# Project Summary

Texas Department of Transportation

# 0-6103: Evaluation of Longitudinal Channelizing Barricade Effectiveness

## Background

Work zones create unexpected conditions for all road users. The function of channelizing devices is to warn road users of conditions created by work activities in or near the roadway and to guide them safely through the work zone area. Longitudinal channelizing devices (previously referred to as longitudinal channelizing barricades) are lightweight, deformable devices that may be used instead of a line of cones, drums, or barricades. In contrast to traditional channelizing devices, such as drums, that have some open space between devices (based upon the posted speed), longitudinal channelizing devices (LCDs) can be connected together to form a solid line (i.e., no space between devices). Thus, LCDs can prevent drivers and pedestrians from going between devices and entering the work area (whether inadvertently or deliberately).

To date, LCDs have primarily been used to delineate pedestrian travel paths and keep pedestrians from inadvertently entering the work area. Within the travel way, LCDs have mainly been used to close roadways and driveways to vehicular traffic. On occasion, LCDs have also been used in a longitudinal application to denote the edge of pavement or separate active travel lanes from work areas. The limited application of LCDs in the travel way is not surprising, since guidance regarding work zone configurations and conditions where LCDs should be considered in lieu of other channelizing devices has not been developed.

## What the Researchers Did

Researchers conducted closed-course human factors studies to assess whether the following LCD applications improve the traffic safety and operations of work zones relative to the use of drums:

- Continuous LCDs in the vicinity of exit ramps on high-speed limited access facilities.
- Continuous LCDs in the merging taper of a lane closure on low-speed roadways.
- Single-transverse LCDs (similar to Type 3 barricades) in the merging taper of a lane closure on high-speed roadways.
- Continuous LCDs in the vicinity of driveways on low-speed urban roadways.

Researchers also examined size standards and retroreflectivity requirements. In addition, the practicality of implementing LCDs in lieu of more traditional channelizing devices was considered.


## Research Performed by:

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## What They Found

Daytime closed-course human factors studies confirmed the difficulty drivers have with identifying the correct exit ramp travel path when standard drums are used. When drums delineate an exit ramp that remains open within a work zone lane closure, and the drum spacing is equal to the length of the exit ramp opening, drivers can be confused. In addition, the length of the exit ramp opening significantly impacts a driver's ability to detect the proper exit ramp path. In a lane closure, a closer drum spacing on the tangent in the immediate vicinity of the exit ramp (one times the posted speed limit in mph instead of two times the posted speed limit in mph) may improve the ability of drivers to detect the proper exit ramp travel path.

Continuous LCDs may be used in the immediate vicinity of an exit ramp that remains open within a work zone lane closure, or to delineate the edge of the travel lane in a work zone on an urban roadway. LCDs are most beneficial in situations where a high number of deliberate intrusions into the work zone to access exit ramps, driveways, or minor roads are expected to occur or have occurred while using standard drums. LCDs should be used in situations where the exit ramp opening in feet is less than or equal to two times the posted speed limit in mph (i.e., the channelizing device spacing on the tangent), where workers and equipment are in the work area near the exit ramp opening, and where there are concerns that drivers may unintentionally enter the work area trying to access the exit ramp. The height of the LCDs should be considered in applications where drivers need to be able to see over the devices. Neither continuous LCDs nor single-transverse LCDs should be used to form a lane closure merging taper.

## What This Means

Researchers developed recommendations regarding LCD applications in work zones, minimum lengths for exit ramp openings within work zone lane closures, and use of closer drum spacing on the tangent of a lane closure in the immediate vicinity of an exit ramp.

***Longitudinal Channelizing Devices (LCDs)***


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