



# UNIVERSITY TRANSPORTATION CENTER RESEARCH BRIEF

**PROJECT TITLE:** Agent-based Modeling of Emergency Management Networks with Public Mobilization after a Disaster

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**INSTITUTION:** SINGLE-INSTITUTION PROJECT

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**SPONSORS:** THE PACIFIC NORTHWEST TRANSPORTATION CONSORTIUM, OSU



## Background

Local, state, and federal governments are tasked with the responsibility of managing disaster response with the goal of increasing disaster resilience of a community. This includes continuing adequate service levels for critical infrastructure sectors, reducing

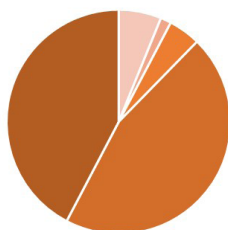
response time and cost, and ensuring the ongoing safety of the community. Complex emergency management systems typically consist of multiple organizations including state Emergency Management Divisions, military, local FEMA. These systems also span multiple levels of government hierarchy from local communities up through the federal level of the United States. Current in-place emergency response networks (ERNs) attempt to mitigate the impact of a disaster as efficiently as possible, to return to normal operating conditions. Post disaster, communities are challenged to holistically function and respond in adherence with their outlined emergency management protocol. However, due to epistemic uncertainty surrounding public response and lack of public awareness of the in-place emergency management protocol, the public may not adhere to the expectations.



## Research Project

The goal of this study is to measure the impact of stated public behavior on the response time and operability of the ERN due to interactions between the public and ERN, and propose changes to the status quo that will improve the ERN's efficiency to respond. The international community has begun to recognize that flexible post-disaster response is necessary to address and solve challenges. Flexible ERNs need to consider the potential behavior patterns from local communities. Lessons learned from the emergency response to previous crises demonstrates that regardless of the cultural differences between communities, and nature of the crisis (i.e. natural disaster versus public health), planning for emergency response is essentially the same. The results of this project include: (i) an interdisciplinary agent-based modeling framework to assess the vulnerabilities at the interface of the public network (i.e., social) and the ERNs (i.e., emergency managers and local authorities), and (ii) improved understanding of the impact (increase/decrease in resiliency) of disruptors that alter the status quo of network-of-networks.

How concerned are you about an earthquake hazard in your community?



- Neither concerned or unconcerned
- Not very concerned
- Very concerned
- Not concerned
- Somewhat concerned

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