



Managing Decisions Regarding Rural Expressway Routes and Associated Highway Bypasses

tech transfer summary

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RESEARCH PROJECT TITLE

Managing Decisions Regarding Rural Expressway Routes and Associated Highway Bypasses

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The Midwest Transportation Consortium (MTC) is part of the Institute for Transportation (InTrans) at Iowa State University. The MTC is the University Transportation Centers Program regional center for Iowa, Kansas, Missouri, and Nebraska.

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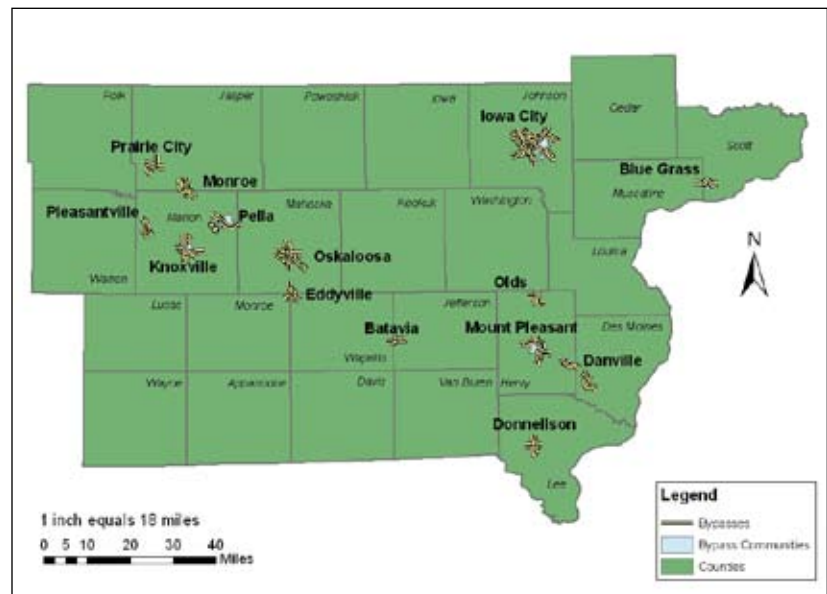
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Objectives

The purpose of this research was to provide guidance in making the planning of highway bypasses more efficient, while improving safety and reducing any negative impacts a bypass may have on a community and its economy.

Problem Statement

For several years, the Iowa Department of Transportation (Iowa DOT) has constructed highway bypasses along rural highway routes. Most bypasses were constructed on the state's Commercial Industrial Network (CIN), which is the system of primary highways that connect Iowa's regional growth areas. Now that work on the CIN has been completed, and the system is open to traffic, it is possible to study the safety, community, and economic impacts of bypasses. In the past, construction of highway bypasses has led community residents and business people to raise concerns about the loss of business activity since highway traffic is re-routed around the community instead of through it. For policy development purposes, it is essential to understand the impacts that a bypass might have on safety, the community, and economics. By researching bypass impacts, policies can be produced that will help to alleviate any negative impacts and create a better system that is more cost-effective.



Map of bypasses in southeast Iowa

Key Findings

In this study, researchers found that the use of trade area analysis does not conclusively demonstrate that bypasses can positively or negatively impact the economy of a rural community. However, this analysis does show that these communities are not generating expected potential sales based on their population and per capita income. The trade area analysis shows that even though the population of a community may be stable for several years and per capita income is increasing, sales leakage still occurs. Some conditions that would minimize the negative impact include improved signage, community or regional plans that include the bypass in future development scenarios, and businesses adjusting their business plans to attract bypass users.

Ultimately, how proactive a community is in adapting to the bypass will determine the kinds of effects felt in the community. As expected, safety analysis indicates that when crashes are classified by severity, bypasses with at-grade accesses appear to perform more poorly than either the bypasses with fully separated accesses or with a mix of at-grade and fully separated accesses. However, the benefit in terms of improved safety of bypasses with fully separated accesses relative to bypasses with a mixed type of accesses is not statistically conclusive.

Policy Implications

A framework for decision making regarding highway bypass construction follows the basic elements of transportation planning process that can be applied on a case-by-case basis:

1. Situation definition
2. Problem definition
3. Search for solutions
4. Analysis of performance
5. Evaluation of alternatives
6. Choice of projects
7. Specification and construction

Alternatives to bypasses should be evaluated if possible in the planning stages. Some basic steps in evaluating alternatives include the following:

- Determine objectives for the evaluation - furnish appropriate information about outcome of each alternative so selection can be made.
- Identify stakeholders
- Select and measure evaluation criteria (capital costs, maintenance costs, facility operating costs, travel time costs, vehicle operating costs, accident costs)
- Identify measures of effectiveness (e.g., travel time costs savings)
- Develop evaluation procedures and decision making

Future Research

Recommendations for future research include the following:

- Perform a location study on the proximity of a small community to a larger community and a bypass/expressway
- Study what the effects of bypass design and characteristics have on economics (e.g., whether the bypass is two-lane or four-lane; number of access points)
- Determine the commuting and shopping habits of bypass community residents
- Evaluate quality of life impacts as a result of highway bypasses



A full-grade separated highway access