AASHTO Technology Implementation Group

Nomination of Technology Ready for Implementation

2012 NOMINATIONS DUE BY FRIDAY, SEPTEMBER 16, 2011

<table>
<tr><td rowspan="8">Sponsor</td><td rowspan="8">Nominations <u>must</u> be submitted by an AASHTO member DOT willing to help promote the technology.</td><td colspan="3">1. Sponsoring State DOT: California</td></tr>
<tr><td colspan="3">2. Name: Larry Orcutt</td></tr>
<tr><td colspan="3">Title: Chief, Division of Research and Innovation</td></tr>
<tr><td colspan="3">Mailing Address: P.O. Box 942873, MS-83</td></tr>
<tr><td>City: Sacramento</td><td>State: CA</td><td>Zip Code: 94273-0001</td></tr>
<tr><td>E-mail:
larry_orcutt@dot.ca.gov</td><td>Phone: (916) 654-8877</td><td>Fax: (916) 657-4677</td></tr>
<tr><td colspan="3">3. Date Submitted: 09/09/2011</td></tr>
<tr><td colspan="3">4. Is the Sponsoring State DOT willing to promote this technology to other states by participating on a Lead States Team supported by the AASHTO Technology Implementation Group?
Please check one: ☒ Yes ☐ No</td></tr>
<tr><td rowspan="3">Technology Description (10 points)</td><td rowspan="3">The term “technology” may include processes, products, techniques, procedures, and practices.</td><td colspan="3">5. Name the technology: Smart Cushion Impact Attenuator</td></tr>
<tr><td colspan="3">6. Please describe the technology:
The Smart Cushion Impact Attenuator is a severe duty crash attenuator that can withstand roadway design speed frontal and side impacts without damaging system components. This provides lower repair parts costs compared to systems that are damaged in similar impact conditions. The Smart Cushion passed the requirements for crash attenuators as specified in the National Cooperative Highway Research Project (NCHRP) Report 350, "Recommended Procedures for the Safety Performance Evaluation of Highway Features" test level 3, in 2003.

Cost Savings and Improved Worker Safety:

The Smart Cushion was designed to only require two shear bolts to restore the unit back to full function after a design criteria impact. providing the following benefits over other lower severity rated attenuator systems:
1. Reduces worker exposure due to fewer repair parts and repairs normally take under 30 minutes.
2. Few repair parts allows workers to quickly repair the Smart Cushion which puts the attenuator back in service and reduces the traveling publics' exposure to repair vehicles and lane closures. Sometimes it is possible to repair the Smart Cushion during incident management which may eliminate a site visit and associated lane closure.
3. Quick repairs lowering labor and equipment costs when compared to lower severity rated systems.
4. The side panel design and supporting structure of the Smart Cushion eliminates damage from side impacts within design criteria. Reducing repairs needed for side impacts results in a cost savings, as well as improved worker and public safety.
5. No police reports for injuries or deaths have been filed.</td></tr>
<tr><td colspan="3">7. If appropriate, please attach photographs, diagrams, or other images illustrating the appearance or functionality of the technology. (If electronic, please provide a separate file.)
Please check one: ☒ Yes, images are attached. ☐ No images are attached.</td></tr>
<tr><td rowspan="2">State of Development (30 points)</td><td rowspan="2">Technologies must be successfully deployed in at least one State DOT. The TIG selection process will favor technologies that have advanced beyond the research</td><td colspan="3">8. Please describe the history of the technology’s development.
The Smart Cushion passed the requirements for crash attenuators as specified in NCHRP Report 350, in 2003. The Smart Cushion (SCI-1000GM) was approved for use by Caltrans in 2006 and has been installed in a number of Districts. It has also been installed other states.</td></tr>
<tr><td colspan="3">9. For how long and in approximately how many applications has your State DOT used this technology?
The Smart Cushion was first installed in California in November of 2006. There are approximately 140 installed on California roads. These are located throughout the state with concentrations in District 4 and 7 (San Francisco and LA, respectively).</td></tr>
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	stage, at least to the pilot deployment stage, and preferably into routine use.	10. What additional development is necessary to enable routine deployment of the technology? The Smart Cushion is available commercially as well as installation and repair support. It has been successfully deployed by Caltrans, however additional outreach to traffic designers would improve deployment, where appropriate. Marketing and exposure to make others aware of the potential for lower costs and increased safety is needed. For non-competitive bids
		11. Have other organizations used this technology? Please check one: ☒ Yes ☐ No If so, please list organizations and contacts.

Organization	*Name*	*Phone*	*E-mail*
Florida	Stephanie Maxwell	8504144314	stefanie.maxwell@dot.state.fl.us
Wisconsin	Kevin Peiffer	4147501408	kevin.peiffer@dot.state.wi.us
Kansas	Rod Lacy	7852963901	rlacy@ksdot.org
Iowa	Chris Poole	5152391864	chris.poole@dot.iowa.gov

Payoff Potential (30 points)	*Payoff is defined as the combination of broad applicability and significant benefit or advantage over other currently available technologies.*	12. How does the technology meet customer or stakeholder needs in your State DOT or other organizations that have used it? The major benefit is safety to the traveling public. There have been no reports of deaths or injuries related to hitting the Smart Cushion. It provides excellent life cycle cost for high hit locations. It is able to absorb full design impacts with minimal hardware damage and allows for straight forward resetting by crews. A benefit is the low repair costs and speed at which the attenuator can be back in full service after an impact.
		13. What type and scale of benefits has your DOT realized from using this technology? Include cost savings, safety improvements, transportation efficiency or effectiveness, environmental benefits, or any other advantages over other existing technologies. Estimated saving on frontal impacts is $2.7M. Additional side impact savings are estimated at $1.4M+. An estimated 370 crew dispatches were not required because of no damage on side impacts. For estimated repairs, there are savings on frontal impacts and side impacts when compared to alternate attenuators. Savings can be significant due to the low cost of repair parts (approximately $40), decreased repair time (usually under 30 minutes) and reduced worker exposure. It is possible to repair the attenuator during incident management thereby eliminiting a future site visit and lane closure.
		14. Please describe the potential extent of implementation in terms of geography, organization type (including other branches of government and private industry) and size, or other relevant factors. How broadly might the technology be deployed? This technology can be used on Interstate, State, County and City roadways. Caltrans uses it in areas with high potential for impacts.
Market Readiness (30 points)	*The TIG selection process will favor technologies that can be adopted with a reasonable amount of effort and cost, commensurate with the payoff potential.*	15. What actions would another organization need to take to adopt this technology? The Smart Cushion is available commercially. Other organizations can purchase or specify it in a contract. Have it placed on a state's approved product list. Produce a public interest finding for the use of federal funds. Conduct pilot projects.
		16. What is the estimated cost, effort, and length of time required to deploy the technology in another organization? The Test Level-3 Smart Cushion (SCI-1000GM) has a published list price of $20,200. Installation costs are similar to other attenuators with concrete foundation, in the range of $1000 to $5000. The system can be installed as part of a improvement program, construction contract or as part of a maintenance project. The system is particulaly suited for higher hit locations (severe duty). Maintenance Training can be done in about 20 minutes and after the first repair, assistance is usually not needed.
		17. What resources—such as technical specifications, training materials, and user guides—are already available to assist deployment? NCHRP 350 test results, drawings, manuals, training materials, videos and design/installation guides are all available.

		18. What organizations currently supply and provide technical support for the technology? Work Area Protection Corporation and their distribution network provide technical support, maintenance training and sales support.
		19. Please describe any legal, environmental, social, intellectual property, or other barriers that might affect ease of implementation. This is a proprietary product that may require a public interest finding when using federal funds if the product is acquired as a sole source (without two alternate products listed).
Submit Completed form to		***http://transportation1.org/tig_solicitation/Submit.aspx***