Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Assessing the health and environmental benefits associated with changes in transportation activities in near-road communities using low-cost sensors
University	The University of Texas at El Paso
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Funding Source(s) and Amounts Provided (by each agency or organization)	CTECH: $88,129 UTEP, $44,065
Total Project Cost	$132,194
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	Start date: 10/01/2020 End date: 05/31/2022
Brief Description of Research Project	Implementation of bicycle programs is considered an attractive approach in air pollution reduction in El Paso, Texas. Transitioning to cycling from any transportation mode other than walking will also improve the health of the individual. In El Paso County, 29% of adults are reported to have no physical activities or exercises (City of El Paso Department of Public Health, 2013). However, underserved communities near major roadways are constantly exposed to traffic-related air pollutants. Their health could be adversely impacted by these pollutants both chronically and acutely. A near-road community is expected to observe significant spatial and temporal variations in pollutant concentrations, as air pollution resulting from emissions from major highways decreases rapidly from the highways. Walking and bicycling aimed at improving health outcomes in underserved populations may therefore have a detrimental impact on health from an emissions exposure perspective.

	This project will demonstrate innovative applications of a type of portable, low-cost sensors to characterize spatial and temporal air pollution exposures and identify "healthier" streets and "healthier" time (with less air pollution concentration) for pedestrians and bicyclists near busy roadways. After identifying the characteristics of the portable/wearable sensor's measurement relative to other costly, bulky conventional devices, we will use portable/wearable devices in conjunction with GPS for continuous monitoring of traffic-related air pollution along arterials and surface streets at different times of the day in a study area with bicycle paths and/or pedestrian traffic. Multiple units of such sensors will be mounted by bicycles or other type of vehicles to make air quality measurement as they are on the move. The "naturalistically measured" results will be used to develop community exposure maps for the study area. The experience gained will also be written into guidelines for the use of such portable/wearable sensors in air pollutant exposure measurement, data handling, processing and visualization. We will work with El Paso MPO to promote the concept of community exposure maps into its bicycle and pedestrian master plan. **Output:** The expected output of this research is a series of concentration maps with healthy streets and bicycle routes identified for different time periods (morning, afternoon, and evening, Weekday/Weekend). The research will be used to promote healthy living (exercise by walking and bicycling) and healthy community (reduction in transportation emissions) in El Paso and other cities. We will publicize this project in local news media. **Outcome:** This project will introduce the concept of citizen science and monitoring to the community so that additional citizen-based, low-cost monitoring stations can be installed and integrated into a real-time network for air pollution monitoring and health routes for walking and bicycling. **Impact:** The stakeholders for this project include City of El Paso, TXDOT, El Paso MPO, Texas Department of Health. El Paso Health Foundation. For the exposure map to be adopted by the stakeholders, we will work with them to make the exposure maps displayed at their websites and track the number of views.

Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	
Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project Website	http://ctech.cee.cornell.edu/final-project-reports/