

US DOT Center for Advancing Research in Transportation Emission, Energy, and Health (CAR-TEEH)

Research Activities in El Paso

Wen-Whai Li, Ph.D., P.E.

The University of Texas at El Paso

May 25, 2017








Background

- The U.S. DOT announced grant competition for establishing University Research Centers (UTCs) to advance research and education programs under the Fixing America's Surface Transportation (FAST) Act in 2016
- 32 UTCs were selected out of 212 applications for a total amount of \$300M for 5 years
- Themes to address for the UTCs:
 - Improving mobility of people and goods
 - Reducing congestion
 - Promoting safety
 - Improving the durability and extending the life of transportation infrastructure
 - Preserving the environment
 - Preserving the existing transportation system

Center for Advancing Research in Transportation Emissions, Energy and Health (CAR-TEEH)



-  The Texas A&M University System (Lead) ,Texas A&M Transportation Institute
-  Johns Hopkins University
-  University of California, Riverside
-  Georgia Institute of Technology
-  University of Texas, El Paso



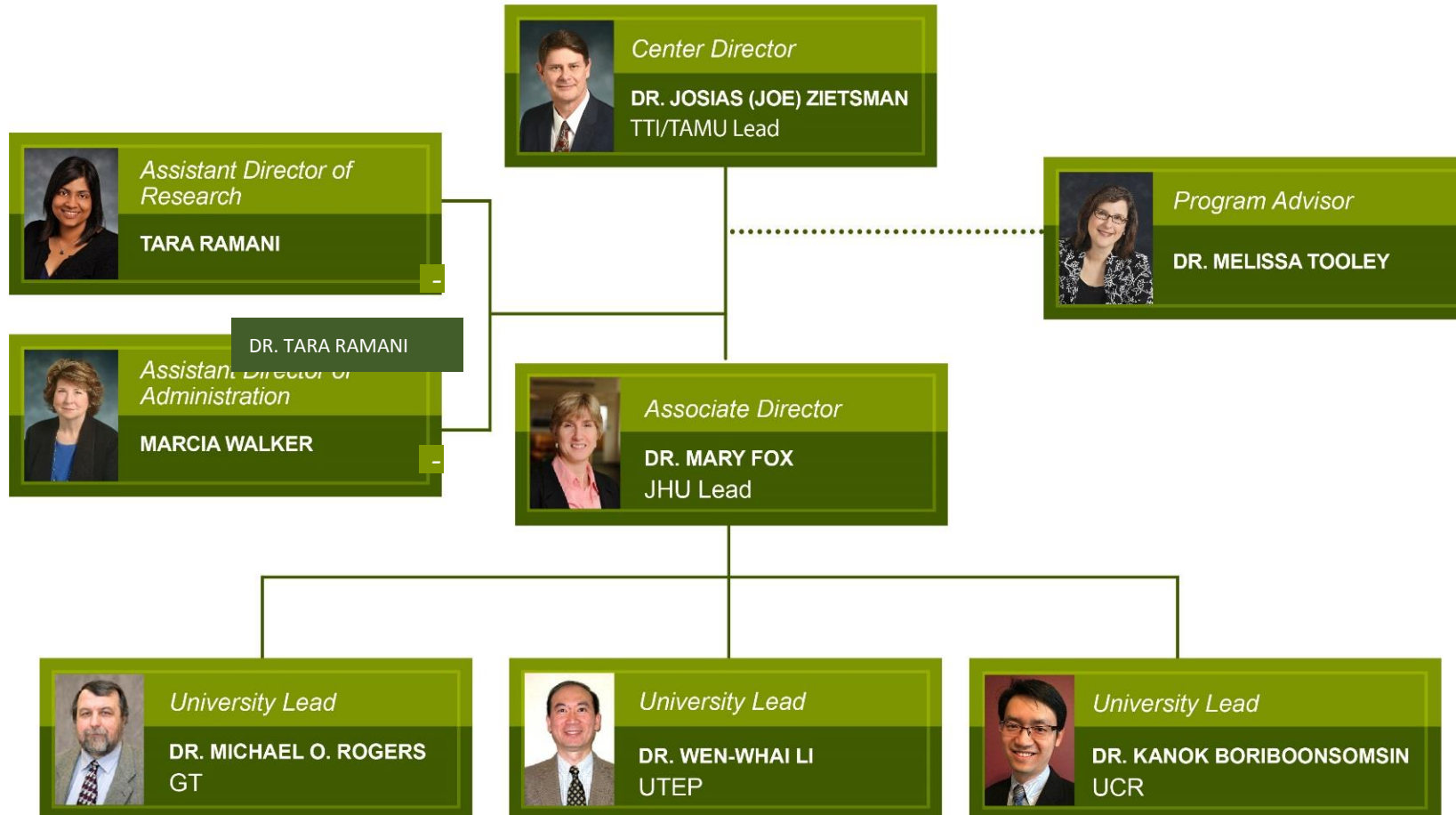
Vision

“CAR-TEEH is a premier University Transportation Center where transportation and public health experts work together to address the impact of transportation emissions on human health.”



CAR-TEEH

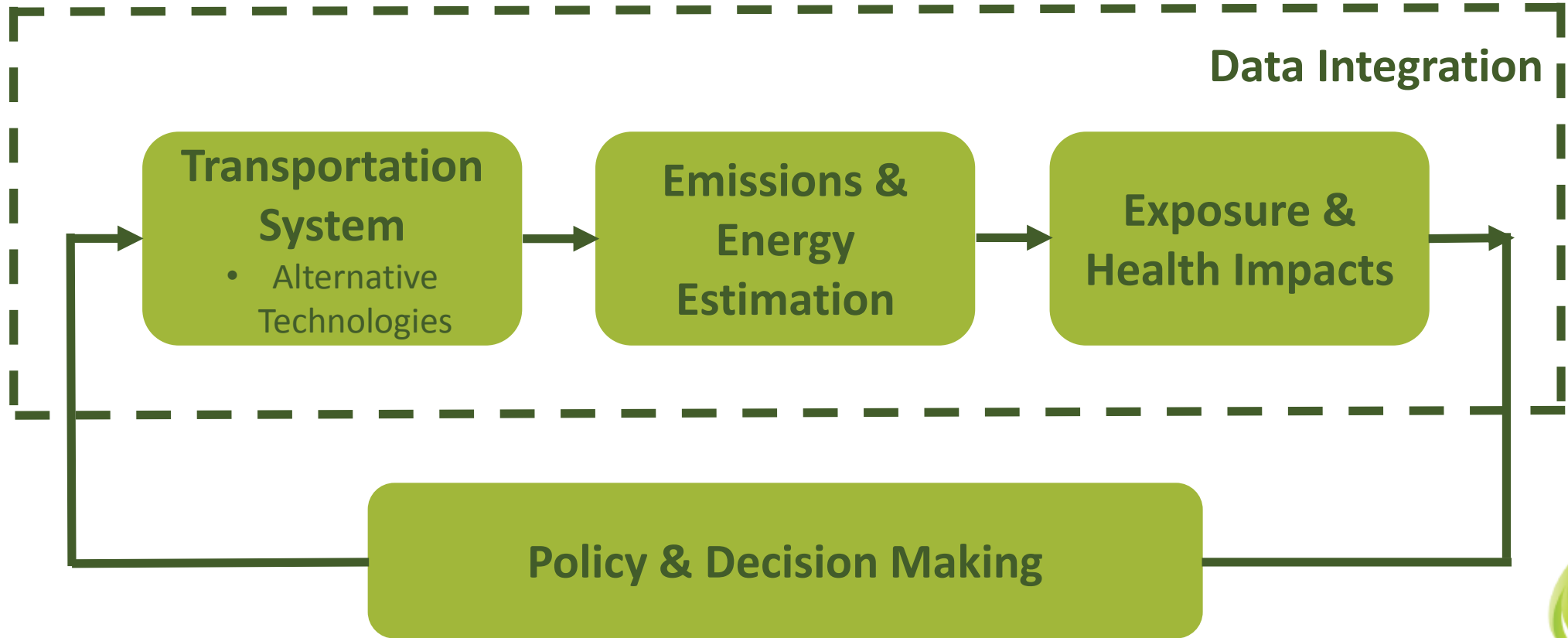
EXECUTIVE COMMITTEE



<https://www.carteeh.org/>



Focus Areas



Research

- Cooperative Program
 - 6 initial collaborative projects
 - At least 20% of future year funds
- Competitive Program
 - Year 2 onwards
 - Administered by individual consortium members

Collaborative Projects

<https://www.carteeh.org/research/focus-areas/projects/>



1. Transportation Emissions and Health Data Hub

Lead: Texas A&M Transportation Institute (TTI)

Partners: All other consortium members

2. Truck Emissions-Exposure Study in Ports

Lead: Georgia Tech (GT)

Partners: University of California Riverside (UCR), TTI

3. Border Crossing Emissions Impacts Study

Lead: TTI

Partners: University of Texas at El Paso (UTEP) and John Hopkins University (JHU)

Collaborative Projects

<https://www.cartteh.org/research/focus-areas/projects/>



4. Healthy Living and Traffic-Related Air Pollution in an Underserved Community

Lead: UTEP

Partners: JHU, UCR, and TTI

5. Development and Evaluation of Connected Vehicle Application for Alternative Fuel Trucks

Lead: UCR

Partners: GT

6. Health Risk Characterization for Transportation Users

Lead: JHU

Partners: UTEP

Matching Funds

- Total funding for a Center's operation must include the US DOT funding plus non-Federal
- Tier 1 match is 50% of the Federal Amount
- Grantees will have the length of the grant period to provide the full amount of required matching funds
- Examples
 - Federal funds provided to a recipient under 23 U.S.C. § 504(b) or 505 (local technical assistance and state planning and research programs managed by the FHWA)
 - Non-Federal matching funds may be cash or in-kind
 - Portion of Faculty salary (or can be split between faculties members)
 - Staff salary
 - Access to databases or lab facilities
 - Any foundation grant to study this topic (must fit the theme of center)

Collaborative Project #4

Objective

- Understand children's exposure to and respiratory health associated with traffic-related air pollutants and
- Develop guidelines on healthy living for the underserved roadside school children

Project Activities

1. Collect children's on-campus and after-school activity data and install ambient air monitoring stations for measuring 3 criteria pollutants
2. Conduct ambient monitoring and respiratory health measurements for a group of K-6 school children,
3. Develop relationships between children's respiratory health, physical activity, active transportation, and air pollution, and
4. Develop guidelines related to healthy living in the context of exposure to traffic-related air pollution.

Background Information for the Project

- Approximately 43.5 million people are routinely exposed to high-level of traffic emissions in the U.S.
- Residents of underserved communities are more likely to be exposed to excessive levels of air pollution.
- An active healthy lifestyle may expose a person to excessive air pollution regardless of whether the exercise takes place indoors or outdoors.
- Abundant evidence of adverse health effects resulting from acute or chronic exposure to traffic-related air pollution.
- Literature shows schoolchildren living 30-300 meters from a major roadway had increased arterial stiffness, increased carotid intima-media thickness, decreased academic performance, increased absenteeism, and increased clinical asthma symptoms.
- Significant associations between weekly averages of measured traffic-related pollutants and both airway inflammation and lung function in asthmatic children.
- In El Paso, a $10 \mu\text{g}/\text{m}^3$ increase in the hourly $\text{PM}_{2.5}$ above the hourly average is associated with higher risks of mortality on the same day and 1-3 days later.

Collaborative Efforts

University	Tasks to lead or with major participation
UTEP	<ul style="list-style-type: none">- Responsible for overall success of the project and daily operations Key participants: Wen-Whai Li, Leah Whigham, Joan Staniswalis, Soyoung Jeon
JHU	<ul style="list-style-type: none">- Advisory- Key participants: Kirsten Koehler, Mary Fox
TTI	<ul style="list-style-type: none">- Traffic data and traffic emissions, physical activity and quality of life surveys and data analysis in coordination with UTEP. Key participants: Ipek Sener, Reza Farzaneh
UCR	<ul style="list-style-type: none">- Dispersion modeling based on emissions information from TTI, advisory regarding possible route selection model Key participants: Kanok Boriboonsomsin

UTEP Team

Wen-Whai Li, Ph.D., P.E., Professor of Civil Engineering

Air Quality Monitoring and Modeling, Exposure and Risk Assessment, Wind Engineering

Leah Whigham, Ph.D., Associate Professor of Public Health; Executive Director, Paso del Norte Institute for Healthy Living

Nutrition and obesity, evidence-based approaches to increase healthy eating and active living, nutrition and physical activity, community public health

Joan Staniswalis, Ph.D., Professor of Mathematics, Fellow of The American Statistical Association

Soyoung Jeon, Ph.D., Research Specialist, Statistical Consulting Laboratory

Nonparametric and semiparametric regression, functional data analysis for curve data, biomedical data analyses, statistical methodology, and experimental design.

William Hargrove, Ph.D., Director, Center for Environmental Resource Management

Environmental sustainability, education outreach, health impact assessment, soil science, environmental justice

Other Investigators

Future Collaboration and Studies in El Paso

- Collaborate with industries, local and state agencies to reduce traffic-related emissions and improve air quality
- Build on the funds available from CAR-TEEH to expand study objectives in the border region
- Broaden the scopes of work to include:
 - Improve air quality
 - Reduce respiratory health risks
 - Develop mitigation measures
 - Conduct air monitoring and exposure assessment
 - Develop technologies to reduce vehicular emissions via hardware and software improvements

CAR-TEEH Project #4

Healthy Living and Traffic-Related Air Pollution in an Underserved Community

Contact Information

Wen-Whai Li, Ph.D., P.E.,
wli@utep.edu,
(915) 747-8755

