

Special Specification 6297

Truck Entering Highway Warning System



1. DESCRIPTION

The Truck Entering Highway Warning Systems (TWS) is a portable, automated, real-time intelligent traffic (ITS) system that warns oncoming traffic of trucks re-entering the highway, allowing traffic an opportunity to slow down or stop, avoiding potential collision.

Furnish, install, operate, maintain, and remove TWS as shown in the plans, as detailed in the special specification, and as directed.

2. MATERIALS

Provide material that complies with the requirements of this Item and the details shown on the plans. Provide materials that meet the manufacturer's specifications and recommendations. Maintain an adequate inventory of parts to support maintenance and repair of the TWS.

2.1. **Portable Changeable Message Signs.** When TWS requires PCMS, provide Department-approved PCMS to convey real-time traffic condition information to motorists. Provide PCMS that comply with the Special Specification, "Portable Changeable Message Sign" and any required provision, the 2011 TMUTCD, and incorporate an approved portable trailer. Ensure each PCMS battery backup has adequate capacity to allow continuous operation for a minimum 14 days during periods of darkness and inclement weather. Provide PCMS capable of displaying 8 characters on each of 3 rows. Properly size each PCMS power supply to allow continuous operation for up to 10 days during periods of darkness and inclement weather.

2.2. **Warning Signs with Flashing Beacons.** When TWS requires warning signs with flashing beacons, provide warning sign that meet TMUTCD as shown on the plans or as directed. Furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) and install the sign support in accordance with the manufacturer's recommendation. Provide sign substrate that meets the CWZTCD listed substrate for the type and model of sign support used. Provide reflective sheeting on warning sign that meets Department Material Specification DMS-8300.

Furnish amber signal heads in accordance with Item 682 "Vehicle and Pedestrian Signal Heads." Provide flashing beacon power system (solar panels and batteries) sized to allow continuous operation for up to 10 days during periods of darkness and inclement weather.

2.3. **Portable Non-Intrusive Traffic Sensors.** The TWS sensors must be side-fired microwave radar type whose accuracy is not degraded by inclement weather and visibility conditions including precipitation, fog, frost, ice, darkness, excessive dust, and road debris. Properly size each traffic sensor power supply to allow continuous operation for up to 10 days during periods of darkness and inclement weather.

2.4. **Communication.** Provide communication between the sensor and sign has the functionality described below.

2.4.1. **Sensor to Sign Communication.** TWS units must meet the following requirements:

- Line-of-sight (LOS) radio must be used to establish the main activation signal communication path between the paired units.
- Transmission LOS range must be no less than 1,000 ft.
- Paired sets will be set up on the same frequency.
- Delay for activation must not exceed 1 sec. under normal operating conditions.

- Modem/cellular data transmission must not be used between sensor and sign.

2.4.2.

Traffic Management Center Communication. When shown on the plans, provide a cellular modem and data connection for remote communication.

- The location of the display unit.
- All times when the display unit was active.

When shown in the plans, TWS data may be linked to the appropriate TxDOT Traffic Management Center displays and systems.

When shown in the plans, TWS unit data must be transmitted to a remote internet-enabled server such that it can be displayed and logged on a website. Web display must be capable of showing, for the entire duration of the project, and per paired TWS set:

3.**CONSTRUCTION**

Provide equipment, tools, supplies, materials, and labor to make the system operational. Assume all communication costs including cellular telephone service, FCC licensing, wireless data networks, satellite and internet subscription charges, solar system support, and battery charging and maintenance. In addition to these requirements, assume responsibility for equipment damaged due to crashes, vandalism, adverse weather, etc. that may occur during the contract period.

Place or relocate TWS units as shown on the plans or as directed. The plans will show the TWS units needed, for how many days, and for which construction phases.

Maintain the TWS units in good working condition. Repair damaged or malfunctioning TWS units as soon as possible.

4.**MEASUREMENT**

This Item will be measured by each TWS paired set, or by the calendar day, including Saturday and Sunday, for the sensor and signs. All TWS units must be set up on a work area and operational before a calendar day can be considered measurable. When measurement by the day is specified, a day will be measured for each TWS paired set that is set up and operational on the worksite.

5.**PAYMENT**

The work performed and materials furnished in accordance with this Item and as provided under "Measurement" will be paid for at the unit bid price for "Truck Entering Highway Warning System," of the type specified. This price is full compensation for the use of the equipment, including labor to set-up, furnish, install, operate, relocate, and remove sign units, replacement parts, maintenance, related consumables, software, programming, and for incidentals necessary to complete the work.

When required in the plans, all costs of cellular equipment, data plans, TWS system servers and websites, and required .xml feeds will be the responsibility of the Contractor for the entire duration of the project, and must be included in the bid price.