

# TRUCKS FOR ADVANCED QUEUE AWARENESS

## **Description**

This work shall consist of strategic and ongoing placement, operation, and repositioning of Queue Trucks pursuant to INDOT's "Protect the Queue" Program in where queue is present in advance of work zones where stopped or slowed traffic presents risk to motorists and workers caused by the speed differential between approaching traffic and traffic traversing the work area. This work shall include a Queue Truck and operator who is actively assessing the queue, providing a designated graphic and message, and repositioning the vehicle to provide awareness of the traffic queue resulting from construction operations. This work shall be in accordance with 105.03 and any stipulations listed in Interstate Highway Congestion Policy Exceptions associated with this contract.

## **Materials**

Materials shall be in accordance with 801.02 as described herein.

## **Traffic Quality Control Means and Methods Coordination Submittal (TQCMMS)**

For each phase, the Contractor and the Engineer shall meet to discuss the deployment of the queue truck for that phase. Subsequently, the Contractor shall provide a TQCMMS as an acknowledgement of the means and methods that incorporates the Traffic Control Plan (TCP) in the Contract Documents or provided by the Engineer. This shall include initial start times, initial truck placements, the anticipated daily duration of queue truck deployment, and the planned schedule of deployment (calendar or workdays). The TQCMMS shall be prepared in acknowledgment of the MOT Plans and INDOT Standards and shall consider the predicted queue lengths and durations of queue listed in the Contract Information Book or the Interstate Highway Congestion Policy (IHCP) Exception. Additionally, the TQCMMS shall address the configuration of the work zone including detour routes, and proposed initial locations for deployment, and staging of the Queue Truck(s). If queue predictions are not stated in the Contract Information Book or not provided in the IHCP Exception, queue predictions will be provided by the Engineer when requested. Finally, the TQCMMS shall address interchange ramp control, the staging of vehicles in standby for cases when queue dissipates, and other specific concerns discussed between the Contractor and the Engineer prior to submittal. The Engineer will provide concurrence with the TQCMMS or provide detailed guidance and request revision.

## **Construction Requirements**

The implementation of Trucks for Advanced Queue Awareness shall be in accordance with the TQCMMS for each phase of construction. The Contractor shall obtain from the Engineer concurrence with the TQCMMS before beginning each phase of work. Start times and initial truck placement shall be confirmed either daily with the Engineer, as agreed at the Pre-Construction Meeting, or as agreed during the execution of the contract.

Queue Truck Operators shall complete the INDOT TRAINING VIDEO FOR QUEUE AWARENESS available on the INDOT Work Zone Safety Website (<https://www.in.gov/indot/2356.htm>) and register online with an affirmation that they have completed the training and shall adhere to the requisite queue awareness practices discussed herein. Queue Truck Operators shall reposition the Queue Truck(s) as necessary as the queue develops and diminishes in accordance with this specification and the TQCMMS. Queues are considered present when either there is stopped or slowed traffic approaching the work zone. This is evident by the presence of brake lights denoting slowing of

vehicles. Queue Truck Operators shall position their Queue Truck(s) on the shoulder of the side of the roadway where the work is performed or where directed by the Engineer. Queue Truck Operators shall actively monitor traffic flow approaching the work zone to maintain a position that is approximately 1/4 mile before the location where braking is observed approaching the queue.

When a second Queue Truck is designated, the TQCMCS shall show the initial placement of the second Queue Truck approximately 2-miles in advance of the first. Both Queue Trucks shall continuously maintain a position for optimal placement relative to the queue. When the queue rapidly expands, overtaking the Queue Truck nearest to the queue, the overtaken Queue Truck shall discontinue messaging and the trailing Queue Truck shall move into the advance position. The overtaken Queue Truck shall drive-out, double-back, and reposition into the trailing position, approximately 2-miles in advance of the leading Queue Truck.

When no queue is present, the Queue Truck Operators shall position themselves in locations designated in the TQCMCS. INDOT's "Protect the Queue" signing shall be stowed when no queue is present such that is not visible to motorists. Queue Truck Operators shall notify the Engineer and be available by phone to receive instruction from the Engineer. Queue Truck Operators can monitor INDOT's DeltaSpeed website (<https://deltaspeed.trafficwise.org/>) and also Google Maps (<https://google.com/maps>) from their Queue Truck with the Traffic Layer activated from their truck to verify the progression of traffic to attempt to determine the development of a queue so they can redeploy to provide queue awareness.

Queue Truck Operators shall implement all aspects of the notification, warning, messaging, and vehicle awareness provided for in this specification and the TQCMCS when deployed in their efforts to alert motorists of the queue. When no queue is present, Queue Truck Operators shall discontinue active notifications. Queue Trucks should only be conspicuous when a queue exists or is developing.

The Contractor shall provide Queue Trucks for each instance where the TCP calls for Queue Trucks in the quantities noted in the Contract Information Booklet.

The Contractor shall provide notice to the Department and the Indiana State Police (ISP) three working days prior to commencing work which may develop a queue, necessitating a need for Queue Trucks. The Contractor's notice shall include the general location, time, and date where a queue or queues may develop.

#### **Equipment**

Queue Truck: Queue Trucks shall consist of a commercial chassis truck ( $\geq 16,000$  LB GVWR). They shall include signing with INDOT's designated "Protect the Queue" imagery and lighting package for Queue Trucks including:

- A metal sign 96" wide and 48" tall, secured to the vehicle in a manner that ensures the safe operation of the vehicle at highway speeds, as provided for in the design of the Queue Truck.
- Four, Whelen Strip-Lite Plus Series SmartLED® WARNING DUO Model: PSD02FCR 12V RED/WHT flasher lights (or equivalent) shall be installed in accordance with the INDOT's "Protect the Queue" Truck Detail. The operation of the flasher lights shall be managed by a Whelen ULF44, 4 Channel LED Flasher device. The lights shall be placed in solid mode

to allow the flasher to operate properly using the ULF44 device. The ULF44 flasher shall be set to operate the ActionFlash 41 pattern.

- The flasher lights shall be operable from inside the vehicle using conventional wiring or wireless devices. Lighting packages shall include a dawn-to-dusk dimmer operation, managed from the Whelen Flasher, to avoid excessive lighting during nighttime operations.
- 6" 3M™ Diamond Grade™ Emergency Vehicle Markings 983-71NL and 983-72NL or equivalent, alternating red and yellow, shall be installed in an upside down "V" fashion in accordance with emergency vehicle marking schemes, at a 45-degree angle making a right angle and the vertical of the center of the sign in accordance with the Queue Truck Detail. Printed sign material shall not be used to ensure that the robust color desired is attained.
- A 30" W3-4 "BE PREPARED TO STOP" sign shall be mounted in the center of the image; the color shall be FLOURESCENT PINK in accordance with Chapter 6I of the Indiana MUTCD and the Queue Truck Detail.
- These signs shall be configured in a manner that does not interfere with brake and reverse lighting ensuring safe operation.

These packages shall be integral to the Queue Truck and INDOT's "Protect the Queue" imagery shall be placed in a conspicuous location in the bed of the truck when in use. They shall include a retractable truck mounted attenuator suitable for the commercial chassis, in accordance with the applicable attenuator manufacturer specifications. Trailer attenuators are prohibited because Queue Truck Operators shall not be able to reposition their vehicles in reverse using trailer attenuators. INDOT's "Protect the Queue" imagery and lighting package may remain on the vehicle when not in use, but it shall be obfuscated by the retracted attenuator when not actively providing queue awareness. Queue Trucks shall include a truck-mount message sign (WANCO Model WVMB Large Display, or equivalent) for messaging as directed by the Engineer. The message sign shall be positioned so that it does not interfere with the conspicuity of the "BE PREPARED TO STOP" sign and shall conform with the IMUTCD.

All queue trucks shall comply with length requirements designated in Indiana Code 9-20-3-4. All Queue Trucks shall be approved in advance by the Engineer prior to initial deployment on the Project.

The default message displayed on message boards during active queue awareness deployment shall be "SLOW TRAFFIC AHEAD". Other messages or graphics (such as an arrow) shall be pre-programmed as options and may be used when directed by Engineer, as approved in the TQCMMS, or as directed by the INDOT Traffic Management Center operations personnel.

All Queue Trucks shall be equipped with a HAAS Transmitter to report activity to the WAZE TRAFFIC APPLICATIONS. Other transmitters, such as iCone's Connectedtech product (used with their Arrow Panel Kits), may be used provided they are able to deliver data to WAZE and GOOGLE TRAFFIC APPLICATIONS.

All Queue Trucks shall be equipped with a rear camera with a monitor capable of continuous operation, irrespective of transmission function, allowing the Queue Truck Operator to continuously monitor approaching traffic - even when INDOT's "Protect the Queue" imagery is deployed and visible to motorists.

#### **Method of Measurement**

Queue Trucks will be measured by the number of days each truck is deployed. A day, for purpose of payment, is an 8-hour continuous period, per truck. Each deployment shall be at a minimum duration of 4-hours for each

truck in use. Additional time will be paid in 1/4-day (2 hour) increments. When queues exist for less than the designated time, Queue Trucks will remain in standby for the remainder of the approved period or until queues return.

**Basis of Payment**

The accepted quantity of Queue Trucks will be paid for at the contract unit price per day.

Payment will be made under:

**Pay Item**

**Pay Unit Symbol**

Queue Truck (ea)

.....DAY

The cost of all labor, equipment and all incidental work shall be included in the cost of the pay item.

