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# bid item #1 – standard Wireless TRAFFIC MONITORING DEVICE

1. **Description.**

This special provision describes furnishing a standalone wireless traffic monitoring device (Device) that is capable of detecting, monitoring, and recording the Media Access Control (MAC) address of various devices through the use of wireless receivers capable of detecting Bluetooth and/or Wi-Fi wireless signals. This information will then be aggregated by a central system software (System) for further processing. By matching unique MAC addresses, or wireless device identifiers, with timestamps from multiple unique Device locations, the System shall provide accurate vehicle speed and travel time data as well as vehicle origin/destination information.

1. **Materials.**

Furnish Device that meets or exceeds the following requirements.

*General Device Requirements*

All Device field components shall meet or exceed all Wisconsin Department of Transportation (WisDOT) operating environment standards and specifications for traffic related field devices. More specifically, the field components of the system shall withstand operating temperatures from -20° F to 145° F. All components shall be resistant to water, snow, ice, fog, dust, salt, and wind speeds of up to 100 mph. The Device shall be capable of being powered by AC 100-240 line voltage, solar power, and a 12V DC battery. The total weight of the Device and enclosure, excluding any optional solar panel equipment, shall not exceed 50 lbs. The Device shall have been marketed and deployed under field conditions for a minimum of one year with details provided upon request.

*Enclosure*

The Device enclosure shall meet all NEMA Type 4 enclosure requirements. The Device enclosure shall be made of a non-metallic material. The door to access the Device controls shall be hinged with a clasping mechanism designed for easy access with quick release and locking. The enclosure shall support the use of a padlock. The Device enclosure shall have adequate ventilation to prevent overheating.

*GPS Receiver*

The Device shall include a global positioning system (GPS) receiver for the purpose of recording accurate location and time stamping information. The GPS receiver datum shall be set to either WGS 84 or NAD 83 (HARN).

*Battery*

The Device shall have a sealed 12V AGM Lead-Acid battery that provides power sufficient for all Device operations for a minimum of ten days during all operating conditions. Device operations are to include all functionality related to the Bluetooth reader, GPS receiver, clock, and communications equipment. The battery shall be housed inside the Device enclosure. The battery shall have a quick connect adapter for easy removal and charging. The battery positive terminal shall be covered with a rubber boot to protect against accidental shorting.

*Clock*

The Device shall include an internal clock that can be synchronized to a master clock to be determined by WisDOT.

*Encryption*

The Device may include a mechanism or switch to toggle MAC address device output between plaintext and a pre-determined cryptographic hash to be determined by WisDOT.

*Antenna and Reception*

The Device shall include an omni-directional antenna capable of supporting a minimum range of 150 feet in all directions in order to adequately cover a large, multi-lane, divided highway during all weather conditions. The antenna shall be easily accessible and connected using a standard antenna connector so that alternate antennas (different signal strength omni antennas and directional antennas) can be used to accommodate alternate deployment scenarios. The Device shall allow the use of an antenna extension cable of up to 100 feet in length in order to externally mount the antenna in situations where mounting the unit at an ideal height is not an option.

*Local Data Storage*

The Device shall be capable of storing data locally on either a micro SD or SD card. This card shall be included with the device and shall be a minimum of 32 GB or of sufficient size to support storing a minimum of six months of wireless detection data on a 100,000 AADT facility, whichever is greater. All data stored shall include the MAC address or wireless identifier, a GPS-furnished location, the time stamp for each individual reading, and the MAC address signal strength.

*Wired Communication*The Device shall support Ethernet communications and shall support both dynamic and static IP addressing. The Device shall also support the use of an external modem for communications.

*External Data Interface*

The Device shall be capable of providing collected data to the System, located either at a WisDOT facility or another third-party location, through a defined, documented interface for further processing. This data interface shall support the polling of data by the System. Data available through the data interface shall be defined by an XML schema provided by the vendor. It is preferable that the data interface adhere to the NTCIP standard for Transportation Sensor Systems (NTCIP 1209).

*Service and Support*

Customer support for the Device shall be available during normal working hours, 8:00 AM to 5:00 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

All Devices shall be warrantied for a minimum of 24 months from the date of WisDOT acquisition of the Device. The supplier shall repair or replace, at no cost to the buyer, any and all Devices that fail to operate as specified. Failed Devices shall be repaired or replaced within 5 business days of WisDOT notification of a failure.

1. **Construction Methods.**

The Devices shall be deliverable to WisDOT via UPS, USPS, FedEx, or in person. Installation shall be completed by WisDOT, but a representative from the supplier shall be available during installation and configuration of the Device to provide support and to answer any questions.

*Unit Mounting*

All brackets and mounts, including hardware, shall be supplied by the vendor with detailed instructions, in English, if assembly is required. All parts shall consist entirely of non-corrosive materials. Bracket(s) shall be saw tooth type and allow device to be quickly and easily mounted to a pole or existing structure along the roadway being studied. The Device, once mounted, shall be secure under all weather conditions with an allowable movement not to exceed ¼ inch. All brackets shall accommodate the use of readily available steel strap ties unless otherwise provided by the vendor. The vendor is to provide all materials to effectively ground cabinet, all cable grounding shields, and any spare or unused conductors.

1. **Acceptance Testing.**

As part of this procurement, the selected vendor and WisDOT will develop an Acceptance Test Procedure (ATP) that will demonstrate all required functionality. Any modifications to the ATP will be submitted to WisDOT for approval prior to testing. In the course of testing, should WisDOT staff determine that the Device, associated hardware, or System performs unfavorably (e.g., taking more than 3 seconds to fully display a new screen or layer or refresh a screen, uses excessive amounts of resources, etc.) or fails any part of the acceptance test, these problems will be corrected at no additional expense to WisDOT by the vendor. Testing will re-commence when the problems are corrected.

1. **Method of Measurement.**

A complete Device shall be measured as a unit delivered, deployed, and tested for valid operation.

1. **Basis of Payment.**

A complete Device, measured as provided above, shall be paid for at the contract price for each Device, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery.

# bID iTEM #2 - CABINET OR RACK MOUNTABLE Bluetooth detector

1. **Description.**

This special provision describes furnishing a cabinet or rack-mountable wireless traffic monitoring device (Device) that is capable of detecting, monitoring, and recording the Media Access Control (MAC) address of various devices through the use of wireless receivers capable of detecting Bluetooth and/or Wi-Fi wireless signals. This information will then be aggregated by a central system software (System) for further processing. By matching unique MAC addresses, or wireless device identifiers, with timestamps from multiple unique Device locations, the System shall provide accurate vehicle speed and travel time data as well as vehicle origin/destination information.

1. **Materials.**

Furnish cabinet or rack-mountable Device that meets or exceeds the following requirements.

*General Device Requirements*

All Device field components shall meet or exceed all Wisconsin Department of Transportation (WisDOT) operating environment standards and specifications for traffic related field devices. The Device shall be compatible with any standard NEMA certified cabinet. The Device Ethernet card shall meet all applicable IEEE standards as well as all Wisconsin Department of Transportation (WisDOT) standards pertaining to rack mounted devices and Ethernet cards. The Device shall be field hardened to withstand operating temperatures ranging from -20° F to 145° F. All components external to the Device shall be resistant to water, snow, ice, fog, dust, salt, and wind speeds of up to 100 mph. The Device shall be capable of being powered by AC 100-240 line voltage. The Device shall have been marketed and deployed in field conditions for a minimum of one year with details provided upon request.

*GPS Receiver*

The Device shall include a global positioning system (GPS) receiver for the purpose of recording accurate location and time stamping information. The GPS receiver datum shall be set to either WGS 84 or NAD 83 (HARN).

*Clock*

The Device shall include an internal clock that can be synchronized to a master clock to be determined by WisDOT.

*Encryption*

The Device may include a mechanism or switch to toggle MAC address device output between plaintext and a pre-determined cryptographic hash to be determined by WisDOT.

*Antenna and Reception*

The Device shall include an omni-directional antenna capable of supporting a minimum range of 150 feet in all directions in order to adequately cover a large, multi-lane, divided highway during all weather conditions. The antenna shall be easily accessible and connected using a standard antenna connector so that alternate antennas (different signal strength omni antennas and directional antennas) can be used to accommodate alternate deployment scenarios. The Device shall allow the use of an antenna extension cable of up to 100 feet in length in order to externally mount the antenna in situations where mounting the unit at an ideal height is not an option.

*Local Data Storage*

The Device shall be capable of storing data locally on either a micro SD or SD card. This card shall be included with the device and shall be a minimum of 32 GB or of sufficient size to support storing a minimum of six months of wireless detection data on a 100,000 AADT facility, whichever is greater. All data stored shall include the MAC address or wireless identifier, a GPS-furnished location, the time stamp for each individual reading, and the MAC address signal strength.

*Wired Communication*The Device shall support Ethernet communications and shall support both dynamic and static IP addressing. The Device shall also support the use of an external modem for communications.

*External Data Interface*

The Device shall be capable of providing collected data to the System, located either at a WisDOT facility or another third-party location, through a defined, documented interface for further processing. This data interface shall support the polling of data by the System. Data available through the data interface shall be defined by an XML schema provided by the vendor. It is preferable that the data interface adhere to the NTCIP standard for Transportation Sensor Systems (NTCIP 1209).

*Service and Support*

Customer support for the Device shall be available during normal working hours, 8:00 AM to 5:00 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

All Devices shall be warrantied for a minimum of 24 months from the date of WisDOT acquisition of the Device. The supplier shall repair or replace, at no cost to the buyer, any and all Devices that fail to operate as specified. Failed Devices shall be repaired or replaced within 5 business days of WisDOT notification of a failure.

1. **Construction Methods.**

The Devices shall be deliverable to WisDOT via UPS, USPS, FedEx, or in person. Installation shall be completed by WisDOT, but a representative from the supplier shall be available during installation and configuration of the Device to provide support and to answer any questions.

*Unit Mounting*

The cabinet or rack mountable Device shall be provided as a pre-assembled package and shall mount directly into a NEMA certified TS1 or TS2 controller cabinet. All brackets and mounts, including hardware, shall be supplied by the vendor with detailed instructions, in English, if assembly is required. All parts shall consist entirely of non-corrosive materials.

1. **Acceptance Testing.**

As part of this procurement, the selected vendor and WisDOT will develop an Acceptance Test Procedure (ATP) that will demonstrate all required functionality. Any modifications to the ATP will be submitted to WisDOT for approval prior to testing. In the course of testing, should WisDOT staff determine that the Device, associated hardware, or System performs unfavorably (e.g., taking more than 3 seconds to fully display a new screen or layer or refresh a screen, uses excessive amounts of resources, etc.) or fails any part of the acceptance test, these problems will be corrected at no additional expense to WisDOT by the vendor. Testing will re-commence when the problems are corrected.

1. **Method of Measurement.**

A complete cabinet or rack mountable Device shall be measured as a unit delivered, deployed, and tested for valid operation.

1. **Basis of Payment.**

A complete Device, measured as provided above, shall be paid for at the contract price for each Device, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery.

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# bid item #3 – portable Wireless TRAFFIC MONITORING DEVICE

1. **Description.**

This special provision describes furnishing a standalone portable wireless traffic monitoring device (Device) that is capable of detecting, monitoring, and recording the Media Access Control (MAC) address of various devices through the use of wireless receivers capable of detecting Bluetooth and/or Wi-Fi wireless signals. This information will then be aggregated by a central system software (System) for further processing. By matching unique MAC addresses, or wireless device identifiers, with timestamps from multiple unique Device locations, the System shall provide accurate vehicle speed and travel time data as well as vehicle origin/destination information.

1. **Materials.**

Furnish Device that meets or exceeds the following requirements.

*General Device Requirements*

All Device field components shall meet or exceed all Wisconsin Department of Transportation (WisDOT) operating environment standards and specifications for traffic related field devices. More specifically, the field components of the system shall withstand operating temperatures from -20° F to 145° F. All components shall be resistant to water, snow, ice, fog, dust, salt, and wind speeds of up to 100 mph. The Device shall be capable of being powered by AC 100-240 line voltage, solar power, and a 12V DC battery. The total weight of the Device and enclosure, excluding any optional solar panel equipment, shall not exceed 50 lbs. The Device shall have been marketed and deployed under field conditions for a minimum of one year with details provided upon request.

*Enclosure*

The Device enclosure shall meet all NEMA Type 4 enclosure requirements. The Device enclosure shall be made of a non-metallic material. The door to access the Device controls shall be hinged with a clasping mechanism designed for easy access with quick release and locking. The enclosure shall support the use of a padlock. The Device enclosure shall have adequate ventilation to prevent overheating.

*GPS Receiver*

The Device shall include a global positioning system (GPS) receiver for the purpose of recording accurate location and time stamping information. The GPS receiver datum shall be set to either WGS 84 or NAD 83 (HARN).

*Battery*

The Device shall have a sealed 12V AGM Lead-Acid battery that provides power sufficient for all Device operations for a minimum of ten days during all operating conditions. Device operations are to include all functionality related to the Bluetooth reader, GPS receiver, and clock. The battery shall be housed inside the Device enclosure. The battery shall have a quick connect adapter for easy removal and charging. The battery positive terminal shall be covered with a rubber boot to protect against accidental shorting.

*Clock*

The Device shall include an internal clock that can be synchronized to a master clock to be determined by WisDOT.

*Encryption*

The Device may include a mechanism or switch to toggle MAC address device output between plaintext and a pre-determined cryptographic hash to be determined by WisDOT.

*Antenna and Reception*

The Device shall include an omni-directional antenna capable of supporting a minimum range of 150 feet in all directions in order to adequately cover a large, multi-lane, divided highway during all weather conditions. The antenna shall be easily accessible and connected using a standard antenna connector so that alternate antennas (different signal strength omni antennas and directional antennas) can be used to accommodate alternate deployment scenarios. The Device shall allow the use of an antenna extension cable of up to 100 feet in length in order to externally mount the antenna in situations where mounting the unit at an ideal height is not an option.

*Local Data Storage*

The Device shall be capable of storing data locally on either a micro SD or SD card. This card shall be included with the device and shall be a minimum of 32 GB or of sufficient size to support storing a minimum of six months of wireless detection data on a 100,000 AADT facility, whichever is greater. All data stored shall include the MAC address or wireless identifier, a GPS-furnished location, the time stamp for each individual reading, and the MAC address signal strength.

*External Data Interface*

Data stored in the Device shall be capable of being uploaded to the System, located either at a WisDOT facility or another third-party location, through a defined, documented interface for further processing. Data available through the data interface shall be defined by an XML schema provided by the vendor. It is preferable that the data interface adhere to the NTCIP standard for Transportation Sensor Systems (NTCIP 1209).

*Service and Support*

Customer support for the Device shall be available during normal working hours, 8:00 AM to 5:00 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

All Devices shall be warrantied for a minimum of 24 months from the date of WisDOT acquisition of the Device. The supplier shall repair or replace, at no cost to the buyer, any and all Devices that fail to operate as specified. Failed Devices shall be repaired or replaced within 5 business days of WisDOT notification of a failure.

1. **Construction Methods.**

The Devices shall be deliverable to WisDOT via UPS, USPS, FedEx, or in person. Installation shall be completed by WisDOT, but a representative from the supplier shall be available during installation and configuration of the Device to provide support and to answer any questions.

*Unit Mounting*

All brackets and mounts, including hardware, shall be supplied by the vendor with detailed instructions, in English, if assembly is required. All parts shall consist entirely of non-corrosive materials. Bracket(s) shall be saw tooth type and allow device to be quickly and easily mounted to a pole or existing structure along the roadway being studied. The Device, once mounted, shall be secure under all weather conditions with an allowable movement not to exceed ¼ inch. All brackets shall accommodate the use of readily available steel strap ties unless otherwise provided by the vendor. The vendor is to provide all materials to effectively ground cabinet, all cable grounding shields, and any spare or unused conductors.

1. **Acceptance Testing.**

As part of this procurement, the selected vendor and WisDOT will develop an Acceptance Test Procedure (ATP) that will demonstrate all required functionality. Any modifications to the ATP will be submitted to WisDOT for approval prior to testing. In the course of testing, should WisDOT staff determine that the Device, associated hardware, or System performs unfavorably (e.g., taking more than 3 seconds to fully display a new screen or layer or refresh a screen, uses excessive amounts of resources, etc.) or fails any part of the acceptance test, these problems will be corrected at no additional expense to WisDOT by the vendor. Testing will re-commence when the problems are corrected.

1. **Method of Measurement.**

A complete Device shall be measured as a unit delivered, deployed, and tested for valid operation.

1. **Basis of Payment.**

A complete Device, measured as provided above, shall be paid for at the contract price for each Device, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery.

# bid item #4 - Wireless detector – solar power system

1. **Description.**

This special provision describes furnishing a complete, ready to install, solar power assembly (Assembly) to provide sufficient power for the operation of a wireless traffic detection device (Device). The Assembly shall be designed to provide adequate power for Device operations in any county in Wisconsin.

1. **Materials.**

The Assembly shall include all solar power arrays, cabling, batteries, mounting hardware, and a solar power charge controller. The Assembly shall meets or exceeds the following requirements.

*General System Requirements*

The Assembly shall be designed by the vendor to operate 24 hours per day, seven days per week, and 365 days per year. The system shall be designed to operate with a probability of failure of 0.05% or less during the worst month of the year and in the Wisconsin county with the least amount of sunlight hours for seven days of functional autonomy. Assembly design calculations shall be submitted along with all vendor bids and will be reviewed prior to awarding this contract and ordering materials. The Assembly shall withstand operating temperatures from -40° F to 140°F.The Assembly and all components shall be resistant to water, snow, ice, fog, dust, salt, and wind speeds up to 100 mph. The Assembly shall be separate from the Device enclosure to allow for optimum orientation and placement independent of the location and orientation of the Device.

*Solar Charge Controller*

The solar charge controller shall be built in to the Assembly enclosure. The solar charge controller shall control battery charging through pulse width, modulated, temperature compensating, constant charging algorithm. It shall control battery charging with both a low voltage and high voltage disconnect. Visible LED’s shall be used to indicate the system is charging correctly. The solar panel, load, and battery shall be fused for short circuit protection and ease of device maintenance. The connector at the end of cable from the charge controller to the solar panel shall be of a quick connect/disconnect design and have a water tight seal at the connection to the Device enclosure.

*Solar Panel*

The solar panel shall be a high efficiency, single crystal silicon solar cell with a 0.5% or lower temperature coefficient per degree Celsius. The power tolerance minimum shall be at least the minimum specified output required to operate/charge the Device. The panel will be self-cleaning, impact resistant, highly transmissive, and of tempered glass superstate. The solar panel module frame shall be made of extruded, polymer-coated aluminum alloy with corners anodized after the cut. The corner seams shall be sealed by screw or weld to protect solar panel from corrosion. The solar panel module junction box shall be made of a non-corrosive material and have a water tight seal. The solar panel shall be pre-wired with a cable of at least twenty linear feet in length with any connectors being of quick connect/release design and water tight upon connection. The minimum wattage for the system shall be determined by the vendor, with design calculations submitted with the bid.

*Battery*

The Device shall have a sealed 12V AGM Lead-Acid battery that provides power sufficient for all Device operations for a minimum of ten days during all operating conditions. Device operations are to include all functionality related to the Bluetooth reader, GPS receiver, and clock. The battery shall be housed inside the Device enclosure. The battery shall have a quick connect adapter for easy removal and charging. The battery positive terminal shall be covered with a rubber boot to protect against accidental shorting.

*Unit Mounting*

All brackets and mounts, including hardware, shall be supplied by the vendor with detailed instructions, in English, if assembly is required. All parts shall consist entirely of non-corrosive materials. Any bracket(s) shall allow device to be quickly and easily mounted to a pole or existing structure along the roadway being studied. The Assembly, once mounted, shall be secure under all weather conditions with an allowable movement not to exceed ¼ inch. All brackets shall accommodate the use of readily available steel strap ties unless otherwise provided by the vendor. The Assembly shall be adjustable to obtain optimum angle and tilt orientation as needed.

*Autonomous Operation (No Sunlight) Duration*

The Solar Power System shall be capable of supporting autonomous operation (periods of minimal or no sunlight) for a total of seven days.

*Service and Support*

Customer support for the Assembly shall be available during normal working hours, 8:00 AM to 5:00 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

All Assembly shall be warrantied for a minimum of 24 months from the date of WisDOT acquisition of the Assembly. The supplier shall repair or replace, at no cost to the buyer, any and all Assembly that fail to operate as specified. Failed Asseblies shall be repaired or replaced within 5 business days of WisDOT notification of a failure.

1. **Construction Methods.**

Assemblies shall be deliverable to buyer via UPS, USPS, FedEx, in person, or available for local pick-up. Installation shall be completed by the buyer, but a representative from the supplier shall be available during installation and configuration of the Assemblies to provide support and answer any questions.

1. **Acceptance Testing.**

As part of this procurement, the selected vendor and WisDOT will develop an Acceptance Test Procedure (ATP) that will demonstrate all required functionality. Any modifications to the ATP will be submitted to WisDOT for approval prior to testing. In the course of testing, should WisDOT staff determine that the Assembly, associated hardware, or System performs unfavorably (e.g., taking more than 3 seconds to fully display a new screen or layer or refresh a screen, uses excessive amounts of resources, etc.) or fails any part of the acceptance test, these problems will be corrected at no additional expense to WisDOT by the vendor. Testing will re-commence when the problems are corrected.

1. **Method of Measurement.**

A complete Assembly shall be measured as a unit delivered and tested for valid operation.

1. **Basis of Payment.**

A complete Assembly, measured as provided above, shall be paid for at the contract price for each Assembly, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery.

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# bid item #5 - Wireless detector – cellular modem communications

1. **Description.**

This special provision provides for providing real-time communications system, or cellular modem (Modem), for transmission of data from a wireless traffic detection device (Device) to a central system software (System) using a cellular signal. Data to be transmitted in a standard format and shall include the MAC address, or wireless identifier, of each detected wireless device, a GPS-furnished location, the time stamp for each individual reading, and the MAC address signal strength.

1. **Materials.**

The Modem shall allow a wireless device to provide data in real-time over a secure network. The Modem shall be compatible with the SIM card of any wireless communication provider. Data transmissions shall include the MAC address, or wireless identifier, of each detected wireless device, a GPS-furnished location, the time stamp for each individual reading, and the MAC address signal strength. The modem shall withstand operating temperatures ranging from -40° F to 140° F.

*Service and Support*

Customer support for the Modem shall be available during normal working hours, 8:00 AM to 5:00 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

All Modems shall be warrantied for a minimum of 24 months from the date of WisDOT acquisition of the Modem. The supplier shall repair or replace, at no cost to the buyer, any and all Modems that fail to operate as specified. Failed Modems shall be repaired or replaced within 5 business days of WisDOT notification of a failure.

1. **Construction Methods.**

The communications hardware shall be located in the wireless device enclosure or shall be able to be mounted in an NEMA certified cabinet (TS1 or TS2). All communications hardware shall be deliverable to buyer via UPS, USPS, FedEx, in person, or available for local pick-up. Installation shall be completed by the buyer, but a representative from the supplier shall be available during installation and configuration to provide support and to answer any questions.

1. **Method of Measurement.**

A complete cellular communications system shall be measured as a unit delivered and tested for valid operation.

1. **Basis of Payment.**

[is payment for ongoing service such as this item described differently from simply “each”? Not sure how to handle the ongoing cellular service. One option is to have the vendor provide the hardware and the first year of service.) Complete cellular communications system, measured as provided above, shall be paid for at the contract price each, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery. Cellular communications system shall include the first year of cellular service.

# bid item #6 – VENDOR-HOSTED Wireless Traffic Detection

# Central system Software

1. **Description.**

This special provision shall provide for central system software (Application), to be located on a server(s) hosted by the vendor, capable of communicating on a periodic basis directly with the wireless traffic monitoring devices (Devices) deployed in the field, retrieving the traffic data collected by those Devices, processing the data received by those devices, and then utilizing that processed data for calculating real-time travel times on the Wisconsin Department of Transportation (WisDOT) roadway network.

1. **Materials.**

Furnish Application that meets or exceeds the following requirements.

*Operating Environment*

The Application shall run on the Windows Server 2008 R2 operating system. The Application shall start automatically when the server is booted and the operating system is started.

*Communications*The Application shall support IP communications to the Devices. The Application shall support periodic polling of the Devices to retrieve collected traffic data. The polling period shall be configurable and shall support a range of once per second to once per day.

*User Interface*The Application shall provide a user interface (UI) that is used to configure the Device information including, but not limited to location and polling period. The Application UI shall display the current status for each Device (online, offline, failed, comm. fail, etc.). The Application UI shall provide display options for the traffic data retrieved from the Devices; these options shall include real-time views, vehicle speeds, vehicle counts and graphical views.

*Data Storage*

The Application shall be capable of storing all traffic data retrieved from the Devices in a centralized database. Data shall include both raw data collected by each device as well as all data processed by the Application.

*External Data Interface*

The Application shall be capable of providing all data, both raw data collected by the Devices as well as data processed by the Application, to an external WisDOT system through a defined, documented interface. This external data interface shall support the polling of data by the external system. Data available through the external data interface shall be defined by an XML schema provided by the vendor. The external data interface shall adhere to the NTCIP standard for Transportation Sensor Systems (NTCIP 1209).

*Service and Support*

Customer support for the Application shall be available during normal working hours, 8 AM to 5 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

The Application shall be warrantied for a minimum of 24 months from the date of WisDOT acceptance testing approval. The vendor shall provide all released software upgrades, updates, and/or patches at no cost for the entire 24-month warranty period.

1. **Acceptance Testing.**

As part of this procurement, the selected vendor and WisDOT will develop an Acceptance Test Procedure (ATP) that will demonstrate all required Application functionality. Any modifications to the ATP will be submitted to WisDOT for approval prior to testing. In the course of testing, should WisDOT staff determine that the Application associated hardware performs unfavorably (e.g., taking more than 3 seconds to fully display a new screen or layer or refresh a screen, uses excessive amounts of resources, etc.) or fails any part of the acceptance test, these problems will be corrected at no additional expense to WisDOT by the vendor. Testing will re-commence when the problems are corrected.

1. **Method of Measurement.**

A complete Application shall be measured as software delivered, installed, configured and tested for valid operation.

1. **Basis of Payment.**

A complete Application, measured as provided above, shall be paid for at the contract price, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery.

# bid item #7 – WISdot-HOSTED Wireless Traffic Detection

# Central system Software

1. **Description.**

This special provision shall provide for central system software (Application), to be located on a server(s) hosted by WisDOT, capable of communicating on a periodic basis directly with the wireless traffic monitoring devices (Devices) deployed in the field, retrieving the traffic data collected by those Devices, processing the data received by those devices, and then utilizing that processed data for calculating real-time travel times on the Wisconsin Department of Transportation (WisDOT) roadway network.

1. **Materials.**

Furnish Application that meets or exceeds the following requirements.

*Operating Environment*

The Application shall run on the Windows Server 2008 R2 operating system. The Application shall start automatically when the server is booted and the operating system is started.

*Communications*The Application shall support IP communications to the Devices. The Application shall support periodic polling of the Devices to retrieve collected traffic data. The polling period shall be configurable and shall support a range of once per second to once per day.

*User Interface*The Application shall provide a user interface (UI) that is used to configure the Device information including, but not limited to location and polling period. The Application UI shall display the current status for each Device (online, offline, failed, comm. fail, etc.). The Application UI shall provide display options for the traffic data retrieved from the Devices; these options shall include real-time views, vehicle speeds, vehicle counts and graphical views.

*Data Storage*

The Application shall be capable of storing all traffic data retrieved from the Devices in a centralized database. Data shall include both raw data collected by each device as well as all data processed by the Application.

*External Data Interface*

The Application shall be capable of providing all data, both raw data collected by the Devices as well as data processed by the Application, to an external WisDOT system through a defined, documented interface. This external data interface shall support the polling of data by the external system. Data available through the external data interface shall be defined by an XML schema provided by the vendor. The external data interface shall adhere to the NTCIP standard for Transportation Sensor Systems (NTCIP 1209).

*Service and Support*

Customer support for the Application shall be available during normal working hours, 8 AM to 5 PM Central Standard Time, Monday through Friday, with an email contact and phone contact provided for the duration of the warranty period.

*Warranty*

The Application shall be warrantied for a minimum of 24 months from the date of WisDOT acceptance testing approval. The vendor shall provide all released software upgrades, updates, and/or patches at no cost for the entire 24-month warranty period.

1. **Acceptance Testing.**

As part of this procurement, the selected vendor and WisDOT will develop an Acceptance Test Procedure (ATP) that will demonstrate all required Application functionality. Any modifications to the ATP will be submitted to WisDOT for approval prior to testing. In the course of testing, should WisDOT staff determine that the Application associated hardware performs unfavorably (e.g., taking more than 3 seconds to fully display a new screen or layer or refresh a screen, uses excessive amounts of resources, etc.) or fails any part of the acceptance test, these problems will be corrected at no additional expense to WisDOT by the vendor. Testing will re-commence when the problems are corrected.

1. **Method of Measurement.**

A complete Application shall be measured as software delivered, installed, configured and tested for valid operation.

1. **Basis of Payment.**

A complete Application, measured as provided above, shall be paid for at the contract price, which price shall be payment in full for completing delivery; and for all labor, tools, transportation, equipment, cables, connections, and incidentals necessary to complete delivery.

**bid item #8 – wireless traffic detection System**

**Warranty, Support, and Maintenance**

1. **Description.**

This special provision provides for a vendor provided two-year warranty (Warranty) for Bid Item #1 through Bid Item #7 of this document as well as vendor provided support and maintenance for Bid Item #1 through Bid Item #7 (Support) of this document for up to three years after the expiration of the Warranty. Bid Item #1 through Bid Item #7 shall collectively be referred to as the system (System).

1. **Materials.**

Furnish warranty, support, and maintenance that meets or exceeds the following requirements.

*Two-Year Warranty Period*

The proposer shall provide hardware and software warranty, support, and maintenance of the System for a period of two years following WisDOT acceptance of the System as part of the overall System cost. The vendor shall provide all necessary on-site and off-site support during this period. The proposer shall be responsive to critical error corrections such that System operation does not adversely affect traffic monitoring, operations, and management.

*Yearly Support and Maintenance*

Following the conclusion of the two year warranty period, the vendor shall continue to provide software support and maintenance of the central system software to the Wisconsin Department of Transportation (WisDOT) for a specified annual fee for the third, fourth, and fifth years. This support and maintenance shall be the same as during the warranty period. Payment for this additional support and maintenance will be paid during the third, fourth, and fifth years.

*Firmware and Software Upgrades*

The proposer shall provide wireless traffic detection device (Device) firmware updates as well as updates of the central system software to the latest available version at no additional cost to WisDOT during the Warranty period and any year-long support and maintenance periods following the acceptance of the project.

1. **Method of Measurement.**

A complete Warranty shall be measured as all required vendor service, support, and maintenance provided for a period of two years from WisDOT acceptance testing approval of the System. Each complete annual support and maintenance period shall be measured as all required vendor service, support, and maintenance provided for each year, up to a total of three years, after expiration of the original Warranty period.

1. **Basis of Payment.**

A complete Warranty, as measured as provided above, shall include all hardware and software warranties, support, and maintenance of the entire System for a period of two years following final WisDOT acceptance testing approval of the System and shall be provided by the vendor as part of the overall System cost. Each complete year of additional support and maintenance, measured as provided above, shall be paid for at the contract price, which price shall be payment in full for completion of up to three years of vendor provided support beyond the expiration of the Warranty period.