Research Project Statement
Fiscal Year 2005

Project Number: 0-5157
Title: Operational and Safety Impacts When Retrofitting Bicycle Lanes

RMC Number: 2
Developed By: TAP

Project Statement Date: 7/31/03

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Duration (# of years): Total Budget: $ Budget by year:
First Year FY $ Second Year FY $ Additional FYs $

Project Description:
Objective: Evaluate and quantify the safety and operational benefits as well as potential hazards associated with retrofitting designated bicycle lanes onto roadways with minimal roadway width and right-of-way. Research will be done to compare various roadway design criteria such as vertical and horizontal alignments, traffic volumes, speed limits, adjacent land uses, drainage, pavement conditions, and cross sections. In addition, this project will focus on retrofitting designated bike lanes on roadways with a median separation verses a roadway without a median separation. This study will produce documentation to evaluate existing roadway conditions with given motorized traffic volumes and proposed bicycle traffic volumes to determine a preferred geometric solution to optimize both traffic operations and bicycle safety.

Description: The physical legacy of the development of our existing roadway network is based primarily on the requirements of the automobile. As growth and development has occurred in Texas over the past 50-60 years, the basis for our design of transportation systems was focused on the most efficient design for the mobility of motor vehicles. However, over the past decade, providing access to the transportation network for alternative modes of travel has become more of a priority.

Provision for facilities that include access for bicycle travel has become more prevalent across the state in the last decade. Since the implementation of the Clean Air Act of 1990, MPOs and cities (in many cases with support by TxDOT) have recognized that retrofitting existing streets and roads to include dedicated bike lanes is one way to provide bicyclists access to the broader transportation network (such as roadway, transit, and/or rail systems). The theory being that more cyclists on the roadway with access to alternative modes of transportation may mean fewer motor vehicles on the roadway – a result that would contribute to a decrease in vehicle emissions.

AASHTO’s Guide for the Development of Bicycle Facilities has been used by transportation agencies as a design reference to implement bikeway facilities including bike lanes on existing roadways. However, there is some question about the safety impacts of these guidelines, especially on narrow curb and gutter roadways without shoulders; what happens to motor vehicle lane tracking when motor vehicle lanes are narrowed to add bike lanes or when less than AASHTO recommend design criteria is used. With the variables of surrounding land use, driveway intensity, motor traffic volumes, available parking, the designer can often face considerable choices in the correct
This project will:

- Examine the operational and safety impacts of retrofitting bike lanes onto existing narrow roadways. Existing bike lanes will be observed to identify lateral clearances between motor vehicle lanes as well as lateral clearances between motor vehicle lanes and bike lanes.
- Consider improvements that may reduce lane tracking encroachment onto existing bike lanes, including alternative pavement marking treatments, adding/reducing median widths, signing treatments, and traffic calming techniques.
- Select several roadways of differing character with retrofit bike lanes and quantify the safety impacts of the existing retrofitted roadways in terms of bicycle and vehicular conflicts as well as completing a crash records review and doing a bicycle count over a logical time period; and
- Develop guidelines for design, utilizing given variables such as typical sections, alignments, prevailing traffic volumes, posted & actual traffic speeds, driveway intensity, crash data, and adjacent land use, that may be used to select the correct/appropriate retrofit configurations for bikeway implementation on existing roadway cross-sections.

**Deliverable Products and Reports:**

- P1. Guidelines for Design
- R1. Research report
- PSR. Project summary report

**Implementation:**

The results of this research will assist TxDOT staff in making decisions about what type of bicycle lane implementation will be appropriate within existing roadways to produce the most efficient and safe retrofit on roadways with minimal width and/or right-of-way. This research will be based on real-world documentation of state and local experience to date with respect to operations and safety on retrofitted roadways for both motor vehicles and bicyclists. This research will provide a set of guidelines to planners and designers that will supplement existing state and federal bicycle design guidelines with information about retrofit bike lanes and design criteria to consider when determining what roadway configuration will be optimal under various motor vehicle and bicycle volume conditions.

**Pre-Proposal Meeting:**

- Yes  No  February 25, 2004 at 10:00 a.m. at TxDOT, 4000 Jackson Ave., Camp Hubbard Bldg. 1, 3rd Fl. San Jacinto Room. Tele-conferencing will be available.

**Sole-Source Project:**

- Yes  No

**Additional Information:**

**Proposal Submission:**

- Proposals are required to be submitted in both hard copy (4 copies) and PDF format (1 PDF file per proposal). Both formats are used within TxDOT for evaluating the proposals and must contain identical information.
- The “Background and Significance” portion of the proposal should be limited to 10 pages.
- All proposals from researchers should be sent directly to your university’s Research Liaison for submission to RTI. The Research Liaison is TxDOT’s official contact with the university.

**Deadlines (for CSTR use only):**

1. All individuals interested in proposing are encouraged to contact the PC or PD by February 12, 2004.
2. Proposals are due to RTI by 4:00 p.m. CST on March 24, 2004.