![Texas Department of Transportation logo]

INNOVATION / TECHNOLOGY DEPLOYMENT SUMMARY

Advance Warning of End-of-Green System (AWEGS)

CHALLENGE

The Dallas District has seen a larger-than-usual number of accidents or near misses on high-speed approaches at some signalized intersections. CRIS data from 2018–2022 shows 368 fatal or serious injury crashes related to disregarding a red light. A majority of these signals are on the outskirts of small cities.

SOLUTION

This innovation deploys an advance warning of end-of-green system (AWEGS) on high-speed approaches to these perimeter traffic signals. An AWEGS consists of an advance warning sign with flashing beacons that activate when the signal is about to change from green to yellow. The system's advance detection can also determine when an approaching vehicle is traveling at a speed and at a distance where it may not be able to stop easily, given the standard yellow clearance timing at the intersection.

Figure 1. Installation of overhead W3-4 sign and flashing beacon.

This deployment involved the installation of overhead W3-4 "Be Prepared to Stop When Flashing" signs with beacons that begin flashing at the onset of the yellow indication in the traffic signal (see Figure 1). Traditional AWEGS installations required the use of a field-hardened laptop computer inside the signal cabinet that was equipped with the logic to turn the flashing beacons on. This project uses advanced logic within the traffic signal controllers to operate the beacons.

TxDOT GOALS

Deliver the right projects

Focus on the customer

Foster stewardship

Optimize system performance

Preserve our assets

Promote safety

Value our employees

Advance Warning of End-of-Green System (AWEGS)

PROACTIVE APPROACH

Implementation of the AWEGS at these intersections is a preventive measure to improve intersection safety. Implementing the system on new or recently installed intersections proactively ensures safer operations at intersections on the outskirts of cities with high-speed approaches.

BENEFITS

Anticipated benefits include a reduction in the number of red-light runners, a slight reduction in approach speeds, and increased driver awareness of traffic signals on the outskirts of cities. These improvements will increase safety at these intersections.

KEY TASKS

- Define criteria and identify other intersections suitable for implementation.
- Design the AWEGS for these intersections, including the type of traffic signal controller and appropriate detector layout.
- Design the AWEGS signs, including the location on the intersection approach.
- Test the AWEGS logic in the signal shop.
- Install the signs in the field.
- Collect high-resolution data from the controller to serve as a benchmark (before data).
- Implement the AWEGS.
- Collect high-resolution data from the controller over time for comparison (after data).
- Analyze the data to assess the impacts of the AWEGS.

DATA SOURCES

Most of the data for assessing the effectiveness of the system consists of high-resolution data from the traffic signal. Other sources include TxDOT's CRIS crash data and connected vehicle data for these intersections.

Resources

Dallas District (txdot.gov)

Crash Data and Analysis: CRIS Query Tool (txdot.gov)

Development of Advance Warning Systems for End-of-Green Phase at High Speed Traffic Signals (trb.org)

Intelligent advanced warnings of end-of-green at signalized intersections (its.gov)

Texas Strategic Highway Safety Plan: Intersection Safety

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