

*Kansas*  
*Department of Transportation*

*Research, Development*  
*and*  
*Technology Transfer*

*Procedures Manual*

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**KANSAS DEPARTMENT OF TRANSPORTATION**

**Research, Development and Technology**

**Transfer Procedures Manual**

**Revised by:**

**Assistant Bureau Chief**

**Bureau of Research**

**in cooperation with**

**U. S. Department of Transportation**

**Federal Highway Administration**

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# TABLE OF CONTENTS

TABLE OF CONTENTS.....	iii
FOREWORD .....	v
1.0 PURPOSE, GOALS AND POLICIES.....	1
1.1 Background.....	1
1.2 Purpose .....	2
1.3 Authority.....	2
1.4 Definitions .....	2
1.5 Research Policy .....	3
1.6 Mission of the Bureau of Research.....	3
1.7 Seven Keys to Building a Robust Research Program.....	4
1.8 Strategic Goals.....	4
1.9 Organizational Structure.....	4
2.0 RD&T INTERACTION.....	7
2.1 Customer Support Development .....	7
2.2 KDOT Research Committees .....	8
2.3 Transportation Research Board .....	14
3.0 PROGRAM DEVELOPMENT .....	17
3.1 Solicitation of Research Ideas .....	17
3.2 Project Prioritization.....	19
3.3 FHWA Research Work Program Requirements.....	23
4.0 PROGRAM EVALUATION .....	25
4.1 Project Level Reporting.....	25
4.2 Overall Program Performance .....	28
4.3 Peer Exchange .....	32
5.0 TECHNOLOGY TRANSFER.....	33
5.1 Outline of Activities .....	33
5.2 TRB’s Transportation Research Information Services (TRIS) .....	34
5.3 Local Technical Assistance Program (LTAP).....	35

**TABLES**

Table 1. Research Committees..... 10

**FIGURES**

Figure 1. KDOT Organization Chart ..... 5  
Figure 2. Research Unit Organization Chart..... 6  
Figure 3. KDOT Research Organization..... 9  
Figure 4. Procedure for K-TRAN Research Implementation ..... 31

**APPENDIX**

Attachment A: SOM 1.5.2 Research, Development and Technology Transfer Projects..... 36  
Attachment B: Form – Research Project Idea ..... 43  
Attachment C: K-TRAN Program..... 44  
Attachment D: Form – K-TRAN Preproposal Ranking Sheets ..... 53  
Attachment E-1: Form – KDOT Research Project Implementation..... 53  
Attachment E-2: Form – KDOT Research Project Implementation Review..... 59  
Attachment E-3: Form – KDOT Research Project Implementation Plan – Independent Review ..... 60  
Attachment E-4: Guidelines for Estimating Triennial Benefits of K-TRAN Research Projects..... 61  
Attachment F-1: Checklist for University Research (K-TRAN) Project Monitors ..... 79  
Attachment F-2: KDOT Research Report Style Guide ..... 86  
Attachment G: SOM 1.14.2 Evaluation of New Products and Procedures for Construction and  
Materials..... 103  
Attachment H: SOM 1.8.4 Transportation Research Board Publications..... 107

## **FOREWORD**

This manual describes the organization of and procedures for conducting research, development and technology transfer (RD&T) activities performed or sponsored by the Kansas Department of Transportation (KDOT). These procedures are followed for all Federal and State funded RD&T projects conducted by KDOT or any party appointed by KDOT to conduct RD&T projects.

This manual describes all aspects of research administration, addresses responsibilities of groups and individuals with RD&T related assignments and explains in detail the steps to be taken from identification of research needs through reporting and implementation of results.

The purpose of the manual is to organize and document all currently used RD&T procedures in one source document. The manual will serve as a resource for management and staff and is designed to document the KDOT RD&T management process to meet the requirements of the Federal Highway Administration as defined in 23 CFR, Part 420. Related KDOT documents and forms, such as KDOT Standard Operating Manual (SOM) policies, are included as attachments in an appendix to the manual. Other RD&T related documents and manuals such as the American Association of State Highway and Transportation Officials (AASHTO) Research Advisory Committee (RAC) Handbook that are referenced in the manual are available from the Assistant Bureau Chief of Research or on the Internet.

Questions concerning interpretation of the contents of this manual should be directed to the Assistant Bureau Chief of Research at the following:

Kansas Department of Transportation  
2300 SW Van Buren St.  
Topeka, KS 66611-1195

(785)291-3845  
(785)296-2526 FAX

## **1.0 PURPOSE, GOALS AND POLICIES**

### **1.1 Background**

Research, one of the principal missions of the first national highway program in the United States is, in fact, the oldest continuous federal highway activity. The Federal Highway Act of 1921 authorized the first sustained fiscal support for highway research. Support for highway research was reaffirmed in the Federal-Aid Highway Act of 1962, which mandated funds for planning and research purposes only. The Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 required that a minimum of 25% of the State Planning and Research (SPR) funds shall be expended on research, development and technology transfer activities. This requirement was continued in the Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21) of 1998 and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) which was signed on August 10, 2005.

The Moving Ahead for Progress in the 21st Century Act (MAP-21), enacted in 2012, included provisions to make the Federal surface transportation more streamlined, performance-based, and multimodal, and to address challenges facing the U.S. transportation system, including improving safety, maintaining infrastructure condition, reducing traffic congestion, improving efficiency of the system and freight movement, protecting the environment, and reducing delays in project delivery.

Fixing America's Surface Transportation (FAST) Act on December 4, 2015, builds on the changes made by MAP-21.

Funding for Federal Highway Administration's (FHWA's) Research and Technology (R&T) Program is provided under Title 23 of the U.S. Code, Chapter 5: Research, Technology, and Education, as amended by Division A, Title VI of the Fixing America's Surface Transportation (FAST) Act. The FAST Act provides authorization for FHWA to use funds from the Highway Trust Fund in fiscal year (FY) 2016 through FY 2020 to conduct R&T activities, which include the FHWA-administered Highway Research and Development Program (HRD), the Technology and Innovation Deployment Program (TIDP), and the Intelligent Transportation Systems (ITS) Program.

Additionally, States are required to set aside funds for the State Planning and Research (SP&R) Program. Funding is provided for SP&R by a 2 percent set-aside from each State's apportionments of five programs: the National Highway Performance Program (NHPP); the Surface Transportation Block Grant Program (STBGP); the Highway Safety Improvement Program (HSIP); the Congestion Mitigation Air Quality Improvement Program (CMAQ) Program; and the National Highway Freight Program (NHFP). At least 25 percent of these funds (approximately \$180 million per year) must be used for research, development, and technology purposes. States use these funds to conduct research aimed at solving specific transportation issues at the State level, or States may leverage these funds by applying them toward Transportation Pooled Fund projects. States can also use these funds as the non-Federal match

for Local/Tribal Technical Assistance Program Centers and for the University Transportation Centers.

## 1.2 Purpose

The purpose of the manual is to organize and document all currently used RD&T procedures in one source document. The manual will serve as a resource for management and staff and is designed to document the KDOT RD&T management process to meet the requirements of the Federal Highway Administration as defined in the Code of Federal Regulations (CFR) under 23 CFR, Part 420. One goal of this effort is to improve the overall effectiveness of research. By identifying the various functions of KDOT's Bureau of Research and giving procedural information about research operations, this manual will produce a general model of the research management system. The programs, projects and products generated by the Bureau of Research using the management system are provided for the benefit of KDOT, its employees and other transportation agencies and users. To promote the effectiveness of the research process and program, several key objectives are followed in the manual:

- Determining the usefulness and implementation potential of the research,
- Inclusion of short term research results in a long-term program,
- Assessing research using project and program accomplishments,
- Improving research through the coordination of several disciplines, and
- Determining the continuation potential of a research project based on a periodic review of its progress.

## 1.3 Authority

The authority for the state transportation Division of Operations is found in K.S.A. 75-5007. The Bureau of Research operates within the Division of Operations. The responsibilities for the Bureau of Research are stated in the Kansas Department of Transportation's Responsibility and Statutory Authority document. The authority for a state research organization to use federal funds is found in 23 U.S.C. 505. The authority for the state to administer the SPR funds in their program is found in 23 CFR, Part 420, Subpart B.

## 1.4 Definitions

The following definitions are as defined in 23 CFR, Part 420, Subpart B, Section 420.203:

*Research* means a systematic study directed toward fuller scientific knowledge or understanding of the subject studied. Research can be basic or applied.

*Basic research* means the study of phenomena, and of observable facts, without specific applications towards processes or products in mind; the primary purpose of this kind of research is to increase knowledge.

*Applied research* means the study of phenomena to gain knowledge or understanding necessary for determining the means by which a recognized need may be met; the primary purpose of this kind of research is to answer a question or solve a problem.

*Development* means the systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems or methods, including design and development of prototypes and processes.

*Technology transfer* means those activities that lead to the adoption of a new technique or product by users and involves dissemination, demonstration, training, and other activities that lead to eventual innovation.

Most of the research sponsored and conducted by KDOT is applied research done to find solutions to specific problems or to develop/implement new products and procedures. Much of the in-house research is related to evaluation of experimental features, development of procedures, specifications and tests to implement new technology, and review of field-related problems to find solutions or improvements.

## **1.5 Research Policy**

The Department has a strong commitment to support research, development and technology transfer activities (RD&T) in the Bureau of Research. While the focal points of RD&T activities are in the Bureau of Research and the Kansas Transportation Research and New-Developments (K-TRAN) Program operated in conjunction with KU and KSU, the Department advocates an interest and involvement in these activities by all KDOT staff members. Activities such as submitting research ideas, implementing research results, providing or monitoring test sections, and administering K-TRAN or other research projects are all important RD&T functions and examples of the involvement and commitment desired from staff.

Management support of RD&T activities will be provided through advocacy, funding, and a willingness to promote implementation of research findings.

## **1.6 Mission of the Bureau of Research**

The mission of the Bureau is:

- To support and encourage innovation throughout the Department by promoting research, development and implementation (RD&T) activities.
- To evaluate problems as they arise during standard construction and maintenance field operations and provide timely responses.
- To serve as an information resource for agency management.

While in-house RD&T activities of the Bureau are primarily focused on highway construction and maintenance materials, products and procedures, the Bureau supports all functional areas through general administration of the K-TRAN Research Program and by providing technical information to management.

A goal of the Bureau is to be service oriented and provide timely responses to the wide array of questions and requests received.

### **1.7 Seven Keys to Building a Robust Research Program**

KDOT is committed to a robust research program, one that is a vital part of the organization. The NCHRP Synthesis of Practice 280, describes the seven keys to a robust research program:

1. Found It on Trust
2. Market Boldly
3. Root It in Economics
4. Make Deals Unabashedly
5. Insist on Accountability
6. Embrace Policy Research
7. Empower the Staff

### **1.8 Strategic Goals**

The “Benefit to Cost Ratio of K-TRAN projects” output measure is formally reported in the K-TRAN Status Report. This report is presented to the Research Program Council at their meeting each spring and fall.

### **1.9 Organizational Structure**

The general KDOT organizational structure is shown in Figure 1. Responsibility for the RD&T function is given to the Bureau of Research in the Division of Operations. The Bureau of Research performs or coordinates essentially all the RD&T functions of the agency as related to the use of Federal funds. The Bureau of Research organization is shown in Figure 2. Other Bureaus are authorized to perform RD&T activities using state funds upon approval by the State Transportation Engineer and the Bureau Chief of Research.

July 25, 2017

# Kansas Department of Transportation

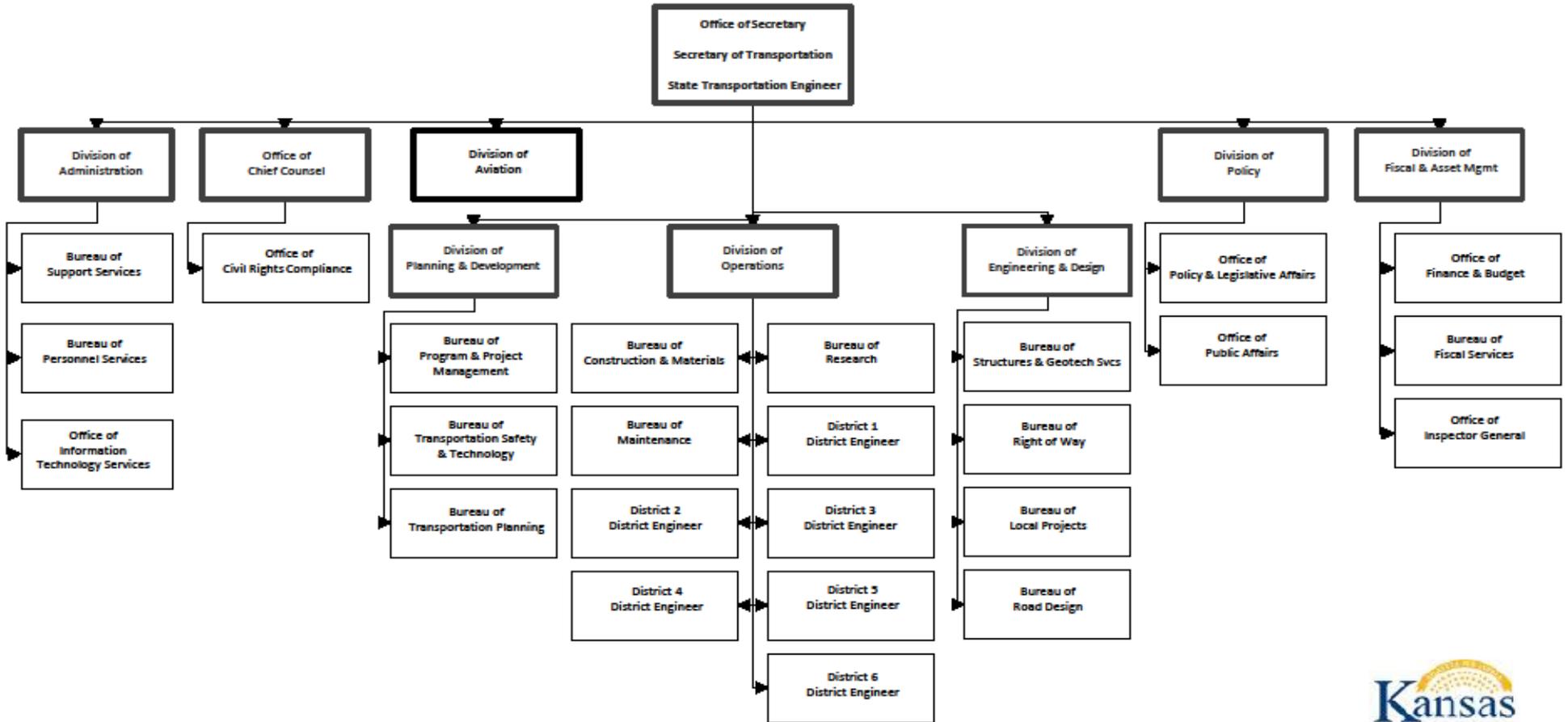
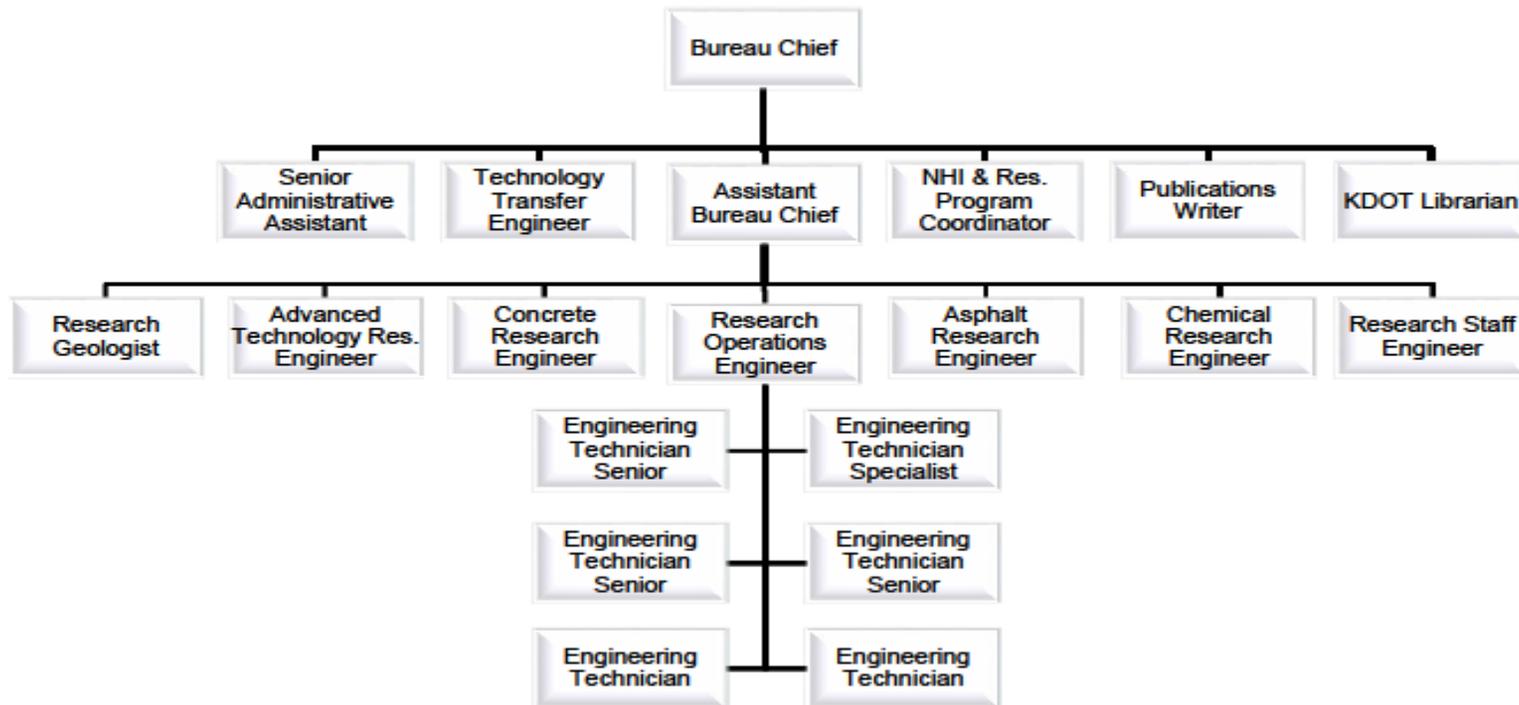


Figure 1.

## KDOT Bureau of Research



8/31/2017

Figure 2.

## **2.0 RD&T INTERACTION**

### **2.1 Customer Support Development**

#### **2.1.1 Purpose**

In Section 1.0, Purpose, the programs, projects and products of research were stated to be for the benefit of the Agency, its employees and other transportation agencies and users. Attaining this objective requires the support of our customers. Customer support can best be achieved by involving them in the process of developing the program and participating in the research process. Participation throughout the process allows their needs and interests to be considered.

#### **2.1.2 Process**

##### **2.1.2.A Outreach Partners**

Research partners come from the ranks of the agency, universities, companies affiliated with transportation (trucking firms, suppliers, contractors, etc.), consultants, local governments, other state departments of transportation, national and regional associations, FHWA, and the public. The partners involved, and their level of involvement will be different throughout the process.

##### **2.1.2.B Methods of Inclusion**

###### **B.1 Public/Private Meetings**

Public and private session meetings with the various research partners, industries, university transportation centers, suppliers, contractors, transit authorities and local governments allow the different institutions to give their input on specific issues, while coming to understand their effect on other institutions. Examples include scheduling supplier presentations to staff, ACPA and KAPA field tours, etc. Meetings are typically held for the purposes of implementation and technology transfer rather than identification of new research topics.

###### **B.2 Committees**

Industry partners may be represented on specific committees, as defined in Section 2.2, Research Committees Structure. A committee serves as the most formal of the interactive techniques and provides non-agency institutions the opportunity to affect policy as voting members.

###### **B.3 Institutional Discussions**

Public/private meetings with individual companies and institutions are held regularly. For example, specific material suppliers and/or contractors, usually through their associations, meet regularly to exchange ideas. Implementation of new technologies affecting the industry is discussed through these forums. Meetings with universities and University Transportation Centers are held to discuss their programs. Meetings and involvement in regional and national

organizations such as the Transportation Research Board (TRB) and American Association of State Highway and Transportation Officials (AASHTO) committees is encouraged as a means to share information and experiences.

#### **B.4 Seminars, Conferences, Workshops**

Agency sponsored seminars, conferences and workshops are used to introduce and discuss broader issues with researchers, users and other experts in a specific field. These meetings offer presentations and discussions directed to advance understanding of issues and promote research efforts for the Agency. Staff members serve on advisory and planning committees related to jointly organized meetings and conferences.

#### **B.5 Requests for Research**

Research ideas are solicited annually each summer from KDOT staff members and institution/industry partners. Section 3.1, Solicitation of Research Ideas, defines the process.

##### **2.1.2.C Procedures**

#### **C.1 Committees Activities**

Committees and their activities are defined in Section 2.2, Research Committees Structure. The procedures to be followed for the committees are also described in that section. The committees perform several functions, namely, assist in the development of the strategic plan, prioritize projects, monitor the progress of projects or discuss the formation of the research work program with Agency management.

#### **C.2 Feedback**

All participants in the annual research idea solicitation process will be given feedback on the results. The program development process will result in a research work program that will be sent to all participants and agencies that submitted research ideas and research project statements.

##### **2.1.3 Product**

The success of a research program hinges on our ability to develop strong and lasting interactive relationships with all the beneficiaries of research. Continuing communications with outreach partners will assist the Agency with program development, consensus building, implementation assistance, technical input and the strengthening of partnerships.

#### **2.2 KDOT Research Committees**

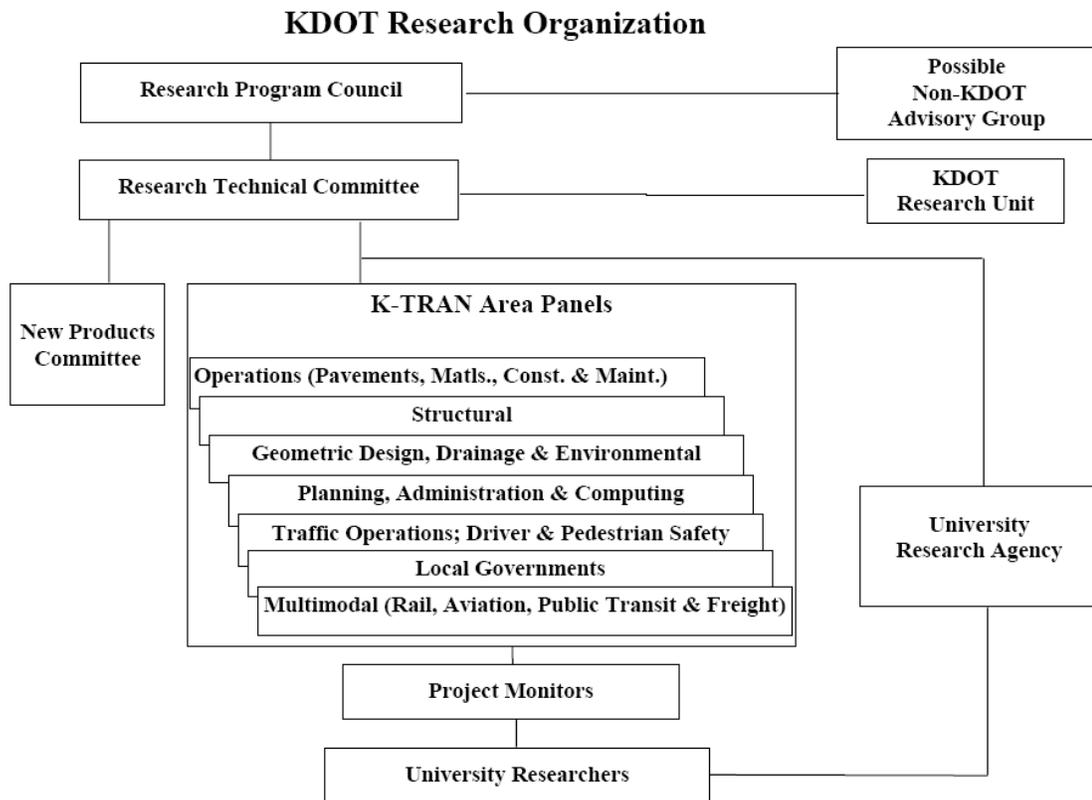
KDOT supports RD&T activities and advocates interest and involvement in these activities by all KDOT staff members. Research committees are organized for specific purposes as described in SOM 1.5.2 but they share the same goals: to prioritize research needs, promote needed

research, and assist with technology implementation. Responsibilities and relationships of the research committees are described in following sections.

### 2.2.1 Committee Membership and Organization

#### 2.2.1.A Research Organization

The KDOT research committee organizational structure is shown in Figure 3. KDOT uses a three-tier organizational structure for research oversight. The duties of each committee are described in Section 2.2.2 Committee Responsibilities. Current committee members and contact information is available on the KDOT web site. Members of each committee are shown in Table 1.



**Figure 3.**

**Table 1.  
Research Committees**

<p><b>Research Program Council</b></p> <p>Secretary of Transportation, Chair  State Transportation Engineer, Vice Chair  Dean, School of Engineering, KU  Dean, College of Engineering, KSU  Chief Engineer, Kansas Turnpike Authority  Two Private Sector Members  FHWA Division Administrator  Chief, Bureau of Research, Secretary, ex officio</p>
<p><b>Research Technical Committee</b></p> <p>Assistant Bureau Chief of Research, Chair  Technology Transfer Engineer, Secretary</p> <p><u>At-Large Members:</u>  Chief, Bureau of Construction and Materials  Chief, Bureau of Computer Services</p> <p><u>Area Panel Leaders:</u>  Operations; Pavements, Materials, Construction &amp; Maintenance - Chief, Bureau of Research, Vice-Chair  Structural &amp; Geotechnical - Chief, Bureau of Structures and Geotechnical Services  Geometric Design, Drainage &amp; Environmental - Chief, Bureau of Road Design  Planning, Administration &amp; Computing - Chief, Bureau of Transportation Planning  Traffic Operations; Driver &amp; Pedestrian Safety - Chief, Bureau of Transportation Safety and Technology  Local Government - Chief, Bureau of Local Projects  Multimodal; Rail, Aviation, Public Transit &amp; Freight - Assistant Chief, Bureau of Transportation Planning</p> <p><u>In addition, the following will be notified of all updates from the Research Technical Committee:</u>  Two representatives each from the University of Kansas and Kansas State University  One representative from the FHWA, Kansas Division</p>
<p><b>K-TRAN Area Panel Members</b></p> <p>The Area Panel Leader is the Chair of their panel. One or more representatives from the FHWA, KU and KSU are appointed to serve on each panel. Each agency appoints their member or members to the Area Panels.</p>
<p><b>New Products Committee</b> (see SOM 1.14.2 for most current)</p> <p>Assistant Chief, Bureau of Construction and Materials  Chief, Bureau of Road Design  Chief, Bureau of Structures and Geotechnical Services  Chief, Bureau of Local Projects  Materials Management Engineer, Bureau of Construction and Materials, Vice Chair  Technology Transfer Engineer, Chair  Engineer of Tests  Chief, Bureau of Transportation Safety and Technology  Chief, Bureau of Maintenance, Engineering Coordinator, FHWA (ex-officio)</p>

## **2.2.2 Committee Responsibilities**

### **2.2.2.A Research Program Council Responsibilities**

The Research Program Council sets policy and approves the annual K-TRAN Program from a prioritized candidate list of research project statements developed by the Research Technical Committee. This is completed by February 15<sup>th</sup> each year for the following fiscal year so the contracts can be completed by deadlines.

### **2.2.2.B Research Technical Committee Responsibilities**

The responsibilities of the Research Technical Committee are as follows:

- Develop knowledge of the needs for research and development in transportation, both at KDOT and throughout the State, and promote the submission of research ideas and research project statements.
- Annually solicit research ideas from KDOT staff, university faculty, other agencies, groups, or individuals.
- Receive and consider research ideas, needs, suggestions, problem statements, and proposals.
- Act upon reports received related to the research and development projects recommended by the committee.
- Assign research project statements to Area Panels for detailed evaluation.
- Prioritize and recommend K-TRAN research project statements to the Research Program Council for approval.
- Assist with the implementation of successful technologies.
- Document implementation activities and benefits of RD&T.
- Monitor the progress on active RD&T Projects and encourage the expedient completion of all such projects.
- Encourage and assist in the dissemination of information concerning transportation RD&T to KDOT staff.

### **2.2.2.C K-TRAN Area Panel Responsibilities**

The responsibilities of the Area Panels are as follows:

- Develop knowledge of research and development needs in transportation, both at KDOT and throughout the State, in the Area Panel specialty area.
- Promote submission of research project statements to K-TRAN by interacting with university faculty and KDOT staff. This will include identifying researchers and determining budgets for research projects.
- Review and prioritize research project statements assigned by the Research Technical Committee.
- Assign a KDOT staff person as Project Monitor for each research project assigned to the Area Panel. The person assigned will be responsible for executing the research project agreements with the University, monitoring research progress, and reviewing draft research reports. The person assigned should be familiar with the topic being researched.

### **2.2.2.D New Products Committee Responsibilities**

The responsibilities of the New Products Committee are as follows:

- The committee will determine whether new products, procedures, and technologies satisfy the criteria for acceptance as stated in Evaluation Criteria in SOM 1.14.2.
- Individual members will evaluate or assign evaluation of products, procedures, etc. in their respective area of expertise and make a recommendation for consideration of the full committee.
- Individual members will draft specifications for review by the Assistant Chief, Bureau of Research, submit a policy statement, new product announcement, and prepare a plan for implementation of high payoff items as judged by the full committee.
- Meet periodically to review procedures.

More details are included in SOM 1.14.2 (See Attachment G) on the procedures and forms used by the New Products Committee. Products reviewed by the committee are those different than those currently described in the specifications. New products approved by the committee can be found on the Intranet. Products approved for use under the standard specifications and special provisions are shown in the Pre-Qualified Products Listing (PQL) which is also on the Internet.

### 2.2.3 Research Project Development Schedule Guidelines

<u>Item</u>	<u>Date*</u>
Solicit research ideas from KDOT staff, local government staff, Kansas Turnpike Authority, University faculty and Industry associations.	June 1
Research ideas due to Bureau of Research	July 15
All K-TRAN research project contracts signed	Aug. 1
Send KDOT Research Needs to University	Aug 1
Host <u>Research Needs Day</u> for University and KDOT staff	Aug. 15
Research Program Council meets to review ideas, program status & set policy	Sept. 15
Request for K-TRAN research project statements from KU & KSU	Oct. 1
K-TRAN research project statements due (aka. RPS/Preproposals)	Oct. 31
Assistant Bureau Chief of Research assigns RPS to area panels	Nov.15
Area panel evaluations completed	Dec. 31
Research Technical Committee prioritizes RPS into a “candidate project list”	Jan. 15
Research Program Council meets to approve K-TRAN program and budget	Feb. 15
Assist. Bureau Chief of Research assigns new K-TRAN projects to area panels	Mar. 1
Area Panel Leaders assign Project Monitors (submit names to ABC, Research)	Mar. 15
Assist. Bureau Chief of Research provides project related information to all University and KDOT staff involved in new projects	Apr. 1
Assist. Bureau Chief of Research provides orientation and training to Project Monitors	Apr. 1
<b>For early start projects (before July 1), contracts prepared and signed</b>	<b>May 1</b>
<b>For projects starting July 1, detailed proposals are prepared for each project by Principal Investigator and approve by Project Monitor</b>	<b>June. 1</b>

\*approximate dates

## 2.3 Transportation Research Board

The Transportation Research Board (TRB) is a division of the National Research Council, which serves as an independent adviser to the federal government and others on scientific and technical questions of national importance. The National Research Council is jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine. The mission of the Transportation Research Board—one of six major divisions of the National Research Council—is to promote innovation and progress in transportation through research. In an objective and interdisciplinary setting, the Board facilitates the sharing of information on transportation practice and policy by researchers and practitioners; stimulates research and offers research management services that promote technical excellence; provides expert advice on transportation policy and programs; and disseminates research results broadly and encourages their implementation.

### 2.3.1 TRB State Representative

The Bureau Chief of Research is the designated TRB State Representative for KDOT. The TRB representative informs KDOT staff about TRB activities, receives all TRB publications, and advises TRB of current and contemplated research activities of the department.

General responsibilities of the TRB representative are as follows:

- Maintain an awareness of general procedures concerning the operation of TRB committees, NCHRP, Transportation Research Information Services (TRIS), and other special activities;
- Keep others in the Agency and other related state agencies informed of TRB activities;
- Recommend qualified people for membership in TRB committees and panels;
- Report initiation of new research in the RiP Database;
- Maintain a distribution list of KDOT personnel who receive TRB materials
- Coordinate responses to TRB-initiated solicitations and questionnaires;
- Assist TRB staff members in scheduling meetings with Agency personnel during field visits;
- Submit items for consideration for the *TR News*; and
- Encourage Agency personnel to submit papers for presentation at TRB meetings and for publication.

KDOT activities with TRB are covered in SOM 1.8.4, Transportation Research Board (See Attachment H).

#### 2.3.1.A Transportation Research Information Services (TRIS)

TRB's Transportation Research Information Services includes the TRB Library and the TRB Databases which are available for free on the TRB website.

- TRID, the TRIS and ITRD Database  
TRID is the world's largest and most comprehensive bibliographic source on transportation information. It contains more than 1.1 million records of published and

ongoing research, covering all modes and disciplines of transportation. See Section 2.3.1.A.1 below for more detailed information about TRID.

- **Research in Progress (RiP) Database**  
RIP contains more than 14,000 current or recently completed transportation research projects, mostly those funded by the modal administrations of the U.S. Department of Transportation, state Departments of Transportation (DOTs), or by TRB's cooperative research programs.
- **Research Needs Statements (RNS) Database**  
An important function of TRB is to stimulate research that addresses issues facing the transportation community. In support of this function, TRB Technical Activities standing committees identify, develop, and disseminate research need statements (RNS) for use by practitioners, researchers, and others.
- **TRB Publications Index**  
PubsIndex contains bibliographic information on more than 70,000 papers, articles, and reports published by the Highway Research Board, Transportation Research Board, Strategic Highway Research Program, and the Marine Board.
- **Practice Ready Papers (PRP) Database**  
PRP contains papers that are defined as those in which the research results presented and discussed contribute to the solution of current or future problems or issues for practitioners. Information presented in these papers is ready for immediate implementation or requires minimal additional research or implementation effort.
- **TRB Library**  
The TRB Library provides reference service to sponsors and staff and offers interlibrary loan service. It is open to the public by appointment. The library's collection includes US DOT, AASHTO and related transportation organization publications and has a number of transportation and engineering monographs and journals in the general collection.

### **A.1 Transport Research International Documentation (TRID) Database**

In 2011, TRB partnered with the members of International Transport Research Documentation (ITRD) to release TRID, the TRIS and ITRD Database. TRID is the world's largest and most comprehensive bibliographic resource on transportation research information. It is produced and maintained by the Transportation Research Board of the US National Academies with sponsorship by State Departments of Transportation, the various administrations at the U.S. Department of Transportation, and other sponsors of TRB's core technical activities. ITRD is produced by ITRD member organizations under the sponsorship of the Joint Transport Research Centre (collectively JTTC) of the International Transport Forum and Organization for Economic Cooperation and Development (OECD) and ITRD.

The Bureau of Research staff searches TRID directly via the Internet. The KDOT Library staff also provide services, such as topical searches, for other KDOT staff upon request.

## **A.2 TRB Publications**

TRB distributes a variety of publications. Full sets of all print publications are received by the KDOT Library and are maintained for future reference. As a TRB sponsor, KDOT is eligible to receive additional print copies of publications as needed. Requests should be sent to the KDOT Librarian, who will order the necessary copies from TRB. Electronic copies of all TRB publications are available to KDOT staff through the KDOT Electronic Library.

TRB publishes the following:

- *TR News*, a bimonthly magazine of TRB and transportation community activities;
- The Transportation Research Record series, documenting research papers presented at the TRB Annual Meeting in January each year;
- The Transportation Research Circular series, documenting presentations and committee activities;
- CRP (NCHRP, TCRP, etc.) Project Reports and Synthesis Series, and
- Major policy studies and other special projects conducted through the work of project committees, staff, and consultants.

More information about TRB publications and KDOT's activities with TRB can be found in SOM 1.8.4, Transportation Research Board Publications (See Attachment H).

## **3.0 PROGRAM DEVELOPMENT**

### **3.1 Solicitation of Research Ideas**

#### **3.1.1 Purpose**

The solicitation for research ideas is used to identify research ideas for the in-house and K-TRAN work programs. Any emphasis areas arising from the Research Program Council meeting are included.

There are several benefits to this type of solicitation process. Field and operating staff can submit problems with the expectation of receiving an objective review. Agency contractors and suppliers can air their concerns within a formal review process. The academic community can use the emphasis areas to submit potential problems within their field of expertise.

#### **3.1.2 Process**

Solicitation requests are sent via e-mail to staff annually. All staff are encouraged to submit problem statements. A reminder note is sent near the end of the solicitation period.

Solicitation requests are also sent by e-mail to universities within the state with civil engineering and transportation research graduate programs. Local government officials and major associations/organizations representing contractors and suppliers associated with transportation activities also receive e-mail solicitation requests.

A form entitled RESEARCH PROJECT IDEA is included with the solicitation request. (See Attachment B). The form contains the following information: project title, problem statement, research objective, urgency, and application of results including cost/benefit relationship and submitter information.

All submitted research ideas are expected to be on this form when submitted to the Research Committees for review. The Assistant Bureau Chief of Research or other committee members may take ideas in any form and use the information to complete the forms.

#### **3.1.3 Submission Schedule and Details**

The Assistant Bureau Chief of Research will make the solicitation request to all potential submitters by June 1st each year. The problem statements can be submitted at any time for future review. Submitters typically have a submission deadline during the middle of August to be included in the review by the Research Program Council and inclusion in the research needs list for the upcoming fiscal year program. The review policy is flexible to allow for late needs. With Area Panel Leader approval, needs identified after the Research Program Council meeting may become project statements under consideration at any time prior to the winter Area Panel meetings.

### **3.1.4 Research Idea Screening**

All research ideas received are reviewed initially for appropriateness by the Research Program Council. Research ideas that are controversial, have been completed by others, are underway by others, should be completed with budgeted funds, are unlikely to be accomplished, or are unneeded are removed from the list. Ideas that can be addressed either by response or in-house research are identified and forwarded for appropriate action by the Bureau of Research or another appropriate Bureau. Some ideas originating from local government officials thought to have solutions available are forwarded to the Director of the Local Technical Assistance Program (LTAP) for response.

Approved K-TRAN research ideas become a needs list that is provided to the Research Technical Committee including the university liaison members. The list is also sent to other university contacts prior to the annual Research Needs Day that is held during late August. Each idea (need) is assigned to Area Panel Leaders who work with their area panel members to clarify the intent of each idea, to generate interest among faculty at the university and to expand the ideas into potential research project statements (also called preproposals). Each year on or near October 1st, a formal solicitation for research project statements is made to KU and KSU administration and faculty. Information about annual solicitation is maintained on the Internet (see Attachment C). Electronic copies of the numbered research project statements are typically due to the Assistant Bureau Chief of Research on or before October 31st.

## **3.2 Project Prioritization**

Setting priorities for the problems received in the solicitation process allows the agency to develop a work program within its budget. Prioritization allows the most important problems to be addressed and advanced for action. A work program depends upon an easily understood program development process. The prioritization portion of the process should be comprehensive in the scope of the selected projects, involve parties from a wide variety of experiences, be open for review to all parties and involve Agency management.

### **3.2.1 Research Project Statement (Preproposal) Screening**

The Chairman of the Research Technical Committee assigns preproposals received from the universities to the appropriate Area Panel Leader. The Area Panel reviews each assigned preproposal. The Area Panel will discuss the preproposals as they relate to:

- the function of the agency,
- the emphasis areas of the Research Program Council,
- the technical merits of each problem,
- the estimated cost of each problem, and
- the relative ranking of the preproposals according to evaluation guidelines.

The Area Panel members will discuss all problems submitted. Any questions about the intent of the principal investigator and KDOT needs are clarified. The assigned preproposals are prioritized by the Area Panel prior to a Research Technical Committee meeting scheduled in mid-January.

At the Research Technical Committee meeting, each Area Panel Leader makes a presentation on the preproposals assigned. Preproposals that are acceptable for funding are presented in priority order by university to the KDOT members of the Committee. The presentation includes the expected benefits and level of critical need to KDOT. Each KDOT Research Technical Committee member votes for preproposals in their priority order by university on a form provided for that purpose (See Attachment D). The Chairman tabulates the ballot results for presentation to the Research Program Council. The actions of the Committee are documented in the official minutes of the meeting (275I-2).

#### **3.2.1.A Evaluation Guidelines**

Guidelines have been developed to assist the Research Technical Committee in formulating and recommending research projects for inclusion in the annual program. These guidelines will be used during the review of research ideas for development into complete proposals for further consideration. The guidelines used are:

- Relevance to critical research needs of KDOT.
- Relevance of proposed research idea to the theme of K-TRAN.

- Amount of overlap of the proposed research idea with other programs or completed research. (Proposed research should not be targeted for research topics or issues currently underway through the current Highway Research Program, the National Cooperative Highway Research Program, other Cooperative Research Programs, or the Local Technology Assistance Program.)
- Duration of proposed research project. (Project statements should be prepared with the most cost-effective duration considering the required workload, typical length of graduate study programs and other factors. The correct length of time shown should result in the project being completed without any cost extensions.)
- Extent to which minorities and persons with disabilities are involved in the research, either as participants, recipients or beneficiaries.

### **3.2.2 Approval of Annual K-TRAN Program**

The Chairman of the Research Technical Committee provides a prioritized list of the preproposals for consideration by the Research Program Council at a meeting scheduled in mid-February. The Research Program Council should be updated on the process used to develop the list as well as any special situations. The Council will review the budget, discuss the recommendations of the Research Technical Committee, approve a final categorized list of projects, allocate funding, and discuss the policy implications of the recommendations. Any policy changes or emphasis areas for the next solicitation are also discussed. The actions of the Research Program Council are documented in the official minutes of the meeting (275I-1) and the annual K-TRAN Program spreadsheet.

### **3.2.3 Assignment of Project Monitors**

The Area Panel Leaders appoint a Project Monitor for each of the preproposals approved to become projects in the annual program. The Project Monitor serves as the official KDOT representative on the project and typically has expertise or knowledge about the subject that will be the focus of the research effort. The Project Monitor may create a technical advisory panel to assist with the project. The Project Monitor is responsible for negotiating the agreement with the university, supplying any data needed, monitoring progress of the research effort and recommending approval of the final report. Project monitor responsibilities and a checklist of activities to be performed are described in more detail in the "Checklist for University Research (K-TRAN) Project Monitors" available on the Intranet (Attachment F-1). Guidelines for research report organization and formatting for project authors are included in the "KDOT Research Report Style Guide" (Attachment F-2).

### **3.2.4 Approval of In-House Research Projects**

Research ideas received from the annual solicitation that are directed to the Bureau of Research by the Research Program Council, experimental feature projects, requests for development of specifications, test methods and/or procedures received from Management, and requests for assistance with technical design, materials, construction and/or maintenance problems that may require the adaptation of new technologies are usually directly assigned to the appropriate staff person by the Bureau Chief of Research or the Assistant Bureau Chief of Research. Expansion of the idea, experimental feature, et cetera, into a brief work plan is done without review and approval by the Research Technical Committee. Priorities are assigned based on how critical the need is for the results. This work effort may be accomplished with Federal SPR, Project (Federal or State) or Bureau of Research overhead (State) funds depending on the circumstances.

Research studies that are sufficient in scope to warrant a separate summary line item in the Annual SPR Work Program and Cost Estimate are approved in advance using the procedures described in SOM 1.5.2 (Attachment A). Other studies, experimental feature projects, et cetera, are included with the list under SPR Study 73-1 "Implementation of Research and Development Findings."

#### **3.2.4.A Approval of Transportation Pooled Fund Projects**

Proposed transportation pooled fund (TPF) projects are reviewed for potential KDOT participation on an ad hoc basis as soon after receipt of the solicitation as feasible. The process begins by directing the proposed work plan and other documentation to the bureau(s) with technical expertise to evaluate the project. If the bureau recommends participation, the request is then reviewed by the Technology Transfer Engineer, the Bureau Chief of Research and the Bureau Chief of Transportation Planning to determine if funds are available and gain concurrence. If all concur, a recommendation is made to the State Transportation Engineer to approve KDOT participation if the pooled fund project proceeds. The Technology Transfer Engineer then enters the commitment and Technical Advisory Committee (TAC) member on the TPF website. Notification is also sent to the TAC member and the FHWA Program and Projects Engineer.

If KDOT serves as a “lead state” on a TPF project, then administration is accomplished in similar fashion to other federally funded research projects. Approval is obtained for the total anticipated cost of the project and KDOT commitment. Once partners are found and needed funds committed, the project proceeds to contract. With approval of the State Transportation Engineer, the contractual process may proceed with in state universities before all funds are transferred to KDOT and obligated in advance. The KDOT (lead state) member of the Technical Advisory Committee (consisting of one member from each partner) serves as Chair of the TAC and also as the Project Monitor. An administrative contact is also named by each partner to assist with the transfer of funds and related paperwork. The Technology Transfer Engineer serves as the administrative contact for KDOT on TPF projects. On TPF projects to which KDOT has committed funds, the Bureau Chief of Research is delegated signature authority to initiate the transfer of SPR funds to the lead entity (FHWA Forms 1575 and 1576).

For more information, refer to the KDOT Transportation Pooled Fund (TPF) Procedures Manual.

### **3.2.4.B Development of Research Proposals or Work Plans**

The assigned K-TRAN Project Monitor helps the Principal Investigator accomplish the following general tasks during development of the Proposal for the approved project. KDOT researchers assigned as a Principal Investigator on a formal research project also follow the same procedures.

#### **B.1 Discussion with Submitters**

The Principal Investigator should have discussions with the problem submitter as needed. The Principal Investigator should probe for all conditions or circumstances under which the problem exists. This information will be used in discussions with other affected units and to conduct a literature review. Follow-up discussions may be held with the submitter to refine the Proposal or work plan.

#### **B.2 Discussion with Affected Units**

The Principal Investigator should involve the management of the units that may be affected by the study. Discussions will determine if the proposed study might improve the operation of the unit. If the submission came from outside the organization, the affected unit will be asked to assess its potential for implementation. Refinements should result from these discussions.

#### **B.3 Literature Review**

After discussing the problem with the submitter and the affected units, the Principal Investigator will conduct a literature search. The details of the search are discussed in Section 5.2, TRB’s Transportation Research Information Services (TRIS). The search will provide insights to the problem area. This information can help avoid unnecessary duplication of ongoing or completed research and enhance the study results. Staff and faculty may also do their own search directly using the TRID database which is available on the Internet. The TRB Research in Progress (RiP) Database is available on the Internet and should be searched to determine if other related

research projects may be in progress. Links to these databases can be found on the Bureau of Research website. The KDOT Librarian will also perform literature searches upon request.

### **3.2.5 Product**

The solicitation and research screening process provides the most complete and accurate information in the program development process. All the necessary participants are involved in the solicitation process. Enough guidance is provided to the participants in defining the research problem statements and a complete screening of each problem involves literature and submitter reviews. With this effort completed, the committees and management have assurance that their discussions toward a decision are well founded.

## **3.3 FHWA Research Work Program Requirements**

### **3.3.1 Purpose**

The documents assembled by a state research organization help define and justify the expenditure of resources. The research work program is the single document that concisely describes all the activities undertaken, both on a technical and financial basis.

### **3.3.2 Process**

#### **3.3.2.A Requirements**

The RD&T Work Program requirements are defined in the Code Of Federal Regulations (CFR) under 23 CFR Part 420, Section 420.207. They are as follows:

- (a) The State DOT's RD&T program must, as a minimum, consist of a description of RD&T activities to be accomplished during the program period, estimated costs for each eligible activity, and a description of any cooperative activities including the State DOT's participation in any transportation pooled fund studies and the NCHRP. The State DOT's work program should include a list of the major items with a cost estimate for each item. The work program should also include any study funded under a previous work program until a final report has been completed for the study.
- (b) The State DOT's RD&T work program must include financial summaries showing the funding levels and share (Federal, State and other sources) for RD&T activities for the program year. State DOT's are encouraged to include any activity funded 100% with State or other funds for information purposes.
- (c) Approval and authorization procedures in 23 CFR Section 420.115 are applicable to the State's RD&T work program.

### **3.3.2.B FHWA Certification Requirements**

A state DOT's RD&T program is required to meet certification requirements as per 23 CFR, Section 420.209. A state DOT must develop, establish, and implement a management process that identifies and results in implementation of RD&T activities expected to address high priority transportation issues as a condition for approval of FHWA planning and research funds for RD&T activities. The State DOT must include a certification that it is in full compliance with the requirements of this subpart in each RD&T work program. The certification must consist of a statement signed by the Administrator, or an official designated by the Administrator, of the State DOT.

### **3.3.3 Product**

The activities of the Bureau of Research are concisely and completely described in a single document. The elements of the work program describe the technical and financial responsibilities of the Bureau of Research.

## **4.0 PROGRAM EVALUATION**

### **4.1 Project Level Reporting**

#### **4.1.1 Purpose**

As the research effort focuses on customer benefit, it is conducted with an eye toward implementation. The implementation process is aided by the exchange of information, which starts with clear, concise and complete project reports. These reports detail the progress and accomplishments of a research project and are written with the customer in mind.

The proper reporting of the individual parts, represented by the projects, will enhance the evaluation of the entire research program.

#### **4.1.2 Process**

##### **4.1.2.A Technical Status**

###### **A.1 Tasks**

Each of the major tasks outlined in the project work plan will be briefly described, whether they have been completed or are still in progress.

###### **A.2 Schedules**

The planned and actual time schedule for the project will be shown.

###### **A.3 Problems/Resolutions**

Financial, staff, equipment and technical problems will be discussed, as they affect the individual tasks. Their resolution, or attempts at resolution, will also be stated.

##### **4.1.2.B Technical Findings**

###### **B.1 Accomplishments/Implementation Efforts**

Milestones such as an interim report, completion of data collection, etc. will be used to describe the completion of a task. Each task may result in an accomplishment. The significance of the accomplishment will be discussed with respect to its advancement of an implementable product. This section of the report is the most important to the end users. The potential success of the research and proposed plan for implementation of the results is stated here by the Principal Investigator. On K-TRAN projects, a formal Research Implementation Plan that states what findings will be implemented, assigned responsibilities for implementation and a timetable; and costs and benefits of implementation is completed for each project. The Research

Implementation System, which also addresses benefits for the entire program, is discussed in more detail in Section 4.2.2.A.

#### **4.1.2.C Financial Status**

##### **C.1 Budget**

The line items of budgeted funds for salaries, overhead, travel, equipment and miscellaneous category will be shown as necessary. Contracts will list the same items.

##### **C.2 Expenditures**

The line item expenditure of funds will be shown for salaries, overhead, travel, equipment and a miscellaneous category. The same line items will be listed for contracts. The budget and expenditures will be shown in the same table.

#### **4.1.2.D Reports**

Cyclical reports can be produced on a quarterly, semiannual or annual basis.

The Project Monitor for K-TRAN projects and Assistant Bureau Chief of Research for in-house projects (Section 2.2.2.C) are the principal reviewers of the cyclical and interim reports. Meetings may be scheduled to review the findings in these reports if needed.

##### **D.1 Frequency**

K-TRAN project progress reports will usually be written quarterly or as detailed in the Proposal, incorporating the information in 4.1.2.A. through C. Reports will be prepared on an annual basis for SPR funded research and for in-house research reports and experimental features, etc.

##### **D.2 Interim**

Projects that have a significant accomplishment during the course of the research will be detailed in an interim report. In addition to the information in 4.1.2.A. through C., the interim report will discuss the implementation process and expectations. This report covers a significant part of the research, including impediments to implementation and suggestions for overcoming the impediments.

##### **D.3 Final**

The Project Monitor and Area Panel Leader associated with the project (or Principal Investigator and Assistant Bureau Chief of Research) are aware of the findings prior to the final report. The research community and operational units affected by the work must be informed. The final report is the most lasting and complete document of the research and will be carefully assembled to include at least the following information:

- Technical Report Documentation Page (Form DOT F 1700.7) including a brief description (abstract) of the work and conclusions
- Preface, Notice, Disclaimer Page
- Introduction, including the problem, its background and a concise history of research
- Recommendations based on the findings and conclusions; suggestions for additional research
- Implementation Plan, defining the procedure to introduce the results into practice, including suggestions for organizational responsibility
- Work Plan, including the experimental research plan, data collection, description of sites and activities and an analysis of the data
- Findings and Conclusions

Draft final reports on projects funded with SPR funds will be submitted to the FHWA Division Office in digital format for review and approval prior to publication. All reports will be published using English units except instances where SI is accepted standard practice.

#### **D.4 Final Report Numbering Schemes on Published Reports**

K-TRAN project reports are published using the standard K-TRAN report cover (front and back). The report number will include the K-TRAN project number (example: K-TRAN: KSU-17-4).

Reports for projects funded with SPR funds or state only funds will be assigned a sequential project number for each calendar year that includes the funding sources (example using SPR funds: FHWA-KS-17-01; example using only state funds: KS-17-2).

##### **4.1.3 Product**

The project reports are the official documentation of the research. Quarterly and semi-annual reports are used to monitor progress. The interim and final reports form the basis for discussion of the research and presentations to the transportation community. The output of this section is the technical and financial status of a project in cyclical and final report form that is the basis for the implementation effort.

Electronic copies of all published reports are created in Adobe PDF format and stored in the KDOT Document Management System. Summary reports (1 to 2 pages) are created for most of the newly published reports. Access to these publications is made using the KDOT Electronic Library Catalog (Intranet) or the KDOT Research Reports Catalog (Internet). Electronic copies are sent to the Transportation Research Board for linking to TRID (the TRIS and ITRD database). Digital copies have replaced paper copies for distribution. A paper copy will be made for an ADA request.

When reports are published, a link to the published report and summary report will be sent by e-mail to approximately 145 contacts on the distribution list which includes the following:

FHWA Research Library

National Technical Information Service (NTIS)

National Transportation Library (NTL)

FHWA Office of Corporate Research, Technology and Innovation Management

TRB Library (TRID)

Transportation Library, Northwestern University, Attn: Roberto Sarmiento

FHWA Kansas Division Office

- Project Delivery Team Leader
- Project Delivery Team Transportation Engineer
- Program Development Team Community Planner

FHWA Midwest Resource Center

FHWA Associate Administrator for RD&T

Research Director or designee in each of the states, D.C. and Puerto Rico

State Library Designee in states that have a Library, D.C. and Puerto Rico

AASHTO SCOR/RAC Website Distribution List

KSU Civil Engineering Department Dean & Research Rep

KU Civil, Environmental and Architectural Engineering Department Dean and Research Rep

Kansas Historical Society Library and Archives

Kansas Turnpike Authority Director of Engineering and Chief Engineer

Research Program Council

Research Technical Committee

Principal Investigator

Project Monitor

KDOT Library

KDOT Bureau Chiefs

KDOT District Engineers

KDOT Research Employees

State Interest Groups, such as:

- Asphalt Institute
- Missouri/Kansas Chapter American Concrete Pavement Association (MO/KS ACPA)
- Kansas Asphalt Paving Association (KAPA)
- GBA Architects Engineers

An electronic copy of the annual and semiannual SPR funded project reports is sent to the FHWA Division Office and placed on the KDOT Intranet. An e-mail with the link is sent to selected KDOT technical staff. The annual work program also comprises the report for the period ending June 30th. The draft SPR work program and cost estimate is due by May 12th each year. The published approved SPR work program is due by October 1st. The annual and semi-annual reports for the period ending December 31<sup>st</sup> are due by April 1st of the following year.

## **4.2 Overall Program Performance**

### **4.2.1 Purpose**

The public expenditure of funds is subject to careful scrutiny. The profit motive doesn't exist in the public arena; hence, these programs must prove their value in other ways. After carefully selecting problem statements and developing the work program, the research effort must follow well-defined procedures that result in unbiased and meaningful results. On an individual project basis, these results are very meaningful. On a program basis, the projects should be aggregated to define the cumulative effect of the program.

#### **4.2.2 Process**

##### **4.2.2.A Implementation Results**

The implementation efforts of the individual projects were discussed in Section 4.1.2.B. Summary tabulations of the project efforts will document the progress for the entire program. The tabulations will include implementation discussions for all major projects. All partial or full implementations will be documented on major projects. Although a project may have been formally closed out, records of the subsequent implementation successes will be maintained for at least three years thereafter. The initial Research Implementation System report will be requested at the time the final report is submitted for final editorial review. Annual Implementation Progress Report updates, if the implementation is still in progress, will be completed annually.

##### **4.2.2.B Accomplishments**

The work program is the sum of all activities planned for the year. These activities are primarily projects, technology transfer efforts and technical assistance, seminars and implementation efforts. Milestones are achieved for each of these activities. A record of each of these activities will be kept.

##### **4.2.2.C Funding Adherence**

Each research fund source has been programmed for the various activities (projects) in the work program. In addition, each activity (project) has a specific budget. A record will be kept for both the project level and funding source expenditures by coding time and other expenditures to the correct project number assigned for that activity. Allowances are made for over spending on the individual SPR projects for the year, but the total program funds for SPR or other funding sources cannot be exceeded. Progress reports will reflect the reasons for the individual project over or under runs.

##### **4.2.2.D Schedule Adherence**

The projects are the most important activities as far as schedules are concerned. Most other activities can be planned throughout the year. The ability to adhere to the schedule for a project is contingent on many factors. The Principal Investigator and Assistant Bureau Chief of Research or Project Monitor will be in frequent communication with each other to avert major slippage.

The quarterly, semiannual or annual report (Section 4.1, Project Level Reporting) will reflect the estimated level of completion for each project. The planned and actual time schedules will also be shown.

### **.E Benchmarking**

The achievements of the research program cannot easily be reflected on a total performance basis. The diversity of the activities is too large to permit their summation. However, the quality of the program can be judged by observing the progress of some of the measurable parameters. Benchmarking not only demonstrates progress but it also improves the progress by a quality improvement thrust. Some of the factors that will be benchmarked to show the performance of the program are:

- Programmed funds
- Staff research projects
- Contract research projects
- Accomplishments

### **4.2.3 Product**

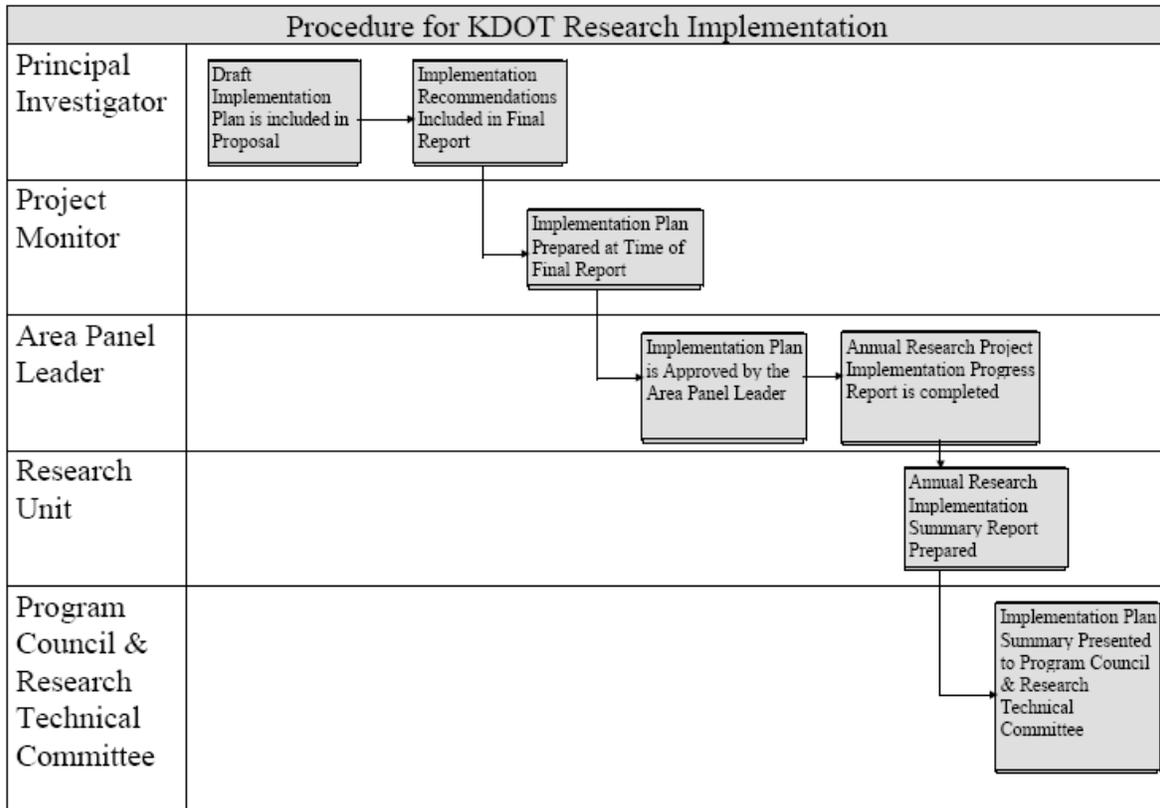
The documentation of a successful performance of the research effort is important to continue to receive the management and financial support that it requires. Objective and quantifiable parameters can give the basis for this support. Overall program performance can be measured by a combination of the achievement of implementation and milestones and a qualified adherence to financial and scheduling limits.

The formal process for tracking the benefits of the K-TRAN research program is the Research Implementation System. This is shown in general terms in Figure 4.

For each K-TRAN project, implementation is considered at each step of the project development process from the proposal to the final report. Once the final report is published, the Project Monitor with the assistance of the Principal Investigator and the Area Panel Leader prepares the “KDOT Research Implementation Plan” form (Attachment E-1) that details what findings and recommendations from the project will be implemented along with the responsible parties and the expected costs and benefits of doing so. The Research Implementation Plan form includes tables for the project monitor to assess the benefits of the project by category, if implemented, and to assess the research team performance for the project. The Implementation Plan form also includes the “Research Project Implementation Progress Report”. Instructions for completing the implementation progress report are provided to the project monitors. These instructions were included in research report KS-03-9 titled “Guidelines for Estimating the Triennial Benefits of Kansas Transportation Research and New Developments (K-TRAN) Research Projects” by Robert W. Stokes, Michael W. Babcock, Eugene R. Russell, Margaret J. Rys, Kansas State University, July 2004 (Attachment E-4).

If the implementation is in progress and will be implemented in the future, then annually until implementation is completed, an updated copy of the “KDOT Research Project Implementation Review” (Attachment E-2) will be requested by the Bureau of Research. Instructions for

completing implementation review forms are the same as for the implementation progress report. The “KDOT Research Project Implementation Plan – Independent Review” form (Attachment E-3) is to be used when the estimated implementation benefits are over one million dollars.



**Figure 4.**

The Technology Transfer Engineer and Bureau of Research staff are responsible for issuing, collecting and summarizing the data from these forms. An "Implemented K-TRAN Projects" document, "Status of K-TRAN Projects" document and "K-TRAN Status Report" document are all updated twice each year with the new information received from the project monitors.

The "K-TRAN Status Report" is presented to the Research Program Council at the September and February meetings. These reports are available from the K-TRAN web site on the Intranet.

The SPR Annual Work Program and Cost Estimate, and semi-annual reports of research due April 1st each year, constitute the formal summary reports prepared for the in-house research program. Part II of the work program has information about the SPR funded portion of the research program and Part IV has information about the state funded portion.

Summary reports (1 to 2 pages) are prepared to briefly document the accomplishments of each published research report.

## **4.3 Peer Exchange**

### **4.3.1 Purpose**

A quality research program depends upon its ability to implement effective and timely solutions to the problems of the Agency. It is the execution of the procedures and processes developed by staff and management that promote the attainment of this objective. One technique designed to improve the quality of the program is a peer exchange.

Peer exchanges, as required under 23 CFR, Section 420.207(b) are a practical and effective tool to foster excellence in R&T program management. They provide an opportunity for participants to share best practices and management innovations through an open exchange of ideas, knowledge, and brainstorming. Both staff and management from the home State and a group of invited top-level State and Federal managers exchange information particularly relevant to the home State's R&T program over 2 to 4 days.

### **4.3.2 Process**

KDOT will follow the guidelines found within the AASHTO Research Advisory Committee (RAC) website under the Peer Exchange Program link.

## **5.0 TECHNOLOGY TRANSFER**

### **5.1 Outline of Activities**

#### **5.1.1 Purpose**

Research may be described as the careful, systematic study to establish facts in a specific field, but the crux of the effort for the state is in the application of research results. Technology transfer in research goes beyond the use of the results of the research projects conducted by the Bureau. Research staff has acquired an expertise in a range of transportation fields. That expertise is continuously in demand by the operating units of the agency. Further, the field of transportation is dynamic, a fact that compels the research staff to keep the transportation community of the state abreast of the latest developments.

#### **5.1.2 Process**

##### **5.1.2.A Customers**

Everyone benefits from the transportation system, and hence, from research into the system. In Section 1.2, Purpose, the immediate beneficiaries of research were stated to be the Agency, its employees and other transportation agencies and users. The technology transfer activities of research will be directed to the immediate customer, with the larger community in mind.

##### **5.1.2.B Partners**

The partners of research, as defined in Section 2.1.2.A., Outreach Partners, are also the beneficiaries of research. Gaining the support of the beneficiaries of research was outlined in Section 2.1, Customer Support Development. The partnerships formed with Agency operating units, universities, companies, transit authorities, consultants, local governments, regional agencies, FHWA and the public will require constant renewing. The transfer of technology cannot be accomplished without the concurrence and assistance of these partners.

##### **5.1.2.C Outreach Activities**

Research staff will be active participants in the technology transfer activities in the following ways:

- Progress of the research projects will be regularly examined to determine whether the deliverables are amenable to implementation.
- Results of research projects will be advanced for implementation.
- Expertise of staff will be available to the operating units of the agency for problem solving.
- Results of promising research from other agencies and publications will be made available to the agency's operating units.

- Information on FHWA Demonstration projects will be disseminated to agency staff and analyzed for a potential workshop session.
- Research staff will be actively involved in the installation and analysis of experimental features in construction.
- As noted in Section 2.1, Customer Support Development, research staff will actively participate in the development of committees, institutional discussions and seminars to involve potential partners in the research process.
- Staff will attend important regional and national meetings and disseminate the results.

### **5.1.3 Product**

All possible methods of collecting and disseminating information on transportation improvements will be pursued within the limits of available resources. The results of this activity will foster implementation, avail the research partners of staff expertise and keep the transportation community apprised of the latest advances in the field.

## **5.2 TRB's Transportation Research Information Services (TRIS)**

### **5.2.1 Purpose**

The basis of research support is the information it provides clients. Despite the expertise of the staff, there are many informational requests made of research that require literature searches. An analysis of problem statements and informational requests must consider the literature defining the state of the art of the subject. The Transport Research International Documentation (TRID) Database is the single most comprehensive file of literature on all subjects in the field of transportation. The Bureau of Research will contribute project information to this system. For more information on TRID see Section 2.3.1.A.1.

### **5.2.2 Process**

#### **5.2.2.A Reporting to TRID**

Ongoing research activities will be reported to the TRB Research in Progress (RiP) database. Completed projects with published reports will be reported to the TRID database. Electronic copies of full text reports will be furnished for linking to the abstracts in TRID. The reporting will include the status of existing projects, significant changes to existing projects, the addition of new projects, the completion of projects and significant technology transfer activities.

#### **5.2.2.B TRID Searches for Information**

A search of a computerized file for information on a subject starts with a selection of the appropriate keywords. If the keywords are too broad in scope, too much information will be returned. Conversely, if the keywords are too specific, very limited information may be returned.

A selection of keywords should be made after discussing the subject with the client. Only then can the search structure be properly established. The search must be structured correctly so that

the information returned to the user adequately covers the subject. The KDOT Library staff will also assist with literature searches upon request.

TRIS access options are described in Section 2.3.1.A.

### **5.2.2.C Synthesis**

If appropriate, a summary of the findings of the search will be developed from the abstracts of the search. This will serve as the basis for defining further study of the subject. If the search is made for a client, a review of the synthesized material with the client should be the most helpful means of deciding follow-up review procedures. If the search is made as part of the literature review process at the outset of a project, the synthesis will serve as background material for the research.

### **5.2.2.D Further Review**

A study of the abstracts should lead to an in-depth review of some articles. For the more esoteric subjects, this is a necessary step. It could lead to additional keywords and the suggestion that another informational system may have to be accessed.

### **5.2.3 Product**

The TRID database should provide the Bureau of Research with the best possible background on the issue under question and distribute agency research results to a broad audience.

## **5.3 Local Technical Assistance Program (LTAP)**

The Local Technical Assistance Program (LTAP) is a high-profile technology transfer program sponsored by FHWA. The program, established in 1981, encourages cost-effective improvements to roads and bridges owned and maintained by local government.

Federal-aid LTAP funds are available for nominally 50% of the program funding. The remaining 50% match consists of KDOT 80-20 SPR funds. Additional work is accomplished because the University of Kansas waives a portion of the indirect costs normally charged on a federally funded project. Through training courses, production of users' manuals, on-site demonstrations, and a strong network of technical expertise available to the local governments, the program furthers the implementation of highway innovations at the local level. The funds available and the people-intensive focus enable new processes, methods, and other innovations to be more easily applied to local highway practice.

The LTAP Center is located at the University of Kansas and is operated by Transportation Center (KUTC) staff. The Technology Transfer Engineer in the Bureau of Research functions as a program administrative director and technical advisor. The Center provides proposals of work for the coming performance time frame and is awarded funds based on the proposals. The Center has a close association with agency technical personnel, who facilitate the flow of technical information to the Center and its customers.

## **APPENDIX**

**Attachment A****Kansas Department of Transportation  
Standard Operating Manual**

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 7	PAGE: 1 of 7
	EFFECTIVE DATE: 11/01/2014	
INFORMATION CONTACT: Bureau of Research		
APPROVED: _____, Secretary of Transportation		

**POLICY STATEMENT:**

The Kansas Department of Transportation (KDOT) shall support research, development, and technology transfer (RD&T) activities and shall advocate interest and involvement in these activities by KDOT staff members.

**DEFINITIONS:**

Area Panel. A panel that represents a specific set of transportation-related interests within KDOT. EX: Planning, Administration and Computing is one Area Panel.

Consultant. A Consultant is a qualified individual, university, group, or firm able to perform specialized research and development. A Consultant engaged by KDOT is termed a “contractor” in the project agreement.

In-house RD&T. Research, development, and technology transfer performed by the Bureau of Research or cooperatively with other KDOT Bureaus or Districts is referred to as In-house RD&T.

Executive Managers. The Secretary of Transportation (Secretary), the Deputy Secretary and State Transportation Engineer, the Chief Counsel and the Directors of the Divisions of Engineering and Design, Operations, Fiscal and Asset Management, Planning and Development, and Partner Relations are Executive Managers.

K-TRAN Program. The Kansas Transportation Research and New Developments (K-TRAN) Program is a cooperative transportation research program between KDOT, the University of Kansas, and Kansas State University.

Principal Investigator. The person directly in charge of an RD&T Project is the Principal Investigator.

Project Monitor. The KDOT staff person assigned to oversee the technical and administrative supervision required on an RD&T Project performed by a Consultant is the Project Monitor.

RD&T Idea. An RD&T Idea means a brief statement of a problem or topic for an RD&T Project.

RD&T Need. An RD&T Need is a research idea approved by the Research Program Council for which Research Problem Statements will be solicited.

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 6	PAGE: 2 of 7
	EFFECTIVE DATE: 11/01/2014	

RD&T Project. An RD&T Project is a specific study or investigation for which KDOT has approved the use of research, development, and technology transfer funds.

RD&T Proposal. A detailed plan stating RD&T tasks to be accomplished which provides the basis for KDOT approval of the project is referred to as an RD&T Proposal.

Research Problem Statement. A Research Problem Statement is a detailed statement of a problem or topic for which an RD&T Proposal is desired. It is also called an RD&T pre-proposal.

Senior Managers. Individuals in positions including Bureau/Office Chief, District Engineers, and above are Senior Managers.

## **PROCEDURAL GUIDELINES:**

### **Responsibilities**

None of the requirements in this SOM shall be construed or used in a manner to prevent establishment of an RD&T Project by any Division, Bureau, Office, or District of KDOT when budget authority and administrative staff are available to fund and monitor the project in the originating group and the Deputy Secretary and State Transportation Engineer supports the RD&T Project.

The Engineer of Research of the Bureau of Research is responsible for soliciting and receiving RD&T Ideas, needs, and problem statements, as well as for submitting them to the Research Technical Committee or the Research Program Council.

The Engineer of Research shall assist in the preparation and submittal of agreements, act as liaison, monitor progress, make financial recommendations, and provide summary information for In-house RD&T Projects and non-K-TRAN projects performed by outside contractors. The K-TRAN Project Monitor shall perform this duty for K-TRAN projects.

The Principal Investigator or K-TRAN Project Monitor is responsible for making recommendations in all problem statements and proposals. The K-TRAN Area Panel leader and Project Monitor shall approve all final K-TRAN reports. The Chief of the Bureau of Research shall approve all In-house RD&T final reports. The Deputy Secretary and State Transportation Engineer shall be notified of the intent to publish in-house or K-TRAN reports if the subject matter warrants it.

### **Research Technical Committee Responsibilities**

The responsibilities of the Research Technical Committee (see [Attachment A](#) for membership list) are as follows:

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 7	PAGE: 3 of 7
	EFFECTIVE DATE: 11/01/2014	

- Develop knowledge of the needs for research and development in transportation, both at KDOT and throughout the State, and promote the submission of research ideas and research project statements.
- Annually solicit research ideas from KDOT staff, university faculty, other agencies, groups, or individuals.
- Receive and consider research ideas, needs, suggestions, problem statements, and proposals.
- Act upon reports received related to the research and development projects recommended by the committee.
- Assign research project statements to Area Panels for detailed evaluation.
- Prioritize and recommend K-TRAN research project statements to the Research Program Council for approval.
- Assist with the implementation of successful technologies.
- Document implementation activities and benefits of RD&T.
- Monitor the progress on active RD&T Projects and encourage the expedient completion of all such projects.
- Encourage and assist in the dissemination of information concerning transportation RD&T to KDOT staff.

**Research Program Council Responsibilities**

The Research Program Council (see [Attachment A](#) for membership list) shall set policy and approve the annual K-TRAN Program developed by the Research Technical Committee so that the contracts can be completed on approved projects by March 1 each year for the following fiscal year.

**K-TRAN Area Panels Responsibilities**

The responsibilities of the Area Panels (see [Attachment A](#) for membership list) are as follows:

- Develop knowledge of research and development needs in transportation, both at KDOT and throughout the State, in the Area Panel specialty area.
- Promote submission of research project statements to K-TRAN by interacting with university faculty and KDOT staff. This will include identifying researchers and determining budgets for research projects.

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 7	PAGE: 4 of 7
	EFFECTIVE DATE: 11/01/2014	

- Review and prioritize research project statements assigned by the Research Technical Committee.
- Assign a KDOT staff person as Project Monitor for each research project assigned to the Area Panel. The person assigned will be responsible for executing the research project agreements with the University, monitoring research progress, and reviewing draft research reports. The person assigned should be familiar with the topic being researched.

### **Research, Development, and Technology Transfer Ideas and Problem Statements**

Ideas for RD&T Projects and Research Problem Statements should be transmitted to the Engineer of Research, who will present them to the Research Technical Committee and Research Program Council for review and recommendation.

RD&T Ideas or Research Problem Statements may be initiated by any individual or group from KDOT, industry, university, or other governmental entity. Members of the Research Technical Committee shall encourage and may assist in the preparation of ideas and Research Problem Statements.

Research Problem Statements recommended by the Research Technical Committee for the K-TRAN Program shall be documented in the minutes, listed in priority order, and transmitted to the Research Program Council for approval.

### **Proposals for Research, Development, and Technology Transfer Project**

The Engineer of Research, K-TRAN Area Panel Leaders, and/or assigned Project Monitors may assist in the preparation of RD&T Proposals and shall review all proposals submitted for appropriate action. All proposals shall be based upon problem statements which have been approved by a KDOT Senior Manager or are listed in an approved.

Proposals for RD&T Projects to be conducted by outside entities may be prepared by prospective contractors on the basis of approved Research Problem Statements.

### **Establishment of Research, Development, and Technology Transfer Projects**

Approved In-house RD&T Projects will be prioritized by the Chief of the Bureau of Research and the Engineer of Research. Ability to proceed with the project by the Bureau of Research, Research Unit will be dependent upon the availability of adequate funding and/or redirection of priorities.

The Research Program Council will approve projects and authorize funds for the annual K-TRAN Program by March 1 each year.

### **Funds for Research, Development, and Technology Transfer Projects**

Funds for formal research and development projects are provided from the State Highway Fund. Some projects may be eligible for federal-aid funds. For In-house RD&T Projects, research

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 7	PAGE: 5 of 7
	EFFECTIVE DATE: 11/01/2014	

funds may be used to purchase essential equipment for the Bureau of Research and/or for other Bureaus and Districts as required to complete the project. Requests for the purchase of such equipment should be made by the Bureau of Research using established purchasing guidelines.

Once approval from the Senior Manager and Executive Manager has been received for the office initiating the request, RD&T Projects that require special funding shall be sent to the Deputy Secretary and State Transportation Engineer for approval to expend the required funds. Staff involved in the funds-approval process shall be notified that the project funding has been approved by the initiating Office/Bureau/Division. A “RE” jurisdiction project number may be assigned to each RD&T Project.

The Engineer of Research shall provide fiscal data and other information required for RD&T Projects included in Part II of the “State Planning and Research Work Program and Cost Estimate” prepared annually for the Federal Highway Administration (FHWA) and KDOT.

When federal-aid funds are required for an RD&T Project, the Engineer of Research shall generate the required documents and shall request approval from the FHWA. Other involved bureaus will provide information required to complete these documents on an agreed time schedule.

### **Contracts for Research, Development, and Technology Transfer Projects**

All agreements with outside entities to conduct an approved RD&T Project are required to be signed by the Secretary or the Deputy Secretary and State Transportation Engineer before the project proceeds. Contracts prepared for RD&T Projects shall employ a standard format whenever possible and follow the standard contracting procedures.

The Engineer of Research, K-TRAN Area Panel Leader, or designated Project Monitor shall submit all original contracts to the Office of Chief Counsel for review and stamping. The “Secretary Signature Routing Form” will be used to route the stamped contracts through the appropriate Bureau Chief and Division Director to the Office of the Secretary. Research contracts are signed by the Secretary or the Deputy Secretary and State Transportation Engineer. No cost extensions to existing contracts may be approved by the Project Monitor.

### **Monitoring of Research, Development, and Technology Transfer Projects**

Monitoring of a project provides information that it is proceeding in accordance with the level of effort expended, in adherence to the time schedule, in conformance with the approved work plan, and that the required reports are submitted. A Project Monitor will be assigned for all RD&T Projects placed under contract with an outside entity. Area Panel Leaders will select Project Monitors for their assigned K-TRAN projects. Refer to “[Project Monitor Instructions](#)” on the Bureau of Research intranet web site.

Monitoring of other RD&T Projects is the responsibility of the contracting bureau; however, that bureau may request assistance from personnel of other bureaus who are knowledgeable in the subject matter of the research, are convenient to the research site, or can aid in the research in some significant manner. The Engineer of Research shall be notified of RD&T Projects being

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 7	PAGE: 6 of 7
	EFFECTIVE DATE: 11/01/2014	

performed by other bureaus by transmittal of copies of proposals, major progress reports, and published reports to aid in coordination of all RD&T Projects.

### **Field Operations for Research, Development, and Technology Transfer Projects**

If any field operations are required for an In-house RD&T Project, they shall be performed by the cooperating Bureau or District and the Bureau of Research, according to the proposal for the project.

Field operations required for an RD&T Project conducted by a research contractor shall be coordinated by the Engineer of Research or K-TRAN Area Panel Leader. Appropriate Bureau and District personnel shall be advised whenever a research contractor's personnel are to be engaged in field operations.

### **Expenditures for Research, Development, and Technology Transfer Projects**

RD&T contractors shall be reimbursed according to the terms of the contract. Payments to RD&T contractors shall be approved by the Engineer of Research. Interim payments may be made monthly or quarterly on the basis of invoices submitted by the contractor and as specified in the agreement.

The Bureau Chief of Research shall request the Chief of the Bureau of Fiscal Services to encumber funds needed to complete and pay for the project as stated in the agreement.

The Bureau Chief of Research shall withhold approval of final payment for the project until all deliverables have been accepted and an audit is performed (if needed). On K-TRAN projects, this determination will be made by the Engineer of Research with the approval of the Project Monitor and/or Area Panel Leader.

### **Reports on Research, Development, and Technology Transfer Projects**

For In-house RD&T Projects, the responsibility for reports shall normally rest with the principal or co-Principal Investigator of the projects. Assistance with the preparation of reports shall be provided by the Engineer of Research.

For RD&T Projects performed by research contractors, the requirements for reports and other deliverables shall be stated in the contracts. The final report and other deliverables acceptable to the Project Monitor shall be regarded as tangible evidence that the project has been satisfactorily completed.

		SOM: 1.5.2
SUBJECT: <b>Research, Development, and Technology Transfer Projects</b>	VERSION: 7	PAGE: 7 of 7
	EFFECTIVE DATE: 11/01/2014	

**AUTHORITATIVE REFERENCES:**

Note: The following references are for additional information only. Clarification of this policy may be obtained from the information contact listed.

- 23 USC 505

**CROSS REFERENCES:**

- KDOT Research Policy (Signed by W.M. Lackey May 17, 1991)
- “KDOT Research, Development, and Technology Transfer Procedures Manual”
- <http://kdotweb/KDOTOrg/BurMatrRes/Documents/PROJLIST.htm>

**Attachment B**

***Kansas Department of Transportation***

**RESEARCH PROJECT IDEA**

1. Project Title:	
2. Problem Idea:	
3. Research Objective:	
4. Urgency:	
5. Implementation of Results Including Cost/Benefit:	
Submitted By:	Date:
Organization:	Phone:
Address:	
e-Mail Address:	

## Attachment C

# K-TRAN

## KANSAS TRANSPORTATION RESEARCH AND NEW - DEVELOPMENTS PROGRAM

The K-TRAN Program is an ongoing, cooperative and comprehensive research program addressing transportation needs of the State of Kansas utilizing academic and research resources from the Kansas Department of Transportation, Kansas State University and the University of Kansas. Projects included in the annual research program are jointly developed by professionals at KDOT, KSU and KU.

Major benefits of the program include development of a flow of high quality transportation research targeted to Kansas transportation needs; financial support to engineering students contributing to the pool of transportation professionals in Kansas; continuing education opportunities for KDOT personnel; enhanced quality of faculty, staff and graduates in the transportation area; attracted federal research resources for use in Kansas; and a much expanded but efficiently organized transportation research resource in Kansas.

Electronic full text copies of completed K-TRAN research reports and summaries may be located on the [KDOT Research Reports Catalog](#) web site.

Information about active K-TRAN projects may be found on TRB's Research in Progress website: <https://rip.trb.org/>

Contacts for more information:

Richard E. Kreider, P.E., Bureau Chief, Bureau of Research, and Chairman of Technical Committee (785-296-1195) Fax: 785-296-2526, [Richard.Kreider@ks.gov](mailto:Richard.Kreider@ks.gov)

Eric Fitzsimmons, Ph.D., Kansas State University (785-532-0889), [fitzsimmons@ksu.edu](mailto:fitzsimmons@ksu.edu)

Lisa Harris, University of Kansas (785-864-2590), [lharris@ku.edu](mailto:lharris@ku.edu)

As of 06/12/2017

## K-TRAN ANNUAL SOLICITATION GUIDELINES

Research project statements that are submitted by annual deadline will be evaluated by K-TRAN Area Panels and prioritized by the Research Technical Committee. The Research Program Council approves an annual program using input from the Research Technical Committee and Area Panels. The seven Area Panels that have been organized for the review and development of research ideas are:

- Planning, Administration and Computing
- Operations: Pavements, Materials, Construction and Maintenance
- Geometric Design, Drainage and Environmental
- Structural & Geotechnical
- Traffic Operations; Driver and Pedestrian Safety
- Multimodal: Rail, Aviation, Public Transit and Freight
- Local Government

Research Needs Day is held in August in Topeka to discuss research needs developed from the annual idea solicitation and other topics of interest to both the Area Panel members and faculty attending. This is an opportunity for faculty attending to discuss potential research topics they have and get feedback prior to preparing their research project statements (pre-proposals).

**Submit one copy of all research project statements using the following format before October 31<sup>st</sup>, each year to your University K-TRAN Technical Committee Coordinating Group Representative:**

University of Kansas  
Lisa Harris  
KU Transportation Center  
1536 West 15<sup>th</sup> Street  
Lawrence, KS 66045  
[lharris@ku.edu](mailto:lharris@ku.edu)

Kansas State University  
Eric Fitzsimmons, Ph.D.  
Dept. of Civil Engineering  
2118 Fiedler Hall  
Manhattan, Kansas 66506  
[fitzsimmons@ksu.edu](mailto:fitzsimmons@ksu.edu)

**The Universities will number the original research project statements and electronically submit them to KDOT by November 7<sup>th</sup> each year.**

## FORMAT FOR RESEARCH PROJECT STATEMENTS

Submit one copy of research project statements (pre-proposals) with no more than two, single-spaced pages containing following information to your University K-TRAN representative (Eric Fitzsimmons, KSU, or Lisa Harris, KU):

- I. RESEARCH PROJECT TITLE
- II. RESEARCH PROBLEM STATEMENT
- III. RESEARCH PROPOSED OR RESEARCH OBJECTIVES  
Include tasks to be performed
- IV. ESTIMATE OF FUNDING AND RESEARCH PERIOD  
Inclusive of indirect costs, if appropriate  
Use budget sheet provided by KDOT to Universities  
Include the anticipated period of performance
- V. URGENCY AND PAYOFF POTENTIAL  
Include expected benefits expressed in dollars saved if results expected are obtained and implemented
- VI. IMPLEMENTATION STRATEGY
- VII. PROJECT PERSONNEL  
Faculty and students who might be involved with the project
- VIII. SUBMISSION INFORMATION  
Date  
Name and Title  
University address  
University telephone and Fax number  
E-mail address

**Use Standard English units in all research project statements, interim reports and final reports. Prepare the final report in Microsoft Word and submit file via email, ftp or CD.**

## GUIDELINES FOR EVALUATING RESEARCH IDEAS

Guidelines have been developed to assist the Research Technical Committee in formulating and recommending research projects for inclusion in the K-TRAN Program. These guidelines will be used in the review of research ideas for development into complete proposals for further consideration.

- Relevance to critical research needs of KDOT
- Projects with a high payoff potential described in dollars that can be saved if the research results envisioned result and are implemented.
- Relevance of proposed research idea to the theme of K-TRAN
- Amount of overlap of the proposed research idea with other programs or completed research idea with other programs of completed research (Proposed research should not be targeted for research topics or issues currently underway through the National Cooperative Highway Research Program or the Local Technology Assistance Program.)
- Duration of proposed research project. Project statements should be prepared with the most cost-effective duration considering the required workload, typical length of graduate study programs and other factors. The correct length of time shown should result in the project being completed without any cost extensions.
- Extent to which minorities and handicapped persons are involved in the research, either as participants, recipients or beneficiaries.

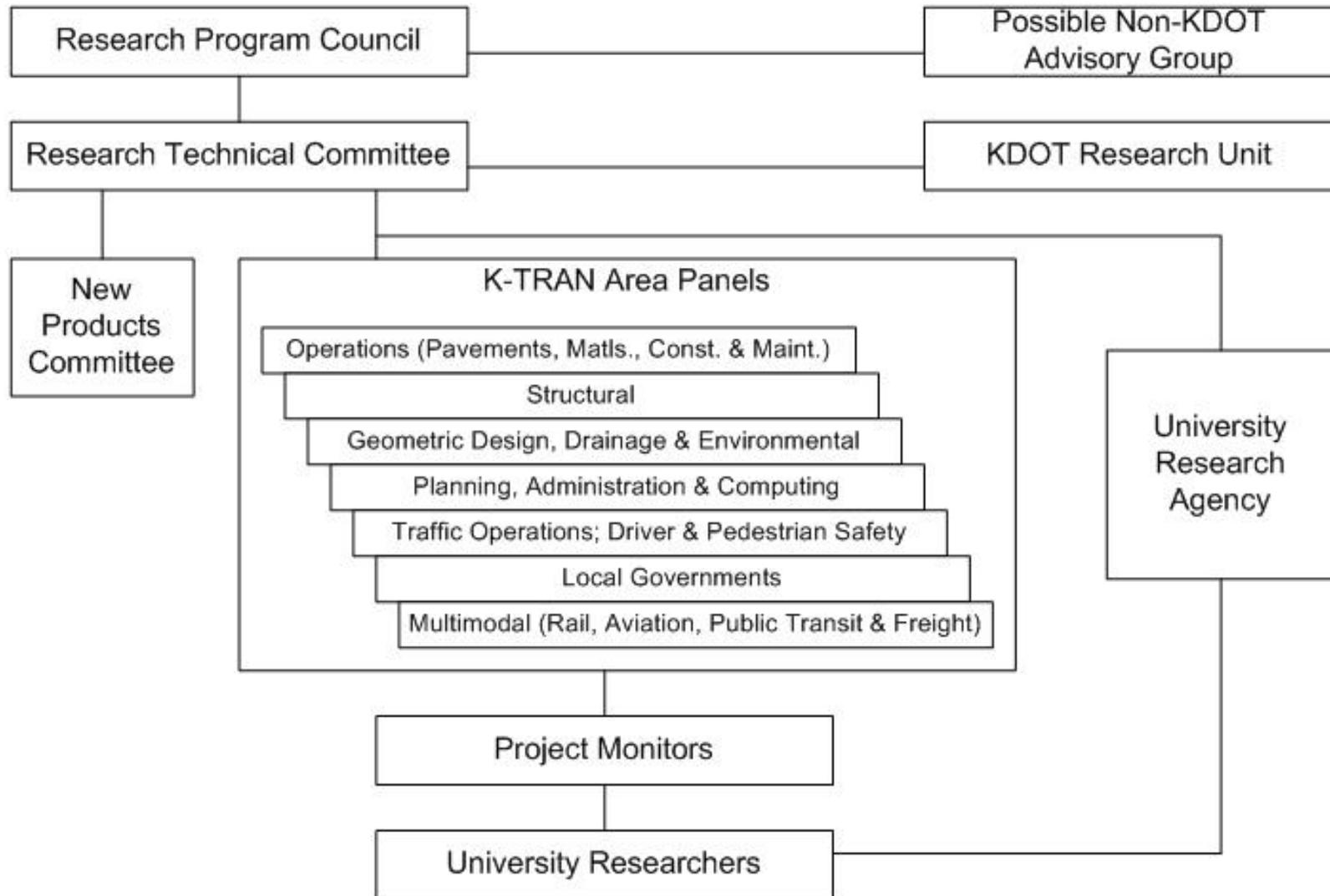
**K-TRAN ANNUAL TIMELINE GUIDELINE**

<b><u>Item</u></b>	<b><u>Date*</u></b>
Solicit research ideas from KDOT staff, local government staff, Kansas Turnpike Authority, University faculty and Industry associations.	June 1
Research ideas due to Bureau of Research	July 15
<b>All K-TRAN research project contracts signed</b>	<b>Aug. 1</b>
<b>Send KDOT Research Needs to University</b>	<b>Aug. 1</b>
Host <u>Research Needs Day</u> for University and KDOT staff	Aug. 15
Research Program Council meets to review ideas, program status & set policy	Sept. 15
Request for K-TRAN research project statements from KU & KSU	Oct. 1
K-TRAN research project statements due (aka. RPS/Preproposals)	Oct.31
Assistant Bureau Chief of Research assigns RPS to area panels	Nov.15
Area panel evaluations completed	Dec. 31
Research Technical Committee prioritizes RPS into a “candidate project list”	Jan. 15
Research Program Council meets to approve K-TRAN program and budget	Feb. 15
Assist. Bureau Chief of Research assigns new K-TRAN projects to area panels	Mar. 1
Area Panel Leaders assign Project Monitors (submit names to ABC, Research)	Mar. 15
Assist. Bureau Chief of Research provides project related information to all University and KDOT staff involved in new projects	Apr. 1
Assist. Bureau Chief of Research provides orientation and training to Project Monitors	Apr. 1
For early start projects (before July 1), contracts prepared and signed	May 1
For projects starting July 1, detailed proposals are prepared for each project by Principal Investigator and approve by Project Monitor	June 1

Revised 8/29/18

\*approximate dates

### KDOT Research Organization



## Research Technical Committee

### **At Large Members:**

*Chair:* Dave Meggers (785-291-3845) [Dave.Meggers@ks.gov](mailto:Dave.Meggers@ks.gov)

*Secretary:* David Behzadpour (785-291-3847) [David.Behzadpour@ks.gov](mailto:David.Behzadpour@ks.gov)

Greg Schieber (785-296-3576) [Greg.Schieber@ks.gov](mailto:Greg.Schieber@ks.gov)

Jeff Neal (785-296-3727) [Jeff.Neal@ks.gov](mailto:Jeff.Neal@ks.gov)

### **Area Panel Leaders:**

*Planning, Administration and Computing:* Mike Moriarty, Chief, Bureau of Transportation Planning (785-296-3841), [Michael.Moriarty@ks.gov](mailto:Michael.Moriarty@ks.gov)

*Operations: Pavements, Materials, Construction and Maintenance:* Rick Kreider, Chief, Bureau of Research (785-296-1195) [Richard.Kreider@ks.gov](mailto:Richard.Kreider@ks.gov)

*Geometric Design, Drainage and Environmental:* Scott King, Bureau of Road Design (785-296-3901) [Scott.King@ks.gov](mailto:Scott.King@ks.gov)

*Structural & Geotechnical:* Mark Hoppe, Chief, Bureau of Structures and Geotechnical Services (785-296-3531) [Mark.Hoppe@ks.gov](mailto:Mark.Hoppe@ks.gov)

*Traffic Operations; Driver and Pedestrian Safety:* Brian Gower, Chief, Bureau of Transportation Safety and Technology (785-296-7431) [Brian.Gower@ks.gov](mailto:Brian.Gower@ks.gov)

*Multimodal: Rail, Aviation, Public Transit and Freight:* Davonna Moore, Bureau of Transportation Planning (785-296-0346) [Davonna.Moore@ks.gov](mailto:Davonna.Moore@ks.gov)

*Local Government:* Michael Stringer, Chief, Bureau of Local Projects (785-296-3861) [Michael.Stringer@ks.gov](mailto:Michael.Stringer@ks.gov)

### **University of Kansas Designees:**

Lisa Harris, University of Kansas (785-864-2590), [lharris@ku.edu](mailto:lharris@ku.edu)

Bruce McEnroe, University of Kansas (785-864-2925), [mckenroe@ku.edu](mailto:mckenroe@ku.edu)

### **Kansas State University Designees:**

Eric Fitzsimmons (785-232-0889), [fitzsimmons@ksu.edu](mailto:fitzsimmons@ksu.edu)

Mustaque Hossain (785-532-1576), [mustak@ksu.edu](mailto:mustak@ksu.edu)

### **FHWA Representative:**

Doug Daugherty (785-273-2600) [Doug.Daugherty@dot.gov](mailto:Doug.Daugherty@dot.gov)

## K-TRAN Area Panel Members

### **Planning, Administration and Computing:**

**KDOT:** Mike Moriarty (785-296-3841) [Michael.Moriarty@ks.gov](mailto:Michael.Moriarty@ks.gov)

**FHWA:** Paul Foundoukis (785-273-2600) [paul.foundoukis@dot.gov](mailto:paul.foundoukis@dot.gov)

**KSU:** Bobb Stokes (785-532-1595) [drbobb@ksu.edu](mailto:drbobb@ksu.edu)

**KU:** Lisa Harris (785-864-2590) [lharris@ku.edu](mailto:lharris@ku.edu)

### **Operations: Pavements, Materials, Construction and Maintenance:**

#### **KDOT:**

Rick Kreider (785-296-1195) [Richard.Kreider@ks.gov](mailto:Richard.Kreider@ks.gov)

Greg Schieber (785-296-3576) [Greg.Schieber@ks.gov](mailto:Greg.Schieber@ks.gov)

#### **FHWA:**

Tom Deddens (785-273-2600) [tom.deddens@dot.gov](mailto:tom.deddens@dot.gov)

Doug Daugherty (785-273-2600) [doug.daugherty@dot.gov](mailto:doug.daugherty@dot.gov)

**KSU:** Mustaque Hossain (785-532-1576) [mustak@ksu.edu](mailto:mustak@ksu.edu)

**KU:** Robert Parsons (785-864-2946) [rparsons@ku.edu](mailto:rparsons@ku.edu)

### **Traffic Operations; Driver and Pedestrian Safety:**

**KDOT:** Brian Gower (785-296-7431) [brian.gower@ks.gov](mailto:brian.gower@ks.gov)

**FHWA:** David LaRoche (785-273-2600) [david.laroche@dot.gov](mailto:david.laroche@dot.gov)

**KSU:** Eric Fitzsimmons (785-532-0889) [fitzsimmons@ksu.edu](mailto:fitzsimmons@ksu.edu)

**KU:** Steven Schrock (785-864-3418) [schrock@ku.edu](mailto:schrock@ku.edu)

### **Structural & Geotechnical:**

**KDOT:** Mark Hoppe (785-296-3531) [Mark.Hoppe@ks.gov](mailto:Mark.Hoppe@ks.gov)

**FHWA:** Steven Toillion (785-273-2600) [steven.toillion@dot.gov](mailto:steven.toillion@dot.gov)

**KSU:** Hayder Rasheed (785-532-1589) [hayder@ksu.edu](mailto:hayder@ksu.edu)

**KU:** Caroline Bennett (785-864-3235) [crb@ku.edu](mailto:crb@ku.edu)

**Geometric Design, Drainage and Environmental:**

**KDOT:** Scott King (785-296-3901) [Scott.King@ks.gov](mailto:Scott.King@ks.gov)

**FHWA:** Vacant

**KSU:** Mustaque Hossain (785-532-1576) [mustak@ksu.edu](mailto:mustak@ksu.edu)

**KU:** Dennis Lane (785-864-2942) [lane@ku.edu](mailto:lane@ku.edu)

**Multimodal: Rail, Aviation, Public Transit, Freight:**

**KDOT:** Davonna Moore (785-296-0346) [Davonna.Moore@ks.gov](mailto:Davonna.Moore@ks.gov)

**FHWA:** Paul Foundoukis (785-273-2655) [Paul.Foundoukis@dot.gov](mailto:Paul.Foundoukis@dot.gov)

**KSU:** Eric Fitzsimmons (785-532-0889) [fitzsimmons@ksu.edu](mailto:fitzsimmons@ksu.edu)

**KU:** Lisa Harris (785-864-2590) [lharris@ku.edu](mailto:lharris@ku.edu)

**Local Government:**

**KDOT:** Michael Stringer, Chief, Bureau of Local Projects (785-296-3861)  
[Michael.Stringer@ks.gov](mailto:Michael.Stringer@ks.gov)

**FHWA:** James “Rusty” Simerl (785-273-2629) [james.simerl@dot.gov](mailto:james.simerl@dot.gov)

**KSU:** Eric Fitzsimmons (785-532-0889) [fitzsimmons@ksu.edu](mailto:fitzsimmons@ksu.edu)

**KU:** Lisa Harris (785-864-2590) [lharris@ku.edu](mailto:lharris@ku.edu)

**Attachment D**

Name \_\_\_\_\_

**KSU Rankings**

Ranking	Preproposal Number
1	KSU-XX - _____
2	KSU-XX - _____
3	KSU-XX - _____
4	KSU-XX - _____
5	KSU-XX - _____
6	KSU-XX - _____
7	KSU-XX - _____
8	KSU-XX - _____
9	KSU-XX - _____
10	KSU-XX - _____

Note: XX = Program Year

Name \_\_\_\_\_

### KU Rankings

Ranking	Preproposal Number
1	KU-XX - _____
2	KU-XX - _____
3	KU-XX - _____
4	KU-XX - _____
5	KU-XX - _____
6	KU-XX - _____
7	KU-XX - _____
8	KU-XX - _____
9	KU-XX - _____
10	KU-XX - _____

Note: XX = Program Year

# Attachment E-1

## KDOT RESEARCH PROJECT IMPLEMENTATION PLAN

RESEARCH STUDY NO.:

KDOT PROJECT NO.:

TITLE:

PRINCIPAL INVESTIGATORS:

PROJECT MONITOR:

AREA PANEL LEADER:

CONTRACTING AGENCY:

STUDY COST:

A. SUMMARY OF RESEARCH FINDINGS – (Info from Project Summary Sheet)

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B. IMPLEMENTATION POTENTIAL –

Have Results been implemented? \_\_\_\_\_ YES \_\_\_\_\_ NO

Will Research results be implemented? \_\_\_\_\_ YES \_\_\_\_\_ NO

IF NO, LIST IMPLEMENTATION STRATEGIES & SCHEDULING - The goals and scope of implementation, any potential problems or constraints, and the tools needed to achieve implementation. Include any approvals required.

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C. BUDGET ESTIMATING - Detail the expected costs of implementation as well as the anticipated benefit saving from implementation (See Part D of this Form).

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**D. PROJECT ASSESSMENT USING MULTI-OBJECTIVE CRITERIA** – In the following Table, rate the project on the basis of the extent to which the project, if implemented, would result in a benefit in each of the assessment categories. Rate from 0 to 3, with 3 being the most successful. Rating Guide: N/A = factor does not apply to this project; 0 = absolutely no benefit; 1 = intuitive feeling that the project has some slight benefit; 2 = no clear evidence but strong subjective feeling that the project has a significant benefit; 3 = clear evidence or strong feeling the project has an excellent to outstanding positive benefit. [Note: A rating of “3” in at least one of the Assessment Categories indicates a “successful” (cost effective) project. This criterion should be considered when assigning numeric ratings.]

Assessment Category	Subjective Rating	Triennial Benefits (\$)	Comments
<b>Construction Savings</b> (materials, Labor, equipment, time, quality)			
<b>Operation and Maintenance Savings</b> (materials, labor, equipment, time)			
<b>Increase Lifecycle</b>			
<b>Decrease Lifecycle Costs</b>			
<b>Safety</b> (Reduction of crash frequency, Reduction of crash severity)			
<b>Decrease Engr./Admin. Costs</b> (planning/design costs, paperwork)			
<b>Environmental Aspects</b> (pollution, hazardous waste reduction, recycling)			
<b>Technology</b> (technology transfer, new materials, new methods)			
<b>User benefits</b> (time, dollars)			
<b>Impact On KDOT Policy</b>			

BENEFITS

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E. CONTRACT RESEARCH PERFORMANCE ASSESSMENT:

Please mark one selection for each statement:	Strongly Agree	Agree	Disagree	Strongly Disagree
Principal investigator maintained good communication throughout project.				
Final report fulfilled the study objectives and tasks as stated in the proposal.				
Final report was accurate and clearly written.				
Project was kept on schedule and completed within the expected timeframe.				
PI and project team were competent, understood and responded to KDOT needs.				
Benefits were received that corresponded to project costs.				

Comments: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Prepared by: \_\_\_\_\_ Date \_\_\_\_\_  
 K-TRAN Project Monitor

Approved by: \_\_\_\_\_  
 K-TRAN Area Panel Leader

**IF IMPLEMENTED (Please put an X in one box):**

Hardware/Physical Product	Software	Policy Study	Design/Evaluation Procedure	Test Method	Training Material

State of Kansas - Department of Transportation <b>RESEARCH PROJECT IMPLEMENTATION PROGRESS REPORT</b>														
Title of Study								Study Number						
KDOT Project No. & Contract Number						Principal Investigator		Project Monitor						
Project Budget \$	Implement Budget/Expenditures	Total Budget/Expenditures	Triennial Benefits				B/C Ratio							
<b>Has Project Been Implemented</b> _____ <b>YES</b> (Skip Boxes A-C) _____ <b>NO</b> (Complete A-C below)														
					20__		20__			20__				
A. List of Implementation Tasks List specific major tasks or phases to accomplish the findings Use an "S" to indicate the Starting Date and a "C" to indicate the Completion Date					Prior	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	Jul - Sep	Oct - Dec	Jan - Mar	Apr - Jun	B e y o n d
B. Explain what was done this period. Describe any unanticipated problems that arose this period or any recent implementation.														
C. Briefly describe the work planned for the next period along with any projected deviations from the work plan or anticipated modifications to the cost estimate or the work schedule.														
Project Monitor's Signature								Progress Reporting Date						

**Attachment E-2**

**PROJECT IMPLEMENTATION REVIEW**

RESEARCH STUDY NO.:

KDOT PROJECT NO.:

TITLE:

A. SUMMARY OF RESEARCH FINDINGS – (Info from Project Summary Sheet)

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B. IMPLEMENTATION POTENTIAL –

Have Results been implemented?       YES             NO      

BENEFITS

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Project Budget	Implement Budget/Expenditures	Total Budget/Expenditures	Triennial Benefits	B/C Ratio
\$	\$	\$	\$	

Prepared by: \_\_\_\_\_

\_\_\_\_\_ Date

Approved by: \_\_\_\_\_

K-TRAN Area Panel Leader

### Attachment E-3

## KDOT RESEARCH PROJECT IMPLEMENTATION PLAN INDEPENDENT REVIEW FORM

RESEARCH STUDY NO.: \_\_\_\_\_

KDOT PROJECT NO.: \_\_\_\_\_

TITLE: \_\_\_\_\_  
\_\_\_\_\_

Please review the attached **DRAFT** copy of the Research Implementation Plan and initial Annual Progress Report that has been prepared by the Project Monitor for the above-named project and make comments and/or recommendations for improvement. The purpose of this review is to verify that the rationales used are defensible and thus help improve the accuracy and credibility of the Research Implementation Plan before it is signed by the assigned Area Panel Leader and presented to the Research Program Council.

I concur with the amount of triennial benefits stated and rationale used to calculate them.

YES: \_\_\_\_\_

NO: \_\_\_\_\_

IF NO, RECOMMENDATIONS FOR IMPROVEMENT:

\_\_\_\_\_  
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COMMENTS:

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\_\_\_\_\_  
\_\_\_\_\_

Reviewed by: \_\_\_\_\_

Date: \_\_\_\_\_

## **Attachment E-4**

Report No. KS-03-9 Final Report (July  
2004)

### **GUIDELINES FOR ESTIMATING THE TRIENNIAL BENEFITS OF KANSAS TRANSPORTATION RESEARCH AND NEW DEVELOPMENTS (K-TRAN) RESEARCH PROJECTS**

Robert W. Stokes, Michael W. Babcock, Eugene R. Russell and Margaret J. Rys  
Kansas State University

## **Guidelines for Estimating the Benefits of K-TRAN Research Projects**

### **Overview**

Two basic approaches for assessing the benefits of transportation improvement and research projects are:

. The first approach is applicable when the economic impacts (benefits and costs) of transportation research projects can be expressed primarily in monetary terms. In this case, traditional benefit-cost techniques can be used to assess the economic effectiveness of the project.

. The second basic approach is applicable to those cases where project benefits cannot be expressed in strictly monetary terms. In these situations, project benefits are assigned numeric ratings that reflect how well the research results satisfied the study objectives. This basic approach is commonly referred to as “multi-objective” analysis.

Several forms of the multi-objective analysis technique were evaluated in this research project. The various forms considered included techniques that require the analyst to assign “weights” to the individual benefit impact categories, and techniques that lead to the development of a “benefit-cost effectiveness index” for each research project. The “benefit-cost effectiveness index” is calculated by dividing the sum of the ratings assigned to each of the factors affected by the research project by the cost of the research project. Since this index is obtained by dividing an index number (i.e., impact category rating) by a dollar cost value, it is

not a particularly meaningful standalone measure of research project effectiveness. As a result, it was determined by the research team that assigning a simple (i.e., non-weighted) numeric rating to the individual impact factors produced a more meaningful and understandable assessment of overall project success than more elaborate measures such as composite benefit indices.

The multi-objective assessment technique recommended in this study is a modified version of the multi-objective assessment procedure that was used by KDOT as part of the department's K-TRAN Research Assessment and Implementation (A&I) reporting process until 1998. This multi-objective assessment technique is based in large part on the work of Tavakoli and Collyard (1992).

The guidelines presented in this report represent a hybrid approach to research project assessment that incorporates elements from traditional benefit-cost and multi-objective analysis techniques. The basic methodology requires the researcher to perform an initial subjective assessment of project benefits using a checklist of potential benefit categories. The researcher is then guided through a process whereby he/she is asked to attempt to quantify (i.e., assign a monetary value to) the benefits identified in the initial subjective assessment. The process provides the researcher with guidelines for developing a range of possible impact values. This process is intended to lead to the development of a "reasonable" (i.e., "justifiable") estimate of potential project benefits expressed in monetary terms. If the process leads to the development of a monetary estimate of benefits, then a traditional benefit-cost analysis of the project can be performed. If it is determined that the project benefits cannot be expressed in purely economic terms, then the results of the subjective multi-objective assessment are assumed to represent the best assessment possible at that point in time.

The guidelines for the multi-objective assessment technique include recommendations for rating project impacts and for identifying “successful” projects based on a project’s overall rating.

The recommended assessment guidelines are presented in the following section of this report. Application of the guidelines is illustrated through an extensive set of examples using information from nearly 75 K-TRAN research projects for the period 1991-2000.

*The intent of the guidelines and the accompanying example applications is to illustrate that, based on a careful and thoughtful examination of research project results, K-TRAN researchers and project monitors should be able to arrive at reasonable (i.e., “justifiable”) estimates of the monetary benefits that could be achieved if the research results were to be implemented.*

### **Summary of Recommended Guidelines**

The recommended guidelines for estimating the triennial benefits of K-TRAN research projects consist of the following basic steps.

#### **Step 1: Determine if research findings can be implemented.**

The project principal investigator(s) and the KDOT Project Monitor should review the completed research and determine what (if any) of the research findings can be implemented. The *KDOT Research Project Implementation Plan* forms provided in Appendix B should be used to complete this Step. If it is determined that the research findings will be implemented, the analyst should proceed to Step 2 of the recommended assessment process. If it is determined that none of the research findings can be implemented (i.e., the research has no benefits), this information should be recorded on the *K-TRAN Research Project Implementation Progress Report Form* (see

Appendix B). If it is determined that the research has no benefits, the project assessment process can be concluded at this point.

**Step 2: Identify benefit impact areas affected by the research project.**

The project principal investigator(s) and the KDOT Project Monitor should review the check list of potential benefit categories shown in Part F of the *KDOT Research Project Implementation Plan* forms provided in Appendix B and identify those that are applicable to the research project being evaluated. As part of this phase of the process, the project principal investigator(s) and the KDOT Project Monitor should also consider the potential “beneficiaries” of the research effort. In many cases, KDOT will be the primary beneficiary, but the potential impacts of the research on other state and local agencies should not be overlooked.

**Step 3: Assign a numeric rating to the applicable benefit categories.**

The principal investigator(s) and the KDOT Project Monitor should review the objectives of the research project and assign a numeric rating to indicate the potential significance of the research results in terms of the applicable impact factors. The applicable benefit categories (see Part F of the *KDOT Research Project Implementation Plan* forms provided in Appendix B) should be rated from 1 to 3, with 3 representing the most significant positive benefit. The following guidelines for selecting an appropriate numeric rating are suggested: NA = factor does not apply to this project; 0 = absolutely no benefit; 1 = intuitive feeling that the project has some slight benefit; 2 = no clear evidence but strong subjective feeling that the project has a significant positive benefit; 3 = clear evidence or strong feeling the project has an excellent to outstanding, positive benefit.

This study recommends that research projects be considered “successful” (i.e., cost effective) if they receive a rating of “3” in at least one of the impact categories listed in Part F of the *KDOT Research Project Implementation Plan* forms provided in Appendix B. Principal investigators and project monitors should consider this criterion when assigning numeric ratings to the impact factors.

**Step 4: Document the results of Steps 2 and 3.**

The basis for the ratings assigned to the benefit categories in Step 3 should be fully documented. This is an important step in the assessment process in that the documentation may provide useful guidance in identifying potential monetary impacts of the research (see Step 5). The documentation should also identify the potential beneficiaries of the research (KDOT, cities, counties, motorists, the business community, etc.), the geographic scope of the potential impacts of the research (national, statewide, local, etc.), and the likely timing of the benefits (immediate, 5 years from now, 10 years from now, etc.). In this step, the principal investigator and the project monitor should strive to “quantify” to the extent possible the rationale behind the numeric ratings assigned to the benefit impact factors in Part F of the *KDOT Research Project Implementation Plan* forms provided in Appendix B.

**Step 5: Estimate the potential economic impacts of the research.**

In many cases, this will be the most difficult phase of the assessment process. However, if the basis for the benefit category ratings established in Step 3 is carefully documented, it should be possible in many cases to develop a range of estimates of potential economic impacts. For example, if it is determined in Step 2 that the research could lead to a travel time savings for motorists, information on current traffic volumes and generally accepted values of time (see

Appendix C) could be used to estimate the potential economic impacts of the research.

In attempting to quantify the economic benefits of a research project, the principal investigator and the project monitor should brainstorm on the implications of a range of potential strategies concerning the implementation of the research results. For example, the principal investigator and the project monitor should initiate the brainstorming by addressing the following basic questions.

- Does the research propose (or imply) changes in existing policy, standards, or practice?
- If the research proposes changes in existing policy, standards, or practice, how soon could the research findings be implemented?
- If the research proposes changes in existing policy, standards, or practice, what would be the scope of the changes in terms of agencies and geographic areas affected?
- If the research proposes changes in existing policy, standards, or practice, are there specific agencies and/or project sites where the research results could be evaluated?
- Does the research provide any evidence concerning the potential magnitude of the impacts of the proposed changes?
- Does the research provide any evidence concerning the potential magnitude of the economic impacts of the proposed changes?

The goal of the brainstorming should be to arrive at a reasonable estimate(s) of the potential economic impacts of the research project. As suggested by the questions listed above

this process should begin by determining the implementation potentials of the research findings. If the research findings have the potential for immediate implementation, the agencies (KDOT Bureaus, counties, cities, etc.) and geographic areas (statewide, selected sites, etc.) affected by the implementation need to be identified. By clearly identifying the agencies and geographic areas affected by the research findings it may be possible to identify a specific agency office, project site or case study to serve as a basis for assessing the economic impacts of implementing the research findings. In the ideal situation, evidence from the research project concerning the potential magnitude of the impacts that could be expected if the research findings are implemented could be applied to the project site or case study conditions. If it is not possible to identify a project site or case study, or if evidence is not available from the research project concerning the potential magnitude of the impacts that could be expected if the research findings are implemented, a more generic “what if” approach may be needed. This approach is outlined below.

Clearly, the development of precise estimates of economic impacts is not possible in all situations. In such cases, the principal investigator and the project monitor are encouraged to take a “what if” approach in attempting to estimate the potential economic impacts of research projects. This approach could involve assessing the economic impacts of a range of “what if” scenarios concerning implementation of research findings. An example of this approach can be found in K-TRAN Study KSU-97-5. That study examined the susceptibility of different geologic formations to slope failure and suggested general guidelines to predict slope failures. In assessing the economic benefits of the research, the principal investigator suggested that “*if* the study prevents 1 slope failure, the resulting savings would be \$120,000 over a 3-year period.” A similar approach was taken in K-TRAN Study KU-97-2. In that study the researchers were

asked to develop practical guidance for the design and implementation of temporary erosion control measures. In assessing the potential benefits of the research project, the principal investigator noted that “in 1996, total dollar bids for temporary ditch checks and temporary slope barriers for KDOT projects were \$2,950,900”. The principal investigator suggested that “*if* the study findings resulted in a 10 percent reduction in the required temporary erosion measures, potential savings of \$295,000 per year could be realized”.

***[Note: K-TRAN Studies 97-5 and 97-2 referenced above have not been implemented. The intent of the discussion of these projects is to illustrate the “what if”, brainstorming approach to identifying benefits that may result from project implementation.]***

If the principal investigator and the project monitor are able to arrive at a reasonable estimate of the economic benefits of the research project, the benefits should be reported in terms of a triennial (3-year) value. Given the relatively short time frame (i.e., 3 years) and the approximate nature of the estimated benefits, it is recommended that the annual benefits not be adjusted to account for the effects of compounding over the 3-year period (i.e., triennial benefits = annual benefits x 3). The estimated benefits should be documented and recorded in the “projected” or “actual” triennial benefits cells of the *Research Project Implementation Progress Report* provided in Appendix B.

Much of the discussion to this point has addressed research studies that could result in benefits that would be realized in a relatively short time frame following implementation. However, research findings with benefits that may not be realized until 10- 20 years into the future should not be ignored when estimating current (triennial) benefits. To illustrate this point, consider the results from K-TRAN Study KU-94-1. The objectives of that study were to determine the potential factors contributing to bridge deck cracking and to recommend

procedures to alleviate the problem. The study concluded that if the study findings were implemented the department would realize a savings of \$1.4 million per year beginning 15 years from the time the study findings are implemented. This “future benefit” can be expressed as an equivalent present value and used to estimate the triennial benefits of the research.

If the principal investigator and the project monitor are unable to assign a monetary value to the potential benefits of the research project, the results of the subjective multi-objective assessment completed in Steps 2-4 can be assumed to represent the best assessment possible at that point in time.

**Step 6: Document the results of the assessment process.**

The results of the assessment process should be fully documented. The documentation should include the results of the multi-objective assessment and a discussion of the basis for the numeric ratings assigned to each of the applicable benefit factors. If estimates of the economic impacts of the research are developed, data sources and all assumptions should be clearly documented in the Forms provided in Appendix B.

### **Estimating Economic Benefits: Example Applications**

This section of this report illustrates the application of the “Recommended Guidelines” through a set of examples that draw upon information reported in selected *A&I* and *Research Implementation Plans* for the period 1991-2000. Because it is frequently the most difficult phase of the assessment process, the examples focus on estimating the economic (monetary) benefits of research projects.

*The intent of the example applications is to illustrate that, based on a careful and thoughtful examination of research project results, K-TRAN researchers and project monitors should be able to arrive at reasonable (i.e., “justifiable”) estimates of the monetary benefits that could be achieved if the research results were to be implemented. Many of the examples represent projects that have not been implemented. As a result, the non-implemented studies do not appear in the benefit assessment data presented in Table 1 of this report.*

#### **Example 1**

K-TRAN Title:	Prototype Expert System for Resolution of Concrete Construction Problems.
K-TRAN No.:	KSU-91-1
Study Objectives:	Development of an expert system (computer program) for use by construction staff as an aid in identifying and repairing problems that sometimes occur during the construction of bridges.
Estimated Benefits:	The project principal investigator suggests that if the software became widely distributed and was used as a training tool, expected savings of a nominal 0.1% of the triennial bridge construction budget could be expected. For the period 1995 - 97, this would be \$220,000.
Study Cost:	\$40,278.
Estimated B/C Ratio:	5.5:1.

**Example 2**

K-TRAN Title: Studies in the Establishment of Native Woody Plants.  
 K-TRAN No.: KSU-91-5.  
 Study Objectives: To determine if and under what environmental and physiological conditions and cultural practices woody plants could be economically established on the roadside by direct seeding.  
 Estimated Benefits: The results of this study were presented at the national meeting of the American Society for Horticultural Science and distributed to over 20 local, state and national agencies. The study clearly has a benefit in terms of technology transfer. While it is difficult to precisely quantify the benefits of this technology transfer, a benefit equal to the initial estimate of the cost of the study (\$40,000) does not appear to be unreasonable.  
 Study Cost: \$29,686 (actual project expenditures).  
 Estimated B/C Ratio: 1.3:1.

**Example 3**

K-TRAN Title: Evaluation of Policies on Highway Sign Materials.  
 K-TRAN No.: KSU-92-8.  
 Study Objectives: Determine the best, cost-effective policy, consistent with safety, for material type used on highway signs in Kansas.  
 Estimated Benefits: The potential to reduce traffic crashes was determined to be the primary benefit of this research. The researchers estimated the safety benefits of the study by assuming that implementation of the study findings could result in a 1% reduction in all traffic crashes on the state highway system for the period 1991-93 (63,842 crashes). The researchers assumed the average cost of a traffic crash to be \$20,777. Based on these assumptions, the estimated triennial benefit is approximately \$13,270,000.  
 Study Cost: \$14,942.  
 Estimated B/C Ratio: 8.1:1.

**Example 4**

K-TRAN Title: Scanning Electron Microscope Studies of Silica Fume Concrete.  
K-TRAN No.: KSU-93-4.  
Study Objectives: To observe progress of hydration of Portland cement paste containing silica fume, and correlate mix specifications and concrete test results with silica fume content.  
Estimated Benefits: The researchers suggested that the construction cost savings of a bridge deck using silica fume rather than regular concrete would be approximately \$15,500 in 1996. Assuming that 25 to 30 decks per year would qualify for these designs, an estimated annual savings of approximately \$400,000 could be realized. The estimated potential triennial benefit would be \$1,200,000. The researchers suggest a triennial savings of one-half this amount (\$600,000) as a reasonable estimate of potential benefits.  
Study Cost: \$36,000.  
Estimated B/C Ratio: 16.7:1.

**Example 5**

K-TRAN Title: Rainfall Inputs for Simulation of Design Floods for Kansas.  
K-TRAN No.: KU-93-3  
Study Objectives: Develop a “design storm” for input into a flood hydrograph model for determining hydrologic responses of Kansas streams.  
Estimated Benefits: The researcher assumed that 1) total highway construction costs = approximately \$200 million per year, 2) 15 percent of the total construction cost on highway projects is drainage related, and 3) the research findings would result in a 0.1 % savings in the cost of drainage structures. Based on these assumptions, the estimated triennial benefit is \$90,000.  
Study Cost: \$29,500.  
Estimated B/C Ratio: 3.1:1.

**Example 6**

K-TRAN Title: Bridge Deck Cracking in Steel-Concrete Composite Bridges.  
 K-TRAN No.: KU-94-1.  
 Study Objectives: To determine the potential factors contributing to bridge deck cracking and to recommend procedures that will alleviate the problem.  
 Estimated Benefits: The researcher estimated that implementation of the study findings would result in an annual savings of \$1.4 million beginning fifteen years from the time the findings are implemented. This future benefit has an equivalent “present value” that should be considered. At 5% interest, \$1.4 million 15 years from now is equivalent to \$673,000 today. The estimated triennial (3-year) benefit is approximately \$2 million.  
 Study Cost: \$40,000.  
 Estimated B/C Ratio: 50.0:1.

**Example 7**

K-TRAN Title: The Economic Impact of General Aviation Airport Deterioration on Kansas Communities. K-TRAN No.: KSU-95-8. Study  
 Objectives: To document the deterioration of Kansas general aviation airports by obtaining information regarding needed capital improvements, to measure the economic impacts of substandard airports on general aviation service users, and to identify the types of business firms whose location decisions are affected by high quality air service.  
 Estimated Benefits: The researchers suggest that the study findings may attract as much as \$100,000 in federal funds over a 3-year period for systems planning activities related to general aviation in Kansas.  
 Study Cost: \$25,000. Estimated  
 Estimated B/C Ratio: 4.0:1.

**Example 8**

K-TRAN Title: Evaluation of Fatigue Behavior of Web (Rat Holes) for Accessibility to Transverse Butt Welds.

K-TRAN No.: KU-95-6.

Study Objectives: Examine the fatigue behavior of cope holes to establish the AASHTO fatigue category that governs cope holes. Develop a procedure to upgrade the fatigue behavior of existing cope holes.

Estimated Benefits: The researcher concluded that implementation of the study findings could extend the life of bridges and result in an annual savings of \$52,000 per bridge. A very conservative estimate of the triennial benefits is \$156,000 (\$52,000 x 3 years).

Study Cost: \$35,000.

Estimated B/C Ratio: 4.5:1.

**Example 9**

K-TRAN Title: Transit Needs Assessments for Major Cities in Kansas.

K-TRAN No.: KSU-96-7

Study Objectives: To estimate the capital and operating costs associated with providing public transportation services in Topeka, Wichita, Manhattan and Lawrence, Kansas over the next 10 years.

Estimated Benefits: The results of this study were used by local transit service providers in Topeka and Wichita in preparing budgets and funding requests. The study results were provided at no cost to the local transit service providers. The results of the study also were used by KDOT in preparing the State's Long-Range Transportation Plan. The KDOT portion of the research project budget was used to leverage an additional \$20,000 in research funds from the Mid America Transportation Center. It is estimated that the triennial benefits of this study to local transit service providers is at least \$50,000.

Study Cost: \$23,921.

Estimated B/C Ratio: 2.1:1.

**Example 10**

K-TRAN Title: Pavement Performance Models: An Artificial Neural Network Approach.  
 K-TRAN No.: KSU/KU-97-3.  
 Study Objectives: Development of neural network-based pavement performance models for use in KDOT's Project Optimization System (POS).  
 Estimated Benefits: The researchers estimate that triennial savings of \$1,149,000 in fuel consumption could result from implementation of accurate POS prediction models. The estimated benefits are attributed to reduced pavement roughness.  
 Study Cost: \$40,000.  
 Estimated B/C Ratio: 28.7:1.

**Example 11**

K-TRAN Title: Transit Needs Assessments for Major Cities in Kansas (Year 2).  
 K-TRAN No.: KSU-97-4  
 Study Objectives: To estimate the capital and operating costs associated with providing public transportation services in Topeka, Wichita, Manhattan and Lawrence, Kansas over the next 10 years.  
 Estimated Benefits: The results of this study were used by local transit service providers in Topeka and Wichita in preparing budgets and funding requests. The study results were provided at no cost to the local transit service providers. The results of the study also were used by KDOT in preparing the State's Long-Range Transportation Plan. The KDOT portion of the research project budget was used to leverage an additional \$15,000 in research funds from the Mid America Transportation Center. It is estimated that the triennial benefits of this study to local transit service providers is at least \$30,000.  
 Study Cost: \$15,000.  
 Estimated B/C Ratio: 2.0:1.

**Example 12**

K-TRAN Title: Sedimentologic and Mechanical Analysis of Uppermost Pennsylvanian and Permian Mudstones in Northeastern Kansas.

K-TRAN No.: KSU-97-5.

Study Objectives: To study the susceptibility of different geologic formations to slope failure and characterize the critical elements for improved prediction of slope failures.

Estimated Benefits: The researchers suggest that if the study results prevent 1 slope failure, the resulting triennial benefits would be approximately \$120,000.

Study Cost: \$39,419.

Estimated B/C Ratio: 3.0:1.

**Example 13**

K-TRAN Title: Aggregate Specifications for SMA.

K-TRAN No.: KU-97-5.

Study Objectives: To evaluate Kansas aggregates for use in SMA mixes, evaluate moisture susceptibility and develop related SMA aggregate specification requirements.

Estimated Benefits: The researcher estimated that implementation of the study findings could result in a reduction of aggregate costs of \$1/ton. Using average tonnage on 2 recent SMA projects, the researcher estimated potential triennial savings attributable to implementation of the research findings of approximately \$44,000.

Study Cost: \$45,000.

Estimated B/C Ratio: 1:1.

**Example 14**

K-TRAN Title: Use of KDOT Storm Analysis to Improve Flood Discharge Estimates.

K-TRAN No.: KU-98-1.

Study Objectives: To develop relationships specific to Kansas drainage basins to more confidently predict flood discharge.

Estimated Benefits: The research results indicate that some savings may be realized by permitting use of smaller drainage structures. The researcher estimates potential triennial benefits attributable to the research of approximately \$72,000.

Study Cost: \$30,000.

Estimated B/C Ratio: 2.4:1.

**TABLE C-1: Valuation of Vehicle Operating Costs**

Vehicle Type	Vehicle Operating Cost per 1000 Miles of Travel		
	Cost (\$) at 20 mph	Cost (\$) at 55 mph	Cost (\$) at 65 mph
Car	220	275	275
Single Unit Truck	600	650	710
Tractor Trailer Truck	600	820	875

Source: AASHTO (1977). Adjusted to 2003 at 3% annual inflation.

**TABLE C-2: Valuation of Travel Time**

Category of Travel	Typical Hourly Values (\$)	
	Per Vehicle	Per Person
Freight (Tractor Trailer)	25	25
Freight (Single Unit Truck)	20	20
Persons (Work Trips)	15	15
Persons (Non-Work Trips)	5	10

Source: Weisbrod and Weisbrod (1997). Updated to 2003 at 3% annual inflation.

**TABLE C-3: Recommended Values for Traffic Crashes**

Crash Category	Cost (\$)
Fatality	3,952,000
Injury	342,000
Property Damage Only	2,500

Source: KDOT Bureau of Transportation Planning. Updated from 1996 to 2003 at 3% annual inflation.

## Attachment F-1

FY 2018

### CHECKLIST FOR UNIVERSITY RESEARCH (K-TRAN) PROJECT MONITORS (In chronological order of occurrence)

April 2017

By

David A. Meggers, P.E., Assistant Bureau Chief, Bureau of Research  
([Dave.Meggers@ks.gov](mailto:Dave.Meggers@ks.gov))

1. A copy of the Research Project Statement (preproposal) for your assigned project and research idea form (if prepared) will be or should have been sent to you. Discuss these with your Area Panel Leader, the person who submitted the idea, and selected staff in the units of interest to gain information about what KDOT needs are. You may wish to create a small panel or committee to work with you during the project, but it is not required unless stated in the Proposal.
2. Meet with Principal Investigator (PI) to discuss research needs, data inputs by KDOT staff, proposal development, confidentiality, etc. **Proposal Development Instructions** (attached – page 6 of this document) give more details on each of these and other important items to consider. **Please read these detailed instructions before meeting with the PI to discuss the Proposal.**
3. Review draft(s) of Proposal (or email) and make clarifications, corrections, additions, etc. as needed. The Proposal will become Special Attachment 1 in the contract. Consult with your Area Panel Leader if necessary.
  - a. **Be sure that KDOT inputs and deliverables from the research project are both clearly defined.**
  - b. **Require a report to be submitted to KDOT in Microsoft Word. Include the following wording in the Proposal regarding the written report:**  
*“A written report shall be submitted to KDOT in Microsoft Office Word format. The report shall utilize KDOT Microsoft Office Styles and guidelines with regard to pictures and graph sizes.”*
  - c. **The review by a technical writer is required by KDOT before the submission of a report.**
  - d. **Be sure to emphasize any hard deadlines for completion like “we have to have this policy study completed before the legislature convenes”.**
  - e. **Be sure a Recommended Implementation Plan section is included.**
  - f. **Check budget for non-approved conference or out of state travel, computers and reasonable fund allocation to line items. Conference travel that does not directly benefit the work being done by the project must be**

**approved in advance by Catherine Patrick. Computers must also be approved by Catherine Patrick.**

- g. Confirm that no indirect costs are being charged on state funds.**
4. Approve final Proposal either by email or by writing "APPROVED" on the cover sheet, signing, dating and send it back to the PI. Notify Amanda Jones, NHI and Research Coordinator, in the KDOT Library on the 4<sup>th</sup> floor of ESOB with a copy of the approved Proposal. This should be done before the beginning date shown on the proposal. Research will take care of items 5 thru 8. Please contact Research (Dave Meggers) if there needs to be a Confidential Information clause— (see number 8 of this document).

**Research will take care of items 5 thru 8. – See Amanda Jones.**

5. KDOT's Office of Chief Counsel will create the entire Agreement document using our approved standard "boilerplate" research project language. They will include the approved Proposal as Special Attachment 1. Amanda will check to be sure; that the Agreement includes the proper agreement boilerplate and confirm that the Proposal (Special Attachment No. 1) is the final version that you approved; that the other three attachments are included with the contract and that the signature block has the correct names. Amanda will check to be sure that the budget amount is the amount that K-TRAN programmed, is the amount agreed to between you and the PI and agrees with the budget page in the proposal (Attachment 1).
6. Amanda will send the Contract to the Universities for the proper signatures. The Universities will send the signed contract back to Amanda. Amanda will mark the two places to sign on the agreement with "sign here" flags or paper clips and route the Contract to the Secretary's office for the KDOT approval. Please notify her if confidential information will be involved (See 8. below). She will work with the Contract Attorney in the OCC office.
7. Once Catherine Patrick has signed the original ***in two places***, then Amanda will email a signed copy to the PM and then forward the contract to Brenna Saville, Research Administrative Assistant. Brenna will send a copy to Alicia Reed or Dr. Paul Lowe, after the Bureau of Fiscal Services has set up the contract funding, as appropriate:

Alicia Reed  
Interim Director Research Administration  
University of Kansas - Center for Research, Inc  
2385 Irving Hill Rd.  
Lawrence, Kansas 66045-7563

Dr. Paul R. Lowe  
Assistant Vice Provost for Research  
Kansas State University  
2 Fairchild Hall  
Manhattan, Kansas 66506-5103

The PI and PM will be copied on all future correspondence including a copy of the signed agreement. Brenna will request encumbrance of funds for the project through Fiscal Services. **Agreements starting before July 1 each year must be reviewed, approved, stamped and signed by Catherine Patrick and delivered to Fiscal Services by May 15<sup>th</sup> so encumbrance paperwork can be processed before the end of the fiscal year. If you are close to the May 15<sup>th</sup> deadline, please call me so we can obtain information needed to prepare the draft contract cover sheet and prior authorizations forms. Deliver the signed contract to Dave Meggers and Research will provide additional documents to the Bureau of Fiscal Services prior to the deadline.** When Brenna gets the completed contract cover sheet (encumbrance) back from Fiscal Services, she will make distribution.

8. Confidential Information. A clause (Section 5D.) is included in the Agreement requiring the University not to disclose the data to any third parties when sensitive or confidential KDOT data is supplied for the research. **If confidential information will be supplied to the University as part of your project, this special paragraph will need to be included in the transmittal letter to them:**

“KDOT has a privilege under 23 USC 409 that states: "Notwithstanding any other provision of law, reports, surveys, schedules, lists, or data compiled or collected for the purpose of identifying, evaluating, or planning the safety enhancement of potential accident sites, hazardous roadway conditions, or railway-highway crossings, pursuant to sections 130, 144, and 152 of this title or for the purpose of developing any highway safety construction improvement project which may be implemented utilizing Federal-aid highway funds shall not be subject to discovery or admitted into evidence in a Federal or State court proceeding or considered for other purposes in any actions for damages arising from any occurrence at a location mentioned or addressed in such reports, surveys, schedules, lists or data." Any such information covered by 23 U.S.C. 409 used by the University for this project should be coordinated with the project sponsor to determine if it should be released to anyone outside of KDOT.”

**Data or information provided to the PI as part of the project should be clearly marked as confidential when delivered.** If you have a special situation, contact the Contract Attorney, Office of Chief Counsel, for advice on any questions regarding language changes from the standard approved language.

*END OF CONTRACT PHASE – START OF PROJECT PHASE*

9. Once project work begins, provide responses to questions regarding research in progress, provide KDOT information as agreed in Proposal in the timeframe agreed to, **and review quarterly reports as needed.** Plan to meet face-to-face with the PI at least once each quarter to discuss the project progress and to discuss progress in between using telephone and/or e-mail. Remember that University faculty and graduate students are not full-time consultants or contractors like we normally work with. They merge research work with teaching (attending class) so progress will not necessarily be steady, yet their billing procedures require them to bill a fixed amount for salaries each pay period. The graduate student(s) work part-time, typically 50% or less, on our projects. Busy times for our projects will be during the summer, spring and fall breaks, between semesters, etc.

10. Contract payments for projects are made using interfund vouchers and are sent directly from the Universities to Brenna Saville, at the Materials and Research Center for processing. Brenna completes the coding for payment. Brenna will send you an e-mail notice requesting approval for the amount paid and the period of work. At least 2% of the contract amount, typically the final invoice, will be withheld for payment until the final report is received by the Research Unit, final edits have been made by the PI and the report is ready to be published. **Contact me if you want any interfund voucher (other than the final one) held for payment until a milestone is reached.** If you get an invoice from KSU or KU by mistake that should have gone to Brenna Saville send it to her by building mail or e-mail.

KDOT will grant a maximum of two No Cost Extensions for time, not to exceed one year. The second request for NCE must include a detailed plan on how the deadline will be met. After the expiration of the final NCE the Principal Investigator and Co-PI's will be put on a late list and will not be awarded further K-TRAN Projects until removed from the list.

*END OF PROJECT PHASE – START OF REPORT PHASE*

11. As the project nears completion, you will receive the draft final report and other deliverables from the PI. Recommend corrections, additions or clarifications as needed and return as quickly as feasible. You can have Amanda Jones or Audrey Atkinson review it for grammar and citation issues, so that you can focus on the engineering technical issues. **KDOT is now requiring that the Report be reviewed by a technical writer on staff at the University.** Let the Assistant Bureau Chief know if you receive an unacceptable report.
12. Once the Area Panel Leader and you have approved the final report for technical content and completeness, send the report in electronic format as a **Microsoft Word word-processing file** including graphs and pictures and camera-ready paper copy, if available, to Amanda Jones. **The PI should use Microsoft Office software to produce the final report, incorporating all graphs and files into one file that matches the paper copy.**

After the Word document has been received, Audrey Atkinson, Research's Publication Writer, will make a final editorial review and work with faculty to get these changes made. This review is for grammar, missing pages, typos, etc. not technical content. If you and the Area Panel Leader think the report is controversial, then discuss it with other appropriate parties. We do not have to publish the final report but do need to document why we did not. This documentation (e-mail or letter) is needed to formally close a project. The University has the right to publish with a disclaimer even if we do not. We now primarily publish electronically on the Internet and distribute via email to other Department of Transportation's Libraries. A final report should be published even if KDOT chooses not to implement the findings, so we can share this information with other researchers.

13. We are requesting the PI and University administrative office to formally state their intention to file a copyright or patent application on software or inventions arising from the project at the same time the final report and other products are delivered. If the University does not copyright software products that will be implemented by KDOT, then KDOT will probably file the copyright to better protect our interests especially when the product will be shared with other states and consultants. If you receive a letter or notice from the PI or University related to this, please share it with the Area Panel Leader, OCC Contract Attorney and Dave Meggers.

*END REPORT PHASE – START IMPLEMENTATION PHASE*

14. You will receive a boilerplate draft of the Research Implementation Plan (RIP), the initial Research Project Implementation Progress Report form and instructions from Amanda Jones, after the final invoice has been paid. This will come to you as an attachment in a meeting notification. It is asked that each PM and David Behzadpour, Technology Transfer Engineer, meet to discuss the project and possible implementation routes. Using the items in the RECOMMENDED IMPLEMENTATION PLAN chapter, determine which items are practical for KDOT to implement. If staff time and/or funding are required, discuss needs with your Area Panel Leader. Ask the PI for assistance and input, if appropriate. Complete the RIP and return to Amanda Jones.
15. If the Implementation of the report is not implemented, or still in progress, annually thereafter, you will need to complete the Research Project Implementation Progress Report and return it to Amanda Jones. She will send these to you annually. These reports are required until the implementation steps outlined have been completed and triennial benefits can be calculated. Calculation of benefits in dollars is important to management so your assistance doing this is really appreciated. The Benefit Cost Ratio of the K-TRAN Program is reported twice per year to the Research Program Council and Research Technical Committee. **Guidelines** and examples for determining benefits are available. Peer reviews of RIPs will be done if the benefits exceed \$1 million.

## Proposal Development Instructions

Development of Proposals for projects starting each spring (before July 1<sup>st</sup>) should be underway and signed agreements must be completed, signed and delivered to Fiscal Services by May 15<sup>th</sup>.

This section gives the minimum general requirements for information in the Proposal. The Work Plan, Deliverables and Implementation sections in the proposal are very important. Later in this document, you will see the layout for the proposal. It is very important to have clear and precise language in the work plan, budget and deliverables sections.

Anything requiring KDOT action such as data, cores, tests, traffic control, etc. should be clearly documented as to amount, time limits, etc. so that everyone understands and agrees to the commitment in advance of signing the contract. If we have a hard deadline for the completed report, such as having a policy study completed prior to the next legislative session, make sure that the PI is clearly aware of the critical need for timely completion.

Do not agree to anything KDOT staff cannot provide due to other work requirements, etc. Any deliverables such as reports required, software, etc. should be listed with due dates. Generally, any equipment created or purchased, including computers, will be delivered to KDOT at the end of the contract, but we must take delivery within one year of the end of the agreement. Do not assume anything--BE SPECIFIC! **As Project Monitor, you represent KDOT in this contract.**

Be sure that the PI is aware that implementation of the results is included as part of the Proposal development and that a **Recommended Implementation Plan** Section is to be included in the Proposal and the Final Report, include how findings will be implemented if the project progresses as expected in the Proposal. The PM will then review these recommendations for feasibility and develop an implementation schedule in the Research Implementation Plan. This focus throughout the project will hopefully lead to implementation of more results and clearly document what has and has not been implemented.

KDOT will grant a maximum of two No Cost Extensions for time, not to exceed one year. The second request for NCE must include a detailed plan on how the deadline will be met. After the expiration of the final NCE the Principal Investigator and Co-PI's will be put on a late list and will not be awarded further K-TRAN Projects until removed from the list.

**Strongly encourage PI's to reduce no-cost extensions by better planning and adding extra time to original agreements for reporting/review activities.** Except in emergency situations, we need to eliminate agreement (and no-cost extension) requests for contract cover sheets (encumbrance) to Fiscal Services between 15 May and 15 July each year. This will require PI's and PM's who want to start work during the summer to get proposals/agreements done early. Also, strongly encourage all involved to be timely in the agreement processing process. **Ideally other times of the year, agreements will be signed and sent to Fiscal Services before the indicated start date and definitely within the month following it.**

Based on previous policies set or approved by the Research Program Council, the following items should be adhered to in the Agreements and Proposals:

1. Conference travel expenses (out-of-state) for the purpose of presenting the research findings will not be included in any project or administrative agreement. Exceptions may be granted on a case-by-case basis if a Project Monitor, Area Panel Leader and Principal Investigator all feel that conference travel is necessary and will benefit KDOT. **These requests should be submitted with justification to Catherine Patrick for review and approval prior to inclusion in the proposal budget.**
2. Some proposals may include graduate student tuition in the budget in addition to salary. This is an approved use of KDOT funds. It is viewed by some professors as a tax-free enhancement to the graduate student's salary and has been approved in previous agreements.
3. Equipment purchased for the project or created by the research effort, including computers, is the property of KDOT during the life of the agreement unless special terms are placed in the agreement. KDOT must specifically claim the equipment within one year after the end of the agreement or it automatically becomes the property of the University. This includes any computers that were purchased under our agreement. **The purchase of computers must be approved by Catherine Patrick.**
4. **English units of measurement are required** except in cases where metric (SI) units are the customary units used in the USA. The goal should be to write a final report that is user-friendly.

You should review and approve the Proposal language before the PI sends it to the University Administrative Office for incorporation into the Agreement. This is usually done by email to speed the process.

## **Outline for University Research (K-TRAN) Proposals**

**COVER SHEET (Use standard format)**

**GENERAL PROBLEM STATEMENT**

**BACKGROUND**

**BENEFITS (include expected savings in dollars if project proceeds as expected)**

**WORK PLAN AND SCHEDULE (Include required KDOT data inputs)**

**PROPOSED BUDGET**

**STAFF AND FACILITIES AVAILABLE**

**REPORTS/DELIVERABLES**

**RECOMMENDED IMPLEMENTATION PLAN**

**Note: Use English units of measure only throughout the proposal and report except when metric units represent the customary units used in the USA.**

## Attachment F-2

### KDOT Research Report Style Guide

Thank you for reading this guide to the publication style of KDOT Research Reports. The purpose of this document is to help authors know how to format and edit their reports. KDOT prefers all Research Reports submitted to us utilize either this Style Guide or the FHWA-RD-03-074 “Communications Reference Guide” if the research report is also being submitted for national publication (i.e., NCHRP, TRB, AASHTO, etc.). Our house style is based on the *Publication Manual of the American Psychological Association*, 6<sup>th</sup> Edition. For any items not discussed in this style guide, please refer to the *Publication Manual of the American Psychological Association*, 6<sup>th</sup> Edition. In cases where this style guide and the *American Psychological Association (APA)* do not recommend the same treatment of a particular item, this style guide should be followed by authors for reports.

**All reports must be in Microsoft Word and must be in .docx (preferable) or .doc file format. A Word document containing the correct formatting and styles is available upon request.**

Please note that styles have been provided for you in the styles ribbon (see Figure 0.1). Please apply the appropriate styles to your document so that the text will appear in the correct format with minimal manual editing on our part. Authors can locate the style ribbon by clicking on the Home tab in Microsoft Word. Clicking the arrow in the bottom right corner of the ribbon shows all styles at once. To apply a style to your document, simply place the cursor on the text and click on the name of the style.

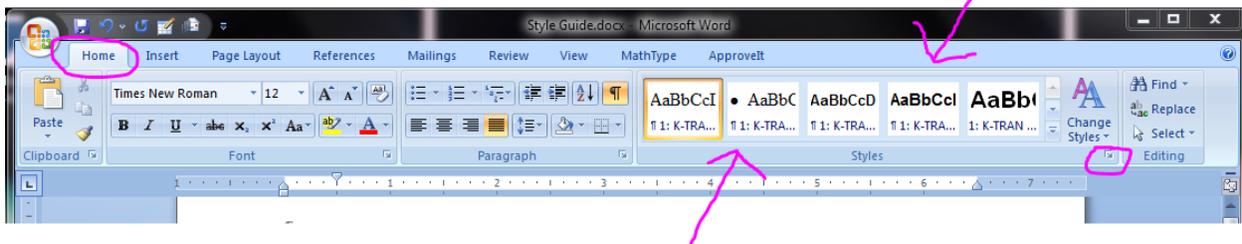


Figure 0.1: The Style Ribbon

**Please do not add internal links to your document.**

# Chapter 1: Organization

## 1.1 General Guidelines

- The maximum number of pages for reports is 75 pages (excluding appendices). Any exceptions to this limit should be approved by KDOT prior to submission.
- The target audience for the report will be provided by KDOT (e.g., paving contractors, bridge designers, KDOT), and the report should be written with them in mind. Master's theses or doctoral dissertations may not satisfy this requirement.
- It is not necessary to provide chapter summaries, either in the introduction or in the body of the report.
- Literature reviews should be relevant to the central topic of research and kept as brief as possible.
- All references must be clearly cited within the text of a report and included in the reference list. See Chapter 4 of this Style Guide for information on references.
- **The scope and conclusion of a research report must be consistent with the project proposal approved as Special Attachment No. 1 in the contract.**

## 1.2 Numbering

Sections should be numbered by chapter, section, subsection, etc. This document is an example of how your reports should be numbered:

# Chapter 1: Name of Chapter (the name of this style is Heading 1)

## 1.1 Name of Section (the name of this style is Heading 2)

### 1.1.1 Name of Subsection (the name of this style is Heading 3)

#### 1.1.1.1 Name of Next Level Subsection (the name of this style is Heading 4)

## 1.3 Components

Here is a list of sections and subsections that authors often include:

- Cover page
- Abstract
- Acknowledgments
- Table of Contents
- List of Tables
- List of Figures
- Introduction
  - Overview
  - Background
  - Problem Statement
  - Objectives
  - Scope
- Literature Review
- Methodology
- Results
- Discussion
- Applications
- Implementation
- Suggestions
- Conclusions
- Recommendations
- References

### 1.3.1 Cover Page

The cover page should include the title of the report; each author's name, academic and professional titles, and affiliations; the completion date; and the institution for which the report was prepared.

### *1.3.2 Abstract*

**An abstract is required for each research report and must include the results of the project.** There may be readers that see the abstract as a stand-alone piece before they see the report as a whole, so authors must make sure that the abstract is brief (usually not longer than 250 words) and detailed. An abstract must be able to be read apart from the report as a whole. Other researchers in your field will decide whether or not they want to read your report based on your abstract, so you should tell them why they should be interested (without saying, “You should be interested in reading my report because...”).

Here are a few more ideas about what we expect in an abstract:

In addition to information about the purpose, scope, and research methods used, the informative abstract summarizes the results, conclusions, and any recommendations. The informative abstract retains the tone and essential scope of the report, omitting its details (Alred, Brusaw, & Oliu, 2006).

### *1.3.3 Acknowledgments*

Often, people who contributed to the research, but who did not participate in the writing of the report (and who could therefore not be considered co-authors) are listed here. Project monitors are often named in this section. Please note that this is a professional acknowledgment section—only persons or institutions that supported your work in a professional aspect should be listed here. Please do not use this space to acknowledge family, friends, or other persons or institutions that supported your work in a personal aspect.

### *1.3.4 Table of Contents*

These can be automatically generated using the Table of Contents feature in Word. Leader dots should be used between the entry and the page number (Figure 1.1). This list should include sections, subsections, and appendices (if the report contains them).

<b>Table of Contents</b>	
Abstract.....	i
Acknowledgements.....	ii
Table of Contents.....	iii
List of Tables.....	v
List of Figures.....	vi
Chapter 1: Introduction.....	1
1.1 Background.....	1
1.2 Problem Statement.....	2

**Figure 1.1: Leader Dots in a Table of Contents**

### *1.3.5 Conclusions*

The conclusions should include the major findings presented in the body of the report and should fulfill the expectations set forth in the introduction. No new information or analysis should be presented here. You may wish to address ambiguous data or unanswered questions or concerns in this section. You may also wish to clearly communicate any limitations to your research, i.e., include a mild caution about conclusions that *cannot* reasonably be drawn from the data you have presented. In this section, you should tell the reader the implications of your research—tell the reader why your report is important (again, without saying, “my report is important because...”).

### *1.3.6 Recommendations*

Recommendations should provide KDOT guidance to implement the major findings of the report. They should flow directly from the conclusions and be fully supported by information presented in the body of the report. The recommendations should be as specific as possible, actionable, and address the problem(s) detailed in the project proposal.

## Chapter 2: Layout

The margins for the entire document are 1 inch.

### 2.1 Body Text

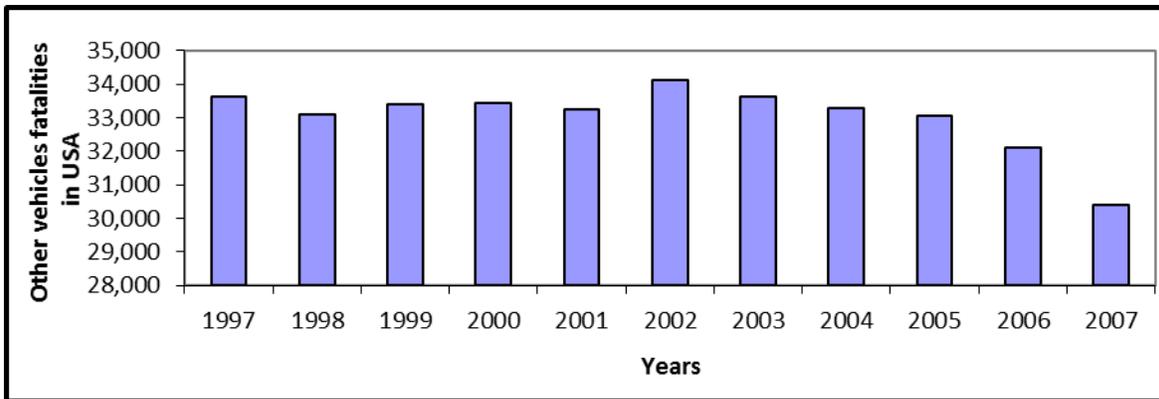
The body text should be set in Times New Roman, 12-point font, with the line spacing set to at least 22 points. The first line of every paragraph should be indented 0.5 inches. This paragraph style can be found in the ribbon and is called “body text.”

### 2.2 Figures

Figures should be detailed and should contribute to the understanding of the information presented in the report. Figures are numbered according to their chapter and order. For example, the first figure in Chapter 1 would be called Figure 1.1. Next would be Figure 1.2, Figure 1.3, and so on. Chapter 2 would start with Figure 2.1, Figure 2.2, etc. Figures should only be numbered 1, 2, 3, and so on, if the report is written using the FHWA-RD-03-074 “Communications Reference Guide” (i.e., if the report is being submitted for national publication).

**Please make sure that the figure is editable in every way by not embedding the figure caption or number in the figure itself. Figures must not be blurry or hard to decipher. Do not link figures to separate files or programs.**

Captions should appear on the same line as the figure label. Each word in the caption except for prepositions should be capitalized. Figure captions and labels appear underneath the figure, as shown:



**Figure 2.1: Trend in Other Vehicle Fatalities in the U.S., 1997-2007**

Source: NHTSA Traffic Safety Facts (2008)

This style can be found in the ribbon, and it is called “figure caption.”

Charts and graphs should be designed in such a way that they are easily understood when rendered in black and white. We do not publish print reports; however, many readers choose to print the PDF of reports, and they usually do so in black and white.

If you are including photographs as figures, please insert them directly into the document. Please make sure that the photos are high resolution and that they show exactly what you want them to feature with minimal background detail. Any unnecessary elements should be cropped out. Please make sure that the size of your photo is appropriate—small enough to economize space and not to give any undue emphasis, but large enough to show detail where necessary. Photos should be .jpg with a resolution of 200 to 300 dpi.

Please do not submit the photos or figures as separate files—insert them into the document.

## 2.3 Tables

The guidelines for tables are similar to those for figures. If a table is the first table in the first chapter of the report, then the label should be Table 1.1, followed by Table 1.2, Table 1.3, and so on. Chapter 2 would start with Table 2.1, Table 2.2, etc. Tables should only be numbered 1, 2, 3, and so on, if the report is written using the FHWA-RD-03-074 “Communications Reference Guide” (i.e., if the report is being submitted for national publication).

**Tables that appear in the body of the report must be fully editable. Screenshots or saved images are not acceptable. Do not link tables to separate files or programs.**

Table labels and captions appear above the table, together on one line.

As a general rule, the text within a table should be oriented toward the bottom of the cell with the cells sized in order to economize vertical space within the report. The column on the left should be left aligned, with the other columns centered under their headings, as in the example below:

**Table 2.1: Method Quality Matrix**

Item	Method			
	New Method*	LCA	EIO-LCA	DEP
Method of Acquisition	2	2	2	2
Independence of Source	1	1	1	1
Data Representation	1	1	1	2
Time Relevance	1	2	2	1
Graphical Representation	1	2	2	2
Technological Representation	1	1	1	1

\*Using the Example Agency of 941 buildings

\*\*All values come from the information each method would utilize from the same source

This style can be found in the ribbon, and it is called “table caption.”

## 2.4 Equations

Equations should be numbered by chapter as well: the first equation in the first chapter is numbered Equation 1.1. Equations should only be numbered 1, 2, 3, and so on, if the report is written using the FHWA-RD-03-074 “Communications Reference Guide” (i.e., if the report is being submitted for national publication).

If the equation is short enough, the equation should appear on the left side of a single line, with the equation label on the right side of the line:

$$IQ = \left( \frac{SL}{PL-10} \right) * V * 0.55$$

**Equation 2.1**

If the equation is too long for this type of layout, please place the equation label on the second line on the right-hand side:

$$Y = 0.19955 + 0.01468ALCO - 0.0722HL - 0.0674PCI + 0.0095AFAM - 0.0677HMRR$$

**Equation 2.2**

If the equation contains variables that must be defined, you may use the “equation variables” style to format these below the equation.

Microsoft Word 2010 and newer versions include built-in support for writing and editing equations. KDOT prefers that authors use these built-in tools to write equations in their reports.

## **2.5 Appendices**

Appendices should contain any information that can be considered supplemental or tangential to the information supplied in the main body of the report. Appendices should be labeled using the Heading 1 style and should be lettered Appendix A, Appendix B, and so on. Tables and figures included in appendices should be labeled as Table A.1, Table A.2, Table A.3, or Figure A.1, Figure A.2, Figure A.3, etc.

## Chapter 3: Usage Items

### 3.1 Numbers

Always spell out numbers beginning a sentence or recast the sentence so that the number does not appear at the beginning (*APA* 4.32).

Spell out numbers zero through nine; use numerals for numbers 10 and greater. However, always use numerals to express a quantity if the number immediately precedes a unit of measurement (*APA* 4.31).

Use a space, not a hyphen, between the numeral and the abbreviation or symbol. The exception to this rule is in the case of measures of angles, in which case no space is used (*APA* 4.31 and 4.40):

4.5 ft, 12 °F, but 45° angle

For expressions including two or more quantities, do not repeat the abbreviation or symbol (*APA* 4.27):

16-30 kHz                      0.3, 1.5, and 3.0 mg/dl

*APA* notes that units of measurement used without a numeral should always be spelled out (*APA* 4.40).

### 3.2 Abbreviations, Acronyms, and Initialisms

Terms, names of organizations, etc., should be spelled out the first time they are used in the abstract and in the body of the report. The acronym, initialism, or abbreviation follows in parenthesis in the text and in the abstract. The acronym, initialism, or abbreviation can be used in the subsequent text in the abstract and in the text of the report.

Units of measure should be spelled out upon the first usage in the abstract and in the body of the report, with the abbreviation following in parentheses. The unit of measure may be abbreviated in subsequent uses. *Inches* should always be spelled out.

Omit the period after every technical abbreviation.

For more information regarding abbreviations, please see *APA* 4.22-4.30, pages 106–111.

### **3.3 Capitalization Style for Titles, Chapter and Section Headings, Figure and Table Captions**

See *APA* 4.14-4.20 for further information.

Capitalize all major words in titles of books and articles within the body of the paper.

Conjunctions, articles, and short prepositions are not considered major words; however, capitalize all words of four letters or more.

Capitalize all verbs (including linking verbs), nouns, adjectives, adverbs, and pronouns.

When a capitalized word is a hyphenated compound, capitalize both words.

Capitalize the first word after a colon or a dash in a title.

## Chapter 4: References

Please note that any idea that did not originate with you as an author must be attributed to its source, whether it is quoted verbatim or not. Please be especially careful with paraphrasing or summarizing. **Any report with undocumented or improperly documented sources will be returned to the authors for rework.**

For help with references, please use the *Publication Manual of the American Psychological Association*, 6th Edition. Chapters 6 and 7 will be particularly useful. Please also utilize the resources your university has at your disposal.

### 4.1 In-Text Citations

We use what is called the author-date system of documentation with a reference list (see *APA* 6.11-6.21). Each entry in a reference list must correspond to an in-text citation and vice versa.

The author's last name and the year of publication should be placed in parenthesis in the text after a quotation or reference. If the author's surname is used in the text, simply place the year of publication in parenthesis after the surname (*APA* 6.11-6.21). For example:

“Kessler (2003) found that among epidemiological samples...”

“Early onset results in a more persistent and severe course (Kessler, 2003).”

For sources with only **one or two authors**, all names are listed for each reference in the text. For example:

Walker and Allen (2004)

(Walker & Allen, 2004)

For sources with **three to five authors**, list all authors in the first citation; in subsequent citations, list only the last name of the first author, followed by “et al.” and the year of publication. For example:

First citation: “Kisangau, Lyaruu, Hosea, and Joseph (2007) found...”

Subsequent citations: “Kisangau et al. (2007) found...”

First citation: (Kisangau, Lyaruu, Hosea, & Joseph, 2007)

Subsequent citations: (Kisangau et al., 2007)

For sources with **six or more authors**, list only the first author’s surname followed by “et al.” and the year of publication. The entry in the reference list will contain the names of all the authors. For example:

Wasserstein et al. (2005)

(Wasserstein et al., 2005)

For further information about in-text citations, please refer to the *Publication Manual of the American Psychological Association*, 6<sup>th</sup> edition, sections 6.11-6.21, and especially Table 6.1 on page 177.

## 4.2 Reference Lists

The reference list appears at the end of the paper. Entries appear in alphabetical order.

Please include enough information in the citation so that KDOT and readers can locate each of your sources. Your reference list should allow readers to assess each source’s usefulness and legitimacy, as well as serve as a resource for readers’ and your future research.

Please refer to the *Publication Manual of the American Psychological Association*, 6<sup>th</sup> edition, sections 6.22-6.26, for more information on building a reference list. For specific reference examples, see Chapter 7.

- This example is from a scholarly journal; note the volume, issue, and page numbers (*APA* 7.01):

Light, M.A., & Light, I.H. (2008). The geographic expansion of Mexican immigration in the United States and its implications for local law enforcement. *Law Enforcement Executive Forum Journal*, 8(1), 73-82.

- For sources that are articles in scholarly journals that are accessed online, please provide the DOI or a *stable* URL (From APA 7.01):

Herbst-Damm, K.L., & Kulik, J.A. (2005). Volunteer support, marital status, and the survival times of terminally ill patients. *Health Psychology, 24*, 225-229. doi:10.1037/0278-6133.24.2.225

Sillick, T.J., & Schutte, N.S. (2006). Emotional intelligence and self-esteem mediate between perceived early parental love and adult happiness. *E-Journal of Applied Psychology, 2*(2), 38-48. Retrieved from <http://ojs.lib.swin.edu.au/index.php/ejap>

- When citing a report related to a government agency, cite the report number:

Brigs, D.W., & Chatfield, B.V. (1987). *Integrated highway information systems* (NCHRP Report 133). Washington, DC: Transportation Research Board, National Research Council.

- When citing websites, you must include the URL. Retrieval dates are not necessary unless the website is likely to undergo frequent change:

KU Institute for Policy & Social Research. (2013). *Kansas statistical abstract 2012* (47<sup>th</sup> ed.). Retrieved from <http://ipsr.ku.edu/ksdata/ksah/>

### 4.3 Citing Google Maps or Google Earth

Authors of KDOT research reports often include maps and satellite imagery obtained from Google Maps or Google Earth. These resources must be properly cited in your report and reference list. Proper citation format is as follows (APA 7.07, Example 53):

Google Maps. (2015). Kansas State Capitol Visitor Center [Street map]. Retrieved from <https://www.google.com/maps/place/Kansas+State+Capitol+Visitor+Center,+300+SW+10th+St,+Topeka,+KS+66612/@39.0602249,-96.2192798,10z/data=!4m5!1m2!2m1!1skansas+statehouse!3m1!1s0x87bf03054f1090ab:0xdb988932a5cda3f8>

The required reference elements are (Trinity College Library, n.d.):

1. Cartographer/Author: Google Maps, Google Earth
2. Copyright date: Year
3. Title or description of map: If no title is given, create a short description.  
For Google Earth, use the image details: location, co-ordinates, elevation.
4. Map type: Street map, Satellite imagery, etc.
5. URL: Stable link to the map cited

In-text citations should be handled like any other reference type. For example:

Google Maps (2015)

(Google Maps, 2015)

For further help with citing maps, please see the following guide provided by the Trinity College Library: <http://citesource.trincoll.edu/apa/apagooglemap.pdf>.

#### 4.4 Examples of Frequently Used References

The following references are provided as an example of resources frequently used by authors of KDOT research reports.

ASTM D4253-00. (2000). *Standard test methods for maximum index density and unit weight of soils using a vibratory table*. West Conshohocken, PA: ASTM International. doi: 10.1520/D4253-00, [www.astm.org](http://www.astm.org)

Kansas Department of Transportation. (2007). *Standard specifications for state road & bridge construction*. Topeka, KS: Author.

Kansas Department of Transportation. (2013). *Aggregates for on grade concrete (Special provision 07-11004-R08). Special provision to the standard specifications, 2007 Edition*. Topeka, KS: Author.

KT-22 Kansas Test Method. (2010). Making and curing compression and flexural test specimen in the field. *Kansas Department of Transportation construction manual, part V*. Topeka, KS: Kansas Department of Transportation.

KTMR-22 Kansas Test Method. (2012). *Resistance of concrete to rapid freezing and thawing*. Topeka, KS: Kansas Department of Transportation.

## References

- Alred, G.J., Brusaw, C.T., Oliu, W.E. (2006). *Handbook of technical writing* (8th ed.). New York: Bedford/St. Martin's.
- American Psychological Association. (2009). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: Author.
- Hacker, D. (2004). *A pocket style manual* (4th ed.). Boston: Bedford/St. Martin's.
- Trinity College Library. (n.d.). *APA style – Google Map*. Retrieved from <http://citesource.trincoll.edu/apa/apagooglemap.pdf>

**Attachment G****Kansas Department of Transportation  
Standard Operating Manual**

		SOM: 1.14.2
SUBJECT: <b>Evaluation of New Products and Procedures for Construction and Materials</b>	VERSION: 7	PAGE: 1 of 4
	EFFECTIVE: 04/01/2014	
INFORMATION CONTACT: Bureau of Research		
APPROVED: _____, Secretary of Transportation		

**POLICY STATEMENT:**

New highway construction and maintenance products, materials, and procedures shall be evaluated to determine whether they improve the Agency's efficiency over currently used products or methods or satisfy an Agency need.

**PROCEDURAL GUIDELINES:****Application for Product Evaluation**

Parties who are interested in submitting a product to the Kansas Department of Transportation (KDOT) for evaluation must complete the [DOT Form 1190](#), "Preliminary Information for Product Evaluation," and submit it to the Technology Transfer Engineer (forms may be obtained from the Bureau of Research or the KDOT Internet web site). Vendors are encouraged and may be requested to submit supplemental information including the manufacturer's technical literature, test reports, and OSHA Material Safety Data Sheet, where applicable, to assist in the product evaluation. KDOT accepts and utilizes testing from other state and federal agencies and recognizes independent research entities such as AASHTO Product Evaluation Listing (APEL) and National Transportation Product Evaluation Center (NTPEP) when evaluating new products. KDOT will duplicate such tests only when particular Kansas materials warrant additional testing for verification.

**Initial Processing**

The Technology Transfer Engineer will review [DOT Form 1190](#), "Preliminary Information for Product Evaluation," to ascertain whether the product is a valid new product. Products which may be qualified for KDOT use under the provisions of a standard specification or special provision will be forwarded to the Materials Management Engineer, Bureau of Construction and Materials, for disposition.

The Technology Transfer Engineer will:

- 1) Establish the material's new product file which will include the [DOT Form 1190](#), "Preliminary Information for Product Evaluation" and the supplemental information submitted by the manufacturer.
- 2) Forward the information and a New Products Evaluation to the New Products Committee (NPC) member or their designee who has managerial jurisdiction for the testing and field application of the products (see below), along with a request for an initial review of the product.

		SOM: 1.14.2
SUBJECT: <b>Evaluation of New Products and Procedures for Construction and Materials</b>	VERSION: 7	PAGE: 2 of 4
	EFFECTIVE: 04/01/2014	

## NPC Membership

Membership on the committee will be individuals in the following positions or their designee:

- Assistant Chief, Bureau of Construction and Materials
- Chief, Bureau of Road Design
- Chief, Bureau of Structures and Geotechnical Services
- Chief, Bureau of Local Projects
- Materials Management Engineer, Bureau of Construction and Materials, Vice Chair
- Technology Transfer Engineer, Chair
- Engineer of Tests
- Chief, Bureau of Transportation Safety and Technology
- Chief, Bureau of Maintenance, Engineering Coordinator, FHWA (ex-officio)

## NPC Responsibilities

The responsibilities of the NPC are as follows:

- The committee will determine whether new products, procedures, and technologies satisfy the criteria for acceptance as stated in **Evaluation Criteria** below.
- Individual members will evaluate or assign evaluation of products, procedures, etc. in their respective area of expertise and make a recommendation for consideration of the full committee.
- Individual members will draft specifications for review by the Assistant Chief, Bureau of Research, submit a policy statement, new product announcement, and prepare a plan for implementation of high payoff items as judged by the full committee.
- Meet periodically to review procedures.

## Initial Review

The committee member assigned to review a product will personally review or select a staff member who has expertise in the relevant area to review the product information package and render a professional judgment of the product's acceptability. The New Products Evaluation should be completed, including a response to the following questions:

- What are the specific claims for this product?
- Do the materials conform to relevant specifications?
- Does this product satisfy an existing or future need of the KDOT or offer improvement over currently used products, processes, or materials?
- How would the KDOT benefit from adopting this product, procedure, or system?
- Has this product been approved for use by other states or agencies?

		SOM: 1.14.2
SUBJECT: <b>Evaluation of New Products and Procedures for Construction and Materials</b>	VERSION: 7	PAGE: 3 of 4
	EFFECTIVE: 04/01/2014	

- What is your recommendation? Should this product be approved for use in KDOT operations, construction, or maintenance activities?

The completed New Products Evaluation will be returned to the Technology Transfer Engineer within 30 days.

### **New Product Committee Action**

The Technology Transfer Engineer will distribute copies of the New Products Evaluation and a NPC Ballot Form ([Attachment A](#)) to each NPC member. The NPC will determine whether the new products satisfy the criteria for acceptance as a qualified KDOT product, procedure, or system. They will review the evaluation reports independently and make recommendations to the Chairman of the NPC by the ballot.

### **Evaluation Criteria**

In evaluating new products, procedures, and systems, the committee members shall determine:

- Whether the prospective vendor has demonstrated that the product serves an Agency need.
- The prospective vendor does not attempt to place the responsibility for developing a use for the firm's product with KDOT.
- The product satisfies an existing or future need, or offers improvement over currently used products.
- Which products are cost-effective and have potential for savings when used in Division of Operations.

### **NPC Recommendations**

Recommendations made by committee members may include the following:

- Acceptable for use.
- Not acceptable for use at KDOT at this time.
- Referral to Bureau of Research for investigation, testing, and evaluation.
- Referral to the appropriate Bureau or District for field trials and evaluation.
- Referral to the party requesting evaluation for additional information.

In lieu of an independent review of evaluation reports, committee members may request that a product be reviewed by the committee as a whole during a regularly scheduled committee meeting to permit discussion and questioning concerning the product.

The completed ballots will be returned to the Technology Transfer Engineer for tabulation.

		SOM: 1.14.2
SUBJECT: <b>Evaluation of New Products and Procedures for Construction and Materials</b>	VERSION: 7	PAGE: 4 of 4
	EFFECTIVE: 04/01/2014	

### **NPC Direction of Development and Implementation**

A proposal for development and implementation or a referral for investigation and testing of a product will be returned to the committee member responsible for evaluating the product who will undertake the following actions:

- Submit a draft specification for the product to the Assistant Bureau Chief, Bureau of Research.
- Submit a policy statement for the new procedure or system to the Technology Transfer Engineer.
- Submit a draft of a new product announcement to the Chief of the Bureau of Research for publication and distribution.
- Prepare a plan of action to implement use of a product to which the NPC has assigned a high-implementation priority.

### **Vendor Notification**

The Technology Transfer Engineer will notify vendor of:

- a. Approval or rejection of the new product by the NPC.
- b. Referral for additional investigation, testing, and evaluation.
- c. Final action upon completion of item b.
- d. A request for additional information.
- e. The application of current specification.

### **CROSS-REFERENCES:**

- [SOM 1.5.2](#), “Research, Development, and Technology Transfer Projects”

**Attachment H**

## Kansas Department of Transportation Standard Operating Manual

		SOM: 1.8.4
SUBJECT: <b>Transportation Research Board Publications</b>	VERSION: 6	PAGE: 1 of 1
	EFFECTIVE DATE: 05/01/2015	
INFORMATION CONTACT: Bureau of Research		
APPROVED: _____, Secretary of Transportation		

**POLICY STATEMENT:**

Kansas Department of Transportation (KDOT) employees shall have access to Transportation Research Board (TRB) publications. KDOT employees are encouraged to serve on appropriate TRB committees.

**PROCEDURAL GUIDELINES:**

The Engineer of Research shall be the KDOT TRB representative.

The TRB representative's responsibilities include notifying staff of pertinent TRB activities.

**Publications**

New TRB publications are announced in the TRB E-Newsletter, which is distributed by e-mail to subscribers every week, generally on Tuesdays. Bureau/Office Chiefs and District Engineers are responsible for notifying their staff about the E-Newsletter and encouraging them to subscribe if their duties include reviewing pertinent TRB publications.

Print copies of many TRB publications are complimentary for KDOT employees. If any employee wishes to read a print copy, the report will be available for checkout from the KDOT Library. If any employee would like a print copy to use for an indefinite period of time, the KDOT librarian can request the publication from TRB.

Not all TRB publications are complimentary. The TRB requires limited/special publications to be purchased. Before ordering a publication, check with the KDOT librarian to determine if additional copies are needed. Contact KDOT's TRB representative to confirm whether a TRB discount is available.

When employees no longer need their print copies of TRB publications, the reports should be forwarded to the KDOT library for retention.

**CROSS-REFERENCES:**

- Transportation Research Board, <http://www.trb.org>