
Semi-Annual Progress Report for University Transportation Center at the
University of Texas at Arlington

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University, Georgia Institute of Technology, University of
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1. ACCOMPLISHMENTS:

What are the major goals and objectives of the program?

MISSION:

The Center for Transportation Equity, Decisions and Dollars (CTEDD) is a University of Texas at Arlington (UTA)-led partnership alongside the California Polytechnic State University (Cal Poly), Georgia Institute of Technology (GIT), University of Wisconsin-Madison (UWM), and University of South Florida (USF). CTEDD aims to lead transportation policy research that improves economic development through more efficient, cost-effective use of existing transportation systems, and offer better access to jobs and opportunities. CTEDD hopes to address these needs through innovative use of cutting edge technology, and policies that harness private resources for public infrastructure. CTEDD and its consortium members aim to serve their fast-growing regions and the nation as a whole through various programs that expand economic prosperity, provide outreach to policy makers, address infrastructure needs through innovative methods, and educate future leaders of the transportation field.

VISION:

CTEDD aims to be a leader in transitioning our antiquated transportation system towards the future through innovative policymaking and the latest technology. The major goals for CTEDD, as described in our application, fall into four categories:

CATEGORY #1: Research

GOAL 1: CTEDD PROPOSES MULTIDISCIPLINARY RESEARCH IN SIX BROAD AREAS:

Focus Area 1: Creative Use of Existing Infrastructure for Future Transportation Needs: Optimizing and upgrading the existing infrastructure to accommodate different mobility options, infrastructure preservation, innovative land use planning, and enhancing ridership.

Focus Area 2: Innovative Funding Strategies for Future Transportation Infrastructure, and Better Maintenance of Existing Infrastructure: Understanding the nature of policy making, its challenges and obstacles for future transportation infrastructure, and providing the knowledge to overcome them.

Focus Area 3: Transportation Systems, Economic Competitiveness, and Equal Access: Understanding different transportation demands due to the multi-scalar nature of economic developments, and designing transportation systems that serve users equally and enable them to access opportunities.

Focus Area 4: Employing Big Data and Innovative Techniques to Improve System Efficiency: Updating infrastructure maintenance management and public participation practices through the utilization of innovative and data driven strategies.

Focus Area 5: Ensuring Transportation System Vitality through Performance Management and Monitoring Systems: Upgrading monitoring systems for infrastructure maintenance and performance management of transportation systems.

Focus Area 6: Transportation Policy and Decision Making: Understating the obstacles to decision making due to jurisdictional fragmentation, and seeking solutions to the multi-scalar nature of transportation systems.

GOAL 2: COMPETITIVE, PEER REVIEW PROJECT SELECTION PROCESS

- CTEDD projects are selected through an open Request for Proposals (RFP) process.
- RFPs are open to faculty at member institutions. All faculty members, postdocs, and research associates are eligible to submit research, education, and technology transfer project proposals responding to CTEDD's themes.
- Proposal evaluation and selection processes are based on external peer review and rely on the expertise of practitioners and researchers nationally.

GOAL 3: DIVERSE RESEARCH GRANT CATEGORIES

- *General RFP:* CTEDD distributes grants among affiliated faculty members through the CTEDD General RFP.

- *SEED Grants:* The SEED Grant aims to encourage postdocs and junior faculty to participate in research projects. Compared to the CTEDD General RFP, SEED Grants have a larger financial cap and wider scope.
- *Emerging Scholar Research Fellowship RFP:* CTEDD supports research activities of young, emerging scholars through thesis and fellowships.

GOAL 4: ENHANCE COLLABORATIVE RESEARCH AND PARTNERSHIP OPPORTUNITIES

- *External Advisory Board:* The Advisory Board helps CTEDD identify significant research topics, monitor the Center's annual plan, and connect with appropriate partners.
- *Industry-University grant:* This initiative assists local transportation-related organizations, entities, industries and communities seeking partnerships with our expert research team. CTEDD aims to link these opportunities to its affiliated research faculty.
- *Diverse Internal Collaboration:* CTEDD encourages Multi-modal, multi-disciplinary collaborations across disciplines. The areas of research covers expertise from engineering, planning, public policy, business, social science, and big data.

CATEGORY #2: Education and Workforce Development

CTEDD's education and workforce development goals will be accomplished through the creation of pre-college, undergraduate, and graduate programs and professional learning opportunities. These initiatives target traditional educational venues and alternatives provided in short-term formats or via virtual technologies.

GOAL 1: ATTRACT AND EDUCATE PRE-COLLEGE STUDENTS

- *Leveraging and Supporting the Existing Initiatives:* CTEDD's members will use existing programs to expose K–12 students to transportation as a career choice.
- *Joint educational initiatives with K-12 schools:* CTEDD will facilitate partnerships with K–12 and secondary schools, along with community colleges, and technical schools, to align education and industry, and to support career pathways for current and future transportation workers.

GOAL 2: ATTRACT AND EDUCATE UNDERGRADUATE AND GRADUATE STUDENTS

- Offering degrees, courses, curricula, certificates and E-Modules
- *Providing Experiential Training Opportunities through Students' Involvement in Research Projects:* CTEDD requires research projects to involve undergraduate and graduate students. We also aim to broaden these students' exposure to the range of transportation professions available, particularly through the lens of equity and upward social mobility. Our intent is to expand the workforce pool and diversity of new professionals.
- *CTEDD Student Chapter-Led Activities:* CTEDD leadership structure includes the elected student leadership council. The council members are elected leaders of the CTEDD student chapter and represent students through decision making processes.
- *Student Competitions, Fellowship and Scholarship Programs:* To demonstrate our commitment to the ongoing education of graduate students, CTEDD offers competitive scholarships, fellowships, assistantships and awards to attract graduate students, especially those from underrepresented populations.
- *Hosting Seminars, Workshops and Online Training Initiatives:* CTEDD creates and maintains a calendar of seminars, workshops, professional courses and other training opportunities targeted at our audiences.

GOAL 3: PROFESSIONAL DEVELOPMENT OPPORTUNITIES

- *Hosting Transportation Oriented Annual Career Fairs*
- *Developing Joint Industry-University Educational Programs,* housed by private companies and agencies.
- *Citizens and Transportation Policymakers and Leaders:* In order to improve the information available to the public on issues related to CTEDD research priorities, our researchers will be required to submit a 1–2 page policy brief along with their research findings. These policy briefs will be written in a layperson style and disseminated through appropriate media channels.

CATEGORY #3: Engagement and Technology Transfer

CTEDD aims to ensure that research moves routinely into practice and consistently equips decision makers, researchers and communities with data and information for transportation decision-making, funding sources, and mechanisms to achieve efficiency, equity and upward social mobility. To achieve this, CTEDD's goals and programs are as follows:

GOAL 1: REGULAR DISSEMINATION OF INFORMATION FOR CTEDD PROGRAMS, EVENTS AND NEWS

- *CTEDD Social Media:* The center seek to develop an extensive social media and electronic presence so that information are shared in the way that is accessible to all, efficient and consistent.
- CTEDD's website is a principal communication channel to both disseminate research news, and act as an online host for news outlets to share CTEDD news with a broader audience. CTEDD's website will house a blog platform through which researchers and subject matter experts can exchange their knowledge, ideas and expertise.
- *CTEDD Subscription and Email Pipeline:* CTEDD research, news, events and updates are publicly accessible through a subscription. CTEDD will send a quarterly e-newsletter to a list of recipients to drive interest and awareness in center's programs
- *YouTube and Periscope Channels:* CTEDD YouTube and Periscope channels also make CTEDD's recorded events, webinars, and other educational programs publicly accessible.

GOAL 2: INNOVATIVE USE OF TECHNOLOGY FOR DISSEMINATION:

- *Multimedia Collaboration with Established Outlets:* CTEDD seeks to collaborate with TEDx Talk and radio podcast programs for joint events such as CTEDDx Talks and Webinar Series.
- *Livestream of Events:* CTEDD social media and website pages will host live broadcasts of events.
- *CTEDD Testimonies:* CTEDD established a new tradition of outreach; regular and free-of-charge presentations to inform decision makers.

GOAL 3: EFFECTIVE DISSEMINATION AND IMPLEMENTATION OF EACH RESEARCH PROJECT

- *Two Page Policy Briefs:* Each project is required to produce a plain-language research brief written for decision-and policy makers.
- *Journal Publications and Conference Presentations:* The CTEDD project budget includes expenses for conference travel to present results, PIs are also encouraged to publish their research results in top peer-reviewed journals.
- *Two to five local implementation contacts:* CTEDD PIs must identify 2-5 practitioners at local nonprofits or governmental agencies who may directly implement the research outcomes.
- *Implementation plan:* CTEDD research proposals will identify a strategy for implementing their outcomes and/or research findings.
- *Bridging the gap between research and technology transfer through local consultancy and advising.*
- *Webinar Series:* CTEDD projects are required to present a webinar session upon completion of the projects.

What was accomplished under these goals?**Administrative**

CTEDD completed the following administrative tasks during the reporting period of October 1, 2018 to March 31, 2019:

- CTEDD hired a visiting scholar who is an expert on online shopping and travel behavior and she will be facilitating more data-driven research at the Center.
- A Technology Transfer (T2) Assistant Director from each campus (five in total) joined the CTEDD team to assist in all technology transfer activities in their campuses. The details of the arrangement and responsibilities are explained in the "Technology Transfer" section of this report.
- A Research staff from CTEDD has taken on the post-completion review process of research projects. This involves contacting peer reviewers who are experts in the topics to provide a detailed review of final deliverables for PIs to address before they can be uploaded on the CTEDD and TRID websites.

- A full time Administrative Assistant dedicated to facilitating all financial reconciliation, employee paperwork, and related tasks has been hired with funding from the UTA’s Office of vice president for research (as cost-share).
- Two Communications Assistants, one dedicated to CTEDD promotions, and one focused on website development, have been hired. Both work on research, outreach and educational program promotion to ensure more engagement and collaborations are established.
- Administrative support was provided from both the Institute of Urban Studies and the Vice President of Research office at UTA for cost share and budgeting requirements through a Coordinator of Special Programs.
- Monthly meetings take place between the Office of Accounting, the Director of the Office of Grants and Contracts at UTA, and CTEDD pertaining to any financial planning, budgeting, different grant processed and technology transfer plans.
- An in-person meeting with the Executive Committee was arranged at the 2019 annual TRB meeting to discuss annual CTEDD plans as well as details of tech-transfer efforts. Monthly meetings with the committee have since taken place to discuss RFP releases, tech-transfer plans, consortium-wide events and other related details.
- The CTEDD Student Council has been conducting bi-weekly meetings to plan CTEDD events and outreach.

Research

DIVERSE RESEARCH GRANT CATEGORIES

Creation, solicitation and dissemination of a variety of research grants.

Table 1.1 – Projects Completed within the Last Reporting Period

Project ID	Focus Area	Project Name	Amount Expended	Consortium Member	Stakeholders/Partners
CTEDD 017-01	1,2, and 4	Evaluation of Adaptive Ramp Metering on I80 in The San Francisco Bay Area	\$69,101.44	Cal Poly	-Cal Poly -Caltrans
CTEDD 017-04	1, 2, 4, and 5	When and Where are Dedicated Lanes Needed under Mixed Traffic of Automated and Non-Automated Vehicles for Optimal System Level Benefits?	\$105,887.65	Georgia Tech	-Georgia Tech -Georgia DOT
CTEDD 017-06	3 and 6	Moving Communities Forward: Social Marketing and Social Change for Transportation	\$75,000	USF	-City of Raleigh, NC -UTA -TXDOT -ACHD -Commuteride (Boise, ID) -CUTR
CTEDD 017-07	4, 5, and 6	Improving Transportation Performance Measurement via Open “Big Data” Systems – Phase I Transit	\$97,500	USF	-University of Toronto -USF -CUTR
CTEDD 017-10	2, 4, and 5	Evaluation of Pavement Performance Using Remote Sensing Techniques	\$97,509	UTA	-TXDOT
CTEDD 018-01 SG	6	Transportation Policies to Facilitate Electric Vehicle Adoption at the Local Government Level: A Preliminary Study	\$52,682.61	UTA	
CTEDD 018-02 SG	4 and 6	Assessment of Extreme Weather Events Under Changing Climate on Transit Desert Communities	\$46,344.85	UTA	-Houston Metro -FEMA
CTEDD 018-03 SG	1, 4, and 5	Creative Utilization of Urban Roadway Facilities with Predictive Safety Assessment Tool – Phase I	\$45,000	USF	-Florida DOT -FHWA
CTEDD 018-04 SG	3, 4, and 6	Assessing Viability of Carsharing for Low-Income Communities	\$45,005.14	UTA	-City of Arlington, TX -NCTCOG

					-Tarrant County Homeless Coalition -Arlington (TX) Housing Authority
CTEDD 018-05 SG	2 and 6	Identifying, Weighting & Causality Modeling of Social and Economic Barriers to Rapid Infrastructure Recovery from Natural Disasters: A Study of Hurricanes Harvey, Irma & Maria	\$53,002.91	UTA	-TXDOT -Florida DOT

Table 1.2 – Projects that Began In Last Reporting Period (SEED Grants)

Note: SEED Grants are usually single university participation due to the smaller scale

Project ID	Focus Area	Project Name	Amount Budgeted	Consortium Member	Stakeholders/Partners
CTEDD 019-04 SG	4 and 5	Measuring Transportation Network Performance During Emergency Evacuations: A Case Study of Hurricane Irma and Camp Fire	\$45,000	USF	-City of Tampa -Florida DOT
CTEDD 019-06 SG	1, 3 and 5	Capacity-flow Feature-based Restoration Strategy Optimization for Resilient Transportation Systems to Enhance Mobility, Accessibility, and Equity after Disruptive Events	\$42,280	USF	-City of Tampa, FL -AECOM
CTEDD 019-05 SG	1, 3 and 6	Incorporating Mixed Automated Vehicle Traffic in Capacity Analysis and System Planning Decisions	\$52,500	USF	-Florida DOT -AECOM -Plan Hillsborough MPO -Swiss Federal Institute of Technology
CTEDD 019-03 SG	2 and 5	Investigation, Testing and Development of an RFID System for Effective Maintenance of the Existing National Transportation Infrastructure	\$44,997.49	UTA	-US DOT -US Fire Administration -US EPA -FHWA
CTEDD 019-02 SG	1, 3 and 6	Preparing for Progress: Establishing Guidelines for the Regulation, Safe Integration, and Equitable Usage of Dockless Electric Scooters in American Cities	\$52,916.64	UTA	-City of Dallas -Blue Duck Scooters -Bike DFW
CTEDD 019-01 SG	1 and 3	On-Demand Microtransit for Better Transit Station and Job Accessibility	\$54,880.88	UTA	-Dallas Area Rapid Transit -Go Link -Transportation Department at North Central Texas Council of Governments
CTEDD 019-07 SG	1	Safety Effects of Transit Signal Priority: Magnitude and Mechanism	\$52,499.54	UWM	-Metro Transit
CTEDD 019-01 IN	3 and 6	Capacity Analysis, Success Factors, and Growth Vision for the Fort Worth Medical Innovation District (FW-MID)	\$98,313	UTA	-City of Fort Worth
CTEDD 019-02 IN	1 and 4	Relative Logistics Sprawl: Measuring Changes in the Relative Distance from Warehousing and Logistics Businesses to the Consumer Markets	\$29,385.495	UTA	-TXDOT -NCTCOG
CTEDD 019-03 IN	3 and 4	More freight vehicle crashes on city streets in residential areas: Why and to what extent? A case study in the Dallas-Fort Worth region	\$29,385.495	UTA	-NCTCOG -City of Dallas -City of Carrollton -City of Richardson

General RFPs:

- Year 3:
 - The third round of request for proposals for the General grant were distributed among CTEDD member universities in January 2019.
 - Based on CTEDD's technology transfer plan submitted to USDOT in the last round, this RFP had a stronger technology transfer component, the details for which are in the "Technology Transfer" section of this report.
 - The Center received 26 proposal submissions for this round with many multi-disciplinary and inter-university projects covering a wide variety of transportation issues.
 - The proposals are currently undergoing a peer-review process involving both an academic and non-academic expert in the proposal's subject area.
 - The aim is to fund approximately 15 projects totaling roughly \$1 million, based on the level of stakeholder involvement and strength of technology transfer of the project.
- Year 2:
 - The second round of projects are currently in progress and should be completed by fall, 2019.
 - Quarterly and semi-annual progress reports for these projects have been submitted by PIs in a timely manner to ensure that the projects are on track in accordance with CTEDD's research goals.
- Year 1:
 - All projects from the first General round have been completed except two that are due to be submitted in June with a no-cost extension.
 - PIs have submitted final deliverables for these projects, which include a final report, a policy brief, performance indicators, a final progress report, copies of publications, a layman narrative for the general public, and any databases and technologies related to the project.
 - Information on each project's stakeholders and partners can be found in Table 3.1.
 - All final deliverables are currently under review. The final reports have been sent to peer reviewers to provide feedback to PIs. Reviews will conclude in April of 2019, and the PI's will then have 2-4 weeks to update their reports based on the comments provided. Once the reports are up to the standards of USDOT and CTEDD requirements, these will be uploaded on the TRID and CTEDD websites.
 - The projects that were completed in the last reporting period are outlined in Table 1.1.

SEED Grants:

- Year 2:
 - CTEDD's second round of SEED request for proposals were released in October, 2018 to encourage more junior scholar involvement in research.
 - The theme for this round was "transportation project prioritization and funding."
 - It had a major technology transfer component and requested PIs to form collaborations with external stakeholders at the proposal phase. More details are in the "Technology Transfer" section.
 - 15 proposal submissions were received, and 7 were selected.
 - Projects in progress are outlined in Table 1.2.
- Year 1:
 - All first-round SEED projects have been completed except one that has a no-cost extension to June, 2019.
 - PIs have submitted final deliverables for these projects which include a final report, a policy brief, performance indicators, a final progress report, copies of publications, a layman narrative for the general public, and any databases and technologies related to the project.
 - All final deliverables are currently under review. The final reports have been sent out to peer reviewers to provide feedback to PIs. Reviews will conclude in April, 2019, and the PIs will then have 2-4 weeks to update their reports based on the comments provided. Once the reports are up to the standards of USDOT and CTEDD requirements, these will be uploaded on the TRID and CTEDD websites.
 - The completed SEED projects are outlined in Table 1.1.

COMPETITIVE, PEER REVIEW PROJECT SELECTION PROCESS

Ensuring a thorough internal and external review of projects.

- SEED RFP:
 - The Executive Committee reviewed and finalized the second SEED RFP before solicitation.
 - In October, 2018, CTEDD released the second SEED RFP for consortium member researchers (especially junior scholars and faculty) to submit proposals
 - The Director, Program Manager and Executive Directors worked with the PIs and their consortium member staff during the proposal submission process to provide assistance with the requirements, matching sources, documentation and budgeting for their projects.
 - After proposal submission, the Director and Program Manager finalized a list of relevant external reviews in accordance with the submitted topics. The Program Manager reviewed proposals in terms of the required items and documents through an internal review, before sending them out for peer review.
 - Due to its smaller scale, each proposal was reviewed by at least one external reviewer from the Peer Review Committee, including academics and practitioner:
 - Alignment to CTEDD's RFP Objective
 - Fitness to CTEDD's Focus Areas
 - Intellectual Merit
 - Applicability of Outcomes
 - Qualifications
 - Innovation
 - Methodology
 - Resources and Collaboration
 - Broader Impact
 - Viability of Proposed Tech Transfer Activities
 - Each proposal was also reviewed and scored by the Program Manager for the following programmatic criteria:
 - Fit with the CTEDD and RFP objectives, and focus areas
 - Focus on transportation
 - Student support/mentoring
 - Support for untenured tenure-track (junior) faculty
 - Leveraging of matching funds
 - Substantive and meaningful external collaboration; multi-disciplinary and/or multi-campus collaboration.
 - National relevance and support for equity/diversity
 - Synthesized results from external and programmatic review, and ranked proposals accordingly.
- The final selection of the awardees was made, after which the Office of Grants created their Notice of Awards. The projects are currently in progress.

ENHANCE COLLABORATIVE RESEARCH AND PARTNERSHIP OPPORTUNITIES

Ensuring opportunity for multi-disciplinary and multi-university collaboration

- CTEDD promotes collaboration between disciplines and universities to create more impactful projects. The second round of the SEED grant has collaborations between e.g. the Department of Civil and Environmental Engineering and the College of Arts and Science.
- The currently released General RFP ensures that multi-disciplinary research is promoted by providing higher funding incentives for projects that are multi-disciplinary as well as multi-university. Some examples of proposed multi-disciplinary and multi-university collaborations taking place via CTEDD projects include:

<ul style="list-style-type: none"> Dept. of Civil Engineering at UTA Center for Urban Transportation Research at USF College of Education at UTA Dept. of Civil and Environmental Engineering at Cal Poly School of City and Regional Planning at GIT Dept. of Computer Science at UWM Dept. of Physics at UTA Dept. of Mathematics at USF College of Engineering at UWM Dept. of Civil and Environmental Engineering at USF 	<ul style="list-style-type: none"> College of Social Work at UTA University of Toronto College of Architecture Planning and Public Affairs at UTA Dept. of Sociology and Anthropology at UTA School of Industrial and Systems Engineering at GIT Dept. of Industrial, Manufacturing and Systems UTA Dept. of Mechanical and Aerospace Engineering at UTA University of Hawaii Dept. of Planning and Landscape Architecture at UWM Dept. of Mathematics at UTA
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Ensuring opportunity for collaboration with external stakeholders

- CTEDD promotes collaboration between researchers and external stakeholders that have an invested interest in the topic and outcomes of the research. Such collaborations deem more impactful in the long-term. Some of these collaborations have been outlined in Table 1.4 and Table 2.1.

Education and Workforce**ATTRACT AND EDUCATE PRE-COLLEGE STUDENTS**

- Pathways to College Access and Career Readiness: The Pathways to College program, which was granted funding to attract pre-college students to the transportation field and encourage them to apply for transportation-related degrees and gain scholarships, is still ongoing. Goals achieved during the last reporting period were as follows:
 - A total of 13 mentors were hired to be CTEDD champions and serve 5,180 high school students through GO centers within the DFW Metroplex.
 - The scholarship application for mentored high school students is now open, and a total of 21 applications have been received.
- Pi Day Math Festival: On March 2019, the CTEDD Student Council (CSC) participated at the Pi Day Math Festival at the AT&T Performance Art Center in Dallas. The event was organized by talkSTEM and walkSTEM, organizations working to improve STEM pedagogy for K-12 kids and teachers. CSC engaged with kids from Middle School and High School using creative math problems on walkability and transportation in the city of Dallas, especially for downtown Dallas to instill a better understanding of how their curriculum applies to the transportation field.

ATTRACT AND EDUCATE UNDERGRADUATE AND GRADUATE STUDENTS

- Research Assistantships: In addition to the 29 students from the second round of the General RFP who are currently assisting on research projects, the second round of the SEED grants has 13 students as research assistants. Notably, 4 of these students are from underrepresented populations.
- Part-Time Opportunities: In order to enhance opportunities for students from different disciplines who can contribute to CTEDD's success, two new part-time student employees were hired to assist with website maintenance and the promotion of CTEDD's research and outreach activities. Details about these activities are mentioned in the "Technology Transfer" section.
- Pathways to College Access and Career Readiness: All undergraduate and graduate program Mentors have been trained to understand how they can all potentially contribute to the transportation industry, regardless of major chosen. This same information is being shared at the GO Centers when students are making their career choices.
- CTEDD Student Council: The CTEDD Student Council continued to organize events, workshops and outreach activities to promote the field of transportation at both the pre-college and undergraduate/graduate level. Some of the activities that they have organized and participated in include:
 - Travel footprint competition to promote active transportation in daily commuting and relay these experiences to stir conversations on accessibility and equity – fall, 2018.
 - Outreach at Texas Mobility Summit to promote CTEDD research and programs – October/November 2018
 - Practice sessions for TRB and ACSP conferences such as TRB and ACSP to promote student participation.
 - Software workshops to enhance research efficiency for everyday tasks – fall, 2018 and spring, 2019.
 - Annual conferences including TRB and ACSP – fall, 2018 and spring, 2019.
 - Semester Kick-offs to promote CSC and share semester plans with members – fall, 2018 and spring, 2019.
 - Assistance at University-wide and Departmental career fairs to encourage transportation-related organizations to promote their work and attract a young workforce – February, 2019.
 - Pi Day Math Festival to attract pre-college students to the transportation field – March, 2019
 - Field trips to new transportation and technological sites such as autonomous vehicles – April, 2019

- **Student Group Funding:** CTEDD has an annual student group funding opportunity where student groups from any of the consortium universities can apply for CTEDD funding to carry out student-led activities and events. This allows existing groups to collaborate and host more transportation-oriented activities. The first round of applications/proposals are due in April, 2019. These proposals will then be evaluated and given funding after approval with quarterly and semi-annual reporting requirements. Some activities that CTEDD proposes to support include:
 - Collaborating on conference receptions, such as the annual CTEDD TRB reception in Washington, D.C.
 - Outreach activities that raise awareness of transportation studies and careers for K-12 students.
 - Speaker series/events where local and national guest speakers are invited to speak on-campus.
 - Field trips to transportation-related organizations/centers/agencies etc.
 - Software workshops to enhance student learning in their studies.

PROFESSIONAL DEVELOPMENT OPPORTUNITIES

- **Texas-Building Better Boards:** The Texas Building Better Boards (TX-BBB) program started in February, 2019. This is a Texas-focused professional development program for transit agency board members across the state. TX-BBB aims to empower members to make more informed decisions. TX-BBB is intended to develop a permanent Texas Association of Transit Board Members. For the first phase, 35 board members from seven Texas transit agencies – Dallas Area Rapid Transit (DART), Trinity Metro (TRE), Houston Metro, Capital Transit (Austin), VIA transit (San Antonio), Sun Metro (El Paso) and Corpus Christi Regional Transportation Authority (CCRTA) – are being recruited. Recruiting board members was an important task for this phase of the project. Recommendations were sought from current board members, planners within CTEDD’s network, community activists, journalists, and elected officials. So far, 12 board members have been recruited and a total of 55 board members have been contacted. Phone interviews were done with the recruited board members to form the vision for the TX-BBB program and to create a “hot topics” list.
- **Tarrant Transit Alliance:** The Tarrant Transit Alliance (TTA) is a local civic group that aims to support transit-oriented development in Tarrant County, Texas, by providing information to the local community on the benefits of transit, developing regional agreements on strategies to fund transit, and advocating for dedicated funding for regional and local transit. CTEDD researchers have collaborated with TTA by hosting and participating in workshops and panel discussions with local government officials on how CTEDD-sponsored research can inform transit decision-making.
- **Texas Mobility Summit:** CTEDD partnered with the Texas Innovation Alliance for this year’s Texas Mobility Summit in October 2018. The summit brought together Texas state and local governments, educational institutes, private industry leaders, and community leaders to discuss the future of transportation in Texas. CTEDD provided insights based on its research and conducted outreach to local organizations. CTEDD was able to leave the summit with new stakeholders and partners interested in collaborating with CTEDD on research, education and technology transfer. These collaborations have been highlighted in the “Participants and Collaborating Organizations” section.

Engagement and Technology Transfer

Based on the “Technology Transfer Plan” that was submitted to the USDOT in fall 2018, the following has been accomplished in order to enhance the technology transfer component of CTEDD:

Consortium-Wide:

- Five T2 Assistant Directors have been identified by each campus to lead all technology transfer activities in their campuses and serve as consultants for technology transfer for individual projects.
- All T2 Assistant Directors were brought on board based on their previous technology transfer experience. The UTA Assistant Director, who is the main lead for this initiative has specific technology transfer experience for UTA’s Research Institute. Her responsibilities include:
 - Being the primary point of contact for CTEDD for T2 related activities
 - Participate in Executive Committee meetings and other director level meetings.
 - Coordinate with Assistant Directors for T2 at member institutions for the following items:

- CTEDD newsletter input
 - Conference funding opportunities for PIs and students
 - Funding opportunities for student groups to carry out student-led activities, events, and workshops.
 - Individual project tech transfer plans and implementation
 - Collecting data for USDOT reporting requirements, progress reports, and performance indicators.
 - Conducting monthly meetings for T2 updates and decisions.
 - Any other T2 items as needed.
- For individual projects for PIs at UTA, she will provide the following assistance:
 - Pre-award:
 - Evaluate the T2 portion of the proposals.
 - Participate in the overall review selection of proposals with the Executive Committee.
 - Post-award:
 - Meet with PIs for each project to review and finalize the T2 plan and set up deliverables and milestones.
 - Monitor the T2 progress for each project based on the T2 plan.
 - Work with Assistant Directors for T2 and PIs to adjust the T2 plans as needed
 - Post-completion:
 - Continue to communicate with the Assistant Directors for T2 and PIs for T2 related activities on-going after end of award period based on the T2 plan.

Individual Projects:

To ensure that technology transfer becomes an inherent component for all research projects, the following was implemented in the new General RFP that was released in January 2019.

- PIs are required to scale their project on the Technology Readiness Level (TRL) based on the following [FHWA Guidelines](#).
- The T2 Assistant Director for each consortium university will assist PIs in their technology transfer at all stages of the project including pre-award (proposal) phase, post-award phase and post-completion phase. The PIs are encouraged to set their technology transfer goals specific to their proposed research in consultation with T2 assistant directors.
- Proposals need to reach at least the 3rd level of technology readiness for funding consideration.
- Proposals that have already reached a 6 or above level of technology readiness receive higher funding and can propose a longer timeline.
- PIs are required to identify at least 2 non-academic stakeholders (who are contacted before the proposal-writing phase) for collaborations on the project for research, dissemination, implementation and/or match funding. PIs must indicate the name of contact, name of organization, and contribution to the research project.
- The T2 assistant director ensures that viable stakeholders are involved, technology transfer milestones are being achieved and reported to the UTA T2 Assistant Director, and projects are kept track of even after completion.

REGULAR DISSEMINATION OF INFORMATION FOR CTEDD PROGRAMS, EVENTS AND NEWS:

- CTEDD has conducted and partnered on a wide variety of technology transfer activities including presentations, summits, book launches, lectures and student-led events. Table 1.3 shows all the different activities conducted in the last reporting period.

Table 1.3 – Technology Transfer and Community Engagement Activities Conducted Within the Last Reporting Period

Title	Platform	Date	Stakeholders	Participants
CTEDD News	Online Newsletter	Weekly	All consortium members and stakeholders	2000 recipients
Research Webinar Series	Webinar 1 - CTEDD 017-03	10/18	All consortium members and stakeholders	17
	Webinar 2 – CTEDD 017-08	11/18		43
	Webinar 3 – CTEDD 017-11	02/19		18

Rethinking America's Highways: A Book Talk with Robert Poole	Luncheon and book talk by a nationally-recognized expert on highway finance.	10/18	North Central Texas Council of Governments	40
Arlington Commuter Workshop	Professional Development Workshop for local community on social marketing impacts on commuter transportation	10/18	USF; CUTR; UTA	15
What's Your Travel Footprint Competition	Social media-based competition to promote active transportation in daily commutes, and stir conversations on the barriers to using transit for commuting.	10-11/18	All consortium universities/members	10
Texas Mobility Summit	Summit for Practitioners, Academics and Legislators to discuss key policy issues in transportation and how collaborations between different partners can help negate negative externalities of new transportation technologies.	10-11/18	Texas Innovation Alliance; UT Austin; Texas A&M University	350
Research Information Sessions	Online information sessions for PIs on how to ensure stakeholder involvement and collaboration.	Fall 2018 Spring 2019	All consortium universities/members	15-20
ACSP Practice Sessions	Allowed students attending the ACSP conference to practice research talks.	10/18	UTA	15-20
Association of Collegiate Schools of Planning (ACSP) Conference	International conference for academic researchers in planning.	10/18	All consortium universities/members	2000
The 2018 Transit Academy	Workforce development, lectures, workshops and panel discussions on transit use and other transportation issues in the DFW region.	11/18	Tarrant Transit Alliance; UTA; AECOM; NCTCOG; Via; TEXRail	50
Research Roundtables	Workshops, research discussions, trending topics in transportation issues, research opportunities.	Fall 2018 Spring 2019	All consortium universities/members	15-20
Software Workshops	Workforce development; workshops on research and organizational software for students, staff and faculty at CTEDD consortium universities.	Fall 2018 Spring 2019	All consortium members.	15-20
Transportation Research Board Annual Meeting	Prestigious conference for academics in transportation to present their research.	01/19	All consortium members.	10,000
CUTC Annual Banquet	Council of University Transportation Centers annual banquet to celebrate achievements including CTEDD's student of the year.	01/19	All consortium members.	300
Lecture Series Session 1 – Equity Issues in Transportation	Invited external speakers from the country to talk about overcoming equity issues in transportation in the nation.	02/19	UT Austin; UTA; Trinity Metro; all consortium members; local and regional government officials; industry partners	65
Bright Spark Keynote Lecture	Lecture in Cairo, Egypt by UTA student on a research project he assisted on with a CTEDD faculty member.	12/18	UTA; GeoMEast, Bright Spark	150
Machine Learning Workshop	Workshop hosted by UTA's mathematics department for CTEDD faculty and staff to learn about data science and machine learning research methods that can be applied to transportation research.	03/19	UTA	18

Pi Day	A pre-college student fair for primary and secondary school students to learn about application of STEM education on transportation. It was conducted by the CTEDD Student Council	03/19	UTA; TalkSTEM; KERA Texas	1000
Career Fair	Collaborating with UTA departments and local transportation firms to allow transportation, planning and engineering students to apply for internships/jobs.	02/19	Local transportation, planning and engineering firms in Texas; UTA	350
Data Science Seminar	“Applications of Data Science in Transportation: The Intersection of Big Data, Smart Cities and Transportation” presentation by CTEDD Director at College of Science at UTA	02/19	UTA	40
Fort Worth Medical Innovation District	Presentation of Best Practices; Focus Groups; SWOT with community leaders	03/19	UTA, Fort Worth Economic Development Department	40
The Journal of Public Transportation (JPT)	International, peer-reviewed open access journal.	09/18 – 08/19	Center for Urban Transportation Research; UTA; USF	36,822 downloads

INNOVATIVE USE OF TECHNOLOGY FOR DISSEMINATION TO REACH OUT TO A BROADER AUDIENCE:

- CTEDD has hired a part-time Computer Science student, as well as a part-time Communications student to assist in creating innovative platforms to disseminate CTEDD’s research including the website, the CTEDD newsletter, and social media. They have revamped the website to make it more user-friendly. Their new process allows the website to be updated on a regular basis allows researchers, students and the layperson to keep up-to-date with CTEDD opportunities and events. They have also successfully publicized CTEDD research and researcher highlights, events, and announcements with the CTEDD community and beyond through a layperson, user-friendly newsletter. CTEDD had the following engagements on its website for the past reporting period:
 - 7,433 unique website visitors
 - 670,450 hits
- CTEDD has continued to successfully make use of social media platforms to disseminate CTEDD updates, events, projects and publications. The main social media platform has become Twitter where students and researchers feel most comfortable to share their events, initiatives and transportation research. Based on these platforms, the analytic results for the past reporting period is as follows:
 - The CTEDD Twitter page has made more than 38,000 impressions.
 - The CTEDD Facebook page has made more than 9,000 impressions.
- CTEDD has hosted several research webinars, lecture series, and workshops that have been hosted live and recorded for them to be viewed on YouTube by audiences around the world. Attendees and participants of these events have included state and city officials, civic groups, researchers, CTEDD PIs, students and faculty. The analytics for these events are in Table 1.2.

DISSEMINATION AND IMPLEMENTATION OF EACH RESEARCH PROJECT:

How have the results been disseminated? If so, in what way/s?

All research project dissemination activities have been highlighted in Table 1.4 and Table 3.1.

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

Research

- *General RFP 2017*
 - Complete final deliverable review process and allow PIs to implement recommended changes before uploading all documents to CTEDD and TRID websites.
 - Work with T2 Assistant Directors of each campus to propose technology transfer initiatives for these projects with individual consultation.
- *General RFP 2018*
 - Receive final deliverables for this round to be reviewed by peer reviewers before being sent to USDOT and uploaded on CTEDD website.
 - Work with T2 Assistant Directors of each campus to propose technology transfer initiatives for these projects with individual consultation.
- *General RFP 2019*
 - Complete review process for all projects internally and with executive committee members.
 - Implement award process for selected projects
 - Conduct post-award information session for PIs on reporting requirements and project expectations.
 - Keep projects on track with quarterly and semi-annual reports, as well as technology transfer consultation with T2 Assistant Directors.
- *SEED Grant 2018*
 - Complete final deliverable review process and allow PIs to implement recommended changes before uploading all documents to CTEDD and TRID websites.
 - Work with T2 Assistant Directors of each campus to propose technology transfer initiatives for these projects with individual consultation.
- *SEED Grant 2019:*
 - Receive final deliverables for this round to be reviewed by peer reviewers before being sent to USDOT and uploaded to CTEDD website.
 - Work with T2 Assistant Directors of each campus to propose technology transfer initiatives for these projects with individual consultation.

Education and Workforce

- Reviewing final deliverables and analyzing the success of the Pathways to Success program in attracting pre-college to transportation-related degree programs. This will help decide whether this can be an ongoing program for CTEDD.
- CTEDD Student Council elections for the 2019/2020 academic year for the President, Events lead, Research Lead, and Coordination Lead positions.
- Continue to collaborate with the Tarrant Transit Alliance, Conference of Minority Transportation Officials, and other local and national stakeholders on educational and workforce development in the transportation field.

Engagement and Technology Transfer

The UTA T2 Assistant Director will hold introductory and subsequent call with all other T2 representatives from member universities to discuss T2 plans and responsibilities. A plan for the summer and fall of 2019 will be finalized which will include:

- Modified reporting requirements that incorporate technology transfer as a major component and cater to USDOT requirements.
- An information session for PIs of upcoming projects on stakeholder involvement and technology transfer plans, reporting requirements, and how to achieve targeted technology readiness levels.
- A phone call and reminder to PIs of ongoing projects on upcoming and modified reporting requirements to ensure they can incorporate those changes in a timely manner before the next USDOT report.
- Data collection by T2 representatives on above items in time for USDOT reports and performance indicators.

CTEDD's planned events, tech-transfer and engagement activities (consortium-wide) for the upcoming reporting period are outlined in Table 1.4.

Table 1.4 – Consortium-wide Planned Events, Engagement and Technology Transfer Activities for Next Reporting Period

Title	Platform	Date	Stakeholders
CTEDD News	Online Newsletter	Weekly	All consortium members and stakeholders
Research Webinar Series	CTEDD 017-06 Student Thesis Fellowship Presentation All remaining General 2017 and SEED 2018 projects.	04/19 05/19 Summer 2019	All consortium members and stakeholders
Lecture Series Session 2 – Planning Mobility Systems in a High-Tech Economy Era	Invited external speakers from the country to talk about how current mobility systems need to be enhanced to serve innovation and high-tech districts of cities.	04/19	UC Berkeley; City of Irving; City of Richardson; UTA; local civic groups and government officials.
Leadership Dallas Summit 2019	Presentation by CTEDD director on transportation and accessibility to DFW Metroplex leaders.	04/19	DFW city and state officials; civic groups; UTA
Drive A.I Experience	Organized by CTEDD Student Council, a field trip to ride the new autonomous vehicles in Arlington by Drive A.I.	04/19	UTA students, staff and faculty.
Professional Conference Meetings	Conference attendance and presentations by students from Cal Poly and USF.	06/19 07/19	Cal Poly ITE USF
Build an Engineer Day	Middle school students' fieldtrip to Cal Poly campus to participate in traffic counting and speed survey activity.	09/10	Cal Poly Middle School Students from San Luis Obispo
Software workshops	Workshops organized by students for software used routinely by transportation professionals.	Fall 2019	Cal Poly UTA
Guest Speaker Events	Invited talks by external experts in transportation organized by USF students.	Fall 2019	USF ITE WTS SPO
The Journal of Public Transportation (JPT)	International, peer-reviewed open access journal.	09/18 – 08/19	Center for Urban Transportation Research; UTA; USF
Student Group Activities	CTEDD funded activities by student groups from member universities.	Summer 2019 Fall 2019	All CTEDD consortium members and stakeholders.

2. PARTICIPANTS & COLLABORATING ORGANIZATIONS: Who has been involved?

What organizations have been involved as partners?

The members of the consortium include the University of Texas at Arlington, California Polytechnic State University, San Luis Obispo, Georgia Institute of Technology, University of Wisconsin–Madison and University of South Florida. Table 2.1 presents a list of current and future CTEDD external partners.

Table 2.1: CTEDD External Partners in the Last Reporting Period

Organization Name	Location	Partner's Contribution	Category	Status
Go Link	Regional	Partnership on Research Project by UTA	Research	3
City of Fort Worth	Local	Partnership on Research Project by UTA	Research	3
The Near Southside Inc.	Local	Partnership on Research Project by UTA	Research	3
City of Dallas	Local	Partnership on Research Project by UTA	Research	3
City of Tampa	Local	Partnership on Research Project by USF	Research	1

Florida Department of Transportation	State-Wide	Partnership on Research Project by USF	Research	1
Texas Department of Transportation	State-Wide	Partnership on Research Project by UTA	Research	3
Georgia Department of Transportation	State-wide	Partnership on Research Project by GIT	Research	1
Swiss Federal Institute of Technology in Zurich	International	Partnership on Research Project by GIT	Research	1
Conference of Minority Transportation Officials (COMTO)	Regional	Collaboration on symposiums, events, educational programs	Tech Transfer and Education	3
US Environmental Protection Agency	National	Collaboration on Research project by UTA	Research	1
Federal Highway Administration	National	Collaboration on Research project by UTA	Research	1
University of Utah	National	Partnership on Research Project with UTA	Research	4
Metro Transit (Wisconsin)	Regional	Partnership on Research project at UWM	Research	2
Tarrant Transit Alliance	Regional	Partnership on workforce development and tech transfer in DFW	Education and Tech Transfer	3
Blue Duck Scooters	National	Collaboration on Research project at UTA	Research	2
Bike DFW	Regional	Collaboration on Research project at UTA	Research	2
TransitCenter	State-wide	Partnership on transit agency board member training – TX-BBB	Education and Tech transfer	3
Union Cab	Local	Partnership on Research Project by UWM	Research	3
Texas Innovation Alliance	State-wide	Partnership on Texas Mobility Summit	Tech Transfer and Education	3
Status *** 1 Initial arrangement 2 Agreement made, will be implemented 3 Implementation phase 4 Completion				

Have other collaborators or contacts been involved? Please see Table 2.1.

3. **OUTPUTS:** What has the program produced?

Publications, conference papers, and presentations; journal publications; books or other non-periodical; one-time publications; websites or internet sites; technologies or techniques; inventions, patent applications and/or licenses.

Table 3.1 shows the list of all outputs produced in the last reporting period, based on the categories mentioned above.

4. **OUTCOMES:** What outcomes has the program produced? How are the research outputs described in section (3) above being used to created outcomes?

Table 3.1 shows the list of all outcomes produced in the last reporting period.

5. **IMPACTS:** What is the impact of the program? How has it contributed to improve the transportation system: safety, reliability, durability, etc.; transportation education; and the workforce?

Table 3.1 shows the list of all of the actual and anticipated impacts of research projects in the last reporting period.

In addition to the outputs listed in Table 3.1, all CTEDD projects have submitted a final report, a final dataset, a policy brief, a “layman narrative” of their project, research highlights, performance indicators, a progress report, and materials for CTEDD’s newsletter and website such as webinars, press releases etc.

Table 3.1 – Outputs, Outcomes and Impacts for Individual Projects Produced in the Last Reporting Period

Project ID	Output	Category*	Outcome	Impact	Stakeholders
CTEDD 017-01	-Report to Caltrans on ramp-metering on I-80 -3 conference presentations including TRB	2;5	-3 graduate students trained (2 from underrepresented minority groups) - 2 follow-up projects secured with Caltrans - ITS course materials written -First complex evaluation of ARM systems based on travel time reliability and efficiency	-Caltrans is now reforming state policy regarding Adaptive Ramp Metering based on this project's recommendations	-Cal Poly -Caltrans
CTEDD 017-02	-One journal publication: Wang and Ross (2018). "Machine Learning Travel Mode Choices: Comparing..." -4 conference presentations including TRB	2;3;4	-4 graduate students trained -2 graduate-level courses created from project materials -109 downloads of publication and 3 citations -Findings sent to 56 local/state governments	N/A in this reporting period	-Georgia Tech
CTEDD 017-03	-2 presentations submitted to the Institute of Asset Management 2019 North American Conference - Online survey template for Asset Management programs -Guidelines for municipal Asset Management strategies	1;2;4	-1 graduate-level course created from project materials -4 graduate students trained -Working database of Asset Management practices in Georgia counties established - Asset Management guidelines and survey template sent to all 159 Georgia counties	N/A in this reporting period	-Georgia Tech -Institute of Asset Management -Georgia DOT -Chatham County, GA -Fayette County, GA -Fulton County, GA
CTEDD 017-06	- Open-source database for transit data, posted online for public usage - Workshop template for future educational efforts -Social media marketing plan template for transit agencies	1;3;4;5	-36 professionals trained on social marketing in transit -Over 250 Boise residents attended a public forum on social media for transit -3 local governments received workshop results and template for future planning efforts -3 transit providers developed a social marketing plan derived from this project's efforts	-Raleigh transit staff are now using social media to market carpools and transit passes -Transit providers in Arlington, TX are now marketing a vanpool program using this marketing plan	-City of Raleigh, NC -UTA -TXDOT -ACHD -Commuteride (Boise, ID) -USF -CUTR
CTEDD 017-07	-2 TRB presentations -Open source software (data archiving system) developed -Real-time improvement to Retro GTFS developed -Modifications to Conveyal, Inc.'s backend Analysis Tool	1;2	-1 graduate student trained -1 private-sector partner has adopted the project's software into its client-facing toolkit -Framework and software written to enable standardized and scalable data-collection for real-time transit data -14 users have downloaded the open-source system since March 2019	-Conveyal, Inc. is now utilizing the modified process in its Conveyal Analysis product for GTFS projects and agency clients	-University of Toronto -Conveyal, Inc. -CUTR
CTEDD 017-08	-Database of 200 regional governments, 618 transit	1;2;3	-8 graduate students trained (7 from underrepresented minority groups)	N/A in this reporting period	-Virginia Tech -Tarrant Transit Alliance

	agencies, and 12,569 local governments -National metric of transit fragmentation/regionalization -1 TRB/TRR submission -5 conference presentations -Webinar presentation		-43 people in attendance of webinar including Texas city and State officials; civic groups; and CTEDD community.		-Global Forum for Urban and Regional Resilience
CTEDD 017-11	-Post-processing code for evaluating micro-fractures in pavement -Micro-crack evaluation tool with wave detection capability -Cloud-based computing platform to host raw data -Android app to monitor/manage data -Webinar presentation	1;3	-5 graduate students trained (5 from underrepresented minority groups) -1 graduate course developed based on project findings -18 DFW community members in attendance of webinar including City of Arlington, UTA, TXDOT.	-Hardware and Android app are in field-adoption phase	-TXDOT -Arlington Airport -DFW Airport -TXDOT Bridge Team -Municipal Airport -DFW Airport
CTEDD 018-04 SG	-GIS database of carsharing trips, stop locations, and area income data -2 journal articles submitted -3 conference presentations -Presentation to community stakeholders -Survey/focus group template for future analysis of low-income carsharing	1;2;3	-4 graduate students trained in GIS, data analysis, and qualitative research methods -28 participants attended 7 focus groups	-Updated maps on Tarrant County's car sharing operations -14-member local advisory board on economic justice issues formed based on study	-City of Arlington, TX -NCTCOG -Tarrant County Homeless Coalition -Arlington Housing Authority
CTEDD 018-05 SG	-3 journal articles in process -3 conference presentations -Typology of disaster recovery indicators -Survey template for disaster resilience policies -Causality model on policy barriers to disaster recovery	1;4	-3 graduate students trained (3 from underrepresented minority groups) -Findings folded into a larger NSF grant to nationalize the study over a longer term	-2 state DOT's are working to implement policy recommendations	-Texas DOT -Florida DOT
CTEDD 018-08 SG	-Guidebook on dock-less bikeshare regulation	1;3;5	-4 graduate students trained (2 from visible minority groups)	-8 cities forming policies based on project findings -2 nonprofits using workshop template.	-Institute for Urban Studies -Bike DFW -City of Tempe, AZ -SF Bike Coalition

*Category Codes
 1 New Technology and Technique
 2 Conference Presentation
 3 Community-oriented Presentation
 4 Peer-Reviewed/Periodical Publication
 5 Non-Periodical Publication

Website(s) or other Internet site(s)

CTEDD Website: <https://ctedd.uta.edu>
 CTEDD Twitter Page: <https://twitter.com/CTEDD>
 CTEDD Facebook Page: <https://www.facebook.com/UTACTEDD/>

CTEDD YouTube Channel: <https://www.youtube.com/channel/UCqf2G50JsqMMC66kcUMKYJA/playlists>

CTEDD LinkedIn Page: <https://www.linkedin.com/company/institute-of-urban-studies/>

6. CHANGES/PROBLEMS:

Changes in approach and reasons for change

We added two more University of Wisconsin-Madison executive committee members to free up the workload for the previous executive committee member as she will be reaching her retirement soon. One of them has taken on the technology transfer and community engagement lead role for her campus, being the T2 Assistant Director. The second representative is the research lead for her campus. These changes were discussed with Denise Dunn in a phone call.

Actual or anticipated problems or delays and actions or plans to resolve them

Nothing to report for this period

Changes that have a significant impact on expenditures

Nothing to report for this period

Significant changes in use or care of human subjects, vertebrate animals, and/or biohazards

Nothing to report for this period

Change of primary performance site location from that originally proposed

Nothing to report for this period

7. SPECIAL REPORTING REQUIREMENTS:

In order to be able to successfully keep track of research project progress for each PI, the following are reporting requirements for all CTEDD projects:

Pre-award:

- Initial Research Summary that outlines the anticipated outcomes and benefits of the research topic and project.
- Data Management Plan to outline how and where data will be stored once the project is completed.
- Budget projections of how/when CTEDD and match funds will be distributed along the timeline of the project.

During the Award Period:

- Quarterly reports every quarter outlining project expenditure in CTEDD and match fund; number of students involved; milestones achieved; pending items for next reporting period
- Semi-annual progress report much like the USDOT one highlighting accomplishments, outputs, outcomes, impacts, collaborators, and any changes made to the project in the reporting period.

Final Deliverables:

- Final report
- Final dataset
- 2-page policy brief
- Layman narrative explaining the project in lay terms for the general public
- Research highlights outlining key components of the project that were innovative to the field
- Performance indicators outlining number of students, outputs, outcomes, impacts etc.
- Project closure form outlining key student accomplishments during research period
- Technology transfer plan/budget for post-completion based on technology readiness level achieved during research phase.
- Research webinar for PI to present their project to a wider audience online.