

I. PROJECT INTRODUCTION

The Kentucky Transportation Cabinet (KYTC) has undertaken a strategic corridor planning study for a portion of a proposed interstate route, Interstate 69 (I-69), which is proposed to travel from Indiana through Kentucky and into Tennessee. As shown in **Figure 1-1** the project corridor travels the Purchase Parkway north from the Tennessee state border to the I-24 interchange, and then travels east along I-24 to west of the Wendell H. Ford (Western Kentucky) Parkway. The corridor travels through Fulton, Hickman, Graves, Marshall, Livingston and Lyon Counties.

Project Purpose and Need

The primary purposes of the strategic corridor study are to review the existing conditions along the Purchase Parkway and I-24 to identify locations that may not meet American Association of State Highway Transportation Officials (AASHTO) highway design guidelines, evaluate the degree to which these guidelines are not met, identify options for making improvements to address identified deficiencies, and make recommendations regarding suitability of routing I-69 along the Purchase Parkway and I-24.

This planning-level analysis utilized As-built construction plans provided by KYTC, the KYTC Highway Information System (HIS) database, and field reviews to collect roadway geometry and highway operations. National I-69 studies undertaken for the Federal Highway Administration (FHWA) were also reviewed for information on a national level.

This study addresses the need and justification of upgrades to the Purchase Parkway to achieve interstate highway design guidelines. The study includes an Environmental Overview and an Environmental Justice Review (**Appendix A**) to evaluate associated environmental factors, social/economic conditions of the project area. Comments and suggestions from a local/elected officials meeting are included in **Appendix B**. **Appendix C** includes minutes and material from a public meeting held November 15, 2005. A Geotechnical Overview of the Purchase Parkway was conducted to summarize the existing geotechnical conditions along the project corridor and is included in **Appendix D**.

A. Background of I-69 Corridor

The federal Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 identified the I-69 (Corridor 18) as a Priority Corridor. The results from a 1995 Federal Highway Administration *Corridor 18 Feasibility Study* concluded that the future construction of I-69 from Canada to Mexico was economically feasible. The I-69 corridor begins at Port Huron, Michigan, and the Canadian border; passes through Michigan, Indiana, Kentucky, Tennessee, Mississippi, Arkansas, Louisiana, and Texas; and terminates at the Lower Rio Grande Valley and Mexican border.

The *Corridor 18 Special Issues Study* completed in 1997 identified a Representative Corridor which best serves the purposes of Corridor 18 and yields the most benefits relative to facility costs. This study also identified Segments of Independent Utility (SIU) that would allow completion of the I-69 corridor in segments that could function independently on a reasonable basis. In Kentucky, the Representative SIU segments were defined as follows:

- SIU 4
 - I-64/I-164 north of Evansville to the Edward T. Breathitt (Pennyrile) Parkway at Henderson, Kentucky;
- SIU 5
 - The Edward T. Breathitt (Pennyrile) Parkway from Henderson, Kentucky to the interchange with Wendell H. Ford (Western Kentucky) Parkway;
 - The Ford Parkway to the interchange with I-24;
- SIU 6
 - I-24 at Ford Parkway to the interchange with the Julian M. Carroll (Purchase) Parkway;
 - The Purchase Parkway to the Tennessee state line.



Figure 1-1 Study Area, Fulton to Eddyville, KY

The initial national goals for this project included enhancing the movement of goods, creating greater employment opportunities, and improving system linkage. Because of these goals one of the primary justifications for the I-69 route is increased freight transport along the corridor between Canada and Mexico. The I-69 corridor has been designated by Congress as a “North America trade route”.

In Kentucky these national goals are consistent with the regional and local goals of providing improved mobility and serving local connectivity needs. Utilizing the existing Parkway system for I-69 meets the national and local goals.

SIU 4 in Kentucky crosses the Ohio River at Henderson connecting SIU 5 in Kentucky and SIU 3 in Indiana.

A strategic corridor planning study for SIU 5 has been completed and KYTC is currently developing strategies for implementation. With completion of this study, recommendations for needed improvements in SIU 6 will be developed and presented.

B. Highway Segments – SIU 6

The segments of SIU 6 include the Purchase Parkway and I-24. Since I-24 is currently in the interstate system, analysis for this study is of a cursory nature. Thus I-24 was only evaluated in bridge vertical clearances, traffic operations, and crash history. A more thorough evaluation of the Purchase Parkway was conducted and compared to the current interstate standards.

A more descriptive summary of the I-69 corridor along the Purchase Parkway and I-24 follows:

The Purchase Parkway begins at the city of Fulton at the Tennessee state line (MP 0.0) and runs north through the cities of Mayfield and Benton before intersecting with I-24 (MP 51.398) near Calvert City.

The segment of I-24 within the I-69 corridor runs from the interchange with the Purchase Parkway (MP 24.941) to just west of the interchange with the Wendell H. Ford Parkway (MP 41.25).

The following chart summary illustrates the I-69 corridor by county.

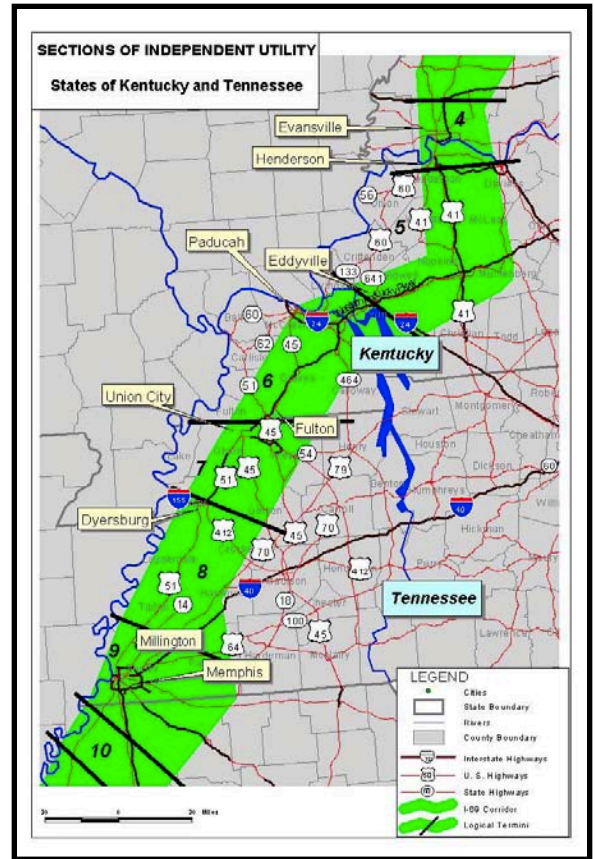


Figure 1-2 Interstate 69 Representative Corridor Sections of Independent Utility

ROUTE	COUNTY	BEGIN MP	END MP	TOTAL MILEAGE
PURCHASE PARKWAY	Fulton	0	3.43	3.43
	Hickman	3.43	8.35	4.92
	Graves	8.35	34.49	26.14
	Marshall	34.49	51.40	16.91
Total				51.40
I-24	Marshall	24.94	29.35	4.41
	Livingston	29.35	33.88	4.53
	Lyon	33.88	41.25	7.37
Total				16.31
TOTAL PROJECT				67.71

Table 1-1 I-69 Corridor Mileage

C. Analysis Considerations

The Purchase Parkway was evaluated based on the current KYTC and FHWA design standards and guidelines. Applicable references are listed below:

- “A Policy on Geometric Design of Highways and Streets, 4th Edition” (American Association of State Highway Officials, Current Edition)
- “AASHTO Roadside Design Guide” (American Association of State Highway Officials, Current Edition)
- “Highway Capacity Manual” (Transportation Research Board, Current Edition)
- “Manual of Uniform Traffic Control Devices, Millennium Edition” (Institute of Transportation Engineers, Current Edition)
- “A Policy on Design Standards Interstate System” (American Association of State Highway Officials, Current Edition).
- Kentucky Transportation Cabinet Highway Design Manual (KYTC, Current Edition)

The existing conditions of the Purchase Parkway were established by utilizing as-built plans provided by KYTC, the HIS database, and CRASH database. This information was analyzed based on the reference list above to determine the extent to which it meets the current design guidelines. The analysis also includes determining whether the Purchase Parkway currently satisfies the safety and operational concerns that might be expected from converting the parkway into an interstate highway. The rural and urban sections of the Purchase Parkway were compared to interstate criteria. The rural sections of the Purchase Parkway traverses from Kentucky-Tennessee state line (MP 0.0) to MP 21.3 south of Exit 21 (US 45) and from north of Exit 25 (US 45) at MP 25.1 to the I-24 interchange (MP 51.4). The section of the Purchase Parkway that traverses through the city of Mayfield is commonly known as the Mayfield Bypass and was compared to the urban interstate criteria.

The following report is structured based on key factors in determining applicable design guideline compliance of the Purchase Parkway. A summary of these key factors are described below.

- **Chapter 2: Early Coordination and Public Involvement**
- **Chapter 3: Operational Considerations** - An analysis of operational factors including crash history, traffic volumes, and operational levels of service for existing and future traffic conditions.
- **Chapter 4: Mainline Geometry and Typical Section** – A discussion and evaluation of the existing corridor on the following topics: Mainline geometric issues, design speed,

median widths, clear zones, horizontal and vertical alignments, superelevation rates, and sight distances.

- **Chapter 5: Bridges and Overpasses** - An evaluation of the existing bridges and overpasses based on lateral and vertical clearance.
- **Chapter 6: Interchanges and Ramps** – A summary of interchange and ramp conditions and a comparison of those conditions with AASHTO guidelines for design speed, typical sections, alignment geometry, speed-change lanes, and weaving situations.
- **Chapter 7: Key Findings of Existing Conditions Overview** – An overview of the identified deficiencies in the project corridor.
- **Chapter 8: Potential Improvement Alternatives and Development Costs** – An overview of a range of alternatives under consideration for development of the I-69 corridor.
- **Chapter 9: Recommendations** – Recommendations based on the Strategic Corridor Planning Study and future analysis necessary to provide direction for design decisions for the corridor.

D. Design Exceptions and Variances

The FHWA has identified thirteen design features that are important to the operational and safety performance of a highway. These controlling design features compiled are commonly known as the *13 controlling criteria*. A formal written design exception is required when any of the 13 criteria are not met on the National Highway System (NHS). The Interstate System is part of the NHS. The *13 controlling criteria* are listed below. These design features are evaluated in this report and are evaluated for compliance. Design features that deviate from common practice but are not included in the *13 controlling criteria* will be termed design variance. There are two categories for design variances. A design variance is a design feature that (1) varies from the current AASHTO criteria but not part of the *13 controlling criteria* or (2) a design feature that varies from common practice but not part of the *13 controlling criteria*.

1. Design speed
2. Lane width
3. Shoulder width
4. Bridge width
5. Horizontal alignment
6. Superelevation
7. Vertical alignment
8. Grade
9. Stopping sight distance
10. Cross slope
11. Vertical clearance
12. Lateral offset to obstruction
13. Structural capacity