



Center for Safety Equity in Transportation

If you have a right to get there, you have a right to get there safely.

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Semi-Annual Progress Report for University Transportation Centers

Submitted to: Office of the Assistant Secretary for Research and Technology
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

Project Title: **Tier 1 University Transportation Center for Safety Equity in Transportation (CSET)**

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Signature:

Billy Connor
CSET, Director

Abbreviations

- AKDOT&PF – Alaska Department of Transportation and Public Facilities
- ANTHC – Alaska Native Tribal Health Consortium
- AUTC – Alaska University Transportation Center
- CSET – Center for Safety Equity in Transportation
- GIS – Geographic Information System
- ORCID – Open Researcher and Contributor ID
- PI – Principle Investigator
- PPPR – Program Progress Performance Report
- RiP – Research in Progress
- RITI – Rural, Isolated, Tribal, Indigenous
- UAF – University of Alaska Fairbanks
- UHM – University of Hawai'i Manoa
- UI – University of Idaho
- UW – University of Washington

1. Accomplishments

What are the major goals and objectives of the program?

The goal of CSET is to develop context-sensitive transportation solutions that address the safety needs of RITI communities. The Center will develop safety approaches that are sensitive to heritage, traditional ways of knowing and learning, and the preservation of culture. The mission of the Center for Safety Equity in Transportation (CSET) is to provide everyone with fair and equitable access to a safe transportation system.

What was accomplished under these goals?

During the past six months of the project:

- *Setting up email list, website, and social media accounts*

The official CSET email, cset.utc@alaska.edu, has been used to communicate with Executive and Advisory Board members as well as project PIs. A contact list is being maintained for the duration of the project. Center announcements are distributed through emails and social media posts to various audiences and stakeholders. Activities are posted to the website in a timely fashion.

- *Communication: gotomeeting and gotowebinar*

An account has been set up for CSET with gotomeeting and gotowebinar. The Center will utilize gotomeeting for project progress reports and updates, advisory board meeting and board of directors. The Center will utilize gotowebinar for project updates to stakeholders and other efforts to disseminate research findings.

- *E-newsletters*

The Center distributed its sixth quarterly newsletter in May 2019 and a seventh in August 2019. The newsletter is available under the *Publications* section of the website. <http://cset.uaf.edu/publications/>

- *Research projects*

Eighteen projects continued during this reporting period under three primary areas: knowledge gathering, outreach, and baseline data collection. Two of the eighteen submitted their final report for review this period. Three reports were submitted to TRID during the reporting period. Ten new projects were approved and started during the period covered in this report. The project information is posted on the CSET website, and logged in the RiP database. Annual project update meetings are held each summer, and quarterly reports are collected in a timely manner.

- *Training programs*

Bike safety programs developed by the League of American Bicyclists were offered to interested individuals including the principle investigator on the project that did the investigation, Nathan Belz. The training certified people as trainers that could present the courses in rural Alaska villages.

- *Active student internships*

None developed during this period.

- *Teacher training and curriculum development activities*

None developed during this period.

- *Data collection tools developed*

- A CSET project at the University of Idaho, *Operational Safety of Gravel Roads in Rural and Tribal Communities: Vulnerability to Structural Failures and Geo-hazards*, developed a questionnaire and sent it to all local highway jurisdictions in the state of Idaho to investigate whether any rural community has experienced unpaved road closures or not, the location of the community, and the reason(s) for closure.
- The University of Hawai'i Manoa CSET project *Driving Behavior and Traffic Safety Perceptions of Hawaiians, part-Hawaiians and Pacific Islanders*, developed a detailed, computer-based survey to collect information on the traffic safety perceptions of Hawaiians, part-Hawaiians and Pacific Islanders in rural and urban areas. The survey was deployed in May 2019 and is expected to conclude in October 2019.
- The CSET project at UAF, *Enabling Data-driven Transportation Safety Improvements in Rural Alaska*, completed development of a traffic counting application. The design effort was successful and the complete app is ready for field-testing in a rural setting. The app, UAF Traffic, was developed to obtain traffic counts for all types of conveyances in rural Alaska, as well as monitoring turning movements. The app was designed to work on an iPad or similar device. The final product supports non-traditional vehicles common in Alaska, allows data collection on up to five vehicles at a time, ease-of-use to support future STEM/STEAM education efforts, can handle 2-, 3-, and 4- way traffic intersections. The app is available for free download through the Apple Store. <https://apps.apple.com/us/app/uaf-traffic/id1477376858>

- *Sponsorship*

Nothing to report for this period.

How have the results been disseminated?

CSET staff and researchers have been actively seeking out opportunities to interact with the public, stakeholders and the transportation community.

Professional Meetings

During this reporting period, CSET representatives attended the following professional event:

1. Council of University Transportation Center Summer Meeting, Norman, Oklahoma, June 2019.

Outreach

- *2019 Tribal Leadership Summit, April 24, 2019*

At this year's Summit, tribal traffic safety was a primary topic. Because of the success of the 2018 Summit, the organizers asked the University of Washington (UW) research team to present to the roundtable regarding their CSET project and progress that had been made, and what was needed to further the research. This was one of the first examples of the success of the UW outreach activities, as tribal leaders begin to reach out as the reputation grows. This continued after the 2019 Tribal Leadership Summit as members of the Tulalip Tribes responded to us positively following the event to inquire more about the project and set up a site visit to their reservation and meet with their planning department head, the chief of police, and other interested parties.

- *Trail of the Coeur D'Alenes Trail Commission Meeting, April 30, 2019*

Michael Lowry and Kevin Chang of the University of Idaho presented project plans and goals to the Trail of the Coeur D'Alenes commission at their meeting on April 30, 2019 in Smeltonville, Idaho. The commission members provided suggestions and feedback for the intercept survey being developed by the project. Members of the project's Expert Task Group (ETG) attended the meeting and were involved in the discussions.

- *Tulalip Tribal Police Department Meeting, June 13, 2019*

The University of Washington research team was invited to the Tulalip Tribal Police Department to meet with tribal police representatives and other interested traffic safety related parties from the tribal government. During the meeting, the research team presented the CSET introductory materials, the center's goals and objectives, research areas, project status, etc. The Tulalip representatives showed the research team the traffic safety related issues and potential areas of improvement.

- *LAB Smart Cycling Course, June 26 and 27, 2019*

UAF hosted the Smart Cycling Course led by Pierce Schwalb of Bike Anchorage. The course is designed to reach people of all ages and abilities by improving skills, building confidence, and teaching others. There were 10 attendees at this event including CSET assistant director, Nathan Belz. This event was provided at no cost to participants through a Highway Safety Office grant given to Bike Anchorage.

- *Tulalip Tribal Representatives Visit UW STAR Lab, July 18, 2019*

Tulalip representatives visited the STAR Lab. The meeting was very productive and both sides agree to collaborate on improving Tulalip Tribes' traffic safety conditions. Tulalip Tribe representatives were interested in sharing the traffic data and safety data with the STAR Lab. The meeting identified the following important research topics that could help improve Tulalip Tribes' traffic safety conditions: develop an efficient tablets-based crash data reporting and management system for the Tulalip Tribes Police Department and perform safety evaluation on certain intersections and roadway facilities based on traffic and safety data analysis.

- *LAB League Certified Instructor (LCI) Training, July 19 to 21, 2019*

UAF hosted the LCI course. Led by Jennifer Laurita of the League of American Bicyclists, the LCI course is designed to certify enthusiastic and competent cyclists how to teach Smart Cycling classes to children as well as adults. Their goal is to help people feel more secure about getting on a bike, to create a mindset that bikes are treated as a vehicle, and to ensure that people on bikes know how to ride safely and legally. A CSET project at UAF led by Nathan Belz solicited a call for proposals and provided the cost of registration and

certification to five individuals that expressed dedication and interest in improving bike safety in rural communities.

What do you plan to do during the next reporting period to accomplish the goals and objectives?

We will follow the implementation plan to ensure that all the CSET's funded research, education, and outreach activities move forward as scheduled.

- The Center website, social media presence, and emailing contact lists will be regularly updated and used to promote the Center and its activities.
- CSET's eighth and ninth quarterly newsletters will be distributed during the month of November and February. The newsletter will highlight Center progress, such as projects starting/concluding, new calls for proposals, STIs, etc.
- Steps will be taken to continue bringing students on as research assistants.
- Steps will be taken to develop training programs, curriculum development activities, outreach, and sponsorship opportunities.
- Center researchers and staff will continue participation and involvement with seminars, workshops and conferences.
- Year 4 request for proposals will be developed and released.
- Efforts to provide community training will be increased based on CSET research. Specifically, there are plans in place for conducting safety training and dust mitigation training for rural Alaska communities.

2. Participants & Collaborating Organizations

What organizations have been involved as partners?

- *Collaborative research and financial support*
Newtok Village Council, Newtok Alaska, Alaska Native Tribal Health Consortium

- *Technology Transfer Expert Task Groups*
CSET projects have established advisory groups for improving technology transfer from the project to interested stakeholders. Each project has met with members of the groups either individually or in a group during the period covered by this report.

Have other collaborators or contacts been involved?

Email correspondence been exchanged during the reporting period to discuss research ideas and broad collaborations on research, education, workforce development, and outreach activities between CSET and various collaborators.

- The center collaborated with the Region 10 Transportation Center (PacTrans) to co-sponsor the annual Regional Transportation Conference held in Seattle, Washington on October 11, 2019.
- Collaboration with the League of American Bicyclists led to two training classes offered in Fairbanks to train new instructors in bicycle safety.

3. Outputs

Publications, conference papers, presentations, websites, lectures, seminars, workshops, invited talks

Publications

- *Journal Publications*
 - None to report for this period.

- *Reports*
 - Prevedourous, Panos, Kishor Bhatta, and Mintu M. Miah. *2007-2016 Fatal traffic Crashes in Alaska, Hawaii, Idaho and Washington, and Characteristics of Traffic Fatalities Involving Hawaiians and CSET Minorities*. CSET Project Reports, April 2019.
 - Wang, Yin Hai, Ziqiang Zeng, Christopher Gottsacker and Hao Yang. *Develop a Regional Multi-Source Database System for Safety Data Management and Analysis in RITI Communities in Washington State*. CSET Project Reports, May 2019.
 - Wang, Yin Hai, Christopher Gottsacker and Ziqiang Zeng. *Promoting CSET Outreach Activities through Safety Data Management and Analysis in RITI Communities*. CSET Project Reports, June 2019.

- *Conference papers*
 - Nathanail, Eftichia, Panos D. Prevedouros and Mintu M. Miah, *Predicting the Impact of Text-Reading Using Decision Trees*, Paper No. 245, EPIA Conference on Artificial Intelligence, Vila Real, Portugal, September 3rd-6th, 2019.

- *Presentations*
 - de Melo Barros, Rafaela and Panos D. Prevedouros, *Equity in Transportation Safety and Preliminary Assessment in Hawaii*, PacTrans Conference 2019, Univ. of Washington, Seattle, October, 2019.
 - Prevedouros, Panos D., Eftichia Nathanail, Md. Mintu Miah and Rafaela D. De Melo Barros, *Predicting Behavior of Professional Drivers while Text-Reading Using Cluster Modeling*, Paper 185, Conference on Road Safety & Simulation (rss2019.org), Iowa City, Iowa, USA, October 14-17, 2019.
 - Nomura, Diana, Panos D. Prevedouros and Rafaela De Melo Barros, *Traffic Safety Problems at Popular Rural Tourist Attractions*, Paper 20-02953, 99th Annual Meeting of TRB, Washington, D.C., 2020.

- *Other Products*
 - Gottsacker, C. 2019. *A Pilot Data System and Analytical Framework for Tribal and Rural Community Traffic Safety Equity Assessments*. Master's thesis. University of Washington. Available at: <https://digital.lib.washington.edu/researchworks/handle/1773/44116?show=full>.

- Rafaela de Melo Barros, *Equity in Transportation Safety and Preliminary Assessment in Hawaii*, M.S. Thesis, Department of Civil and Environmental Engineering, University of Hawaii at Manoa, 81 pp., September 2019.
- *Website Updates*
 - The CSET website is live at cset.uaf.edu.
 - Year 3 project information is available on the website.
 - Events deemed noteworthy have a brief summary and photo displayed on the website.
- *Lectures/Seminars/Workshops/Invited Talks*
 - *Workshop: Washington National Guard Tsunami Workshop*, Facilitated by Dr. Xuegang Ban, University of Washington. June 20, 2019. This workshop mainly discussed the current challenges, issues and opportunities when handling the distant-resource tsunami evacuation within 3 hours.
- *New methodologies, technologies or techniques*
 - A project at the University of Idaho, *Improving Safety for RITI Communities in Idaho – Documenting Crash Rates and Possible Intervention Measures*, developed a GIS safety analysis tool for crash rate analysis using different exposure measures and a GIS Python-based toolbox to estimate Average Annual Daily Traffic (AADT) for rural roads using historical traffic flow and land use data. The tools are written in Python and follow the methods described in the Highway Safety Manual. The tools are currently being tested and improved by the research team.
 - Students at UAF, as part of the CSET project *Developing a Safe and Sustainable Transportation System in Mertarvik – Phase II CSET Outreach and Partnership with the Newtok Relocation Project*, developed templates and plans to produce 3D printed models of roads that include the various layers of materials that go into road construction in the arctic. The models also depict deformation that occurs in roads because of melting permafrost and other temperature related changes to the substrate. The team is currently working on developing handouts and informational cards to accompany the models as mass production of the basic models is just beginning.
- *Inventions, patents and/or licenses*
None to report at this time.

4. Outcomes

- *What outcomes has the program produced? How are the research outputs described in section 3 being used to create outcomes?*

The *Develop a Regional Multi-Source Database System for Safety Data Management and Analysis in RITI Communities in Washington State* project at the University of Washington developed a safety data visualization platform with two layers: the interface and visualization layer and the data and computational layer. In the first part, the Wix interface framework, the Google Map system is used to interact with users and visualize the results.

Wix is a cloud based on-line open source interface framework based on HTML language. For the second layer, the Vaadin architecture is an open source platform for web application development based on Java. The Vaadin platform includes a set of Web components, a Java Web framework, and a set of tools and application launchers. In addition, this project uses a data management system based on SQL database. The visualization platform is able to display the crash records for Washington State on the map interface with color-coded severity levels, extracting detailed information for any specific crash record, etc. The visualization of safety data could assist transportation analysts with decision-making in an efficient manner.

The Washington National Guard Tsunami Workshop held on June 20, 2019 generated an extended study to identify the critical challenges and needs during the disaster scenario for the RITI communities as well as possible drone applications under certain circumstance, including warning message spreading, searching and rescuing, post-disaster goods delivery, etc.

5. Impact

- *What is the impact on the development of the principal discipline(s) of the program?*

- *Other Disciplines –*

CSET is a multidisciplinary Center, and will therefore have an impact in fields outside of the traditional areas of transportation research. In future reports, this section will serve to answer the following questions.

- *What is the impact on the development of transportation workforce development?*
- *What is the impact on safety in RITI communities?*

The CSET project, *Results and Implications of Traffic Safety and Equity Perceptions of Hawaiians, part-Hawaiians and Pacific Islanders*, at UHM released their preliminary analysis of the effects of tourism on a rural road in the wake of a pedestrian crash that occurred at Laniakea Beach Park, a site studied by the project. The report received television coverage and Councilwoman Heidi Tsuneyoshi who received the report in August submitted and passed a resolution to improve safety at Laniakea Beach.

Time line of events:

8/3/2019 -- In wake of pedestrian crash, state to look at building parking for Laniakea Beach Park <https://www.hawaiinewsnow.com/2019/08/03/wake-pedestrian-crash-state-look-building-parking-laniakea-beach-park/>

8/20/2019 -- Email from Prevedouros to representatives, decision makers and Hawaii DOT, with CSET draft report.

9/24/2019 -- City Council considers resolution to reinstall barriers near Laniakea Beach
<https://www.hawaiinewsnow.com/2019/09/24/city-council-considers-resolution-reinstall-barriers-near-laniakea-beach/>

9/25/2019 -- State to begin first step in addressing traffic issue at Laniakea Beach
<https://www.hawaiinewsnow.com/2019/09/25/state-begin-first-step-addressing-traffic-issue-laniakea-beach/>

- *What is the impact on physical, institutional, and information resources at the university or other partner institutions and communities?*
- *What is the impact on technology transfer?*

The University of Washington research team submitted a technical report, “Developing a Data-Driven Safety Assessment Framework for RITI Communities in Washington State”. The technical report contains the safety assessment framework for RITI communities based on a multi-source database management and visualization platform. The report also contains crash-modeling analysis identifying and analyzing the contributing factors of crashes in the RITI communities. Based on the results of crash modeling analysis and the data-driven safety assessment framework, the report proposes several suggestions to improve the traffic safety conditions of RITI communities.

- *What is the impact on society beyond science and technology?*
- *In what ways have researchers and students who are part of or who focus on native or federally recognized tribes and communities been involved?*

6. Changes/Problems

- Nothing to report.