

CONTEXT-SENSITIVE DESIGN CASE STUDY NO. 1

Paris Pike - Kentucky

LOCATION:

Paris Pike (US 27/US 68 between Lexington and Paris - Kentucky)

PROJECT DESCRIPTION:

Paris Pike is a US urban/rural primary route between the northern limits of Lexington and the southern limits of Paris. The project involved reconstruction of an existing two-lane road into a four-lane over a distance of approximately 13.5 miles. The route served commuters as well as through travelers on a segment officially designated as a scenic route. There were four construction sections included in the project as shown below:

Section 1
(Paris) Length: 0.75 miles
 Letting: 12-13-97
 Work Start: 4-17-97
 Work Complete: 8-3-00
 Contractor: Hinkle Contracting
 Amount: \$4,541, 555

Section 2
(Houston Creek) Length: 3.2 miles
 Letting: 12-18-98
 Work Start: 2-18-99
 Work Complete: 5-14-01
 Contractor: Hinkle Contracting
 Amount: \$13,988,659

Section 3
(Hutchinson) Length: 4.1 miles
 Letting: 3-31-00
 Work Start: 5-22-00
 Work Complete: Spring 2002
 Contractor: Hinkle Contracting
 Amount: \$17,495,523

Section 4
(Fayette County) Length: 5.6 miles
 Letting: 8-24-01
 Work Start: 10-1-01
 Work Complete: Fall 2003
 Contractor: Central Rock
 Amount: \$33,899,753

PURPOSE AND NEED STATEMENT

The purpose of this project is to improve a 13-mile section of US 27/68 between Lexington and Paris, Kentucky. The need for this improvement is based on Paris Pike's importance in the regional transportation system, i.e. its system linkage, its lack of sufficient capacity to adequately serve not only projected travel but also existing traffic demands, inadequate existing roadway geometrics and design features, safety considerations, and social

demands.

CONTEXT-SENSITIVE FACTORS

A wide range of sensitive issues were addressed as part of the construction, impacting both the natural and human environments. Context-sensitive design and construction issues which were implemented as part of the Paris Pike project included the following:

- Silt loam topsoil, which was critical to the central Kentucky horse farm industry, was stripped, stockpiled and returned to the original thickness after grade and drain work was completed.
- Roadway alignment was selected to avoid and minimize impacts to historical properties and structures. Dry-stone walls were prominent along the corridor and approximately three miles of walls were dismantled and reconstructed or newly constructed. Historic signature entrances to horse farms were avoided where practical and where impacted, new entrances were built to match the original entrances as part of the contract cost.
- Timber guardrail was used for aesthetics, with steel backing for structural integrity.
- Stone facade matching indigenous stone outcrops was applied to concrete bridge structures.
- Extensive landscaping with local plant species was included. Roadway alignment and median widths were selected to minimize impact to matriarchal trees. Extensive tree protection was maintained to prevent root zone damage to mature trees. Utility easement modifications were coordinated to lessen impact on trees. An endangered species, Running Buffalo Clover, was transplanted to a fence-protected easement purchased specifically for this purpose.
- Grass shoulders along the roadway were selected and designed/constructed as functional and aesthetic features of the roadway.
- Water channel changes were combined to minimize and control erosion.
- Archeological site investigations were performed at Monterey and McConnel Station.

HISTORY OF PROJECT

Paris Pike has been designated as a historic scenic corridor marking an early Kentucky trail that connected Maysville, Kentucky on the Ohio River to Lexington, Kentucky. Native Americans first used this route to follow herds of grazing buffalo. Later, the route was used by early settlers of central Kentucky. Paris Pike was one of the first roads built west of the Allegheny Mountains.

In recent years Paris Pike became recognized for its safety and capacity problems. Although the overall accident rate was not greater than the average for all two-lane roads, the fatal accident rate was significantly higher. Factors which contributed to the high fatal accident rate were relatively narrow lane widths, lack of adequate shoulders, inadequate clear zones, steep ditches and side slopes, insufficient passing sight distances, fixed objects along the roadside, and various scenic distractions.

HIGHWAY AGENCY INVOLVEMENT

The Kentucky Transportation Cabinet had significant involvement beginning with the preliminary planning studies that were initiated in 1966 to identify safety and traffic operations improvements. Their involvement continued throughout the project and was critical to the evolution of events and eventual progress that occurred on the project.

RESOURCE AGENCIES INVOLVEMENT

Several resource agencies were involved in the project from the beginning stages. Included were the following agencies:

Federal Highway Administration
State Historic Preservation Officer
Bluegrass Trust for Historic Preservation
Land and Nature Trust of the Bluegrass
Kentucky Department of Natural Resources

COMMUNITY INVOLVEMENT

There was direct community involvement in the early stages of the project, specifically landowners adjacent to the existing alignment of US 27/US 68. Through the coalition of affected landowners and other indirectly affected citizens, a civil lawsuit was filed in the Federal District Court resulting in issuance of an injunction, which halted progress on the project prior to the completion of right-of-way acquisition. This court injunction was in place for 14 years from 1977 to 1991. Significant events in the acceptance of the project by the public were the “hayride tours” which permitted landowners and other interested parties to see firsthand the proposed corridor and understand the project plans. As part of the resolution to end the injunction, the Paris-Lexington Road Project Advisory Task Force was formed to direct the project. The Advisory Task Force was composed of representatives from the following agencies or special interest groups:

- Kentucky Transportation Cabinet
- Federal Highway Administration
- State Historic Preservation Officer
- Lexington-Fayette Urban County Government
- Land and Nature Trust of the Bluegrass
- The Bluegrass Trust for Historic Preservation
- Lexington Directions
- Bourbon County Magistrate
- Citizen representative
- Landscape Architect
- Civil Engineer

The role of the Advisory Task Force was to guide the project development and management through the stages of design and construction with minimal impacts to the historic and scenic resources unique to the Paris Pike corridor.

NATURAL ENVIRONMENT ISSUES

There were several issues related to the natural environment that warranted special attention. Following is a summary of the most prominent issues addressed.

- Running Buffalo Clover was identified within the project corridor and was successfully replanted in a protected area on a farm along the corridor.
- Unavoidable impacts to a wetland on the Hutchinson Segment is being

mitigated on a 5.5 acre site where a prior converted wetland at Peaks Mill in an adjacent county is being restored.

- Savannah Remnants and other trees along the corridor have been avoided, incorporated into the median, and protected by guardrail to the maximum extent possible throughout the project.
- The original topsoil, Marnie silt loam, was stripped, stockpiled and returned to the original thickness and ground contours to insure preservation of this irreplaceable natural resource unique to the central Kentucky horse farms.

HUMAN ENVIRONMENT ISSUES

Historic District

The Paris Pike Historic District was evaluated professionally to document and insure minimal impacts to the buildings and structures. Those adversely affected buildings and structures were documented to the Historic American Building Survey and the Historic American Engineering Record. Existing and as-built landscapes were documented, in addition to before and after video driving tour recordings.

Approximately three miles of dry-laid stone fences have been either rebuilt or built new to retain the character of the existing road. Fence styles were customized to each individual property owner's original fence. The Transportation Cabinet also sponsored certification training through the Dry-Stone Conservancy to bring stone masons from Scotland to Kentucky as the trainers.

A landscape architecture firm was contracted with to participate on the design team. The project was designed to blend with the landscape, preserve mature trees, avoid impacts to the historic district and minimize impacts to the existing stone fences. Manufactured stone veneer was used on concrete retaining walls, bridge abutments, and bridge rails. Steel-backed timber-faced guardrail was used in the rural sections of the project in Bourbon County, and rusticated steel guardrail was used in Fayette County. In addition, extensive landscaping was used to retain the parkway-type aesthetics of the roadway corridor.

The Wright House, a historic structure on the Paris end of the project, was purchased with plans to renovate and donate to Lexington-Fayette County as a multi-use facility by the public.

Archaeology

Archaeological investigations along the Paris Pike identified several prehistoric and historic sites. Included were the following:

- The community of Monterey where European Americans lived side by side with both free and enslaved African Americans
- The structure at McConnel's Station, an early 1800's house where early settlers of Lexington lived and entertained.
- The residence at Clovelly Farm which was occupied from about 1850 - 1900 and contained a range of artifacts from that time period.

Public Education

Exhibits and kiosk-type displays will be developed at each end of the project after construction is completed. One exhibit will focus on the thoroughbred horse industry with

specific attention to the horse farms in Fayette County. At the previously mentioned Wright House, exhibits will be devoted to the history and archaeology of the pike between Lexington and Paris. A driving tour brochure will also be developed which identifies and explains interesting features along the route.

Public Involvement

Extensive public involvement was utilized to seek input and guide the project during the various stages of project development. The Advisory Task Force played a significant role in the interaction and involvement of the public.

SCHEDULE OF ACTIVITIES

Following is a time-line of significant events in the Paris Pike project development process:

- 1966 - Kentucky Transportation Cabinet (KYTC) initiated a planning study to identify safety and traffic operations improvements
- 1973 - KYTC submitted and Federal Highway Administration (FHWA) approved Environmental Impact Statement (EIS)
- 1975 - KYTC held first public hearing
- 1975 - KYTC commissioned a special historic study
- 1976 - KYTC commissioned a design study
- 1977 - KYTC reinitiated right-of-way acquisition
- 1978 - Civil suit filed on behalf of citizens' group in Federal District Court
- 1978 - Injunction issued by Federal District Court
- 1980 - Project cancelled by KYTC
- 1986 - Public hearing held by KYTC in Paris
- 1987 - Traffic Safety Memorandum approved
- 1988 - Supplemental EIS submitted by KYTC
- 1991 - FHWA executed Section 106 of Memorandum of Agreement and approved the FSEIS and 4(f) Statement
- 1993 - Court injunction was lifted
- 1995 - Participants selected for constructibility review process
- 1996 - First design segment on the Paris end of project was completed
- 2001 - Final three design segments were combined into one construction contract

PROJECT OUTCOME AND LESSONS LEARNED

Key attributes of the Paris Pike project were summarized to provide insight into the performance results and how these results differ from other highway projects where the concepts of context-sensitive design were not implemented. Following is a listing of the most prominent attributes of the project and an assessment of the success achieved.

- A major emphasis of the project was environmental sensitivity to the construction processes used on the project. It appears that significant success

has resulted from the attention given to site and corridor- specific characteristics.

- The Paris Pike project has received statewide and national attention for the management and cooperative processes used to achieve the partnerships necessary to insure success.
- A quality-based prequalification process was used to secure contractors with credentials most suited to the project.
- Contractor involvement in constructibility reviews was a critical component resulting in appropriate attention being given to the design sensitivities delineated in the project documents.
- An outcome of the cooperative partnerships developed was fewer change orders as compared to typical projects.
- The Advisory Task Force was a positive factor in creating a trusting relationship between the public representatives and the project team of Transportation Cabinet representatives and contractors.
- In general, the Paris Pike project was a successful effort involving a wide range of stakeholders in the development and direction of designing and constructing a highway through an esthetic and historic section of central Kentucky.



The cut/fill was minimized to match original ground contours



The roadway was aligned to miss historical properties and structures



A house on the Historic Registry was refurbished as an interpretive center



The roadway was aligned to miss historic mortar-less stone walls



If not, stonewalls were dismantled and rebuilt



Steel-backed timber guardrail was used to provide driver safety while giving strong consideration to aesthetics



A stone facade to match the local indigenous stone outcrops was applied to the bridge structures near Paris



Extensive tree protection zones were established and maintained to prevent root affected zone damage of the existing mature trees



The roadway alignment was adjusted to selectively keep, or replace, specific tree species



Scupper slab erosion control technique was used at the Paris bridge



A water channel change combining multiple water channels performed to allow for a single culvert installation to minimize and control erosion



An endangered species, *running buffalo clover*, was transplanted to a fenced easement track of land, purchased by the DOH solely for this reason



Archeological site investigations were performed at *Monterey*, the first free-black community in Kentucky



The original topsoil, *Marnie* silt loam, was stripped, stockpiled and returned to the original 1 to 1½ foot thickness



Historic signature entrances to the horse farms were avoided by roadway alignment or rebuilt to original form



Utility easement modifications were coordinated to lessen impact on trees and overall aesthetics of the countryside



The Paris to Lexington Road Project – Adapting to the Environment