

**Performance Indicators for University Transportation Centers (UTCs)
Reporting Period 1: January-December 2012**

Part I – Program-Wide Indicators

Report the program-wide indicator metrics for the completed grant year and for the institution(s) comprising your UTC, unless the indicators are included in Part II below.
In the event that a sub-grantee university participates in more than one UTC, include only the metrics corresponding with your grant.

| Program-wide Indicators | |
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| 1. Number of transportation-related courses offered during the reporting period that were taught by faculty and/or teaching assistants who are associated with the UTC. · Undergraduate courses _____ 40 _____ · Graduate courses _____ 40 _____ | |
| 2. Number of students participating in transportation research projects funded by this grant. · Undergraduate students _____ None _____ · Graduate students _____ 8 _____ | |
| 3. Number of transportation-related advanced degree programs that utilize grant funds to support graduate students. · Master's Level Programs <u>Three, one at each consortium university (TISE @ VTTI; NRC @ Morgan State, and CTS @ UVA)</u> · Doctoral Level Programs <u>Three, one at each consortium university (TISE @ VTTI; NRC @ Morgan State, and CTS @ UVA)</u> | |
| 4. Number of graduate students supported by this grant. · Master's Level Students Supported _____ 18 _____ · Doctoral Level Students Supported _____ 31 _____ | |
| 5. Number of students supported by this grant who received degrees. · Master's Level Degrees _____ None _____ · Doctoral Level Degrees _____ None _____ | |
| 6. Number and total dollar value of research projects selected for funding using UTC grant funds (Federal and/or Recipient Share) that you consider to be applied research and advanced research: · Applied research projects & dollar value _____ 6 projects; \$529,868.00 _____ · Advanced research projects & dollar value _____ 4 projects; \$945,847.00 _____ | |

Part II – UTC-Specific Indicators

Report here the annual performance metrics that you identified in your application for each category below, include the description of the indicator and the corresponding metric.
In the event that a sub-grantee university participates in more than one UTC, include only the metrics corresponding with your grant.

| Category | Metrics with Descriptions from FY 2011 Grant |
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| 1. Research Capability | Like any university center, the CVI-UTC will have traditional metrics of performance, including refereed publications, invited presentations, and completed student theses and dissertations. |

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| | <ul style="list-style-type: none"> - Refereed Publications: 3 - Invited Presentations: 3 - Completed student theses and dissertations: 0 <p>In 2012, the CVI-UTC was initially established, so our numbers for these metrics are quite low, as we had to build the testbed and vehicle fleets in order to perform research, we were able to get a few presentations out to conferences and public, but not as much as we would have liked given our research plans and goals.</p> <p>In addition, related metrics such as technology disclosed or patented would also be important.</p> <ul style="list-style-type: none"> - Technology disclosed or patented: 0 <p>Again, having just purchased and installed the testbed and vehicle fleet equipment, we were unable to develop any new technology at this time, however there are several projects in place, such as developing cell phone technology and work zone safety DSRC enabled vests, to name a few.</p> <p>Additionally, the Consortium will track and report metrics specific to the theme of the CVI-UTC, including the number of V2V and V2I applications developed, improved, successfully evaluated, and deployed. Specific research results that impact the design of such applications will also be reported such as guidelines to reduce driver distraction, impacts of market penetration, and driver acceptance. By including these types of measures, the CVI-UTC can make the greatest impact on not only the scientific community but also on the progress of deploying CVI technology by both the private and public sectors.</p> <ul style="list-style-type: none"> - Number of V2V and V2I applications developed/improved/successfully evaluates/deployed: 0 <p>This is another area, that while 19 projects are currently working on this particular metric – none of them are completed to deployment, although this is something we aim to have completed by the end of the grant in 2016 (hopefully sooner if possible!), but going from development to deployment will be the most time-consuming metric that we have offered for evaluation.</p> |
| <p>2. Leadership</p> | <p>In addition to the traditional UTC performance metrics described in the other sections of this proposal (e.g., publications, students graduated, patents awarded, etc.) the Consortium will specifically track several measures that relate to the CVI-UTC impact upon the national and international transportation communities. These measures include: growth in both private and public sector partners and stakeholders; numbers of applications developed, improved or evaluated that are adopted (or planned for future adoption) by private or public sector entities; and impacts on the design of deployed (or pre-deployment) CVI technologies.</p> <ul style="list-style-type: none"> - Impact upon the national and international transportation communities: participated in events like TRB Annual Meeting, ITS Meeting in Vienna, and ITS Meeting in National Harbor, MD – at each national and international meeting, we had at least three researchers presenting connected vehicle-infrastructure work, and a booth featuring CVI-UTC developed technology and poster presentations at the national conferences. |

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| | <ul style="list-style-type: none"> - Growth in both private and public sector partners and stakeholders: There was a gain of new partnerships with wireless communication companies like Raytheon, Cox Communications, Qualcomm, Nokia, and Square E. Qualcomm also joined the advisory board for the CVI-UTC. - Number of applications developed, improved, or evaluates that are adopted (or future adoption) by public and private sector entities: None, yet. - Impacts on the design of deployed (pre-deployment) CVI Technologies: We currently work with Savari on developing better testbed and vehicle fleet ideas as we work through several communication and connectivity issues. We have therefore been able to improve Savari's Streetline and MobiWAVE systems but working together. <p>Because the CVI-UTC was funded for the first time this year, a lot of these performance metrics are also low, but expected to improve and increase as research is concluded, but right now, research is still in the beginning stages – so we anticipates to have a greater impact next year.</p> |
| <p>3. Education and Workforce Development</p> | <p>The performance metrics that will be used to measure the effectiveness of the CVI-UTC's education and workforce development activities include: a) The number of graduate students funded under the program; b) The number of M.S. and Ph.D. graduates each year; c) A tracking of the placement of the graduate students after completion of their degree; d) The number of summer internships offered to undergraduate students; e) The number of under-represented students funded by the CVI-UTC; f) The number of continuing education short-course offerings and the number of attendees; and g) The number of K-12 students attending the School Day event. These statistics will be compiled on an annual basis, and mid-course adjustments may be made to address any deficiencies in achieving the desired measures.</p> <ul style="list-style-type: none"> - Number of graduate students funded under the UTC: 49 - Number of M.S. and Ph.D. graduates: 0 - Placement after graduation: 0 - Summer internships offered to undergraduate students: 0 - Number of underrepresented students funded under the UTC: 31, the majority of funded students are non-white, or female graduate students due to the consortium partnership and the commitment of the UTC to support underrepresented students in STEM education and careers. - Number of short courses: 10 - Number of K-12 students attending School Day: 235 <p>Because this is the first year of our UTC program, we do not have any graduates to report at this time – however we anticipate that over the next four years of the life of the grant that we will be able to graduate and place all of the students that we support through the UTC program. Also, our focus has been graduate and professional development, so there is no undergraduate data to report at this time, but it is something we will be focusing on in the future.</p> |
| <p>4. Technology Transfer</p> | <p>Performance metrics that the CVI-UTC will use to assess the progress of technology transfer activities include: the number of CVI applications developed that result in IP that is either solely developed by the Consortium or developed in conjunction with its public and private sector partners; the number of outside universities participating in the CVI-UTC open solicitation and their progress in developing or improving CVI applications; and the number of participants attending Center workshops, short courses and distance learning opportunities.</p> <ul style="list-style-type: none"> - Number of CVI applications developed that result in IP: 0 - Number of outside universities participating in open solicitation: 3 - Number of outside universities developing or improving CVI applications: 0 - Number of participants attending educational events: 850 |

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| | <p>Intellectual property has not been developed yet because no research is complete enough in order to register it, but it is anticipated that this will occur before the end of the grant in 2016. Several universities have either spontaneously applied in the open solicitation like Villanova and Montana State, and other have been sought out for partnership like Carnegie Mellon, Clemson, and George Mason – all through existing partnerships with the consortium university partners. Finally, we have been very successful at holding educational and outreach events at TRB, and through each university UTC educational programs, we seek to increase our efforts in research, as our outreach and education has had such an interest.</p> |
| <p>5. Collaboration</p> | <p>The CVI-UTC Consortium will carefully track the success of collaboration within the Center. These metrics will be reviewed on a monthly basis and will be used to serve as benchmarks when identifying new projects:</p> <ul style="list-style-type: none"> • Size of advisory board – As described in the previous section, the advisory board of the CVI-UTC will grow as collaborative outreach efforts progress. 12 members from groups like Denso, Savari, Kapsch, Volvo, Toyota, Fairfax County and VDOT/VCTIR. • Number of comments received from advisory board members – Beyond the size of the board, the level of activity will be tracked. Quarterly meetings and voting on research are held with the advisory board – there are numerous comments requested by board members as to research and funding goals, however, an exact number has not been tabulated due to the nature of the meeting where collaboration and participation are very high. <p>Average number of investigators per project – Each project will include at least one member from each of the core partners. However, given the breadth of connected-vehicle activities, it will be important to include a variety of investigators from each consortium member. 2-4; there is generally a PI or co-PI team between consortium universities, with at least 1 or 2 graduate students taking on lead research roles in each of the 19 projects.</p> |