The Sharing Economy and Evacuations

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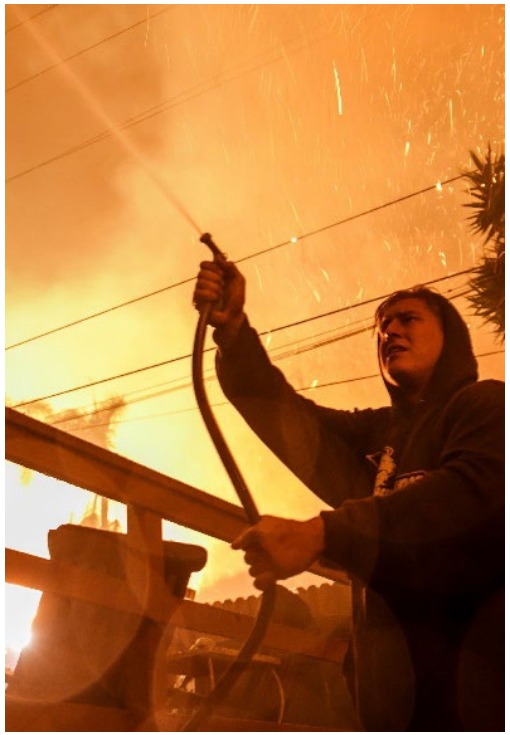
Overview

Critical Evacuation Challenges



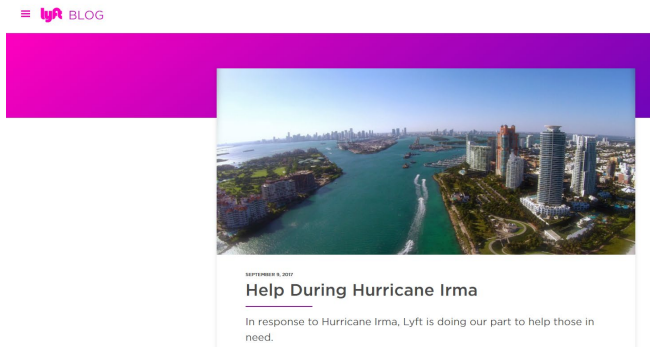
1. Persistent non-compliance to mandatory evacuation orders
2. Poor transportation response, leading to heavy congestion, slow evacuation clearance times, and high evacuee risk
3. Minimal attention in ensuring all populations, especially those most vulnerable, have transportation and shelter

Compliance, Congestion, and Social Equity

Strategy - The Sharing Economy

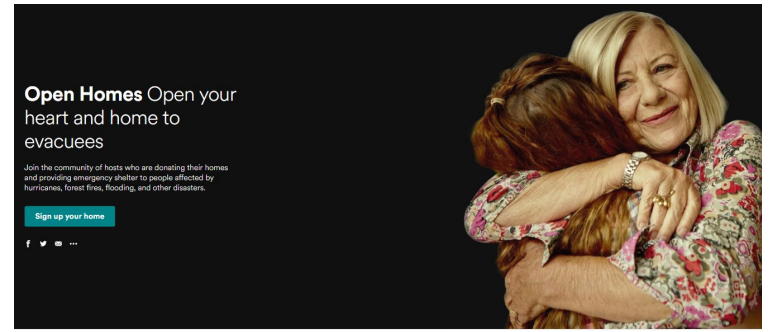
Feasibility of the sharing economy and emerging mobility in evacuations

- New technological connections (i.e., expanded Internet, smartphone adoption) and sharing economy platforms (i.e., Airbnb, Uber, Lyft)
- Resources from private companies or citizens could supplement public resources
- Sharing rides and shelter within communities and neighborhoods or to strangers



UBER

American Red Cross



Research Contributions

- Current state of the sharing economy in evacuations, benefits and limitations, and willingness of individuals to share resources
- Impact of different factors, including trust and compassion, on willingness to share transportation and sheltering
- Extent to which shared resources can improve or reduce social equity for vulnerable populations
- Sharing behavior nuances of different models, including latent classification and joint modeling

Data

Post-Disaster Surveys

- 2017 Hurricane Irma in Florida (n=645)
- 2017 December Southern California Wildfires (n=226)
- 2018 Carr Wildfire (n=284)

Post-Disaster Focus Groups

- Four groups (n=37): low-income, older adults, individuals with disabilities, Spanish-speaking
- Impacted by California wildfires

Expert Interviews (n=24)

- Opinions related to shared mobility in disasters

Results

Sharing Economy Limitations

To be successful in a disaster, a sharing economy strategy must address key concerns related to safety, equity, communication, and driver reliability.

- Expert interviews with 24 high-ranking experts
- 13 critical limitations (e.g., who pays, who matches, technology)
- Need for new partnerships and mechanisms

1. Significant planning, especially with a community-based approach
2. MOUs between agencies and companies
3. Low-tech solutions (e.g., telephone, bulletin boards, pre-disaster agreements)

Sharing Economy Social Equity Barriers

Vulnerable groups are highly concerned with driver availability and reliability, the ability of vehicles to reach evacuation zones, costs, and communication challenges.

- Focus groups (n=37) post-wildfire
- Low-income – no driver incentives to assist
- Older adult – adds confusion to evacuation
- Individuals with disabilities – vehicle accessibility
- Spanish-speaking – low trust of companies

1. Building robust transit-based plans that include shared mobility
2. Create partnerships ahead of time for paratransit with proper training

Sharing Economy Actions

Sharing economy companies are acting in disaster and these actions have become more consistent and structured.

- Since Hurricane Sandy, at least one of three companies – Uber, Lyft, and Airbnb – has acted in 30+ U.S. disasters
- Originally ad hoc, now structured with defined policies across most geographical areas
- Open Homes (Airbnb); Wheels for All (Lyft); Global Security Center (Uber)

1. Partnerships between agencies and companies
2. Communicate via alliances, meetings, and training exercises
3. Surge pricing/consumer protection flagging

Sharing Economy Benefits

Sharing economy could solve some issues including: resource deficiency, slow responsiveness, poor communication, and low support for vulnerable groups.

- 24 expert interviews
- 11 key sharing economy benefits (e.g., redundant, flexible, adaptive, informational)
- Companies benefit through press coverage, asset removal, and connections with community

1. TNC and paratransit pilot programs to test first- and last-mile connections
2. Test pilots during recovery period from disasters

Private Citizen Reservations

Private citizens for wildfires had a number of reservations and concerns about sharing resources in an evacuation.

	Sheltering	Transportation
Safety and security	55% - 57%	45% - 48%
Feeling responsible for individuals	45% - 49%	26% - 45%
Interacting with stranger	36% - 41%	17% - 26%
Not having space for other's luggage	-----	43% - 54%
Adding extra time to evacuation	-----	46% - 57%

1. Match through established CBOs
2. Pickup points for shared mobility

Private Citizen Sharing

1) Little use of the sharing economy; 2) Private citizens are somewhat willing to share their homes but much more willing to share transportation; 3) Capacity exists in the form of spare beds and spare seatbelts, indicating potential for sharing.

	Extremely Willing to Share in Future Disaster				Capacity	
Metric	**Shelter for Cost**	**Shelter for Free**	**Transport Before**	**Transport During**	**Spare Bed or Mattress**	**Spare Vehicle Space (2+ seatbelts)**
Hurricane	6.7%	19.2%	29.1%	23.6%	84%	77%
Wildfires	12%-14%	24%-30%	37%-48%	59%-72%	84%-90%	64%-69%

1. Bolster neighborhood and community networks
2. Resident-based approach will require training and integration into current mechanisms (CERTs)

Influencers on Sharing

Multiple important factors influence the willingness to share resources in a future disaster.

- Increase willingness for wildfires: trust and compassion across all resources; past disaster volunteers and members of community groups; evacuation urgency (e.g., visual fire, smoke, traffic, visibility)
- Sporadic or weak impact of most demographic variables (except families and homesharing users)
- Correlation of sharing behavior across hypothetical sharing scenarios for hurricanes and linkage via classes of individuals and/or joint behavioral preferences.

1. Need to increase trust/compassion (e.g., community cohesion, training, key leaders, civic pride)
2. Holistic sharing economy strategy at all temporal points of disaster and resource types

What Can CPUC Do?

- Allowing companies to observe or participate in training exercises for disasters and evacuations
- Setting working relationships with sharing economy companies to rapidly disseminate information
- Considering how to retain drivers and other employees in a disaster who could transport residents
- Setting equitable mechanisms for the reimbursement of transportation and sheltering services, paid for by providers, utilities, or others

What Can CPUC Do?

- Developing policies/regulations for sharing economy companies to provide services in evacuations/disasters (e.g., addressing price gouging that can arise from on-demand services in disasters)
- Piloting a matching system that connects supply and demand of resources (company and/or public fleets and/or private)
- Working directly with CBOs and NGOs on a strategy to build trust, compassion, and volunteerism and increasing information about how to share resources with other residents in a disaster

Acknowledgements

- National Science Foundation: Graduate Research Fellowship Program (GRFP) and Graduate Research Opportunities Worldwide (GROW)
- Federal Highway Administration: Dwight D. Eisenhower Transportation Fellowship Program
- University of California Institute of Transportation Studies (UC ITS): Road Repair and Accountability Act of 2017 (Senate Bill 1)
- Transportation Sustainability Research Center and Institute of Transportation Studies – Berkeley
- Agencies and community organizations across Florida and California for distributing the surveys
- Participants in expert interviews and focus groups

Sharing Economy Publications

Wong, S., Yu, M., Kuncheria, A., Shaheen, S. & Walker, J. (2021): Understanding the Willingness to Share Resources in Evacuations: A Multi-Modeling Approach. *(In preparation for submission)*

Wong, S. D., Broader, J. C., & Shaheen, S. A. (2020). Can Sharing Economy Platforms Increase Social Equity for Vulnerable Populations in Disaster Response and Relief? A Case Study of the 2017 and 2018 California Wildfires. *Transportation Research Interdisciplinary Perspectives*, *5*, 100131. https://doi.org/10.1016/j.trip.2020.100131

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Other Wildfire/Hurricane Publications

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Stephen Wong is a doctoral candidate at the University of California, Berkeley studying Transportation Engineering. His research focuses on the intersection of evacuations, decision-making, and shared mobility. His research aims to develop empirically driven evacuation and resilience strategies for governmental agencies to prepare for, respond to, and recover from disasters.

Stephen is also currently a graduate student researcher for the California Resilient and Innovative Mobility Initiative (CA RIMI). CA RIMI aims to inform the state's immediate COVID-19 response and recovery needs, while establishing a long-term pathway for a more sustainable and resilient transportation system.

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