

Major Corridor Study

Kansas Department of Transportation
Kansas Turnpike Authority

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Connects



Executive Summary

HDR

BRW

METRO

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MRI

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West



KAW CONNECTS EXECUTIVE SUMMARY

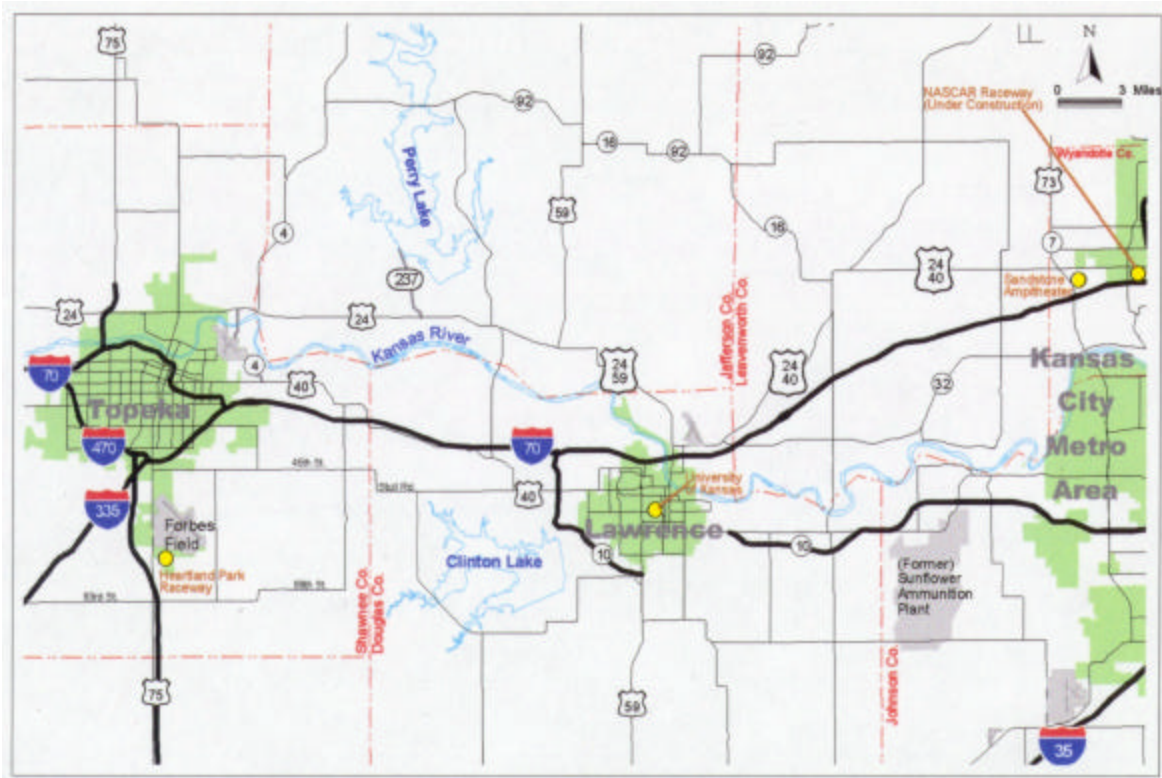
Introduction

The Kansas Department of Transportation (KDOT) and the Kansas Turnpike Authority (KTA) have both recognized the need to plan for the future transportation demands in the region between Topeka and Kansas City. To develop this plan, the two agencies initiated a Major Corridor Study (MCS) to identify and evaluate a wide variety of transportation investment alternatives. The impetus for this joint study was twofold. First, both agencies are keenly aware of significant traffic increases in the study area and the need to provide their customers with adequate transportation facilities now and in the future. Second, any improvements made by one agency will have direct impacts on the other and need to be studied in a comprehensive manner.

Study Area

As shown below, the study encompassed an area of approximately 50 miles by 26 miles and included portions of six counties in northeast Kansas: Johnson, Wyandotte, Leavenworth, Douglas, Jefferson, and Shawnee. Many communities within the study area rely on the existing transportation system for commuting and for goods movement. Major activity centers in the study area include the City of Topeka, City of Lawrence, and the Kansas City metropolitan area. The study area also contains several sizeable recreational areas and special event venues, including Perry Lake, Clinton Lake, Heartland Park Raceway, Sandstone Amphitheater, and the University of Kansas. In addition, a NASCAR speedway is under construction in Wyandotte County, and a "Land of Oz" theme park is being proposed in Johnson County (on the former Sunflower Ammunition Plant site).

Study Area



Kaw Connects

Topeka/Lawrence/Kansas City
Major Corridor Study



Study Process

The purpose of the Major Corridor Study was to provide the Kansas Department of Transportation, the Kansas Turnpike Authority, and the citizens of Kansas with a transportation planning tool that addresses the future travel needs between Topeka and Kansas City. To meet the intended purpose of the study, seven study goals were established; these goals are listed at right.

The study required several significant data-collection efforts. A corridor-wide origin-destination (O-D) study collected license-plate data from 170,000 vehicles at 26 locations throughout the study area. Construction of computerized environmental constraint maps involved encoding 36 layers of geographical data, each covering the 725,000-acre study area. A corridor-wide telephone survey sampled opinions of over 400 road users. The study team collaborated with representatives of six counties and at least 14 cities. Six “open house”-style public meetings were attended by nearly 1,300 people.

The MCS incorporated an evaluation process consisting of two distinct screening activities. An evaluation methodology was developed for both screenings that included public input, engineering, mobility and environmental criteria. The first screening occurred early in the study to eliminate alternatives that did not meet the goals and objectives developed by both public and agency input. The second screening occurred near the end of the project to select the alternatives that would best fit within a preferred strategy for the region. In both screenings, all criteria were given equal consideration in a graded evaluation.

Four study committees (listed below) provided invaluable assistance to the study team both in the technical and policy areas. These committees met at specific milestones during the course of the study to evaluate the findings and provide direction to the study team. The public was presented numerous opportunities to participate via public meetings, presentations, a corridor-wide telephone survey, a web page, a hotline and many traveling displays.

Study Goals	
1	Identify existing mobility issues.
2	Identify current travel patterns.
3	Project future travel demands.
4	Identify future mobility needs.
5	Generate meaningful public and agency involvement.
6	Identify social, environmental, and economic issues that may impact future improvements.
7	Identify & analyze transportation improvement alternatives.

Committee	Membership	Purpose
Steering	KDOT, KTA, FHWA	Guide study development
Advisory	Local elected officials, Agency/coalition representatives, Economic Development representatives, Chamber of Commerce representatives, Other interested individuals	Provide input; Evaluate information provided by Consultant; Report study progress to member agency/group
Technical	City/County/State/MPO Staff	Provide input; Evaluate information provided by Consultant; Report study progress to member agency
Public Involvement Workgroup	Public affairs representatives from KDOT, KTA, MARC, other local agencies	Provide input and guidance to study team regarding public involvement

Once the final screening was conducted, the remaining alternatives were refined and assessed focusing on general corridor locations and estimated costs.



Existing Conditions

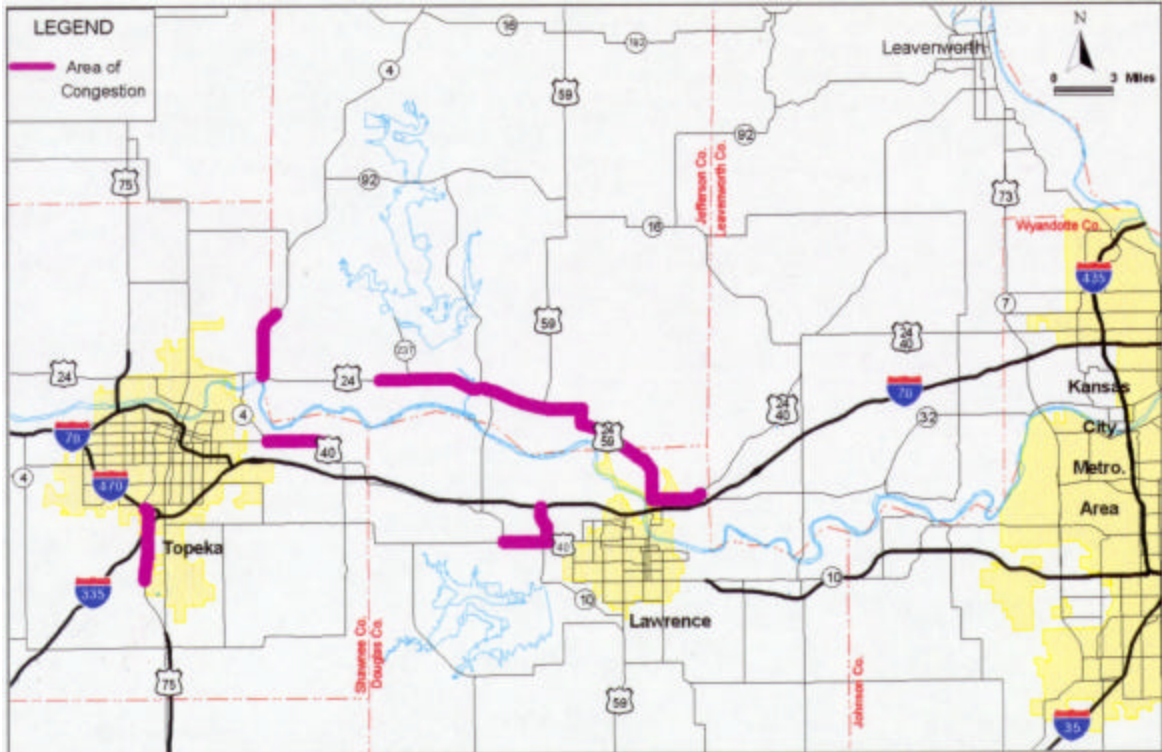
The existing highway system within the study area includes several facility types, ranging from urban interstate freeways to rural two-lane highways. The major east-west facility in the study area is I-70, which runs through Topeka, Lawrence, and Kansas City. In the study area, I-70 is a toll facility (Turnpike) operated and maintained by KTA. Other major east/west facilities include K-10, US-24, US-40, K-32, and 45th Street/Stull Rd. Major north/south routes in the study include US-75, US-59, K-4, and K-7. Public transportation within the study area is provided by several individual bus services. No commuter rail or light rail operations currently exist.

Both KDOT and KTA have experienced steady traffic growth in the study area. KDOT's priority formula has identified needs on several highways, including portions of K-4, US-24, US-40 and US-59. K-10 has also experienced rapid traffic growth. At the same time, KTA has experienced traffic increases on I-70 that are exceeding projections and could result in some segments operating at unacceptable levels of service within the next five years.

In addition to congestion, several other traffic-related issues are also of concern to the general public, including safety, Turnpike access, Kansas River crossings, and the potential effects of new or improved highways.

The map below highlights current areas of congestion within the study area. Congestion was measured using the Level of Service (LOS) concept based on daily traffic volumes, speeds and roadway characteristics; facilities operating at LOS D or worse were considered congested.

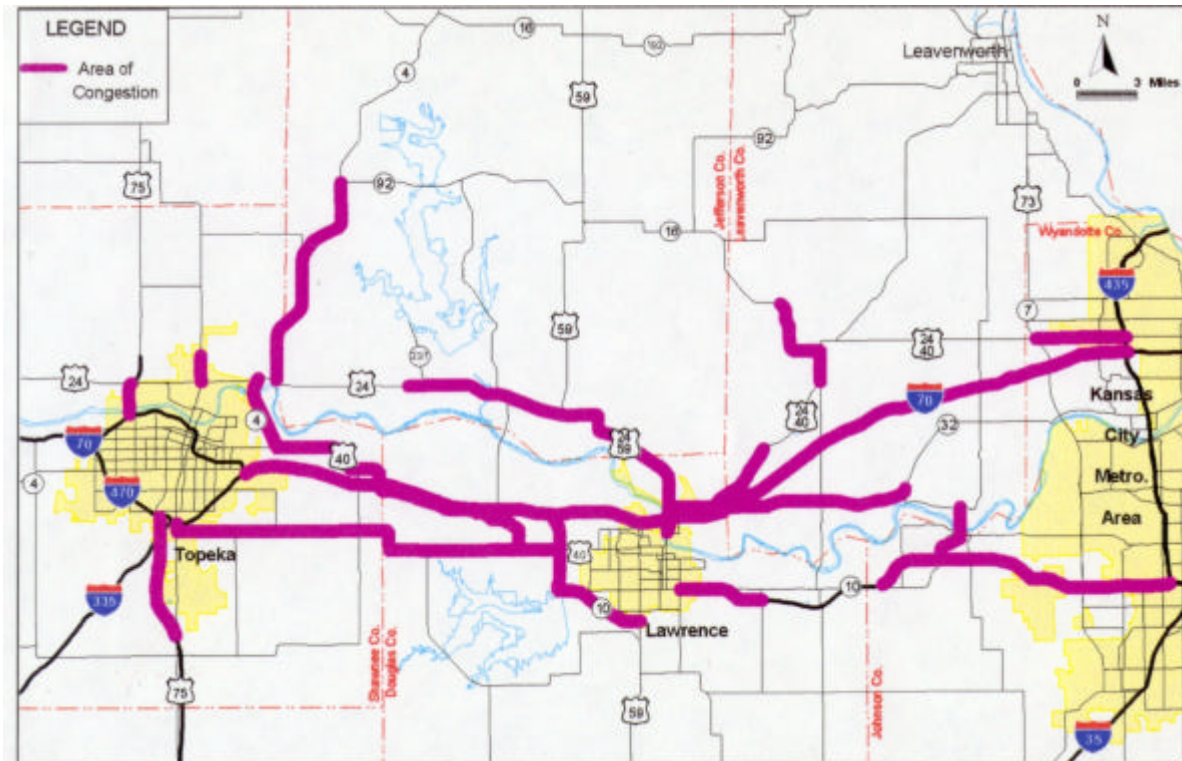
Existing Areas of Congestion



Future (Year 2025) Conditions

The study team developed a computerized transportation demand model to forecast Year 2025 conditions within the study area. The map below illustrates projected congestion in 2025 for the “Existing plus Committed” scenario, in which only currently programmed and funded highway improvements were assumed to be constructed. As the map shows, congestion is forecasted for the majority of the major east-west highways in the study area; in fact, 49 percent of the total study-area lane miles are anticipated to operate at LOS D or worse by 2025.

Year 2025 Areas of Congestion



The traffic model was used to evaluate the alternatives described in the following pages. Over 40 roadway network configurations were tested, each representing a unique combination of potential improvements. The effects of individual alternatives, as well as summary measures for key “packages” of alternatives, were evaluated and compared against each other.

One significant data-gathering component of the traffic modeling, and a general tool for understanding traffic patterns in the study area, was the license-plate Origin-Destination (O-D) study conducted early in the process. Based on observations of over 170,000 vehicles traveling through the study area on a single day, the study team was able to generate key inputs to the traffic model related to the proportion of “through” trips. One of the findings of the O-D study was that the City of Lawrence was a primary origin and destination for trips to and from either end of the study area.

Initial Screening of Alternatives

The study team initially developed 12 broad categories of improvements, ranging from multi-modal enhancements to Intelligent Transportation System (ITS) strategies. Through an initial screening process involving the input of key study committees and the general public, the list of categories was narrowed and refined. The initial screening process involved rating each strategy’s ability to satisfy the five evaluation criteria listed at right.

Below are listed the 12 initial strategies (plus the “No Build” option) and the results of the initial screening. Highway-related alternatives and the “No Build” option were retained for further analysis.

Initial Screening Criteria	
1	Meet traffic demands of the region
2	Minimize engineering/construction impacts
3	Minimize negative environmental effects
4	Minimize negative economic/social impacts
5	Maximize cost-effectiveness

The phrase “dropped as ‘stand-alone’” indicates that the four strategies so named were not considered strong enough to meet the study goals by themselves. The study team decided that these alternatives would be most effective in combination with other, stronger alternatives.

Results of the Initial Screening		
“Carried Forward” Strategies	Strategies Dropped as “Stand-alone”	“Dropped” Strategies
No Build	Transportation Systems Management (TSM) ¹	Non-Motorized
New Local Roadways	Transportation Demand Management (TDM) ²	Commuter Rail
Widen Existing Highways	Intelligent Transportation Systems (ITS) ³	Light Rail
New Interchanges	Transit (Bus)	
New Toll-Supported Highways		
New Tax-Supported Highways		

Notes:

¹ *Transportation Systems Management (TSM)* strategies include relatively low-cost enhancements to the existing transportation network that can greatly improve operational efficiency. Examples include traffic signal improvements, geometric improvements, and pavement-marking improvements.

² *Transportation Demand Management (TDM)* strategies are aimed at reducing the volume (demand) of vehicles on the transportation network during peak periods. Examples include High-Occupancy-Vehicle (HOV) lanes, employee trip-reduction programs (such as telecommuting), parking management, and ridesharing.

³ *Intelligent Transportation Systems (ITS)* can be defined as the application of technology to the transportation system to increase efficiency and reduce motorists’ delays. Examples include automated incident detection/response, automated highways, and traveler information systems.



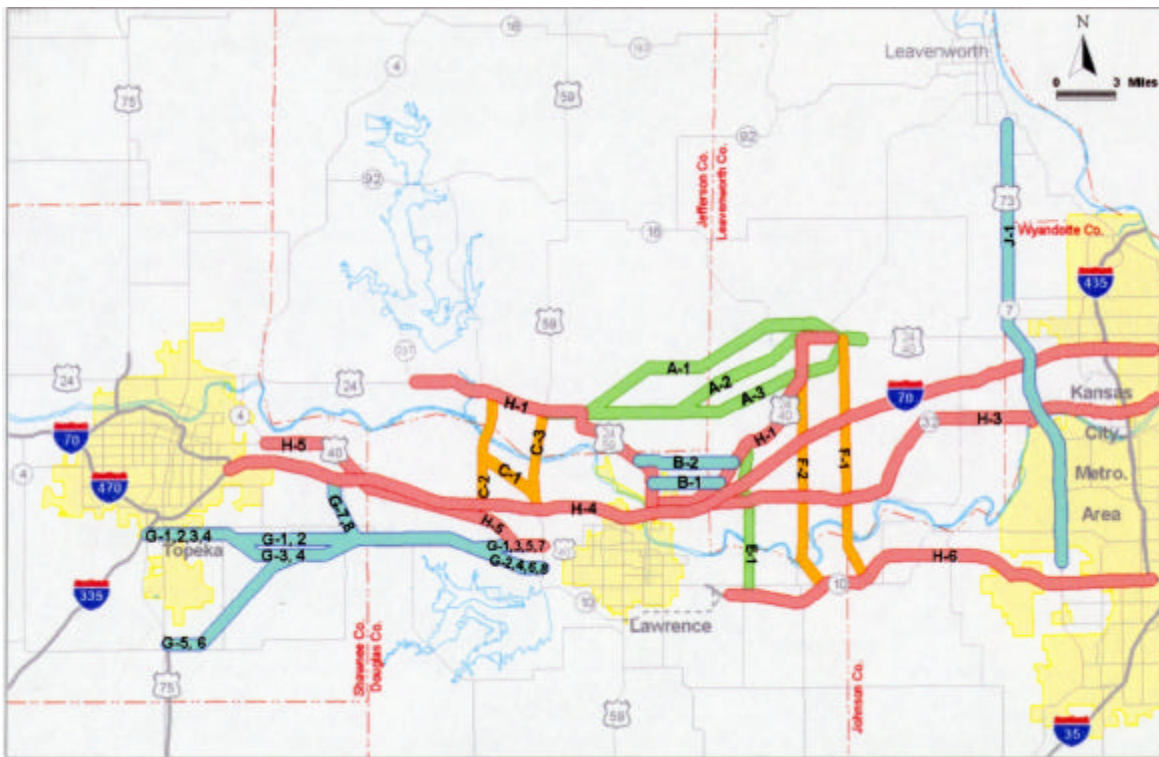
Final Screening of Alternatives

Based on the “Carried Forward” strategies, the study team developed eight “families” of roadway improvements that (in addition to the “No Build” scenario) formed the set of 26 alternatives that were to be analyzed in further detail. The table at right lists these alternatives. Initially, these alternatives were loosely and conceptually defined based on public input; subsequently, they were refined to half-mile-wide corridors (based on feasible alignments) to allow a consistent basis for comparison. The map at the bottom of this page shows the approximate locations of these corridors.

Each alternative was subjected to a detailed evaluation with respect to each of the five evaluation criteria listed on the previous page. The evaluation process integrated all of the information developed during study: traffic projections, environmental constraints, improvement cost estimates, inventories of existing topography and development, existing and expected growth and activity patterns, potential alignment locations, and public/committee input. The evaluation process resulted in a final matrix, which is presented and described on the following page.

“Carried Forward” Alternatives	
A	US-24 extension from Perry to Tonganoxie
B	US-24 realignment
C	US-59 extension from US-24 to I-70
E	East Lawrence bypass
F	Leavenworth-Johnson County Connector
G	Shawnee-Douglas County Connector
H	East-West capacity improvements (widening existing roads)
J	K-7 freeway upgrade

Highway Corridor Alternatives



Final Rating of Alternatives

The final stage of the Major Corridor study was the rating of each alternative using the five evaluation criteria listed on Page E-5. The alternatives were rated on a five-tier scale based on their respective abilities to satisfy each of the criteria. The matrix on this page summarizes the alternative ratings. Only the I-70 and K-10 widenings received five "high" ratings; these alternatives also received much positive feedback from the public.

Next Steps

This study is intended to serve as a planning tool for KDOT and KTA for many years to come. It will provide the two agencies with additional information as they prioritize future travel needs, both statewide and locally. Although this study provides a planning tool, it does not provide a blueprint for construction. The study outlines each alternative's benefits and drawbacks, but stops short of ranking or prioritizing the alternatives.

Two of the alternatives emerged as beneficial to the future travel needs of the region under all improvement scenarios. The widenings of I-70 and K-10 were rated high in all evaluation categories and also enjoyed public support. The study also showed a need to complete US-24 as a four-lane divided facility.

The study identified travel demand and needs expected over the next twenty-five years. KTA will use the results of the study to plan future improvements to I-70. For KDOT, the only potential funding during the next 10 years would be the System Enhancement (SE) component of the Comprehensive Transportation Program passed by the 1999 Legislature. The SE program allows cities and counties to propose candidate improvements to the state highway system. These candidate projects are ranked by KDOT according to traffic characteristics, safety issues, and economic development potential. The MCS provides valuable supplemental information that will be useful in evaluating the study region's candidate SE projects.

Should KDOT or KTA decide to pursue any of the alternatives analyzed in the Major Corridor Study, more detailed and focused analysis, including additional opportunities for public involvement, would be necessary.

Evaluation Criteria

Maximize Cost Effectiveness
Minimize Negative Economic/Social Impacts
Minimize Negative Environmental Effects
Minimize Engineering/Construction Impacts
Meet Traffic Demands of the Region

		Maximize Cost Effectiveness	Minimize Negative Economic/Social Impacts	Minimize Negative Environmental Effects	Minimize Engineering/Construction Impacts	Meet Traffic Demands of the Region
No Build		★	●	●	●	★
A	US-24, Perry to Tonganoxie A-1	●	★	●	●	●
	A-2	●	★	●	●	●
	A-3	●	★	●	●	●
B	US-24 Realignment B-2	●	●	★	●	●
C	US-59 Extension to I-70 C-1	★	●	●	●	★
	C-3	★	●	●	●	★
E	East Lawrence Connector	●	●	●	●	●
F	Leavenworth-Johnson Co. Connector F-1	●	●	●	●	●
	F-2	●	●	●	●	●
G	Shawnee-Douglas Co. Connector G-1	●	★	★	★	●
	G-2	●	★	★	★	●
	G-3	●	★	★	★	●
	G-4	●	★	★	★	●
	G-5	●	★	★	★	●
	G-6	●	★	★	★	●
	G-7	★	●	●	●	●
	G-8	★	●	●	●	●
H	East-West Capacity Improvements H-1 (US-24)	●	●	●	●	●
	H-3 (K-32)	●	●	●	●	●
	H-4 (I-70)	●	●	●	●	●
	H-5 (US-40)	●	★	●	●	●
	H-6 (K-10)	●	●	●	●	●
J	K-7 Freeway upgrade	●	★	●	●	★

Rating (ability to meet criterion):

- ★ = Low
- = Low to Medium
- = Medium
- = Medium to High
- = High

*Data not sufficient to provide definitive rating.

