



## Technology Transfer Plan for the Center for Safety Equity in Transportation

Submitted by

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# CSET UTC Technology Transfer Plan

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## INTRODUCTION

This document provides Technology Transfer Plan (T2P) information related to Center for Safety Equity (CSET) UTC projects. CSET is committed to a strong program of technology transfer directed toward:

1. Broader communities of transportation professionals and road users interested in learning and employing technology and solutions to rural transportation safety problems;
2. Industry partners interested in developing and marketing the technological solution packages;
3. Transportation researchers and technology developers motivated to improve technologies and solution packages; and
4. Public decision makers and the public needing to understand how technology and solution packages affect safety and/or public policy.

It is estimated that only 30 percent of research is adopted. Contributing to this problem are five major barriers which hinder the technology transfer process:

1. Stakeholders don't know the research exists
2. Research products are not in an implementable form
3. Lack of resources for implementation including funding and training
4. Research outcomes are often inconsistent with local culture, policies and procedures
5. University tenure and promotion criteria typically do not value implementation activities

While CSET has no authority to insist stakeholders adopt research outcomes, CSET recognizes that it can, by overcoming these barriers, influence the adoption of its research by those stakeholders. CSET also recognizes that inclusion in the development of the research creates ownership of that research thereby increases the probability of adoption. It is important that stakeholders want to implement innovative ideas because it is in their best interest to do so.

The only practical means of breaking down the fifth barrier is to make implementation activities a condition of the project funding and to directly fund implementation projects. CSET will work directly with researchers to ensure they understand the importance of implementation activities.

It is also important to recognize that the impacts of research take time. Furthermore, the nature of research and the adoption of research products and their derivatives are subject to the fact that:

- Implementation is rarely linear.
- Public policy is weakly based on research due to political pressures and informational gaps.
- Decision makers rarely understand science.
- Acceptance of innovative ideas is often delayed due to misconceptions, conflict with current policies and procedures and cost.

Consequently, while the research outcomes are often ultimately adopted, the timeline may well be outside the term of this grant. This T2P is intended to provide a means by which to measure the progress and impact of the CSET UTC by defining center-wide targets and objectives. Ultimately, we intend for the methods and requirements outlined in this T2P will help to facilitate the adoption of research products generated by CSET. This T2P provides guidance for Principal Investigators both during and after the completion of CSET research projects on dissemination and sharing of research results



and the development and potential adoption of each project's products. More broadly, the primary goal of the CSET UTC is to reduce transportation-related fatalities and injuries in rural, tribal, indigenous, and isolated areas; the following document is designed with that objective in mind.

#### PROPOSAL IMPLEMENTATION PLAN REQUIREMENTS

All research proposals submitted to CSET must include an *Implementation* section that identifies how the project will address the tasks and performance measures as outlined herein.

Each research proposals must, at minimum, include a brief description of how a project will adhere to this implementation plan in the *Tasks and Deliverables* section. CSET proposals must clearly state the need for adoption of the anticipated product(s), identify the value to potential stakeholders, and define an implementation timeline. Though a single project in and of itself may not lead to a tangible product other than a report or other scholarly material, the PI must show clear vision for how the work will lead to an implementable product (e.g., what is the process and how does it all fit together?).

As part of the project-specific implementation plan, PI's should also identify four individuals (at minimum) that would be appropriate to serve on an Expert Task Group (ETG) comprised of stakeholders to advise research activities over the life of the project. The ETG will be required to meet with the project PI and affiliated researchers in a minimum of three meetings to include a:

1. Kick-off meeting to ensure the scope and proposed deliverables have value to anticipated stakeholders;
2. Mid-project meeting to ensure timeline and products are on track; and
3. Project closeout meeting to finalize implementation activities and identify commercialization and intellectual property opportunities if appropriate.

#### INVOLVEMENT OF STAKEHOLDERS

Involvement of stakeholders is a critical component of the research and development process. Input from relevant parties is essential when defining research needs. CSET will engage ... CSET will work closely with organizations such as FHWA, NACE, LTAP, TTAP, TRB, NLTAPA and state and local organizations as they each play a vital role in the development of a safety culture. FHWA's Tribal Transportation Program (TTP) recognizes that non-traditional vehicle safety is a critical concern to many reservations and native and tribal villages. UAF has an ongoing dialogue with people involved with FHWA TTP on research that has the potential to improve safety for the many Federally Recognized Tribes which in part would include utilizing the latest technology as countermeasures.

CSET will appoint a single Outreach and Technology Transfer (OTT) Leader from the participating consortium members to represent the center. This leader will be responsible for engaging relevant industry, government, and university representatives as well as local RITI representatives in the research output implementation phase. This leader will oversee the collection of relevant information, develop and disseminate e-newsletters, and publish success stories and new research and practice advancements on the CSET website. The OTT Leader will also be responsible for securing members for project-specific ETGs based on the suggestions made in each proposal. The CSET Director and Assistant Director will be responsible for reviewing and approving the ETGs. PI's will be responsible for providing the OTT Leader with meeting minutes and feedback provided by the ETG in each of the aforementioned meetings (and any additional meetings if held).



## **Involvement of Tribal and Indigenous Stakeholders**

Tribal and native villages, indigenous communities will play an integral role in the research, education, and outreach activities of CSET. UAF, UH and UW actively sponsor multiple programs to attract and retain a diverse body of engineering students, specifically among underrepresented populations. These programs include:

*The Alaska Native Knowledge Network (ANKN)* serves as a resource for compiling and exchanging information concerning Alaska Native ways of knowing. ANKN assists Alaska Natives, government agencies, educators and the public gain access to the knowledge Alaska Natives have accumulated throughout their history.

*The Alaska Native Science and Engineering Program (ANSEP)* encourages Alaska Native young people to seek science and engineering as a career path. Potential students are brought to campus to experience college life during the summer months. After students enroll a science and engineering program, they are encouraged to join a support group which helps them learn to manage their time, provides tutoring, mentoring and social interaction with others who are facing the challenges of moving from the village into the college environment.

*The Center for Pacific Islands Studies* in the University of Hawai'i at Mānoa School of Pacific and Asian Studies, is both an academic department and a larger home for initiatives that bring together people and resources to promote an understanding of the Pacific Islands and issues of concern to Pacific Islanders.

*Information School (iSchool)* at the University of Washington focuses on Native North American Indigenous Knowledge.

*The Native American Student Center (NASC)* at the University of Idaho empowers Native American students by providing academic, social and cultural needs.

The CSET consortium also has a long history of collaborative research on safety issues. UAF transportation research dates back to the 1970s and has focused on rural transportation in cold regions. UAF has strong relationship with the Alaska Department of Transportation and Public Facilities, Alaska Tribal Technical Assistance Program, Alaska Native Tribal Health Consortium, the Denali Commission and has conducted considerable research with faculty in the UAF College of Rural and Community Development and Alaska Native Studies Program. In addition, UAF also has satellite campuses in Bethel, Nome, Dillingham, and Kotzebue along with centers in Galena, Ft. Yukon, Tok, Unalaska, McGrath, Shishmaref, Unalakleet, Togiak, King Salmon, and Delta and has the resources to involve partners who live in remote communities which have a tribal heritage such as Inupiat, Yupik, Aleut, and a number of Northern Athabaskan cultures.

Across Alaska, Hawaii, Washington, and Idaho, there are a total of 336 federally recognized American Indian reservations and off-reservation trust land areas, tribal subdivisions, state-recognized American Indian reservations, Alaska Native regional corporations, and Hawaiian home lands. This accounts for nearly 60% of all federal and state recognized tribes nationwide. As such, the existing relationships developed by the CSET consortium universities has uniquely positioned us to involve tribal and indigenous partners. Moreover, CSET will encourage research products and findings be incorporated into the consortium university's academic curricula (e.g., Introduction to Transportation, Highway Planning and Design, Traffic and Operations, etc.) with the anticipation that this will reach and extend to many of the STEM education courses such as the Alaska Native Science and Engineering Program. We will also support efforts that distribute educational materials to satellite campuses to facilitate



distribution into rural and isolated communities. CSET will also work directly with K-12 educators in rural communities to develop a safety culture.

#### IMPLEMENTING AND DEPLOYING RESEARCH OUTPUTS

CSET's intent to work directly with RITI communities to assess their needs, identify possible resources that will cater to their needs (some of which may be low-cost or available with limited barriers to entry; open platform and on-line cloud storage for materials serve as possible examples), and then work collaboratively with RITI communities to develop personalized resources and tools that will match and meet their culture and specific needs. Ensuring that we overcome cultural barriers to implementation is critical and the involvement of key stakeholders and ETG will be monumental in this phase. We anticipate that CSET efforts and resources will also be used to enhance training, education, and outreach activities being offered in RITI communities.

The OTT Leader will be responsible for three phases of the Research Output Implementation efforts: 1) compiling relevant proposal information for review by the advisory board during the Pre-Award phase to identify projects that are proposed to have clear and identifiable products that can be implemented by RITI communities or would be appropriate candidates for commercialization and intellectual property; 2) developing a Products Report at the end of the yearly research cycle to be presented and discussed at the annual meeting of the center's advisory board; and 3) engage the Advisory Board in reviewing the Products Report.

The OTT Leader and Advisory Board will be responsible for:

- Reviewing and commenting on project-specific implementation plans;
- Reviewing and contributing to the identification of key stakeholders that would be interested in or benefit from research products;
- Identifying potential barriers to the adoption of research products; and
- Identifying which projects are worth implementing and allocate additional funding as appropriate to those selected.

#### COMMERCIALIZATION

CSET will provide guidelines and criteria for successful commercialization efforts to investigators interested in commercialization. These groups are accustomed to creatively matching industry with technology which allows them to make creative matches. For example, a safety technology used for the cold climate needs of Alaska may have a use elsewhere in the country that has remained undiscovered. The university commercialization offices within the CSET consortium are specifically designed to make connections between university and industry.

#### INTELLECTUAL PROPERTY

Though it is not our intent to specifically focus efforts on the development of intellectual property, CSET supports the collection and use of licensing revenues where appropriate to provide further support for research and technology transfer activities. CSET will promote activities and endeavors that lead to the acquisition and maintenance of intellectual property rights. Products that are likely to become intellectual property will be identified by project-specific PI's, the OTT Leader, and the advisory board. Appropriate resources and guidance will be provided as necessary.



## DISSEMINATION OF RESEARCH RESULTS

The CSET consortium universities currently publish a large collection of transportation research projects that have been conducted with state, national, and international partners and sponsors. We will place our research and implementation outcomes in the USDOT Research Hub to increase accessibility. CSET will use webinars to describe findings. These will be offered at no cost using researchers with the help of CSET. Material will remain accessible on the CSET website.

Unfortunately, the large number of RITI communities and cost to visit the communities is quite high. Consequently, CSET is forced to be strategic in its implementation and education activities. CSET will host various events including workshops and teleconferences to highlight research results, technologies, and other safety solutions. Discussion opportunities among researchers, practitioners, and stakeholders will also be provided. Selected results from these events will also be posted on the CSET website. Where appropriate, CSET will disseminate key research results through traditional media outlets (TV, newspapers, etc.) and in electronic formats. CSET will use research products to educate the public on road user safety and cost-effective solutions.

The methods and modes of product-related information delivery will be identified on a case-by-case basis. For example, in some cases it might be appropriate to compile the research into a manual of best practice. In others, the method of delivery might be better facilitated by creating and disseminating an online video (e.g., YouTube). Further, there may also be cases where the products must be produced in two or more languages to best serve the anticipated users and stakeholders. CSET will rely on input from the ETG and advisory board to facilitate this dissemination process.

CSET will also co-host the annual Region 10 Transportation conference with the Pacific Northwest Transportation Consortium (PacTrans). This annual conference brings together the Pacific Northwest's transportation community to network and share current research results for technology transfer and ideas for research, education, workforce development, and future collaboration. Other annual meetings of key stakeholders such as the Alaska Federation of Natives and the Tribal Transportation Summit will serve to disseminate research findings and products to a large audience.

## TRACKING AND REPORTING

CSET will reach out to the public to demonstrate the practical implications of research. Each center-affiliated researcher will be asked to record their accomplishments in an electronic worksheet or database especially designed for recording and evaluating these outcomes through our standard quarterly reporting requirements. This information will be compiled by the CSET Outreach Coordinator annually specifically for the purpose of meeting the T2P requirements specified by US DOT.

## GOALS AND PERFORMANCE MEASURES

### *Research Output*

- Number of completed projects; Target – 6/yr.
- Number of papers and reports directly resulting from research collaborations; Target–4/yr.
- Number of conference and invited presentations from collaborations; Target – 10/yr.

### *Research Outcomes*

- Number of collaborative training programs established and number of attendees; Target – 2/yr.
- Number of seminars, meetings, and workshops organized with state, tribal, and local agencies and the number of attendees; Target – 2/yr.
- Number of implementable work products (e.g., manuals, specifications, and toolkits); Target – 2/yr.



### *Research Impacts*

- Number of organizations/partners actively working with CSET to achieve the strategic RITI-focused goals; Target – 10 partners/yr.
- Number of student research internships granted; Target: 8 students/yr.
- Amount of attention received by center (i.e., volume, source and author); Target – 10 cites/yr.

