

## CHECKLIST TO DESIGNATE AREAS OF EVALUATION FOR REQUESTS FOR PROPOSAL (RFP)

	REQUISITION NUMBER	DUE DATE	
MDOT PROJECT MANAGER	JOB NUMBER (JN)	CONTROL SECTION (CS)	
DESCRIPTION			
<b>MDOT PROJECT MANAGER:</b> Check all items to be included in RFP  WHITE = REQUIRED GRAY SHADING = OPTIONAL  Check the appropriate Tier in the box below		<b>CONSULTANT:</b> Provide only checked items below in proposal	
<input type="checkbox"/> <b>TIER I</b> (\$25,000-\$99,999)	<input type="checkbox"/> <b>TIER II</b> (\$100,000-\$250,000)	<input type="checkbox"/> <b>TIER III</b> (>\$250,000)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Understanding of Service
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<i>Innovations</i>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Organizational Chart
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Qualifications of Team
Not required as part of Official RFP	Not required as part of Official RFP	<input type="checkbox"/>	Quality Assurance/Quality Control
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<b>Location:</b> The percentage of work performed in Michigan will be used for all selections unless the project is for on-site p=inspection or survey activities, then location should be scored using the distance from the consultant office to the on-site inspection or survey activity.
N/A	N/A	<input type="checkbox"/>	Presentation
N/A	N/A	<input type="checkbox"/>	Technical Proposal (if Presentation is required)
3 pages (MDOT Forms not counted) ( <b>No Resumes</b> )	7 pages (MDOT Forms not counted)	14 pages (MDOT forms not counted)	Total maximum pages for RFP <b>not including key personnel resumes.</b> Resumes limited to 2 pages per key staff personnel.

**PROPOSAL AND BID SHEET EMAIL ADDRESS** – [mdot-rfp-response@michigan.gov](mailto:mdot-rfp-response@michigan.gov)

### GENERAL INFORMATION

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least five (5) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

MDOT is an equal opportunity employer and MDOT DBE firms are encouraged to apply. The participating DBE firm, as currently certified by MDOT's Office of Equal Opportunity, shall be listed in the Proposal.

### MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

**5100D** – Request for Proposal Cover Sheet

**5100J** – Consultant Data and Signature Sheet (Required only for firms not currently prequalified with MDOT)

**(These forms are not included in the proposal maximum page count.)**

**REQUEST FOR PROPOSAL**

The Michigan Department of Transportation (MDOT) is seeking professional services for the project contained in the attached scope of services.

If your firm is interested in providing services, please indicate your interest by submitting a Proposal, Proposal/Bid Sheet or Bid Sheet as indicated below. The documents must be submitted in accordance with the latest (Consultant/Vendor Selection Guidelines for Services Contracts" and "Guideline for Completing a Low Bid Sheet(S)\*, if a low bid is involved as part of the selection process. **Reference Guidelines are available on MDOT's website under Doing Business > Vendor/Consultant Services >Vendor/Consultant Selections.**

**RFP SPECIFIC INFORMATION**

BUREAU OF HIGHWAYS  BUREAU OF TRANSPORTATION PLANNING  OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

NO  YES DATED \_\_\_\_\_ THROUGH \_\_\_\_\_

**Prequalified Services** – See page \_\_\_\_ of the attached Scope of Services for required Prequalification Classifications.

**Non-Prequalified Services** – If selected, the vendor must make sure that current financial information, including labor rates, overhead computations, and financial statements, if overhead is not audited, is on file with MDOT's Office of commission Audits. This information must be on file for the prime vendor and all sub vendors so that the contract will not be delayed. **Form 5100J is required with Proposal for firms not currently prequalified with MDOT**

**Qualifications Based Selection** – Use Consultant/Vendor Selection Guidelines

**For all Qualifications Based Selections**, the section team will review the information submitted and will select the firm considered most qualified to perform the services based on the proposals. The selected vendor will be contacted to confirm capacity. Upon confirmation, that firm will be asked to prepare a priced proposal. Negotiations will be conducted with the firm selected.

**For a cost plus fixed fee contract**, the selected vendor must have a cost accounting system to support a cost plus fixed fee contract. This type of system has a job-order cost accounting system for the recording and accumulation of costs incurred under its contracts. Each project is assigned a job number so that costs may be segregated and accumulated in the vendor's job-order accounting system.

**Qualification Review / Low Bid** – Use Consultant/Vendor Selection Guidelines. See Bid Sheet instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted. The vendor that has met established qualification threshold and with the lowest bid will be selected. The selected vendor may be contacted to confirm capacity.

**Best Value** – Use Consultant/Vendor Selection Guidelines, See Bid Sheet Instructions below for additional information. The bid amount is a component of the total proposal score, not the determining factor of the selection.

**Low Bid** (no qualifications review required – no proposal required.) See Bid Sheet Instructions below for additional instructions.

**BID SHEET INSTRUCTIONS**

Bid Sheet(s) must be submitted in accordance with the "Guidelines for Completing a Low Bid Sheet(s)\* (available on MDOT's website). Bid Sheet(s) are located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the email address: [mdot-rfp-response@michigan.gov](mailto:mdot-rfp-response@michigan.gov). Failure to comply with this procedure may result in your bid being rejected from consideration.

**NOTIFICATION  
MANDATORY ELECTRONIC SUBMITTAL**

**Proposals submitted for this project must be submitted electronically.**

**The following are changes to the Proposal Submittal Requirements:**

- Eliminated the Following Requirements:
  - Safety Program
  - Communication Plan
  - Past Performance as *a separate section*
  - Separate section for DBE Statement of goals. Include information in Qualification of Team section
  
- Implemented the Following Changes:
  - All proposals require an Organization Chart
  - Resumes must be a maximum of two pages
  - Only Key (lead) staff resumes may be submitted
  - Tier III proposal reduced from 19 to 14 pages
  - Forms 5100D, 5100I, and 5100G combined – 5100D
  - Forms 5100B and 5100H combined – 5100B
  - RFP's will be posted on a weekly basis -- on Mondays

**The following are Requirements for Electronic Submittals:**

- Proposals must be prepared using the most current guidelines
- The proposal must be bookmarked to clearly identify the proposal sections (See Below)
- For any section not required per the RFP, the bookmark must be edited to include “N/A” after the bookmark title.  
**Example:** Understanding of Service – N/A
- Proposals must be assembled and saved as a single PDF file
- PDF file must be 5 megabytes or smaller
- PDF file must be submitted via e-mail to [MDOT-RFP-Response@michigan.gov](mailto:MDOT-RFP-Response@michigan.gov)
- MDOT's requisition number and company name must be included in the subject line of the e-mail. The PDF shall be named using the following format:
  - Requisition#XXX\_Company Name.PDF
- MDOT will not accept multiple submittals
- Proposals must be *received* by MDOT on or before the due date and time specified in each RFP

**If the submittals do not comply with the requirements, they may be determined unresponsive.**

The Consultant's will receive an e-mail reply/notification from MDOT when the proposal is received. Please retain a copy of this e-mail as proof that the proposal was received on time. **Consultants are responsible for ensuring the MDOT receives the proposal on time.**

**Required Bookmarking Format:**

- I. Request for Proposal Cover Sheet Form 5100D
  - A. Consultant Data and Signature Sheet, Form 5100J (if applicable)
- II. Understanding of Service
  - A. Innovations
- III. Qualifications of Team
  - A. Structure of Project Team
    - 1. Role of Firms
    - 2. Role of Key Personnel
  - B. Organization Chart
  - C. Location
- IV. Quality Assurance / Quality Control Plan
- V. Resumes of Key Staff
- VI. Pricing Documents/Bid Sheet (if applicable)

**2/14/12**

**Michigan Department of Transportation**

**SCOPE OF SERVICE  
FOR  
SPECIALTY SERVICE**

Road Weather Information Systems (RWIS) Services  
Best Value Selection

**CONTROL SECTION:** 84900

**JOB NUMBER:** 116395

**PROJECT LOCATION:**

Various locations throughout the state of Michigan, including MDOT Bay, Grand, Metro, North, Southwest, Superior and University Regions.

**DESCRIPTION OF WORK:**

To complete Road Weather Information Systems (RWIS) services including: RWIS Central Management System, RWIS Pavement Forecasting System, and Environmental Sensor Station (ESS) infrastructure maintenance statewide. ESS infrastructure is currently installed or planned to be installed in the counties specified per each MDOT region below.

- Bay Region – N/A
- Grand Region – N/A
- Metro Region – N/A
- North Region – Alcona, Alpena, Antrim, Benzie, Cheboygan, Crawford, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Mason, Ogemaw, Osceola, Otsego, Presque Isle, Roscommon, and Wexford Counties
- Southwest Region – TBD
- Superior Region – Alger, Baraga, Chippewa, Delta, Houghton, Iron, Mackinac, Marquette, and Schoolcraft Counties
- University Region – N/A

All work to be performed through this contract shall be done in accordance with the Michigan Department of Transportation's 2012 Standard Specifications for Construction; the 2011 Michigan Manual on Uniform Traffic Control Devices; all applicable national, state and local building and electrical codes; and all applicable national, state, and local worker safety policies.

Michigan has 51 ESS. These ESS collect a variety of data that may include: pavement temperature (in-pavement and non-invasive), atmospheric, frost depth, snow depth, traffic, cameras, and/or visibility. Transportation authorities use data from these sensors, additional weather information, and forecasts provided under this contract to make decisions on deploying maintenance crews and determining appropriate pavement treatments. These actions, based on accurate weather forecasts, are critically important to public safety, the State's economy, and the environment.

MDOT will become a participant in the development or deployment of an advanced Maintenance Decision Support System (MDSS) to assist decision-makers with the deployment of resources during winter storms.

ESS device to be maintained in this scope of service has been identified in ATTACHMENT A.

**PRIMARY PREQUALIFICATION CLASSIFICATION(S):** N/A

**SECONDARY PREQUALIFICATION CLASSIFICATION(S):** N/A

**ANTICIPATED START DATE:** January 1, 2013

**ANTICIPATED COMPLETION DATE:** December 31, 2014

**DBE REQUIREMENT:** There is no DBE requirement for this project.

**PREFERRED CONSULTANT QUALIFICATIONS:**

The consultant shall have five related projects working with state government or local municipalities over the past five years. Each of these projects should relate to central management, forecasting, or ESS maintenance, all three of these topics should be shown at least once.

**MDOT PROJECT MANAGER:**

Elise Kapphahn  
Michigan Department of Transportation  
8885 Ricks Rd.  
P.O. Box 30049  
Lansing, MI, 48917  
517-636-0036  
[KapphahnE@michigan.gov](mailto:KapphahnE@michigan.gov)

**REQUIRED MDOT GUIDELINES AND STANDARDS:**

Work shall conform to current MDOT, FHWA, and AASHTO practices, guidelines, policies, and standards (i.e., Road Design Manual, Bridge Design Manual, Standard Plans, Drainage Manual, Roadside Design Guide, A Policy on Geometric Design of Highways and Streets, Michigan Manual of Uniform Traffic Control Devices, 2012 Standard Specifications for Construction, the Design Survey Manual, etc.).

**BACKGROUND:**

The Contractor shall have substantial experience in the areas of RWIS Central Management Systems, RWIS Pavement Forecasting Systems, as well as in ESS infrastructure maintenance. The Contractor shall furnish all services and labor necessary to conduct and complete the services described herein. The Contractor shall also furnish all materials, equipment, supplies, and incidentals necessary to perform the Services (other than those designated in writing to be furnished by the Department) and check

and/or test the materials, equipment, supplies and incidentals as necessary in carrying out this work. The Services shall be performed to the satisfaction of the Department consistent with applicable professional standards.

The Contractor shall comply with all applicable Federal and State laws, rules, and regulations. The Contractor’s staff shall conduct themselves with professionalism in carrying out their duties.

The Contractor shall notify the Project Manager, in writing, prior to any personnel changes from those specified in the Contractor’s original approved proposal. Any personnel substitutions are subject to review and approval of the MDOT Project Manager.

At the request of the Department, the Contractor, during the progress of the Services, shall furnish information or data relating to the Services described herein. These may be required by the Department to enable it to carry out or to proceed with related phases of the Project not described herein, or which may be necessary to enable the Department to furnish information to the Contractor upon which to proceed with further Services.

**SELECTION CRITERIA:**

<b>Criterion</b>	<b>Max Points</b>
Contracting Firm Experience and References	20
Assigned Staff Qualifications	30
Technical Approach and Preventative Maintenance Plan	45
Proposal Cost Estimate*	33
Location	5
<b>Total</b>	<b>133</b>

**CONSULTANT RESPONSIBILITIES:**

The following section outlines the mandatory requirements of the Contractor as it relates to the services supplied for RWIS Central Management System, RWIS Pavement Forecasting System, and ESS infrastructure maintenance statewide.

**1. Michigan Climatology, Roadways, and Winter Maintenance Practices**

- a. The Contractor shall demonstrate an understanding of Michigan weather and climatology, as well as a thorough knowledge of winter weather patterns and the variations within the State.
- b. The Contractor shall demonstrate an understanding of MDOT’s trunk line system and its winter maintenance practices.
- c. The Contractor shall demonstrate an understanding of MDOT’s existing RWIS network.

**2. RWIS Central Management System**

- a. General
  - i. The Contractor shall supply a system to perform the collection, processing, storing, transferring, and integration of data

continuously from all associated sensors in the manner described. All software provided must be “open architecture” with no confidential or proprietary modules, functions, or protocols and the Contractor must provide MDOT with all source codes or perpetual licenses.

- ii. The Central Management System (CMS) shall be implemented in a centralized configuration, hosted in a contractor’s data center on contractor’s hardware, and under its total responsibility.
  - iii. The CMS shall be accessible 24/7/365 to MDOT users, their representatives, and/or partnering agencies via a secure (password protected) web site. Each licensed user will have a unique username and password.
  - iv. The CMS site will support up to 50 simultaneous users with no reduction in system performance.
- b. Communications
- i. The CMS shall be capable of transferring data via the following service types:
    - 1. Landline dial-up modem
    - 2. High Speed Local Area Network (LAN)/Wide Area Network (WAN) (e.g. T1, Digital Subscriber Line (DSL))
    - 3. Cellular service
    - 4. Microwave radio transmission
    - 5. Fiber Optic Transmission Systems (FOTS)
  - ii. The CMS shall provide a complete integrated polling system (software, hardware, modems, and installations). The system shall be capable of setting communication time-out frequencies to optimize system performance.
- c. Display
- i. MDOT will supply access to the Remote Processing Unit (RPU) Internet Protocol (IP) addresses at all ESS sites.
  - ii. The following parameters shall be displayed:

<b>Parameter</b>	<b>Units</b>
Pavement Temperature	°F
Bridge Deck Temperature	°F
Pavement Condition	Note <sup>1</sup>
Probability of frost	%
Air Temperature	°F
Dew Point Temperature	°F
Relative Humidity	%
Barometric Pressure	in Hg
Wind Direction	Cardinal pts. or degrees
Wind Speed	Mph
Wind Gust Speed	Mph
Wind Gust Direction	Cardinal pts. or degrees
Precipitation Type	Note <sup>2</sup>
Precipitation Rate	in/hr

Last Precipitation start and end times	time
Precipitation Accumulation (at least 6 ranges from 10 min to 24 hrs.)	Inches
Traffic Speeds (at least 6 ranges from 0 mph to 100 mph)	Mph
Traffic Volumes	
Traffic Classification (at least 6 ranges from 0 to 70 ft.)	
Visibility	Miles
Depth of Frost	Inches

Note<sup>1</sup> – Pavement Conditions MDOT requires at a minimum include:  
 DRY, WET, SNOW, ICE, SLUSH, FROST, DAMP, TRACE MOISTURE

Note<sup>2</sup> – Precipitation Type MDOT requires at a minimum include:  
 RAIN, SNOW, FOG, FREEZING RAIN/SLEET, HAIL, DRIZZLE

Accuracy and resolution of all data shall be similar to that of the sensor collecting the data.

- iii. The user shall be able to display each of the parameters listed in section 2) b) ii) as overlays on top of background map features. The geographic background map shall include state boundaries, MDOT Region boundaries, Transportation Service Center (TSC) boundaries, county boundaries, and all state highways. Major local roads may also be displayed.
- iv. The user shall be able to select which parameters to be displayed on the background map. An ‘all parameters’ option shall be available to select.
- v. All ESS sites shall be shown at their approximate location. The icons shall provide the capability to access site control and data viewing directly from the map for sites selected by the user, using a mouse.
- vi. The user shall be able to view select parameters including but not limited to pavement temperature, air temperature, and surface condition, in a graphical format. Graphs shall display a 24 hour period and be selectable.
- d. Transfer to other agencies
  - i. System shall be capable of managing data push/pull with the MDOT Advanced Traffic Management System (ATMS) software or third-party Meteorological Service Providers. Data shall be transferred to ATMS via a standard data format as specified by MDOT.
  - ii. System shall be capable of transferring data to external agencies such as the National Oceanic and Atmospheric Administration (NOAA), which supports the Binary Universal Form for the Representation of Meteorological Data (BUFR) standard. Data shall meet applicable BUFR standards.
  - iii. System shall allow for data transfer to external agencies that do not support the BUFR standard. System shall interface via Extensible Mark-up Language (XML) or Comma-separated Values (CSV) file transfer, using appropriate National Transportation

Communications for ITS Protocol (NTCIP) Management Information Base (MIB) encoding. Any mutually agreed upon transfer method may also be acceptable.

e. Archiving of Data

- i. Historical data shall be available twelve months back. Data older than twelve months may be archived.
- ii. Archived data shall be easily accessible and retrievable. Display features available shall be similar to the current data view. Archive data shall have sort features that allow the user to search for specific data sets. User shall be able to create and view historical trend graphs of any reported data and save data and reports to a data file containing time-stamped information from all reporting devices in ASCII format.
- iii. Archived data shall be provided by the 15<sup>th</sup> of each month for the previous month. All archived data shall be able to be added or imported into the real-time RWIS system.
- iv. Camera images shall be archived at the rate of one image per half hour and shall be easily retrievable.

f. Data Collection

- i. The CMS shall provide a complete integrated polling system (software, hardware, modem, and installations). Polling shall be a completely automated process, requiring no user involvement once setup, and support manual polling at any time by a user. Polling frequency shall be user definable from 1 to 20 minutes. Depth of Frost data shall be polled 4 times daily (6 am, noon, 6 pm, and midnight). Auto polling software must attempt at least 3 connections to the ESS modem with sufficient time allowed between attempts to reset the modem and attempt to at least block 3 transmissions before aborting. Polling after outage period, of either the server or field locations, shall recover data from missed periods. The connection polling time frames shall be configurable to optimize the system performance.
- ii. System shall be capable of collecting data from up to 150 ESS within the State of Michigan. These sites may be owned by MDOT or another road authority. These sites may contain equipment from various vendors.
- iii. System shall be flexible or open enough to permit upgrades to future devices to NTCIP interface standards.
- iv. Data and archived data shall be exportable to a spreadsheet or database that is accessible by MDOT.
- v. CMS shall be capable of maintaining, manipulating, and uploading/downloading complete ESS and RPU configuration data.
- vi. All data and information derived from that data generated by the RWIS system shall be the sole property of the State of Michigan to use and distribute. Any secondary distribution of the data and information shall be at the sole discretion of the State.

g. Cameras

- i. Each location shall be capable of displaying a minimum of eight images. Provide one summary page that shall display all cameras within one MDOT Region.
- ii. At each site, the user shall have the option to view each camera image independently or view all images simultaneously.
- iii. Each independent camera image shall have the capability to be viewed through a continuous loop through the past 1 ½ hours.
- iv. All camera images shall be the sole property of the State of Michigan to use and distribute. Any secondary distribution of the data and information shall be at the sole discretion of the Department.

### **3. Road and Weather Forecasts**

#### a. General

- i. All forecasts provided by the Contractor will become the property of MDOT. MDOT may, at its discretion, share the forecast with other agencies as appropriate. A unique forecast shall be provided for each licensed user.
- ii. Every ESS site shall have a pavement forecast specific to that site.

#### b. Technical Support

- i. The Contractor shall provide a 24 hour, toll-free telephone number with access to a forecaster to discuss the current or forecasted weather situations to all MDOT and Contract personnel. Methods shall be put in place to assure ready access without unreasonable delays in contacting a forecaster.
- ii. A representative of the forecast agency shall contact each Region RWIS coordinator monthly to discuss improvements to the forecasting service and to clarify issues of concern to either party.

#### c. Frequency of Forecasts

##### i. October 1 thru March 31

- 1. Short-Term Forecasts shall be provided four times daily (3 AM, 11 AM, 3 PM, and 7 PM) and shall cover a period from 1 to 36 hours. These forecasts shall be created and delivered in the one hour time frame proceeding the designated forecast times.
- 2. Long-Term Forecast shall be provided once daily and shall cover a period of 1 to 10 days.
- 3. An updated forecast shall be provided whenever an un-forecasted pavement temperature change through the freezing point occurs or is expected to occur.

##### ii. April 1 thru September 30

- 1. Long-Term Forecast shall be provided once daily and shall cover a period of 1 to 10 days.
- 2. An update forecast shall be provided whenever an un-forecasted pavement temperature change through the freezing point occurs or is expected to occur.

#### d. Method of Display and Delivery

- i. A system shall be provided that allows a user to obtain all data, both in the office and at home, through an internet connection at all times.
  - 1. Access to forecasts shall be provided to Southeast Michigan Transportation Operations Center (SEMTOC), West Michigan Transportation Operations Center (WMTOC), Statewide Transportation Operations Center (STOC), MDOT Regions, TSCs, MDOT Maintenance Garages and select Contract Agencies.
  - 2. The geographic background map shall include state boundaries, MDOT Region boundaries, TSC boundaries, county boundaries, and all state highways. Major local roads may also be displayed.
  - 3. Parameters shall be selectable enabling each one to be turned on or off.
  - 4. Forecasts shall be displayed hourly for 36 hours and daily for 10 days.
  - 5. Users shall be able to select customizable alerts for specific weather data or sensor data. Limits shall be selectable for each alert. Users will have the option of getting alerts via text, phone, email, or fax.

e. Forecasts Inclusion

- i. The Contractor shall forecast the following parameters:

<b>Parameter</b>	<b>Units</b>	<b>Accuracy</b>
Pavement Temperature	°F	+/- 1/2°
Deck Temperature	°F	+/- 1/2°
Pavement Condition	Note <sup>1</sup>	N/A
Probability of Frost	%	+/- 10%
Air Temperature	°F	+/- 2°
Dew Point Temperature	°F	+/- 2°
Relative Humidity	%	+/- 5%
Wind Direction	Cardinal pts. or degrees	N/A
Wind Speed	Mph	+/- 5 Mph
Wind Gust	Mph	+/- 10 Mph
Precipitation Type	Note <sup>2</sup>	
Precipitation Rate	in/hr	+/- 1/2 in/hr
Storm Total from Start of Forecast (Snow and Rain accumulation)	Inches	+/- 3 inches
Future Radar	Note <sup>3</sup>	
Cloud Cover	% or categories	
Wind Chill	°F	+/- 2°
Visibility	Miles	+/- 1 mile

Note<sup>1</sup> – Pavement Conditions MDOT requires at a minimum include:

DRY, WET, SNOW, ICE, SLUSH, FROST, DAMP, ICE WATCH, TRACE MOISTURE

Note<sup>2</sup> – Precipitation Type MDOT requires at a minimum include:

RAIN, SNOW, FOG, FREEZING RAIN/SLEET, HAIL, DRIZZLE

Note<sup>3</sup> – Future Radar requires forecast radar images at each hour of the forecast period with a three hour projection. This service should distinguish the precipitation based on its type, intensity, and coverage properties using differing colors, hues, and hatching.

- ii. The forecast will indicate the time(s) the pavement temperature is expected to rise above or fall below 32 degrees Fahrenheit.
  - iii. The forecast shall include an outlook for the next 24 to 72 hours in a narrative form.
  - iv. The forecast shall provide a minimum of two hour advance warning for any precipitation type or amount.
    - 1. For snowfall amounts greater than two inches or any freezing rain, a minimum of four hour advance notice is required.
  - v. The forecast shall provide two hours advance warning for all pavement temperature changes through the freezing point during precipitation and frost events.
- f. Forecast Verification
- i. Contractor shall provide MDOT with statistics and data utilized to determine statistics showing forecast verification rates for snowfall greater than or equal to one inch and freezing rain.
    - 1. A ‘HIT’ is defined as an event that was forecasted and occurred within the time range stated in 3) e) iv.-v.
    - 2. A ‘MISS’ is defined as a forecasted event that did not occur or an event that occurred but was not forecasted. A ‘MISS’ is also defined as an event that was forecasted and occurred outside of the time range state in 3)e)iv – 3)e)v.
  - ii. Statistics shall show the number of forecast hits and misses. The forecast verification rate for the above criteria is expected to be 85 percent or better. Failure to meet these criteria shall be grounds for terminating the contract, at the discretion of the MDOT Project Manager.
  - iii. Statistics shall be submitted to MDOT twice a year, January 30 and May 15, and shall include data from April 1 - December 30 and January 1 - March 31 respectively.
- g. Forecast Discussion
- i. The Contractor shall hold four meetings with MDOT and their representatives to discuss progress to date.
  - ii. The Contractor shall conduct an annual post-winter meeting with MDOT and their representatives. The meeting shall cover all aspects of the winter forecasting service. Emphasis shall be placed on improving the forecasting service in the future.
- h. Other Weather Data
- i. National Weather Service Information
    - 1. Display all current National Weather Service (NWS) watches, warnings, and weather messages issued by the NWS. These shall be displayed by State, MDOT Region, and county. Users shall be able to select the option of

being notified of new watches, warnings, etc. by email, text, fax, and/or phone.

2. Provide maps depicting weather conditions from the most current NWS observations and the previous hourly images back six hours. The parameters shall include:
  - a. Air temperature
  - b. Dew point temperature
  - c. Relative humidity
  - d. Wind speed and direction hourly radar-estimated precipitation with observed (ground truth) values overlaid
  - e. Observed weather
  - f. High pressures/low pressures/fronts
- ii. Automated Weather Observing System (AWOS)/Automated Surface Observing Systems (ASOS)
  1. Data from all AWOS, ASOS, and any other ESS sites located within the State of Michigan or bordering states and countries as requested by MDOT, shall be displayed on the map and shall be selectable to be displayed on or off (i.e. sites in Wisconsin, Indiana, or Ohio)
- i. RWIS Observations
  - i. User shall be able to display the most current RWIS observations for the parameters that are collected at each MDOT or other road agency ESS site including, but not limited to: air temperature, wind direction, wind speed, precipitation type, precipitation probability, barometric pressure, dew point.

#### **4. ESS Infrastructure Maintenance**

The Contractor shall be responsible for all maintenance of all ESS Infrastructure as referenced in Attachment A.

- a. General
  - i. Monitor system daily in order to identify malfunctions.
  - ii. Provide on-site or remote service interruption analysis at those sites identified as malfunctioning, dependent on the necessary action to remedy malfunction.
  - iii. Replace or repair non-functioning equipment. The Contractor shall include the cost for equipment/sensor replacement in the cost proposal. Equipment/sensors requiring replacement during the term of the contract will not be paid for individually. Rather, the overall contract amount bid shall include the estimated cost of equipment/sensor replacement. All surface sensors originally installed by Vaisala or surface sensors installed in accordance with the Vaisala installation manual are covered by a lifetime warranty from Vaisala. There shall be no replacement equipment cost to MDOT for failed surface sensors. The only exceptions are if the sensor fails due to:
    1. Abnormal wear.

2. Attempts by MDOT or its representatives to remove, re-install, or change the physical location of the sensor.
  3. Visible or non-visible damage due to acts of God, including, but not limited to, shifting of the earth or other natural disasters, except lightning.
  4. Visible or non-visible damage caused by acts, accidental or intentional, of man or machinery.
  5. Failure of MDOT to properly maintain the pavement in which the sensor is installed, including, but not limited to, repairing cracks around the sensor and saw kerfs.
- iv. Proposers may include labor costs for such sensor replacements in their proposals.
  - v. Contractor shall provide a minimum of one Service Technician permanently located in Michigan for the servicing of the RWIS. This technician shall be dedicated to maintenance of the Michigan RWIS and shall not be assigned duties not related to this contract without the prior consent of MDOT. If it is found to be necessary, a second Service Technician shall be made available within Michigan in order to comply with the specified response time.
  - vi. Response Time: The Contractor shall respond on site to service non-functioning equipment within 48 hours of the reporting of non-functioning during the period from October 1 – March 31 and within five days during the period from April 1 - September 30.
    1. MDOT will send all requests for maintenance or reports of problems with the RWIS via e-mail to the Service Contractor on an ESS Service Request Form provided by the Service Contractor. The time and date imprinted on the received form shall be used as the start time for measurement of the response time to service the ESS. Liquidated damages will not apply to system problems or requests for maintenance that are not documented by email or fax to the Maintenance Contractor. MDOT will make a confirming telephone call to the Maintenance Contractor's toll-free Customer Service number to confirm receipt of the email by the Maintenance Contractor.
  - vii. All replacement parts supplied by the Contractor shall be new or reconditioned such that their performance is equal to that of the equivalent new part. Contractor will maintain an inventory of spare parts. All spare parts will be new, complete and fully serviceable and carry a full two year warranty. Along with spares, the inventory will include any special tools or test equipment that may be required for repair and maintenance of the spare parts. These spare parts will be utilized by the contractor during the warranty and extended maintenance period as needed. Contractor shall replenish the inventory of spare parts as they are used, and will turn a complete inventory of spare parts, special tools and equipment over to MDOT at the end of this contract period. Contractor is fully responsible for these spares. MDOT has the

right to audit the inventory at any reasonable time by providing the contractor with five days' notice. The cost of storing and maintaining the inventory of spare parts and equipment should be included in the lump sum cost of the maintenance period. A 15% markup is allowed on the purchase of replacement spares. Replacement spare shipping, insurance and purchase costs should be paid by the contractor and billed to MDOT. Spare parts inventory shall include at a minimum:

- (2) RPU
- (6) Cellular Modems
- (2) Visibility Sensors
- (2) Air Temperature/Humidity Sensors
- (2) Ultrasonic Wind Sensors
- (2) Barometric Pressure Sensors
- (2) Precipitation Sensors
- (2) Infrared Illuminators
- (2) IPP Surveillance System,
- (8) Pavement Condition Sensor, Invasive
- (1) Pavement Condition Sensor, Non-Invasive
- (1) Pavement Temperature Sensor, Invasive
- (3) Subsurface Temperature Probe
- (2) Microwave Vehicle Detection Systems
- (1) PDU
- (1) Tower (2 month turnaround when ordering towers)

b. Principal Period of Maintenance

- i. Any service as described in this proposal shall be performed during daylight hours only, Monday through Friday, excluding legal holidays. MDOT must approve service provided outside the Principal Period of Maintenance (PPM) in advance. If service is provided outside the PPM without MDOT's prior approval, MDOT will not approve any charges billed to it for this service. Service provided outside the PPM shall be billed at a mutually agreed rate as stated in the service agreement.

c. Software Maintenance

- i. The Contractor shall provide software support necessary to maintain and operate the ESS.

d. Preventive Maintenance

- i. The Contractor shall perform annual preventive maintenance on the equipment that requires preventive maintenance. Equipment requiring preventive maintenance includes RPU's and all atmospheric and pavement sensors, CPU's, and all communication equipment, such as modems. Preventive maintenance shall be performed during the PPM, between August 1 and October 30, and shall coincide with on-site hardware maintenance when possible.
- ii. The Contractor shall develop and submit a preventative maintenance plan. The preventative maintenance plan must be comprehensive and address all items in sufficient detail, including

time durations. Consideration must be giving to the overall contract length as it pertains to and affects device preventative maintenance. The Contractor shall adhere to all submitted and approved preventative maintenance activities and schedules

- e. Pre-Service Contract Meeting
  - i. Upon issuance of the service contract, the Contractor shall schedule a pre-servicing contract meeting with MDOT to review the terms and conditions of the contract, scheduling of work, and the exchange of contact names and telephone numbers required by both the Contractor and MDOT.
- f. System Monitoring
  - i. The Contractor shall monitor the system daily from its central office or the service technician's office to provide information for System Status Report.
- g. Warranties
  - i. The Contractor must ensure that all warranties remain valid. To achieve this, the Contractor shall perform all the preventive work specified by the manufacturer within the periods specified by the manufacturer for all equipment. During the warranty period the Contractor will replace all defective equipment covered by the warranty at no expense to MDOT.
- h. Miscellaneous Services
  - i. Upon authorization by MDOT, the Contractor shall notify and coordinate with any utility contacts required to correct interruptions in electrical power service or communication service to the RPU's. MDOT will provide a list of the appropriate contact names and telephone numbers for each location.
    - 1. MDOT Region Office Contacts. The Contractor shall be responsible for notifying the region office contact person when the service technician is beginning work in that region and when work is completed.
    - 2. The Contractor shall schedule an annual review meeting with MDOT during the first four months of each year to review the highway improvement program for that year and schedule reinstallation of sensors affected by improvement projects.
  - ii. When performing any work on MDOT right of way, the Contractor's work vehicle shall be properly identified and equipped with a flashing yellow light per MDOT requirements. See Section H – Traffic Control and MDOT Permits for additional requirements.
  - iii. When two or more sites are reporting malfunctions, the Contractor shall coordinate the repair schedule and prioritization with MDOT's RWIS Program Manager. In general, the following prioritization will apply:
    - 1. CPU malfunction, including but not limited to, user interface and central polling system
    - 2. Communication failure at an RPU

3. Surveillance system failure
  4. Temperature/relative humidity sensor failure
  5. Wind sensor failure
  6. Surface sensor failure
  7. Precipitation sensor failure
  8. Subsurface sensor failure
- iv. The Contractor may bill MDOT for miscellaneous expenses not specifically outlined in this RFP. However, any incidental expenses incurred and billed must be approved by MDOT prior to billing. If such expenses are not approved in advance by MDOT, the Contractor will not be reimbursed for said expenses.
- i. System Status Report
- i. The Contractor shall provide a system status report by e-mail to each region office and a statewide report to MDOT each Tuesday (or another day mutually agreed upon by MDOT and the Contractor) from October 1 through April 30 and once per month during the last full work week of the month from May 1 through September 30. Contacts will be specified by the MDOT upon contract award. Status reports shall include the status of each RPU and each sensor, reasons for non-functioning sensors, and repair schedule. A separate report to MDOT will include the date of the service request, a description of the problem, the date of initial service contractor response, and the date of resolution of the problem.
- j. Performance Reporting
- i. The Contractor shall report weekly the in-commission rates for all sensor types, including, but not limited to:
    - Surface sensors
    - Subsurface sensors
    - Precipitation sensors
    - Communications effectiveness
    - Temperature/humidity sensors
    - Wind sensors
    - Traffic sensors
    - Cameras
- k. Liquidated Damages
- i. MDOT reserves the right to deduct liquidated damages under the following circumstances.
    1. If, during the period from October 1 through March 31, the Contractor does not respond to a reported malfunction within 48 hours of receiving notification from MDOT of said malfunction, MDOT may, at its discretion collect \$100 in liquidated damages per day for each malfunction not responded to within 48 hours.
    2. If, during the period from April 1 through September 30, the Contractor does not respond to a reported malfunction within five working days of receiving notification from

MDOT of said malfunction, MDOT may, at its discretion collect \$100 in liquidated damages per day for each malfunction not responded to within five working days.

3. If, during the period from October 1 through March 31, a system status report is not delivered within two business days after the day of the week for which it is required, MDOT, may, at its discretion, collect \$100 in liquidated damages for every week in which the report was not delivered within two business days of the day it was required.
1. Return of Service Requests
  - i. The Contractor shall return any service request ticket submitted by MDOT with the time of initial response to the request annotated on the request form. This shall be accomplished via e-mail. The request form shall be returned no more than seven days after the Contractor responds to the outage. If no form is returned, MDOT will assume, for the purposes of liquidated damage deduction that no response occurred.

#### **4. Maintenance Decision Support System (MDSS) Functionality**

- a. The weather forecasting system shall include integrated MDSS functionality to support appropriate road maintenance actions that result in optimal road surface results with efficient use of resources for specific weather conditions. Treatment recommendations shall be provided for each hour of the forecast when indicated by the current and future pavement and weather forecast parameters.
- b. The system shall support the FHWA Pavement Recommendation Rules of Practice regime as the default treatment recommendations for specific weather situations. It shall also allow users to incorporate up to ten of their own customized treatment plan recommendations to reflect individual best practices in chemical application, timing, type and rate as well as plowing actions. Users must also be able to select the appropriate route cycle times or times for their routes. Treatment recommendations must be provided for the next 36 hours to indicate required actions prior to, during, and after a storm.

#### **5. Training**

- a. Contractor shall provide training for RWIS CMS; Forecasting, and any other software necessary to meet the requirements of this Proposal. All training will meet or exceed the requirements listed below.
  - i. Course materials shall be approved by MDOT at least 10 calendar days prior to the training.
  - ii. Training shall be conducted by classroom style or webinar, as agreed upon by MDOT.
  - iii. Training shall be provided to both MDOT staff and other agencies as deemed appropriate by MDOT.
  - iv. Training shall cover the use of all computer software and web-based applications.

- b. Initial Training
  - i. Initial training shall be provided at three locations statewide for a minimum of thirty users per training.
- c. Update Training
  - i. Update training shall be provided on an annual basis during the life of the contract. At three locations statewide for a minimum of twenty users at each location.
- d. Forecasting Training
  - i. Forecasting training shall be provided on an annual basis during the life of the contract. At three locations statewide for a minimum of twenty users. Training shall focus on understanding the content of forecasts that are being delivered and general weather information appropriate to maintenance decision making.

**MDOT RESPONSIBILITIES (GENERAL):**

- 1. Schedule and/or conduct the following:
  - a. Project related meetings
  - b. Stakeholder engagement meetings
- 2. Make decisions or provide input for the following items:
  - a. Resolve issues related to funding
  - b. Review and approve all budget and schedule aspects

**TRAFFIC CONTROL AND MDOT PERMITS**

The Contractor shall be responsible for all traffic control required to perform the tasks as outlined in this Project Scope of Design Services. Traffic control shall conform to the most recent version of the MDOT Maintenance Work Zone Traffic Control Guidelines.

**PROJECT MANAGEMENT:**

- 1. This project will require close interaction and good communication between the Consultant and multiple MDOT staff.
- 2. If there are any major deviations from the original scope of this assignment, these changes must be documented and jointly approved by the Consultant and MDOT.
- 3. The selected Consultant shall provide all necessary project management services, including monthly and quarterly progress reports, and providing invoices in a timely manner.
- 4. Consultants should provide a description of their management team for this project and list all key personnel responsible for the deliveries of this RFP.

**STATUS REPORTS/ MEETINGS:**

- 1. There shall be periodic, regular meetings between MDOT representatives and the selected Consultant to review work product and to communicate progress, issues, ideas, and expectations.
- 2. The selected Consultant shall provide copies of all project reports, correspondence, meeting announcements, and meeting minutes from all meeting attended, which shall be delivered by email to the MDOT Manager. These shall be distributed by email to the MDOT Project Manager.

**PROJECT DOCUMENTATION:**

All documentation and reports shall be delivered in the current version of Microsoft Word or Adobe Acrobat (whichever applies) being used by MDOT. All documentation delivered shall be clear, concise, complete, and in compliance with standards required by the MDOT Project Manager. All CADD files shall be delivered in the current version of MicroStation being used by MDOT.

**CONSULTANT PAYMENT – Unit Price and Lump Sum:**

Compensation for some items on this this project shall be on a **unit price** basis. This basis of payment typically includes a maximum quantity of units and a maximum reimbursable cost per unit.

And compensation for some items on this project shall be on a **lump sum** basis. One lump sum payment will be made once the deliverable is received and approved by the MDOT Project Manager. These items will be based on actual cost and may not exceed the actual cost of work. The MDOT Project Manager may authorize partial payment if the project is delayed due to circumstances beyond the consultant's control.

All billings for services must be directed to the Department and follow the current guidelines. The latest copy of the "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways" is available on MDOT's website. This document contains instructions and forms that must be followed and used for billing; payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for services rendered shall not exceed the maximum amount unless an increase is approved in accordance with the contract with the Consultant. Typically, billings must be submitted within 60 days after the completion of services. Refer to your contract for your specific contract terms.

**ATTACHMENT A:  
CURRENT SYSTEM DESCRIPTION**

Provided in the following section are detailed descriptions of the ESS Infrastructure currently installed in the field, as well as descriptions of planned systems in the future.

**Bay Region**

The MDOT Bay Region does not currently have any ESS devices installed in the field or planned for completion during the life of this contract.

**Grand Region**

The MDOT Grand Region does not currently have any ESS devices installed in the field or planned for completion during the life of this contract.

**Metro Region**

The MDOT Metro Region does not currently have any ESS devices installed in the field or planned for completion during the life of this contract.

**North Region**

The MDOT North Region currently has 12 ESS that are operational, and is in the process of installing 11 additional ESS that will be operational by January 1, 2013. In all, the North Region will have 23 ESS in 19 counties that will be operational for the start of this contract. The possibility of installing additional ESS and/or sensors within the contract timeframe exists, although it is not planned at this time.

**Southwest Region**

The MDOT Southwest Region does not currently have any ESS devices installed in the field; however a project is in the process of being designed to install multiple ESS. A brief description of the future system is provided below.

FY2015

RWIS Phase 1 Build (JN107966) – 10 ESS

**Superior Region**

The MDOT Superior Region currently has 12 ESS that are operational, and is in the process of installing 16 additional ESS that will be operational by January 1, 2013. In all, the North Region will have 28 ESS in 15 counties that will be operational for the start of this contract. The possibility of installing additional ESS and/or sensors exists for the summer of 2014. At this time, there is not an exact number, but an estimate would be 15 locations throughout the Region.

**University Region**

The MDOT University Region does not currently have any ESS devices installed in field or planned for completion during the life of this contract.

**Statewide**

Any supporting documentation that is needed by the consultant to verify device locations, type, characteristics, etc. can be supplied by the Engineer at the contractor's request.

Throughout the duration of the contract, multiple ESS deployments will be installed and documentation will be provided as it becomes available. Multiple systems are currently in the design phase and documentation will be supplied as developed and approved.

ESS and/or sensors that are installed in the future will be included in the maintenance contract quantities upon verification of operation. Additional payment for the pay item “Maintain Communications System” will not be given under this scenario.

**BID SHEET**  
**Consultant Services for Statewide RWIS Services**  
MDOT STATEWIDE  
PAYMENT ITEMS  
(All entries made on this page shall be handwritten in ink.)  
**Revised 9/24/2012**

	ITEMS OF WORK	UNIT	QUANTITY	PRICE/UNIT	TOTAL PRICE
1	RWIS Central Management	Month	24		
2	RWIS Pavement Forecasting System (Oct 16 - Mar 15)	Month	12		
3	RWIS Pavement Forecasting System (Mar 16 - Oct 15)	Month	12		
4	ESS Infrastructure Maintenance Statewide (51 Devices for 24 Months)	Month	1224		
5	Non-routine Maintenance and Repairs	<del>Lump Sum</del> Dollar	+ 56,000	1.0	*\$56,000
6	Training Development	Each	3		
7	Training Class	Daily	42		
8	Maintain Spare Parts Inventory	Month	24		
9	Spare Parts Direct Cost	<del>Lump Sum</del> Dollar	+ 217,000	1.0	*\$217,000
10	Utility Staking and Protection One Person	Hour	28		
11	Lighted Arrow, Type C, Furn.	Each	4		
12	Lighted Arrow, Type C, Oper.	Each	4		
13	Plastic Drum, High Intensity, Lighted, Furn.	Each	150		
14	Plastic Drum, High Intensity, Lighted, Oper.	Each	150		
15	Sign Cover	Each	32		
16	Sign, Type B, Temp, Prismatic, Furn.	Sq Ft	864		
17	Sign, Type B, Temp, Prismatic, Oper.	Sq Ft	864		
18	Truck Mounted Attenuator	Each	2		
19	Mobilization, Max.	Lump Sum	1		

**CHECK UNIT PRICE COLUMN FOR OMISSIONS BEFORE ENTERING BID TOTAL**

\* Not to exceed amounts. Payment to be made based on actual cost

**Note that Lump Sum price shall be based on actual cost of work and will not exceed that cost**

**Bid Price for the above listed items and quantities: \$\_\_\_\_\_**

**CONTRACTOR'S NAME:** \_\_\_\_\_

**CONTRACTOR'S SIGNATURE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_