

REQUEST FOR INFORMATION (RFI)

Date: December 15, 2009

Subject: Michigan Automotive Robotics Cluster Initiative

Requesting Organization: The Michigan Economic Development Corporation

Background:

The Michigan Automotive Robotics Cluster (MARC) initiative was established in July 2009. MARC seeks to build upon the available resources of Michigan to develop, produce and support a mobile robotics industry in Michigan.

MARC is an initiative involving the Small Business Administration, Michigan Economic Development Corporation, TARDEC (US Army Tank-Automotive Research Development and Engineering Center), Automation Alley, Joint Center for Robotics, Great Lakes Chapter of the Association for Unmanned Systems International, Michigan Small Business and Technology Development Center and Oakland University.

In July 2009 the parties cosponsored an industry meeting and identified a goal of establishing a mobile robotics industry cluster in Southeast Michigan. This cluster would leverage the existing resources of the Michigan automotive industry and business development community to evolve, establish, and grow a capability to develop, produce and support a mobile robotics industry.

The initial robotics industry sectors identified as areas of potential opportunity are:

1. Defense
2. Energy and Lightweight Materials
3. Logistics
4. Passenger Vehicles
5. First Responders
6. Service
7. Security
8. Environmental Security
9. Mining
10. Agriculture

Purpose of this Request for Information:

The Michigan Economic Development Corporation (MEDC) is requesting information from interested parties regarding the use and/or management of potential funds targeted at the MARC initiative.

THIS RFI IS SEEKING INFORMATION AND DOES NOT IMPLY, COMMIT OR GUARANTEE FUNDING IN ANY MANNER NOW OR IN THE FUTURE TO ANY PARTY

Michigan Economic Development Corporation
Michigan Automotive Robotics Cluster Initiative
Request for Information

Request for Information (RFI) Guidelines:

I. Guidelines:

Responses will be accepted from December 16, 2009 through January 15, 2010.

Response submissions should be sent by email only to: marcrfi@michigan.org

II. Responses to this RFI

Objectives: This RFI encourages respondents to submit timely information in sufficient detail to support a thorough analysis of robotics opportunities in the State of Michigan.

General Schedule: The following summarizes the RFI schedule:

RFI Issue Date December 15, 2009

RFI Responses Accepted Starting at 12:01AM Eastern Standard Time on December 16, 2009

Deadline for RFI Responses 5:00 PM Eastern Standard Time on January 15, 2010

Review Process: In order to encourage timely submissions of substantially complete responses to this RFI, responses will be evaluated on a continuous basis in the order in which they are received. Respondents are encouraged to provide late-developing information that may materially change the evaluation of their original responses.

III. Response Outline

Respondents are required to respond to items 1 and 2 in this section as related to their personal, organization or business experience and history.

Respondents should reply to at least two of the areas numbered 3 through 13, and may respond to more than two of the listed areas if so inclined.

Items 3 through 12 include guidance outlines for each item. Respondent's replies are **not** restricted to these suggested areas of opportunity, see item number 13.

Respondents should limit their replies to no more than 3 pages for each numbered item that they submit information on, plus any supporting documentation as Appendices.

1. Contact Information of the Respondent – Required

- a. Organization or business name and address,
- b. Name, title email and phone number of the individual(s) responsible for the respondent's RFI response

Michigan Economic Development Corporation

**Michigan Automotive Robotics Cluster Initiative
Request for Information**

2. Background, Area of Expertise and Experience of the Respondent – Required

- a. Organization or Business Details
 - i. Incorporation date or startup date
 - ii. Number of employees
 - iii. **Optional** - Gross annual revenues for the past three years or total annual budget for the past three years
- b. Automotive, automotive supplier and general manufacturing expertise and experience
- c. Robotics industry expertise and experience
- d. Robotics research and development expertise and experience
- e. Public and/or private sector grants expertise and experience
- f. Private and/or public investment management expertise and experience
- g. Loan management expertise and experience
- h. Experience in one or more of the following areas:
 - i. Defense
 - ii. Energy and Lightweight Materials
 - iii. Logistics
 - iv. Passenger Vehicles
 - v. First Responders
 - vi. Service
 - vii. Security
 - viii. Environmental Security
 - ix. Mining
 - x. Agriculture
 - xi. Program and/or Fund Management
- i. Economic Development and/or Public Policy expertise and experience
- j. Government, Department of Defense and/or Homeland Security expertise and experience
- k. Organization and/or business history in Michigan

3. Program and Fund Management

If funding was available, how should the funding be managed to best support the establishment and commercialization of a robotics industry in Michigan?

- a. Private sector management
 - i. Consultants
 - ii. Venture Capital
 - iii. Banks
 - iv. Other

Michigan Economic Development Corporation
Michigan Automotive Robotics Cluster Initiative
Request for Information

Program and Fund Management - Continued

- b. Public Sector management
 - i. State agencies
 - ii. NGO
 - iii. Regional Economic Development Organizations
 - iv. Universities and Community Colleges
 - v. Other
- c. Forms of Financial support
 - i. Direct investment
 - ii. Loan
 - iii. Grant
 - iv. Other

4. Information regarding Civil and/or Defense Energy Storage and Lightweight Material Opportunities in Robotics

Potential Civilian uses

- a. Security
- b. Long range use
- c. Extended time use
- d. Remote and or hazardous area use
- e. Cross over technology that applies to many other non-robotic sectors

Potential Defense uses

- a. Same as civilian

Potential Capabilities

- a. Energy Storage and Lightweight Material advances to improve energy life span
 - i. Per charge life span
 - ii. Number of charges life span
- b. Strengthen and/or improve
 - i. Weight
 - ii. Functionality
 - iii. Durability
- c. Persistent stare robotics battery charge extension
- d. Weight reduction energy performance enhancement
- e. Field recharging capabilities
- f. Improved armor and impact absorption capabilities

5. Information regarding Civil and/or Defense Logistics Opportunities in Robotics

Potential Civilian uses

- a. An automated and flexible mobile robot vehicle with the ability to efficiently and repetitively carry packages, baggage from cargo carrier to stock on shelving or distribution system.

Michigan Economic Development Corporation
Michigan Automotive Robotics Cluster Initiative
Request for Information

Logistics Opportunities in Robotics - Continued

Potential Defense uses

- a. Same as civilian tasks but in exterior unprepared surface environment.

Potential Capabilities

- a. Precise package location on carrier, gripper, tong emplacement, lift and removal.
- b. Precise and safe movement in cluttered environment with obstacle sensing and avoidance.
- c. Ability to operate on smooth surfaces.
- d. Flexibility to accept various tools for handling various packages and material.
- e. Optional ability for defense application to operate on unprepared surfaces including gravel grass and limited mud.
- f. An optional configuration can perform mining operations including tool operations, spoil and coal hauling/removal from mine shaft.
- g. Defense application can include site placement and installation of reconfigurable armor protection systems after air or sea transport

6. Information regarding Civil and/or Defense Passenger Vehicles Opportunities in Robotics

Potential Civilian uses

- a. Mass transit
- b. Accident avoidance
- c. Dual mode transit

Potential Defense uses

- a. Same as civilian
- b. Autonomous vehicle supply support
- c. Autonomous vehicle combative support

Potential Capabilities

- a. Ground capabilities
- b. Partially autonomous
- c. Fully autonomous
- d. Rail
- e. Marine
- f. Air

7. Information regarding Civil and/or Defense First Responders Opportunities in Robotics

Potential Civilian uses

- a. A multi-function public safety robot capable of entering high risk situations for firefighting and police operations. The robot will survey the building for victims, fire sources, structure layout and integrity, criminals and relevant firefighting and police operations.

Potential Defense uses

- a. Capability to support Military police operations
- b. Shipboard fire reconnaissance and extinguishing operations

Michigan Economic Development Corporation

**Michigan Automotive Robotics Cluster Initiative
Request for Information**

First Responders Opportunities in Robotics - Continued

Potential Capabilities

- a. Mobility thru doorways, over thresholds and rubble, stair climbing, drag or lift victim in evacuation.
- b. Mount sensors adaptable to operation/function desired.
- c. Ability to interact and manipulate door opening, furniture movement, and other entry and interior movement tasks.
- d. Ability to deploy and operate a fire hose, lethal and non-lethal weapons, retrieval of victims and material

8. Information regarding Civil and/or Defense Service Opportunities in Robotics

Potential Civilian uses

- a. A family of mobile robotic disability aids to provide aid to the physically, visually and mentally disabled individuals. This family of mobile robot will provide safe transport or ambulatory support or location and direction assistance.

Potential Defense uses

- a. Same capabilities for wounded and recovering active duty and veterans.

Potential Capabilities

- a. Safe interior and exterior operation. Ability to avoid obstacles and steps. Automated movement, speed and steering with minimal operator guidance.
- b. Three levels of aid:
 - i. Transport Wheelchair
 - ii. Support Walker
 - iii. Guide Intelligent Cane/leader dog

9. Information regarding Civil and/or Defense Security Opportunities in Robotics

Potential Civilian uses

- a. An automated and intelligent mobile patrol robot for exterior and interior areas.
- b. Full-time 24 hour security to patrol manufacturing and utility plants, gated neighborhoods, prison perimeters and other high value perimeter areas.

Potential Defense uses

- a. Mobile robotic patrol of bases, airfields in prepared and unprepared environments and surfaces.

Potential Capabilities

- a. Autonomous patrol and surveillance, automated reporting and tracking intruder or perimeter disturbance.
- b. Automated alert and warning devices.
- c. Optional reaction and threat engagement systems.

Michigan Economic Development Corporation

**Michigan Automotive Robotics Cluster Initiative
Request for Information**

10. Information regarding Civil and/or Defense Environmental Security Opportunities in Robotics

Potential Civilian uses

- a. Cleanup of contaminated sites, ranges, disaster areas from hazardous chemical spills of nuclear release and dumps

Potential Defense uses

- a. Cleanup of contaminated sites, ranges, airfields and other military targets of cluster type munitions

Potential Capabilities

- a. Precision geo referenced land operation with controlled overlap to assure total area coverage.
- b. Stable platform to mount a suite of mobility and remediation sensors
- c. Multi tool attachment capable with tools varying from push and pull tillers, manipulator arms, power equipment such as hydraulic buckets, grapplers, brush hogs, lumber cutters, etc.
- d. Optional configurations can perform agricultural and lawn service functions.

11. Information regarding Civil and/or Defense Mining Opportunities in Robotics

Potential Civilian uses

- a. An automated and flexible mobile robot vehicle with the ability to efficiently and repetitively carry tools, product and people from site to cargo carrier or other distribution system.
- b. Perform mining operations including tool operations, spoil and coal hauling and removal from mine area.

Potential Defense uses

- a. Same as civilian tasks but in exterior unprepared surface environment.

Potential Capabilities

- a. Ability to evaluate mining material while in process

12. Information regarding Civil and/or Defense Agriculture Opportunities in Robotics

Potential Civilian uses

- a. Cleanup of contaminated sites, ranges, disaster areas from hazardous chemical spills of nuclear release and dumps

Potential Defense uses

- a. Cleanup of contaminated sites, ranges, airfields and other military targets of cluster type munitions

Potential Capabilities

- a. Precision geo referenced land operation with controlled overlap to assure total area coverage.
- b. Stable platform to mount a suite of mobility and remediation sensors
- c. Multi tool attachment capable with tools varying from push and pull tillers, manipulator arms, power equipment such as hydraulic buckets, grapplers, brush hogs, lumber cutters, etc.
- d. Optional configurations can perform agricultural and lawn service functions.

13. Other areas with potential or current Civil and/or Defense Opportunities in Robotics