

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
EQUIPMENT DIVISION

PROCUREMENT SPECIFICATIONS  
NO. 843-1-H

OPEN END CONTRACT

FULL MATRIX  
TRAILER MOUNTED SOLAR POWERED MESSAGE BOARD

1.0 PURPOSE

It is the purpose of these specifications to describe a Full Matrix Trailer Mounted Solar Powered Message Board (hereinafter referred to as a "unit") to be purchased for use by the West Virginia Division of Highways (DOH) on an Open End Contract basis.

2.0 BIDDING PROCEDURES

**The current purchasing procedures regarding bidding as established by the Department of Administration, Purchasing Division, shall apply.** Failure to submit the " Request for Quotation" forms, complete in its entirety and according to directions indicated, may subject the bidder to disqualification. **Each bid submitted shall also be accompanied by a Bidder's Evaluation Report completed in detail.** Addendums in order, along with exception sheets, should be with Bidder's Evaluation Report. **FAILURE TO SUBMIT THE BIDDER'S EVALUATION REPORT, COMPLETE IN ITS ENTIRETY, WILL RESULT IN AUTOMATIC DISQUALIFICATION.**

3.0 SPECIFICATIONS

The specifications named herein, mandatory and non-mandatory, establish the acceptable level of quality only and are not intended to reflect a preference or favor any particular brand or vendor.

3.1 EXCEPTIONS TO NON-MANDATORY SPECIFICATIONS

Exception to a non-mandatory unit specification may be made by the bidder, providing the exception is not available from the manufacturer. **Any such exception must be noted on the bidder's evaluation report and should be accompanied by supporting documentation/literature from the manufacturer. Any exception must be indicated on a separate attachment to the bidder's evaluation report and labeled as "Exception to Specifications".** The state reserves the right to waive minor irregularities in bids or specifications in accordance with §148-1-4(f) of the WV Legislative Rules and Regulations.

### 3.2 MANDATORY SPECIFICATIONS

**All specifications preceded by "shall, will, and/or must" or are stated as a "minimum and/or maximum" are mandatory as stated in Purchasing Divisions Policies and Procedures. Any bid failing to meet any mandatory item shall be immediately disqualified.** Failure to respond in the appropriate evaluation section will also be grounds for immediate disqualification at the discretion of the State.

A mandatory pre-bid conference is scheduled for this equipment purchase as stated in the RFQ. Vendors having products with variations or exceptions in specified mandatory items are expected to address any such variations or exceptions during the pre-bid conference. **The State shall review and consider any such variation or exception, and may at its sole discretion, issue an addendum to change mandatory specifications deemed to be in the State's best interest. Bids from any vendor failing to attend the mandatory pre-bid shall be disqualified. Bids containing any variation or exception to a mandatory specification that was not addressed during the pre-bid conference and accepted by the issuance of an Addendum shall be disqualified.**

### 4.0 REPRESENTATIVE UNIT FOR TEST

**The successful vendor must (if specified) provide DOH one (1) completed representative unit to be observed and evaluated on each order to insure compliance with specification. If requested, the time period for testing and evaluation shall be seven (7) working days following receipt of the unit.** DOH will incur no obligation for deterioration of surfaces, finishes, seals, and mechanical or electrical parts on the unit resulting from operation and testing within the limits of these specifications; nor will DOH incur obligation for damage to the unit resulting from failure to meet specifications when due care and attention is given by DOH and testing is done within the limits of these specifications. Failure of the pilot unit to satisfactorily meet specifications as bid may be cause for cancellation of the purchase order, and return of the delivered unit along with all associated equipment to the vendor at the vendor's expense.

### 4.1 CONDITION OF UNIT(S) UPON DELIVERY

**All units must arrive at the prescribed delivery point having been completely preserviced with oil, lubricants, and coolant.** All prescribed precautions pertaining to first operations and break-in of the unit are to be posted conspicuously on the unit for ready observance by the operator.

### 4.2 DELIVERY

Delivery point of the completely assembled representative unit will be the DOH, Equipment Division, Route 33 at Brushy Fork Road, Buckhannon, West Virginia (26201).

The vendor is responsible for guaranteeing delivery of the completed units within the time specified and agreed to by the State. Delivery is preferred within 120 days after receipt of purchase agreement. The vendor is responsible for establishing and coordinating delivery terms with allied manufacturers or suppliers. Delivery terms should be stated in the bid and the State reserves the right to accept or reject such terms. Failure to reach an agreement may result in rejection of the bid. **The successful bidder shall provide their manufacturer's confirmation of the order to the WVDOH contact person within seven (7) working days after receiving the approved purchase order.**

**A completed pilot model for inspection must be provided within 30 calendar days after receipt of the purchase agreement by the successful vendor.**

Delivery is an integral part of this specification and failure to comply will be cause to initiate a D.O.T. Administrative Form WV-82, Vendor Performance Form. The WV-82 Form will provide a means of officially notifying the Purchasing Division and the vendor of unsatisfactory performance; such as late deliveries, poor service, inadequate parts supplies, etc.

The decision to initiate subject Form will be at the sole discretion of the D.O.H. Commissioner's established Equipment Review Board.

Issuance of the WV-82 Vendor Complaint Form on unsatisfactory delivery against any vendor will be cause to refuse to consider similar items from those vendors on future Request For Quotations.

(NOTE: Delivery time could be altered due to labor strikes, severe inclement weather conditions, etc.)

## 5.0 AWARD CRITERIA

5.1 DOH will recommend the award in accordance with the RFQ evaluation criteria described in the requisition. **The award shall be made to the lowest unit cost vendor that meets or exceeds the specifications.** DOH reserves the right to place multiple orders in any quantity.

## 6.0 SPECIFICATIONS AND GUIDELINES - GENERAL

### 6.1 IDENTIFICATION OF THE UNIT BEING PROPOSED

**The bidder must identify the unit by manufacturer, model, series, and year of manufacture, to enable identification by DOH in the manufacturer's specifications of the proposed unit.** The bidder will submit complete descriptive literature of the proposed unit, to establish that the bid is the manufacturer's most current model, including latest engineering improvements, which have been, or will imminently be, regularly advertised and sold on the open market. The unit specified herein and offered

to be manufactured after January 1, 2011 and be clearly identified and marked with date of manufacture.

6.2 OPERATING AND SERVICE MANUALS AND PARTS LISTS

**An operator's manual must be included with each unit upon delivery. A "line sheet" (if applicable) and Equipment Preventative Maintenance Questionnaire (as shown in X6.2 of the Bidder's Evaluation Report) must be with pilot unit upon delivery. In addition, there must be 12 service, shop, or maintenance manuals; ten (10) to be distributed to the Districts and two (2) for the Equipment Division. Also, there must be 14 parts manuals; ten (10) to be distributed to the Districts and four (4) for Equipment Division use. CD ROM is preferred in lieu of parts or service manuals.**

\* **NOTE: MANUALS SHALL BE DELIVERED UPON COMPLETION OF DELIVERY OF TOTAL UNITS. FAILURE TO DO SO WILL DELAY PAYMENT.**

6.3 TRAINING:

Manufacturers and/or dealers will be required to stage a thorough seminar on the subjects of Preventative Maintenance, Operator and Mechanic Training. **In order to keep the operators and mechanics updated, the successful vendor shall conduct training with each purchase order against this open end contract.** Training is preferred within 2 working days after delivery of the pilot unit on the individual purchase order.

**Manufacturers and/or dealers shall be required to furnish the Training Academy with one (1) Operator's Manual to be shipped direct to WVDOH Training Academy, Post Office Box 610, Buckhannon, West Virginia 26201 prior to delivery of the pilot.**

The seminar to be held at the W. Va. Division of Highways, Equipment Division, Buckhannon, West Virginia.

6.4 PREVENTIVE MAINTENANCE AND OPERATOR PROCEDURES:

**Manufacturers and/or dealers will be required to submit to the Equipment Division, in addition to the operating and service manuals, booklets and pamphlets explaining the Preventive Maintenance and Operator Procedures to be used by the operators of this equipment, and must include such things as daily prestart inspection procedure, service schedule, and routine maintenance required, safety precautions, etc.**

**The successful vendor shall furnish all training aids; i.e., videos, projectors, etc. required in conducting the training.**

## 6.5 WARRANTY AND SERVICE POLICY

The Manufacturers warranty or service policy is to apply to the unit. Such warranty or service policy is to be recognized at any authorized unit dealer, representing manufacturer of proposed unit throughout the State of West Virginia. The applicable warranty or service policy will not be contingent upon obtaining routine service, lubrication, and servicing of the unit from factory authorized agencies. It will be the responsibility of the bidder to have available labor to repair or replace any defective replacement parts, components and materials, and to have available those replacement parts, components, and/or materials found to be defective during the terms of the warranty period. The bidder should state the labor rates, locations where parts will be stocked, availability of parts, and discounts offered for parts, when terms of the warranty offer a pro-rated cost for parts and labor. In addition, the successful bidder should offer field work to repair or replace defective parts, components, and materials found to be defective during the terms of the warranty and should provide mechanic's travel rates, mileage charges, field mechanic rates, and any surcharge for miscellaneous items, if applicable, for field work during the warranty period. Submit to Division of Highways any technical or engineering improvements during the term of the warranty. **The unit must be accompanied upon delivery by the unit's manufacturer's executed warranty or service policy.**

**A mandatory minimum two (2) year bumper to bumper basic parts and labor warranty excluding abuse and normal wear items is required for this unit.**

**THE "WARRANTY AND SERVICE POLICY QUESTIONNAIRE" ATTACHED IN THE BIDDER'S EVALUATION REPORT MUST BE COMPLETED IN ITS ENTIRETY BY THE SUCCESSFUL BIDDER OR MANUFACTURER PRIOR TO DELIVERY OF THE PILOT MODEL. (SEE SECTION X6.5 OF BIDDER'S EVALUATION REPORT).**

## 6.6 EVALUATION COMMITTEE REQUIREMENTS

Detailed component specifications, product literature, component models, required for specification compliance determination by the Evaluation Committee should be provided with each bid. Any information supplied that is contrary to/or conflicting with the specifications and/or attached Bidders Evaluation Report may be sufficient cause for rejection of bid.

## 6.7 UNSPECIFIED ACCESSORIES & FEATURES

**All parts, equipment, accessories, material, design and performance characteristics not specified herein, but which are necessary to provide a complete unit, must be furnished with each unit and required to conform to strength, quality of material, and quality of workmanship to those which are advertised and provided to the market in general by the unit industry.**

**All parts and accessories advertised and regularly supplied as standard shall be included, except those which would represent duplication of these specified, and except those which, by specification, are not to be furnished. All standard safety features, required by Federal and State Law, shall be included.**

## 7.0 SPECIFICATIONS OF THE QUOTED UNIT ARE AS FOLLOWS:

To be a trailer mounted Full – Matrix Variable Message Board consisting of an optically enhanced L.E.D.s. **L.E.D.s shall have a minimum of a 30° vertical and 30° horizontal cone of visibility. The full-matrix panel shall be powered by a bank of batteries in order to convey bright, distinctive messages to the traveling public. All Full-Matrix Variable Message Boards shall be tested by AASHTO’s National Transportation Product Evaluation Program (NTPEP).**

**7.1 Batteries shall be automatically recharged by a group of solar panels located at the highest point on the unit.**

**7.1.1 Unit shall be designed with sufficient energy backup to operate for a period of 30 days without any sun.**

7.1.2 The solar panel generator array should recharge the battery bank at a rate of approximately 2.5 hours sun to one (1) 24 hour period of usage. (Refer 7.5.3)

7.2 Sign Panel Construction:

7.2.1 To be of aluminum construction or fabricated with powder coated sheet metal and in a flat black finish. **All exposed panels and seams shall be corrosion proof for a minimum of ten (10) years. With construction, all panels/parts shall be assembled as to prevent corrosion or to prevent dissimilar metal reaction from occurring.**

**7.2.2 The sign panel frame to be a welded assembly constructed of aluminum alloy channel, or from steel panels powder coated in a corrosion proof manner for a minimum of ten (10) years.**

- 7.2.3 **Length of sign panel shall not exceed 140 inches.**
- 7.2.4 **Face of sign shall incorporate measures to prevent fading from UV light, such as a polycarbonate or lexan face with UV inhibitors incorporated. Other methods shall be subject to review and approval.**
- 7.2.5 **The sign face shall be of a sufficient size in order to display three (3) lines of eight (8) characters, with each character to be eighteen (18) inches tall by twelve (12) inches wide. Characters to be spaced a minimum of three (3) inches apart.**
- 7.2.6 Each character configuration to contain 54 L.E.D. lamp pixels in a six (6) element horizontal by nine (9) element vertical arrangement.
- 7.2.7 **Each pixel shall consist of a minimum of three (3) LEDs.**
- 7.2.8 Message color to be approximately 590 nanometers.
- 7.3 The sign to have capability to display up to six (6) messages in sequence, with variable timing in ¼ second increments under computer control.
  - 7.3.1 **As part of the manufacturer's pre-programmed message sequences, arrow display and flashing caution functions shall be included. All arrow and flashing caution displays described in the current MUTCD shall be provided.**
  - 7.3.2. **All abbreviations used in pre-programmed messages shall be in compliance with the current MUTCD.**
  - 7.3.3. Entire sign to have capability to change all lines of message copy in not more than 100 mili-seconds.
  - 7.3.4. **The sign shall be clearly visible a minimum of 4500 feet.**
  - 7.3.5. **The sign legend shall be legible from a minimum distance of 1,000 feet under daylight conditions as defined by NTPEP for two –non-traffic word message.**
  - 7.3.6. **The sign legend shall be legible from a minimum distance of 900 feet under night-time conditions as by NTPEP for a two non-traffic word message.**
  - 7.3.7. **Under variable light conditions, the unit shall automatically adjust light source so as to meet the visibility requirements, without being too bright or too dim.**

#### 7.4 Solar Message Board Support

**7.4.1 Solar message board sign panel shall be supported on a telescoping upright member in order to permit raising the sign panel for operation and lowering the panel for transport. The upright must be capable of 360 degrees rotation and to lock into any position to which it is manually or electrically rotated.**

**7.4.2** Raise and lower travel to be approximately four (4) feet and **shall be accomplished by a hydraulic power pack.**

**7.4.3** **The bottom of the sign to be minimum of seven (7) feet above ground level when in the raised position.**

**7.4.4** **In transport position, the sign shall orient to the longitudinal axis of the trailer in a manner that effectively reduces aerodynamic drag during towing.**

#### 7.5 Power and Miscellaneous Equipment:

**7.5.1** **Unit shall be designed to accept two (2) power sources; one (1) being a battery bank consisting of four (4) size 4-D, deep cycle, lead acid 12 volt DC batteries wired in parallel (or as designed to meet power/time requirements).**

**7.5.2** The second power supply to have the capability of the unit to accept existing 120 volt commercial electric service.

**7.5.3** Batteries to be recharged by a solar panel array producing approximately 165 watts of power. (Refer 7.1.2)

**7.5.4** **Unit shall provide a built-in battery charger with a minimum 25 ampere per hour rating.**

**7.5.5** **Battery bank shall be housed in lockable heavy duty weatherproof battery boxes.**

**7.5.6** The two (2) power sources to be enclosed in an appropriate protective housing.

**7.5.7** Batteries to be capable of being recharged by a commercial 110 volt battery charger.

#### 7.6 Control Requirements:

**7.6.1** **The unit shall be controlled in all functions by an on-board dedicated computer of solid state design and be removable.**



- 7.6.2 **Unit shall include a keyboard through which user originated messages may be entered for display or storage.**
- 7.6.3 Include an LCD display screen upon which messages can be reviewed before display on sign board.
- 7.6.4 **Computer shall store a minimum of 250 programmed messages for display when called upon by user through the keyboard.**
- 7.6.5 **Capability of storing a minimum of 100 message sequences.**
- 7.6.6 Unit to maintain stored message list.
- 7.6.7 Unit to provide password coding or key entry.
- 7.6.8 Provide control programming to present sequences messages under operator control through keyboard entry.
- 7.6.9 Provide control for moving arrow displays.
- 7.7 **Solar Panel Control Unit**
- 7.7.1 **The computer and power control unit shall be housed in a weather resistant, shock resistant lockable control box which includes lighting for night-time operation.**
- 7.7.2 Power control unit to contain two (2) current meters; one (1) to show amperage generated with the battery charge operating, and one (1) to indicate amperage generated from the solar panels to be stored in the battery bank.
- 7.7.3 **The power control unit shall incorporate a PV regulator with thermal compensation for variances in ambient temperature to regulate the charge rate to the battery bank.**
- 7.7.4 The unit to incorporate an automatic intensity control feature in order to keep L.E.D. lamp matrix intensity constant with a reduction in voltage.
- 7.7.5 **The message unit must provide a photocell in order to reduce the lamp intensity at night eliminating blinding.**
- 7.8 Trailer:
- 7.8.1 **Two (2) wheel trailer shall be structurally adequate to serve both platform for components.**
- 7.8.2 Fenders: Steel fenders to be provided and installed over each wheel.

- 7.8.3 Trailer to be equipped with a hydraulic brake actuator system.
- 7.8.4 Leveling Jacks: Four (4) crank type, heavy duty, industrial leveling jacks; one (1) at each corner of the trailer deck to be installed.
- 7.9 Lighting:
  - 7.9.1 **Unit shall include LED tail lights, stop lights, turn signals, license mount with light, and all necessary reflectors.**
  - 7.9.2 Trailer electrical cable and connector (Cole Hersee Pt# 12081 male or equal) compatible with towing vehicles to be installed.
  - 7.9.3 All trailer wiring to be encased in heavy duty hypalon type industrial wire looms clamped to underside of the trailer structural tubing.
  - 7.9.4 **A two (2) inch ball type trailer hitch 6,000 pound capacity with double safety chains in accordance with SAE J684F shall be installed.**
- 7.10 Hydraulic Power Pack:
  - 7.10.1 **Shall be 12 volt DC motor, pump, valve, reservoir, manual hand pump or approved equal.**
- 7.11 Message Cabinet Dimensions:
  - 7.11.1 **Length: Maximum length of inches.**
  - 7.11.2 **Height: Maximum of 79 1/2 inches**
- 7.12 Central Processing Unit – CPU Specifications (Minimum):
  - 7.12.1 **Microprocessor Based 27.1 MHz.**
  - 7.12.2 **Power requirements: 175 mA DC at 12 volts DC.**
  - 7.12.3 **Screen Size: Minimum of Three (3) lines, with Eight (8) characters per line.**
  - 7.12.4 **Interfaces: (2) RS232 9 pin D connectors and documentation on port numbers and pins. In addition, one USB port or one ETHERNET Port with USB adaptor shall be provided**
  - 7.12.5 **Code: Application source code to be delivered with unit or held in escrow and provided to WVDOH in case company goes out of business.**

- 7.12.6 **Documentation: Technical documentation for unit and for application programs.**
- 7.12.7 **Unit shall include all other features considered as standard equipment but not specifically addressed previously.**
- 7.12.8 **Vendor must certify that must certify that unit offered will comply with Occupational Safety and Health Act of 1970 and subsequent amendments.**
- 7.12.9 **Paint: The complete unit to be painted with the manufacturers standard colors and materials.**
- 7.12.10 **Advertising: Manufacturer to attach a metal plate on the unit stating manufacturer, date of manufacture, serial number, model number, etc. No large decals or painted advertisements are permitted.**
- 7.12.11 **Preventive Maintenance and Operator Procedures: Manufacturers and or Dealers shall provide a preventive maintenance and operator orientation seminar at the Equipment Division, in Buckhannon, WV. All training aids i.e., videos, charts, manuals, etc., to furnished by successful vendor.**

**7.13 Communications:**

- 7.13.1 **Unit shall be guarded from any unwanted outside RF interference which would include but not be limited to VHF/FM receiver, 2 way radio receiver, cell phones, etc.**
- 7.13.2 **Each PVMS shall be controlled and monitored by its own sign controller directly from the control console inside the control cabinet on the trailer itself.**
- 7.13.3 **The PVMS sign controller shall be able to receive instructions from and provide information to a computer containing PVMS control software compliant using NTCIP compliant communications modes:**
- 7.13.4 **Remote Communications control via wireless communications with a remotely located computer. The system communications backbone, as well as all field modems or signal converters, shall provide the PVMS sign controller with a RS232 signal having a baud rate between 2,400 bps and 115,200 bps.**
- 7.13.5 **Local Communications control shall be available via direct connection with a laptop computer that is connected directly to the sign control using a null modem connection and a baud rate between 2,400 bps and 115,200 bps.**

**7.13.6** Local Communications control via a keypad and LCD interface. **Features shall include addition or removal of message or message(s) from the PVMS list of playing messages, adjustment of luminosity to manual or automatic, and monitor miscellaneous data like battery voltage, photocells reading, etc.**