CONSTRUCTION MEMORANDUM   **No. 02-2024**

DESIGN MEMORANDUM   **No. 02-2024**

MAINTENANCE MEMORANDUM

TO: Chief District Engineers
             TEBMs for Project Delivery and Preservation
             TEBMs for Project Development
             Project Development Branch Managers
             Active Consultants
             Section Engineers

FROM: Matthew P. Simpson, P.E.
             Director
             Division of Construction   *MPS*

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             Director
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DATE: February 14, 2024

SUBJECT: Queue Protection Items Guidance for KYTC Work Zones

The Division of Construction has developed a document to provide guidance for the use of Queue Protection pay items for KYTC work zones. These Queue Protection items should be considered and utilized if determined to be applicable by KYTC project teams.

Attachment: *Queue Protection Items Guidance for KYTC Work Zones*

MPS
Cc: KAHC

QUEUE PROTECTION ITEMS GUIDANCE FOR KYTC WORK ZONES

Portable Queue Warning Alert System

Portable Queue Warning Alert System (PQWAS) provides real-time automated ITS queue warning alerts to the traveling public via a series of message boards linked to real time traffic data. Message boards relay important work zone data to drivers approaching a work zone. Traffic data is provided by site located sensor equipment or available crowd-source data. PQWAS should be considered when one or more of the following conditions exist:

- Interstates, Parkways, and other High-speed/High-volume routes

- Traffic queuing more than ½ mile is anticipated due to construction activities.

Project teams should include bid quantities to place adequate message boards to exceed the length of the longest anticipated queue. Once the project begins, project engineers can adjust the number of boards if queues exceed the limits of the PQWAS area. The most current Special Note should be included in the project proposal.

Guidance for determination of initial project quantities:

Portable Queue Warning Alert System

Item Code 26136EC

Pay Unit = Month

> To calculate the quantity of **Months** for a contract use the following formula:

> **PQWAS Pay Quantity = Anticipated Work Zone Duration (months) x Number PQWAS***

*While this number will usually be 1, it would be multiple if the project contains more than one route, and each route utilizes a separate stand-alone PQWAS. For projects that have multiple counties a PQWAS bid item will be established for each county.

Queue Warning PCMS (Portable Changeable Message Signs)
Item Code 26137EC
Pay Unit = 1 Month

> **Queue Warning PCMS Pay Quantity = Anticipated Work Zone Duration (Months) X Number of PCMS**

Queue Warning Portable Radar Sensors

Item Code 26138EC

Pay Unit = Month

Queue Warning Portable Radar Sensors Pay Quantity = Anticipated Work Zone Duration (Months) x Number of Radar Sensors**

** Calculation for Queue Warning Portable Radar Sensor Pay Quantity:

Each Queue Warning PCMS unit will have a corresponding Queue Warning Portable Radar Sensor unless crowd-source data is utilized in lieu of the Radar Sensor. If crowd-source data is utilized, there will be no pay for the Queue Warning Radar Sensor and this work will be considered incidental to the payment for PQWAS.

Example:

Interstate Rehabilitation Project on Interstate I-65.

Anticipated WZ Duration: Beginning June through September.

WZ Duration = June + July + August + September = 4 MONTHS

Longest Anticipated Queue = ~2 miles

Pay Item Quantity to include in initial project:

Calculation for Portable Queue Warning Alert System pay quantity:

PQWAS Pay Quantity = (4 Months) x (1 PQWAS) = 4 Month

Calculation for Queue Warning PCMS Pay Quantity:

With queue length anticipated to be ~2 miles the project team determines to place a PCMS at 1 mile, 2 miles, and 3 miles prior to the work zone resulting in 3 PCMS per direction of work zone traffic for a total of 6 PCMS for the project.

Queue Warning PCMS Pay Quantity = (4 Months) x (6 PCMS) = 24 Month

Calculation for Queue Warning Portable Radar Sensor

Queue Warning Portable Radar Sensor Pay Quantity= (4 Months) x (6 PCMS) = 24 Month

Queue Protection Vehicle Guidance

Queue Protection Vehicles provide visual alerts making motorists traveling toward the work zone aware that they are approaching slow or stopped traffic. The decision to include a Queue Protection Vehicle requirement in a project will be based on the engineering judgement of the project design team. A Queue Protection Vehicle should be considered when the following conditions exist:

- Interstates, Parkways, and other High-speed/High-volume routes
- Adequate shoulder widths to allow the placement of Queue Protection Vehicle
- Anticipated Queue lengths more than ½ mile

Guidance for determination of initial project quantities:

Furnish Queue Protection Vehicles

Item Code 25117EC

Pay Unit = Month

Furnish QPVs Pay Quantity = Anticipated Work Zone Traffic Impact (months)*

*Anticipated Work Zone Traffic Impact should be only months that construction operations or traffic phasing impacts increase the likelihood of a traffic queue. Project team will use engineering judgement to make this determination.

Queue Protection Vehicle   Item

Code 25075EC

Pay Unit = Hour

KYTC Div. of Construction-Feb.2024

QPV Pay Quantity = Anticipated Work Zone Duration (months) x Hours of Operation per month x Number of QPVs Operating**

**Man hours of active use of Queue Protection Vehicle. Project team will use engineering judgement to establish hours needed throughout the different phases of the project.

Example:

Interstate Rehabilitation Project on Interstate I-65.

Anticipated WZ Duration: Beginning June through September.

WZ Duration = June + July + August + September = 4 MONTHS

Longest Anticipated Queue = ~2 miles

Pay Item Quantity to include in initial project:

Calculation for Furnish Queue Protection Vehicles Pay Quantity:

Project team decide that lane closures necessary for the months of June, July, and August present the potential for queueing traffic. September work will consist of work outside of the travel way.

Furnish QPVs Pay Quantity = (Anticipated Work Zone Traffic Impact) = 3 Months

Calculation for Queue Protection Vehicle Pay Quantity:

Project team anticipate the Queue Protection Vehicle to be utilized 30 hours a week for the months of June, July, and August. Queue Protection Vehicles will be utilized simultaneously for both directions of traffic.

Hours of Operation per month = 4 weeks/month x 30 hours/week =120 hours/month

QPV Pay Quantity = 3 months x 120 hours/month x (2 QPVs) =720 Hours