Texas A&M Transportation Institute

PROJECT SUMMARY

Texas Department of Transportation

0-6643: Guidelines for the Effective Use of Flexible Pylons for Congestion Mitigation, Access Management, and Safety Improvement

Background

Over the past decade, flexible pylons have been increasingly used on Texas roadways for the purposes of lane delineation and separation. Pylons (see Figure 1) are used for lane separation, delineation of median curbs, and access management on arterials, among other applications. If pylons are hit by a vehicle, an unsafe condition for motorists could result as debris from broken pylons and/or curbs leave exposed nails or broken curbs. The use of pylons can result in increased long-term maintenance costs for the Texas Department of Transportation (TxDOT) and other agencies, even though the initial deployment costs are typically much less than traditional concrete median barriers. While some standards exist to test durability of pylons, this project aimed to provide guidelines for implementation of pylons.

Figure 1. Examples of Pylon Devices.

What the Researchers Did

Researchers conducted a state-of-the-practice review and vendor interviews regarding pylon use. They sent surveys to transportation agencies and performed case studies in the Houston, Dallas, and San Antonio regions. Using feedback from the agency surveys, researchers identified safety and maintenance issues that are common across the state.

Researchers then devised and performed controlled experiments testing a motorist's ability to maneuver between pylons while driving at various speeds and various spacing distances between pylons. Researchers took the information learned from the different tasks and compiled guidance on best practices of pylon implementation and maintenance.

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What They Found

In the literature review, researchers found very little detail regarding specific guidelines for pylon design or use. Some guidelines regarding the color and retroreflectivity of channelizing devices could be inferred from Sections 3H and 6F of the *Manual on Uniform Control Devices*. Some vendors provide implementation guidelines to customers regarding pylon spacing, buffer spacing, curb spacing, running length, pylon height, and pylon visibility.

From the agency surveys, a majority of users indicated that they had issues with pylon replacement or pylons getting dirty and losing their target value, and attributed hit and missing pylons to driver disregard and inattention. The case studies showed that a majority of the hits at all locations were intentional and involved light vehicles such as sedans, SUVs, and pickup trucks. Regarding the closed-course driving experiment, the speed at which motorists can successfully maneuver without hitting or encroaching appeared to increase linearly with spacing.

What This Means

Researchers recommend a minimum of 10-ft spacing near the entry and exit access locations on managed lanes. It is the first few pylons that are hit most at access locations on managed lanes. For freeway ramp–frontage road lane separation or access restriction applications, a pylon spacing of 6 ft is acceptable in most cases. Spacing of 3 ft may be used to provide a more restrictive barrier configuration to deter motorists from crossing the pylons. When curb-mounted pylons are used, drainage requirements at a specific site may influence the minimum spacing between the pylon units. The relationship between buffer width and pylon replacement per year is shown in Figure 2. A life-cycle cost comparison between pylons and center median barriers revealed that both deployments can be cost-effective but are highly dependent on buffer width and right of way.

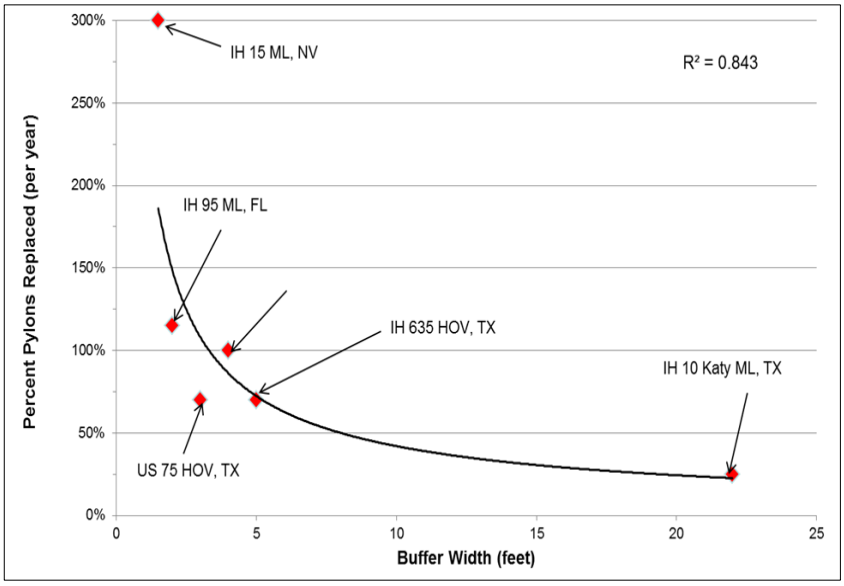

Figure 2. Buffer Width versus Pylon Replacement per Year.

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