

FDP Cost Reimbursement Research Subaward Agreement

Pass-through Entity (PTE): REGENTS OF THE UNIVERSITY OF MICHIGAN		Subrecipient: CITY OF ANN ARBOR	
PTE Principal Investigator (PI): James Sayer		Subrecipient Principal Investigator (PI): Yu Liu	
PTE Federal Award No: DTFH6115H00005	FAIN: DTFH6115H00005	Federal Awarding Agency: Department of Transportation	
Federal Award Issue Date: May 19, 2015	Total Amount of Federal Award to PTE: \$ 3,000,000.00	CFDA No: 20.200	CFDA Title: Highway Research and Development Program.
Project Title: Maintain, Operate and Sustain the Ann Arbor Test Environment.			
Subaward Period of Performance: <u>Pre-award auth. from 3/25/2015</u> Start: May 11, 2015 End: May 10, 2016		Amount Funded This Action: \$ 26,625.00	Subaward No. 3003532118
Estimated Project Period (if incrementally funded): Start: May 11, 2015 End: May 10, 2018		Incrementally Estimated Total: \$ 79,252.00	Is this Award R & D <input checked="" type="checkbox"/> Yes or <input type="checkbox"/> No
Check all that apply <input checked="" type="checkbox"/> Reporting Requirements (Attachment 4) <input checked="" type="checkbox"/> Subject to FFATA (Attachment 3B) <input checked="" type="checkbox"/> Cost Sharing (Attachment 5)			

Terms and Conditions

- 1) PTE hereby awards a cost reimbursable subaward, as described above, to Subrecipient. The statement of work and budget for this subaward are (check one) as specified in Subrecipient's proposal dated _____ or as shown in Attachment 5. In its performance of subaward work, Subrecipient shall be an independent entity and not an employee or agent of PTE.
- 2) PTE shall reimburse Subrecipient not more often than monthly for allowable costs. All invoices shall be submitted using Subrecipient's standard invoice, but at a minimum shall include current and cumulative costs (including cost sharing), subaward number, and certification, as required in 2 CFR 200.415 (a). Invoices that do not reference PTE Subaward number shall be returned to Subrecipient. Questions concerning invoice receipt or payments should be directed to the appropriate party's Financial Contact, as shown in Attachments 3A. Refer to Attachment 4 for additional terms.
- 3) A final statement of cumulative costs incurred, including cost sharing, marked "FINAL" must be submitted to PTE's Financial Contact, as shown in Attachments 3A, NOT LATER THAN 60 days after subaward end date. The final statement of costs shall constitute Subrecipient's final financial report.
- 4) All payments shall be considered provisional and subject to adjustment within the total estimated cost in the event such adjustment is necessary as a result of an adverse audit finding against the Subrecipient. PTE reserves the right to reject an invoice, in accordance with 2 CFR 200.305.
- 5) Matters concerning the technical performance of this subaward should be directed to the appropriate party's Principal Investigator as shown in Attachments 3A and 3B. Technical reports are required as shown above, "Reporting Requirements."
- 6) Matters concerning the request or negotiation of any changes in the terms, conditions, or amounts cited in this subaward agreement, and any changes requiring prior approval, should be directed to the appropriate party's Administrative Contact, as shown in Attachments 3A and 3B. Any such changes made to this subaward agreement require the written approval of each party's Authorized Official, as shown in Attachments 3A and 3B.
- 7) Substantive changes made to this subaward agreement require the written approval of each party's Authorized Official as shown in Attachments 3A and 3B. The PTE may issue non-substantive changes to the Period of Performance (check one) Bilaterally, or Unilaterally. Unilateral modifications shall be considered valid 14 days after receipt unless otherwise indicated by Subrecipient.
- 8) Each party shall be responsible for its negligent acts or omissions and the negligent acts or omissions of its employees, officers, or directors, to the extent allowed by law.
- 9) Either party may terminate this subaward with thirty days written notice to the appropriate party's Financial Contact, as shown in Attachments 3A and 3B. PTE shall pay Subrecipient for termination costs as allowable under Uniform Guidance, 2 CFR 200, or 45 CFR Part 74 Appendix E, "Principles for Determining Costs Applicable to Research & Development under Grants and Contracts with Hospitals, as applicable.
- 10) No-cost extensions require the approval of the PTE. Any requests for a no-cost extension should be addressed to and received by the Financial Contact, as shown in Attachments 3A, not less than 30 days prior to the desired effective date of the requested change.
- 11) The Subaward is subject to the terms and conditions of the PTE Award and other special terms and conditions, as identified in Attachment 2.
- 12) By signing this Research Subaward Agreement Subrecipient makes the certifications and assurances shown in Attachments 1 and 2.
- 13) Research Terms & Conditions – RESERVED

By an Authorized Official of Pass-through Entity:		By an Authorized Official of Subrecipient:	
Name:	Date:	Name:	Date:
Title:		Title:	

Attachment 1
Research Subaward Agreement
Certifications and Assurances

By signing the Subaward Agreement, the Authorized Official of Subrecipient certifies, to the best of his/her knowledge and belief, that:

Certification Regarding Lobbying

1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Subrecipient, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or intending to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the Subrecipient shall complete and submit Standard Form -LLL, "Disclosure Form to Report Lobbying," to the Pass-through Entity.

3) The Subrecipient shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U. S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Debarment, Suspension, and Other Responsibility Matters

Subrecipient certifies by signing this Subaward Agreement that neither it nor its principals are presently debarred, suspended, proposed for debarment, declared ineligible or voluntarily excluded from participation in this transaction by any federal department or agency.

Audit and Access to Records

Subrecipient certifies by signing this Subaward Agreement that it complies with the Uniform Guidance, will provide notice of the completion of required audits and any adverse findings which impact this subaward as required by parts 200.501-200.521, and will provide access to records as required by parts 200.336, 200.337, and 200.201 as applicable.

Attachment 2
Research Subaward Agreement
Terms and Conditions

General terms, conditions, and governing regulations that apply to this Subaward Agreement are available online at: <http://www.fhwa.dot.gov/aaa/generaltermsconditions.cfm>. Performance under this Subaward Agreement will be governed by and in compliance with the following regulations:

- **2 CFR Part 200, "Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards.**
- **Cost Principles For-profit Organizations: 48 CFR 31 (Federal Acquisition Regulations) Subpart 31.2**

Copy of Prime Award Notice is attached (Begins on Next Page)

Special terms and conditions:

1. **Copyrights**
Subrecipient grants to PTE an irrevocable, royalty-free, non-transferable, non-exclusive right and license to use, reproduce, make derivative works, display, and perform publicly any copyrights or copyrighted material (including any computer software and its documentation and/or databases) first developed and delivered under this Subaward Agreement solely for the purpose of and only to the extent required to meet PTE's obligations to the Federal Government under its Prime Award.
2. **Data Rights**
Subrecipient grants to PTE the right to use data created in the performance of this Subaward Agreement solely for the purpose of and only to the extent required to meet PTE's obligations to the Federal Government under its Prime Award.
3. **Automatic Carry Forward:** Yes No
If no, Carry Forward requests must be sent to the [PTE's] Financial Contact shown in Attachment 3A.

Additional Special Terms and Conditions

1. **Whistleblower Protection:** Subrecipient is hereby given notice that 48 CFR section 3.908, implementing section 828, entitled "Pilot Program for Enhancement of Contractor Employee Whistleblower Protections," of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2013 (Pub. L. 112-239, enacted January 2, 2013), applies to all grants and subaward agreements issued beginning July 1, 2013 through January 1, 2017. Contractor Employee Whistleblower Rights and Requirement To Inform Employees of Whistleblower Rights (Sep 2013) include the following:
 - a. This Subaward and employees working on this Subaward will be subject to the whistleblower rights and remedies in the pilot program on Subawardee employee whistleblower protections established at 41 U.S.C. 4712 by section 828 of the National Defense Authorization Act for Fiscal Year 2013 (Pub. L. 112-239) and FAR 3.908.
 - b. Subrecipient shall inform its employees in writing, in the predominant language of the workforce, of employee whistleblower rights and protections under 41 U.S.C. 4712, as described in section 3.908 of the Federal Acquisition Regulation.
 - c. Subrecipient shall insert the substance of this clause, including this paragraph, in all subawards over the simplified acquisition threshold.

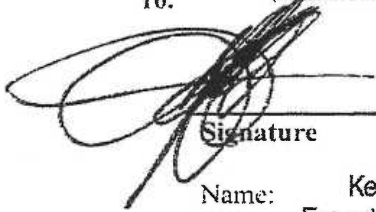
2. **Conflict of Interest**

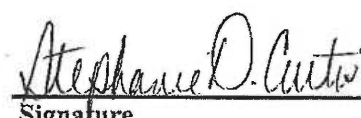
Award recipients must promote objectivity in research by establishing standards that provide a reasonable expectation that the design, conduct and reporting of research funded under NIH awards will be free from bias resulting from an Investigator's Financial Conflict of Interest (FCOI), in accordance with 42 CFR Part 50 Subpart F. Subsequent to the compliance date of the 2011 revised FCOI regulation (i.e., on or before August 24, 2012), Awardees must be in compliance with all aspects of the 2011 revised regulation; until then, Awardees must comply with the 1995 regulation. The Institution shall submit all FCOI reports to the NIH through the eRA Commons FCOI Module. The regulation does not apply to Phase I Small Business Innovative Research (SBIR) and Small Business Technology Transfer (STTR) awards. Consult the NIH website <http://grants.nih.gov/grants/policy/coi/> for a link to the regulation and additional important information.

- | | | | | | | | | |
|--|---|---------------|-------------|-----------------|-------------|--------------|---------------------|--------------------------------------|
| <p>1. Award No.
DTFH6115H00005</p> <p>4. Awarded To
Regents of the University of Michigan
3003 S. State Street
Ann Arbor, MI 48109</p> <p>DUNS: No.: 073133571
TIN No.: 38-6006309</p> <p>6. Period of Performance
36 months from the effective date of award</p> <p>8. Type of Agreement
Cooperative Agreement</p> <p>10. Procurement Request No.
21-21-14046</p> <p>12. Submit Payment Requests To
See Item 8, "Payment," General Terms and Conditions for Assistance Awards</p> <p>14. Accounting and Appropriation Data
15X0447060-0000-021DT20662-2101-000000-25305-61006600 Total Obligated \$3,000,000</p> <p>15. Research Title and/or Description of Project
"Maintain, Operate and Sustain the Ann Arbor Test Environment"</p> | <p>2. Effective Date
5/11/2015</p> <p>5. Sponsoring Office
U.S. Department of Transportation
Federal Highway Administration
Office of Acquisition & Grants Management
1200 New Jersey Avenue SE
HCFA-32, Mail Drop: E65-101
Washington DC 20590</p> <p>7. Total Amount</p> <table border="0"> <tr> <td>Federal Share</td> <td style="text-align: right;">\$8,991,669</td> </tr> <tr> <td>Recipient Share</td> <td style="text-align: right;">\$6,199,290</td> </tr> <tr> <td>Total</td> <td style="text-align: right;"><u>\$15,190,959</u></td> </tr> </table> <p>9. Authority
23 U.S.C. §502</p> <p>11. Funds Obligated
\$3,000,000</p> <p>13. Payment Office
See Item 8, "Payment," General Terms and Conditions for Assistance Awards</p> | Federal Share | \$8,991,669 | Recipient Share | \$6,199,290 | Total | <u>\$15,190,959</u> | <p>3. CFDA No.
20.200</p> |
| Federal Share | \$8,991,669 | | | | | | | |
| Recipient Share | \$6,199,290 | | | | | | | |
| Total | <u>\$15,190,959</u> | | | | | | | |

16. **Regents of the University of Michigan**
(Signature of Person authorized to Sign)

17. **Federal Highway Administration**
(Signature of Agreement Officer)


Signature _____ Date 5/12/2015


Signature _____ Date 5-12-15

Name: Kevin P. Hegarty
Title: Executive Vice President
& Chief Financial Officer

Name: Stephanie D. Curtis
Title: Agreement Officer

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Attachments:

- 1) Technical Application dated January 15, 2015.
- 2) Budget Application dated January 15, 2015.

SECTION A - PROGRAM DESCRIPTION

1. STATEMENT OF PURPOSE

The purpose of this Cooperative Agreement (Agreement) is to maintain the unique research and testing environment the University of Michigan Transportation Research Institute (UMTRI) developed in Ann Arbor under the Safety Pilot. The Connected Vehicle Test Environment (CVTE) was developed as a real world model deployment test site for enabling wireless communications among vehicles and with roadside equipment for use in generating data to enable driver safety warning systems. The CVTE encompasses vehicles of various types that include a mix of integrated, retrofit, and aftermarket safety devices. The data generated and archived in the CVTE is used for estimating the safety benefits of connected vehicle technology as well as for use by the broader industry in researching and developing additional connected vehicle applications. The Agreement seeks to maximize the benefits generated from the CVTE by putting in place a framework under which UMTRI will continue to operate, maintain and upgrade the CVTE and seek further investment and activity from third parties in order to develop a sustainable operational environment.

2. LEGISLATIVE AUTHORITY

Specific statutory authority for conducting this effort is found in 23 U.S.C. §502(c) (1) (A), which authorizes the Secretary of Transportation to “carry out, on a cost-shared basis, collaborative research and development with non-Federal entities, including State and local governments, foreign governments, colleges and universities, corporations, institutions, partnerships, sole proprietorships, and trade associations that are incorporated or established under the laws of any State.” In addition, Section 53004 of Public Law 112-141, the Moving Ahead for Progress in the 21st Century Act (MAP-21) amends Chapter 5 of Title 23, United States Code by the addition of §516, which authorizes the Secretary to “carry out a comprehensive program of intelligent transportation systems research and development, and operational tests of intelligent vehicles, intelligent infrastructure systems, and other similar activities that are necessary to carry out this chapter.”

In accordance with 23 U.S.C. §502 (c) (3) FEDERAL SHARE.—“ The Federal share of the cost of activities carried out under a cooperative research and development agreement entered into under this chapter shall not exceed 80 percent.”

3. BACKGROUND

In 2010 U.S. DOT wanted to accelerate the introduction and commercialization of dedicated short range communications (DSRC)-based crash warning and avoidance systems. To support this goal, the U.S. DOT initiated a Safety Pilot program starting in 2010 and extending into 2014 by contracting with UMTRI for services which included building out vehicles with connected vehicle technology, holding driver training for test participants, deploying 2,000 vehicles equipped Vehicle Awareness Devices (VADs), 290 Aftermarket Safety Devices (ASDs) and Road Side Equipment (RSE) and establishing an operational test environment. The Safety Pilot Program resulted in the establishment of a real-world test

environment in Ann Arbor, Michigan, which provides invaluable research data to U.S. DOT and the Intelligent Transportation Systems (ITS) community to understand the safety, and implementation implications of connected vehicle technologies. In addition the U.S. DOT has opened up this data-rich environment to industry for use in testing their own devices and applications.

The U.S. DOT seeks to continue to maintain, operate and upgrade the Safety Pilot test environment in Ann Arbor Michigan. The test site may be used by the U.S. DOT and its external partners for research and deployment of connected vehicle technology.

4. GOALS

The goal of this Agreement is to provide a basis for the recipient, UMTRI, to work cooperatively with FHWA on various projects that are designed to maintain and upgrade the current Ann Arbor test environment while working with external partners to upgrade and leverage the test site so that it can be sustained without further federal investment after the completion of this Agreement. This Agreement is a new initiative to meet these various objectives. All U.S. DOT proposed projects shall be consistent with the USDOT's Connected Vehicle Program goals and objectives. The Recipient shall collaborate with the FHWA to accomplish the goals of this project.

5. STATEMENT OF WORK

The Recipient shall maintain and develop multiple projects designed to sustain and enhance the unique research and testing environment developed in Ann Arbor under the Safety Pilot Program. It was developed as a real world model deployment test site for enabling wireless communications among vehicles and with roadside equipment for use in generating data to enable driver safety warning systems. The site encompasses vehicles of various types that include a mix of integrated, retrofit, and aftermarket safety devices. This Agreement seeks to maximize the benefit and service extracted from the site by putting in place a framework under which the Recipient shall continue to operate, maintain and upgrade the site and seek further investment and activity from third parties in order to develop a sustainable operational test environment in Ann Arbor.

The following work areas are covered under this Agreement:

Work Area 1: Operate and Maintain Test Environment

This area of work includes the operation and maintenance of the Ann Arbor test environment. This includes ensuring that all equipment has updated software and firmware installed along with performing any necessary troubleshooting and remediation of issues identified. The equipment to be maintained in the test environment is as follows:

- Minimum of 20 Roadside Equipment installations.
- Minimum of 2,000 Basic Safety Message (BSM) transmit-only devices.
- Minimum of 250 BSM transmit and application hosting devices.

Other potential activities in this work area in this area include continuing to collect, store, process and transfer data necessary to support the maintenance of the test environment.

Work Area 2: Upgrade Infrastructure and Security in Test Environment Operations

This area of work includes all activities associated with upgrading the current test environment operations that include infrastructure and security to incorporate new technologies and standards as they become available. For example, FHWA is currently developing updated specifications for the roadside equipment as well as an overall Connected Vehicle Reference Implementation Architecture (CVRIA), and the infrastructure in the Ann Arbor test environment will need to be upgraded to be compliant with the next generation of connected vehicle technology.

Potential activities under this work area include but are not limited to:

- Implement the Connected Vehicle Reference Implementation Architecture.
- Upgrading the infrastructure in the test environment to be interoperable with U.S. DOT affiliated test beds.
- Supporting the development and testing of V2I, V2V and V2P applications and other V2I, V2V, V2P research.
- Supporting other research/projects conducted by state agencies, metropolitan planning organizations (MPOs), researchers or application/device developers by providing necessary access to and data from the environment.
- Upgrading the infrastructure equipment to test and include the monitoring of health of RSEs and transmitted messages (e.g., SPaT, MAP, TIM).
- Upgrading operations that support the transfer of security information between the security entity and the environment devices consistent with security entity upgrades.

Work Area 3: Plan and Develop a Sustainable Operational Environment

This area of work includes all activities associated with developing a plan to maintain the environment at the end of this Agreement without future federal government funding. Work in this area would encourage and support entrepreneurial investment for the commercialization of applications. The Recipient shall actively seek third party relationships that would provide additional funding for current and future research using the Ann Arbor test environment. Third parties may include State DOTs, local agencies (e.g., transit agencies), industry associations, original equipment manufacturers (OEMs), private sector entities, and other research institutions.

Potential activities in this area include but are not limited to:

- Developing a sustainable business model that describes how the site will be funded (taxes, state agency support, private sector).
- Describing how the site will transition into an operational early deployment site.
- Marketing the site to potential application developers.
- Attracting external investments into the test environment to develop and test additional capabilities.

Work Area 4: Support Other Related Research Activities

This area of work includes activities associated with supporting additional research efforts of U.S. DOT and its external partners. The test environment provides a unique environment that can be leveraged for additional U.S. DOT research in areas such as long-range planning, policy, security, deployment, and mobility research. The research into these areas may be conducted by other U.S. DOT contractors, and it would be the role of the Recipient to provide the necessary support to facilitate this additional research.

Potential activities in this area may include but are not limited to:

- Supporting research into institutional barriers, lessons learned, planning and design.
- Reporting on how the data gathered by test site can affect long-term planning processes and the investment decisions of States and MPOs.
- Outlining areas where Safety Pilot can/has affected DOT planning processes
- Collecting and delivering contextual data (traffic, weather, crash, etc.).
- Supporting the investigation of alternative security technical designs and organizational configurations.

SECTION B – FEDERAL AWARD INFORMATION

1. TYPE OF AWARD

This award is a Cooperative Agreement.

2. PERIOD OF PERFORMANCE

The period of performance for this Agreement will be thirty six months (36) from the effective date of the Agreement.

3. DEGREE OF FEDERAL INVOLVEMENT

The FHWA anticipates substantial Federal involvement between it and the Recipient during the course of this project. The anticipated Federal involvement will include:

- Technical assistance and guidance to the Recipient;
- Close monitoring of performance;
- Involvement in technical decisions; and
- Participation in status meetings including kick off meeting and annual technical and budget reviews.

SECTION C – FEDERAL AWARD ADMINISTRATION INFORMATION

1. FEDERAL AWARD

Only the Agreement Officer (AO) can commit the FHWA. The award document, signed by the AO, is the authorizing document. Only the AO can bind the Federal Government to the expenditure of funds.

2. ADMINISTRATIVE AND NATIONAL POLICY REQUIREMENTS

General terms, conditions, and governing regulations that apply to this Agreement are available online at:

<http://www.fhwa.dot.gov/aaa/generaltermsconditions.cfm>

Date of general terms and conditions: March 6, 2015.

Special terms and conditions follow:

A. PUBLIC ACCESS TO DOCUMENTS

The Applicant agrees that the resulting deliverables/documentation submitted to the FHWA under this Agreement may be posted online for public access and/or shared by FHWA with other interested parties. The FHWA anticipates the documents cited herein may be posted on an FHWA website or other appropriate website.

B. INDIRECT COSTS

Indirect costs are allowable under this Agreement in accordance with the Recipient's Federally Negotiated Indirect Cost Rates as documented in writing and approved by the Recipient's cognizant Government agency. In the absence of such Government-approved indirect rates, the following rates are hereby approved for use under this agreement as shown below:

<i>Type*</i>	<i>Indirect Rate</i>	<i>Period</i>	<i>Rate (%)</i>	<i>Base</i>
Prov	Sick/Vacation/ Holiday	Award- 8/31/2017	26%	Direct Labor of full time employees
Prov	Fringe	Award- 8/31/2017	30%	Direct Labor of full time employees
Prov	Fringe	Award- 8/31/2017	7.65%	Direct Labor of students and temporary employees
Pred	F&A	7/1/2014- 6/30/2015	55.5%	Direct costs excluding tuition, equipment, and subcontract costs over \$25,000 per subcontract.

*Types of Rates: Pred - Predetermined; Fixed - Fixed; Final - Final; Prov: Provisional/billing; or De minimus.

In the event the Recipient determines the need to adjust the above listed rates, the Recipient will notify the AO of the planned adjustment and provide rationale for such adjustment. In the event such adjustment rates have not been audited by a Federal agency, the adjustment of rates must be pre-approved in writing by the AO.

This Indirect Cost provision does not operate to waive the limitations on Federal funding provided in this document. The Recipient's audited final indirect costs are allowable only insofar as they do not cause the Recipient to exceed the total obligated funding.

C. DATA RIGHTS

The Recipient must make available to the FHWA copies of all work developed in performance with this Agreement, including but not limited to software and data. Data rights under this agreement shall be in accordance with 2 CFR 200.315, Intangible property.

D. PERSONALLY IDENTIFIABLE INFORMATION (PII)

Personally Identifiable Information (PII) as defined at CFR Part 200.79 and 2 CFR 200.82 at will not be requested unless necessary and only with prior written approval of the AO with concurrence from the Agreement Officer's Representative (AOR).

E. AVAILABLE FUNDING

The total estimated amount of Federal funding that may be provided under this Agreement is \$8,991,669 for the entire period of performance, subject to the limitations shown below:

- (1) Currently, Federal funds identified on page 1 of the award document, are obligated to this agreement.
- (2) Subject to availability of funds, and an executed document by the AO, the difference between the current funding and the total estimated amount of Federal funding may be obligated to this Agreement.
- (3) The FHWA's liability to make payments to the Recipient is limited to those funds obligated under this Agreement as indicated above and any subsequent amendments.

F. KEY PERSONNEL

Pursuant to 2 CFR 200.308(c)(2), the Recipient must request prior written approval from the AO for any change in Key Personnel specified in the award. The following person(s) are/have been identified as Key Personnel:

Name	Title/Position
Dr. James Sayer	Project Director
Debbie Bezzina	Project Senior Manager

G. PROGRAM INCOME

Pursuant to 2 CFR 200.307, Program income earned during the agreement period must be added to the Federal award and used for the purposes and under the conditions of the Federal award, unless otherwise approved by the AO. Program income must not be used to offset the Federal or Recipient contribution to this project.

H. SUBAWARDS

Note: Recipients with a procurement system deemed approved and accepted by the Government or by the AO are exempt from the requirements of this clause. See 2 CFR 200.317 through 200.326.

The following subawards are currently approved under the Agreement:

Name
Cohda Wireless
Savari, Inc.
Denso
Parsons Brinckerhoff
The HNTB Companies
City of Ann Arbor, Michigan
Leidos
Mixon Hill (consultant)

I. ORDER OF PRECEDENCE

The Recipient's technical and budget applications are accepted, approved, and incorporated herein as Attachments A and B. In the event of any conflict between this Agreement document and the Recipient's proposal and/or application, this Agreement document shall prevail.

J. DESIGNATION AS RESEARCH OR NON-RESEARCH AGREEMENT

This Agreement is designated as: RESEARCH.

K. CONFERENCE SUPPORT RESTRICTIONS

The Recipient must obtain written approval from the AOR prior to incurring any costs for conference support. See the definition of conference as contained in 2 CFR 200.432.

Food and beverage costs are not allowable conference expenses for direct reimbursement under this agreement. Any costs associated with food, meals or light refreshments are not allowable for reimbursement under this agreement.

Note: Costs of meals are allowable as a travel per diem expense for individuals on travel status and pursuant to the Travel clause of this agreement.

L. AGREEMENT PERFORMANCE REQUIREMENTS SUMMARY

N/A.

M. DISPUTES

The parties to this Agreement will communicate with one another in good faith and in a timely and cooperative manner when raising issues under this provision. Any dispute, which for the purposes of this provision includes any disagreement or claim, between the FHWA and the Recipient concerning questions of fact or law arising from or in connection with this Agreement and whether or not involving alleged breach of this Agreement, may be raised only under this Disputes provision.

Whenever a dispute arises, the parties will attempt to resolve the issues involved by discussion and mutual agreement as soon as practical. In no event will a dispute which arose more than three months prior to the notification made under the following paragraph of this provision constitute the basis for relief under this article unless FHWA waives this requirement.

Failing resolution by mutual agreement, the aggrieved party will document the dispute by notifying the other party in writing of the relevant facts, identify unresolved issues and specify the clarification or remedy sought. Within five working days after providing written notice to the other party, the aggrieved party may, in writing, request a decision from one level above the AO. The AO will conduct a review of the matters in dispute and render a decision in writing within thirty calendar days of receipt of such written request. Any decision of the AO is final and binding unless a party will, within thirty calendar days, request further review as provided below.

Upon written request to the FHWA Director, Office of Acquisition and Grants Management or designee, made within thirty calendar days after the AO's written decision or upon unavailability of a decision within the stated time frame under the preceding paragraph, the dispute will be further reviewed. This review will be conducted by the Director, Office of Acquisition and Grants Management. Following the review, the Director, Office of Acquisition and Grants Management, will resolve the issues and notify the parties in writing. Such resolution is not subject to further administrative review and to the extent permitted by law, will be final and binding. Nothing in this Agreement is intended to prevent the parties from pursuing disputes in a United States Federal Court of competent jurisdiction.

3. REPORTING

ADDRESSES FOR SUBMITTAL OF REPORTS AND DOCUMENTS

The Recipient must submit all required reports and documents, under transmittal letter referencing the Agreement number, as follows:

Submit an electronic copy to the AS at the following address:

Rob.Miller@dot.gov

Submit an electronic copy to the AOR at the following address:

Kevin.Dopart@dot.gov

QUARTERLY PROGRESS REPORT

The Recipient must submit an electronic copy of the RPPR, to the AOR and the Agreement Specialist on or before the 30th of the month following the calendar quarter being reported. Final RPPRs are due 90 days after the end of the Agreement period of performance. The RPPR is available online at:

http://www.nsf.gov/bfa/dias/policy/rppr/format_ombostp.pdf.

<u>Calendar quarters are defined as:</u>	<u>Reports due on or before:</u>
1 st : January – March	April 30 th
2 nd : April – June	July 30 th
3 rd : July – September	October 30 th
4 th : October – December	January 30 th

Include the following information as attached pages:

- a. SF-425, Federal Financial Report, and
- b. SF-425A, Federal Financial Report Attachment (if applicable).

ANNUAL BUDGET REVIEW AND PROGRAM PLAN

The Recipient must submit an electronic copy and one hard copy of the Annual Budget Review and Program Plan to the AOR and one electronic copy and one hard copy to the Agreement Specialist 60 days prior to the anniversary date of this Agreement. The Annual Budget Review and Program Plan must include the required certification pursuant to 2 CFR 200.415. The Annual Budget Review and Program Plan must provide a detailed schedule of activities, estimate of specific performance objectives, include forecasted expenditures, and schedule of milestones for the upcoming year. If there are no proposed deviations from the

Approved Project Budget, the Annual Budget Review must contain a statement stating such. The Recipient must meet via teleconference or web conference with the FHWA to discuss the Annual Budget Review and Program Plan. Work proposed under the Annual Budget Review and Program Plan must not commence until AO's written approval is received.

4. PRE-AWARD COSTS

FHWA has authorized UMTRI to expend up to \$493,311 in Federal share and \$149,432 in cost share for a total of \$642,643 in pre-award costs. Reimbursement of pre-award costs will be subject to the requirements of 2 CFR 200.458 for reasonableness, allocability, and allowability. The total amount remains the same as reflected in item seven of page one of the Agreement.

Attachment 3A
Research Subaward Agreement

Subaward Number:

Pass-through Entity Contacts

Pass-through Entity

Name:
Address:

City: State: Zip Code:

Pass-through Entity's Administrative Contact

Name:
Address:

City: State: Zip Code:
Telephone: Fax:
E-mail:

Pass-through Entity's Principal Investigator

Name:
Address:

City: State: Zip Code:
Telephone: Fax:
E-mail:

Pass-through Entity's Financial Contact

Name:
Address:

City: State: Zip Code:
Telephone: Fax:
E-mail:

Pass-through Entity's Authorized Official

Name:
Address:

City: State: Zip Code:
Telephone: Fax:
E-mail:

Attachment 3B
Research Subaward Agreement
Subrecipient Place of Performance

Subaward Number:
[]

Subrecipient

Name: [CITY OF ANN ARBOR]
Address: [301 E. Huron St., P.O. Box 8647]
City: [Ann Arbor] State: [MI] Zip Code + 4: [48107-8647]
EIN No.: [] Institution Type: [City/Township Gov't] (Look-Up)

Is Subrecipient currently registered in SAM? Yes No
Is Subrecipient exempt from reporting compensation? Yes No

If no , please complete 3B page 2

DUNS No.: [004913166] Parent DUNS No.: [] Congressional District: [15] Congressional District: []

Subrecipient Administrative Contact

Name: [Craig Hupy]
Address: [301 E. Huron St., P.O. Box 8647]
City: [Ann Arbor] State: [MI] Zip Code: [48107-8647]
Telephone: [(734) 794-6310] Fax: [(734) 994-1816]
E-mail: [chupy@a2gov.org]

Subrecipient Principal Investigator (PI)

Name: [Les Sipowski]
Address: [301 E. Huron St., P.O. Box 8647]
City: [Ann Arbor] State: [MI] Zip Code + 4: [48107-8647]
Telephone: [734-764-6410] Fax: [(734) 994-1744]
E-mail: [yliu@a2gov.org]

Subrecipient Financial Contact

Name: [Marti Praschan]
Address: [301 E. Huron St., P.O. Box 8647]
City: [Ann Arbor] State: [MI] Zip Code: [48107-8647]
Telephone: [(734) 794-6310] Fax: [(734) 994-1816]
E-mail: [mpraschan@a2gov.org]

Subrecipient Authorized Official

Name: [Russell Hanshue]
Address: [301 E. Huron St., P.O. Box 8647]
City: [Ann Arbor] State: [MI] Zip Code: [48107-8647]
Telephone: [(734) 794-6550] Fax: [(734) 994-3031]
E-mail: [rhanshue@a2gov.org]

Attachment 3B Page 2
Research Subaward Agreement
Highest Compensated Officers

Subaward Number:

Subrecipient

Institute:

CITY OF ANN ARBOR

PI:

Highest Compensated Officers

The names and total compensation of the five most highly compensated officers of the entity(ies) must be listed if the entity in the preceding fiscal year received 80 percent or more of its annual gross revenues in Federal awards; and \$25,000 or more in annual gross revenues from Federal awards; and the public does not have access to this information about the compensation of the senior executives of the entity through periodic reports filed under section 13(a) or 15(d) of the Securities Exchange Act of 1934 (15 U.S.C. §§ 78m(a), 78o(d)) or section 6104 of the Internal Revenue Code of 1986. See FFATA § 2(b)(1) Internal Revenue Code of 1986.

Officer 1 Name

Officer 1 Compensation

Officer 2 Name

Officer 2 Compensation

Officer 3 Name

Officer 3 Compensation

Officer 4 Name

Officer 4 Compensation

Officer 5 Name

Officer 5 Compensation

Attachment 4
Research Subaward Agreement
Reporting & other Requirements

Pass-through Entity will check all that apply that the Subrecipient will agree to:

- A Final technical/progress report will be submitted to the Pass-through Entity's Financial Contact identified in Attachment 3 within 60 days after the end of the period of performance.
- Monthly technical/progress reports will be submitted to the Pass-through Entity's Financial Contact identified in Attachment 3, within 60 days of the end of the month.
- Quarterly technical/progress reports will be submitted within thirty (30) days after the end of each project quarter to the Pass-through Entity's Financial Contact identified in Attachment 3.
- Technical/progress reports on the project as may be required by Pass-through Entity's Principal Investigator in order that Pass-through Entity may be able to satisfy its reporting obligations to the Federal Awarding Agency.
- Annual technical /progress reports will be submitted within 60 days prior to the end of each project period to the Pass-through Entity's Financial Contact identified in Attachment 3. Such report shall also include a detailed budget for the next budget period, updated Other Support for key personnel, certification of appropriate education in the conduct of human subject research of any new key personnel, and annual IRB or IACUC approval, if applicable.
- In accordance with 37 CFR 401.14, Subrecipient agrees to notify PTE's Financial Contact identified in Attachment 3A within 60 days after Subrecipient's inventor discloses invention(s) in writing to Subrecipient's personnel responsible for patent matters. The Subrecipient will submit a final invention report using Awarding Agency specific forms to the PTE's Principal Investigator identified in Attachment 3A within 60 days of the end of the period of performance so that it may be included with the PTE's final invention report to the Awarding Agency. A negative report is is not required.
- A Certification of Completion, in accordance with 2 CFR 200.201(b)(3), will be submitted within 60 days after the end of the project period to the Pass Through Entity's Financial Contact identified in Attachment 3 (for Fixed Price subawards only.)
- Subaward Closeout Documents: (Inventions Statement & Certification, and Property Clearance Form)
Closeout documents, provided as ATTACHMENT 6, need to be completed and returned along with the Final Invoice. Negative reports are required even if there is no property, inventions or subcontracts to report.

Other Special Requirements

INVOICING:

The invoices shall be e-mailed to Subcontract.invoices@umich.edu for processing. In addition to the invoicing terms and conditions identified on face-page of the Subaward, the following also applies:

- a. A unique invoice number: Each payment request must be identified by a unique invoice number, which can only be used one time regardless of the number of Michigan contracts or orders held by an organization.
- b. Invoice period: The period for which the expenditures apply
- c. Amount actually expended according to each budget/cost category. Sufficient details must be provided within each invoice.
- d. Remittance address

Attachment 5

Cost Reimbursement Research Subaward Agreement

Statement of Work(SOW)

Cost Sharing

Budget

Statement of Work

Below or Attached 2 pages

If award is FFATA eligible and SOW exceeds 4000 characters, include a *Subrecipient Federal Award Project Description*

Statement of Work Begins on Next Page ...

Cost Sharing:

Yes, Amount \$ **\$14,760**

No

Budget Information

Below or Attached 4 pages

Pre-award authorized from March 25, 2015; No Charges are allowed prior to March 25, 2015.
Budget Begins on Next page

Indirect Cost Rate (IDC) Applied ^{81.00%} on TDC, MTDC , or other

Direct Costs
Indirect Costs
Total Costs

\$ 16,655
\$ 9,970
\$ 26,625

City of Ann Arbor Tasks

Network Communications Operation and Maintenance:

The City of Ann Arbor's primary responsibility, as a team partner on the Ann Arbor Test Bed contract and service will be to provide fiber optic backhaul, network authentication, power, connectivity and support test bed Internet Service Provider links for (IPv4 and IPv6) and provide network communications such as, SNMP traps/monitoring/alerting (once configured and enabled on the infrastructure equipment).

The UMTRI Infrastructure team, led by Parsons Brinkerhoff and supported by the City of Ann Arbor, will perform any necessary network configuration changes or modifications to maintain network connectivity and backhaul for Ann Arbor CVTE including operations and maintenance of primary network switches and edge switches housed in traffic signal cabinet enclosures.

Test Environment Maintenance:

The City of Ann Arbor will assist other project Partners maintaining, operating, and sustaining the Ann Arbor Connected Vehicle Test Environment. This includes ensuring that all equipment has updated software and firmware installed along with performing any necessary troubleshooting and remediation of issues identified. The equipment to be maintained in the test environment includes:

- 25 Roadside Equipment Installations
- 2,000 Basic Safety Message (BSM) transmit-only devices or more deployed at any given time
- 200 BSM transmit and application hosting devices or more deployed at any given time

Roadside Equipment Installations:

The UMTRI Infrastructure team, led by Parsons Brinkerhoff and supported by the City of Ann Arbor, MDOT, and Savari Networks, will perform operations and maintenance for all RSE/RSU devices. The work as part of this contract, the Ann Arbor CVTE, will utilize equipment initially installed, configured and maintained as part of the USDOT Safety Pilot project. Equipment installation components that will be maintained under the Ann Arbor Test bed project include:

- Three freeway WSA sites using three Savari RSEs using USDOT RSE 3.0 specification equipment;
- Three curve speed warning sites using four Savari RSEs (including one additional RSE as a staging test unit) using USDOT RSE 3.0 specification equipment;
- Six SPaT/GID sites along Fuller Road using eight Savari RSEs (including one additional RSE as staging test unit) using USDOT RSE 3.0 specification equipment and integrated with Econolite Traffic Signal Controllers;

- Six SPaT/GID sites along Plymouth Road using six Savari RSEs (including one additional RSE as a staging test unit) using Savari RSE 3.0 specification equipment and integrated with Siemens Traffic Signal Controllers;
- Seven WSA sites using seven Savari RSEs using USDOT RSE 3.0 specification equipment; and
- Two lab test sites using two Savari RSE 3.0 specification equipment (one at UMTRI, the other as a bench set-up at the City of Ann Arbor Wheeler facility).

Support Equipment Replacement:

Spare units will be used to replace any units damaged beyond repair in the field. The field replacements and repairs will be handled directly by Savari, the manufacturer, at the request of the UMTRI Infrastructure team. The City of Ann Arbor will assist the UMTRI Infrastructure with any required maintenance and device installation support, such as removing and/or replacing damaged or non-functioning equipment.

The timing for the infrastructure is to begin installations in the spring of 2015, weather dependent. The plan is to have all major roads and intersections within the City limits equipped with RSUs by the fall of 2017.

Expanding the Current Infrastructure Footprint:

The City will assist the UMTRI Infrastructure Team with adding as many as 45 additional infrastructure sites, at a rate of 15 to 20 sites per year. The sites where fiber optic backhaul already exists will be completed first. Those sites will include the expansion to all of Washtenaw Avenue, Stadium Boulevard, the Packard/Eisenhower corridor, and the Main/Saline corridor.

Additionally, the fiber optic backhaul will be expanded to include Huron Parkway, 7th Street, and Pauline Avenue. The University and the City of Ann Arbor are actively working together to integrate their fiber networks in order to leverage one another's assets. So expansion of the fiber backhaul in the City will ultimately be a combination of dedicated, shared, and leased network infrastructure.

 Proposal (volume I & II) submitted by UMTRI in Response to DTFH61-14-RA-00002, Maintain, Operate & Sustain Ann Arbor Test Environment is incorporated herein by reference.

CITY OF ANN ARBOR FEDERAL BUDGET
to University of Michigan Transportation Research Institute
for inclusion in the USDOT - Federal Highway Administration RFA to
"Maintain, Operate, and Sustain the Ann Arbor Test Environment"

YEAR 1		WA1: Operate and Maintain Test Environment						WA2: Upgrade Infrastructure & Security in Test Environment Operations										Total WA2: Upgrade Infrastructure & Security in Test Environment Operations		WA3: Plan & Develop a Sustainable Operational Environment		WA4: Support Other Related Research Activities		TOTAL BUDGET										
		Data Collection & Mgmt		Test Environment Maintenance		IRB & Subject Mgmt		Total WA1: Operate and Maintain Test Environment		Improving Device Robustness		Improving Quality of the Environment		Improving ASD DVI to Support Future Testing		Transition to CVRA		Transition to RSU 4.0 & Expand Current Infrastructure Footprint		Increasing Vehicle Deployments		Conducting Focused Research		Total WA2: Upgrade Infrastructure & Security in Test Environment Operations		WA3: Plan & Develop a Sustainable Operational Environment		WA4: Support Other Related Research Activities		Hourly Rate	Hrs	Amt		
Name*	Project Role	Hourly Rate	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt				
Les Sioswki	Engineer	\$43.53	0	0	8	348	0	0	8	348	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$43.53	8	348	
Jeremy Sype	Electrician	\$25.77	0	0	15	387	0	0	15	387	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$25.77	15	387	
John Tomich	Electrician	\$27.63	0	0	15	414	0	0	15	414	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$27.63	15	414	
Robert Medaugh	Electrician	\$29.80	0	0	15	447	0	0	15	447	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$29.80	15	447	
Beth Nieman	Electrician	\$27.64	0	0	15	415	0	0	15	415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$27.64	15	415	
Dennis Fischer	Electrician	\$32.87	0	0	15	493	0	0	15	493	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$32.87	15	493	
Terry Clark	Electrician	\$32.87	0	0	15	493	0	0	15	493	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$32.87	15	493	
Tim Pagan	Electrician	\$32.87	0	0	15	493	0	0	15	493	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$32.87	15	493	
Kevin Brain	Electrician	\$32.87	0	0	40	1,315	0	0	40	1,315	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$32.87	40	1,315	
Stephen Longworth	Electrician	\$27.64	0	0	15	415	0	0	15	415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$27.64	15	415
Russell Hanshue	Project Manager	\$47.74	0	0	12	573	0	0	12	573	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$47.74	12	573	
Dave Harris	Network Administration	\$38.39	0	0	12	461	0	0	12	461	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$38.39	12	461	
William Duff	Network Administration	\$35.70	0	0	12	428	0	0	12	428	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$35.70	12	428	
Brian Klinge	Electrician	\$31.30	0	0	10	313	0	0	10	313	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$31.30	10	313	
Chuck Fojtik	Field Operations Supervisor	\$36.31	0	0	10	363	0	0	10	363	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$36.31	10	363	
		\$0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$0.00	0	0	
Total Salaries					224	7,357	0	0	224	7,357	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	224	7,357		
Average Fringe Benefits		0%			0	0			0	0																					0	0		
Average Fringe Benefits		67.3%			4,952	0			4,952	0																					4,952	0		
FICA (Temp)		7.5%			0	0			0	0																					0	0		
Subtotal Labor					0	12,309	0	0	12,309	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12,309	0		
Equipment					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Subtotal Equipment					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Other Direct Costs																																		
1800 1999 Air Compressor		7.71	0	0	10	77	0	0	10	77	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77	0		
2292 2009 Ford F-250		8.11	0	0	10	81	0	0	10	81	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81	0		
4240 2009 Dodge Caravan		14.25	0	0	10	143	0	0	10	143	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	143	0		
4247 2009 Ford F-250		10.11	0	0	10	101	0	0	10	101	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	101	0		
4248 2006 GMC C-1500		4.58	0	0	10	46	0	0	10	46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46	0		
4272 2006 GMC Sierra		10.35	0	0	10	104	0	0	10	104	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104	0		
4364 Cable Trail Trailer		3.21	0	0	10	32	0	0	10	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	32	0		
4404 1999 Trailer		5.98	0	0	10	60	0	0	10	60	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60	0		
4405 2001 Reel Trailer		12.53	0	0	10	125	0	0	10	125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125	0		
4412 2005 Trailer		6.9	0	0	10	69	0	0	10	69	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	69	0		
4502 2001 Dump Truck		23.9	0	0	10	239	0	0	10	239	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	239	0		
4505 2013 Dump Truck		13.6	0	0	10	136	0	0	10	136	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	136	0		
4603 2000 Ford F-750		40.89	0	0	14	572	0	0	14	572	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	572	0		
4612 Platform Truck		47.36	0	0	15	710	0	0	15	710	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	710	0		
4616 Bucket Truck		22.99	0	0	13	299	0	0	13	299	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	299	0		
4617 2011 Ford F-750		19.18	0	0	15	288	0	0	15	288	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	288	0		
4782 Trencher		157.89	0	0	5	789	0	0	5	789	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	789	0		
6613 2013 Ford F-750		31.65	0	0	15	475	0	0	15	475	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	475	0		
					0	4,346	0	0	4,346	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,346	0		
Travel					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Subtotal Travel Costs					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total Direct Cost					0	16,655	0	0	16,655	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16,655	0		
Indirect Costs	</																																	

CITY OF ANN ARBOR
COST SHARE BUDGET
to University of Michigan Transportation Research Institute
for inclusion in the USDOT - Federal Highway Administration RFA DTFH6114RA00002
to "Maintain, Operate, and Sustain the Ann Arbor Test Environment"

TOTAL BUDGET		WA1: Operate and Maintain Test Environment								WA2: Upgrade Infrastructure & Security in Test Environment Operations								Total WA2: Upgrade Infrastructure & Security in Test Environment Operations		WA3: Plan & Develop a Sustainable Operational Environment		WA4: Support Other Related Research Activities		TOTAL BUDGET												
		Data Collection & Mgmt		Test Environment Maintenance		IRB & Subject Mgmt		Total WA1: Operate and Maintain Test Environment		Improving Device Robustness		Improving Quality of the Environment		Improving ASD DVI to Support Future Testing		Transition to CVRBA		Transition to RSU 4.0 & Expand Current Infrastructure Footprint		Increasing Vehicle Deployments		Conducting Focused Research		Hrs		Amt		Avg Pay Rate		Hrs		Amt				
Name*	Project Role	Ave Pay Rate	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Hrs	Amt	Avg Pay Rate	Hrs	Amt					
0	0	Varied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
0	0	Varied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
0	0	Varied	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Total Salaries			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
<i>Sick/Vacation/Holiday (POGL)</i>		27%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
<i>Fringes Benefits (Permanent Staff)</i>		30%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
<i>FICA (Temps)</i>		7.56%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Subtotal Labor			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Equipment			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Subtotal Equipment			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Direct Costs			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fiber wire usage			14,760	0	0	0	0	14,760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,760
Subtotal Other Direct Costs			14,760	0	0	0	0	14,760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,760
Travel			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Travel Costs			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Direct Cost			14,760	0	0	0	0	14,760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,760
In-kind Cost Share			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal In-kind Cost Share			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indirect Costs		81.0%	11,956	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimated Total Cost			26,716	0	0	0	0	14,760	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14,760

CITY OF ANN ARBOR
COST SHARE BUDGET
 to University of Michigan Transportation Research Institute
 for inclusion in the USDOT - Federal Highway Administration RFA DTFH6114RA00002
 to "Maintain, Operate, and Sustain the Ann Arbor Test Environment"

YEAR 1		WA1: Operate and Maintain Test Environment								WA2: Upgrade Infrastructure & Security in Test Environment Operations										Total WA2: Upgrade Infrastructure & Security in Test Environment Operations		WA3: Plan & Develop a Sustainable Operational Environment		WA4: Support Other Related Research Activities		TOTAL BUDGET									
		Data Collection & Mgmt			Test Environment Maintenance		RS & Subject Mgmt			Total WA1: Operate and Maintain Test Environment		Improving Device Robustness		Improving Quality of the Environment		Improving ASD DVI to Support Future Testing		Transition to CVRA		Transition to RSU 4.0 & Expand Current Infrastructure		Increasing Vehicle Deployments		Conducting Focused Research		Total WA2: Upgrade Infrastructure & Security in Test Environment Operations		WA3: Plan & Develop a Sustainable Operational Environment		WA4: Support Other Related Research Activities		Avg Pay Rate	Hrs	Amount	
Name*	Project Role	Ave Pay Rate	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Hrs	Amount	Avg Pay Rate	Hrs	Amount				
0	0	\$0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	\$0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
0	0	\$0.00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total Salaries			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Sick/Vacation/Holiday (POOL)</i>		27%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<i>Fringes Benefits (Permanent Staff)</i>		30%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>FICA (Temps)</i>		7.56%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Subtotal Labor			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Equipment			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Equipment			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Direct Costs																																			
Fiber wire usage				4,920	0	0	0	4,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,920
Subtotal Other Direct Costs				4,920	0	0	0	4,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,920
Travel			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal Travel Costs			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Direct Cost				4,920	0	0	0	4,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,920
In-kind Cost Share			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal In-kind Cost Share			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Indirect Costs		81.0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Estimated Total Cost				4,920	0	0	0	4,920	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4,920

PROPERTY CLEARANCE FORM

Reference: Research Subaward/Subcontract # _____ from the University of Michigan.

The following information is required for Property Clearance on the above referenced Subaward/Subcontract:

- 1) There was was not fabricated equipment of a permanent and useful nature generated under this agreement. If so, describe briefly:

- 2) There was was not residual inventory of unused supplied and other expendable property exceeding \$5,000 in total aggregate value remaining upon termination or completion of the project (OMB A-110), Subpart C-35, supplies and other expendable property). If so, describe briefly:

- 3) List any and all items of equipment acquired under this Subaward/Subcontract:

<u>Equipment</u>	<u>Manufacturer's Name & Model #</u>	<u>Date Acquired</u>	<u>Purchase Price</u>	<u>Serial #</u>

SUBCONTRACTOR: _____

AUTHORIZED SIGNATURE: _____

TITLE: _____ DATE: _____