

## How we get Connected Portable Traffic Signals (CPTS) required to be on our projects:

Specifications Section 2528: [Section 2528 | Revised 10/17/2023 \(iowadot.gov\)](#)

(It's easier to read here compared to the "strike and replace" stuff in the link above.)

### **G. Temporary Traffic Signals.**

#### **1. General.**

- a. Set up and operate temporary traffic signals as shown in the contract documents. Ensure the temporary traffic signal system meets the physical display and operational requirements of conventional traffic signals as specified in Part 4 of the MUTCD. Unless stated otherwise in the contract documents, either a span wire or trailer mounted temporary traffic signal system may be provided.
- b. In the event any part of the temporary traffic signal system malfunctions or a continuous red flash mode is encountered, furnish flaggers on a 24 hour/7 day a week basis until repairs are made and the signals are fully functional. For temporary traffic signals at intersections, install stop signs on all approaches until the signals are fully operational, at no additional cost to the Contracting Authority.
- c. Notify the Engineer at least 48 hours prior to the use of the signals for timing approval and verification.

#### **2. Equipment.**

##### **a. Portable or Span Wire Mounted Systems.**

- 1) Furnish actuated signal controllers complying with NEMA and ITE standards. Ensure the temporary traffic signal system complies with the following:
  - a) Includes a solid state digital traffic signal controller capable of operating the signals according to MUTCD requirements and NEMA Standard TS-5. A copy of the manufacturer's certificate of compliance is to be posted in the control cabinet (in a weatherproof folder) and made available to the Engineer upon request.
  - b) Has conflict monitoring complying with NEMA Standard TS1 and the following:
    - Detects the presence of conflicting signal indications, absence of proper voltages, and proper operation of the controller.
    - Upon detection of a conflict or loss of communication, all signals enter into flashing red mode.
- 2) For one lane two way traffic control:
  - a) **Green Revert.**

If during an All Red clearance interval a call occurs on the phase losing the right-of-way prior to a call on any other traffic phase, the right-of-way reverts to the previous traffic phase, initiating the initial green interval. The transfer is to be immediate without completing the All Red clearance interval.
  - b) **Rest in Absence of Actuation.**

In the absence of detector actuation of assertion or recall switch(es), the right-of-way indication dwells in All Red.
- 3) Comply with the following:
  - a) Clearance for overhead wiring is a minimum of 18 feet.
  - b) A detection area is located near the stop line with the downstream edge positioned 6 feet from the stop line. A second detection area is located 100 to 150 feet in advance of the stop line. The size of detection areas is 6 feet by 10 feet. A single above-ground detector may be used to provide detection for both areas.

- c) Signal heads have 12 inch lenses and comply with ITE Specification “Vehicle Traffic Control Signal Heads”. All signal heads are equipped with visors and back plates. The backplate provides a minimum of 5 inches black field around the signal assembly and has a dull black finish.
  - d) A minimum of two traffic signal heads per approach. All signal heads mounted over the road surface are mounted a minimum of 15 feet from the bottom of the signal head to the top of the road surface. One signal head mounted over the center of the travel lane. All far right signal heads mounted a minimum of 8 feet from the bottom of the signal head to the top of the ground surface. Required signal heads for through traffic on any one approach located no less than 8 feet apart measured horizontally perpendicular to the approach between the centers of the signal faces.
- b. Portable Traffic Signals.**
- 1) Provide a system consisting of two or more self-contained trailer or pedestal mounted units. Two signal heads shall be visible for each approach.
    - a) Trailer systems shall have one signal head mounted on a mast arm capable of extending over the center of the travel lane and the other signal head mounted on the same trailer.
    - b) Pedestal systems shall have a signal head mounted on each side of the roadway. Pedestal systems may only be used up to 3 continuous days.
  - 2) When using portable traffic signals for stationary work zones on Primary roadways for contracts let in October 2024 or later, remote communication capabilities meeting requirements of [Article 4188.11](#) are required.
- c. Span-Wire Mounted Systems.**  
Ensure posts meet the requirements of [Article 2528.03, A.](#)
- 3. Operational Requirements.**
- a. Locate signals, stop bars, and signs exactly as identified in the contract documents. Secure and level temporary traffic signal installations in a manner approved by the Engineer.
  - b. Program all temporary traffic signals for red flash upon startup, conflict, or power failure. Program the temporary traffic signal system to dwell in All Red.
  - c. For one lane two way traffic control operations, when an additional phase is used for a side road movement, only one long all red interval is to be used between active phases on each side of the work area.
  - d. Set signal timing as identified in the contract documents.
- 4. Equipment Crossings.**
- a. For equipment crossings, use a signal operator to control the signal system. Position this operator with good sight distance for both the mainline and haul road.
  - b. Program the signal system with fixed yellow and all red time periods so the operator can only activate the beginning of the yellow interval for mainline traffic.
  - c. When the equipment crossing is not in use, set the signal to yellow flash mode. If hauling operations are suspended for more than one week, cover the signal heads, or if portable trailer units are used, remove the trailers.

Section 4188: [Section 4188 | Revised 10/17/2023 \(iowadot.gov\)](#)

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**F. 4188.11 GPS and Remote Communications.**

A. When specified, device shall have the ability to receive and transmit its GPS coordinates (latitude and longitude) within a 30 foot diameter of its true location.

B. Electronic communications between device or device’s central server and the Department shall follow communication protocol defined in [Materials IM 488.01](#).

C. Device shall transmit status and location as follows:

1. Mode change within 2 minutes.
2. Location (if moved more than 500 feet) within 2 minutes.
3. Health check every 30 minutes.

Materials IM 488.01: [iowadot.gov/erl/current/IM/content/488.01.htm](http://iowadot.gov/erl/current/IM/content/488.01.htm)

## **INSPECTION, ACCEPTANCE AND COMMUNICATION PROTOCOL OF CONNECTED PORTABLE TRAFFIC SIGNALS (CPTS)**

### **GENERAL**

Connected Portable Traffic Signals (CPTS) must meet the requirements found in the Manual on Uniform Traffic Control Devices (MUTCD – 2009) Part 6F.84 and Iowa DOT Specification [Article 2528.03.G](#). CPTS utilized on the Primary Highway System must utilize GPS and Communications requirements set forth in [Article 4188.11](#) and this IM. Approved Products that meet the GPS and Communications protocol are listed in the Materials Approved Products Listing Enterprise (MAPLE). CPTS that do not require GPS and Communication requirements are not included within [MAPLE](#). Retrofit Kits for other Temporary Traffic Signal (TTS) types are included in [Appendix A](#).

### **APPROVAL PROCEDURES WHEN 4188.11 APPLIES**

**Approval Request Submittal Form:** When a CPTS vendor or TTS Retrofit kit vendor is requesting the Department to evaluate its ability to meet [4188.11](#) and this IM, the vendor shall submit a device for testing and complete the form “ Connected Temporary Traffic Control Device Approval Form”.

**Communications Protocol:** Manufacturers and Suppliers shall utilize the Iowa Connected Portable Signal Protocol (CPSP) found in Attachment 1 of the Connected Portable Traffic Signal Deployment Plan.

### **APPROVED PRODUCTS**

Approved Products of CPTS meeting the requirements of [Article 4188.11](#) will be listed in Appendix A of this IM within [MAPLE](#). Retrofit kits for other TTS types are Included in Appendix A.

[MAPLE](#) does not list regular portable temporary traffic signals.

### **ACCEPTANCE**

Acceptance of CPTS and retrofit kits for other TTS types are by Brand Name and Manufacturer as listed in [MAPLE](#).

### **Updates/Newsletters/Latest Information:**

The Iowa DOT maintains a web page called “Work Zone reference Library” where we put everything going on in Iowa for Work Zones. There is a “Featured Topic” section on Connected Portable Traffic Signals that future information will be placed there about changes or the “next device” that we convert to being “Smart”. <https://iowadot.gov/workzonereferencelibrary>

### **Contact Information:**

Any of the three Iowa DOT staff members can answer questions you may have:

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