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Project Title:
Estimating Transit-Based Evacuation
Demand in Wildfires

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Estimating Transit-Based Evacuation Demand in Wildfires

This research will develop an accurate estimation of transit-based evacuation demand in wildfires so that public transit can be appropriately used to reach those at-risk populations.

WHAT IS THE NEED?

Multiple wildfire evacuation events per year have become the norm in California due to the impacts of climate change. Meanwhile, population growth has pushed more residents into wildland-urban interface (WUI) areas threatened by wildfires. These wildfire events thus have made evacuations more frequent and larger. Previous wildfire evacuations have seen massive congestion on primary evacuation routes. Additionally, many historically-disadvantaged populations, such as low-English-proficiency, low-income, carless, senior, and/or disabled individuals, have faced difficulties in evacuations. Mass transit and rail have the potential to serve their travel needs during evacuations. What is needed is an accurate estimation of transit-based evacuation demand in wildfires, so that public transit can be appropriately used to reach those at-risk populations.

WHAT ARE WE DOING?

To tackle this problem, we propose to leverage the anonymized GPS trajectory data (generated from mobile devices such as smartphones and smartwatches), the General Transit Feed Specification (GTFS) and/or GTFS Realtime data, the survey data collected from the disadvantaged populations, and public comments on unmet transit needs to estimate the transit-based evacuation demand during wildfires. We will use Sonoma County, California, as the study area, as it has been frequently impacted by wildfires and ordered large-scale evacuations in the past several years.



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WHAT IS OUR GOAL?

The end product of this research is a research report about:

1. How transit vehicles are used for wildfire evacuation by analyzing GPS data and GTFS/GTFS Realtime data
2. How historically-disadvantaged populations connect with public, nonprofit, and volunteer services to evacuate from wildfires, whose travel needs are not sufficiently met, and how wildfire evacuation plans might be adjusted to optimize these services
3. How to accurately estimate transit-based evacuation demand in wildfires.

The products will contain recommendations for future research and potential immediate implementation plans or action items to aid disadvantaged populations in future wildfire evacuation events. With the findings and products of this research, transit agencies, local governments, emergency management professionals, and nonprofit organizations will have greater knowledge on wildfire evacuation by transit, and thus can effectively and equitably incorporate disadvantaged populations' needs into safety elements of General Plans, developing evacuation service programs, and other relevant programs and plans.

WHAT IS THE BENEFIT?

This research project will produce greater knowledge about wildfire evacuation by transit and how disadvantaged populations connect with and utilize existing transportation services to evacuate from wildfires, which can be used to help plan for future wildfire evacuations.

WHAT IS THE PROGRESS TO DATE?

The research contract has not been executed.