MEPNN Supplier Scouting Opportunity Synopsis

Section 1: General Information

Scouting Number	2025-363
Item to be Scouted	Traffic Monitoring Site Equipment
Days to be scouted	30
Response Due By	12/19/2025
Description	The Florida Department of Transportation (FDOT) uses Traffic Monitoring Site (TMS) equipment to monitor the volume, speed, number of axles, weight of wheels, axles or vehicles, or vehicular axle classification types

Section 2: Technical Information

Type of supplier being sought	Florida Manufacturer
Reason	BABA
Describe the manufacturing processes (elaborate to provide as much detail as possible)	Product must meet FDOT Standard Specification requirements as well as Federal BABA requirements for Manufactured Products; see attached file. Manufacturing processes include: electronic component assembly.
Provide dimensions / size / tolerances / performance specifications for the item	Product must meet FDOT Standard Specification requirements. Dimensional requirements vary by product type; see attached file.
List required materials needed to make the product, including materials of product components	Product must meet FDOT Standard Specification requirements. Required materials vary by product type; see attached file.
Are there applicable certification requirements?	Yes
Details	Product must meet FDOT Standard Specification requirements as well as Federal BABA requirements for Manufactured Products. Certification requirements vary by product type; see attached file. Requirements include: National Electrical Manufacturers Association (NEMA) TS-2, Section 2 Federal Communications Commission (FCC) wireless band
Are there applicable regulations?	Yes
Details	Product must meet FDOT Standard Specification requirements as well as Federal BABA requirements for Manufactured Products. Requirements vary by product type; see attached file. Regulations include: Federal Communications Commission (FCC) wireless band Code of Federal Regulations 2 CFR 200.216: Prohibition on certain telecommunications and video surveillance equipment or services
Are there any other stndards, requirements, etc.?	Yes
Details	Product must meet FDOT Standard Specification requirements as well as Federal BABA requirements for Manufactured Products. Requirements vary by product type; see attached file. Regulations include: International Municipal Signal Association (IMSA) 51-7 wire for Inductive Loops
Additional Technical Comments	

Section 4: Business Information

Estimated potential business volume	Quantities vary by product type for FDOT projects statewide. Additional quantities may be requested for local agencies. Loop Assemblies: 1000+/year purchased by FDOT Contractors statewide. Electronic components & Site Cabinets: 120+/year purchased by FDOT Contractors statewide.
Estimated target price / unit cost information (if unavailable explain)	Prices vary by product type for FDOT projects statewide, as bid by contractors. Additional quantities may be requested for local agencies. Loop Assemblies: Approximately $1,000-2,000 each Non-weight sensors: Approximately $2,000 each Speed/classification units: Approximately $10,000 each Site Cabinets: Approximately $5,000-10,000 each, varies by type
When is it needed by?	Begin within 5 months; ongoing need to meet FDOT and BABA requirements.
Describe packaging requirements	No packaging requirements. Best available. Delivered undamaged. Specifics discussed in negotiation.
Where will this item be shipped?	Florida

Additional Comments

Is there other information you would like to include?	Agency providing funds: Florida Department of Transportation Name/POC for BABA related questions: Melissa Hollis or Karen Byram Email address of contact: Melissa.Hollis@dot.state.fl.us or Karen.Byram@dot.state.fl.us

SECTION 695
TRAFFIC MONITORING SITE EQUIPMENT

695-1 Description.

Furnish or furnish and install a complete, operable traffic monitoring site (TMS) as shown in the Plans and Standard Plans. The Department uses TMS to monitor the volume, speed, number of axles, weight of wheels, axles or vehicles, or vehicular axle classification types.

695-2 General.

695-2.1 Materials: Meet the following requirements:

Poles	Section 646
Transformer Base*	Section 646
Wire for Inductive Loop*	Section 997
Class II Piezoelectric Axle Sensor*	Section 997
TMS Vehicle Non-Weight Axle Sensors*	Section 997
TMS Vehicle Microwave Radar Vehicle Sensors*	Section 997
TMS Vehicle Video Sensors*	Section 997
TMS Vehicle Strain Gauge Sensors*	Section 997
TMS Vehicle Quartz Piezoelectric Sensors*	Section 997
TMS Non-Motorized Axle Sensor*	Section 997
TMS Non-Motorized Infrared Sensor*	Section 997
TMS Non-Motorized Video Sensor*	Section 997
TMS Solar Power Unit For Vehicle Data Collection*	Section 997
TMS Solar Power Unit For Non-Motorized Data*	Section 997
TMS System Communications Modem*	Section 997
TMS Modem Antenna*	Section 997
TMS Vehicle Speed/Classification Unit*	Section 997
TMS Vehicle Weigh-In-Motion (WIM) Unit*	Section 997
TMS Non-Motorized Data Collection Unit*	Section 997
Adhesive Bonding Agent*	Section 997
Loop Sealant*	Section 997
TMS Cabinets*	Section 997
TMS Suppression Devices (power, sensor)*	Section 997
TMS Managed Field Ethernet Switch*	Section 997
Patch Panel	Section 633

*Use products listed on the Department's APL.

695-2.2 Traffic Monitoring Site Component Approval: Submit forms in accordance with 603-5. Any electronics unit or software submitted for approval must be compatible with or convert the data into a format compatible with the Department's polling and processing software and be compatible with the existing and new equipment. Remove and replace any new equipment that fails the operational test at no cost to the Department.

695-2.3 Notification: Notify the Engineer 10 working days prior to beginning work in the area of the TMS to coordinate the removal of existing TMS equipment.

A TMS Inspector must be onsite during TMS installation. Notify the Engineer 10 working days prior to installation of the TMS to coordinate the scheduling of a TMS Inspector.

For the Weigh-In-Motion (WIM) electronics sensor and unit, notify the Engineer for final acceptance inspection after the completion of a 30 day operational period with no deficiencies. For all other equipment, notify the Engineer for final acceptance inspection after the completion of a 14 day operational period with no deficiencies.

695-2.4 Poles: Install the weather head in accordance with Standard Plans, Index 695-001. Ground the pole in accordance with Section 620.

695-2.5 Manufacturer's Warranty : Ensure that the terms and conditions of warranties are documented when submitting equipment submittal for approval. Furnish replacements within 10 calendar days of notification for any part or equipment found to be defective during the manufacturer's warranty period at no cost to the Department. Transfer warranties upon final acceptance in accordance with 5-11. Document all warranties and warranty transfers and submit to the Engineer.

Leave a copy of the warranty in the cabinet once it is installed and submit the warranty to the Engineer. The Engineer will submit warranty forms received from the Contractor to the TDA TMS Manager.

695-3 Vehicle Sensor (Non-Weight) Applications.

695-3.1 General: The vehicle classification site consists of axle sensors and inductive loop sensors. Furnish and install TMS vehicle sensors of the type and at the location shown in the Plans.

695-3.2 Axle Sensor:

Section, Contract Documents, and Standard Plans, Index 695-001. Ensure axle sensors are installed in the roadway and secured using an adhesive bonding agent as listed on the APL.

Allow newly applied friction course to cure for a minimum of 30 days prior to the installation of in-road sensors.

Install axle sensors in the right-hand wheel-path midway between the leading and trailing loops as detailed in Standard Plans, Index 695-001. Install axles sensors in the left-hand wheel-path when no paved shoulder exists and sensor lead exit windows are installed at the right-hand edge of the roadway surface or in a lane which is to the left of and adjacent to an open lane of traffic.

Install the axle sensor such that the cable end is closest to the pull box to which the sensor lead cable will be routed. Install the end of the sensor mid-way into the edge line stripe or lane line stripe. Ensure that the axle sensor being installed has lead-in cables of sufficient length to reach the cabinet without splicing. Do not splice axle sensor lead-in cables.

Route the sensor leads to the pull box then to the TMS cabinet. Mark the sensor leads at the pull box and at termination in the cabinet. Submit lane numbering information as specified in Standard Plans, Index 695-001.

Cut the slot the length of the sensor plus an additional 3 to 4 inches. Ensure the depth and width of the slot is installed as recommended by the sensor manufacturer, typically 0.75 inch wide by 1.5 to 2 inches deep.

Use clips or jigs provided by the manufacturer to suspend the sensor at a uniform depth in the slot. Mix and apply the adhesive bonding agent ensuring the slot is completely full with no voids beneath the sensor.

695-3.2.2 Test Requirements: Perform the manufacturer's recommended on-site pre-installation test to determine the sensor's condition using an Inductive Capacitance Resistance meter. Replace any sensors that fail the pre-installation test.

Record all test results by lane on the warranty form provided by the manufacturer and leave a copy in the cabinet.

Repeat the test at the termination point in the cabinet after installation. Use an oscilloscope to view and record typical waveforms and signal intensity measurements for the axles of passenger cars and large trucks. Remove and replace any sensor that fails the test at no additional charge to the Department.

Perform an operational test to meet final acceptance requirements. The operational test requires the equipment to operate without deficiencies for a minimum of 14 days prior to final acceptance. The sensor shall be operating without deficiencies at the time of final acceptance. Remove and replace any sensor that fails the operation test at no additional charge to the Department. Final inspection will be completed by FDOT TDA staff for final acceptance.

695-3.3 Non-Intrusive Vehicle Sensors:

695-3.3.1 General: Install motorized (radar, microwave, or video) vehicle sensors on a pole as shown in the Plans, Contract Documents, and Standard Plans, Index 695-001.

695-3.3.2 Installation Requirements: Install the sensor on a pole perpendicular to the target lanes of traffic with room to perform horizontal and vertical aiming adjustments.

Ensure that the wireless vehicle sensor has sufficient cable length to reach the cabinet without splicing. Fasten the cable to the pole so wind does not move it or route the cable within the pole cavity to the cabinet termination point. Provide 18 to 24 inches of slack in the cable at the connections to the sensor and in the cabinet to ensure the cable is stress-free. Include the appropriate mounting hardware and the manufacturer's recommended surge suppression as a part of the installation.

Set up the lane detection zones using the manufacturer's instructions and software and verify that the sensor's orientation is perpendicular to the roadway.

Configure the wireless vehicle sensor for vehicle volume unless otherwise specified in the Plans.

695-3.3.3 Test Requirements: Conduct a visual test to determine that all detection zones are being counted accurately.

Connect a personal computer (PC) to the electronics unit and observe traffic in every lane, verifying that each vehicle is displayed on-screen. A minimum of 20 vehicles should be observed for each lane of traffic with all vehicles counted; assuming a clear line of sight between the sensor and the vehicle being observed is maintained.

If any vehicles are not counted, reconfigure the wireless vehicle sensor and repeat the visual observation test until all lanes count correctly. If the sensor fails to provide accurate counts after three test attempts, it must be replaced with a new unit at no expense to the Department.

Submit a 48 hour verification (class, speed and volume) report for all TMS to the Engineer and leave a copy in the cabinet.

Perform an operational test to meet final acceptance requirements. The operational test requires the equipment to operate without deficiencies for a minimum of 14 days prior to final acceptance. The sensor shall be operating without deficiencies at the time of final acceptance. Final inspection will be completed by FDOT TDA staff for final acceptance.

695-7 Weigh-In-Motion Electronic Sensor.

695-7.1 General: The weigh-in-motion (WIM) lane consists of WIM sensors and inductive loops sensors. The first type of WIM sensor, strain gauge sensor, is described in 695-7.3. The second type of WIM sensor, quartz piezoelectric weigh-in-motion sensor, is described

in 695-7.4. The inductive loop assembly is described in 695-10. Furnish and install the Traffic Monitoring Site (TMS) Weigh-In-Motion Electronic Sensor in the configuration shown on the Standard Plans, Index 695-001. Install in accordance with Manufacturer's instructions.

695-7.2 Installation Requirements: The installer must have a valid certification from the manufacturer for installing the Weigh-In-Motion Electronics Sensors. Use a chalk line or equivalent method to outline the perimeter of the sensor on the pavement and routes for lead-in cables. Do not allow the saw cut in the pavement to deviate more than 1.0 inch from the chalk line. Ensure that all saw cuts are free of any dust, dirt, or other debris and completely dry prior to the installation.

695-7.3 Strain Gauge Sensor: Install two strain gauge sensors in line with each other in each wheel path to cover a 12-foot lane in the roadway. Connect the strain gauge sensors to an interface processor.

Install the strain gauge sensor frames into concrete slabs of 6 inches or more without constructing a special foundation socket. The frames, including strain gauge sensor embedded in it, have an average depth of 1.5 inches.

If the concrete slab is less than 6 inches or if the roadway material is asphaltic concrete, install a special foundation socket of concrete under the frame, just as wide as the frame. Bore 1-inch diameter anchors to a minimum of 8 inches into the base course.

Install the manufacturer provided drain pipe from lower side of the foundation frame towards the slope into the drain water shaft. Ensure that water does not accumulate in the frame and properly drains the frame.

Install the strain gauge sensors in accordance with the manufacturer's installation procedures and in the presence of the manufacturer's representative. Ensure that the procedures are approved by the Engineer.

695-7.4 Quartz Piezoelectric Weigh-In-Motion Sensor: Install two quartz piezoelectric sensors in line with each other in each wheel path to cover a 12-foot lane in the roadway.

Install the quartz piezoelectric sensor by sawing slots into the pavement perpendicular to the flow of traffic, equal to the length of the sensor plus 1 inch, by 2.875 inches wide, and by 2.125 inches deep. Sawcut a 1 inch wide by 2 inches deep cable run slot from the end of the sensor slot to the edge of the pavement shoulder.

Install the quartz piezoelectric sensor into the slot, properly aligned and positioned using specially constructed installation and leveling beams. Pour the manufacturer recommended adhesive bonding agent into the cavity until it is at the proper height above the road surface and allow it to set. After the adhesive bonding agent hardens, grind it to be level with the road surface. The top of the sensor must not deviate more than 1/24 inch above the height of the pavement surface over the length of the sensor.

Route the sensor lead-in cables to the pull box and through the conduit to the traffic monitoring site cabinet. Mark the sensor lead-in cables at the pull boxes and at the point of termination within the traffic monitoring site cabinet, in accordance with Standard Plans, Index 695-001. Connect the cable to the interface card installed in the traffic monitoring cabinet.

695-7.5 Weigh-In-Motion Electronics Sensor Test Requirements: Perform the manufacturer's recommended on-site pre-installation test to determine the Weigh-In-Motion electronics sensor's condition. Install only those Weigh-In-Motion electronics sensors that pass the pre-installation test.

Repeat the test, following installation, at the lead-in point of connection in the traffic monitoring site cabinet. Remove and replace any Weigh-In-Motion electronics sensor

which fails the test at no additional cost to the Department. Prior to post-installation acceptance, the Contractor shall demonstrate in the presence of the Engineer that the equipment supplied and installed for the system is in full compliance with the Plans and Specification herein.

The Department will operate the complete system for 30 consecutive days without failures prior to Final Acceptance. The Department will poll the site and statistically check data from historical data, field collected data and field observations. In the event of failures, the Contractor shall correct the problem(s) and restart the 30-day test. Any equipment or labor that is found to be defective during the operation test and prior to Final Acceptance shall be replaced or corrected at no expense to the Department. Final Acceptance will be made upon the successful completion of the 30-day test.

Place a copy of the final test results, including the date of installation, manufacturer's name, model number for each Weigh-In-Motion electronics sensor, laboratory calibration sheet provided by the manufacturer, and type of adhesive bonding agent used in a waterproof package in the cabinet and furnish one copy to the Engineer.

695-8 Non-Motorized Sensor Applications.

695-8.1 General: The non-motorized site uses axle sensors, inductive loops sensors, and infrared sensors. The inductive loop assembly is described in 695-10. Furnish and install TMS non-motorized sensors of the type and at the location shown in the Plans and Index 695-001.

695-8.2 Non-motorized Axle Sensor:

695-8.2.1 Installation Requirements: Allow newly applied friction course to cure for a minimum of 30 days prior to the installation of in-path sensors.

Ensure axle sensors are installed in the pathway and secured using an adhesive bonding agent as listed on the APL.

Cut the slot the length of the axle sensor plus an additional 3 to 4 inches. Ensure the depth and width of the slot is installed as recommended by the sensor manufacturer. Ensure that all saw cuts are free of any dust, dirt, or other debris and completely dry prior to the installation.

Use clips or jigs provided by the manufacturer to suspend the sensor at a uniform depth in the slot. Mix and apply the adhesive bonding agent ensuring the slot is completely full with no voids beneath the sensor. Once cured, grind down excess adhesive bonding agent to be level with the road surface, sidewalk, side path, or shared-use path.

695-8.2.2 Test Requirements: Perform the manufacturer's recommended on-site pre-installation test to determine the sensor's condition using an Inductive Capacitance Resistance meter. Install only those sensors that pass the pre-installation test. Record all test results on the warranty form provided by the manufacturer and leave a copy in the cabinet.

Repeat the test at the termination point in the cabinet after installation. Use an oscilloscope to view and record typical waveforms and signal intensity measurements for the axles of non-motorized vehicles.

Connect a personal computer (PC) to the electronics unit and observe bicycles and pedestrians in the pathway, verifying the detection of each non-motorized vehicle on-screen. A minimum of 20 non-motorized vehicles shall be observed with all non-motorized vehicle manually counted.

If any non-motorized vehicles are not counted by the sensor, reconfigure the sensor and repeat the visual observation test until all are counted correctly. If the sensor fails to provide accurate counts after 3 test attempts, it must be replaced with a new unit at no expense to the Department.

The sensor shall operate without any deficiencies for two weeks after installation and at final acceptance. Remove and replace any sensor that fails the 14 day operation test at no additional charge to the Department.

Submit all documents to the Engineer and leave a copy of the report in the cabinet.

695-8.3 Infrared Sensors:

695-8.3.1 Installation Requirements: For grade level applications, install the sensor perpendicular to the pathway and pointed parallel to the ground. The sensor shall not point towards the vehicular traffic lane, reflective surfaces, direct sunlight exposure, or moving infrastructure. Ensure that the sensor has sufficient cable length to reach the cabinet without splicing.

For overhead applications, route the cable within the pole cavity or conduit to the cabinet termination point. Provide 18 to 24 inches of slack in the cable at the connections to the sensor and in the cabinet to ensure the cable is stress-free. Include the appropriate mounting hardware as a part of the installation.

Set up the detection zones using the manufacturer's instructions and software and verify that the sensor's orientation is perpendicular to the pathway.

Configure the sensor for pedestrian and bicycle traffic.

695-8.3.2 Test Requirements: Conduct a visual test to determine that all detection zones are being counted accurately.

Connect a personal computer (PC) to the electronics unit and observe traffic in the pathway, verifying that each non-motorized vehicle or pedestrian is displayed on-screen. A minimum of 20 non-motorized vehicles and 20 pedestrians shall be observed with all non-motorized vehicles and pedestrians counted.

If any non-motorized vehicles or pedestrians are not counted, reconfigure the infrared sensor and repeat the visual observation test until all are counted correctly. If the sensor fails to provide accurate counts after 3 test attempts, it must be replaced with a new unit at no expense to the Department.

The sensor shall operate without any deficiencies for two weeks after installation and at final acceptance. Remove and replace any sensor that fails the 14 day operation test at no additional charge to the Department.

Submit all documents to the Engineer and leave a copy of the report in the cabinet.

695-10 Inductive Loop Assembly.

695-10.1 General: Install TMS motorized inductive loop assembly and non-motorized inductive loop assembly at the locations shown in the Plans. Ensure that all materials furnished, assembled, or installed are new products.

Install loop wire in accordance with Standard Plans, Index 695-001. Install the inductive loops such that the loop leads reach the cabinet. Do not splice loop leads.

695-10.2 Installation Requirements:

695-10.2.1 Saw Cuts: Perform saw cuts across concrete pavement expansion joints as detailed in Standard Plans, Index 695-001.

For pavement thickness greater than or equal to 2 inches deep, make saw cuts deep enough to allow 1 to 1-1/2 inch of sealant cover over the installed loop wire.

For pavement thickness less than 2 inches, make the saw cut depth to 1 inch.

695-10.2.2 Loop Wire: Ensure that all motorized vehicular loops have four complete turns of wire and all non-motorized vehicle loops have eight complete turns of No. 14 AWG stranded copper wire that meet the requirements of International Municipal Signal Association (IMSA) 51-7, wound in a clockwise manner. Do not damage the insulation.

For roadways, ensure that the hold down material is non-metallic; placed in the saw slot using segments 1 to 2 inches long, spaced 12 inches apart; and the distance from the top of the hold down material to the final roadway surface is not less than 1-1/2 inches.

For sidewalks, side paths, or shared use paths, the distance from the top of the non-metallic hold down material to final surface elevation must be 1/2 inch or greater.

Install inductive loops in the pathway and secure using loop sealant listed on the APL. Avoid installation of inductive loops in areas that have electromagnetic interference from power lines (overhead or underground) or buried telecommunication equipment or in the proximity of other inductive loops.

695-10.2.3 Loop Wire Twisted Pair Lead: For motorized vehicular loops, create a loop wire twisted pair lead by twisting the loop wire pair a minimum of 8 to 16 twists per foot from the edge of the loop to the termination point in the cabinet. Provide a minimum of 3 feet of twisted loop wire pair lead in the pull box located adjacent to the roadway. For non-motorized vehicle loops, create a loop wire twisted pair lead by twisting the loop wire pair 10 twists per foot from the edge of the loop to the termination point. Splicing of the loop wire is not permitted.

695-10.2.4 Loop Sealant: Use loop sealant in accordance with Section 997. Prepare and apply the sealant in accordance with the manufacturer's instructions. Remove excess sealant from the roadway surface. Ensure that the loop sealant has cured completely before allowing vehicular traffic to travel over the sealant.

695-10.3 Testing: Conduct all testing with the leads disconnected from the backplane. The loops shall operate without any deficiencies for two weeks after installation. Remove and replace any loop that fails the 14 day operation test at no additional charge to the Department. Submit all documents to the Engineer and leave a copy of the report in the cabinet.

695-10.3.1 Motorized Vehicular Loop Resistance: Ensure new loops have a resistance reading of 3.0 Ω or less.

695-10.3.2 Motorized Vehicular Loop Inductance: Ensure new loops have a minimum inductance reading of 100 μH.

695-10.3.3 Motorized Vehicular Loop Insulation Resistance (Megging): Ensure new loops have a minimum reading of 200 MΩ at 500 V.

695-10.3.4 Non-Motorized Vehicular Loop Resistance: Ensure new loops have a resistance reading of 3.0 Ω or less.

695-10.3.5 Non-Motorized Vehicular Loop Inductance: Ensure new loops have an inductance reading of 100 to 150 μH.

695-10.3.6 Non-Motorized Vehicular Loop Insulation Resistance (Megging): Ensure new loops have a minimum reading of 200 MΩ at 500 V.

695-14 Method of Measurement.

The Contract unit price for each vehicle axle sensor will include the vehicle sensor, lead-in cables, adhesive bonding agent; and all equipment, materials, testing and labor necessary for a complete and accepted installation.

The Contract unit price for each non-intrusive vehicle sensor will include the vehicle sensor, cables, conduit, conduit accessories such as the weatherhead and couplings; and all equipment, materials, testing and labor necessary for a complete and accepted installation.

The Contract unit price per assembly for the vehicle speed/classification unit includes the electronics unit and equipment cable, all equipment, materials and labor necessary for a complete and accepted installation.

The Contract unit price per assembly for the weigh-in-motion unit includes the electronics unit and equipment cable, all equipment, materials and labor necessary for a complete and accepted installation.

The Contract unit price per assembly for the non-motorized data collection unit includes the electronics unit and equipment cable, all equipment, materials and labor necessary for a complete and accepted installation.

The Contract unit price for each Weigh-In-Motion Electronics Sensor, furnished and installed, will consist of the Weigh-In-Motion sensor, lead-in cable(s), adhesive bonding agent, loop sealant, all equipment, materials, and labor necessary for a complete and accepted installation.

The Contract unit price for each non-motorized axle sensor will include the sensor, lead-in cables, adhesive bonding agent, loop sealant; and all equipment, materials, testing and labor necessary for a complete and accepted installation.

The Contract unit price for each non-motorized infrared sensor will include the infrared sensor, mounting hardware, cabling; and all equipment, materials, testing and labor necessary for a complete and accepted installation.

The Contract unit price for each solar power unit includes the solar power unit as specified in the Contract Documents, all equipment, materials (weatherhead, conduit, conduit accessories), and labor necessary for a complete and accepted installation.

The Contract unit price for each inductive loop assembly includes loop wire, loop sealant, all equipment, materials, testing, and labor necessary for a complete and accepted installation.

The Contract unit price for each TMS cabinet includes the TMS cabinet, shelf, suppression device, and backplane components as specified in the Contract Documents, all equipment, materials, and labor necessary for a complete and accepted installation. The cost of the base or pedestal, as shown in the Standard Plans, is included in the cost of the cabinet. The cost of the pole for pole mounts will be paid in accordance with Section 646.

The Contract unit price for each TMS modem will include the modem and all equipment, materials, and labor necessary for a complete and accepted installation.

The Contract unit price for each TMS antenna will include the antenna and all equipment, materials, and labor necessary for a complete and accepted installation.

The Contract unit price for each TMS Managed Field Ethernet Switch (MFES) will include the MFES and all equipment, materials, and labor necessary for a complete and accepted installation.

695-15 Basis of Payment.

Price and payment will be full compensation for all work specified in this Section.

Payment will be made under:

Item No. 695- 1-	TMS Vehicle Axle Sensor - Non-Weight Applications- each.
Item No. 695- 2-	TMS Vehicle Non-Intrusive – Non-Weight Applications – each.

Item No. 695- 3-	TMS Vehicle Speed/Classification Unit - per assembly.
Item No. 695- 5-	TMS Solar Power Unit - each.
Item No. 695- 6-	TMS Inductive Loop Assembly – each.
Item No. 695- 7-	TMS Cabinet - each.
Item No. 695- 8-	TMS System Communications Modem – each.
Item No. 695- 9-	TMS Weigh-In-Motion Axle Sensor – each.
Item No. 695- 10-	TMS Weigh-In-Motion Unit – per assembly.
Item No. 695- 11-	TMS Non-Motorized Data Collection Unit – per assembly.
Item No. 695- 12-	TMS Non-Motorized Axle Sensor – each.
Item No. 695- 13-	TMS Non-Motorized Infrared Sensor – each.
Item No. 695- 14-	TMS Non-Motorized Inductive Loop Assembly – each.
Item No. 695- 15-	TMS Non-Motorized Solar Power Unit – each.
Item No. 695- 16-	TMS Surge Suppressor – each.
Item No. 695- 17-	TMS Patch Panel – each.
Item No. 695- 18-	TMS Managed Field Ethernet Switch – each.

SECTION 997

TRAFFIC MONITORING SITE MATERIALS

997-1 Description.

This Section governs the requirements for all traffic monitoring site (TMS) material as shown in the Plans and Standard Plans.

Provide products compatible with all other TMS APL equipment. Any electronics unit or software submitted for approval must be compatible with or convert the data into a format compatible with the Department's polling and processing software. Any substitute software modules submitted must be tested and approved by the Department.

Provide products constructed of corrosion-resistant materials, such as plastic, stainless steel, anodized aluminum, brass, or gold-plated metal. All fasteners exposed to the elements shall be Type 304 or 316 passivated stainless steel.

Provide warranties that are fully transferrable to the Department. Terms and conditions of warranties must be documented when submitting a request to the Department for certification. Include terms for a specified service performance with provisions for repair parts and labor, or for replacement.

Ensure the terms and conditions define the equipment installation date as the date for such warranty to be in effect. The installation date for construction projects is the day the site is accepted by the Engineer. For warehouse purchases, the installation date is the date of visual inspection approval, not to exceed ten days after delivery date.

Furnish replacements within 10 calendar days of notification for any part or equipment found to be defective during the warranty period at no cost to the Department.

997-1.1 Approved Product List Submittal Requirements: All products shall be listed on the Department's Approved Product List (APL). Manufacturers seeking evaluation of their product for inclusion on the APL shall submit an application in accordance with Section 6 including documentation identified in Table 997-1 and this section. Documentation must demonstrate that the product meets the requirements of this Section.

Table 997-1

Documentation	Requirements
Technical Data Sheets	This document will be used to verify physical and performance properties.
Product Label Photo	Provide equipment permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number.
Product Sample	When requested, submit a product sample.
Installation Manual	Instructions describing mounting, cabling, and configuration.
Product Photo	Display significant features of the products.

997-2 TMS Vehicle Sensors (Non-Weight).

997-2.1 General: Non-weight vehicle sensors include inductive loops, Class II piezoelectric axle sensors, microwave radar, and video data collection technologies.

997-2.2 Wire for Inductive Loops: Materials used in the creation of the inductive loops must meet the material specification of No. 14 AWG International Municipal Signal Association (IMSA) 51-7 wire.

997-2.3 Class II Piezoelectric Axle Sensor: In-Roadway Class II piezoelectric axle sensors shall meet the physical characteristics in Table 997-2.

Table 997-2 Physical Characteristics, Class II Piezoelectric Axle Sensor	
Property	Requirements
Sensor Element Dimensions	Approximately 6 ft. to 10 ft. in length, 3/16 in. to 3/8 in. in diameter (varies by manufacturer)
Sensor Element Material	Pressure sensing piezoelectric
Pavement Operating Temperature Range	Minimum 0°F to +150°F
Output Signal	Minimum +200mV or produce a charge signal for a FHWA Class 2 Vehicle.
Environmental Requirements	NEMA TS-2, Section 2

997-2.4 Microwave Radar Sensor: Sensors shall meet the physical characteristics in Table 997-3.

Table 997-3 Physical Characteristics, Microwave Radar Sensor	
Property	Requirement
Detection Range	A minimum of 8 distinguishable lanes within a minimum 200 feet of detection zone.
Direction	Bidirectional
Operating Temperature Range	Ambient temperature of 0°F to 140°F
Enclosure Dimensions	Weatherproof aluminum, stainless steel, or polycarbonate housing. Typically, up to 15” X 12” X 6” Weight typically <10 lbs.
Operating Frequency	Wireless transmission in Federal Communications Commission (FCC) approved band or unlicensed RF range.
Communications	RS-232/RS-485 ports, supports minimum 19,200 baud rate.
Data Interface Compatibility	Compatible with the vehicle speed/classification unit and the Department’s traffic polling system.

997-2.5 Video Sensor: Sensors shall meet the physical characteristics in Table 997-4. Cameras shall be compliant with the Code of Federal Regulations Section 200.216 Prohibition on certain telecommunications and video surveillance services or equipment.

Table 997-4 Performance Characteristics, Video Sensor	
Property	Requirements
Configuration	Displays detection zones, activations, overlaid on live video inputs.
Configuration	Editable detection zone size, placement, and sensitivity. Parameters stored in and retrieved from nonvolatile memory.
Processor	Video analysis, presence detection, data collection, storage and reporting of detection data.
Communications	TIA-232, 10/100 Base TX, FCC certified secure wireless, or cellular compatible with Agency's carrier. Department must approve carrier.
Communications	CDMA compatible
Solid State Detection Output	NEMA TS2, 6.5.2.26
Environmental Requirements	NEMA TS-2, Section 2.

997-4 TMS Vehicle Sensors (Weight for Motorized Vehicle Data Collection).

997-4.1 General: Weight sensor arrays include inductive loops with strain gauge sensors or quartz piezoelectric sensors.

997-4.2 Wire for Inductive Loop: Materials used in the creation of the inductive loops must meet the material specification of No. 14 AWG International Municipal Signal Association (IMSA) 51-7 wire.

997-4.3 Strain Gauge Sensor: Weigh-In-Motion (WIM) systems utilize plates with strain gauges bonded to the underside or one-piece gauge strip scale. The strain gauge sensors shall meet the physical characteristics in Table 997-8.

Table 997-8 Physical Characteristics, Strain Gauge Sensor	
Property	Requirements
Sensor Size	.5 in. to 20 in. wide x 50 in. to 80 in. long
Operating Temperature Range	-50°F to 176°F
Scale Capacity	45,000 pounds per axle and overload protected to 8,0000 pounds per axle
Environmental Requirements	NEMA TS-2, Section 2.

997-4.4 Quartz Piezoelectric Sensor: Quartz piezoelectric sensors use one piece quartz crystal sensors to collect Weigh-In-Motion data. The quartz sensor shall meet the physical characteristics in Table 997-9.

Table 997-9 Physical Characteristics, Quartz Piezoelectric Sensor	
Property	Requirements
Measuring Range wheel load (At a referenced tire contact area)	0 to 34000 pounds (8 in. by 12.6 in.)
Overload (twin wheel)	55000 pounds
Sensitivity – Nominal	7.6 ± 12% pC/lbf
Sensitivity shift over sensor length	<± 3%
Threshold	<0.1 lbf
Linearity	<± 2% Full Scale Output
Hysteresis	≤ 2% Full Scale Output
Natural Frequency	> 5 kHz
Operating Temperature range	-40°F to 176°F
Temperature coefficient of sensitivity	-0.04%/°F
Operating Speed	5 MPH to 100 MPH
Insulation resistance	> 100 GΩ
Capacitance with 130 ft. cable	8 to 12 nF
Environmental Requirements	NEMA TS-2, Section 2

997-12 Adhesive Bonding Agent.

Meet the requirements in Table 997-26.

Table 997-26 Physical Characteristics, Adhesive Bonding Agent	
Property	Requirements
Agent	Flowable mortar-based methyl methacrylate resin
Application	Per manufacturer's instruction.
Curing Time	Less than 60 minutes.
Gel Time	At 77ºF, 13 to 17 minutes
Tensile Strength	Greater than 2,000 psi