 alternative provided an option to crossing at the existing KY 80 bridge, but created low traffic service levels and adverse travel by the circuitous alignment of this corridor alternative between Somerset and London/Corbin. It was determined that Kentucky's Wild River Statutes permitted the construction of a bridge in the vicinity of KY 80, south of the N-2 corridor. Also, input from environmental resource agencies suggested that expanding or replacing the existing KY 80 bridge would potentially have less adverse environmental impacts than constructing a new bridge within the N-2 corridor. The N-2 corridor also passed within close proximity to Wood Creek Lake, which provides approximately 50 percent of the drinking water for the City of London. Therefore, it was concluded that there would not be

any net environmental benefits gained by the N-2 corridor while there would be a significant loss in traffic and operational efficiency, making the elimination of this alternate advisable.

Meeting attendees noted that an opportunity likely existed for using sections of KY 80, but use of the entire corridor would likely be prohibitive due to right-of-way costs, socioeconomic impacts and major construction challenges. It was noted that construction challenges for an I-66 alternative north of London, traffic service levels, transportation system connectivity, and local preferences generally supported a corridor that would pass south of London and provide access to both London and Corbin. Therefore, it was concluded that the N-3 alternative should be eliminated.

Relative to the N-1 and N-4 corridor alternatives, the major difference identified between the two was that N-1 was situated closer to London. It was generally concluded that interchange challenges with I-66 and I-75 would exist for both of these options, but more flexibility was afforded to Corridor Alternative N-4. Additionally, N-1 could have more significant impacts to subdivisions and business between I-75 and US 25. The N-1 alternative would also be in close proximity to the Levi Jackson State Park, passing between the park and the City of London, and input from local officials and the State Police encouraged consideration of routes farther south of London. Therefore, consensus was reached among meeting attendees on the recommendation of a corridor alternative that would be largely representative of the N-4 alternate. It was suggested, however, that the study recommendations permit future consideration of alignment options along or in close proximity to KY 80, where further design and environmental studies showed such options to be feasible. Further corridor adjustments should be permitted whenever future environmental and design studies would warrant such adjustments.

CHAPTER 6 – RECOMMENDATIONS AND CONCLUSIONS

The recommendations and conclusions for this I-66 study are based upon the evaluation of corridor alternates for an interstate-type facility from Somerset in Pulaski County to London in Laurel County. Geometric criteria used in the preparation of this study include a 70 mph design speed; moderate horizontal and vertical curvature; access available only at interchanges; and four twelve-foot lanes. Considered in this chapter are the recommended I-66 corridor, cost estimates, prioritization of corridor segments, and conclusions of the study.

A. DEVELOPMENT OF RECOMMENDED CORRIDOR

1. Corridor Advantages and Disadvantages

Shown in **Table 6.1** are identified advantages and disadvantages for each of the study alternates presented at the Interdisciplinary Team meeting on April 26, 2000. In short, the evaluation results indicate the following:

- KY 80 Alternate
 - Generally good in most traffic and socioeconomic areas
 - Slightly below average in environmental categories
 - Most expensive project costs
 - Many access control and right-of-way issues
 - Geometric, design and operational issues
- North Alternates
 - Generally good in most traffic and socioeconomic, environmental and cost categories
 - Alternates passing between London and Corbin offer better traffic service
- Middle Alternate
 - Modest traffic service and additional highway service infrastructure will be needed
 - Impacts to undisturbed natural areas
 - Potentially prohibitive impacts to the Wild River portion of the Rockcastle River
 - Least expensive costs
- South Alternates
 - Generally below average in traffic and environmental categories
 - Particular concerns relative to impacts to the Daniel Boone National Forest
 - Greater impacts to threatened and endangered species
 - Potential negative impacts to Laurel River Lake
 - More expensive overall costs

2. Corridor Recommendation

Using the results of the corridor evaluation effort, public and resource agency input, interdisciplinary team efforts (minutes included in Appendix G), and a recommendation for a corridor alternate was selected that would best meet the stated project goals. A discussion of the reasons for this selection is described in the following paragraphs.

Due to potentially serious environmental concerns, public opposition and low traffic service levels, the south and middle corridor alternates are generally not preferred. All of the south alternates are considered to have potentially significant environmental concerns, particularly with respect to impacts on sensitive areas of the Daniel Boone National Forest, the Laurel River Lake area, and possible locations of threatened and endangered species. These corridors are also expected to carry traffic volumes that are generally lower than some of the north alternatives. The S-3 corridor passes south of Somerset and would consequently impact more people and businesses, as well as require more major bridge crossings of the Laurel River and Lake Cumberland than the other alternatives.

The M-1 corridor also involves potentially significant environmental concerns, particularly with respect to impacts on sensitive areas of the Daniel Boone National Forest and possible locations of threatened and endangered species. This corridor alternate passes through a large number of undisturbed areas of the forest and creates a new crossing through the state-designated Wild River section of the Rockcastle River. Traffic service levels and accessibility to existing highway facilities are also relatively low for M-1, and costs to provide infrastructure to service this corridor would be higher than other alternatives.

Among the north alternates, N-2 was eliminated as a preferred option due to low traffic service levels and adverse travel created by the circuitous alignment of this corridor between Somerset and London. The primary reason for proposing the N-2 alternate was to provide a corridor that would fall outside the designated Wild River boundary of the Rockcastle River. Since further investigation of Kentucky's Wild River legislation indicates the permitted use of KY 80 at the Rockcastle River, the N-2 alternate can be eliminated from further consideration. It should be noted that discussions with the Wild River coordinator in the Division of Water of the Kentucky Natural Resources and Environmental Protection Cabinet have indicated that utilizing the KY 80 crossing may be a preferred option for the recommended corridor. Additionally, the KYTC has purchased property for a 4-lane ultimate facility at KY 80 and the Rockcastle River; therefore, additional right-of-way for the project should be minimal in this section.

With the south, middle and N-2 corridors eliminated from further consideration, the remaining analyses involved a critical examination of the relative advantages and disadvantages of an improved KY 80 and the N-1, N-3 and N-4 alternates. Environmental groups generally identify KY 80 and the north routes as being acceptable. While many organizations have expressed a preference for making maximum use of the KY 80 corridor, a number of concerns have been identified related to the exclusive use of the KY 80 corridor. Opportunities likely exist for using sections of KY 80, but use of the entire corridor could be prohibitive due to right-of-way costs, socioeconomic impacts and major construction challenges. In developed areas, the right-of-way costs could be excessive, particularly in the vicinity of London. Displacements of residences and businesses could also create social and economic impacts. Construction activities to widen some sections of KY 80 would be greater than the costs of new construction, and maintenance of traffic along KY 80 throughout construction would be difficult in areas. Recommendations should allow future design and environmental studies to examine alignment options near to or along sections of KY 80 from Somerset to the Rockcastle River; however, KY 80 from the Rockcastle River to the Daniel Boone Parkway was eliminated from further consideration.

Table 6.1 Evaluation Matrix

Alternate	Advantages	Disadvantages
KY 80	Provides above average traffic service	Most expensive project costs
	Improves system connectivity	Difficult I-75 interchange issues at Pittsburg
	Minimal impacts to DB National Forest	Extensive maintenance of traffic
	Avoids cliff lines, streams and wetland sites	May require frontage roads or major ROW acquisition
	Improves an existing corridor	Major impacts to cultural and sensitive land uses
		Crosses the Wild River area
		Poor recreational access
		Requires the most number of displacements
N-1	Provides best traffic service	I-75 crossing could impact airport
	Avoids areas of disadvantaged populations	Poor accessibility between KY 80 and I-75
	Offers service to London and Corbin	I-75 interchange may affect more homes and businesses
	Avoids many natural and environmentally sensitive areas	May impact more churches, schools and cemeteries
	Provides good service to industrial areas	Provides below average system connectivity
	Has lower than average project costs	Impacts the Wild River Area
	Can potentially use strip-mined lands	
	DB Parkway tie closer to London	
N-2	No impact to Wild River boundary	Constructibility difficult in areas of rugged terrain
	Avoids most natural and environmentally sensitive areas	Provides below average traffic service
	Avoids the most threatened and endangered species	Most likely to impact disadvantaged populations
	Offers good industrial and system serviceability	Does not access lake and recreational areas
	Avoids many cultural land uses	May potentially impact Wood Creek Lake
	Has lower than average costs	
N-3	Avoids many natural and environmentally sensitive areas	Presents construction challenges at I-75
	Impacts the least amount of DBNF	Carries less traffic around London
	Avoids known cave routes	Potentially disturbs more disadvantaged populations
	Provides best travel time and distance savings	
	Provides below average costs	
N-4	Carries higher than average traffic volumes	Impacts the Wild River area
	Offers high accident reduction	Potentially impacts more cultural land use areas
	Offers service to both London and Corbin	Provides below average system connectivity
	Avoids pristine areas of the DBNF	Construction challenges in rough terrain and basins
	Avoids many natural and environmentally sensitive areas	
	May offer best I-75 interchange location	
	Likely impacts fewer areas of disadvantaged populations	
Extends the corridor further east than other alignments		

Alternate	Advantages	Disadvantages
M-1	Provides shortest distance	Provides below average traffic service
	Provides the lowest overall project cost	Provides poor system connectivity
	Causes the least number of displacements	May cause significant impact to DBNF
	Requires low maintenance of traffic during construction	Likely impacts many threatened and endangered species
	Provides above average industrial serviceability	Direct impact to the Wild River area
	Causes minimal impact to cultural land uses	
	Avoids many wetland sites and cave routes	
S-1	Improves an existing corridor	Provides below average traffic service
	Provides average system and industrial connectivity	Likely to impact disadvantaged populations
	Avoids known archaeological and historic sites	Significant impacts to the DBNF
	Avoids the Wild River area	Many environmental impacts overall
	Provides low per-mile project costs	Likely to affect many threatened/endangered species
	Provides access to communities south of London	
S-2	Crosses I-75 in less-populated area	Impacts existing weight stations
	Potential tie to US 25E possible	Provides below average traffic service
	Provides average system and industrial connectivity	Likely to impact disadvantaged populations
	Avoids known archaeological and historic sites	Significant impacts to the DBNF
	Avoids the Wild River area	Many environmental impacts overall
	Provides low per-mile project costs	Likely to affect many threatened/endangered species
S-3	Provides access south of Somerset	Large bridge structures required
	Provides average system and industrial connectivity	Interchange at US 27 not feasible
	Avoids known archaeological and historic sites	Significant impact to cave systems
	Avoids the Wild River area	Provides below average traffic service
	Provides low per-mile project costs	Likely to impact disadvantaged populations
	Provides access to communities south of London	Significant impacts to the DBNF
		Many environmental impacts overall
	Likely to affect many threatened/endangered species	
S-4	DB Parkway tie closer to London	I-75 crossing could impact airport
	Provides average system and industrial connectivity	Provides below average traffic service
	Avoids known archaeological and historic sites	Likely to impact disadvantaged populations
	Avoids the Wild River area	Significant impacts to the DBNF
	Provides low per-mile project costs	Many environmental impacts overall
	Provides access to communities south of London	Likely to affect many threatened/endangered species

Construction challenges for an I-66 alignment north of London, lower traffic service levels, and concerns over the close proximity of the corridor to Wood Creek Lake indicate the N-3 alternate passing north of London to be the least desirable of the remaining alternatives. A corridor that would pass south of London and provide access to both London and Corbin offers a greater number of advantages and better meets the project goals. Identified problems related to constructing I-66 north of London (the N-3 alternate) include a continuously elevated section of the route over I-75, US 25 and the CSX railroad. Poor accessibility to both London and Corbin is a factor for this option, which carries less traffic than alternates passing between London and Corbin. The potential for geologic concerns relative to the possibility of abandoned underground coal mine areas are also an issue for the N-3 alternative. It was also noted that public concerns have been raised associated with the impacts of the N-2 and N-3 corridors on Wood Creek Lake, which provides half of London's water supply. In consideration of these issues, it was concluded that further consideration of the N-3 corridor alternate should be eliminated.

The N-1 and N-4 alternates both provide improved access not only to London, but also to Corbin, and thereby better meet some of the project goals. For the N-1 corridor, concerns were raised over the proximity of the corridor to the London-Corbin Airport flight path, thereby eliminating future airport expansion. The location of the I-75 and I-66 interchange could also create right-of-way acquisition problems east and west of I-75. Several subdivisions in the area would be impacted along with some large business/industrial areas along the US 25 corridor. Additionally, while the N-1 corridor does not directly impact the Levi Jackson State Park area, the corridor could have indirect impacts on this area. The N-1 corridor does pass in close proximity to the park and it would also fall between London and the park, thereby potentially limiting recreational access to the park facilities. In general, the N-1 corridor presents concerns on the eastern side of the I-75 corridor, closer to London.

One of the major considerations for the N-4 alternate involves its impact on the new truck weigh stations along I-75. At its proposed location, the interchange will be located less than one mile from the entrance ramp to the truck weigh station on the southbound side of I-75. This location places the interchange in a position where it may interfere with the existing truck weigh station operations. However, design modifications could be provided to the configuration of the interchange or to the truck ramps serving the weigh stations to allow both to coexist. An additional issue pertaining to the N-4 alternate is that, west of I-75, the corridor has several crossings of Sinking Creek, which is a known habitat for endangered species of mussels. Although the N-4 route would pass through the Daniel Boone National Forest on a new location, much of that portion of the forest has already been disturbed by logging and mining.

Given all of the issues identified above, and specific consideration of the advantages and disadvantages associated with the N-1 and the N-4 alternatives, it is recommended that the N-4 corridor provide the basis for future development of I-66 between Somerset and London. In using the N-4 corridor, however, there are several recommendations for corridor adjustments that should be considered with future project development activities. These issues are discussed later in this chapter and include the following:

- North of Somerset, consider opportunities to adjust the corridor northward to better avoid new subdivisions in the area;
- From Somerset to east of the Rockcastle River, the recommended corridor should include portions of the KY 80 corridor to the maximum extent possible;

- West of I-75, the corridor should seek to reduce the number of crossings of Sinking Creek in order to minimize potential impacts to threatened and endangered species habitats; and
- More detailed studies will be required in the design phase to finalize the location of the I-66/I-75 interchange. The interchange is expected to be located in a section that is at least one to one and a half miles north of the southbound weigh stations.

3. Recommended Alternate Issues

The recommended alternate for the I-66 corridor between Somerset and London is the N-4 corridor with a selected set of potential modifications, as shown in **Exhibit 6.1** (see next page). While these potential modifications do not involve a formal change, they do offer some flexibility to the proposed corridor that should be considered as options during subsequent project development activities. The following sections cover these issues as they relate to the recommended corridor.

• I-66/I-75 Interchange

An approximate location for the I-66/I-75 interchange is identified in **Exhibit 6.2**. The N-4 corridor crosses I-75 at a point just north of the southbound truck weigh station. Because of the proximity of this interchange to both the southbound and northbound truck weigh stations, adjustments to the interchange or truck weigh station ramps will likely be needed to avoid operational conflicts between entering and exiting traffic.

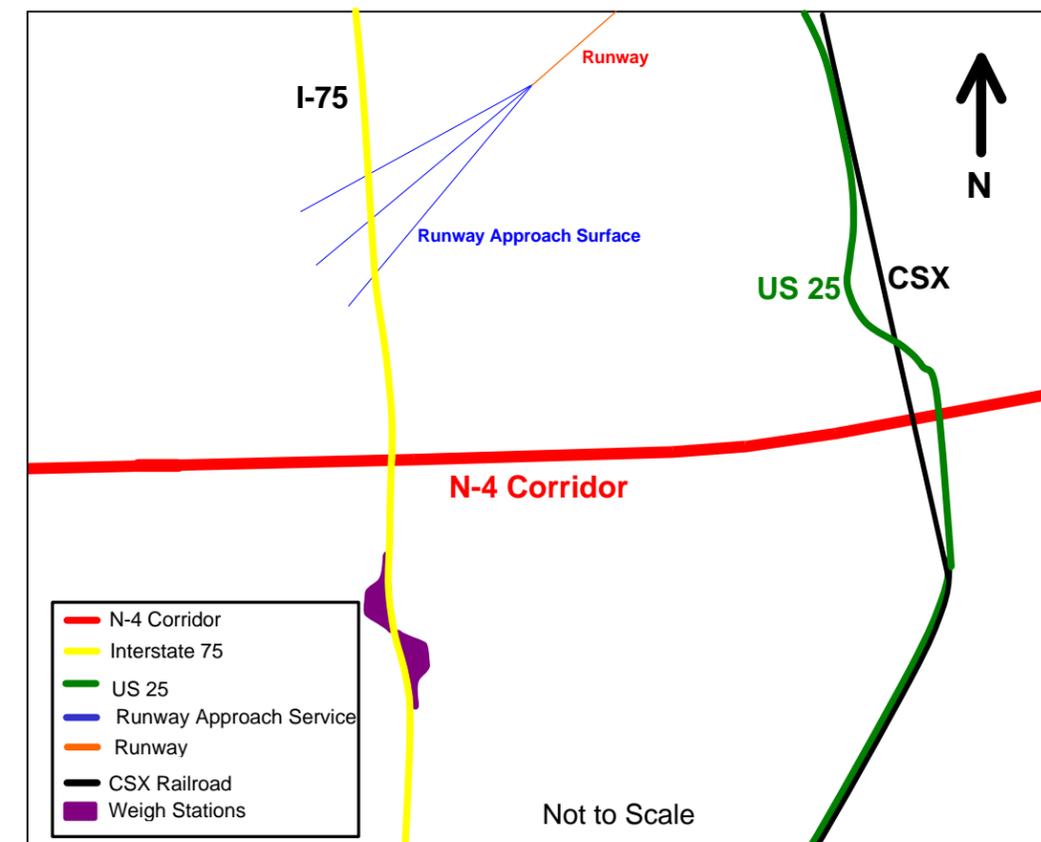


Exhibit 6.2 Approximate Location of I-66/I-75 Interchange

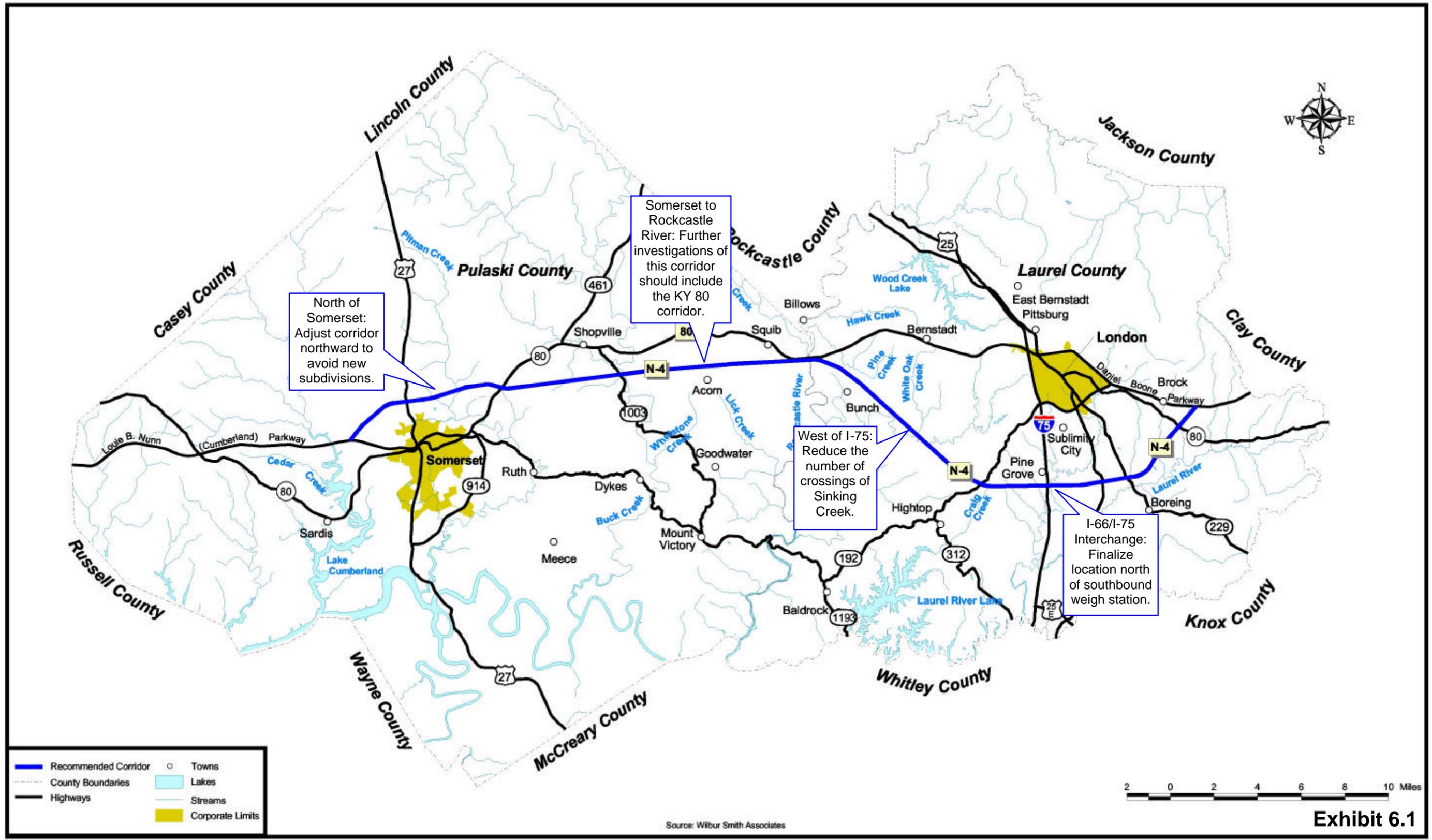


Exhibit 6.1
Recommended Corridor

If the interchange location is adjusted a little farther north, conflicts with trucks merging back onto I-75 from the northbound truck lane would likely be eliminated. Therefore, only traffic conflicts associated with southbound trucks would need to be addressed. Ramping options associated with this interchange must first consider a basic interchange configuration. While many alternatives exist for freeway-to-freeway interchange connections, the most simple and inexpensive of these would be a basic cloverleaf design, as illustrated by the schematic drawing in **Exhibit 6.3**. Also shown in this exhibit is a potential ramp configuration between the southbound traffic coming from I-75 or I-66. As illustrated, trucks destined to the weigh station would be removed at selected points in the traffic stream, and that would serve to reduce the number of conflict points.

Many other variations exist for the proposed I-66/I-75 interchange and the associated truck ramps. A more thorough examination of design options, operational issues, costs and benefits may help to reveal the most practical option for this element of the N-4 alternate. One additional option for locating the I-66/I-75 interchange would be to push the location far enough

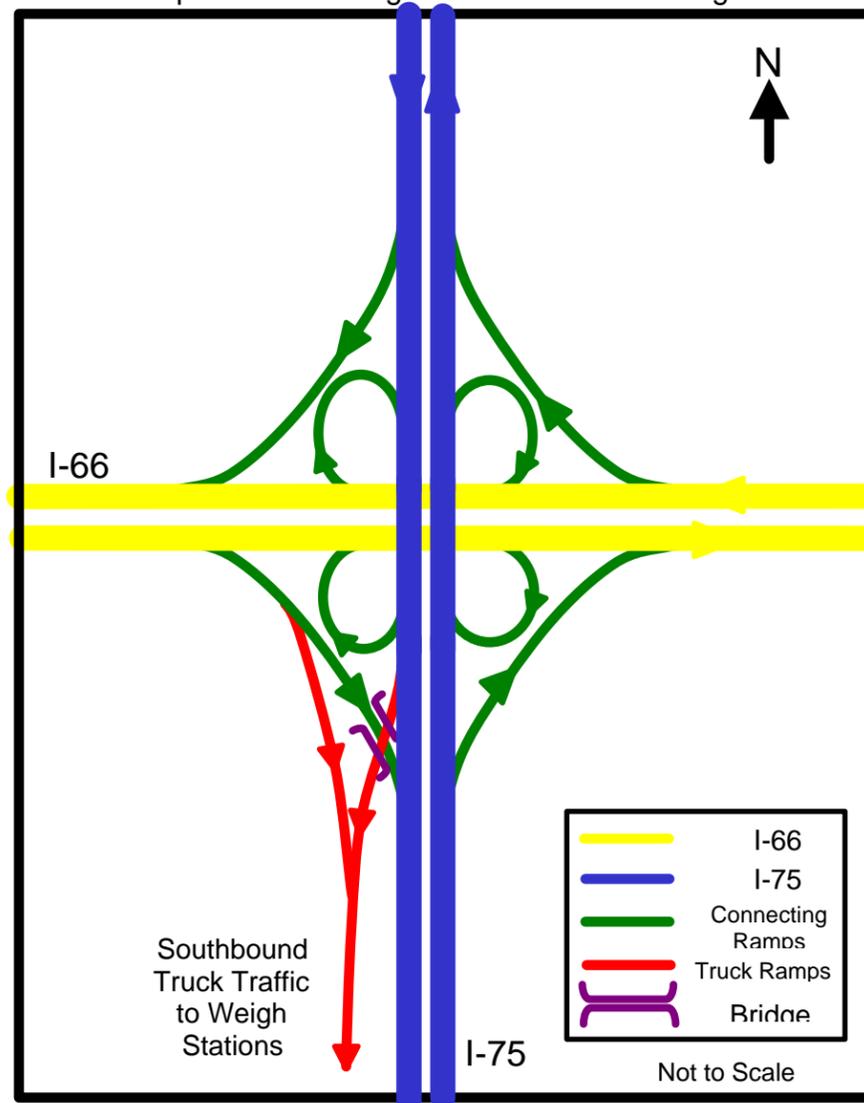


Exhibit 6.3 Design Consideration For I-66/I-75 Interchange

north so that adequate spacing would exist between the interchange ramps and the truck ramps to the southbound weigh stations. However, further investigation reveals that the runway approach might prohibit any other interchange locations.

The London-Corbin Airport currently has a non-precision approach with a 34:1 slope on the obstruction clearance surface. With this criterion, a maximum elevation of the tallest bridge deck surface for the I-66/I-75 interchange is approximately 1330 feet. The elevation of I-75 at this location is approximately 1160 feet. Lighting elevations will also be an issue. If this structure did meet the requirements for the existing obstruction clearance surface, it might still potentially interfere with the airport's ability to ultimately be upgraded to an Instrument Landing System (ILS) precision approach. An ILS

precision approach would require a 50:1 slope on the obstruction clearance surface. This requirement would result in a maximum bridge deck elevation of approximately 1287 feet. Additional Federal Aviation Administration Part 77 surface considerations may come into play with an interchange located within or near the approach surface illustrated in Exhibit 6.2.

Future design studies will be required to select the final interchange location. Nevertheless, the potential interchange should fall within the segment along I-75 that is bounded by the weigh stations to the south and the London-Corbin Airport's runway approach surface to the north. Future studies should look specifically at interchange design configurations, the associated elevation requirements for FAA Part 77 surfaces, and the requirements of the Master Plan for the London-Corbin Airport.

- Parkway Interchanges

The two termination points for this priority section of I-66 are identified as the Louie B. Nunn (Cumberland) Parkway and the Daniel Boone Parkway. Recognizing that future development of the I-66 corridor would extend beyond these prescribed segment end points, the orientation and configuration of the interchanges at these points should be developed accordingly.

At the Louie B. Nunn (Cumberland) Parkway, the interchange must also account for the proposed northern extension of the Somerset Southwest Bypass. Illustrated in **Exhibit 6.4** is the proposed concept for this location. The I-66 corridor will be connected to the Somerset Southwest Bypass with a directional interchange, potentially oriented with a 'trumpet' configuration. West of the Somerset Southwest Bypass, I-66 will continue as an uninterrupted

four-lane freeway to the Louie B. Nunn (Cumberland) Parkway. At the point where I-66 connects to the Louie B. Nunn (Cumberland) Parkway, the highway should be designed to afford a seamless and continuous flow of traffic from the Louie B. Nunn (Cumberland) Parkway on the west to I-66 on the east. The remaining section of the Louie B. Nunn (Cumberland) Parkway between I-66 and the Somerset Southwest Bypass is not initially envisioned to require any type of direct access to I-66. In fact, the orientation of the Somerset Southwest Bypass and I-66 might render this small portion of the parkway as obsolete and it could be removed or redesignated as a local facility.

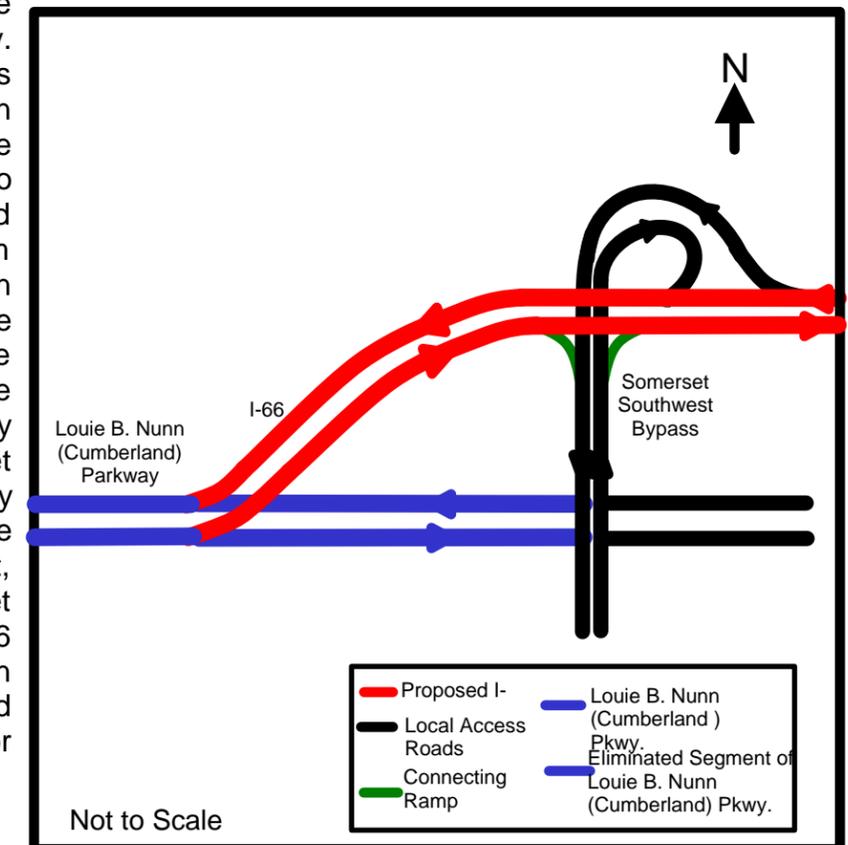


Exhibit 6.4 Potential Louie B. Nunn (Cumberland) Parkway Interchange

At the Daniel Boone Parkway connection, a similar requirement exists for providing a continuous and seamless transition between the proposed I-66 corridor to the west and the existing Daniel Boone Parkway on the east. While the planning and design of this facility should provide for a continuous four-lane, divided freeway facility, the route and connection might initially be constructed as a two-lane facility at this point to correspond with the existing two-lane construction of the Daniel Boone Parkway. The proposed orientation of the interchange is shown in **Exhibit 6.5**.

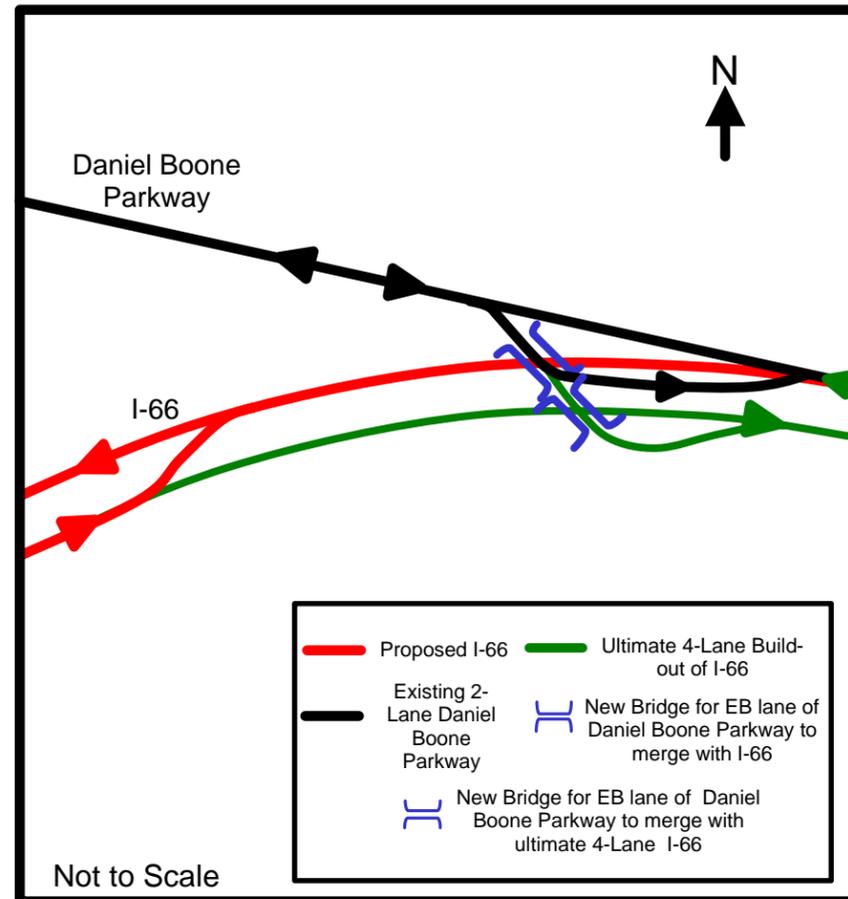


Exhibit 6.5 Potential Daniel Boone Parkway Interchange

Note that, in advance of the interchange to the west, I-66 could be transitioned to a two-lane roadway before continuing eastward as the Daniel Boone Parkway. A flyover ramp would be constructed to allow for an eastbound connection from the Daniel Boone Parkway connection north of London to cross over I-66 and continue east on the Daniel Boone Parkway toward Hazard, Kentucky.

• *Future Corridor and Route Alignments*

In this planning study, the analysis of alternate corridors has focused upon a series of 2,000-foot wide corridors within which future alignment alternatives might be developed. Having identified the N-4 corridor as the recommended alternative, future environmental studies and design efforts will focus upon alignment options that are principally focused within this corridor. However, this 2,000-foot corridor is not intended to serve as a boundary that would restrict the consideration of alignment options that might pass outside of this corridor. In the case of the N-4 Alternative, there are several locations where such adjustments might prove to be beneficial in minimizing environmental impacts or reducing construction costs.

For instance, once a more definitive location for the I-66/I-75 interchange is established, the highway alignments to connect to this facility might pass slightly outside of the current N-4 corridor. North of Somerset, new residential development is occurring that may require the consideration of alignment variations that pass outside of the current corridor.

Passing between Somerset and London, many have suggested the consideration of options to utilize portions of the KY 80 corridor. While the sole use of this corridor may be prohibitive from many standpoints, a more detailed analysis of design options might identify segments of KY 80 that could be successfully used for the purpose of I-66. Finally, environmental concerns have been raised over the number of times the N-4 corridor crosses Sinking Creek, which is home to habitats of threatened and endangered species downstream of these crossings. Efforts to develop alignment alternatives to reduce the number of crossings of this creek may help to eliminate or minimize the threat to sensitive species within this area.

B. RECOMMENDED CORRIDOR EVALUATION

This section provides an evaluation of the recommended corridor based on the criteria discussed in Chapter 4. The recommended corridor is evaluated in three basic categories: traffic and socioeconomic analyses, environmental issues, and engineering and construction cost analyses.

1. Traffic and Socioeconomics

The following paragraphs provide an analysis of several traffic and socioeconomic issues related to travel benefits, and social and economic considerations.

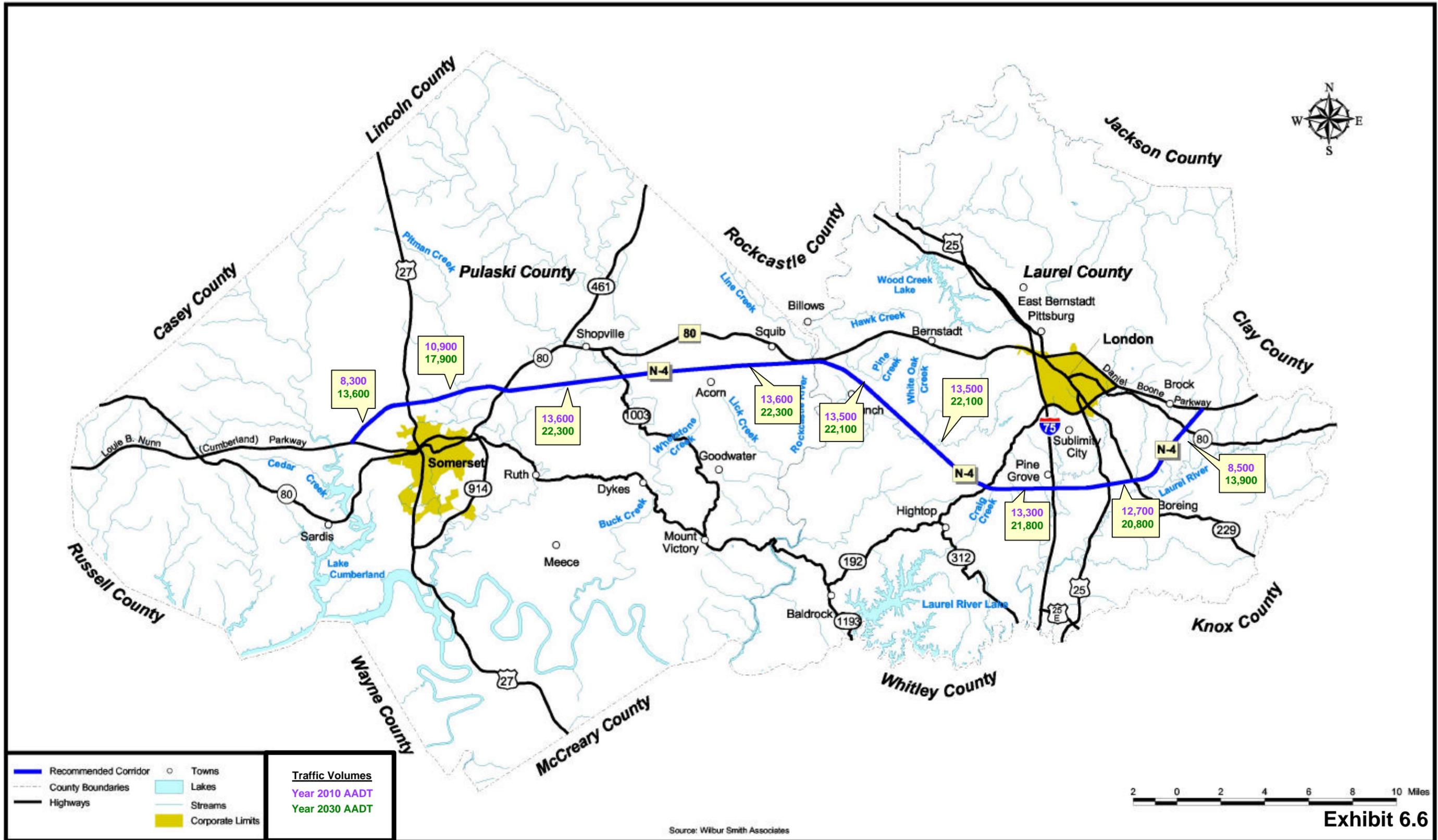
• *Travel Benefits*

Projected traffic volumes were derived for the recommended corridor for the years 2010 and 2030. As shown in **Table 6.2**, the weighted (based on segment length) average annual daily traffic (AADT) along the recommended corridor is expected to reach 19,900 vpd by the year 2030. **Exhibit 6.6** graphically displays the volumes for the projected years.

Time and distance savings can be approximated by comparing travel to and from the same terminus points for the recommended corridor and KY 80. As shown in Table 6.2, about 10.5 minutes are expected to be saved with the recommended corridor, typical time savings for the north corridors. Likewise, about 3.1 miles in distance savings are anticipated for the recommended corridor.

Table 6.2 Traffic and Socioeconomic Issues

Criteria	Evaluation
Travel Benefits	
Year 2030 Volume (vehicles per day)	19,900
Time Savings (M:S)	10:26
Distance Savings (miles)	3.056
VMT Served (vehicle-miles)	932,000
VHT Saved (vehicle-hours)	3,470
Accident Reductions by Year 2030 (accidents)	480
Social and Economic Issues	
Recreational Proximity (miles)	31.8
Industrial Serviceability (miles)	5.7
Environmental Justice (% fewer than regional average)	29



Recommended Corridor Traffic Volumes

The ‘Daily VMT Served’ provides a measure of the vehicle -miles traveled along the recommended corridor, while the ‘Daily VHT Saved’ measures the number of vehicle-hours saved by the use of the corridor. The recommended corridor is expected to serve about 932,000 vehicle-miles and save about 3,500 vehicle-hours by the Year 2030.

An analysis of the recommended corridor segments was completed to determine the potential annual accident reduction based on the daily vehicle-miles traveled. As shown in Table 6.2, the expected number of annual accidents is expected to be reduced by 480 by the Year 2030.

- *Social and Economic Issues*

Proximity to local recreational facilities was estimated for the recommended corridor. For the purposes of this report, recreational proximity is defined as the average distance from the nearest proposed interchange along the recommended corridor to 116 recreational facilities in the two study counties and ten surrounding counties. As shown in Table 6.2, the recommended corridor, like the other north alternates, is situated farther from recreational facilities, resulting in an average distance of about 31.8 miles.

Similar to the measurement for recreational facilities, industrial serviceability is measured by determining the average distance from the recommended corridor to 203 industrial facilities in the study area. Similar to the other north alternates, the recommended corridor has an average distance to industrial facilities of approximately 5.7 miles.

For this study, environmental justice is estimated by calculating the percentage of minority, elderly and low-income persons along the recommended corridor. Values above zero indicate a corridor is more favorable than the regional average, potentially causing fewer negative impacts to these population groups. As shown in Table 6.2, the recommended corridor has fewer environmental justice concerns than the region, containing about 29% fewer minority, elderly and low-income persons.

2. Environmental Issues

An environmental overview of the recommended corridor alternate was completed using GIS databases, other technical resources available in-house, and various agency and private resources, as discussed in Chapter 4. This overview is intended to provide KYTC officials with knowledge of potential environmental issues that can be reasonably identified at a corridor planning level. The following paragraphs identify ‘potential’ issues with in buffer zones of either 500 or 2,000 feet in width, along the recommended corridor. Environmental issues considered for this study include cultural and historic features, native species, natural areas, and other issues. These are summarized in **Table 6.3**.

- *Cultural and Historic Features (within a 2,000-foot corridor)*

A total of 26 known archaeological sites are located within the recommended corridor, about the same number reported for most of the north alternates studied. It is important to note that the number of known sites is often only a reflection of the amount of cultural resource survey that has been conducted within the area. There is also one known historic structure within the corridor, but it is not eligible for the National Register of Historic Places. Compared to the study corridors, the recommended corridor contains a similar number of cemeteries and churches, or 6 and 9, respectively. This does not necessarily mean that 6 cemeteries and 9 churches would be impacted by the recommended corridor. It is only an indication of the

number that fall within a 2,000-foot buffer zone. A total of 2 schools are contained within the corridor, similar to other study alternates.

- *Native Species (within a 2,000-foot corridor)*

The data summarized in this analysis represent known occurrences of species within the defined corridors and are not necessarily an indication of the impacts that may be caused by a future corridor. As shown in Table 6.3, a total of 2 threatened and endangered species are known to be located within the recommended corridor. This number is similar to the number of species located within the other north study corridors and considerably lower than those known to be near the middle corridor and most of the south alternates. A total of 1 potential threatened and endangered species is located within the recommended corridor.

- *Natural Areas (within a 500-foot corridor)*

Natural areas encompass a broad range of features within the study area, including National Forest property, geologic and cave features, cliff lines, streams, wetlands, lakes and rivers. The recommended corridor contains approximately 390 acres of property owned by the Daniel Boone National Forest, the same amount of property contained by the south study corridors.

As shown in Chapter 4, the KY 80, N-2 and N-3 corridors would likely have the least degree of impact to the forest. However, study alternates such as N-1 and N-4 pass along areas within the National Forest that have been impacted by previous surface mining activities. Although not as desirable as KY 80, N-2 and N-1, the recommended corridor will have less impact on the forest than the south and middle alternatives.

A review of the geology of the region indicates a diversity of formations and features that present planning and design challenges. As shown by the National Speleological Society’s data in Chapter 4, the north alternates, and therefore the recommended corridor, would likely have the least adverse impact on the active karst and cave systems in the area. Still, addressing these structural and drainage impacts will be an important part of the forthcoming NEPA investigations.

Table 6.3 Environmental Issues

Environmental Feature	Number of Occurrences
Cultural and Historic Sites	
Archaeology Sites	26
Historic Structures	1
Cemeteries	6
Churches	9
Schools	4
Native Species	
Threatened and Endangered Species	2
Potential Threatened and Endangered Species	1
Natural Areas	
DBNF Property (acres)	390
Cliff Lines (feet)	35,860
Stream Crossings	53
Wetland Sites (acres)	90
Wild River Crossing	1
Other Issues	
Oil and Gas Wells	23
Hazardous Sites	0

Cliff lines are prevalent throughout the project area and, dependent upon the terrain and geology, represent areas where rock overhangs or ridges form. As shown in Table 6.3, a total of 35,860 feet of cliff lines may be crossed by a highway developed within the recommended corridor. This figure is low for the study corridors.

Area water resources, including streams, wetlands and river systems were also considered for this analysis. The recommended corridor crosses a total of 53 blue-line streams, and contains approximately 90 acres of wetland areas. The corridor also crosses the Rockcastle River, one of nine rivers in Kentucky that is designated as part of the Wild River System.

- Other Issues (within a 2,000-foot corridor)

Based on available data, the recommended corridor also includes a total of 23 known oil and gas wells and no hazardous sites (landfills, hazardous waste sites, underground storage tanks, Superfund sites, Superfund No Further Action sites, etc.).

3. Estimated Construction Costs

Using the unit costs identified for this project's geometric criteria, total project costs were estimated for the recommended corridor. Cost components calculated for each segment of the route include design, right-of-way, utilities, bridges, interchanges, rest areas and construction activities. As shown in **Table 6.4**, total estimated costs for the recommended corridor are approximately \$949 million. Corridor segments are defined in the following section, and are intended to permit the segmental construction of the corridor. The cost estimate for the recommended corridor is fairly average when compared to the other north alternates, and it is lower than the costs estimated for the KY 80 corridor options.

Table 6.4 Recommended Corridor Cost Estimates

Segment	Length (miles)	Cost Items (million \$) ¹					Total Cost (million \$) ¹	
		Const- ruction	Bridges ²	Inter- changes ³	Design	Right-of- Way and Utilities	Project	Per Mile
1	7.7	77.2	25.5	39.6	21.0	46.4	209.7	
2	13.3	131.8	18.0	13.2	24.4	56.9	244.3	
3	2.0	19.9	11.9	4.0	5.1	9.9	50.8	
4	11.8	117.5	8.8	38.2	25.0	60.4	249.9	
5	8.4	83.3	22.0	26.4	19.5	43.5	194.7	
Total	43.2	429.7	86.2	121.4	95.0	217.1	949.4	22.0

¹ Items have been rounded.

² Includes overpasses and railroad structures.

³ Includes one rest area per alternate.

C. PRIORITY SEGMENTS AND IMPLEMENTATION

1. Project Priorities

In order to begin the consideration of priority segments of the proposed I-66 corridor, the recommended alternate was divided into five basic sections. The section endpoints were chosen to represent logical termini for segments during the planning, funding, design and construction processes. It is important to note that the segments do not represent the recommended phasing order for the corridor – they are only intended for identification purposes. Identified segments of the recommended corridor include:

- Segment 1: Somerset Northern Bypass, Louie B. Nunn (Cumberland) Parkway to KY 80
- Segment 2: KY 80 to the western approaches of the Rockcastle River Bridge
- Segment 3: Rockcastle River Bridge and approaches
- Segment 4: Eastern approach to the Rockcastle River Bridge to I-75
- Segment 5: London Bypass, I-75 to the Daniel Boone Parkway

In order to continue existing Somerset Bypass efforts and provide a complete bypass facility, Segment 1 is recommended to be the first priority for the I-66 project. Segment 5, the London Bypass, is situated in an area with on-going development activities. In order to acquire contiguous right-of-way for the design and construction of this portion of the route, Segment 5 is recommended to be the second priority. This section will also become more critical as traffic and safety concerns continue to increase along existing facilities on the north side of London.

Throughout the course of this project, consideration has been given to the eastward construction of the I-66 corridor in the study counties, from Somerset to London. Existing traffic volumes along KY 80 are slightly higher along the western end of the route, potentially leading to these priority assumptions. However, it is important to consider that the facility will not be continuous without the completion of Segment 4, from the Rockcastle River's eastern approach to I-75. Also, traffic model projections indicate that volumes between Somerset and the Rockcastle River will be largely dependent upon the routing of the corridor between the River and London. Until Segment 4 is completed, the amount of new traffic drawn to the corridor is expected to be limited. Therefore, it is recommended that Segment 4 be the third priority, followed by Segment 3 and Segment 2, respectively. In this way, linkages will be created to maximize the use of this facility.

These recommended project segments are illustrated in **Exhibit 6.7** and are listed below by priority:

- Priority 1: Somerset Northern Bypass, Louie B. Nunn (Cumberland) Parkway to KY 80
- Priority 2: London Bypass, I-75 to the Daniel Boone Parkway
- Priority 3: Eastern approach to the Rockcastle River Bridge to I-75
- Priority 4: Rockcastle River Bridge and approaches
- Priority 5: KY 80 to the western approaches of the Rockcastle River Bridge

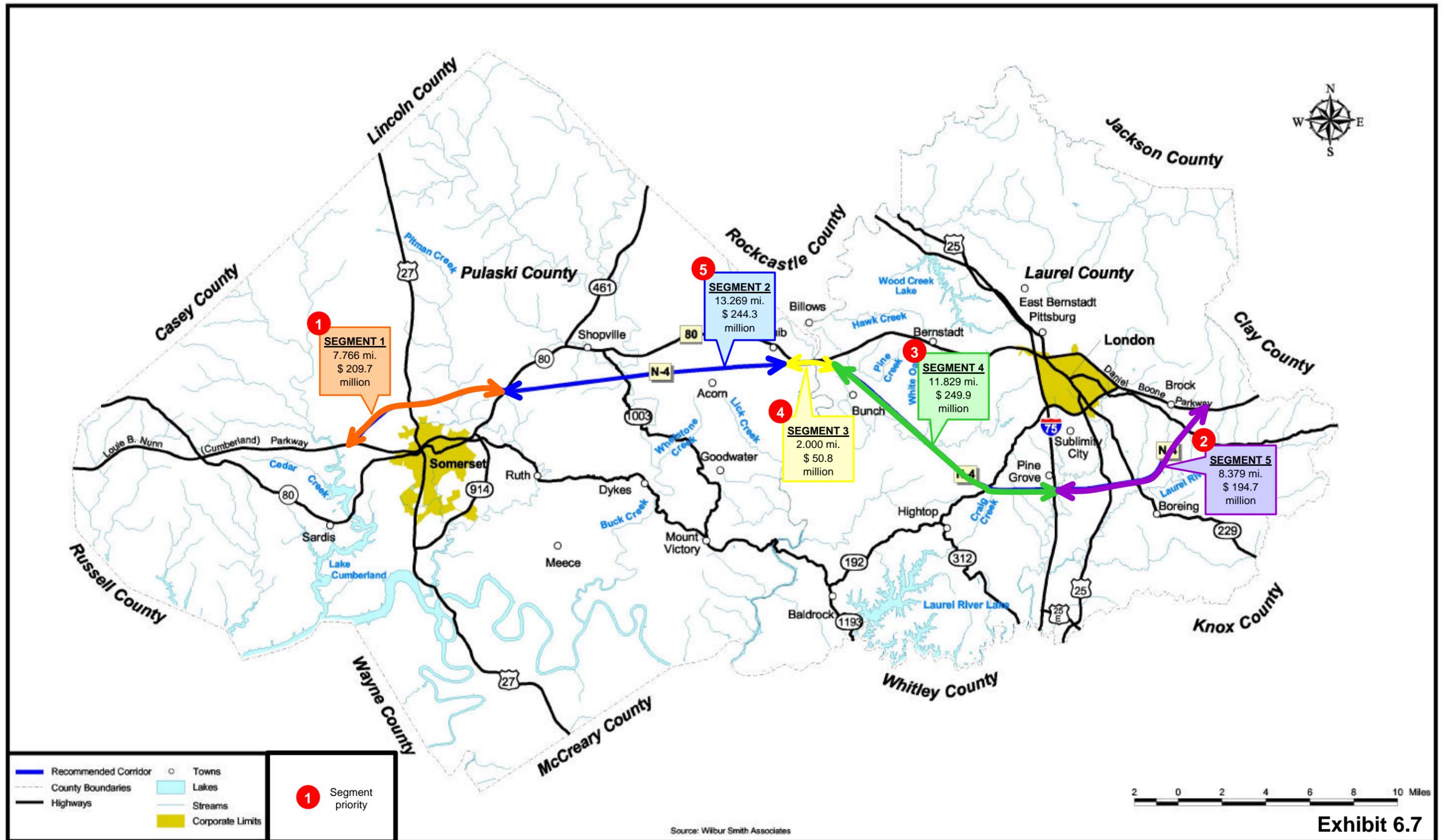


Exhibit 6.7
Recommended Segment Priorities

2. Funding Issues

The Statewide Transportation Plan (STP) identifies programmed and planned short-term and long-term improvements over a twenty-year period. Programmed short-term improvements are those projects that have been specifically defined and have some commitment of funding. The KYTC Six Year Highway Plan (2001-2006) comprises the short-term component of the STP. Programmed short-term funding also exists for further design and development of the I-66 corridor within Pulaski and Laurel counties.

Long-term improvements are those improvements that have been identified as needed but which do not have a commitment of funding. These improvements are contained in the STP as part of the 1999 Long-Range Highway Plan. The Long-Range Plan comprises the years 7 through 20 of the Statewide Transportation Plan. Several long-range improvements are identified for the I-66 corridor within Laurel and Pulaski counties, as well as other counties statewide, as "illustrative" projects. Illustrative highway projects are a special category of needed highway system improvements that are unlikely to move forward until and unless project-specific funding is identified at the federal level. Approximately \$2.6 billion of projects involving I-66 segments within Pulaski and Laurel counties are identified.

Costs for the I-66 project are expected to be expensive and special funding sources will be required through the federal government. Approximately \$25 million in dedicated funding has been contributed to the project. It is possible that Federal funds for interstate improvements could also be set aside and used for I-66. A predetermined, yearly funding structure could possibly be made part of a budget plan and amortized over time to achieve the necessary funding for all of the priority segments.