CENTER FOR ADVANCING RESEARCH IN
Transportation Emissions, Energy, and Health
A USDOT University Transportation Center

PROGRAM PROGRESS PERFORMANCE REPORT

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Project Title:	Center for Advancing Research in Transportation Emissions, Energy, and Health (CARTEEH)
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Report Term:	Semi-annual
Signature of Submitting Official:	Marcia Walker

OVERVIEW

The Center for Advancing Research in Transportation Emissions, Energy, and Health (CARTEEH) has been highly productive during this reporting period. Both the cooperative and competitive research projects are progressing, all involving a group of talented students. We have initiated several of our technology transfer activities, which have received extremely positive feedback. At the end of this reporting period, we are proud of our progress and excited about upcoming activities in all of our goal areas.

ACCOMPLISHMENTS

Leadership and Communications

During this period, CARTEEH leadership, including the partner leads from around the country, have maintained regular contact through a number of meetings, either in person, or via WebEx.

Executive Committee (ExCOM) Meetings: Made up of the partner leads and CARTEEH Director and Assistant Directors, ExCOM meetings are held on a monthly basis via WebEx. Topics include updates on or planning of CARTEEH initiatives, progress on research projects, and administrative issues such as reporting requirements or subcontract modifications.

CARTEEH Advisory Board: The Advisory Board is comprised of distinguished, high-level professionals who are strategically positioned to offer guidance on emerging trends, partnerships, leveraging opportunities, and scientific activities and research.

Table 1: Advisory Board Members

Name	Title	Institution
Dr. Thomas Burke	Jacob I. and Irene B. Fabrikant Professor and Chair in Health Risk and Society	Johns Hopkins University Bloomberg School of Public Health
Dr. Katherine Turnbull	Executive Associate Director	Texas A&M Transportation Institute
Dr. Roberto Osegueda	Vice President for Research	University of Texas at El Paso
Dr. Matthew Barth	Yeager Families Professor, College of Engineering	University of California - Riverside

The first Advisory Board meeting was held via WebEx on May 11, 2018. CARTEEH Director, Dr. Joe Zietsman, gave an overview of CARTEEH's purpose, focus areas, and goals. Each ExCOM member presented their institution's capabilities and the specific areas of expertise that they bring to CARTEEH. Board members provided background on their professional interests and thoughts on CARTEEH's future development. Members were also informed of the newly-required UTC Technology Transfer Plan, and advised that their comments would be solicited during its preparation.

Future Advisory Board meetings were tentatively scheduled for fall of 2018 and in Spring 2019 (at the upcoming CARTEEH Symposium). In the interim, members were asked to be thinking of individuals who could enhance the group and contribute to the Center's growth and long-term efficacy. Notes were distributed highlighting any action items.

Human Subject Compliance: We continue to maintain oversight of IRB-related actvities both at TTI and with our partners' projects. The umbrella protocol continues to work sucessfully.

Professional Service and Outreach: Several CARTEEH researchers continue to serve as ambassadors for our Center through their appointments, participation in technical committees and presentations at conferences. CARTEEH was also represented by the Center Director and Assistant Director for Administration at the Summer 2018 CUTC meeting held in Minneapolis.

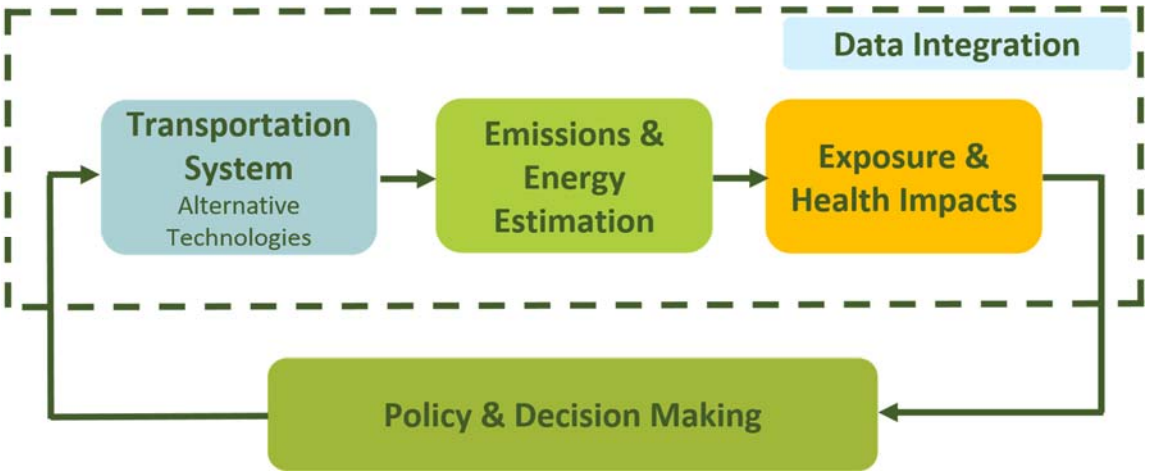
Progress in each CARTEEH goal area is detailed in the following sections.

Major Goals of the Program

CARTEEH is advancing research that addresses transportation emissions in the context of public health, bringing together experts from transportation and public health, two disciplines that have not traditionally worked together. We address the "full-chain," or spectrum, between transportation emissions and human health, as shown below.

By promoting interdisciplinary collaboration and communication, CARTEEH will advance transportation research, technology transfer, and education and workforce development in each of the following focus areas:

Figure 1: CARTEEH Focus Areas



CARTEEH Goal #1: Research Program

Cooperative Research Program

CARTEEH's initial research program focused on the six cooperative research projects identified in the Center proposal. Work on these projects is successfully progressing, and several are nearing completion.

Project #01 – Transportation Emissions and Health Data Hub

Partners: TTI, JHU, GT, UTEP, UCR

Description: This project reconciles differences in characteristics of transportation and health data, and develops a platform to house datasets and link to relevant information related to transportation emissions and public health data.

Project Status and Next Steps: TTI has worked with its partners to upload initial datasets and troubleshoot the data hub. Several "test drives" of the beta version were held during the summer, with institution-wide invitations sent to encourage participation. CARTEEH summer interns participated in smaller, related projects during its development, as well as contributing datasets from their individual summer projects.

Continuing efforts will focus on outreach to CARTEEH partners on its use and obtaining data for further population, and to identify additional enhancements to the platform. After completion of internal efforts, the data hub will be rolled out to the public.

Project #02 – Truck Emissions Exposure Study in Ports

Partners: GT, TTI, UCR

Description: This project assesses pollutant emissions at selected major ports in Georgia, Texas, and California, and evaluates the potential reduction of exposure that can come from using alternative fuel and powertrain technologies for trucking operations at the ports.

Project Status and Next Steps: The emissions measurement phase of this project was delayed due to permit difficulties. An alternative project plan was developed and is moving forward. Project staff are working with the City of Savannah, Savannah/Chatham County Schools and a local assisted living community. Monitoring sites are being reviewed for the study plan. Work will continue on obtaining field measurements and other data and incorporating this information into an assessment of the impacts of these technologies.

Project #03 – Border Crossing Emissions

Partners: TTI/Texas A&M School of Public Health, UTEP, JHU

Description: Characterizes the emissions impact of traffic-related air pollution specifically in the context of border crossings in El Paso, identifies the population groups most affected by the emissions, and implements a personal exposure measurement pilot.

Project Status and Next Steps: The first phase of the project has been completed, and involved screening and GIS -based analysis to identify the affected environment due to traffic from border crossings, and to identify neighborhoods and areas most impacted in the El Paso region. Following this, a study design plan was developed to conduct personal exposure

measurements of residents in El Paso. A sampling plan has been devised, and IRB approvals obtained; data collection is planned for later in the fall.

Project #04 – Healthy Living and Traffic-Related Air Pollution in an Underserved Community

Partners: UTEP, TTI, JHU

Description: Quantifies traffic-related air pollution and the associated respiratory health for vulnerable school children living in a near-road, underserved community in El Paso, Texas; develops guidelines on healthy living for the underserved, roadside communities.

Project Status and Next Steps: Field data collection, which involved collecting ambient air quality data for three criteria pollutants at selected community and near-road school locations has been completed. Currently, the data is being processed and analyzed, and the findings are being incorporated into broader findings related to health outcomes and physical activity of the school children. The remaining work will involve finalizing the analyses and interpreting the results.

Project #05 – Development and Evaluation of Connected Vehicle Application for Alternative Fuel Trucks

Partners: UCR, GT, TTI

Description: Evaluates the energy and emission benefits of battery electric trucks and plug-in hybrid electric trucks over conventional diesel trucks; develops a connected vehicle application for these trucks.

Project Status and Next Steps: Information on the energy consumption and emissions associated with the operation of battery electric trucks (BETs) and plug-in hybrid electric trucks (PHETs) was compiled. Real-world vehicle activity data collected from drayage trucks in the Port of Los Angeles was used to evaluate trips that can be conducted by BETs and PHETs. This data will be used to assess emissions and energy benefits of these trucks, and the findings incorporated into the Fuel and Emissions Calculator platform previously developed by GT. Work has also been done on the development of Eco-Approach and Departure algorithms for conventional trucks and BETs/PHETs.

Project #06 – Health Risk Characterization for Transportation Users

Partners: JHU, UTEP

Description: Develops a cumulative exposure and risk profile for transportation workers and/or transportation system users considering chemical and non-chemical stressors.

Project Status and Next Steps: The study design and IRB clearances have been completed for the project, with equipment procurement underway, and data collection forms and survey instruments developed. Research site identification, outreach to participants, and pilot equipment testing will be conducted, after which the field study will be implemented.

Competitive Research Program

In the first competitive program which was held last fall, the following projects were chosen and work began earlier this year. Quarterly reports track project development.

Table 2: Year Two Competitive Projects

Project	Lead Institution	Principal Investigator	Project Number
Assessing Regulatory Compliance and Community Air Pollution Impacts of Crude Oil by Rail (CBR) Transport in Baltimore City, Maryland	JHU	Dr. Genee Smith	JHU-01-07
Delivers evidence-based characterization of emissions impacts of CBR within Baltimore City, Maryland			
PM Exposure for Paratransit Transport	GaTech	Dr. Alex Samoylov	GT-01-08
Characterizes exposure to PM faced by sensitive populations using paratransit transport			
Measuring Temporal and Spatial Exposure of Urban Cyclists to Air Pollutants Using an Instrumented Bicycle	GaTech	Dr. Kari Watkins	GT-01-09
Develops an understanding of local cyclists' exposure to PM2.5 air pollutants in an urban environment			
Traffic-Related Air Pollution and Childhood Asthma in the United States: A burden of Disease Assessment	TTI	Dr. Haneen Khreis	TTI-01-10
Conducts a burden of disease estimate of childhood asthma attributable to traffic-related air pollution within the US			
Characterizing In-Cab Air Quality in Heavy Duty Diesel Construction Equipment	TTI	Dr. Phil Lewis	TTI-01-11
Analyzes air quality and driver exposure inside the cabs of heavy-duty diesel construction equipment			
Dockless Mobility: Addressing Safety, Emissions and Gaps in Policy Making	TTI	Dr. Suriya Vallamsundar	TTI-01-12
Examines emissions exposure on dockless mobility users in Dallas, Texas			
Quantifying Bioavailable Metals and Potential Dust Emissions from Highway-Related and Desert Sediments at Lordsburg Playa, New Mexico	UTEP	Dr. Thomas Gill	UT-01-13
Scopes the presence of bioavailable metals and potential dust emissions from highway-related and desert sediments in New Mexico			
Secondary Particulate Matter Exceed Primary Emissions from Current Gasoline Vehicles: Air Quality and Public Health Implications	UCR	Dr. Georgios Karavalakis	UCR-01-14
Assesses emissions from gasoline direct injection and multipoint injection vehicles when operated under different driving cycles			
Quantifying Traffic Congestion-Induced Change of Near-Road Air Pollutant Concentration	UCR	Dr. Jill Luo	UCR-01-15
Quantifies the contributions to the ambient air quality degradation due to traffic congestion based on statistical methods			

Strategic Initiatives

In addition to cooperative and competitive projects identified above, a new strategic initiative was started during this reporting period, while work continued on two others.

Mobility and Health - Conceptual Model and Quantitative Health Impact Assessment Model: In this effort, TTI researchers are developing a conceptual model linking urban mobility to health, with a view to providing a holistic picture that goes beyond transportation, air quality, and health issues. Researchers have formulated a high-level framework highlighting the linkages between health and transportation planning and policy. This effort will also undertake a quantitative assessment of the impacts of a broad range of urban and transportation related exposures, including air quality, for a statewide case study in Texas.

Truck Driver Health: In collaboration with Dr. Teresa Penbrooke from GPRed, this study focuses on truck driver wellness in the context of occupational constraints which lead to exposures to poor air quality, increased sedentary behaviors, and poor nutritional habits. During this period, the study design was completed and approval obtained from the TAMU IRB. In coming months, data will be collected from truckers and truck stop personnel from two locations, one in Hillsboro, Texas and another at a location near the ports of Los Angeles and Long Beach in California.

Health and Transportation: Dr. Mark Nieuwenhuijsen, of ISGlobal in Barcelona, Spain, is a highly-regarded expert in the field of the health impact assessment of traffic-related air pollution. We are fortunate to have him participating or advising on several CARTEEH activities. In addition to the seminar/webinar on "Perspectives on Transportation Emissions, Exposures, and Health" in December 2017, Dr. Nieuwenhuijsen and his institution continue to collaborate with CARTEEH. Anticipated cooperation includes potential equipment sharing, curriculum development, and symposium planning.

Research Results Disseminated

Work from CARTEEH projects is being presented, or has been accepted to be presented at a number of upcoming conferences. Our robust dissemination of research results is seen in the extensive list of presentations, conference papers, conference abstracts, and journal manuscripts that are detailed in the technology transfer section. CARTEEH researchers continue to use their professional network and events such as conferences, meetings and seminars to disseminate our research and discuss collaborations to take our work further.

Plans for Next Reporting Period to Accomplish Research Goal

CARTEEH leadership will provide support, guidance, and assistance to project principal investigators to aid in achieving individual project objectives. Additionally, we will ensure that Center activities progress in accordance with the approved work plans.

CARTEEH Goal #2: Education and Workforce Development

Our competitive research program and cooperative projects are catalysts for CARTEEH student involvement, with the number of students involved in CARTEEH increasing each semester.

Table 3: Year Two Students Supported

Level	Number
Undergraduate	9 (TTI 4, GaTech 2, UTEP 3)
Master's	8 (TTI 2, GaTech 3, UTEP 3)
Doctoral	12 (TTI 3, GaTech 1, UTEP 4, UCR 4)

Curriculum Course Development

Progress continues on the development of CARTEEH's cross-disciplinary course titled "Traffic-Related Air Pollution, Human Exposures, and Health." The course outline has been completed and lecturers are being identified for each session.

The course will cover key topics from the transportation, urban planning, exposure assessment and public health and policy domains. It is intended to set the foundation for a three-credit-hour graduate-level course offered by consortium member institutions. The course targets students and practitioners in the areas of urban planning, transportation planning, transportation engineering, geography, environmental sciences, environmental epidemiology, and public health. There will be 52 lectures, which will include a 15 minute pre-recorded video lecture from a subject matter expert for each. Simultaneously, a group of consortium members is exploring a potential book on the same topic. We will follow up with the UTC grant manager to discuss this topic in future reporting periods.

During the following reporting period, we expect to begin development of the course materials, as well as looking into the copyright process, with the assistance of TTI's technology transfer officer.

CARTEEH Summer Internship Program

This summer, CARTEEH awarded internships to four upper-level undergraduate students. Running from May 29th through August 3rd, the interns participated in joint activities with the Safe-D UTC interns, as well as a number of activities targeted specifically to the CARTEEH area of transportation and health. Each student was paired with a mentor to gain hands-on experience on projects related to one of the CARTEEH focus areas.

Students chosen for the CARTEEH internship program came from a variety of academic backgrounds: Civil Engineering (1 student), Urban and Regional Planning (1), and Public Health (2). One of the two public health students, Kristin Sanchez, was hired for the fall semester, and is expected to join CARTEEH full time after graduation in December.

The student intern program concluded with the students participating in Texas A&M's LAUNCH Undergraduate Summer Poster Session, as part of the larger Research Experience for Undergraduate programs being held at Texas A&M. This provided the students with experience in communicating their research projects both visually and verbally.

Student Professional Development Program

Conducted jointly with the SAFE-D UTC, CARTEEH, and SAFE-D graduate students are participating in a professional development program, designed by Dr. Melissa Tooley. During this reporting period, a presentation was given on "Career Readiness: Leveraging Social Media for Business" by Mr. Roland Block of the Texas A&M Engineering Career Services. The lectures are held at TTI, and webcast to all partner SAFE-D and CARTEEH institutions.

Other Activities

Education Results Disseminated

Several of our technology transfer initiatives, such as the seminars and literature library reach students as part of their education. Project work has been incorporated into graduate-level classes at University of Texas at El Paso, and Johns Hopkins University.

Plans for Next Reporting Period to Accomplish Education Goal

During the upcoming reporting period, the current education initiatives will continue and CARTEEH will look for additional opportunities for education and workforce development growth. We anticipate further progress on the curriculum course development, as well as further refinement of the summer internship program. A group from both TTI UTC's meets regularly to plan the 2019 internship program, and Kristin Sanchez, a 2018 CARTEEH intern will be joining the group to provide her perspective as a former intern.

CARTEEH Goal #3: Technology Transfer

A number of technology transfer activities are underway and progressing on schedule. The CARTEEH technology transfer activities aim to make research results and knowledge available to the research community and beyond.

Data Hub

The Transportation Emissions and Health Data Hub project is a key component of CARTEEH's technology transfer vision. It will provide a means to reconcile different methods of data collection and analysis in the fields of transportation and public health. Where applicable, data sets are de-identified and shared in compliance with the relevant institutions' IRB policies. Data will be available in the future for novel research applications. This project output and data sharing capability will serve as one of the products of our technology transfer goals.

Technology Transfer Plan

The CARTEEH Technology Transfer Plan was submitted per USDOT requirements, and approved during this reporting period. During this process, CARTEEH staff, and ExCOM and Advisory Board members collaborated and finalized CARTEEH's Technology Transfer goals, as well as the Center's stakeholders.

CARTEEH's T2 goals are to

1. Facilitate implementation of research findings
2. Engage stakeholders
3. Share knowledge
4. Collaborate and leverage our work and
5. Pursue licensing and commercialization opportunities

CARTEEH Seminars/Webinars

The CARTEEH Seminar/Webinar series continued throughout this reporting period, with two seminars held at Johns Hopkins University and at TTI.

In April, Dr. Thomas Burke, a former Science Advisor and Deputy Assistant Administrator for Research and Development at the US EPA during the Obama Administration (and CARTEEH Advisory Board member) spoke at Johns Hopkins on "The Road to a Healthy Environment: Transportation Research, Planning, and Public Health." The presentation was available via WebEx, and was viewed at Johns Hopkins, as well as by a number of online participants, which included a group of over 30 individuals from TTI.

In September, Dr. Rashid Shaikh visited TTI and spoke on the "Health Effects of Air Pollution: Perspectives and Priorities." Dr. Shaikh is the Director of Science of the Health Effects Institute, and is responsible for the management and oversight of the Institute's diverse research initiatives. Over 100 people registered for Dr. Shaikh's talk, and we received very favorable follow-up comments.

Videos of all CARTEEH seminars are posted to the CARTEEH website for future viewing.

Transportation, Air Quality and Health Symposium

Planning for CARTEEH's inaugural conference continued during this reporting period. The event details were finalized, and the Transportation, Air Quality, and Health Symposium sponsored by CARTEEH will be held February 18-20, 2019 in Austin, Texas. The goal of the symposium is to promote healthy transportation planning and policy by bringing together different disciplines working in the distinct areas of transportation systems, emissions, energy, air pollution, exposures, and public health. The targeted audience for this conference includes students, researchers and university faculty or staff, as well as transportation professionals. We have issued a call for abstracts for the symposium, and are in the process of finalizing keynote speakers and the rest of the agenda.

CARTEEH Literature Library

The CARTEEH literature library continues to develop on the CARTEEH website (https://www.carteeh.org/carteeh-literature-library/). This tool is intended as a resource for students, researchers, and practitioners interested in transportation and health, especially the impact of transportation emissions and air pollution on human health. The reference list has grown to over 800 scientific studies addressing the full chain of events between transportation pollution sources and health impacts. This reference list is periodically updated to include new studies as they become available.

Initial feedback from users has been very positive. We have received comments such as "This is wonderful work and a helpful resource for the research community," and "This looks amazing and very useful!" Statistics compiled by TTI's Communications department show 634 page views, with more than five minutes spent on average, and a 69% bounce rate. The lower bounce rate means that viewers spent time within carteeh.org after visiting the literature library page.

Figure 2: CARTEEH Literature Library Statistics

Page	Pageviews	Unique Pageviews	Avg. Time on Page	Entrances	Bounce Rate
	704 % of Total: 7.43% (9,469)	**634** % of Total: 8.13% (7,794)	**00:05:30** Avg for View: 00:01:34 (251.68%)	**573** % of Total: 11.65% (4,920)	**69.13%** Avg for View: 67.71% (2.10%)
1. /carteeh-literature-library/	**626** (88.92%)	565 (89.12%)	00:05:40	506 (88.31%)	67.83%

Technology Transfer Results Disseminated

All Center activities are posted to the CARTEEH website, with several updates made to the site following this reporting period. In addition, upcoming and planned activities such as webinars are advertised on the website. Once the webinars are completed, a video is posted for public

viewing. Additionally, a number of abstracts have been submitted, as well as presentations made.

Plans for Next Reporting Period to Accomplish Technology Transfer Goal

Technology Transfer Plan: Work will continue the implementation of the Technology Transfer Plan, including incorporating revised reporting requirements

CARTEEH Symposium Planning: The CARTEEH symposium will be held in February 2019, and is anticipated to attract researchers, students as well as practitioners as attendees and speakers, representing CARTEEH consortium member institutions and others in the US and internationally.

Working Papers: CARTEEH leadership and researchers are working on white papers/potential journal papers looking at health and transportation from a high-level policy perspective, with an emphasis on the emissions-related aspects of the disciplines. Working papers being drafted or planned include 1) investigation of the paradigm shift in addressing transportation air quality and health, 2) development of a conceptual model for transportation/mobility, health, and emissions, 3) investigation of the effectiveness of emissions control strategies in reducing health impacts.

Biannual Report: Work continues on the biannual report, and it will be finalized in November. The report will be posted to the CARTEEH website in a printable format. It is not expected to be mass printed, in order to conserve resources.

File Sharing Site: After working extensively with TTI's Communications department, it was determined that a more user-friendly platform was needed than the originally-envisioned SharePoint platform. A WordPress file sharing site is under development, and beta testing is expected to begin during the upcoming report period. This portal will serve as a central repository and is envisioned as a tool for research and administration, project reports, and publications. Forms will be saved in an easily accessible, central location.

PRODUCTS

Presentations

Name Josias Zietsman, Center Director, TTI
Event: Council of University Transportation Centers (June 5, 2018)
Title: Maintaining Working Partnerships
Location: Minneapolis, Minnesota

Name: Tara Ramani, Rohit Jaikumar, Amber Trueblood, Inyang Uwak, Suriya Vallamsundar, Natalie Johnson, and Josias Zietsman, TTI/TAMU
Event: International Conference on Health and Transportation (June 26, 2018)

Title: Traffic-Related Air Pollution Exposures from Border Crossings: Assessing Affected Populations in El Paso, Texas

Name: Haneen Khreis, TTI
Event: Briefing on Breathe Easy Dallas Project to City of Dallas's Members of the Quality of Life, Arts & Culture Committee (September 24, 2018)
Title: Project Highlight: Breathe Easy Dallas
Location: Dallas, Texas

Name: Haneen Khreis, TTI
Event: Workshop on Air Pollution and New Onset of Airway Disease, American Thoracic Society (May 19, 2018)
Title: Exposure to Traffic-Related Air Pollution and Risk of New Onset Asthma: What is the Epidemiological Evidence?
Location: San Diego, California

Name: Haneen Khreis, TTI
Event: The Joint Annual Meeting of the International Society of Exposure Science and the International Society for Environmental Epidemiology (ISES-ISEE 2018), (August 26-30, 2018)
Title: Air Pollution and the Burden of Childhood Asthma in the Contiguous United States in 2000 and 2010
Location: Ottawa, Canada

Name: Andrew Birt and Dan Seedah, TTI
Event: Workshop - CARTEEH Data Hub Update (April 24th, 2018)
Location: College Station, Texas

Name Andrew Birt & Dan Seedah, TTI
Event: Workshop - CARTEEH Data Hub Hackathon (June 7th, 2018)
Location: College Station, Texas

Name: Dan Seedah, TTI
Event: Webinar - CARTEEH Data Enthusiasts Interactive Webinar (July 5th 2018)
Location: Austin, Texas (with remote participation)

Name: Georgios Karavalakis, Associate Adjunct Professor, UCR, CE-CERT
Event: 2018 International Aerosol Conference, (September 2-7, 2018)
Title: Effect of High-Speed Driving Conditions on SOA Formation Potential from GDI Vehicle
Location: St. Louis, Missouri

Name Thomas Gill, Professor, University of Texas- El Paso
Event: New Mexico Geological Society Annual Meeting (April 13, 2018)
Title: Environmental Hazards from Aeolian Dust and Sand in the Chihuahuan Desert
Location: Socorro, New Mexico

Name: R. Scott Van Pelt (Physical Scientist, USDA Agricultural Research Service, unpaid consultant to Dr. Gill's project: co-authored by Iyasu Eibedingil, graduate student research assistant on Dr. Gill's project)

Event: 10th International Conference on Aeolian Research (June 28, 2018)
Title: Erodibility of and Dust Emissions from Bare Soil Surfaces in the North American Southwest
Location: Bordeaux, France

Name: Wen-Whai Li, UTEP
Event: Air Sensors International Conference 2018 (Sep. 12-14, 2018)
Title: Association of Respiratory Responses with Traffic Air Pollution for Asthmatic Children Attending Roadside Schools
Location: Oakland, California

Name: Juan Aguilera, Soyoung Jeon, Mayra Chavez, Leah Whigham, Wen-Whai Li, UTEP
Event: The 73rd Joint Advisory Committee (JAC) for the Improvement of Air Quality in the Ciudad Juárez, Chihuahua / El Paso, Texas / Doña Ana County, New México Air Basin (Sep. 20, 2018)
Title: Moderate to Vigorous Physical Activity Levels Negatively Correlate with Traffic Related Air Pollutants in Children with Asthma Attending a School Near a Freeway
Location: Las Cruces, New Mexico

Conference Abstracts, Conference Papers, and Journal Articles

Accepted

Name: Georgios Karavalakis, Associate Adjunct Professor, UCR, CE-CERT
Event: 2018 International Aerosol Conference, (September 2-7, 2018)
Title: Effect of High-Speed Driving Conditions on SOA Formation Potential from GDI Vehicle

Name: Thomas E. Gill, Miguel Dominguez Acosta, Matthew C. Baddock, Jeffrey A. Lee, Iyasu Eibedingil, and Junran Li, UTEP
Event: New Mexico Geological Society Annual Meeting [for publication in the journal NEW MEXICO GEOLOGY]
Title: Environmental Hazards from Aeolian Dust and Sand in the Chihuahuan Desert

Name: R. Scott Van Pelt, John Tatarko, C. Chang, and Iyasu Eibedingil
Event: Abstracts of the 10th International Conference on Aeolian Research
Title: Erodibility of and Dust Emissions from Bare Soil Surfaces in the North American Southwest

Name: Juan Aguilera, Leah Whigham, UTEP
Event: Journal of Isotopes in Environmental and Health Studies, 2018, Vol 54 (6): 573-587
Title: Using the 13C/12C Carbon Isotope Ratio to Characterize the Emission Sources of Airborne Particulate Matter: A Review of Literature

Name: W. Li, M Chavez, S Jeon, I. Ramirez, A. Rangel, A. Urbina, S. Vallamsundar, R. Farzaneh,
Event: The 2019 TRB Annual Meeting, Washington, D.C. (Jan. 13-17, 2019)
Title: Contribution of Traffic Emissions to Near-Road PM2.5 Air Concentrations as Implied by Urban-Scale Background Monitoring

Name: J. Aquilera, S. Jeon, A. Raysoni, A. Rangel, L. Whigham, W. Li
Event: The 2019 TRB Annual Meeting, Washington, D.C. (Jan. 13-17, 2019)

Title: Moderate to Vigorous Physical Activity Levels Negatively Correlate with Traffic Related Air Pollutants in Children with Asthma Attending a School Near a Highway

Name: S. Vallamsundar, M. Askariyeh, R. Farzaneh, M. Venugopal, W. Li
Event: The 2019 TRB Annual Meeting, Washington, D.C. (Jan. 13-17, 2019)
Title: Near-Road Monitoring Data Assessment: Impact of Traffic, Meteorology and Background Concentration

Name: Amit U. Raysoni, Juan A. Aguilera, Leah D. Whigham, Stephanie Garcia, Moises Garcia, Adan Rangel, Mayra C. Chavez, Ivan M. Ramirez, Wen-Whai Li, University of Texas at El Paso
Event: American Public Health Association 2018 Annual Meeting (November 2018)
Title: Airway Inflammation and Lung Function Measurements in Asthmatic Children at Two Roadside Elementary Schools in El Paso, TX

Name: Ayla Moretti, Ji Luo, Guoyuan Wu, Brandon Feenstra, Kanok Boriboonsomsin, Matthew Barth
Event: The 2019 TRB Annual Meeting, Washington, D.C. (Jan. 13-17, 2019)
Title: Understanding Air Quality Data, Traffic, and Weather Parameters Collected from Near-Road Stations

Name: W. Li, S. Jeon, M. Chavez, I. Ramirez, A. Rangel, A. Urbina, S. Vallamsundar, R. Farzaneh,
Event: The 2019 TRB Annual Meeting, Washington, D.C. (Jan. 13-17, 2019)
Title: Determination of Background PM2.5 Concentrations for a Potential Transportation Project Site

Name: Juan Aguilera, Amit Raysoni, Stephanie Garcia, Wen-Whai Li, Leah D. Whigham
Event: American Public Health Association 2018 Annual Meeting
Title: Associations of Fruit and Vegetables Intake, Naturally Occurring Breath Carbon Stables Isotopes, and Air Quality in Children with Asthma Attending Elementary Schools Near a Heavy Traffic Road in El Paso, TX

Name: Tara Ramani, Rohit Jaikumar, Amber Trueblood, Inyang Uwak, Suriya Vallamsundar, Natalie Johnson, Josias Zietsman
Event: American Public Health Association 2018 Annual Meeting
Title: Traffic-Related Air Pollution Exposures from Border Crossings: Assessing Affected Populations in El Paso, Texas

Name: A. Raed, Mathew Bechle, Julian D. Marshall, Tara Ramani, Joe Zietsman, Mark J Nieuwenhuijsen and Haneen Khreis
Event: The Joint Annual Meeting of the International Society of Exposure Science and the International Society for Environmental Epidemiology (ISES-ISEE 2018)
Title: Air Pollution and the Burden of Childhood Asthma in the Contiguous United States

Name: Haneen Khreis, TTI
Event: Urban Transitions, Barcelona, Spain, November 27, 2018
Title: Monetizing Health and Other Benefits of Transportation Investments and Policies

Name: Phil Lewis, TTI/TAMU
Event: Coordinating Research Council Real World Emissions Workshop 2019
Title: Assessing In-Cab/Near-Cab Air Quality for Heavy Duty Diesel Equipment

Name: Phil Lewis, TTI/TAMU
Event: Coordinating Research Council Real World Emissions Workshop 2019
Title: Data Needs for Updating and Improving the EPA NONROAD Model

Name: Daniel Tong, Barry Baker, Julian Wang, Thomas Gill, Iyasu Eibedingil, et al.
Event: American Geophysical Union Fall Meeting (Washington DC, December 2018)
Title: Multi-platform Observations of Dust Storm Activity over Southwestern United States: Long-term Trend, Climate Drivers, and Societal Impacts

Media References

The Dallas Morning News, Story: "Dallas schools have higher asthma rates than the rest of U.S., and the poorer the school, the worse it gets" https://www.dallasnews.com/news/public-health/2018/09/24/dallas-schools-higher-asthma-rates-rest-us-poorer-school-worse-gets

The Conversation, Story: "Nairobi is planning car-free days. They could bring many benefits" https://theconversation.com/nairobi-is-planning-car-free-days-they-could-bring-many-benefits-99301

News Medical, Story: "Thought Leaders, Dr. Haneen Khreis on The Impact of Air Pollution on Childhood Asthma" https://www.news-medical.net/news/20180501/The-Impact-of-Air-Pollution-on-Childhood-Asthma.aspx

My San Antonio, Story: "You don't have to be in wreck to be a traffic casualty" https://www.mysanantonio.com/opinion/commentary/article/You-don-t-have-to-be-in-wreck-to-be-a-traffic-12852204.php

Meteorologos explican mortiferas tormentas de arena y viento en la India (Meteorologists explain killer storms of sand and wind in India). Las Ultimas Noticias (Santiago, Chile) (May 4, 2018) www.lun.com/Pages/NewsDetail.aspx?dt=2018-05-04&PaginaId=32&bodyid=0
Health, Air Quality Study Seeks Pollution Solutions. https://www.utep.edu/newsfeed/campus/health,-air-quality-study-seeks-pollution-solutions.html

Website

The CARTEEH website is being refined and is being regularly updated. News articles relevant to the CARTEEH focus areas are added weekly, as are videos from CARTEEH seminars, and the new literature library. In conjunction with TTI Communications, we are working to improve our graphics and strengthen our branding.

Technologies

None to report for this period

Inventions

None to report for this period

Other Products

None to report for this period

PARTICIPANTS AND COLLABORATING ORGANIZATIONS

CARTEEH is made up of a consortium of five institutions: TTI is a member of the Texas A&M University System and home to the Center. Faculty and students from other colleges such as the Texas A&M Health Science Center are also involved. Johns Hopkins University, Georgia Tech, University of Texas-El Paso, and the University of California, Riverside complete the partnership.

Partner Organizations and Other Significant Collaborators

CARTEEH's focus areas cross multiple disciplines, bringing opportunities for a unique collaborative effort with institutions and individuals. These partners are essential to the success of the Center. Organizations and individuals in the following tables have directly supported or collaborated on Center activities.

Organization Name	Location	Contribution
Air Alliance Houston	Houston, Texas	Collaboration
American Thoracic Society	New York	Collaboration
Atlanta Bicycle Council	Atlanta, Georgia	Collaboration, In-kind support
California Energy Commission	Sacramento, California	In-kind support
Chesapeake Climate Action Network	Takoma Park, Maryland	Collaboration
City of Carson	Carson, California	Personnel
City of Los Angeles	Los Angeles, California	Data
Clean Water Action	Washington, D.C.	Collaboration
Dallas Independent School District	Dallas Texas	Access to facilities
El Paso Independent School District	El Paso, Texas	Facility and student access
Georgia Ports Authority	Savannah, Georgia	Collaboration
Houston-Galveston Area Council	Houston, Texas	Collaboration
Kelly Burt Dozer	College Station, Texas	In-kind support
Larry Young Paving	College Station, Texas	In-kind support
Los Angeles County Metropolitan Transportation Authority	Los Angeles, California	In-kind support
Maryland Institute College of Art	Baltimore, Maryland	In-kind support
Metropolitan Atlanta Rapid Transit Authority	Atlanta, Georgia	Collaboration, In-kind support
Mississippi State University	Starkville, Mississippi	Collaboration
Mount Winans Community Association	Baltimore, Maryland	Collaboration, facility access
Nashville Metropolitan Transit Authority	Nashville, Tennessee	Collaboration, In-kind support
National Weather Service	Santa Teresa, New Mexico	Information/data sharing, collaboration

North Central Texas Council of Governments	Arlington, Texas	Collaboration
Oak Ridge National Laboratory	Oak Ridge, Tennessee	Computer models
Port of Galveston	Galveston, Texas	Facilities
Port of Houston	Houston, Texas	Facilities
Port of Long Beach	Long Beach, California	Facilities
Port of Los Angeles	Los Angeles, California	Personnel
South Coast Air Quality Mgmt. District	Diamond Bar, California	Data and equipment
Tampere University of Technology	Tampere, Finland	Collaboration, Personnel Exchange, In-Kind Support
TAMU Department of Construction Science	College Station, Texas	Facilities
The City of Dallas	Dallas, Texas	Collaboration
The Nature Conservancy	Austin, Texas	Collaboration
University of Miami	Miami, FL	Collaborative research
USDA Agricultural Research Service	Big Spring, Texas	In-kind support, equipment, collaboration
USDA Agricultural Research Service	Fort Collins, Colorado	In-kind support, equipment, collaboration
USDA Agricultural Research Service	Las Cruces, New Mexico	Equipment, collaboration

Table 6: Significant Collaborators

Name	Affiliation	Contribution	Country
Dr. Susan Anenberg	Environmental and Occupational Health, George Washington University	Collaboration	USA
Dr. Robin Autenreith	TAMU – Civil Engineering	Collaboration	USA
Roya Bahreini	UCR, Environmental Sciences	In-kind contributions	USA
Dr. Mark Benden	TAMU Health Science Center	Collaboration	USA
Dr. Mark Burris	TAMU – Civil Engineering	Collaboration	USA
Dr. Susan Chrysler	TTI – SAFE-D UTC Assistant Director	Collaboration	USA
David Cocker	UCR, Department of Chemical and Environmental Engineering	Experimental Design and Data Analysis	USA
Ms. Victoria DeGuzman	University of Southern California/METRANS	Collaboration	USA
Dr. Kees de Hoogh	Swis Tropical and Public Health Institute	Collaboration	Switzerland
Dr. George Delclos	University of Texas Health Science Center at Houston	Collaboration	USA
David Dubois	Office of the State Climatologist, Las Cruces, NM	Contact	USA
Tom Durbin	University of California, Riverside	Data	USA
Brandon Feenstra	South Coast Air Quality Management District	In-kind support	USA
Cassandra Gaston	University of Miami, Miami, FL	Contact/Collaboration/data sharing/leveraging	USA

Zhiming Gao	Oak Ridge National Laboratory	In-kind support	USA
Dr. Michael Jerett	University of California, Los Angeles	Collaboration	USA
Kent Johnson	University of California, Riverside	Data	USA
Jorma Keskinen	Tampere University of Technology	In-kind contributions	Finland
Martina Klose	Barcelona Supercomputing Center, Barcelona, Spain	Contact/ data sharing	Spain
Niina Kuittinen	Tampere University of Technology	Collaboration	Finland
Dr. Wei Li	TAMU – Landscape Architecture and Urban Planning	Collaboration	USA
Dr. Karen Lucas	University of Leeds	Collaboration	U.K.
Dr. Ellen MacKenzie	Dean, JHU Bloomberg School of Public Health	Collaboration	USA
Douglass Mann	Maryland Institute College of Art	Data collection access	USA
Dr. Julian Marshall	University of Washington	Collaboration	USA
Dr. Rob Scott McConnell	The University of Southern California, Keck School of Medicine	Collaboration	USA
Dr. Jenny Mindell	University College London	Collaboration	U.K.
Dr. Bakeyah Nelson	Air Alliance Houston	Collaboration	USA
Dr. Mark Nieuwenhuijsen	Barcelona Institute for Global Health	Collaboration	Spain
Dr. Eun Sug Park	TTI – Mobility Analysis Program	Collaboration	USA
Hugh Pocock	Maryland Institute College of Art	Data collection access	USA
Dr. Teresa Qu	Michigan State University	Collaboration	USA
Dr. Joan Reibman	New York University School of Medicine	Collaboration	Switzerland
Dr. Ananya Roy	Environmental Defense Fund	Collaboration	USA
Dr. Rashid Shaikh	Health Effects Institute	Collaboration	USA
Dr. Andrea Strzelec	Mississippi State University	Collaboration	USA
John Tatarko	USDA Agricultural Research Service, Fort Collins, CO	Collaboration	USA
Dr. George Thrushton	New York University School of Medicine	Collaboration	USA
Daniel Tong	NOAA, Washington DC	Contact/ leveraging	USA
R. Scott Van Pelt	USDA Agricultural Research Service, El Paso, TX	Collaboration	USA
Nicholas Webb	USDA Agricultural Research Service, Las Cruces, NM	Collaboration	USA
Dr. John Wright	Bradford Institute for Health Research	Collaboration	U.K.
Dr. Qi Ying	TAMU – Civil Engineering	Collaboration	USA
Dr. Kai Zhang	University of Texas Health Science Center	Collaboration	USA
Dr. Yunlong Zhang	TAMU – Civil Engineering	Collaboration	USA

IMPACT

Impact on Development of the Principal and Other Disciplines

Impact on Development of Transportation Workforce Development

CARTEEH's programs are producing outputs which are being shared with the research and professional community, and our first batch of interns will all be graduating into the workforce in the coming year. We anticipate increasing impacts will be seen in future reporting periods.

Impact on Physical, Institutional, and Information Resources at the University or Other Partner Institutions

None to report for this period.

Impact on Technology Transfer

CARTEEH's technology transfer impact has been in the dissemination of our initial research at, in events such as seminars and our products such as the literature library. As we implement our technology transfer plan, we anticipate further impacts in the coming reporting period.

Society beyond Science and Technology

Nothing to report for this period.

CHANGES/PROBLEMS

None

SPECIAL REPORTING REQUIREMENTS

No special reporting requirements.