The following paragraphs describe the vision of what we would like to achieve by 2015. This vision, developed in 2010, has served as a target to guide the development of our goals, objectives, and strategic plans.

**Customer Satisfaction and Customer Relationships**
The Kentucky Transportation Center (KTC) has developed and implemented tools for measuring our customers' perceptions regarding the quality and value of the products and services we provide. These tools are consistently utilized for all projects, regardless of who the client is. Feedback provided by these tools is scrutinized on a regular basis to identify improvements that can be made in policies and/or procedures.

**Research Excellence / National Prominence**
KTC enjoys a strong national reputation in selected, high-priority areas of research and technology transfer. KTC researchers are widely known for their subject matter expertise, group facilitation skills, effective communications, and project management skills. KTC’s technology transfer professionals are nationally recognized for excellence in information delivery and workforce development. This reputation is reflected in strong name recognition at all applicable national and regional meetings and conferences.

**Size of Program and Diversity of Funding Sources**
The size of KTC’s research and technology transfer program has grown substantially over the past five years, primarily due to the identification and cultivation of new funding sources (federal, state, local, and private-sector) and the growth of non-SPR (State Planning and Research) funding. The Center has strategically targeted areas of research and technology transfer that are important to the Kentucky Transportation Cabinet (KYTC) and to the nation. KYTC receives substantial benefits from having direct access to KTC’s research results and technology transfer resources. The SPR program remains strong and vital.

**Work Environment / Employee Satisfaction**
KTC is a rewarding and enjoyable place to work. Employee retention is high, as is employee morale. KTC provides opportunities and support for all employees to continue learning and to grow professionally throughout their careers. Exceptional employee performance is recognized and rewarded. Employees are highly motivated and highly productive. Co-workers treat each other with courtesy and respect. The workforce includes a strong and increasing presence of minorities and women.

**Implementation and Value of Research**
Tools and processes have been put in place to promote, facilitate, and track the implementation of research results. Implementation is a priority for KTC and is accomplished through a team effort, involving practitioners, researchers, and technology transfer professionals. Implementation is considered from the earliest stages of each research project. The benefits resulting from the implementation of research findings are well-documented and well-disseminated. This information is used to promote the value of transportation research and technology transfer programs both within Kentucky and nationally.

The full version of the Vision can be found on our website at [www.ktc.uky.edu/vision.html](http://www.ktc.uky.edu/vision.html)
We have enjoyed another exciting year at the Kentucky Transportation Center. Throughout 2013, we continued to strengthen and grow our core research programs while simultaneously exploring new and innovative opportunities. In fiscal year 2013, we brought in over $10.5 million in sponsored project awards, which ranked us number one in the College of Engineering and number three on the entire University of Kentucky Campus (up from number five the previous year). Our total program expenditures for the fiscal year were $11.3 million, marking the second consecutive year (and the only two years in our 33-year history) that our program has exceeded $11 million. So, in terms of sponsored projects revenue and overall program size, the Center is enjoying unprecedented success.

Throughout the year, we continued to function as the “research arm” of the Kentucky Transportation Cabinet (KYTC), and we greatly appreciate the strong relationship we enjoy with our KYTC colleagues. In September, the Cabinet announced the appointment of Jason Siwula to the position of “Research Coordinator in Training.” We are excited to work with Jason as we pursue improvements in our overall management of the research program, our day-to-day project management and communications, our focus on implementation, and our documentation and dissemination of the value of research.

For the past two years, we have partnered with Marshall University, the University of Louisville, and Hampton University to carry out the work of the Multimodal Transportation and Infrastructure Consortium (MTIC), with funding from the USDOT’s University Transportation Centers (UTC) program. That funding allowed us to greatly expand our focus on freight transportation and inland waterways. We have also participated in the NURail consortium, a rail-focused UTC led by the University of Illinois. The UTC program was re-competed in 2013, and we participated in nine proposals that were submitted in March. Two of those proposals were selected for funding: a Regional UTC focused on Comprehensive Transportation Safety (led by the University of Tennessee) and the aforementioned NuRail consortium, a Tier-One UTC led by the University of Illinois. We anticipate two years of funding for these consortia, and we are excited about the opportunities that they present.

In February, we were selected by the National Cooperative Highway Research Program (NCHRP) to investigate the use of spot painting to repair existing coatings on bridges. Late in the year, we submitted a successful proposal to the American Association of State Highway and Transportation Officials (AASHTO) to become the official testing facility for concrete coatings for the National Transportation Products Evaluation Program (NTPEP). This work will begin in early 2014.

These are just a few of the important projects going on at KTC. You will find many other examples throughout this report. We continue to work with our many sponsors, partners, and stakeholders to carry out a diverse, multidisciplinary, broad-ranging program of research, technology transfer, and education. We strive to address all facets and all modes of transportation, and to truly be THE Kentucky Transportation Center.

Joe Crabtree, Ph.D., P.E.
DECK SEALING AND CRACK REPAIR OF MULTIPLE BRIDGES ON I-24

A number of bridges on Interstate 24 in Western Kentucky (McCracken County) were scheduled for rehabilitation. Twenty of those bridges had decks that were generally in good condition and, instead of receiving overlays, KYTC contracted to have them sealed using a penetrating concrete sealer. KTC Bridge Preservation Program has conducted extensive research with various concrete sealers. It provided KYTC officials with guidelines for sealer application and recommended two sealers that had proven effective in laboratory analysis for use on the contract. KTC also provided relevant “Special Notes” for the contract.

Of the twenty bridges sealed, KTC personnel selected four for follow-on evaluation of the sealing including long-term resistance to chloride penetration and deck deterioration. A concrete crack sealer, not used for the project, was investigated on several of those bridges. The selection of those bridges was based upon size, type, and location of the cracking. Bridges from two to five spans were included in the study.

After project completion, Bridge Preservation personnel spent two days onsite applying the crack repair sealer and collecting samples for subsequent laboratory analysis. The repair consisted of selection of cracks to be repaired, surface preparation prior to sealing, monitoring atmospheric conditions during sealing and mixing and applying the crack sealer. Sampling included collecting concrete powder from the bridge deck at various depths and locations for subsequent determination of chloride levels. Core samples were also collected at the crack repair locations to determine the depth of penetration of the deck and crack sealers.

The samples collected were returned to the KTC Bridge Preservation laboratory for analysis. That data will be utilized as baseline information to monitor the long-term performance of the deck and crack sealers. The target bridge decks will be subject to long-term monitoring and follow-up sampling/testing to determine the effectiveness of deck/crack sealing.

CURRENT PROJECTS
1. Thin Film Concrete Coatings
2. Investigation of Stay Cable Piping of the US 231 Natcher Bridge
3. Chloride Contamination Remediation on Steel Bridges
4. Nondestructive Testing Technology for Bridge Evaluation
5. Improved Joint Materials and Details
6. Rapid Bridge Renewal Using Duplex Coatings
UPDATING THE KENTUCKY CONTRACT TIME DETERMINATION SYSTEM

The Federal Highway Administration requires State Transportation Agencies to have a formal method to estimate contract time for highway construction projects. To meet this requirement, many states use an integrated scheduling system to estimate project duration based on assumed productivity rates and generic job logic. The current work investigated the accuracy of two systems and finding both had high inaccuracy (+200%) in predicting the duration of Kentucky Transportation Cabinet projects. In response to this poor accuracy, a parametric project duration estimating tool was developed based on multivariate regression analysis of bid item quantities and cost estimates. Five regression models were developed to estimate contract time for large projects (greater than $1,000,000) based on key bid item quantities; limited access (+/-22% median error), open access (+/-35% median error), new route (+/-55% median error), bridge rehabilitation (+/-77% median error), and bridge replacement (+/-17% median error). It was not possible to develop a parametric estimating tool for predicting the duration of small projects (less than $1,000,000) as it appeared that the duration of small projects is determined by factors outside of bid item quantities. Instead, worksheets were provided for designers to estimate duration from user predicted productivity rates and validation from available construction experience.

CURRENT PROJECTS
1. Effective Project Scoping Practices to Improve On-Time and On-Budget Delivery of Highway Projects
2. Methods to Expedite Utility Relocations
3. Bridge End Settlement Evaluation and Prediction
4. Implementation of the Kentucky Contract Time Determination System Update
5. Implementation of the Contractor Evaluations in the Contractor Selection Process
The Decision Support Systems team has developed an innovative new approach to predictive archaeological modeling, and produced the first-of-its kind predictive modeling toolkit for the Kentucky Transportation Cabinet archaeologists. Rather than rely on traditional statistical analysis of the sparse existing data, this model translates the landscape knowledge and experience of archaeologists (the experts) into a series of GIS-based predictive surfaces for the Commonwealth.

Kentucky has a very complex landscape and so the modeling tool includes a set of controls that allow the KYTC archaeologists to custom-build their own landscape models, and to update the models as new, more precise spatial data becomes available. The model will help transportation planners avoid unnecessarily routing projects in areas where many archaeological sites can be expected, each of which costs project time and money to explore and document. This research was invited for specialty committee presentation at the Transportation Research Board national meetings in Washington, D.C., January, 2014.

CURRENT PROJECTS
1. Economic Impact of Multi-modal Waterways
2. GIS-based Integrated Freight Network Model
3. Inland Waterways Education and Workforce Development
4. National Waterways Foundation Inland Navigation Jobs Impact and Investment Study
5. Threatened and Endangered Species Habitat GIS Modeling for Kentucky

The “Mapped” landscape is composed of GIS information about Slope, Water Sources, and Landforms.
On August 3, 2007, President Bush signed the “Implementing Recommendations of the 9/11 Commission Act of 2007” (the 9/11 Act). Recognizing the threat posed by hazardous materials shipments, Section 1554 of the 9/11 Act directs the United States Transportation Security Administration (TSA) to develop a program to facilitate the tracking of motor carrier shipments of security-sensitive materials.

Fedtrak™ is a Research and Development initiative funded by the National Institute of Homeland Security, the Department of Homeland Security’s Science and Technology Directorate, and the Transportation Security Administration’s Highway Security Program. Fedtrak™ is designed specifically to meet the needs of TSA as mandated by Section 1554 of the 9/11 Act. KTC and its project partners are designing Fedtrak™ as an implementation tool for TSA’s Tier I Highway Security Sensitive Materials Security Action Items. Fedtrak™ will also function as a sophisticated risk management tool to improve the security of high-risk hazardous materials shipments. TSA’s Security Action Items pertain to all aspects of supply chain security, including topics such as: developing security protocols and industry standards; personnel security; devising strategies to prevent unauthorized access to control systems; and improving the en-route security of security-sensitive goods. Fedtrak™ uses a GIS-based interface, which is underwritten by risk calculation algorithms, to monitor and track the location and security status of materials transported across the United States’ hazardous material supply chain. The Fedtrak™ Risk Engine equips TSA with the dynamic, real time knowledge it needs to identify security threats when they arise. Once fully implemented, Fedtrak™ will enhance the safety and security of the hazardous materials supply chain.

CURRENT PROJECTS
1. Green Infrastructure
2. Mitigation Exemption – Low Quality Streams
3. Inland Waterway Certain Dangerous Cargoes (CDC) Analysis
4. Inland Waterway Operational Model
5. Port Sustainability Audit Content and Processes
6. Inland Waterway Funding Mechanisms Assessment
7. 1554 Analysis for Tier 1 Hazmat Shipments
8. Transportation Funding Sources and Alternatives in the Southeastern States Now and in the Future
Kentucky has 14 fixed inspection stations across the state. Thousands of trucks come through these stations daily, but many have detour routes that are utilized to avoid enforcement. In addition, many routes in the state have significant volumes of truck traffic but no fixed stations. There are locations where trucks are entering the state, traversing several miles, and exiting the state without encountering any type of enforcement. Mobile units augment the fixed stations, but truckers tend to know when a mobile detail is established and they avoid the location or wait them out. In addition, limited staffing makes monitoring multiple routes impossible.

A Virtual Weigh Station (VWS) can provide a low-cost, high-value enforcement tool that helps to address the problem of trucks bypassing the fixed inspection stations or mobile units. A VWS utilizes a license plate reader, USDOT/KYU reader, and an overview camera to collect and process identifying information from the trucks on otherwise unmonitored routes. The data is correlated into a single record, checked against state and federal databases, and available online to enforcement. Enforcement personnel can monitor the location and decide when intervention is needed.

**CURRENT PROJECTS**
1. Coordinating the Use and Location of Weigh-in-Motion Technology
2. Implementation of Three Ramp Screening Systems at Kentucky Weigh Station
3. Implementation of Three Kentucky Automated Truck Screening Systems
4. Evaluation of Coverhaul 18 Technology
5. Redefining Commercial Vehicle Permitting/Credentialing Violations
6. Quick Clearance – Hold Harmless
7. Implementation of a Mainline Screening System
8. PRISM and CVISN Administrative and Technical Support for KYTC
The Kentucky Transportation Center (KTC) and UK’s Center for Visualization have been successful in utilizing the 3-D output from both the stationary and mobile LiDAR scanning units to help assess and solve highway transportation problems. One of these applications is the evaluation of bridge clearance heights above roadways, i.e., the distance from the roadway surface to the bottom of the bridge superstructure above the roadway. Often the original clearance heights are jeopardized after multiple resurfacing projects. Measuring the bridge clearance heights by conventional methods can be difficult, particularly in urban areas where constant traffic limits access to the roadway for gathering measurements. Therefore, KTC and UK’s Center for Visualization have used mobile LiDAR technology to determine bridge clearance heights on the Western Kentucky Parkway and the Watterson Expressway (I-264) in Jefferson County. An Optech Lynx Mobile Mapping LiDAR system was utilized to scan the bridge clearance at highway speeds, without the need for traffic control. Field verification measurements of the project results indicated the accuracy of the LiDAR measurements was within +/- 1.2 inches. This information can be used for routing of superloads and/or for verifying FHWA standards for highway overpass clearance.

CURRENT PROJECTS
1. AASHTO Mechanistic-Empirical Pavement Design Guide Calibration Continuation
2. Development of a Concrete Pavement Repair Manual
3. Rapid Inspection of Bridge Decks Using Multiple Ground Penetrating Radar Antennas
4. Coring and Evaluation of Bridge Decks
5. Culvert Slip Lining Guidance
6. Evaluate Polish Resistance and Skid-Related Performance of Native Kentucky Aggregate
7. Cost/Benefits of Stone Matrix Asphalt Surface
8. Pavement Performance Modeling
9. Asphalt Over Concrete Crack Suppression
10. Pavement Crack Sealing Cost-Effectiveness
LOAD RATING OF BRIDGE SIZE CULVERTS

The Kentucky Transportation Cabinet (KYTC) is responsible for load rating all bridge size (according to the National Bridge Inspection Standards) culverts for their safe load carrying capacity. The objective of this study is to conduct the load rating of the 1300 bridge size culverts in Kentucky. Culvert rating software will be used for standard type culverts. For special culverts (circular, etc.), finite element modeling and evaluation will be carried out. The Inventory and Operating Rating and the culvert’s capacity will be determined for Kentucky’s ‘legal trucks’ (types 1, 2, 3, & 4).

Load ratings will be carried out in accordance with the guidelines in the following manuals and codes: AASHTO Standard Specifications for Highway Bridges; AASHTO LRFD Bridge Design Specifications; and The Manual for Bridge Evaluation. The Inventory and Operating Rating will be calculated using the AASHTO HS20 truck and using Load Factor Design unless the culvert was designed by the Load & Resistance Factor Design, in which case it will be analyzed by the Load & Resistance Factor Rating (LRFR) method.

CURRENT PROJECTS
1. Bridge Deck Rapid Repair
2. Bridge Load Testing vs. Bridge Load Rating
3. Rapid Bridge Repair Using High Performance Materials
4. Effect of Thermal Loads on Bridge Substructures
5. Glass Fiber Reinforced Polymer Stay-in-Place Forms
6. Retrofit of AASHTO Girders Using High Strength Steel Wire Fabric
7. Stainless Steel Reinforcement for a Concrete Bridge Deck
8. Temperature Movement in Bridges
Kentucky’s Technology Transfer Program (T2) promotes efficiency in Kentucky’s transportation system by providing workshops and training events, newsletters, how-to manuals, new and existing technology updates, legislative and regulatory news, on-site technical assistance; and access to the only transportation library in the Commonwealth. The Program is also designated the Local Technical Assistance Program (LTAP) in Kentucky.

During 2013, the Technology Transfer Program presented 278 workshops attended by over 7,000 participants. T2 celebrated the 25th Anniversary of the Roads Scholar Training Program and 15th Anniversary of the Road Master Training Program. There were 124 Roads Scholars and 120 Road Masters who graduated this year. They join the 2,388 Roads Scholars and 1,769 Road Masters who had previously graduated from these programs.

T2 also conducted the Asphalt Qualification Program, leading to the qualification of 70 new technologists and requalification of 11 technologists. The Asphalt Field Technician Qualification resulted in 188 individuals earning their qualification. The Kentucky Erosion Prevention and Sediment Control Program (KEPSC) for Roadway Inspectors trained almost 400 participants, and the Pesticide Continuing Education courses trained over 600 participants. The Work Zone Traffic Control Employee Qualification Program had a record year, qualifying and requalifying 528 flaggers, 668 technicians, and 516 supervisors.

Participants also attended specialized training for Sign Retroreflectivity, Local Public Agencies, Horizontal Alignment Signing, Road Safety Audit, Tractor Mower Safety Training, and Chain Saw Safety.

T2 expanded their Equipment Loan Program with the addition of a safety edge shoe. This free program allows all local public agencies in Kentucky the opportunity to borrow a variety of items including: ball bank indicator, sign retroreflectivity kit, and retroreflectometer.

The Technology Transfer Program produces material that promotes our training program, conferences and events, and services. We publish a quarterly newsletter, The Link, which offers valuable best management practices and insights into new and innovative approaches. Visit our website (www.kyt2.com) for digital copies of most of our resources. Stay informed about the latest news and information by following us on Facebook and Twitter.
The Safety Circuit Rider Program, managed by the Technology Transfer Program, is a free service to local governments. The program uses crash data to locate high-incident sites along roadways and assist communities in finding low-cost roadway safety improvements. The Safety Circuit Rider works with local governments to remove fixed objects such as trees, brush, stumps, etc. and to install signage per MUTCD guidelines. This program is helping communities across the state of Kentucky save lives every day.

TRAFFIC AND SAFETY ACADEMY

Though the Safety Circuit Rider Program reaches several counties, there is a larger need to reach those not currently served by that program. Kentucky’s T2 Program, as part of the LTAP, applied for and received an Accelerating Safety Activities Program (ASAP) grant. The purpose of the grant is to provide local government with the ability to attend the Traffic Safety Academy at no cost and to enhance their understanding of traffic control devices, high friction surfaces for curves, the safety edge, etc. The academy addressed all of FHWA’s Nine Proven Safety Countermeasures.

The Traffic and Safety Academy is designed to offer training to local governments to reduce roadway departure and pedestrian fatalities. The Academy included 16 topics in four training tracks. Specific topics include:
1. Technology: Examining Crash Data, GIS Mapping, Asset Management
3. Design (Addresses Pedestrian Safety & Intersection focus areas): Intersection Safety and Alternative Designs, Pedestrian and Bicycle Safety, Guardrail Installation, Systemic Safety
4. Assessment (Addresses Roadway Departure focus area): Horizontal Curve Alignment, Road Safety Audits, Sign Retroreflectivity, Traffic Management and Inspection, Low-Cost for Rural Roads, Safety Edge

Participants were given many opportunities to interact with each other to find out what others are doing in their areas. Also, having equipment demonstrations allowed them to see what is available to complete road projects or safety improvement plans in their community.

“It’s all very beneficial information and helps in my job,” said Doug Boom, city of Henderson.

Since the time we have held the Traffic and Safety Academy, there have been several requests from other local agencies that wish to participate in the Academy.
POLICE TRAINING PROGRAM TO IMPROVE TRAFFIC CRASH DATA

The purpose of this project was to develop training materials and conduct pilot training for police officers to improve the quality of traffic crash data. A focus of the training was to highlight crash data elements incorrectly entered into the crash system and to demonstrate proper application of descriptive human factor codes. The final product was a course on data quality considerations for KYOPS (Kentucky’s Open Portal Solution which is a repository of crash data received from all police agencies) for presentation to new officers after they receive collision investigation training. The training was developed as an on-line interactive course which included a video, crash data input, voice commentaries, and a quiz to test learning levels. Modules included the need for accurate crash data, details of the proper interview, narrative, assigning human factors, correct location input, and use of mapping software. Specific goals were: 1) to decrease the number of ambiguously coded human factors such as inattention from 45% in 2010 to 20% in 2014; 2) to reduce the percentage of paper reports from 2.1% in 2010 to 0% in 2014; and 3) to reduce the percentage of incorrect locations from 8% in 2010 to 3% in 2014.

The expected results from the training are overall improvements in the quality of traffic crash data, which can benefit safety professionals attempting to identify problems and offer countermeasures to reduce crashes.

CURRENT PROJECTS
1. Evaluation of Commercial Truck Parking and Related Issues
2. Spatial Database for Intersections
3. Permitted Left Turn Guidance
4. Roadside Analysis Rating
5. Geometric Design Training
6. Wet-Nighttime Delineation Evaluation
7. Development of Safety Performance Functions
8. Crash Plug-ins for Desktop Apps
9. Signal System Performance
10. Two-Lane Road Capacity

KY Crash Data Location Glitches Plotted by GPS
Despite Widespread Use of a Mapping System
OVERVIEW OF PLANNING AND EDUCATION PROGRAM

Good planning is fundamental to the successful completion and good performance of all transportation projects. Planning is also among the most interdisciplinary of transportation functions. Planners are, or work with, engineers, urban developers, economists, policy analysts, geographers, environmental specialists, designers, architects, and a host of other disciplines. The role of the KTC Planning program is to coordinate research involving the transportation planning function across the various program areas of KTC and indeed, where possible, across the University. The Planning program conducts research on data and data processing for decision-making, travel models, advanced technologies, and multimodal transportation, almost always in conjunction with other KTC programs.

An example project for 2013 was KTC’s support of the Kentucky Transportation Cabinet’s Vision 2035 Team and Long-Range Transportation Plan efforts. KTC attended all stakeholder and internal meetings for these programs, providing input to visioning and public participation aspects. KTC processed over 10,000 “Your Turn” survey responses, deriving over 5000 public comments and developing an ordered typology of ideas for the future of transportation in the Commonwealth.

Education underpins all we do at KTC. KTC specializes in multidisciplinary undergraduate, graduate and continuing education and certification. Working closely with the Departments of Civil Engineering, Geography, Public Policy, Economics and others, KTC has proposed a revitalized graduate certificate in transportation. This ten credit program allows students from many disciplines to receive a graduate certificate as a standalone credential, as a supplement to a graduate degree, or as a stepping stone on the path to a graduate degree.
## FINANCIAL SNAPSHOT

**FY2013 Expenditures**

<table>
<thead>
<tr>
<th>Category of Expenses</th>
<th>Research **</th>
<th>Technology Transfer***</th>
<th>CTI Academy</th>
<th>Advanced Institute</th>
<th>Total Program</th>
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<tbody>
<tr>
<td>Personnel</td>
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<td>$684,024</td>
<td>$6,323</td>
<td>$24,363</td>
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<td>Operating</td>
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<td>Equipment</td>
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<td>Indirect Costs and Admin Support</td>
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<td>$5,119</td>
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<td><strong>Total Program</strong></td>
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<td>$1,210,596</td>
<td>$16,034</td>
<td>$37,618</td>
<td>$11,289,818</td>
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*Expenditure detail by subcategory of expense is available on request (1-800-432-0719)

**The research program for FY 13 consisted of over 100 projects conducted for numerous agencies and organizations. Primary research sponsors included the Kentucky Transportation Cabinet, the Federal Highway Administration, the Federal Motor Carrier Safety Administration, and the US Department of Homeland Security. KTC partnered with the University of Louisville, the University of Tennessee, the Asphalt Institute, and several other research organizations. Also, KTC continued a unique partnership with the US Army Corps of Engineers focused on inland waterways and continued as a partner with Marshall University in a University Transportation Center consortium funded by USDOT’s Research and Innovative Technology Administration.

***Technology Transfer includes workforce training and technical assistance.

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### Expenditures by Program Area (FY 2013)

- Research: 89%
- Technology Transfer: 0.3%
- CTI Academy: 0.1%
- Advanced Institute: 11%

### Expenditures by Expense Category (FY 2013)

- Personnel: 51%
- Operating: 31%
- Equipment: 16%
- Indirect and Admin Support: 2%

### Funding Sources

- Cabinet SPR: 42%
- Cabinet Other: 14%
- Federal Transportation (FedTrak™): 8%
- UTC: 7%
- Other: 9%
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<th>Report Number</th>
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<tr>
<td>KTC-13-2/SPR449-12-1F</td>
<td>“Assessment of Kentucky’s Road Fund,” Bryan Gibson, Dwight V. Denison,</td>
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<td></td>
<td>Candice Y. Wallace, Christopher Jepsen, Doug Kreis, and Joseph D.</td>
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<td>Crabtree</td>
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<td>KTC-13-7/SPR441-12-1F</td>
<td>“Evaluation of Alternative Snowplowable Markers and Snowplowing</td>
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<td>Procedures,” Kenneth Agent and Jerry Pigman</td>
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<td>KTC-13-8/KSP1-12-1F</td>
<td>“2013 Safety Belt Usage Survey in Kentucky,” Kenneth R. Agent, Eric</td>
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<td>Green, and Tony Fields</td>
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<td>KTC-13-9/FRT199-13-1F</td>
<td>“Utilization of Mobile LiDAR to Verify Bridge Clearance Heights on</td>
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<td>the Western Kentucky Parkway,” Brad Rister, Levi McIntosh and Joe</td>
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<td>KTC-13-10/TA25-06-1F</td>
<td>“A Case Study Analysis of the Kentucky Transportation Cabinet</td>
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<td>Design/Build Pilot Projects,” Paul Goodrum, Moin Uddin, and Bradley</td>
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<td>KTC-13-11/SPR443-12-1F</td>
<td>“Evaluation of Mechanically Stabilized Earth Walls for Bridge Ends</td>
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<td>in Kentucky; What’s Next?,” Charlie Sun and Clark Graves</td>
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<td>KTC-13-12/KSP4-11-1F</td>
<td>“2013 Driver Attitudes and Awareness Survey,” Kenneth Agent, Eric</td>
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<td>Green and Ronald E. Langley</td>
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<td>Green, Kenneth Agent, and Jerry Pigman</td>
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<td>KTC-13-15/FRT190-11-1F</td>
<td>“Tools for Applying Constructability Concepts to Project Development</td>
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<td>(Design), Nikiforos Stamatiadis, Paul Goodrum, Emily Shocklee, Roy</td>
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<td>Sturgill and Chen Wang</td>
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<td>KTC-13-16/RFT126-03-1F</td>
<td>“Repair of I-65 Expressway Bridges Using Carbon Fiber Reinforced</td>
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<td>Polymer (CFRP) Composites,” Ching Chiaw Choo, Abheetha Peiris, and</td>
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<td>KTC-13-17/KH51;52-06-1F</td>
<td>“Repair Using Steel Fiber Reinforced Polymer on US 150 Bridges,”</td>
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<td>Ching Chiaw Choo, Abheetha Peiris, and Issam Harik</td>
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<td>KTC-13-18/UTCNURAIL1-12-1F</td>
<td>“An Overview of US Commuter Rail,” Timothy Brock and Reginald</td>
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<td>KTC-13-19/UTC005-12-1F</td>
<td>“Workforce Assessment of Inland Waterway Industry: A Survey of</td>
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<td>Current and Future Training and Personnel Needs,” Lenahan O’Connell</td>
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<td>and Timothy Brock</td>
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<td>KTC-13-21/RSF27-12-1F</td>
<td>“Kentucky’s PRISM-Based Automated Ramp Screening System Evaluation,”</td>
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<td>Jerry Kissick, David Hunsucker, Andrew Martin, Jennifer Walton and</td>
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<td>KTC-13-22/SPR411-11-1F</td>
<td>“Updating the Kentucky Contract Time Determination System”</td>
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<td>Timothy Taylor, Paul Goodrum, Michael Brockman, Barry Bishop, Yongwei</td>
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<tr>
<td></td>
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