

**I. RESEARCH PROJECT TITLE**

The Economics of Potential Reduction of the Rural Road System in Kansas

**II. RESEARCH PROBLEM STATEMENT**

When the county road grid was established in Kansas each road was used by a large number of households and farms operating small vehicles. Today each road is used by a small number of households and farms operating large vehicles. In many counties the road and bridge characteristics are not sufficient to handle the stresses of the larger vehicles.

It is well known that Kansas agriculture has consolidated into fewer and larger farms due to economies of scale from larger farming operations. The increased size of farms has been accompanied by increasing vehicle size as well. Tractor and combine weight and width has increased and the great majority of farmers deliver their grain in semi trucks. Tandem axle trucks are used to deliver farm supplies. Declining rural population has caused school districts to use larger buses to transport fewer children over longer distances to consolidated schools. The road and width design characteristics of rural roads and bridges are inadequate for the larger and heavier vehicles that are using them.

Kansas ranks fourth in the nation in the number of public road miles and bridges. According to the KDOT website Kansas had 135,019 public road miles in 2005, 92% (124,151 miles) of which were classified as rural. In 2005, Kansas had 25,796 bridges, 22% of which were classified as structurally deficient or functionally obsolete. The financial ability of Kansas counties to maintain and rebuild the road and bridge system isn't keeping up with the rate of deterioration. Many rural Kansas counties don't have the funds to maintain the existing system with the heavier vehicles that are using the system. If the county road and bridge system can't be maintained as it is, reducing the size of the system should be considered.

This research can provide KDOT with the ability to develop guidelines for county engineers to evaluate rural road and bridge investment decisions. It will also give KDOT economically sound information to advise the Kansas legislature in developing rural road and bridge investment policy.

**III. RESEARCH PROPOSED OR RESEARCH OBJECTIVES**

The overall objective of this research is to estimate the economic impact on selected Kansas county road and bridge systems from reducing the size of the system. Specific objectives include:

Objective A – For a small sample of Kansas counties develop a procedure to measure the benefits of keeping the county road and bridge system as it currently exists, rather than eliminating some roads and bridges on those roads.

Objective B – For the same sample of Kansas counties develop a procedure to measure the costs of not eliminating some roads and bridges.

Accomplishment of these objectives is expected to require the successful completion of the following tasks.

- Task 1. Conduct a literature review concerning the economic impacts of reducing the size of county road and bridge systems.
- Task 2. Select a small sample of Kansas counties that vary in the number and quality of paved and unpaved road miles, number and quality of bridges, terrain, economic base, and population.
- Task 3. Measure the benefits of keeping certain road segments (and bridges on the segments) in the county road system rather than eliminating them. This is expected to be the avoided additional travel costs incurred by road users if the roads and bridges are removed from the system.
- Task 4. Measure the costs of keeping the same road segments and bridges in the county road system rather than eliminating them. This is expected to be the road and bridge maintenance, reconstruction and resurfacing costs. These costs are reduced by the incremental maintenance, resurfacing, and reconstruction costs to the roads inheriting the traffic from the eliminated roads.
- Task 5. Develop a model that can be used to measure the minimum cost traffic flows in the sample counties both before and after elimination of some roads and bridges.
- Task 6. Develop a traffic survey of households and farms in the sample counties.
- Task 7. Develop a model to measure the variable vehicle cost per mile for each type of vehicle using the sample county road system.
- Task 8. Working with KDOT personnel, develop maintenance, reconstruction, and resurfacing costs for paved and unpaved county roads as well as bridges.

#### **IV. ESTIMATE OF FUNDING AND RESEARCH PERIOD**

Since the research has a number of complicated tasks it is expected to take 12 to 15 months. Funding is requested from K-TRAN and the UTC. Funds requested from UTC total \$63,640.

#### **V. URGENCY AND PAYOFF POTENTIAL**

In November 2008, Kansas suspended several previously approved highway projects due to lack of funding. The majority of Kansas counties have been losing population for a long period of time. As population falls the tax base to fund maintenance of roads declines as well, resulting in deterioration of the county road and bridge system. This research is urgently needed to explore the economic feasibility of reducing the problem of inadequate financial resources by eliminating some roads and bridges from the county road system. KDOT can utilize the information provided by this project to advise the Kansas legislature in developing solutions to the deterioration of county roads and bridges in Kansas.

The research directly contributes to UTC's mission of the economic and physical sustainability of rural transportation. The research could lead to sustained funding by other Kansas government departments such as Kansas Department of Economic Development. Also since the problem of deterioration of county roads and bridges is national in scope, the research could lead to sustained funding from the U.S. Department of Transportation.

## **VI. IMPLEMENTATION STRATEGY**

The results of the project will be widely distributed to all major stakeholders including KDOT, the Kansas legislature, Kansas county engineer organizations, and county road commissioners. This can be done through the final report, media reports, and presentations by the principal investigator to stakeholder groups.

## **VII. PROJECT PERSONNEL**

Project personnel will include the principal investigator Michael W. Babcock and a graduate student.

## **VIII. SUBMISSION INFORMATION**

December 1, 2008  
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