



Project Summary

Texas Department of Transportation

0-6208: Preserving Functionality/Asset Value of the State Highway System

Background

Mobility, accessibility, operational characteristics, right of way, safety, and roadway conditions define the functionality of highways. Maintaining, preserving, and enhancing the functionality of state and local roadways of our transportation system is important because it:

- maintains capacity and efficiency,
- reduces potential for congestion,
- maintains safety,
- reduces the need for further (or unplanned) improvements, and
- protects the value of investments in both transportation infrastructure and adjacent land development.

Functionality should be considered in all stages of a highway's lifecycle. Ideally, a highway should remain functional through its intended service life. However, unless there is an active process of monitoring functionality followed by actions to restore or enhance deteriorating components, operational functionality can deteriorate to the point where a parallel or replacement facility (or reconstruction) will be needed much earlier than planned.

What the Researchers Did

Researchers examined state highway functionality losses and their causes over time and what actions can be taken to preserve, recover, and enhance functionality. They reviewed practices and policies that play a part in establishing how well a highway serves its intended function. The functionality areas included planning and land development, traffic operations and capacity, right of way, safety, and infrastructure.

The research examined sources or causes of functional deterioration, counter-measures to address them, and how the practices, policies, or programs of the Texas Department of Transportation (TxDOT), metropolitan planning organizations (MPOs), and local jurisdictions have or have not served to preserve, restore, or enhance highway functionality.

The project included three case studies through which the research team investigated in detail the functionality and associated practices, policies, and programs of three highway segments.

Research Performed by:

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Project Completed: 2-28-10

What They Found

Most of the effective practices and programs in place today that help to maintain, restore, or enhance the functionality of highways are located in larger metropolitan areas or communities with active planning and development control programs. In unincorporated areas of the state, a lack of local planning and proper authority to regulate access and site development combined with a business-friendly development climate are major contributors to deterioration of functionality.

The research identified several basic strategies and many new actions, changes, or additions to current practices and policies that are needed to protect, restore, or enhance highway functionality. TxDOT, MPOs, and local agencies should establish work and project priorities or strategies that enhance functionality such as access management, context sensitive design, transit oriented development, travel demand management, corridor management planning, and others.

In TxDOT and local planning, TxDOT should continue to implement its access guidelines through coordination in local development review and provide support to rural districts in these efforts. It should initiate corridor management planning with MPOs and local partners: non-traversable medians; adherence to proper signal spacing thresholds; and connectivity between adjacent local streets and developments. Agencies should protect or preserve right of way early to permit timely facility expansions and additions.

In the area of facility design and enhancement, TxDOT should continue its practice of improving regional links in the highway system with divided sections. All new highway loops or bypasses around communities should be planned and designed as controlled access facilities. As a statewide policy, surface arterials having three or more dedicated through lanes or existing or projected traffic volumes in excess of 24,000 vehicles per day should contain raised non-traversable medians. Where possible, TxDOT should use minor geometric and operational enhancements such as restripings, auxiliary lanes, ramp metering, and braided ramps as faster, lower cost options to address bottlenecks and congestion.

The development and implementation of corridor access management plans by the Houston District and the Houston-Galveston Area Council on an annual basis is a practice that should be expanded and followed by other districts and MPOs in the state.

What This Means

Texas has need for far more highway miles than we can afford to build. Further, it has gotten increasingly difficult to improve the highways we have. Hence, it is extremely important to keep Texas highways – those that we have – functioning at a high level of efficiency. TxDOT has two basic choices when it comes to addressing functionality of the highway system and its component highways: 1) preserve functionality at a high level through effective planning, operational and safety management, refinement, and infrastructure maintenance, and 2) adopt a reactive and corrective approach to fix roadways after they deteriorate.

According to the TxDOT strategic plan, the first choice – functional preservation – is the correct choice. It is more cost-effective and can postpone or alleviate the need for many major projects.

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