



COMMONWEALTH OF KENTUCKY  
TRANSPORTATION CABINET  
[www.transportation.ky.gov/](http://www.transportation.ky.gov/)

Andy Beshear  
GOVERNOR

Jim Gray  
SECRETARY

August 9, 2021

CALL NO. 100  
CONTRACT ID NO. 211037  
ADDENDUM # 1

Subject: Gallatin County, NHPP IM 0712(080)  
Letting August 20, 2021

- (1) Revised - General Summary - Page 52 of 189
- (2) Revised - Special Note - Pages 98-102 of 189
- (3) Revised - Proposal Bid Items - Pages 187-189 of 189

Proposal revisions are available at <http://transportation.ky.gov/Construction-Procurement/>.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

Rachel Mills,

A handwritten signature in black ink that reads "Rachel Mills".

Rachel Mills, P.E.  
Director  
Division of Construction Procurement

RM:mr  
Enclosures

**I-71 PAVEMENT REHABILITATION  
GALLATIN COUNTY  
ITEM NUMBER: 6-20022.00  
GENERAL SUMMARY**

ITEM NUMBER	ITEM	QUANTITY	UNIT
6543	PAVE STRIPING THERMO - 6 INCH YELLOW	109,011	LF
6546	PAVE STRIPING THERMO - 12 INCH WHITE	2,012	LF
6556	PAVE STRIPING DUR TY 1 - 6 INCH WHITE	1,020	LF
6557	PAVE STRIPING DUR TY 1 - 6 INCH YELLOW	815	LF
6613	INLAID PAVEMENT MARKER - B W/R	1,387	EACH
6614	INLAID PAVEMENT MARKER - B Y/R	41	EACH
10020NS	FUEL ADJUSTMENT	66,471	DOLLARS
10030NS	ASPHALT ADJUSTMENT	166,956	DOLLARS
20071EC	JOINT ADHESIVE	225,326	LF
20362ES403	SHOULDER RUMBLE STRIPS	222,643	LF
20411ED	LAW ENFORCEMENT OFFICER	1,000	HOUR
22883EN	CONCRETE WEDGE CURB	10,138	LF
23229EC	HIGH FRICTION SURFACE TREATMENT	35,410	SQ YD
22664EN	WATER BLASTING EXISTING STRIPE	252,805	LF
24679ED	PAVE MARK THERMO CHEVRON	445	SQ FT
25075EC	QUEUE PROTECTION VEHICLE	400	HOUR
25117EC	FURNISH QUEUE PROTECTION VEHICLES	6	MONTH
26136EC	PORTABLE QUEUE WARNING ALERT SYSTEM	6	MONTH
26137EC	QUEUE WARNING PCMS	48	MONTH
26138EC	QUEUE WARNING PORTABLE RADAR SENSORS	48	MONTH

- (1) The quantity for these items includes initial placement. Any relocation required will not be paid for directly, but will be considered incidental to maintain and control traffic.
- (2) Includes fifteen percent additional removal and replacement for continuing deterioration of the existing pavement.
- (3) Includes fifteen percent additional for milling and leveling at pavement repair locations as directed by the Engineer.
- (4) Estimated quantity for perforated pipe trench repairs to be used as directed by the Engineer.

## Special Note for Portable Queue Warning Alert System

### 1.0 Description

This item shall consist of furnishing, installing, relocating, operating, servicing, and removing various components of a portable, quickly deployable, real-time automated ITS queue warning alert system (PQWAS), in accordance with the standard specifications and this special provision. The Contractor shall also provide the maintenance of the complete system for the duration of the project or as directed by the Project Engineer. The Department is willing to look at different technologies (i.e. allow the use of crowd sourcing data to be used in lieu of the portable radar sensors). Any changes to the below requirements must be submitted and approved by the Engineer.

### 2.0 Materials

Materials shall be in accordance as follows:

All materials used shall meet the manufacturer's specifications and recommendations.

All PQWAS materials installed on the project shall be provided by the Contractor in excellent quality condition, shall be corrosion resistant and in strict accordance with all of the details shown within Contractor's Plans approved by KYTC. The Contractor shall maintain an adequate inventory of parts and replacement units to support maintenance and repair of the PQWAS. Pre-deployment is a condition of the system's acceptance and is based on the successful performance demonstration for a (5) day continuous period in accordance to this specification and as set forth in the plans. Ensure compliance to all FCC and Department specifications.

The Contractor shall maintain this system and shall be locally available to service and maintain system components, move portable devices as necessary and respond to emergency situations. The Contractor has oversight responsibility for directing placement of devices in the project area. The Contractor is to be accessible seven (7) days a week and twenty-four (24) hours a day while the system is deployed. The Contractor shall provide contact information for the system's coordinator and others responsible for maintenance of the system prior to installation of the system. Furnish a System Coordinator for monitoring the PQWAS throughout all periods of deployment.

#### A. General Capabilities and Performance Requirements

1. Overall PQWAS capabilities and performance requirements include the following:
  - a. Furnish a system capable of providing advance traffic information to motorists when there is a queueing of traffic due to congestion resulting from lane reductions, emergency events or other conditions. The condition-responsive notification to the motorist occurs with the use of Portable Changeable Message Signs (PCMS) in accordance to the below capabilities and performance requirements, activated through real-time traffic data collected downstream of the PCMS locations. This equipment must

be a packaged system, pre-programmed and operates as a stand-alone PQWAS meeting this specification. Conditions might exist that require relocation of the portable sensors at any given time, the sensors shall be portable and shall not require re-calibration in the field for fast deployments. Due to the potential need to replace damaged sensors or to change the position of one or more sensors at any given time, sensors must be interchangeable and relocatable by an unskilled laborer. The system must continue to function if as many as half the sensors fail to function.

- b. Provide a PQWAS that consists of the following field equipment: portable radar sensors and portable changeable message signs (PCMS). Provide a system capable of withstanding inclement weather conditions while continuing to provide adequate battery power. The portable radar sensor battery, in a stand-alone state and without a solar panel for recharging, shall be capable of keeping power and capable of sending data for (10) consecutive days or longer. The system shall notify drivers of real-time queue events via specifically placed PCMS units up stream of the work zone. All predetermined/preprogrammed messages are to be approved by KYTC. The number and location of portable radar sensors and PCMS units shall be as directed by the Project Engineer. The decision to deploy or relocate field equipment is made by the Project Engineer and instrumented through the System Coordinator. The decision for equipment removal is made by the Project Engineer after work is complete. The sensors and PCMS units shall be identifiable via global positioning system (GPS) and shall contain an accelerometer to detect and alert of unauthorized movement.
- c. The portable radar sensor shall be capable of collecting traffic speed data. The processed data is used to remotely control PCMS units to display user definable, Engineer approved and locally stored messages. The message trigger state thresholds for slow and stopped speeds shall be user configurable and revisable in less than {1} hour from the Project Engineer's request. Weekly Traffic Data Reports shall be presented to the Project Engineer and shall include speed data per sensor location, travel times, and queue lengths in graphical and numerical formats. In the event the Project Engineer requires a report, other than a weekly report, for any reason; then the Contractor shall provide report within (48) hours of request. Unlimited data reports shall be included within price of system. Sensors shall require no calibration adjustments in the field. Sensor should begin transmitting data within (30) seconds of being turned on. Satellite (SAT) communications will be required when cellular service does not provide continuous communications. Contractor shall identify the most trustworthy cellular provider within the project area.
- d. Data shall be accessible through a website and the Contractor shall provide a username and password for protection. The website shall be accessible seven (7) days a week and twenty - four (24) hours a day. The website shall provide historical & real-time data in graphical and numerical formats and shall have the capability of being integrated within the Department's Traffic Management Center (if requested). The website should be compatible to most hand held devices. Data shall be saved on the manufacturer's network for up to (5) years from the deployment date of system and shall be provided at the request

of the Department at any time within the (5) year window. The use of the website shall be included within the price of system.

- e. Warning Alerts: queue events, low battery voltage warnings, sensor movement alerts, high and low speed alerts shall be provided via cellular text messaging and/or via email messaging at the request of select Contractor personnel and KYTC officials.
- f. The PQWAS system shall have the capabilities to provide alternate route messaging on specifically placed portable changeable message units and/or fixed Variable Message Systems (VMS). The intent of this service is to provide alternate route messaging to motorists before entering the project limits from all directions and giving them appropriate time to adjust their routes. Alternative routes shall be predefined and approved by KYTC. Additional PCMS units may be required for alternate route messaging and will be as per Section 5.0 of this note. KYTC's Traffic Management Center will provide detour messages via fixed VMS units during the term of the project.

**B. Portable Radar Sensor Capabilities and Performance Requirements**

The PQWAS shall include portable radar sensors (PRD) to monitor and detect queue events.

- 1. The Radar Sensor shall be FHWA accepted to meet NCHRP 350 test requirements
- 2. The Radar Sensor shall be locatable at all times via an internal Global Positioning System (GPS) and shall be capable of Cellular or SAT Communications.
- 3. The Radar Sensor shall have a dry-cell battery capable of powering the system for (10) consecutive days or longer
- 4. The Radar sensor shall be K-Band technology and have a line of sight up to 200 linear feet without obstruction
- 5. The Radar sensor shall have the ability to be charged in the field through adaptable solar recharging technology in the case the sensor is utilized for more than 10 consecutive days

**C. PCMS Capabilities and Performance Requirements**

The PQWAS shall include portable changeable message signs (PCMS) designated to relay automated messaging of queue events, alternate route messages, and caution for the work area defined by the project limits. PCMS placements shall meet the requirements set forth by the Cabinet in each direction of the National Highway System (NHS).

- 1. The PCMS unit shall be a Full Matrix 24 rows x 50 columns and shall be capable of 1 line, 2line or 3 line messages
- 2. The PCMS unit shall be legible from a distance over twelve hundred feet(1200')
- 3. The height and size of characters shall be 18" to 58"
- 4. The PCMS shall be capable of storing up to 199 pre-programmed messages and up to 199 user-defined messages
- 5. The PCMS shall have a weather tight control cabinet with back lit LCD handheld controller.
- 6. The PCMS shall utilize a hydraulic lift to raise the unit to display height
- 7. The PCMS unit shall include solar recharging ports to allow for recharging of the portable radar sensors when they are not deployed.
- 8. The PCMS shall be NTCIP compliant and shall have an active Modem with active cellular service.

9. The user shall have the ability to communicate and override the PCMS remotely in the event of an emergency, Amber Alert, etc.
10. The PCMS unit shall have a docking station to include safety rails that allow a commercial safety strap to tie down the portable radar sensors while in transport. The docking station shall hold-up to (4) sensors safely and securely at all times

### **3.0 Construction Requirements**

All communication costs include cellular telephone services, FCC licensing, wireless data networks, satellite and internet subscription charges, and battery charging and maintenance. Additional to these requirements, the Contractor shall assume all responsibility for any and all damaged equipment due to crashes, vandalism, and adverse weather that may occur during the contract period.

The PQWAS shall operate continuously (24 hours/ 7 Days) when deployed on the project. The system is in a constant "data collection" mode when deployed. The Contractor shall provide technical support for the PQWAS for all periods of operation.

In the event communication is lost with any component of the PQWAS, provide a means and staff to manually program a PCMS message. If communication is lost for more the 10 consecutive minutes, the system shall revert to a fail-safe ROADWORK/# MILES/AHEAD message displayed on the PCMS units until communication is restored.

System Operator, local control function and remote management operation must be password protected.

The PQWAS shall be capable of acquiring traffic information and selecting messages automatically without operator intervention after system utilization. The lag time between changes in threshold ranges and the posting of the appropriate PCMS message(s) shall be no greater than (60) seconds. The system operation and accuracy must not be appreciably degraded by inclement weather or degraded visibility conditions including precipitation, fog, darkness, excessive dust, and road debris.

The system shall be capable of storing ad-hoc messages created by the System Coordinator and logging this action when overriding any default or automatic advisory message.

The PQWAS communication system shall incorporate an error detection/correction mechanism to insure the integrity of all traffic conditions data and motorists information messages. Any required configuration of the PQWAS communication system shall be performed automatically during system initialization.

The system's acceptance is based on the successful performance demonstration of PQWAS for a (5) day continuous period in accordance to this specification and as set forth in the plans. Ensure compliance to all FCC and Department specifications.

**4.0 Equipment Maintenance.**

Maintain system components in good working condition at all times. Repair or replace damaged or malfunctioning components, at no cost to the Department, as soon as possible and within (12) hours of notification by the Engineer. Periodically clean PCMS units if necessary.

**5.0 Measurement.** The Department will measure each item below in Months. For partial months the Department will pay in 0.25 increments based on the number of calendar days in the below table.

Partial Month Payment Schedule

Days	Increment
0-7 days	0.25
8-14 days	0.50
15-21 days	0.75
22-31 days	1.00

**5.1 Portable Queue Warning Alert System** includes cellular (SAT communications will be required if cellular is not available), all supporting field equipment, website, and unlimited data reports accessible by the Engineer. It will be measured by the number of months authorized by the Engineer for use on the project.

**5.2 Queue Warning PCMS** will be measured by each individual unit multiplied by the number of months authorized by the Engineer for use on the project.

**5.3 Queue Warning Portable Radar Sensors** will be measured by each individual unit multiplied by the number of months authorized by the Engineer for use on the project. Queue Warning Portable Radar Sensors will not be measured for payment if the Contractor utilizes a system operating on crowd sourcing data. Crowd sourcing data systems will only be allowed as approved by the engineer and will be considered incidental to Portable Queue Warning Alert System.

**6.0 Payment.**

<u>Code</u>	<u>Pay Item</u>	<u>Pay Unit</u>
26136EC	Portable Queue Warning Alert System	Month
26137EC	Queue Warning PCMS	Month
26138EC	Queue Warning Portable Radar Sensors	Month

**PROPOSAL BID ITEMS**

211037

Report Date 8/9/21

**Section: 0001 - PAVING**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0010	00071		CRUSHED AGGREGATE SIZE NO 57	227.00	TON		\$	
0020	00191		ASPHALT SCRATCH COURSE PG64-22	11,886.00	TON		\$	
0030	00208		CL4 ASPH BASE 1.50D PG64-22	1,686.00	TON		\$	
0040	00214		CL3 ASPH BASE 1.00D PG64-22	1,000.00	TON		\$	
0050	00342		CL4 ASPH SURF 0.38A PG76-22	32,255.00	TON		\$	
0060	00356		ASPHALT MATERIAL FOR TACK	329.00	TON		\$	
0070	02676		MOBILIZATION FOR MILL & TEXT	1.00	LS		\$	
0080	02677		ASPHALT PAVE MILLING & TEXTURING	51,143.00	TON		\$	
0090	20071EC		JOINT ADHESIVE	225,326.00	LF		\$	
0100	20362ES403		SHOULDER RUMBLE STRIPS-SAWED	222,643.00	LF		\$	
0110	23229EC		HIGH FRICTION SURFACE TREATMENT	35,410.00	SQYD		\$	

**Section: 0002 - ROADWAY**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0120	01984		DELINEATOR FOR BARRIER - WHITE	8.00	EACH		\$	
0130	01985		DELINEATOR FOR BARRIER - YELLOW	8.00	EACH		\$	
0140	02351		GUARDRAIL-STEEL W BEAM-S FACE	100.00	LF		\$	
0150	02369		GUARDRAIL END TREATMENT TYPE 2A	2.00	EACH		\$	
0160	02383		REMOVE & RESET GUARDRAIL	10,162.50	LF		\$	
0170	02387		GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	2.00	EACH		\$	
0180	02562		TEMPORARY SIGNS	5,000.00	SQFT		\$	
0190	02650		MAINTAIN & CONTROL TRAFFIC	1.00	LS		\$	
0200	02671		PORTABLE CHANGEABLE MESSAGE SIGN	4.00	EACH		\$	
0210	02775		ARROW PANEL	4.00	EACH		\$	
0220	05964		MAINTENANCE FERTILIZER	1.00	TON		\$	
0230	05985		SEEDING AND PROTECTION	100.00	SQYD		\$	
0240	06401		FLEXIBLE DELINEATOR POST-M/W	800.00	EACH		\$	
0250	06404		FLEXIBLE DELINEATOR POST-M/Y	30.00	EACH		\$	
0260	06412		STEEL POST MILE MARKERS	20.00	EACH		\$	
0270	06511		PAVE STRIPING-TEMP PAINT-6 IN	440,288.00	LF		\$	
0280	06542		PAVE STRIPING-THERMO-6 IN W	139,947.00	LF		\$	
0290	06543		PAVE STRIPING-THERMO-6 IN Y	109,011.00	LF		\$	
0300	06546		PAVE STRIPING-THERMO-12 IN W	2,012.00	LF		\$	
0310	06556		PAVE STRIPING-DUR TY 1-6 IN W	1,020.00	LF		\$	
0320	06557		PAVE STRIPING-DUR TY 1-6 IN Y	815.00	LF		\$	
0330	06613		INLAID PAVEMENT MARKER-B W/R	1,387.00	EACH		\$	
0340	06614		INLAID PAVEMENT MARKER-B Y/R	41.00	EACH		\$	
0350	10020NS		FUEL ADJUSTMENT	66,471.00	DOLL	\$1.00	\$	\$66,471.00
0360	10030NS		ASPHALT ADJUSTMENT	166,956.00	DOLL	\$1.00	\$	\$166,956.00
0370	20411ED		LAW ENFORCEMENT OFFICER	1,000.00	HOUR		\$	
0380	22664EN		WATER BLASTING EXISTING STRIPE	252,805.00	LF		\$	
0390	24679ED		PAVE MARK THERMO CHEVRON	445.00	SQFT		\$	
0400	25075EC		QUEUE PROTECTION VEHICLE	400.00	HOUR		\$	
0410	25117EC		FURNISH QUEUE PROTECTION VEHICLES	6.00	MONT		\$	



**PROPOSAL BID ITEMS**

211037

Report Date 8/9/21

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0420	26136EC		PORTABLE QUEUE WARNING ALERT SYSTEM	6.00	MONT		\$	
0430	26137EC		QUEUE WARNING PCMS	48.00	MONT		\$	
0440	26138EC		QUEUE WARNING PORTABLE RADAR SENSORS	48.00	MONT		\$	

**Section: 0003 - DRAINAGE**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0450	00078		CRUSHED AGGREGATE SIZE NO 2	20.00	TON		\$	
0460	00461		CULVERT PIPE-15 IN	8.00	LF		\$	
0470	00462		CULVERT PIPE-18 IN	4.00	LF		\$	
0480	01000		PERFORATED PIPE-4 IN	2,046.00	LF		\$	
0490	01010		NON-PERFORATED PIPE-4 IN	500.00	LF		\$	
0500	01020		PERF PIPE HEADWALL TY 1-4 IN	10.00	EACH		\$	
0510	01028		PERF PIPE HEADWALL TY 3-4 IN	10.00	EACH		\$	
0520	01202		PIPE CULVERT HEADWALL-15 IN	2.00	EACH		\$	
0530	01204		PIPE CULVERT HEADWALL-18 IN	1.00	EACH		\$	
0540	01310		REMOVE PIPE	4.00	LF		\$	
0550	01690		FLUME INLET TYPE 1	1.00	EACH		\$	
0560	01691		FLUME INLET TYPE 2	21.00	EACH		\$	
0570	02165		REMOVE PAVED DITCH	921.00	SQYD		\$	
0580	02483		CHANNEL LINING CLASS II	1,432.00	TON		\$	
0590	02575		DITCHING AND SHOULDERING	52,536.00	LF		\$	
0600	02625		REMOVE HEADWALL	3.00	EACH		\$	
0610	02701		TEMP SILT FENCE	100.00	LF		\$	
0620	02703		SILT TRAP TYPE A	10.00	EACH		\$	
0630	02704		SILT TRAP TYPE B	10.00	EACH		\$	
0640	05950		EROSION CONTROL BLANKET	100.00	SQYD		\$	
0650	22883EN		CONCRETE WEDGE CURB	10,138.00	LF		\$	

**Section: 0004 - TRAFFIC LOOPS**

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0660	04793		CONDUIT-1 1/4 IN	80.00	LF		\$	
0670	04795		CONDUIT-2 IN	20.00	LF		\$	
0680	04820		TRENCHING AND BACKFILLING	90.00	LF		\$	
0690	04829		PIEZOELECTRIC SENSOR	4.00	EACH		\$	
0700	04830		LOOP WIRE	1,680.00	LF		\$	
0710	04895		LOOP SAW SLOT AND FILL	400.00	LF		\$	
0720	20359NN		GALVANIZED STEEL CABINET	2.00	EACH		\$	
0730	20360ES818		WOOD POST	4.00	EACH		\$	
0740	20391NS835		ELECTRICAL JUNCTION BOX TYPE A	2.00	EACH		\$	

**Section: 0005 - DEMOBILIZATION &/OR MOBILIZATION**

211037

### PROPOSAL BID ITEMS

Report Date 8/9/21

LINE	BID CODE	ALT	DESCRIPTION	QUANTITY	UNIT	UNIT PRIC	FP	AMOUNT
0750	02568		MOBILIZATION	1.00	LS		\$	
0760	02569		DEMOBILIZATION	1.00	LS		\$	