



Center for Transportation  
Research and Education

November 2007

#### RESEARCH PROJECT TITLE

Evaluation of Gateway and Low-Cost Traffic-Calming Treatments for Major Routes in Small Rural Communities

#### SPONSORS

Iowa Highway Research Board (TR-523)  
Federal Highway Administration

#### PRINCIPAL INVESTIGATORS

Shauna Hallmark  
Associate Professor, Civil, Construction,  
and Environmental Engineering  
Iowa State University  
515-294-5249  
shallmar@iastate.edu

Neal Hawkins  
Associate Director, Traffic Operations  
Center for Transportation Research  
and Education  
Iowa State University  
515-294-7733  
hawkins@iastate.edu

#### MORE INFORMATION

[www.ctre.iastate.edu](http://www.ctre.iastate.edu)

#### CTRE

Iowa State University  
2711 S. Loop Drive, Suite 4700  
Ames, IA 50010-8664  
515-294-8103

The mission of the Center for Transportation Research and Education (CTRE) at Iowa State University is to develop and implement innovative methods, materials, and technologies for improving transportation efficiency, safety, and reliability while improving the learning environment of students, faculty, and staff in transportation-related fields.

The sponsors of this research are not responsible for the accuracy of the information presented herein. The conclusions expressed in this publication are not necessarily those of the sponsors.

IOWA STATE UNIVERSITY

# Gateway Traffic Calming in Union, Iowa

tech transfer summary

Gateway traffic-calming treatments were installed and evaluated in Union, Iowa.

## Objective

The purpose of the project was to evaluate traffic-calming treatments on major roads through small Iowa communities using either single-measure low-cost or gateway treatments. For this portion of the project, gateway traffic-calming treatments were evaluated in Union, Iowa.

## Problem Statement

The main street through many small rural Iowa communities is a state or county highway with high speeds outside the city limits and a reduced speed section through the rural community. Consequently, drivers passing through the community often enter at high speeds and then maintain those speeds throughout. When speeds in rural communities are problematic, traffic calming provides a potential solution. However, traffic-calming measures are generally used in larger urban areas; their effectiveness in small communities is unknown. The Center for Transportation Research and Education (CTRE) at Iowa State University teamed up with the Iowa DOT to evaluate traffic-calming treatments in Union, Iowa.

## Community Description

Union is located approximately 60 miles northeast of Des Moines and has a population of 427. Union is intersected by two major roads: D-65, which runs east to west, and S-62/ SH 215, which runs north to south. Residents complained of high speeds on the north, south, and west edges of town. On the east edge of town, railroad tracks that cross D-65 help to significantly slow drivers that are entering town from the east. Some sensitive areas near the highways include a middle school, a swimming pool, and a golf course.



Layout of Union, Iowa

## Research Description

Union was selected as gateway treatment location. Gateway treatments include a range of measures designed to slow vehicles entering a community and reinforce speeds throughout the community. The gateway treatment for Union consisted of peripheral transverse pavement markings, lane narrowing through median and shoulder widening, and driver feedback signs.

Peripheral transverse markings consist of a series of parallel bars which decrease in spacing as drivers approach the community, giving them the perception that they are speeding up and encouraging them to slow down.

Lanes were narrowed using painted shoulders and a painted center island. Lane narrowing gives drivers a feeling of constraining, causing them to reduce their speed. In addition, wider shoulders provide more space for bicycle lanes and sidewalks.

Two driver feedback signs were placed at areas where pedestrians were most likely to be present and where speeds were higher. Due to backorder and problems with the sign manufacturer, the speed signs were not installed until just before the six-month data collection period.

## Key Findings

The transverse markings appeared to be moderately effective in decreasing vehicle speeds directly downstream of the markings for all three locations, although none of the differences were large. The lane narrowing did not appear to be effective. Once the speed feedback signs were installed, significant speed decreases resulted.

Union appeared to have experienced a general upward trend in speeds independent of the gateway treatments. Speeds measured at control locations where the effect of the treatments would not have been felt indicated that speeds overall increased over the study period. This may suggest that the full effect of the treatments is not reflected in the data presented.

## Implementation Benefits

Lower vehicle speeds produce several safety benefits. For drivers, the area of focus is significantly increased at lower speeds, giving them a greater awareness of their surroundings and more time to react to potential problems.

Lower speeds also reduce the likelihood and severity of vehicle crashes. The Oregon DOT, in a handbook created for rural communities, reported speed statistics indicating that there is an 85% likelihood of death for a pedestrian struck at 40 mph. One struck at 30 mph has a 45% chance of being killed and the risk drops to 15% if the pedestrian is struck at 20 mph.



*Peripheral transverse pavement markings*



*Lane narrowing using center island and shoulder widening*



*Driver feedback sign showing driver speed*

## Implementation Readiness

Many rural communities do not have the resources to implement high-cost, elaborate traffic-calming measures. With the exception of the speed signs, which are moderately expensive, the other treatments used in Union were low cost and simply involved painting the roadway and maintaining the painted markings. These treatments were also designed to accommodate large farm vehicles, which are prevalent in rural communities. The on-pavement markings used in Union could easily be implemented in other rural communities.