



Project Summary

Texas Department of Transportation

0-5856: Safety and Economic Impacts of Converting Two-Way Frontage Roads to One-Way

Background

As areas with two-way frontage roads become more urban in nature and adjacent land develops, traffic volumes increase and safety and operational issues become concerns. When this occurs, the Texas Department of Transportation (TxDOT) begins to consider frontage road conversion to one-way. This typically causes concern with business and property owners regarding possible economic impacts associated with access, business activity, and property values. This research was performed to better understand these concerns and to develop accident modification factors (AMFs) for frontage road conversion.

What the Researchers Did

Researchers studied five corridors in Texas where frontage roads were converted from two-way operation to one-way operation. Researchers identified four corridors in Texas that remained two-way during the same time periods for comparison to the conversion sites. This research project had both a safety component and an economic component.

Pursuing the safety component included evaluation of crash data (historical electronic data and printed crash reports). With the reported crash data, researchers performed both a statistical analysis and a “hot-spot” safety analysis. The statistical analysis resulted in AMFs based on non-property-damage-only (non-PDO) crashes for segments and interchange intersections. The hot-spot analysis identified non-PDO crash impacts along specific segments and interchange intersection locations.

Researchers conducted an economic analysis investigating gross sales, appraised values, and employment data. In addition, they performed surveys with business owners/managers.

Finally, researchers documented their experiences and lessons learned processing and reconciling crash data from TxDOT’s electronic Crash Records Information System (CRIS) and printed crash reports.

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What They Found

As a result of the statistical analysis, researchers developed 12 AMFs related to frontage road conversion for different crash types or crash severity. All of the AMFs indicate a reduction in the given crash type or severity because they show a value of less than 1.0. Users of the AMFs are encouraged to review the full report for additional AMFs, more specific information about how the AMFs were developed, associated caveats, and how to apply the AMFs.

Findings of the hot-spot analysis include several specific segments and interchange intersection locations along conversion sites where crashes per year decreased from the before period to the after period. It is hypothesized that these changes are due, in large part, to the conversion of the frontage roads to one-way.

Of the economic data sources investigated, only the appraisal data and survey data were specific to the corridor of interest. In general, researchers found that the appraisal values increase over time for the years studied. From the aggregate appraisal data analyzed, it does not appear there are substantial overall negative effects on appraisal values along the conversion sites in the long term.

From a limited sample of surveys, researchers found that when frontage road conversions are planned, there is interest from the business community to do conversions as soon as possible, as quickly as possible, and with construction of the support infrastructure (e.g., U-turns, bridges, signage) before the frontage road conversion. It appears perceived economic impacts may be related to timing of additional infrastructure placement and construction.

What This Means

This research provides transportation engineers and planners estimates of the possible impacts of converting frontage roads from two-way to one-way. Most notably, researchers believe this information will be valuable for TxDOT staff in communicating the safety benefits of frontage road conversion and addressing concerns of substantial property value loss. The findings from the business owner/manager surveys may also provide valuable insights for TxDOT staff when considering future conversion projects.

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