

**Performance Indicators for University Transportation Centers (UTCs)
Reporting Period 2: January-December 2013**

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
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 _____ <u>50</u> _____ · Graduate courses _____ <u>50</u> _____
2. Number of students participating in transportation research projects funded by this grant. · Undergraduate students _____ <u>None</u> _____ · Graduate students _____ <u>14</u> _____
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 _____ <u>27</u> _____ · Doctoral Level Students Supported _____ <u>24</u> _____
5. Number of students supported by this grant who received degrees. · Master's Level Degrees _____ <u>None</u> _____ · Doctoral Level Degrees _____ <u>None</u> _____
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 _____ <u>6 projects; \$881,987.00</u> _____ · Advanced research projects & dollar value _____ <u>2 projects; \$299,733.00</u> _____

2013 Consortium University Demographic Information:

	Virginia Tech	University of Virginia	Morgan State University
Tenure and Tenure-track Engineering Faculty	10	15	-
Master's Students Enrolled *	277	65	-
Master's Degrees Awarded *	64	53	-

Doctoral Students Enrolled *	138	20	-
Doctoral Degrees Awarded *	26	12	-
Transportation Graduate-level Courses	30	17	-
Students Funded by Assistantships or Scholarships +	100	50	-
Undergraduate Students Enrolled in Engineering	6,880	2,399	657
Graduate Students Enrolled in Engineering	2,140	621	78
Total Undergraduate Enrollment	23,856	14,641	6,591
Total Graduate Enrollment	6,808	6,454	1,361
Total University Enrollment	31,087	21,095	7,952

*During the past five years, transportation-related fields only

+ Annual Average

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 2013 Grant
1. Research Capability	<ul style="list-style-type: none"> • Number of inner-consortium research papers received and funded: 120 received, 19 funded; additional research will be funded in 2014, with each project being 1-2 year long and an average of \$150K-\$200K per project, all because of UTC funding. • Number of outside university submission for research participations in the CVI-UTC and utilizing CVI-UTC resources, such as the CV Fleet and the two testbeds: 20, from 6 different outside universities. There are no current outside university beneficiaries of the UTC, but it is a goal set for the 2014 research funding protocol through the advisory board. • Number of outside university collaborations on research with CVI-UTC consortium researchers: 0, none through direct funding, yet. • Number of members: stakeholders, subject matter experts, and researchers participating in the CVI-UTC: 14, 2 more than the previous year. • Number of graduate students participating in and taking a lead role in a CVI-UTC research project: 14, with half of those participating in a PI or Co-PI role. • Number of research teams and research papers from the CVI-UTC that is recognized and accepted by national and international transportation conferences and institutions: 9,

	<p>there have been several papers accepted in national conferences like TRB annual meeting, and the ITS meeting in Tokyo by UTC research teams.</p>
<p>2. Leadership</p>	<p>In addition to the traditional UTC performance metrics described previously (e.g., publications, students graduated, patents awarded, etc.), the Consortium will track several measures that relate to the CVI-UTC impact upon the national and international transportation communities. These measures include: a) growth in both private and public sector partners and stakeholders; b) numbers of CVI applications developed, improved, or evaluated that are adopted (or planned for future adoption) by private or public sector entities; and c) impacts on the design of deployed (or pre-deployment) CVI technologies.</p> <ul style="list-style-type: none"> - Growth in both private and public sector partners and stakeholders: Partnerships have been formed with organizations like AASHTO, FHWA, the Motorcycle Safety Foundation, and the Virginia Transportation Museum. - Number of CVI applications, developed, improved, or evaluated that are adopted (future adoption): 0, this still has not occurred yet, due to research that is still ongoing and not ready for adoption. - Impacts on design of deployed (pre-deployment) CVI Technologies: We are still work closely with Savari in resolving our database and long-distance communications problems with getting our Northern Virginia data sent and housed to Blacksburg and coincide with the Blacksburg/Smart Road data. It has allowed us to make a lot of progress in IPV4 to IPV6 transitions and offer suggestions to the Northern Virginia VDOT engineers who work in highway connectivity.
<p>3. Education and Workforce Development</p>	<p>The performance metrics that are currently tracked by the consortium universities and that will be used to measure the effectiveness of the CVI-UTC 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 degrees; 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: 51 - Number of M.S. and Ph.D. graduates: 2 - Placement after graduation: Both graduate have jobs lined up at private consulting firms or engineering practices. - Summer internships offered to undergraduate students: 0 - Number of underrepresented students funded under the UTC: 29, 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: 12 - Number of K-12 students attending School Day: 215 <p>To enhance School Day outreach an event has been planned for specific high school safety and workforce development outreach that</p>

	<p>will serve up to 2000 newly licensed high school drivers in the VA-MD-DC area. This event was originally planned to take place in 2013, but has been moved to 2014 in order to accommodate the completion of research and seeking additional participants for more data. The undergraduate fellowship program is also being developed with help from the Virginia Tech Summer Undergraduate Research Fellowship (SURF) Program, in order to develop a Transportation-similar program called "TURF" and will allow for an assist with recruitment and development in February 2014 to coincide with the current programming.</p>
<p>4. Technology Transfer</p>	<p>Performance metrics that the CVI-UTC uses to assess the progress of technology transfer activities include: a) 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; b) the number of outside universities participating in CVI-UTC open solicitations and their progress in developing or improving CVI applications; and c) 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: 6 - Number of outside universities developing or improving CVI applications: 0 - Number of participants attending educational events: 1100 <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. Outside university participation has been a goal, but still a challenge in gaining more participation, research projects are evaluated by the advisory board based purely on merit of high quality research design and novel ideas in CVI, it has been discussed a training or mentoring program for consortium an outside universities in order to help write better proposals and develop research ideas that are sought out after by real world problems and private/public partnership goals. Finally, we have been very successful at holding educational and outreach events at TRB, and through each university UTC educational programs, and especially our live testbed and vehicle fleet demonstration in Washington DC and Northern Virginia (we are particularly proud of our advancements in this area, as it has led to more invitations to do more work and demonstrations for future partners and national leaders) 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. The following metrics will be reviewed on a monthly basis and will be used 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. 14 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

	<p>nature of the meeting where collaboration and participation are very high.</p> <ul style="list-style-type: none">● 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.
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