

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

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

RFP SPECIFIC INFORMATION

BUREAU OF HIGHWAYS BUREAU OF TRANSPORTATION PLANNING ** OTHER

THE SERVICE WAS POSTED ON THE ANTICIPATED QUARTERLY REQUESTS FOR PROPOSALS

NO YES DATED _____ THROUGH _____

Prequalified Services – See page ___ of the attached Scope of Services for required Prequalification Classifications.

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

Qualifications Based Selection – Use Consultant/Vendor Selection Guidelines

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

****For RFP's that originate in Bureau of Transportation Planning only**, a priced proposal must be submitted at the same time as, but separate from, the proposal. Submit directly to the Contract Administrator/Selection Specialist, Bureau of Transportation Planning (see address list, page 2). The priced proposal must be submitted in a sealed envelope, clearly marked "**PRICE PROPOSAL.**" The vendor's name and return address **MUST** be on the front of the envelope. The priced proposal will only be opened for the highest scoring proposal. Unopened priced proposals will be returned to the unselected vendor(s). Failure to comply with this procedure may result in your priced proposal being opened erroneously by the mail room.

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

Qualifications Review / Low Bid - Use Consultant/Vendor Selection Guidelines. See Bid Sheet Instructions for additional information.

For Qualification Review/Low Bid selections, the selection team will review the proposals submitted and post the date of the bid opening on the MDOT website. The notification will be posted at least two business days prior to the bid opening. Only bids from vendors that meet proposal requirements will be opened. The vendor with the lowest bid will be selected. The selected vendor may be contacted to confirm capacity.

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

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

BID SHEET INSTRUCTIONS

A bid sheet(s) must be submitted in accordance with the "Guideline for Completing a Low Bid Sheet(s)" (available on MDOT's website). The Bid Sheet(s) is located at the end of the Scope of Services. Submit bid sheet(s) separate from the proposal, to the address indicated below. The bid sheet(s) must be submitted in a sealed manila envelope, clearly marked "**SEALED BID.**" The vendor's name and return address **MUST** be on the front of the envelope. Failure to comply with this procedure may result in your bid being opened erroneously by the mail room and the bid being rejected from consideration.

PROPOSAL SUBMITTAL INFORMATION

REQUIRED NUMBER OF COPIES FOR PROJECT MANAGER 5	PROPOSAL/BID DUE DATE 12/30/09	TIME DUE 12p
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PROPOSAL AND BID SHEET MAILING ADDRESSES

Mail the multiple proposal bundle to the MDOT Project Manager or Other indicated below.

- MDOT Project Manager MDOT Other

Greg Krueger
MDOT C&T Building
8885 Ricks Road
Lansing, MI 48917

Mail one additional stapled copy of the proposal to the Lansing Office indicated below.

Lansing Regular Mail	OR	Lansing Overnight Mail
<input checked="" type="checkbox"/> Secretary, Contract Services Div - B470 Michigan Department of Transportation PO Box 30050 Lansing, MI 48909		Secretary, Contract Services Div - B470 Michigan Department of Transportation 425 W. Ottawa Lansing, MI 48933
<input type="checkbox"/> Contract Administrator/Selection Specialist Bureau of Transportation Planning B470 Michigan Department of Transportation PO Box 30050 Lansing, MI 48909		Contract Administrator/Selection Specialist Bureau of Transportation Planning B470 Michigan Department of Transportation 425 W. Ottawa Lansing, MI 48933

GENERAL INFORMATION

Any questions relative to the scope of services must be submitted by e-mail to the MDOT Project Manager. Questions must be received by the Project Manager at least four (4) working days prior to the due date and time specified above. All questions and answers will be placed on the MDOT website as soon as possible after receipt of the questions, and at least three (3) days prior to the RFP due date deadline. The names of vendors submitting questions will not be disclosed.

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

MDOT FORMS REQUIRED AS PART OF PROPOSAL SUBMISSION

- 5100D** – Request for Proposal Cover Sheet
- 5100G** – Certification of Availability of Key Personnel
- 5100I** – Conflict of Interest Statement
- 5100J** - Consultant Data and Signature Sheet (Required only for Non-Prequalified Work)

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

Notification

ARRA MONTHLY EMPLOYMENT REPORTS

Note: This Notification is only applicable for those projects/contracts funded with ARRA funds. If you have questions, please contact MDOT Contract Services Division at (517) 335-0071.

The American Recovery and Reinvestment Act of 2009 (ARRA), requires states receiving stimulus funds for highway projects to provide monthly reports to the Federal Highway Administration (FHWA) regarding the number of employees of prime contractors, all-tier subcontractors and consultants on ARRA funded projects.

The cost for complying with this Notification must be borne by the prime contractor, and all-tiers of subcontractors and consultants, as part of their overhead and is deemed to be included in the payments made under this contract.

Within 10 days after the end of each month in which work is performed on this contract, all prime contractors, and all-tier subcontractors and consultants, must provide the Engineer a monthly report on form FHWA-1589 (<http://www.fhwa.dot.gov/economicrecovery/reportingforms.htm>) providing employment information on each ARRA project, which will include, for work performed in that preceding month:

- The total number of employees who performed work on this contract
- The total number of hours worked by employees who performed work on this contract
- The total wages of employees who performed work on this contract

In addition, the prime contractor must provide a total payment amount made to any subcontractor who is a certified DBE in that preceding month.

This Notification shall be included as a part of each subcontract executed by the prime contractor, and all-tiers of subcontractors and consultants.

If necessary to conform to guidance provided by FHWA concerning the ARRA reporting requirements, the prime contractor, and all-tiers of subcontractors and consultants will revise their reporting as directed by the Engineer.

Failure to comply with the reporting requirements under ARRA would jeopardize the Department's continued receipt of ARRA funding.

Accordingly, if a contractor or any-tier of subcontractor or consultant fails to comply with this Notification, the Department may withhold contract payments until compliance is achieved. If the Department is compelled to incur costs because of such a breach, the amount of those costs may be deducted from payments otherwise to be made under this contract. Additional sanctions may include reduction or elimination of prequalification ratings and removal of bidding privileges.

NOTIFICATION
REQUIRED CONTRACT PROVISIONS TO IMPLEMENT AMERICAN
RECOVERY AND REINVESTMENT ACT (ARRA) SECTIONS 902 AND 1515

Note: This Notification is only applicable for those projects/contracts funded with ARRA funds. If you have questions, please contact MDOT Contract Services Division at (517) 335-0071.

In accordance with requirements under section 902 of the American Recovery and Reinvestment Act of 2009 (ARRA), the following language is made a part of this contract and is to be made a part of all tier subcontracts or consultant contracts:

The U.S. Comptroller General and his representatives have the authority:

- (1) to examine any records of the contractor or any of its subcontractors, or any State or local agency administering such contract, that directly pertain to, and involve transactions relating to, the contract or subcontract; and
- (2) to interview any officer or employee of the contractor or any of its subcontractors, or of any State or local government agency administering the contract, regarding such transactions.

The Comptroller General and his representatives have the authority and rights provided under Section 902 of the ARRA with respect to this contract. As provided in section 902, nothing in section 902 shall be interpreted to limit or restrict in any way any existing authority of the Comptroller General.

In accordance with the requirements of section 1515(a) of the ARRA any representatives of the Inspector General have the authority:

- (1) to examine any records of the contractor or grantee, any of its subcontractors or subgrantees, or any State or local agency administering such contract, that pertain to, and involve transactions relating to the contract, subcontract, grant, or subgrant; and
- (2) to interview any officer or employee of the contractor, grantee, subgrantee or agency regarding such transactions.

Nothing set forth in section 1515 of the ARRA shall be interpreted to limit or restrict in any way any existing authority of an inspector general.

Michigan Department of Transportation

**SCOPE OF SERVICE
FOR
SPECIALTY SERVICES**

Telegraph Road IntelliDrive Road Side Equipment (RSE) Upgrades
Best Value Selection

CONTROL SECTION(S): 84900

JOB NUMBER(S): 100451 & 108002

PROJECT LOCATION: Oakland County, MI

DESCRIPTION OF WORK:

Michigan DOT and the US DOT would like to upgrade the Multiband Configurable Network Unit (MCNU) Road Side Equipment (RSE) platforms to be installed along Telegraph road with capabilities to send specific wireless messages. These messages will carry information originated from the traffic signal controllers installed on the intersections. The messages include current signal phase, countdown timing (signal phase and timing – SPAT), and geographic description of the intersection (geometric intersection description – GID). Between 20 and 25 intersections will be upgraded with such functionality.

ANTICIPATED START DATE: February 1, 2010

ANTICIPATED COMPLETION DATE: June 30, 2011

CONSULTANT QUALIFICATION REQUIREMENTS:

MDOT is requesting the following experience be identified by firms proposing on this project:

1. Development and testing experience with the US DOT Proof Of Concept MCNU/RSE platform
2. Experience interfacing to the Eagle/Siemens traffic signal controller
Development experience and existing implementations of SPAT for transmission over 5.9 GHz DSRC
3. Knowledge of 5.9 GHz DSRC standards and testing experience
4. Development experience and existing implementations of on board equipment for reception and in-vehicle display of SPAT information over 5.9 GHz DSRC
5. Existing test tools and testing experience for RF coverage analysis of 5.9 GHz DSRC for providing RF coverage maps
6. Engineering experience with telecommunications, traffic signal operations, traffic flow theory and traffic management

DBE REQUIREMENT: N/A

MDOT PROJECT MANAGER:

Gregory D. Krueger, P.E.
Program Manager, Intelligent Transportation Systems
Construction and Technology Building
8885 Ricks Road
PO Box 80050
Lansing, MI 48909
Phone: 517-636-5009
E-mail: KruegerG@michigan.gov

Questions regarding this scope shall be submitted in writing to the Project Manager by e-mail. The Consultant shall contact the Project Manager prior to beginning any work on this Project.

GENERAL INFORMATION:

The Consultant shall furnish all services and labor necessary to conduct and complete the Safety Services described herein. The Consultant shall also furnish all materials, equipment, supplies, and incidentals necessary to perform the Services (other than those designated in writing to be furnished by the Department), and check and/or test the materials, equipment, supplies, and incidentals as necessary in carrying out this work. The Services shall be performed to the satisfaction of the Department consistent with applicable professional standards.

- A. The Consultant’s principal contact with the Department shall be through the designated Project Manager.
- B. The Services described herein are financed with public funds. The Consultant shall comply with all applicable Federal and State laws, rules, and regulations
- C. The Consultant agrees to demonstrate knowledge of, and performance in compliance with, the standard practices of the Department; and any and all other references, guidelines, and procedures manuals needed to carry out the work described herein in an appropriate manner.

Key Acronyms

SPAT – Signal Phase and Timing
GID – Geometric Intersection Description
DSRC – Dedicated Short Range Communications
CICAS – Cooperative Intersection Collision Avoidance System
EPAC – Brand name for Siemens Traffic Controllers used by MDOT
MDOT – Michigan Department of Transportation
SAE – Society of Automotive Engineers
MCNU – Multiband Configurable Network Unit
RSE – Roadside Equipment
CAMP – Collision Avoidance Metrics Partnership
RCOC – Road Commission for Oakland County

CONSULTANT RESPONSIBILITIES:

PROJECT SUMMARY

Michigan DOT and the US DOT would like to upgrade the MCNU RSE (Road Side Equipment) platforms to be installed along Telegraph road with capabilities to send specific wireless messages. These messages will carry information originated from the traffic signal controllers installed on the intersections. The messages include current signal phase, countdown timing (signal phase and timing – SPAT), and geographic description of the intersection (geometric intersection description – GID). Between 20 and 25 intersections will be upgraded with such functionality.

The project objectives and success measures include the following criteria:

- Deployment of the SPAT + GID wireless broadcast services over 5.9 GHz DSRC at the targeted intersections using US DOT supplied MCNU RSE platforms and MDOT/RCOC supplied Eagle Siemens traffic signal controllers.
- Delivery of a vehicle-based demonstration and testing platform of the SPAT + GID application. The demonstration application will show dynamic signal phase and timing information from the upcoming traffic light, as the vehicle approaches an intersection.
- The timing and phase information will be synchronized with the timing of the traffic signals and relevant to the vehicle position and direction of travel at the intersection.
- Delivery of documentation providing information relevant to the installation and operation of the MCNU RSE and vehicle-based applications.

ABOUT SPAT AND GID FORMATS AND STANDARDS

There are two main standards referred in implementations of SPAT and GID messages.

1. SPAT and GID messages used in the USDOT CAMP (Collision Avoidance Metrics Partnership) program for the intersection collision avoidance research. This format was extended and adopted for the ITS World Congress New York demonstrations by major automotive OEMs.
2. SPAT and GID message definitions in the SAE J2735 standard. These message formats provide similar information regarding the intersection geography, signal status and intersection timing. Either of the message formats can be used in a vehicle to display information about upcoming traffic signal timing and phase specific in a particular lane.

The main differences between the data definitions are in the data formatting mechanism for transmission. The CAMP and ITS World Congress extension are in a data format known as **Binary XML**. This is a byte ordering scheme which allows fast parsing times and parsing for relevant data while ignoring unwanted elements. It allows easier upgradeability with backward compatibility with “older” message parsers.

SAE J2735 data is formatted using ASN.1 encoding. This encoding allows for a compact compressed data encoding. However, both the receiving and sending clients must use the same version of encoding/decoding routines and must be upgraded simultaneously if standards change.

As stated above, the current mechanism being used by CAMP and the automakers is the CAMP encoding (Binary XML) using protocols published by CAMP, and the 2008 ITS World Congress developed extensions to these protocols. Therefore, it is anticipated that the Telegraph Road, initial implementation, will utilize this system.

However, as is shown in the task list below, it is envisioned that in the immediate future, there will be a need to implement the SAE message set. Likewise, MDOT is working on additional programs related to traffic signals and SPAT / GID messaging that include transit vehicle priority and emergency vehicle preemption and other needs. These are listed as optional, future tasks which may be authorized under separate authorizations under this selection.

PROJECT SCOPE

The following major tasks required to complete the anticipated project scope. For each task, a short description provides the scope of work.

Task 1: Project planning and intersection survey

This task will determine system requirements and deliverables for the system. During this task, the contractor shall prepare functional requirements and review them with the Michigan DOT and US DOT and their associated contractors. During this task, integration testing and system acceptance activities will be planned. Also, the contractor shall prepare the work breakdown, deliverables, list of milestones, and project schedule. The contractor shall survey the target installation area along Telegraph road and relevant information will be collected including intersection geometry, intersection reference points, position of traffic control boxes, etc. This information will be required to prepare unique configuration data for each intersection.

Task 2: SPAT testing

The contractor will perform SPAT testing in the lab. SPAT testing will focus on three major areas.

1. SPAT software will be tested to support traffic signal controller configuration setup at 20 intersections along telegraph road.
2. Contractor SPAT software will be tested for integration into RSE software used in the Detroit Test Environment. The scope of integration testing will be to ensure that SPAT software and the RSE software services installed by Booz Allen Hamilton (US DOT's contractor) can run concurrently without conflicts and crashes. The contractor shall conduct this SPAT testing in the contractor owned laboratories AND in facilities owned or controlled by MDOT or RCOC.
3. The contractor shall prepare and test a vehicle system ("SPAT listener") for demonstration and testing of the basic SPAT functionality in Detroit. The SPAT listener will include an OBE device and a display device. The devices will be portable for easy transfer from vehicle to vehicle.

Task 3: Radio coverage testing on Telegraph road

The contractor shall perform radio coverage survey of the area along Telegraph Road where 20-25 RSEs will be installed. The survey will determine wireless signal reach. The survey test will be conducted once the majority of RSE units along Telegraph are installed. The survey will be useful to determine anticipated performance and reach of the SPAT messages. The survey will also determine any flaws in installations or obstacles in the signal propagation.

Task 4: SPAT Installation and testing on Telegraph road

This task will culminate with installation and testing of the wireless messaging system on roadside units along Telegraph. The customer may choose to utilize the currently available CAMP format (SPAT, which includes ALM as discussed above), or the customer may choose to proceed with Task 5 and install the J2735 compliant version. The currently available SPAT format contains all the information necessary to support SPAT in DSRC equipped vehicles, which is similar in content, but differently formatted than the SPAT and GID messages defined in J2735.

Task 5: SPAT and GID update to latest standards

The SPAT implementation used for Task 2 is based on the CAMP Binary XML format, which includes both SPAT and the ALM as discussed in the introduction. Task 5 will implement necessary enhancements to SPAT and GID software on the MCNU RSE and SPAT listener platforms to support standard message sets as defined by SAE J2735. Upon upgrade completion, MDOT will be able to configure the roadside system to send messages in either Binary XML or J2735 format.

Task 6: Implementation of Signal Preemption/Priority (Optional)

This task will enhance the system services to support traffic signal preemption/priority functionality. The MCNU RSE will invoke the corresponding preemption/priority functionality already supported by the traffic signal controller. The preemption/priority and cycle time will still be managed by the existing traffic signal controllers.

The contractor shall integrate with existing Eagle Siemens signal controller hardware. During this task required enhancements will be determined and implemented which will allow for vehicles to use wireless communication messages to cause signal preemption or priority. Thus, a collated hardware and software solution consisting of hardware connectivity through the standard NTCIP connectors and actuated via software on the RSE will be provided.

Task 7: Support for MDOT International Cooperation Activities (Optional)

MDOT is currently engaged in, or planning to be engaged in activities with Taiwan and Sweden. Some of these activities may include services similar to those in tasks 1-5, including working with SPAT and GID software, but on a smaller scale.

SCORING CRITERIA (100 points)**Past Performance (40 points)**

Provide references and examples of similar work performed for other agencies.

Understanding of Service (15 points)

Describe your understanding of the service to be provided.

Qualifications of Team (10 points)

Provide resumes for key personnel.

Price (25 points)

Completed bid sheet required.

Safety Program (5 points)

Indicate compliance with all MDOT, state, and federal workplace and right-of-way requirements.

Location (5 points)

Indicate percentage of work that will be performed in Michigan.

CONSULTANT PAYMENT - Milestone:

This procurement will be paid on a lump sum basis by task according to the following table. No interim payments are planned:

Task 1: 5%

Task 2: 5%

Task 3: 10%

Task 4: 20%

Task 5: 60%

Tasks 6 and 7 are optional and will have payment terms developed according to a task breakdown if authorized during negotiations.

The MDOT Project Manager may authorize payment if a milestone is delayed due to circumstances beyond the Consultant's control.

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

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

BID SHEET
Telegraph Road RSE Upgrades

All entries on this page must be handwritten in ink or computer generated.

Task Number	Bid Price
Task 1	\$
Task 2	\$
Task 3	\$
Task 4	\$
Task 5	\$

TOTAL BID PRICE: \$

Consultant Name:	
Consultant Signature:	
Consultant Address:	
Date:	

The Michigan Department of Transportation reserves the right to reject any or all bids.