PUBLIC-INTEREST FINDING FOR PROPRIETARY-MATERIAL USE

Non-intrusive radar based vehicle sensors, SmartSensor SS 105 (microwave radar), SmartSensor HD SS125 by Wavetronix and Remote Traffic Microwave Sensor (RTMS) SX300 by Image Sensing Systems

ROUTE: VARDES NO: VAR
PROJECT NO: VAR COUNTY: VAR
PROJECT DESCRIPTION: Programmatic approval.
FHWA OVERSIGHT: ☒YES ☐ NO
PROPRIETARY MATERIAL:
SmartSensor SS105 (microwave radar);
SmartSensor HD SS125
Manufactured by Wavetronix LLC

Remote Traffic Microwave Sensor (RTMS) SX300 RADAR
Manufactured by Image Sensing Systems, Inc.

1. Description of Need:

The ITS Technology Deployment Division of the Indiana Department of Transportation is seeking approval to create a recurring special provision and ultimately incorporate into the Standard Specifications equipment important to the detection and measurement of the traffic on Indiana roadways.

Desired materials are non-intrusive radar-based vehicle sensors. Installed on the side of the road, they provide capability to detect, count, determine speeds of passing vehicles, and, in some configurations, classified them.

Required functionality includes:

- Provide ability to monitor 8-12 user defined zones (lanes of traffic).
- Provide ability to detect presence of vehicle in the detection zone, count vehicles passing through the zone, determine speeds of vehicles, and classify vehicles.
- Provide ability to monitor up to 250 ft of road surface (across the lanes).
- Provide interface with existing network (TMC).
- Provide accurate, per-line data.

2. Product History:

These devices have been in use in Indiana for over 8 years. Over 200 of SS105, SS125, and RTMS G4 devices are currently being used in Indiana. They demonstrate very high reliability (over 96% uptime) and maintainability. Desired product is currently listed on INDOT Approved Materials List for Traffic Signal and ITS Control Equipment under ITS AFP Controller. Testing was conducted according the **ITM No. 953-10P**

3. **Product Availability**: SmartSensors, manufactured by Wavetronix LLC and RTMS G4 by Image Sensing Systems, Inc. are only product on the market, meeting all requirements. Although there are many vehicle detecting microwave radar sensors, most of them are designed for different purposes. There were no attempts by the manufacturers to present their products to be tested to **ITM No. 953-10P**.

4. **Product Cost**: There is no equipment on the market, meeting the requirements, to make a cost comparison with. The next closest product is Microwave Vehicle Motion Sensor TC26-B manufactured by MS SEDCO and priced $3300.00. However, this device is not capable of counting, speed detection, and classification of the vehicles.

5. **Project Compatibility**: Desired products are the only products on the market that meet INDOT requirements for the vehicle detection and data compatibility with currently used Data Bases..

6. **Maintenance**: Desired equipment is very reliable. Current system allows for remote monitoring of the detection sites which drives the maintenance costs down. Training is available on line in Wiki Notes, accessible for tech personnel from any location in Indiana. Low failure rate (less then 5% including "acts of God") and short order turn around time results in the minimal storage requirement.

7. **Engineering Analysis**: This application is programmatic by nature and unique not to a specific ITS project, but to the ITS architecture that is already in place. Microwave radar sensors are essential components that allow monitoring of the live traffic volumes, speed, and classification. The specifications are needed for synchronization with existing system and not unique to the specific project.

8. **Expanded Economic Analysis**: Due to the fact, that there is no equipment on the market to do comparison life cycle analysis, it may be stated that actual yearly maintenance cost is low. The average life cycle of the desired product is evaluated as 5 years. There are units currently in service installed in 2008. Annual replacement rate, including damage done by lightning, is 8 units with approximately 200 units being now in service.

9. **Contractual or Performance Implications**: Use of desired items does not impose any restrictions on the use of other items on the contracts.

10. **Attach Supplemental Documentation:** Attached are:
    a) INDOT ITS Architecture;
    b) ITM # 953-10P Microwave Vehicle Radar.

11. **Length of Time that Approval is Effective:** 3/1/2017 to 3/1/2020

Prepared By: Konstantin Veygman

Field Engineer

INDOT-ITS Technology Deployment Division

Date:

APPROVED: James M. Butler Date: 2/27/17

INDOT Deputy Commissioner
Engineering and Asset Management

APPROVED: Thomas L Duncan Date: 3/06/17

Federal Highway Administration

New 2-09-05
Effective 9-01-05

APPENDIX A
INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF OPERATIONS SUPPORT
PRELIMINARY INFORMATION FOR PRODUCT MATERIAL EVALUATION

Trade Name SMART SENSOR 125 Date 11-5-10

Manufacturer WAVETRONIX Patented? Yes _____ No _____ Applied for X

Address 78 E 1700 S PROVO UT 84606
Street No (P. O. Box) City State Zip Code

Representative TRAFFIC CONTROL CORP Phone No (574) 243-0901

Address 12743 HEATHER MAX DR STE 103 GRANGER, IN 46530
Street No (P. O. Box) City State Zip Code

Product Information FREEWAY DETECTION 45-06 0161HZ
WAVE RADAR

Materials Composition _____

** Is this product considered HAZARDOUS MATERIAL when disposing of non-used or surplus materials? Yes _____ No X

** What is the shelf life of this material? Years _____ Months _____ N/A _____

Recommended Use-Primary FREEWAY APPLICATIONS FOR LANE BY LANE COUNTING

Recommended Use-Alternate _____

APPENDIX A

Advantages and/or Benefits NON-INTRUSIVE DETECTION

** Materials specifications by manufacturer, installation/operation manual, maintenance manual, literature, test results, guarantee, hazardous material data sheets, plan, picture or sketch must be submitted with this form. In the case of electronic devices the schematic diagram, parts list, and parts layout diagram must be submitted for each printed circuit board within the device.

Meets following specifications:

AASHTO _____ _____

ASTM _____ _____

OTHER _____

Use by highway authorities or similar agencies in other states.

Agency	Years Used	Remarks
MDOT	5	MICHIGAN DOT
IDOT	5	ILLINOIS DOT
WISDOT	5	WISCONSIN DOT

** Has product ever been evaluated by and rejected for use by a governmental agency?

Yes _____ No X If yes, by what agency and for what reason?

Will demonstration be provided? Yes X No _____

Availability: Seasonal _____ Nonseasonal X Delivery at site _____

After receipt of order, are quantities limited? Yes _____ No X

APPENDIX A

** Will FREE SAMPLES be furnished? Yes X No _____
If yes, Quantity Furnished 1

** If the sample is salvageable, do you desire to have it returned Yes X No _____

(Desired return of salvageable samples will be at the supplier's expense.)
(The manufacturer agrees upon the return of salvageable samples, such samples may be damaged or non-operable. Normal care will be taken that the samples, when returned, are in operable condition; INDOT, however, does not guarantee that the returned samples are operable.)

Will laboratory analysis be furnished? Yes _____ No _____

** Approximate cost $391.00 Royalty Cost _____

When was the product introduced to the market? 2004

This product is an alternate for what product? INVASIVE DETECTION

Will warranty be provided? Yes X No _____ If yes, for how long? 2 YEARS

Background of company, including principal products ATTACHED

What offices of the Indiana Department of Transportation have been contacted?

Additional Information _____

(Attach additional sheets as necessary)

New 2-09-05
Effective 9-01-05

APPENDIX A

Person furnishing information GENE WALK Regional MGR
Name Title

Address 17743 HEATHER PARK DR STE 103 CARMEL IN 46032
Street No (P. O. Box) City State Zip Code

Items marked ** MUST BE RESPONDED TO or further consideration may not be given for this product.

Please mail this form to:

Manager, Office of Traffic Engineering
100 N. Senate Ave., Room N925
Indianapolis, IN 46204-2249

If INDOT elects to evaluate your product/material - traffic signal equipment will be shipped to:

Electronic Technician Supervisor
Indiana Department of Transportation
6400 E. 30th Street
Indianapolis, IN 46219-8222

While all other materials to be evaluated will be shipped to:

Traffic Evaluations Engineer
Indiana Department of Transportation
6400 E. 30th Street
Indianapolis, IN 46219-8222

ITM 947-05

New 2-09-05
Effective 9-01-05

APPENDIX A
INDIANA DEPARTMENT OF TRANSPORTATION
DIVISION OF OPERATIONS SUPPORT
PRELIMINARY INFORMATION FOR PRODUCT MATERIAL EVALUATION

Trade Name SMART SENSOR 105 Date 11-5-10

Manufacturer WAVETRONIX Patented? Yes _____ No _____ Applied for X

Address 78 E 1700 S PROVO UT 84606
Street No (P. O. Box) City State Zip Code

Representative TRAFFIC CONTROL CORP Phone No (574) 243-0901

Address 12743 HEATHER MASK DR STE 103 GRANGER, IN 46530
Street No (P. O. Box) City State Zip Code

Product Information FREEWAY DETECTION USING 0161MHZ
WAVE RADAR

Materials Composition _____

** Is this product considered HAZARDOUS MATERIAL when disposing of non-used or surplus materials? Yes _____ No X

** What is the shelf life of this material? Years _____ Months _____ N/A _____

Recommended Use-Primary FREEWAY APPLICATIONS

Recommended Use-Alternate _____

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Meets following specifications:

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Will demonstration be provided? Yes X No _____

Availability: Seasonal _____ Nonseasonal X Delivery at site _____

After receipt of order, are quantities limited? Yes _____ No X

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(The manufacturer agrees upon the return of salvageable samples, such samples may be damaged or non-operable. Normal care will be taken that the samples, when returned, are in operable condition; INDOT, however, does not guarantee that the returned samples are operable.)

Will laboratory analysis be furnished? Yes _____ No _____

** Approximate cost 4800.00 Royalty Cost _____

When was the product introduced to the market? 2002

This product is an alternate for what product? INVASIVE DETECTION

Will warranty be provided? Yes X No _____ If yes, for how long? 1 YEARS

Background of company, including principal products ATTACHED

What offices of the Indiana Department of Transportation have been contacted?

Additional Information _____

(Attach additional sheets as necessary)

New 2-09-05
Effective 9-01-05

APPENDIX A

Person furnishing information CORE WALK Regional MGR
Name Title

Address 17743 HEATHER PARK DR STE 105 CARMEL IN 46032
Street No (P. O. Box) City State Zip Code

Items marked ** MUST BE RESPONDED TO or further consideration may not be given for this product.

Please mail this form to:

Manager, Office of Traffic Engineering
100 N. Senate Ave., Room N925
Indianapolis, IN 46204-2249

If INDOT elects to evaluate your product/material - traffic signal equipment will be shipped to:

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While all other materials to be evaluated will be shipped to:

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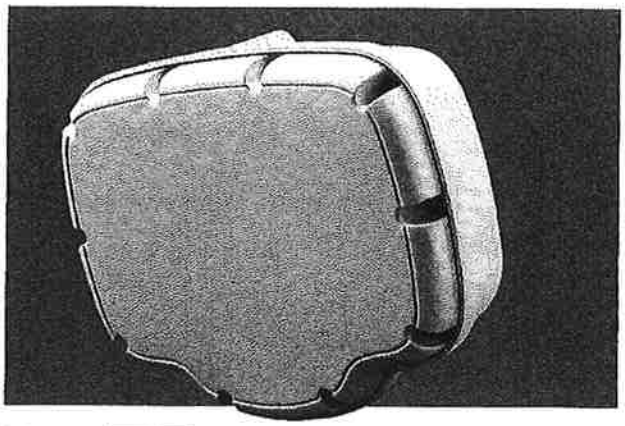
Indiana Department of Transportation
6400 E. 30th Street
Indianapolis, IN 46219-8222



RTMS®

Sx-300

The non-intrusive, radar-based RTMS Sx-300 is an advanced sensor for the detection and measurement of traffic on roadways. It is all-weather accurate and virtually maintenance-free. Best of all, Sx-300 is renowned for long-term worry-free reliability.

The RTMS Sx-300 is a small roadside pole-mounted radar, operating in the microwave band. Simultaneously, the sensor provides per-lane presence as well as volume, occupancy, speed and classification information in up to 12 user-defined detection zones. Output information is provided to existing controllers via contact closure and to other computing systems by serial or TCP/IP communication port. A single radar can replace multiple inductive loop detectors.

The Sx-300's all-in-one concept combines a high resolution radar and a variety of communications options all in a single enclosure. This sleek cabinet free detection station is simple to integrate into any system whether urban signal control or highway traffic management.

BENEFITS

- Fast, safe installation, on existing road-side poles, with no traffic disruptions
- Compatible with all RTMS integrated solutions including detection station, counting, urban traffic control, event reporting, data collection
- Highly flexible: suitable for any road and pole type, with various built-in communication options, including contact pairs and TCP/IP
- Zero Setback™ feature means any pole is suitable
- Low power requirement allows low cost solar power operation

FEATURES

- Provides presence indication and accurate measurements of volume, occupancy, speed and classification in up to 12 separate zones (lanes) up to 76 meters (250 feet) away
- Fully programmable to support multiple applications using simple intuitive software on a Notebook PC
- True-presence: detects stationary and fast moving vehicles; single or dual loop emulation
- Reliable all-weather performance
- Low life-cycle cost with no routine maintenance procedures and high reliability. Typical MTBF – 10 years or 90,000 hours
- Easy to calibrate by fast, automatic set-up wizard

APPLICATIONS

- Mid-block detection for intersections (advance detection)
- Freeway traffic management and incident detection
- Traveler information and journey time prediction
- Ramp metering
- Queue detection
- Work zone safety systems
- Permanent and mobile traffic counting stations
- Loop replacement (single or dual loop emulation)

RTMS®

RTMS Sx-300

SPECIFICATION

Average Coverage (Radar)
The Sx-300 detection field of view covers the area defined by:
- Elevation angle
  50 degrees
- Azimuth
  12 degrees
- Range
  0 to 76 m (0 to 250 ft)

Measurement Resolution
- Detection zones
  up to 12 zones
- Detection range (increment)
  0.4 m (1.3 ft)
- Zone width
  2 to 7 m (7 - 20 ft)
- Time events
  1.3 msec

Frequency Bands
- K band, model Sx-300 operates at high resolution in the 24 GHz band

Regulatory
- FCC
- CE EN 60215, EN 301 489-1, EN 301 489-3, EN 300 440-1, EN 300 440-2, EN61000-4-4
- Canadian CSA C108.8 - M1983

Interface
Single MS type connector provides communications and output signals
- Data: volume, occupancy, speed, gap or headway, six vehicle classes, 85th percentile
- 8MB built-in memory for data storage
- Isolated configurable RS232/RS-485 port provides vehicle presence, per vehicle and statistical data
  Bluetooth communication for setup, calibration and data access

Configuration Options
- Base unit (as configured above)
- Option 1: Base unit plus second serial port (RS-232/422)
- Option 2: Base unit plus TCP/IP

*Note: Option 1 includes 8 optically isolated output pairs rated for 100mA and 24VDC for presence indication and dual-loop speed

Mechanical
- Unit is encased in a rugged, water-tight NEMA 4X & IP-67 polycarbonate enclosure
- Universal mounting bracket mountable on any structure. Tilts on three axes and is lockable.
- Size
  23 x 18 x 17 cm (9 x 7.25 x 6.75 in)
- Weight
  1.02 kg (2.24 lbs) without mount

Power
- Operates on 12 - 24 VAC or VDC
  3.6W max standard
  12W max with IP camera option
- EN 61000-4-5

Maintainability
- Ultra reliable: MTBF (mean time between failures) designed for 90,000 hours (10 years)
- Self-test diagnostic software
- Quick replacement
- Firmware field upgradable

Environmental Conditions
- Temperature range
  -40° to +74°C (-40° to 165°F)
- NEMA TS2: 2003
- Wind
  Up to 190 km/hr (120 mph)
- IP 67 compliant

Warranty
- Five year warranty

CONTACTS

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ImageSensing systems

Precision decisions.

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Due to ISS' continuous efforts to develop the products that are most responsive to our customers needs, the above specifications are subject to change. To verify the current information, please visit the Image Sensing Systems website.