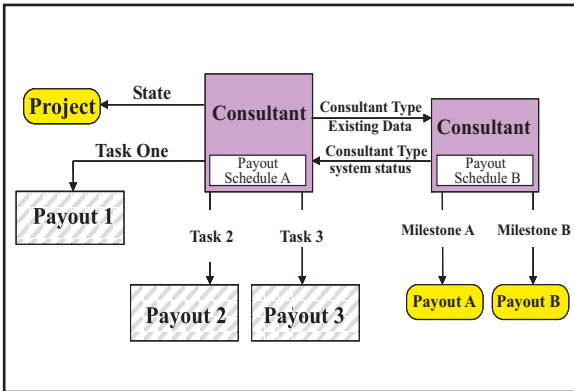


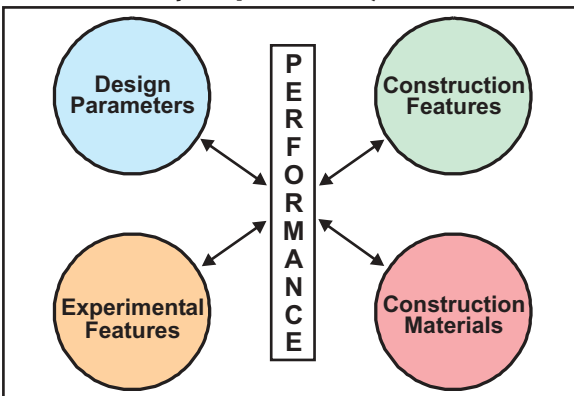
Thirteen new research studies were begun during 2003/2004 on a wide range of topics as highlighted below. For more information on these projects please contact the Kentucky Transportation Center or the staff person listed. These projects are being conducted for the Kentucky Transportation Cabinet.

Requirements Document for Payout Schedule (Study #04-271)



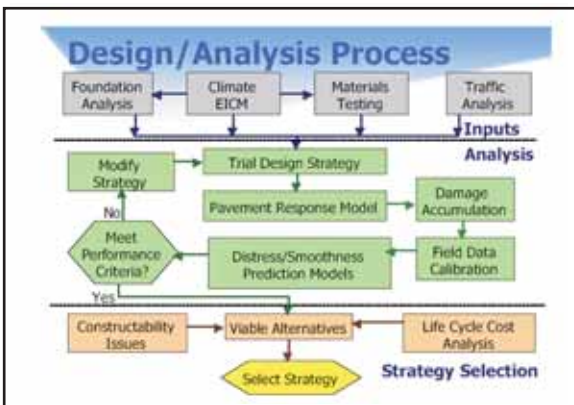
At the present time the Kentucky Transportation Cabinet is involved with a larger number of traditional and nontraditional projects than at any time in the past. While these projects have created unique opportunities for transportation within the state, they have also created a number of areas wherein traditional means of doing business are not as beneficial as they were at one time. One of the areas that is currently under review is the payout schedule for projects sponsored by the Kentucky Transportation Cabinet. Due to the number of projects, the types of projects, and more constrained cash reserves, the payout schedule has become more critical than it has been in recent years. The Requirements Documents for Payout Schedules will help to set up project payouts in a manner that is more efficient for the Kentucky Transportation Cabinet (Contact: Ted Grossardt, (859) 243-0971 ext. 25, thgros00@pop.uky.edu) [Study Advisory Chair: Mike Hancock]

Developing A Database of Materials, Design, Construction and Experimental Techniques of Pavements (Study #04-272)



At the present time, there is limited ability to correlate the performance of highway pavements with the type of construction, materials used, or experimental features utilized. The major objective of this project will be to identify the data sources which are available and to develop guidelines to establish an integrated system which will permit the integration of the various data sources. This project will: 1) evaluate the feasibility of merging historical project data into an integrated system; 2) develop a mechanism to capture these types of data for future highway construction and rehabilitation activities. The objectives of this study will lead to a better understanding of the performance of various techniques and materials which are used across the state. This information will permit the Cabinet to make better-informed decisions with regard to the material specifications, design recommendations, and construction procedures. (Contact: David Allen, (859) 257-4513, ext. 250, dallen@engr.uky.edu) [Study Advisory Chair: Wes Glass]

Evaluation and Implementation Issues for the 2002 Pavement Design Guide (Study #04-273)



The National Cooperative Highway Research Program (NCHRP) is currently developing a new Pavement Design Guide based on mechanistic procedures. Kentucky is one of a very few states which has used mechanistic-empirical design procedures for many years. The Cabinet plans to implement this new design procedure over the next several years. The new design procedure utilizes various material models coupled with a mechanistic analysis procedure to predict pavement performance. This resulting performance is then used to determine if a pavement structure is suitable, based on local conditions and historical pavement performance. The major objective of this project will be to identify all the necessary input and analysis parameters required. A detailed implementation plan will be developed which will guide the Cabinet in establishing the appropriate data collection requirements to support the use of the new procedure. (Contact: David Allen, (859) 257-4513, ext. 250, dallen@engr.uky.edu) [Study Advisory Chair: Dan Hite]

Best Management Practices (BMP) for Erosion Control (Study #04-274)



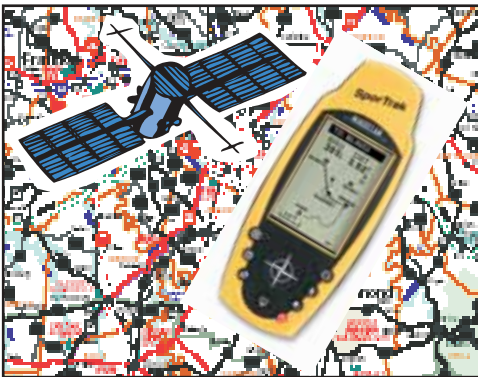
The objectives of this study were to identify the BMP for erosion control elements of a highway project, and to provide related training and reference material that would be relevant to resident engineers and contractor personnel. In the past erosion control practices have been the cause of concern to resource agencies and the credibility of the Cabinet and their practices have been brought into question. Failure to comply with contract provisions for erosion control can lead to punitive damages being assessed to the State and/or the Contractor. Training is deemed essential so that personnel associated with construction activities understand the important elements that are important for erosion control and apply them in a timely and effective manner. The guides are to be designed for quick reference for the field personnel. (Contact: Paul Toussaint, (859) 257-4513 ext. 223, toussain@engr.uky.edu / Sudhir Palle, (859) 257-2670, sudhir@engr.uky.edu) [Study Advisory Chair: Linda Wagner-Justice]

Implementation, Maintenance and Full Development of the Kentucky Geotechnical Database (Study #04-275)



Major aims of this study are to implement the Kentucky Geotechnical Database, examine and analyze regional geotechnical data, and build geotechnical software and management techniques into the database system. The database provides permanent electronic storage of geotechnical data and is accessible by all highway districts via a server in Frankfort, Kentucky. The rock slope and landslide modules are very useful in generating and prioritizing sites for the state's 6-year plan. Cabinet personnel in the twelve highway districts will be trained to enter landslide and rock slope information and use the management systems. The system will be built to "capture," in a real time mode, geotechnical data generated by the Cabinet's Geotechnical Branch; store and retrieve geotechnical reports; and enter, analyze, and graph field instrumentation data. A dynamic and interactive web browser will be built to facilitate access and use of the Kentucky Geotechnical Database. (Contact: Tommy C. Hopkins, (859) 257-4513 ext. 249, thopkins@engr.uky.edu) [Study Advisory Chair: Bill Broyles]

Usage of GPS Technology for Traffic Crash Locations (Study #04-276)



The crash report format that was implemented in Kentucky starting in 2000 has data fields for the investigating officer to indicate the latitude and longitude of the traffic crash. All officers who investigate crashes have been provided GPS units and training for their use. However, preliminary analysis of the data show a substantial amount of inaccurate and inconsistent information relating to the GPS data. It is not apparent whether these inaccuracies have been caused by the investigating officer, data entry, the CRASH conversion program, or a combination of these. The study will involve comparing the coordinates given on the police report with other information on the report that provides the crash location. Data entered by investigating officers will be analyzed to determine if there are patterns of error that can be identified. Expanded applications of GPS technology location information will also be investigated and documented. The objective of this study will be to evaluate the accuracy of GPS coordinates placed on crash reports to determine if they represent a viable means of locating traffic crashes.

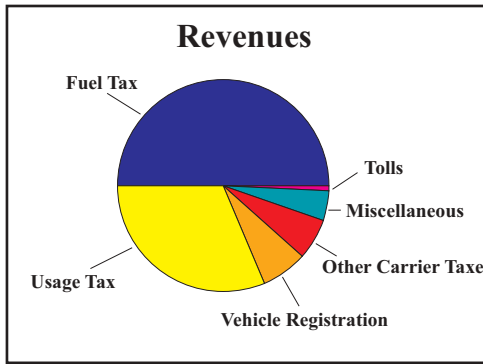
(Contact: Kenneth R. Agent, (859) 257-4513 ext. 253, kagent@engr.uky.edu) [Study Advisory Chair: JoAnn Tingle]

Evaluation of Auto Incident Recording System (Study #04-277)



The Auto Incident Recording System (AIRS) was originally installed at the intersection of Brooke Street and Jefferson Street in Louisville as an electronic monitoring device to improve safety at that intersection. The system continually records digital video of the intersection and monitors the vicinity for the sound of vehicle crashes or near misses. When an incident is detected, an eight-second segment of video (beginning four seconds before the incident) is stored on VHS videotape. Traffic engineers can then study the incidents on the videotape and identify the types of behavior (and contributing factors) that are causing incidents. Corrective measures can then be developed to reduce the number of incidents. The objectives of this study will be to evaluate the effectiveness and the benefits of the AIRS implementation and to develop recommendations regarding continued use of the system at the present location and/or at other locations. (Contact: Jerry G. Pigman, (859) 257-4513 ext. 252, jpigman@engr.uky.edu) [Study Advisory Chair: Nancy Albright]

Highway Cost Allocation Analysis (Study #04-278)



Traditionally government bears the primary responsibility for providing and maintaining public roads and streets, and these highways continue to be financed largely from tax revenues and user tolls. Primary goals for those charged with drafting highway tax legislation include an equitable assignment of responsibility to various groups of taxpayers and an efficient system for tax administration. Highway cost allocation studies have sought to assure that the goal of equity is met. Highway cost allocation research, A means for evaluating the equity of highway user taxation, highway cost allocation research was first reported in Kentucky in 1956. The current series of highway cost allocation studies have been conducted for Kentucky beginning in 1982. Changes in the types of data used and the methodologies employed have resulted over the period of years, and the processes have been progressively streamlined and automated to permit more efficient analyses to be performed. Prior studies have been limited to the state-

maintained highway system, which comprises approximately 27,000 miles of the 73,000 miles of roads and streets in Kentucky. The overall objectives of this study are to determine the levels of revenue contribution and cost responsibility of highway users operating on Kentucky's state-maintained highway system. (Contact: Jerry G. Pigman, (859) 257-4513 ext. 252, jpigman@engr.uky.edu) [Study Advisory Chair: Taylor Manley]

Develop an Archived Data Management System Prototype (Study #04-279)



The increasing deployment of Intelligent Transportation Systems (ITS) throughout the country has generated massive amounts of data. The data collected by these systems are primarily used for short-term purposes, such as real-time operations management of transportation systems. In most cases, the data are not being appropriately archived, despite the great potential value of the data for transportation planning or other uses. Two major regional traffic management systems (ARTIMIS and TRIMARC) have been deployed in Kentucky, and these systems collect substantial amounts of traffic data. The goal of this project is to develop an integrated archived data management system for the Kentucky Transportation Cabinet based on data collected by ARTIMIS and TRIMARC. (Contacts: Joe Crabtree, (859) 257-4513, ext. 241, crabtree@engr.uky.edu / Mei Chen, (859) 257-9262, mchen@engr.uky.edu) [Study Advisory Chair : Rob Bostrom]

Evaluate Methods to Limit the Time to Investigate Crash Sites (Study #04-280)



In addition to the direct costs of highway crashes (death, injury, and property damage), there are substantial indirect costs as well. A primary source of indirect costs is the congestion and delay from lane blockages or road closures while the crash is being investigated and cleaned up. In many cases, roadways could be reopened very quickly, but this does not occur because of the requirement to thoroughly investigate the crash scene. Thus, the process of crash scene investigation can substantially increase the congestion and delay costs associated with the crash. It has been suggested that, in many cases, the incremental cost of the investigation greatly exceeds any value that it may produce. The goal of this project is to identify opportunities to reduce the time required to investigate and clear crash scenes. (Contact: Joe Crabtree, (859) 257-4513, ext. 241, crabtree@engr.uky.edu) [Study Advisory Chair: Chuck Knowles]

Testing and Calibration of the Bridge Management System (Study #04-281)



Bridge management Systems are essential in prioritizing bridges for maintenance and repair. A system recently acquired by the Kentucky Transportation Cabinet is in need of being adapted to the Cabinet's requirements. The objectives of this study are: (1) Evaluate the Cabinet's current Bridge Management System; (2) Calibrate the various parameters used in the decision making process; and (3) Prepare a training manual and hold training sessions. The implementation of the new management system will greatly enhance the capabilities of the transportation Cabinet in prioritizing bridges for maintenance and repair. (Contact: Issam E. Harik, (859) 257-4513 ext. 273, iharik@engr.uky.edu) [Study Advisory Chair: Bob Pruitt]

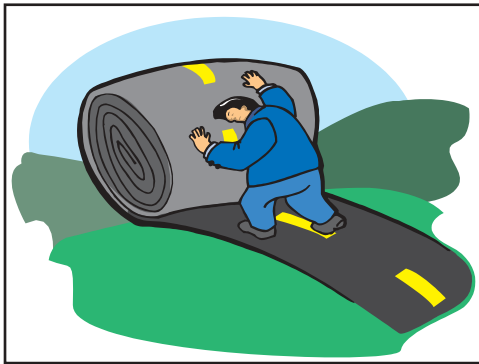
Impact of Outsourcing KyTC Project Services (Study #04-282)



There are many functions carried out by a state transportation agency and many relate to its major responsibility for transportation project delivery. The primary function is that of senior management, which is often called Program Management. The more traditional functions are: Planning, Design, Pre-construction, Construction, Operations and Maintenance. All of these functions require manpower, resources, and senior management attention for project delivery. For years agencies have conducted most of their functions with their own resources. There has always been some outsourcing of work, especially for construction services and to a lesser extent, design services. The increasing demands and changing resources are causing investigation of alternative methods of accomplishing those essential functions. A major option is to contract out more of its work to external parties, commonly called outsourcing. The purpose of this project is to evaluate the effectiveness, benefits and concerns of the possible outsourcing

of primary project delivery functions by the KyTC. (Contact: Donn E. Hancher, (859) 257-4856, hancher@engr.uky.edu) [Study Advisory Chair: Ken Sperry]

Innovative Rapid Construction Methods (Study #04-283)



A vast majority of KYTC construction projects are now reconstruction and rehab projects. Meanwhile, the volume of traffic on state roads is increasing, environmental regulations are becoming stricter, and the cost of conventional road and bridge construction methods is on the rise. Conventional construction/reconstruction methods will be seriously strained to meet the demands of future needs, especially the current philosophy of "Get In, Get Out, and Stay Out." The use of innovative construction/reconstruction practices could help alleviate these concerns. The purpose of this project is to identify innovative, and cost effective, construction methods and processes to enhance the speed of construction on Ky TC construction projects.

(Contact: Paul M. Goodrum, (859) 257-5416, pgoodrum@engr.uky.edu) [Study Advisory Chair: Dexter Newman]

Sampling of Reports Published in 2003

KTC-03-02	Investigation of Soluble Salts on Kentucky Bridges
KTC-03-05	Analysis of Field Permeability and Laboratory Shear Stress for Western Kentucky Parkway, Milepost 18.240 to Milepost 25.565, Caldwell-Hopkins Counties
KTC-03-12	Roadway Lighting And Driver Safety
KTC-03-14	Assessment and Modeling of Stream Mitigation Procedures
KTC-03-15	Development Of Procedures For Identifying High-crash Locations And Prioritizing Safety Improvements



For a copy of the prospectus covering these studies or general information regarding the Kentucky Transportation Center, contact:

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