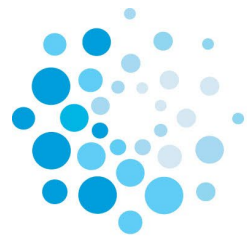


# The Road Ahead for the Legacy Diesel Fleet

*Tara Ramani*

*Texas A&M Transportation Institute and member of the HEI  
Heavy-Duty Diesel Fleet Turnover Panel*

*May 6, 2025*



## Health Effects Institute

# MOTIVATION TO STUDY THE LEGACY DIESEL FLEET

- Substantial improvements can be achieved with new technology for heavy-duty diesel engines.
- Almost half of the current fleet of trucks and buses are older vehicles that do not meet the newest standards.
- Older, more polluting vehicles often operate near communities.
- An opportunity exists to identify the exposure and health benefits that could be achieved by replacing older diesel vehicles with new cleaner technologies.

**(A) Mass Emissions**

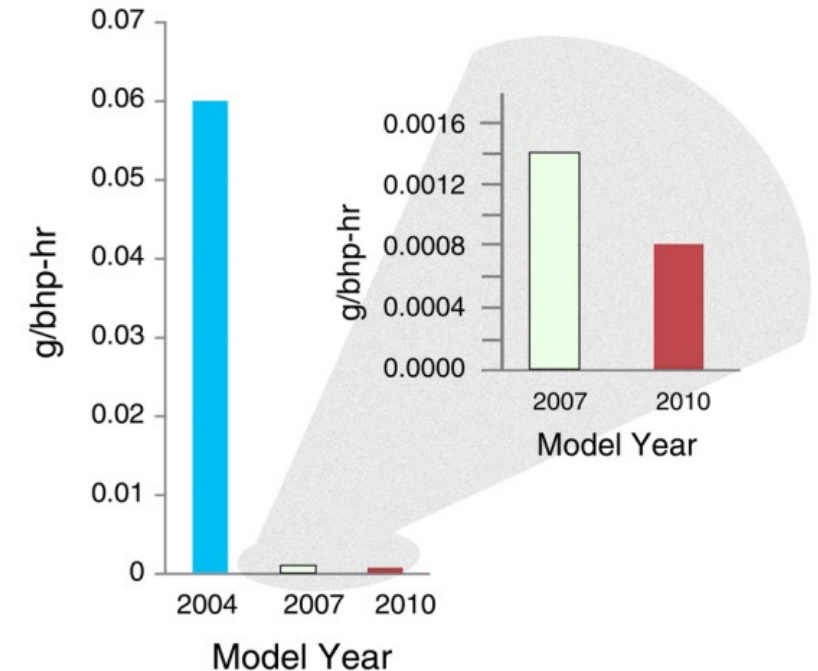
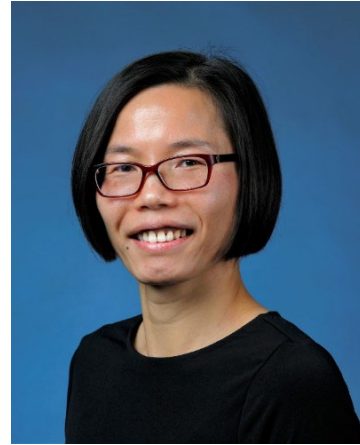


Image source: HEI-funded Advanced Collaborative Emissions Study (ACES) Executive Summary

# HEI HEAVY-DUTY DIESEL FLEET TURNOVER PANEL



**Marianne Hatzopoulou, Ph.D., Chair,** Professor and Department Chair, University of Toronto and HEI Research Committee



**Jane Lin, Ph.D.,** Professor, University of Illinois Chicago



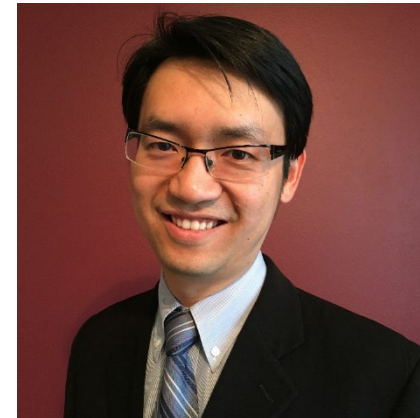
**Christopher Tessum, Ph.D.,** Assistant Professor, University of Illinois at Urbana—Champaign



**Tara Ramani, Ph.D., P.E.,** Research Engineer, Texas A&M Transportation Institute



**Deb Niemeier, P.E., Ph.D.,** NAE, Clark Distinguished Chair in Energy and Sustainability and Professor, University of Maryland



**Kanok Boriboonsomsin, Ph.D., P.E.,** Research Engineer and Associate Director at CE-CERT, UC Riverside

# HEAVY-DUTY DIESEL VEHICLE TURNOVER: SPECIAL PROJECT

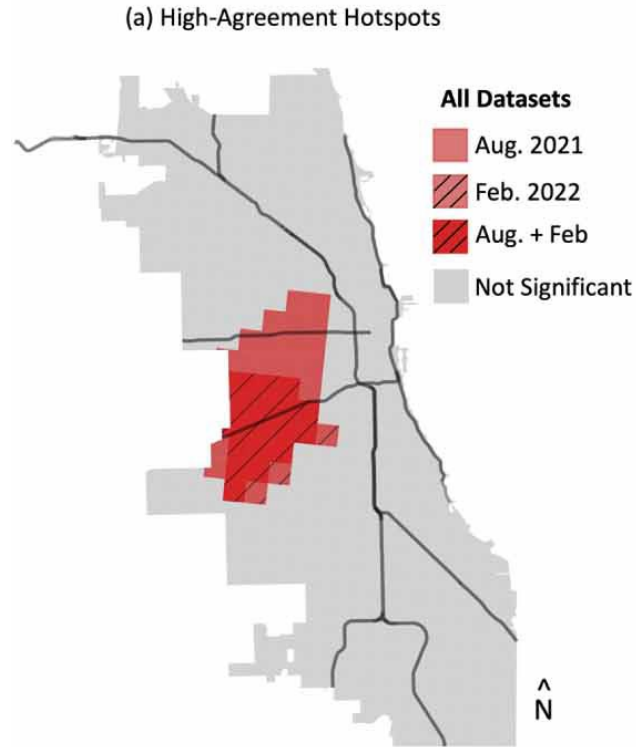
**Research Question:** What are the potential near-term emissions, air quality, human exposure, or health benefits that could be achieved by replacing older medium- and heavy-duty diesel vehicles in the United States with cleaner vehicle technologies?

**Expected Outcome – A report to inform HEI sponsors and HEI's future research directions. Report to provide...**

- Landscape of the medium- and heavy-duty diesel vehicle fleet in the United States.
- New research on potential near-term effects of replacing older diesel vehicles.
- Summary of findings and their implications for policy and science.



# MEDIUM AND HEAVY-DUTY DIESEL FLEET TURNOVER STUDY



Montgomery et al. 2023

## PI: Daniel Horton, Northwestern University

- Selected a neighborhood on the west side of Chicago with high levels of diesel traffic and air pollution.
- Will determine potential benefits of replacing older diesel trucks to emissions, air quality, exposure, health, and equity.
- Will incorporate industry and community perspectives on fleet conversion through workshops, surveys, and other engagement.



# CHARGE QUESTIONS FOR PANELISTS

1. What are the main questions or concerns that people in your sector have related to the legacy diesel fleet and fleet turnover?
2. What are the air quality and health effects of older medium- and heavy- duty vehicles? What are the co-benefits and trade-offs of the replacement of these vehicles with newer diesel vehicles?
3. What are the implications, positive or negative, for populations living near hotspots?

**TUESDAY, MAY 6, 2025**

# The Road Ahead for the Legacy Diesel Fleet

**SESSION  
CHAIR**



**Tara Ramani**

**Texas A&M Transportation Institute &  
HEI Heavy-Duty Diesel Fleet Turnover Panel Member**

**SPEAKERS**



**Ray Minjares**

**International Council on  
Clean Transportation**



**Daniel Horton**

**Northwestern  
University**



**Arvind Thiruvengadam**

**Paccar Inc.**



**Regan Patterson**

**University of California,  
Los Angeles**