

Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Cargo Routing, Health Impacts, and Disadvantaged Communities
University	University of California, Davis
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT: \$120,000 UC Davis: \$60,001
Total Project Cost	\$180,001
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	■ Start date: 10/01/2021 ■ End date: 03/31/2023
Brief Description of Research Project	<p>Most policies and strategies in California to contend with the environmental issues from trucks traffic are based on vehicle technology improvements (fostering the use and adoption of zero and near-zero emission vehicles ZEHDTs, or vehicle standards). However, it is critical to identify other complementary and supplementary strategies since some technologies are not market ready, or their adoption will take time due to costs, technical specifications, or other important factors. This project proposes the consideration and evaluation of strategies that can address the vehicle operations of today, and the future, and that can target direct improvements on these communities. Specifically, the work will focus on routing technologies that consider the health impacts from freight flows at the local level, coupled with spatially constrained strategies such as geo-fencing.</p> <p>In doing so, the team will build upon recently completed work that developed a stochastic eco-routing tool that generated routing options based on different private objectives, such as the minimization of fuel consumption, or GHGs or criteria pollutant emissions, considering network conditions. Moreover, they</p>

	<p>developed a novel multi-class environmentally friendly traffic assignment model to estimate the network-wide effects of emissions reductions. They also expanded on the multi-class Traffic Assignment by Paired Alternative Segments (m-iTAPAS) algorithm. The model dynamically estimates vehicle emissions based on congestion impacts from the traffic assignment, and its network-based nature provides high-resolution link-level emissions.</p> <p>One important limitation of the model is that it only considers changes in emissions and does not consider health impacts to the specific populations affected by the [equilibrium] routes. Therefore, in this project, the team seeks to add health impact capabilities to the model. To the best of their knowledge, there are no studies that have taken this upstream approach to understanding and mitigating health impacts from freight on disadvantaged communities.</p> <p>The primary contribution of this study to the existing field of knowledge is the novel integration of a Human Exposure Model (HEM) with a multi-class traffic assignment model, which would seek a health impacts-based equilibrium. Additionally, this study lends a hand to policy measures that aim to preemptively minimize impacts on human health to disadvantaged communities rather than mitigating them after they have occurred.</p> <p>The team will design simulation scenarios that also implement geo-fenced assessment over key sensitive areas. For example, they will conduct analyses to evaluate the potential health-impact reductions to the South East Los Angeles (SELA), which has a significant higher proportion of lower income households, Hispanics, foreign non-citizens, and workers in front-line occupations compared to the LA County statistics. The work and modeling will identify public health costs as a function of geography, proximity to roadway segment, and population characteristics. Additionally, the researchers will collaborate with SELA organizations to garner community commentary and feedback on related topics.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	

Web Links

- Reports
- Project website

<http://ctech.cce.cornell.edu/final-project-reports/>