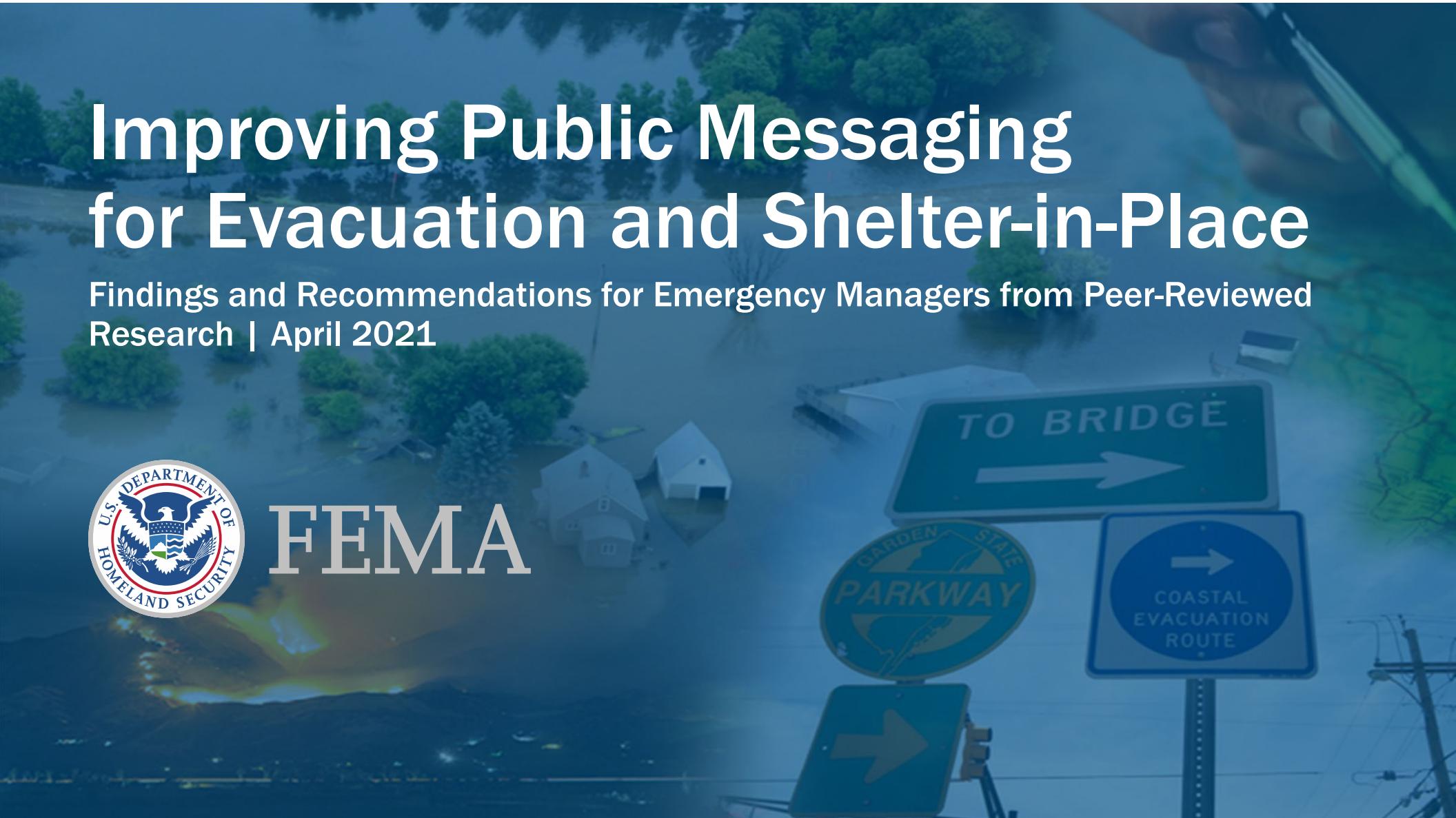


# Improving Public Messaging for Evacuation and Shelter-in-Place

Findings and Recommendations for Emergency Managers from Peer-Reviewed  
Research | April 2021



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# Evacuation and Shelter-in-Place Literature Review

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**Purpose:** An examination of published peer-reviewed research on evacuation and shelter-in-place protective actions to:

- Document research findings; and
- Present research-based recommendations to emergency managers on:
  - Informing community members about risk, and
  - Providing effective messaging to increase compliance with instructions to evacuate or to shelter-in-place.



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# Design and Methodology

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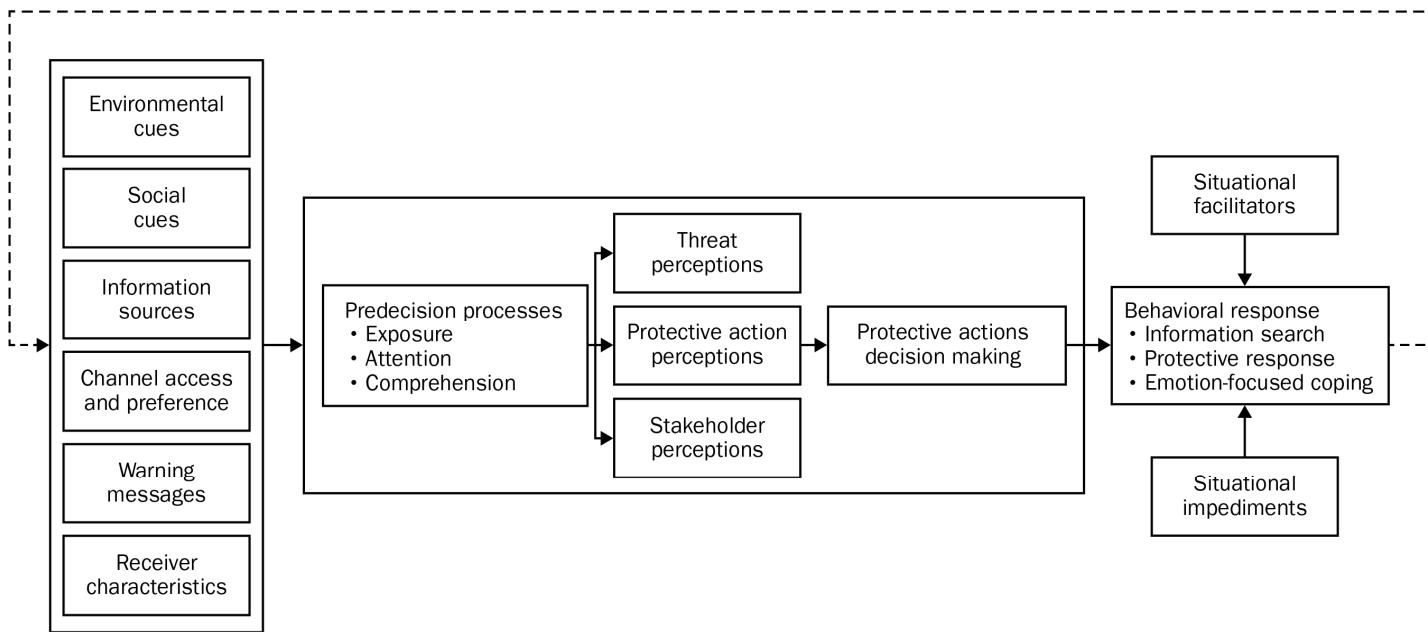
1. Used the Protective Action Decision Model (PADM) to create five research questions.
2. Established a list of search terms based on the questions.
3. Used search terms to identify relevant research, resulting in 771 distinct peer-reviewed articles.
4. Created and applied inclusion criteria resulting in 127 articles:
5. Documented research findings using NVivo software.
6. Grouped findings by research questions and then by PADM element.
7. Created recommendations from findings.

- Included literature:
  - Published in past 10 years (2009-19)
  - Focused on individual decision-making
  - Researched U.S. populations
  - Researched expected population behavior or experiences
  - Focused on community evacuation vs. building evacuation
- Excluded literature:
  - Focused on technology solutions or transportation models



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# Protective Action Decision Model (PADM)



Protective Action Decision Model: Lindell, M. and R. Perry. "The Protective Action Decision Model: Theoretical Modifications and Additional Evidence." *Journal of Risk Analysis*, Vol. 32, No.4. 2012.



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## Research Questions (RQ)

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- RQ1. How do environmental and social cues affect individuals' attention and response to evacuation and SIP guidance?
- RQ2. How do warning messages, information sources, and channels affect the message receiver's beliefs and behaviors?
- RQ3. What individual and family characteristics affect beliefs and behaviors relative to evacuation and SIP guidance?
- RQ4. How do awareness and perceptions of different threats and hazards affect decision-making?
- RQ5. What are the impediments to positive behavioral response? What situational factors tend to support public response to evacuation and SIP guidance?

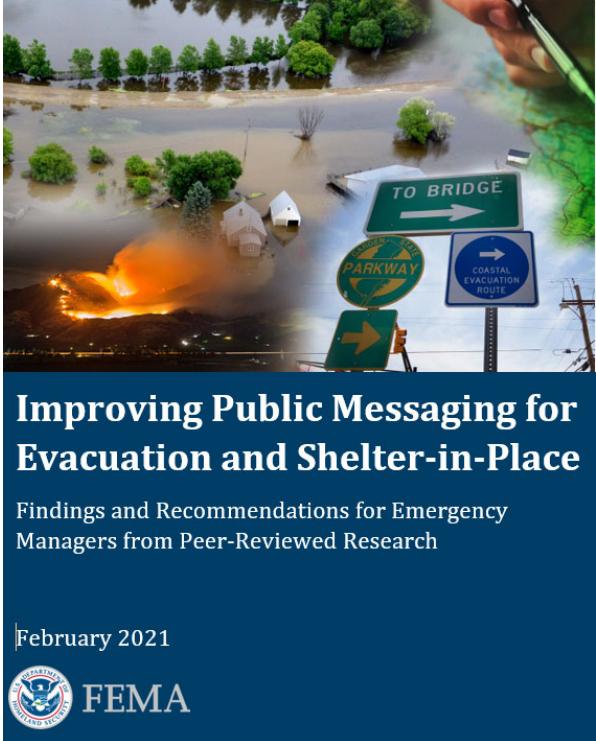


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# The Report

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- The full report is available on the Planning Guides webpage of the FEMA website, in the Emergency Management tab:

[Planning Guides | FEMA.gov](#)

The report and these PowerPoint slides contain links and references to nonfederal products and entities. Inclusion of such references is not an endorsement by the Federal Emergency Management Agency, the Department of Homeland Security, or any federal employee of the content they may contain.

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# How to Use This Slide Deck

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- This slide deck provides the findings and recommendations from the Evacuation and Shelter-in-Place Planning Literature Review.
- The findings and recommendations are provided in two ways:
  - 1. Organized by the Research Questions and their Sub-Elements** (Aligned with the Report's Table of Contents). Slides 8-85.
  - 2. Organized by Communication Strategies and Implementation Timeline: Prepare/Respond** (Aligned with Appendix C). Slides 86-143. The notes section includes the relevant report references.
- Select the slides that work best for your purposes. Note: This full slide deck is NOT intended to be used as-is, as presenting both sections in full will be duplicative.



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# **Evacuation Shelter-in-Place: Research Findings and Recommendations**

**Organized by the Research Questions and their Sub-Elements (Aligned with the Report's Table of Contents)**

# RQ1: Environmental Cues

## Findings and Recommendations



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## Findings: Environmental Cues

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- Sights, sounds, or smells that indicate an impending threat are important for confirming that a risk is real.
- People seek environmental cues for the decision to take a protective action (rising water, smoke or flames).
- If environmental cues are not present, individuals may take a wait-and-see approach.



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## Recommendations: Environmental Cues

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- Use websites and social media platforms, and work with local media to provide authoritative, time-stamped, geo-tagged photos and videos of hazards such as rising waters and wildfires. Encourage individuals to share those visuals with friends and family and on social media.



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# RQ1: Social Cues

## Findings and Recommendations



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## What We Found: Social Cues

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- Seeing neighbors or others evacuate was a predictor of increased evacuation across hazard types.
- If individuals in non-evacuation zones saw neighbors leave, it increased the likelihood that they would also leave. If individuals in areas that should evacuate did NOT see neighbors leave, that may have caused them to conform to the neighborhood norm and also not evacuate.
- Receiving messages from family and friends in addition to local authorities was a major positive influence on evacuation decision-making. Those who share information with others were more likely to themselves evacuate.
- The actions of local governments and businesses also provided important social clues that can heighten risk perception, such as closing/boarding up businesses and closing public areas, public transportation, or specific roads.



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## Recommendations: Social Cues

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- Encourage media to cover the different ways jurisdictions, businesses, and individuals are preparing for the threat e.g., closing public transportation or other public areas.



- Encourage businesses to share actions they are taking on their websites and social media accounts (closing their businesses, encouraging employees to evacuate and stay safe).



- Encourage individuals to share the alerts and warning messages they have received and the protective actions they are taking with their friends. Also, encourage individuals to post photos of visual cues of the hazard as they evacuate.



- Encourage social media platforms like Nextdoor, and homeowners' associations (HOAs), to share evacuation guidance and check on neighbors.



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# RQ2: Warning Messages

## Findings and Recommendations



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## What We Found: Warning Messages

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- Mandatory evacuation orders significantly increase evacuation rates.
- Changing the type or area of the order causes confusion and delay.
- Messages that clearly describe the tangible personal impact of the hazard motivate protective action.
- Messages that compared the current storm to similar storms from the past helps individuals understand the risk.
- Adding visuals, such as maps or photos, improves message comprehension and decision-making.



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## What We Found: Warning Messages, continued

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- Attention-getting language and describing storm impacts is effective. However, language designed to scare people did not seem to further increase the motivation to act.
- There may be a risk of “over-warning,” for hazards like tornadoes. Warning areas are typically much larger than the area at risk which desensitizes individuals to future warnings.
- Individuals do not understand that the hurricane category and NWS warning “cone” only address wind damage, not surge, and that an increase in category represents an exponential rise in the risk of damage.



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## Recommendations: Alert and Warning Messages

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- Use language that will capture attention but is not overly dramatic.



- When communicating about **hurricane risk**, ensure that the message includes **flood and storm surge risk** as well as the hurricane category.



- Use **mandatory, timestamped evacuation orders** associated with specific evacuation zones when possible. Understand that changing the geographic area of evacuation orders will cause confusion.



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## Recommendations: Alert and Warning Messages

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- Use the Integrated Public Alert and Warning System's **Wireless Emergency Alert (WEA)** capability for messages, as WEAs are not constrained by the same bandwidth limitations as general text messages.



- Provide **interactive maps** to help individuals locate their home and work addresses and know their zone before an event.



- Provide easy and quick ways for individuals to corroborate information through **hyperlinks** to other authoritative sources.



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## Recommendations: Alert and Warning Messages

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- Compare the potential impact of an upcoming storm to other storms that have posed similar threats and post visual cues.



- Given increased forecasting accuracy for tornadoes, **use the smallest map polygon possible**, associated with local landmarks, to increase people's understanding that the warning forecast is specific to their area.



- **Highlight probable impacts** to individuals who stay and the potential duration of those impacts. Address the urgency for immediate action by noting when it will no longer be safe to evacuate or for emergency personnel to attempt rescues as the storm gets close.



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## Recommendations: Alert and Warning Messages

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- When issuing evacuation orders, **explain the risks** that led to the decision to evacuate some zones and why other zones are not evacuating.



- Always encourage individuals to **share information** with family and friends.



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# RQ2: Information Sources

## Findings and Recommendations



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## What We Found: Information Sources

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- Receiving **several warning messages** from multiple credible, trusted sources, increased rates of evacuation. NWS was specifically seen as a trusted source of information.
- **Evacuation orders issued by local authorities** helped uncertain individuals make the decision to evacuate.
- Both **authorities and family and friends** influenced the decision to evacuate. Studies do not agree on their relative influence.
- **Authority figures acting as role models** by evacuating their families or going door to door to urge others to leave could increase the effectiveness of evacuation messages.



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## What We Found: Information Sources, Continued

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- Trust in government and guidance from **local first responders** influences preparedness and the decision to evacuate. For wildfires, an element of this trust was due to the **visibility of firefighters** in the community. For hurricanes, individuals were more likely to take action when emergency responders went **door-to-door** in the community.
- Lack of trust in authorities causes individuals to spend more time discussing their evacuation decision with others.
- **High trust in authorities** causes some to believe that community officials would keep them safe, and therefore they don't need to evacuate.
- **Tourists** who seek information from tourist offices rather than hotel staff are more likely to evacuate.



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## Recommendations: Information Sources

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- Build relationships in advance with television and radio reporters, weather forecasters and other journalists likely to cover hazards facing the community.



- Familiarize the media with evacuation zones, transportation for those who need it, and support for those in nursing homes or other similar facilities.



- Provide information about how plans consider public health issues, such as the spread of illness in crowded public shelters.



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## Recommendations: Information Sources

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- Encourage individuals and organizations with large numbers of followers (e.g., media stations, weather forecasters, American Red Cross, houses of worship, universities) to follow the jurisdiction's social media accounts so they can receive updates during the disaster and share authoritative messages with their networks.
  
- Have plans to use all communication channels that can provide information, especially if cell bandwidth becomes constrained. This includes highway advisory radio, highway signs, amateur radio and NWS weather radio.



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## Recommendations: Information Sources

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-  ▪ Encourage individuals to sign up for the jurisdiction's opt-in alert and warning channels so they directly receive updated information.
  
-  ▪ Confirm that the jurisdiction's **social media channels** are active and provide up-to-date information during the event.
  - Include messaging and live interviews that **address individuals' barriers to evacuation**.
  - **Collaborate with and follow the social media of authoritative sources** within the jurisdiction and across neighboring jurisdictions to keep information consistent and address inconsistencies and inaccuracies if they occur.



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## Recommendations: Information Sources

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- Share and promote NWS's warnings and forecasts to reinforce those of the local jurisdiction. Recommend that individuals follow the local NWS Forecast Office social media accounts.
  
- Provide easy and quick ways for individuals to corroborate information through **hyperlinks to other authoritative sources**. Always encourage individuals to share information with family and friends.



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# RQ2: Channel Access and Preference

## Findings and Recommendations



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## What We Found: Channel Access and Preference

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- While television remained the chief communication channel, receiving warnings from multiple channels increased the likelihood of individuals taking protective action.
- People use social media as a complementary source rather than their primary source of information.
- As cell phone ownership is now more prevalent than home landlines, public alert and warning calls to landline phone numbers are less effective. The increased reliance on cell phones may also result in cellular bandwidth congestion during an incident.
- Evacuated individuals rely on the same information sources for the re-entry phase that they used in deciding whether to evacuate.



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## Recommendations: Channel Access and Preference

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- Work closely with local media during the event to show first responders encouraging evacuations.



- Provide press with information so viewers **see the actions of first responders, businesses, and individuals taking action before the storm.**



- Update media regularly on alternative routes to avoid congestion, availability of services along evacuation routes and shelter information.



- Highlight how local authorities are heeding warnings: closing roads, boarding up schools or other government buildings at risk, etc.



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## Recommendations: Channel Access and Preference

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- Use social media monitoring tools to identify the channels that reach the most people with effective messaging. Use these channels to disseminate information about plans for re-entry.
- Plan to surge staff to monitor social media for rumors, misinformation and disinformation that must be quickly corrected.



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# RQ2: Information Seeking

## Findings and Recommendations



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## What We Found: Information Seeking

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- Individuals seek corroborating information, although that may be reduced by receiving warnings with geographically specific information.
- Those who accessed weather apps and/or radar imagery were more likely to seek shelter in the event of a tornado warning.
- Tourists not familiar with hurricanes or the area they are visiting look for information from multiple sources when a hurricane was approaching.
- Tourists who were more local to the area at risk generally relied on their existing knowledge and did not seek as much information.



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## Recommendation: Information Seeking

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- Work with local hotels and motels to provide tourists guidance from local authorities regarding evacuation or SIP decisions.



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# **Q3: Multiple Vehicles**

## Findings and Recommendations



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## Findings: Access to Vehicles

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- Households with multiple vehicles not only evacuated in multiple vehicles but tended to split their evacuation times. Households with multiple vehicles were 2.7 times more likely to evacuate in multiple vehicles. Multiple-vehicle evacuation increases highway congestion. Households see the ability to evacuate with multiple vehicles as a benefit, as one person can delay leaving in order to safeguard property.
- Those living in an evacuation zone tended to evacuate with all their vehicles to minimize potential damage.



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## Recommendations: Multiple Vehicles

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- Factor the added volume from multiple cars and multiple departure times into evacuation models.



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## RQ3: Age

### Findings and Recommendations



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## What We Found: Age

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- Across the literature, findings regarding the relationship between age and evacuation varied. This may indicate that other factors have greater influence on the evacuation decision. These variations were similar across hazard types.



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## RQ3: Attitude

Findings and Recommendations



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## What We Found: Attitude

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- Those with **stronger confidence in their ability to defend their home**, as well as attitudes associated with self-reliance and being an individualist, **were associated with lower levels of evacuation**. Those who see themselves as individualists may also have felt that warnings were overblown.
- Those who indicated they were **less likely to evacuate** tended to have **higher self-reported risk tolerance**. In wildfire areas, those with higher risk tolerance also tended to have a stay-and-defend attitude, as well as the belief that individuals who choose to live near wildland–urban interface areas should accept the risk. They also had a strong emotional connection to their property.



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## Recommendations: Attitude

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- In messaging to those who want to stay and defend their property (more likely to be men), **clearly define the risks** and communicate the likely inability of first responders to help them once the threat has reached a certain severity threshold.



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# RQ3: Education

## Findings



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## What We Found: Education

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- Individuals who have not completed high school are less likely to evacuate.
- Those with higher levels of education had higher rates of home ownership, and that characteristic may make it less likely for those individuals to evacuate.



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# RQ3: Gender

## Findings and Recommendations



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## What We Found: Gender

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- Women are more likely to take appropriate protective action than men. Female tourists are also more likely to evacuate. This holds true for wildfires as well as hurricanes.
- Men were more likely not to evacuate because they wanted to protect their property.



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## Recommendation: Gender

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- Communications strategies should be tailored to gender differences. For example, given that women are more likely than men to take protective actions, messaging on preparedness should use outreach channels geared toward women.



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# RQ3: Households with Children/Pets

## Findings and Recommendations



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## What We Found: Households with Children

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- Parents with children in the household tended to have more difficulties deciding to stay or to leave for hurricanes and flooding.
- The desire to "keep my family safe" served as a motivation to evacuate.
- More children in the home meant lower likelihood of evacuation. For wildfires, however, parents tended to make decisions to evacuate faster, even if the evacuation order was voluntary.
- Households with children tended to go to friends' homes or motels rather than to public shelters.
- Single parents with medical conditions were less likely to evacuate than others.



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## What We Found: Households with Pets

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- Having a pet, especially where there is a strong attachment to the pet, **decreased the likelihood of evacuation.** Many studies highlighted concerns about shelters accepting pets, the added cost of evacuating with pets, and the logistics of having a pet at a shelter as impediments to evacuation.
- A greater number of pets **exacerbated the difficulties** associated with evacuation leading more individuals to decide not to evacuate.
- One research study on wildfires noted that having **livestock** contributed to the sense of a need to “**stay and defend.**”



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## Recommendations: Helping Households with Children/Pets

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- Consider using daycare centers, schools, pet stores and breeders, and rescue centers as delivery channels for information that can help parents and pet owners reduce the stress of an evacuation by pre-planning, including preparing go bags.



- Include the message “keeping my family and/or my pets safe” to motivate families with children to evacuate early, which will reduce the stress of the actual evacuation.



- Encourage shelters and hotels to note their policy regarding pets.



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# RQ3: Housing - Homeowners, Renters, and Those Living in Mobile Homes

## Findings and Recommendations



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## Findings: Homeowners, Renters, and Those in Mobile Homes

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- Homeowners were less likely to evacuate than those who rent. They tend to underestimate storm severity and believe their home is safe.
- Those who rent were more likely to believe that their home was not safe from a hurricane.
- Those who live in mobile homes were more likely to evacuate from a hurricane than those who live in other types of housing.
- Mobile home residents living in areas susceptible to tornadoes were less likely to have a preparedness plan that included where to go for shelter in the event of a tornado.
- Residents with stronger confidence in their ability to defend their home as well as attitudes associated with self-reliance and being an individualist were less likely to evacuate.



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# Recommendations: Homeowners, Renters, and Those in Mobile Homes

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- Promote methods to safeguard homes prior to evacuation and note the likely impacts of the hazard, including loss of electricity and running water, which will make staying uncomfortable.



- Address concerns about how re-entry will be handled upfront. Messaging should acknowledge that homeowners will be anxious to return to their homes as soon as possible but that should not stop them from evacuating. If relevant, note steps that government is taking to keep property secure until individuals can return to their community (increased patrols, curfews, etc.).



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# Recommendations: Homeowners, Renters, and Those in Mobile Homes

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- Those who have purchased generators may feel more secure in staying, so if there is loss of power, messaging should address how to use generators safely to avoid carbon dioxide poisoning.
- In messaging to those who want to stay and defend their property (more likely to be men), clearly define the risks and ensure they understand the likely inability of first responders to help them once the threat has reached a certain severity threshold.
- Provide messaging specifically for residents of manufactured or mobile homes in areas at risk. Encourage those individuals to evacuate.



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# RQ3: Income Findings



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## What We Found: Income

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- If households with higher incomes evacuate, they do so in multiple groups, at different times, using multiple vehicles. They stay at hotels or friends' houses rather than shelters.
- Those with lower incomes or lacking bank accounts are less likely to understand evacuation orders.
- If they do evacuate, they go to public shelters.



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# **RQ3: Need for Assistance - Individuals who have Disabilities or Dementia or are Homebound, and Their Caregivers**

## Findings and Recommendations



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## Findings: Individuals who Have Disabilities or Dementia or Are Homebound, and Their Caregivers (page 1)

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- Older, homebound adults indicated a lack of ability to evacuate due to issues of physical mobility. Many would **need assistance** to leave their house, and transportation out of the area.
- Family and friends (the social network) play an important role in determining whether to evacuate or not.
- Older adults who have dementia or other cognitive disabilities and a caregiver(s) that would evacuate with them have evacuation rates that are the **same as, or lower than others**. Caregivers are concerned about their care receivers being exposed to stigma and lack of privacy in a shelter, and that unfamiliar settings would exacerbate their symptoms.



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## Findings: Individuals who Have Disabilities or Dementia or Are Homebound, and Their Caregivers (page 2)

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- Older adults with dementia and their caregivers who go to shelters experience increased agitation, emotional distress, and disorientation, among other symptoms. It is challenging for caregivers to provide normal levels of care and comfort in this environment.
- Care facilities and caregivers are challenged in deciding whether to evacuate given their sense of responsibility to their residents. It is important for care facility residents and their families to decide (and document the decision) who would care for them in a disaster to decide whether they would evacuate to a family's residence – and then sticking to that decision.



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# Recommendations: Individuals who Have Disabilities or Dementia or Are Homebound, and Their Caregivers (page 1)

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- Ensure that **representatives of advocacy organizations** are involved in shelter preparations. Ask them to **communicate** with their at-risk constituents and **describe** how shelters are prepared to provide appropriate care and services.



- Bring together **community advocates** for those with access and functional needs to discuss and address challenges.



- Work with first responders and other agencies to **plan for** evacuation transportation assistance and medical needs for those who cannot evacuate on their own.



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## Recommendations: Individuals who Have Disabilities or Dementia or Are Homebound, and Their Caregivers (page 2)

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- Acknowledge and **express empathy** for the stress and anxiety associated with evacuations.



- Encourage households with children and pets to **discuss and agree on evacuation plans early**.



- Include **individuals with disabilities** in planning efforts for evacuation.



- Ask neighbors to help plan. When evacuation orders are issued, **encourage neighbors to ask** if they need help to evacuate and, if so, alert authorities that these individuals need evacuation assistance.



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## **Recommendations: Individuals who Have Disabilities or Dementia or Are Homebound, and Their Caregivers (page 3)**

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- Provide as much information as possible on evacuation routes, traffic, shelters, and re-entry plans to reduce the number of evacuation unknowns.
  
- Provide and promote behavioral health services at shelter locations to support those who are feeling anxious and stressed.



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# RQ3: Preparedness

## Findings



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## What We Found: Preparedness

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- Having a household plan increases the likelihood of taking the appropriate protective action for a tornado.
- Individuals who have prepared for an emergency by strengthening their home or purchasing generators are less likely to evacuate.
- Individuals who lack knowledge of their community plan, or who don't know if their community has an emergency management plan, tended to be less willing to comply with evacuation directives.



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# RQ3: Race Findings



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## What We Found: Race

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- Black and Hispanic people have relatively high intentions to evacuate when asked about different hazard scenarios.
- Black and Hispanic people are less likely to evacuate than white people.
- In the literature reviewed, no differences in race/ethnicity are documented related to trust in media sources.



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## RQ3: Social Networks

Findings and Recommendations



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## Findings: Social Networks (page 1)

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- For hurricane areas generally, a strong social network supported the decision to evacuate. However, others did not evacuate because of the support they felt they had within the community.
- For the medically fragile, a strong sense of social support tended to result in non-evacuation.
- Residents in communities with higher broad community cohesion tended to make similar evacuation decisions (whether to evacuate or not to evacuate), while those who felt their specific social network would provide support tended to stay.
- In wildfire-prone areas, strong social networks tend to support the decision to evacuate.



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## Findings: Social Networks (page 2)

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- Those who are married were less likely to evacuate.
- Being employed and having family/friends significantly increased the likelihood of receiving information about evacuation orders.



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## Recommendations: Social Networks

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- Seek out leaders of HOAs or other community leaders who can encourage their constituents to evacuate and commit to modeling that evacuation behavior.
- Encourage advocacy organizations for those who are medically fragile to work with these individuals, their caregivers, and their social support network to help them through the evacuation decision-making process.
- Encourage people to share official warnings and safety information with their personal social networks.



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# RQ4: Threat Perceptions

## Findings and Recommendations



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## Findings: Threat Perceptions

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- Many studies noted that the greater the perceived risk, the greater the likelihood of evacuation.
- The personalization of risk/impact (I/my family/my house is at risk) also increased the probability of evacuation.
- Individuals' perception of a hurricane's risk tended to focus on its Saffir-Simpson hurricane category (higher categories reflect higher risk), which conveys only wind speeds, and whether its forecasted path was directly over their location. However, some studies also found that perception of hurricane risk included the potential for flooding and storm surge.



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## Recommendations: Threat Perceptions

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- To motivate people to leave when evacuations are issued, include information about the risk of the hazard and its probable effect on individual safety, property damage, and community functions. Include descriptions of prolonged impact on quality-of-life considerations, e.g., water, electricity, food.
  
- For hurricane risk, include all risks associated with a hurricane, including flooding and storm surge, in messages.



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# RQ5: Facilitators and Impediments to Appropriate Evacuation and SIP Decision-making

## Findings and Recommendations



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## **Findings: Impediments to Appropriate Evacuation and SIP Decision-making (page 1)**

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Impediments include:

- Traffic congestion and availability of gasoline. Individuals facing hurricanes and wildfires want reliable information about alternative routes to help overcome worries about traffic congestion. Residents at risk of wildfire were especially concerned with the capacity of the road system to handle the traffic.
- The greater the number of pets in the household, the greater the barrier to departure.
- The physical security of the home. Many studies noted concerns about the ability to re-enter the evacuation zone after the disaster to quickly take care of any damage, as a reason not to evacuate. These concerns were especially prominent in the hurricane research, as delays in repairs to water damage could lead to mold. Some studies also noted fear of looting in evacuated neighborhoods.



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## **Findings: Impediments to Appropriate Evacuation and SIP Decision-making (page 2)**

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- Costs of evacuation, including travel costs.
- Legal status of undocumented immigrants.
- Stress and anxiety surrounding evacuation decision-making including unknowns related to the evacuation (potential destination, space at shelters, travel issues) as well as separation from family, pets, and the home.
- Individuals faced with a public shelter as their primary destination had more reluctance to evacuate. Their concerns include crowding with strangers and being located farther away from social networks.
- Some individuals could not leave because of ongoing job responsibilities.
- Lack of agreement among family members about the stay/leave decision could delay or inhibit evacuation decision-making.



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# **Findings: Facilitators to Appropriate Evacuation and SIP Decision-making**

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**Facilitators include:**

- The desire to be safe and to ensure children were safe from physical or psychological harm from experiencing a disaster were positive motivations to evacuate.
- Ensuring comfort and convenience (power and air conditioning) supported evacuation decisions.
- Evacuation notifications issued early in the day or at other trigger points, such as school dismissal.
- Evacuation orders issued early enough for individuals to leave before traffic became congested and allow choice of preferred destination (family, hotel) rather than a public shelter.
- The ability to leave at a time that allowed travel to be completed during daylight hours.



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# Recommendations: Impediments and Facilitators to Appropriate Evacuation and SIP Decision-making (page 1)

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- Continue/implement public education “know your zone” campaigns.



- Link alert and warning communication channels to interactive maps that can pinpoint specific addresses as in or not in evacuation zones.



- Work with the media to ensure evacuation information reaches transient populations such as tourists.



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## Recommendations: Impediments and Facilitators to Appropriate Evacuation and SIP Decision-making (page 2)

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- Provide information about public shelters, including items associated with comfort (availability of power, air conditioning, rest rooms, and space for families to ensure lack of crowding) as well as services for individuals with disabilities and facilities for pets.



- When possible, encourage individuals to evacuate early to avoid traffic congestion, drive during daylight hours, and have more assurance regarding availability of gasoline and other services. Provide up-to-date information on evacuation routes, alternatives, and services available.



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## RQ5: Evacuation Zones

Findings and Recommendations



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## What We Found: Evacuation Zones

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- Evacuation likelihood is higher for those who believe they live in evacuation zones. Those in designated evacuation zones are significantly more likely to take preparation measures on receipt of advanced watches or warnings.
- For individuals living outside of hurricane evacuation zones, the media focus on severe weather forecasts noting elevated risks from wind damage causes them to evacuate unnecessarily.
- Studies indicated that many individuals did not know whether they were in an evacuation zone or an area with flood risk.



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## Recommendations: Evacuation Zones (page 1)

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- Begin or continue public education “know your zones” campaigns. Ensure individuals are aware of their location relative to evacuation zones or areas of flood risk.



- Link alert and warning communication channels to interactive maps that can pinpoint specific addresses as in or not in evacuation zones. Work with the media to help this information reach transient populations such as tourists.



- To reduce these elevated levels of stress, encourage individuals, especially households with children and pets, to **discuss and agree on evacuation plans early**.



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## Recommendations: Evacuation Zones (page 2)

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- Have and promote behavioral health services available at shelter locations to support those who are feeling anxious and stressed.
- When issuing evacuation orders, explain the risks that led to the decision to evacuate some zones and why other zones are not evacuating.
- Provide as much detailed information as possible on **evacuation routes, traffic, shelters and re-entry plans** to reduce the number of evacuation unknowns.



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# Evacuation Shelter-in-Place: Research Findings and Recommendations

Organized by Communication Strategies and Implementation Timeline: Prepare/Respond (Aligned with Appendix C)

# **Prepare the Public**

## Findings and Recommendations



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## What We Found: Prepare the Public

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- Evacuation likelihood was higher for those who believed they lived in evacuation zones. Those in designated evacuation zones were significantly more likely to take preparation measures on receipt of advanced watches or warnings.
- Studies indicated that many individuals did not know whether they were in an evacuation zone or an area with flood risk.
- Receiving several warning messages from multiple, credible, trusted sources, such as NWS, local authorities and local media, increased rates of evacuation. NWS was specifically seen as a trusted source of information.



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## What We Found: Prepare the Public

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- Those who lived in communities with higher community cohesion tended to make similar evacuation decisions (whether or not to evacuate), while those who felt their specific social network would provide support tended to stay.
- Care facilities and their caregivers were challenged in making the decision whether to evacuate or not, given their sense of responsibility to their residents. This research also indicated the importance of care facility residents and their families deciding (and documenting) who would care for them in a disaster (e.g., whether or not they would evacuate to a family's residence) and then not changing that decision as the threat neared.



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## What We Found: Prepare the Public

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- Older, homebound adults indicated a lack of ability to evacuate due to issues of physical mobility. Many would need emergency responder assistance to leave their house, as well as assistance with transportation out of the area.
- Adults who have dementia or other cognitive disabilities and a caregiver(s) who would evacuate with them have evacuation rates that are the same as, or lower than, others.
- Caregivers were concerned with the potential for those in their care to be exposed to stigma and lack of privacy in a shelter. They were also concerned that unfamiliar settings would exacerbate their symptoms. Family and friends (the social network) tended to play an important role in determining whether to evacuate or not.

## What We Found: Prepare the Public

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- Tourists who sought information from tourist offices rather than hotel staff were more likely to evacuate.
- Tourists not familiar with hurricanes or the area they were visiting tended to be more concerned with the potential impact of a hurricane than those more familiar with the area, and so they looked for information from multiple sources when a hurricane was approaching. Tourists who were more local to the area at risk generally relied on their existing knowledge and did not seek as much information.



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## What We Found: Prepare the Public

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- In response to hurricanes, those who live in mobile homes were more likely to evacuate than those who live in other types of housing. Mobile homes do not provide adequate safety from a tornado, yet mobile home residents living in areas susceptible to tornadoes were less likely to have a preparedness plan that included where to go for shelter in the event of a tornado.



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## Recommendations: Prepare the Public

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- Provide public outreach “know your zone” campaigns with links to interactive maps to help individuals locate their home and work addresses and know their evacuation zone.



- Encourage individuals to **sign up** for the jurisdiction’s opt-in alert and warning channels so they directly receive updated information.



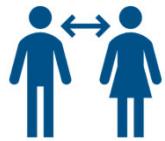
- Ask community and HOA leaders to **encourage planning** for evacuations and commit to modeling that evacuation behavior.



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## Recommendations: Prepare the Public

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- Ask neighbors to check in on individuals with access and functional needs to help them plan how to evacuate.
- Encourage advocacy organizations for access and functional needs individuals, their caregivers and social support networks to help them prepare for an evacuation. Integrate advocacy organizations into the community planning process for evacuation and shelter in place.
- Work with local hotels and motels to provide tourists information on whether the hotel/motel is in an evacuation zone and how to access evacuation guidance from local authorities.



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## Recommendations: Prepare the Public

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- Provide outreach and messaging specifically for residents of **manufactured or mobile homes** in areas at risk because this type of housing is structurally less safe. Encourage those individuals to be ready to evacuate and plan to provide services to those who may need assistance.



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# **Target Messaging Based on Socio-Demographic Characteristics**

## Findings and Recommendations



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## What We Found: Socio-Demographic Characteristics

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- Those living in an evacuation zone tended to evacuate with **all their vehicles** to minimize potential damage.
- Women are more likely to take appropriate protective action than men.
- **Men were more likely not to evacuate** because they wanted to protect their property.
- Households with multiple vehicles not only evacuated in multiple vehicles but tended to split their evacuation times. Households with multiple vehicles were 2.7 times more likely to evacuate in multiple vehicles. Multiple-vehicle evacuation increases highway congestion. Households see the ability to evacuate with multiple vehicles as a benefit, as one person can delay leaving in order to safeguard property.



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## What We Found: Socio-Demographic Characteristics

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- Those with **stronger confidence** in their ability to **defend their home**, as well as attitudes associated with self-reliance and being an individualist, were associated with **lower levels of evacuation**. Those who see themselves as individualists may also have felt that warnings were overblown.
- Those who indicated they were less likely to evacuate tended to have higher self-reported risk tolerance. In wildfire areas, those with **higher risk tolerance** also tended to have a **stay-and-defend** attitude, as well as the belief that individuals who choose to live near wildland–urban interface areas should accept the risk. They also had a strong emotional connection to their property.



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## What We Found: Socio-Demographic Characteristics

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- Parents with children in the household tended to have more difficulties deciding to stay or to leave for hurricanes and flooding.
- The desire to "keep my family safe" served as a motivation to evacuate.
- More children in the home meant lower likelihood of evacuation. For wildfires, however, parents tended to make decisions to evacuate faster, even if the evacuation order was voluntary.
- Households with children tended to go to friends' homes or motels rather than to public shelters.
- Single parents with medical conditions were less likely to evacuate than others.

## What We Found: Socio-Demographic Characteristics

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- Having a pet, especially where there is a strong attachment to the pet, decreased the likelihood of evacuation. Many studies highlighted concerns about shelters accepting pets, the added cost of evacuating with pets, and the logistics of having a pet at a shelter as impediments to evacuation.
- A greater number of pets exacerbated the difficulties associated with evacuation leading more individuals to decide not to evacuate.
- One research study on wildfires noted that having livestock contributed to the sense of a need to “stay and defend.”



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## What We Found: Socio-Demographic Characteristics

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- Homeowners were less likely to evacuate than those who rent. They tend to underestimate storm severity and believe their home is safe. For hurricanes, homeowners who did evacuate did so only after protecting their homes (e.g., boarding up windows).
- Those who rent were more likely to believe that their home was not safe from a hurricane.



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## What We Found: Socio-Demographic Characteristics

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- Those who live in mobile homes were more likely to evacuate from a hurricane than those who live in other types of housing.
- Mobile home residents living in areas susceptible to tornadoes were less likely to have a preparedness plan that included where to go for shelter in the event of a tornado.
- Residents with stronger confidence in their ability to defend their home as well as attitudes associated with self-reliance and being an individualist were less likely to evacuate.



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## What We Found: Socio-Demographic Characteristics

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- Homebound adults indicated a lack of ability to evacuate due to issues of physical mobility. Many would **need assistance** to leave their house, and transportation out of the area.
- **Family and friends** (the social network) play an important role in determining whether to evacuate or not.
- Adults who have **dementia or other cognitive disabilities** and a caregiver(s) that would evacuate with them have **evacuation rates** that are the **same as, or lower than others**. Caregivers are concerned about their care receivers being exposed to stigma and lack of privacy in a shelter, and that unfamiliar settings would exacerbate their symptoms.



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## What We Found: Socio-Demographic Characteristics

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- Older adults with dementia and their caregivers who go to shelters experience **increased agitation, emotional distress, and disorientation**. It is challenging for caregivers to provide normal levels of care and comfort in this environment.
- Having a **household plan** increased the likelihood of taking the appropriate SIP protective action for a tornado.
- Care facilities and caregivers are challenged in deciding whether to evacuate given their sense of responsibility to their residents. It is important for care facility residents and their families to decide (and document the decision) **who would care for them in a disaster**, e.g., whether or not they would evacuate to a family's residence – and then sticking to that decision.



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## Recommendations: Socio-Demographic Characteristics

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- Given that **women** are more likely than men to take protective actions, messaging and communication channel selection should focus more on women.
- **Households with children and/or pets:**



- Include the message “**evacuating will keep your family and/or your pets safe**” to motivate **households** with children and pets to evacuate early.
  - **Acknowledge and express empathy** for the stress and anxiety associated with evacuations for households with children and/or pets. Recommend these households discuss and agree on evacuation plans early.



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## Recommendations: Socio-Demographic Characteristics

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- Households with children and/or pets:
  - Consider using daycare centers, schools, pet stores, rescue centers as delivery channels for information to help parents and pet owners reduce the stress of an evacuation by pre-planning, including preparing go bags. For children, go bag items can include games, special foods, clothes/diapers, health information and medications. For pets, consider pet carriers and pet food, pet identification and health and vaccination information, as well as information on shelters or hotels and motels that take pets.



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# Recommendations: Socio-Demographic Characteristics

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- Homeowners:
  - Promote methods to mitigate damage to homes prior to evacuation.



- Note the likely impacts of the hazard, including loss of electricity and running water, which will make staying risky and uncomfortable.



- Messaging should acknowledge that homeowners will be worried about security and anxious to return to their homes as soon as possible but that should not stop them from evacuating. If relevant, note steps that government is taking to keep property secure such as increased patrols, curfews, etc.



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## Recommendations: Socio-Demographic Characteristics

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- Encourage those living in mobile and manufactured homes to evacuate early and plan to provide services to those who may need assistance.



- Ensure messaging includes information about how individuals with **access and functional needs** can find support for transportation evacuation planning, transportation assistance, and assistance at shelters.



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# Work with Local Media

## Findings and Recommendations



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## What We Found: Work with Local Media

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- Receiving several warning messages from multiple credible, trusted sources, increased rates of evacuation. NWS was specifically seen as a trusted source of information.
- Evacuation orders issued by local authorities helped uncertain individuals make the decision to evacuate.
- Both authorities and family and friends influenced the decision to evacuate. Studies do not agree on their relative influence.
- Authority figures acting as role models by evacuating their families or going door to door to urge others to leave could increase the effectiveness of evacuation messages.



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## What We Found: Work with Local Media

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- Trust in government and guidance from **local first responders** influences preparedness and the decision to evacuate. For wildfires, an element of this trust was due to the **visibility of firefighters** in the community. For hurricanes, individuals were more likely to take action when emergency responders went **door-to-door** in the community.
- Lack of trust in authorities causes individuals to spend more time discussing their evacuation decision with others.
- **High trust in authorities** causes some to believe that community officials would keep them safe, and therefore they don't need to evacuate.
- Tourists who seek **information from tourist offices** rather than hotel staff are more likely to evacuate.



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## Recommendations: Work with Local Media

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Familiarize the media with community plans in advance of a disaster:



- Ensure the media has access to easy-to-use **information and graphics** related to evacuation zones and routes. The graphics should clearly depict what zones are included in evacuation orders and which are not.



- Provide information on the jurisdiction's **plans for transportation** for those who need it and support for those in nursing homes or other similar facilities.



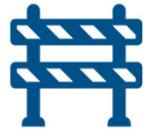
- Describe how plans consider **public health issues**, such as minimizing the spread of illness in public transportation or shelters.



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## Recommendations: Work with Local Media

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- Provide press with information about the early stages of evacuation so viewers see the jurisdiction, businesses, and individuals taking action before the storm. Highlight how local authorities are heeding the warnings: activating the emergency operations center, closing roads and boarding up schools or other government buildings at risk.



- Keep media informed with regular, updated information (including information to overcome potential barriers to evacuation), including suggestions of how to avoid congestion, availability of services along evacuation routes and shelter information.



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## Recommendations: Work with Local Media

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- Encourage local media to show **first responders** evacuating community members and their own family members. For example: “I’m staying here because it’s my job, but my family has evacuated to safety.”
  
- Provide media with **authoritative, time-stamped, geo-tagged photos and videos** that they can share during broadcasts and their websites of:
  - Hazards such as rising waters and wildfires.
  - Different ways jurisdictions, businesses, and individuals **prepare for the threat**, including preparing to evacuate (e.g., closing public transportation or other public areas).



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# **Maximize Social Media Use**

## Findings and Recommendations



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## What We Found: Maximize Social Media Use

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- While television remained the chief communication channel, receiving warnings from multiple channels increased the likelihood of individuals taking protective action.
- People use **social media as a complementary source** rather than their primary source of information.
- As cell phone ownership is now more prevalent than home landlines, **public alert and warning calls to landline phone numbers are less effective**. The increased reliance on cell phones may also result in cellular bandwidth congestion during an incident.
- Evacuated individuals rely on the same information sources for the **re-entry phase** that they used in deciding whether to evacuate.



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## What We Found: Maximize Social Media Use

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- The actions of local governments and businesses also provided important social cues that can heighten risk perception. These included closing and boarding up businesses and closing public areas, public transportation or specific roads.
- Adding **visuals**, such as maps or photos, improved message comprehension and supported decision making.
- Research indicates that both authorities and family/friends influenced the decision to evacuate. Studies show mixed results in trying to gauge their relative influence.
- Receiving **several warning messages** from multiple, credible, trusted sources, such as NWS, local authorities and local media, increased rates of evacuation. NWS was specifically seen as a trusted source of information.



**FEMA**

## Recommendations: Maximize Social Media Use

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- Confirm that the jurisdiction's social media channels are active before and during the event. Provide up-to date information during the event.
- Encourage individuals and organizations with large numbers of followers (e.g., media stations, weather forecasters, American Red Cross, houses of worship, universities) to follow the jurisdiction's social media accounts so they can receive updates during the disaster and share authoritative messages with their networks.
- Follow and monitor the social media accounts of other authoritative sources within the jurisdiction and across neighboring jurisdictions to keep information consistent and address inconsistencies and inaccuracies if they occur.



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## Recommendations: Maximize Social Media Use

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- Urge businesses to share their preparedness and response actions on their websites and social media accounts (e.g., closing their businesses, encouraging employees to evacuate and stay safe).
- Encourage those with neighborhood-focused social media platforms like Nextdoor, homeowner associations (HOAs) and other neighborhood groups to support evacuation guidance and checks on neighbors.



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## Recommendations: Maximize Social Media Use

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- Provide environmental cues that the hazard is real by posting authoritative, time-stamped, geo-tagged photos and videos of hazards such as rising waters and wildfires on social media and website. Encourage individuals to share those visuals with friends and family, including via their social media.
  
- Encourage people to share official warnings and safety information with their personal social networks. Encourage them to post photos/videos of visual cues of the hazard as they evacuate.



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## Recommendations: Maximize Social Media Use

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- Use social media monitoring tools to identify the channels that reach the most people with effective messaging. Use these channels to disseminate information about plans for re-entry. Plan to surge staff to monitor social media for rumors, misinformation and disinformation that must be quickly corrected.
  
- Use social media channels during the event to encourage individuals to sign-up for community alerting systems to make sure they receive the most up-to-date information.



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# Leverage Trusted Messengers

## Findings and Recommendations



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## What We Found: Leverage Trusted Messengers

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- Receiving several warning messages from **multiple, credible, trusted sources**, such as NWS, local authorities and local media, increased rates of evacuation. NWS was specifically seen as a trusted source of information.
- Homebound adults indicated a lack of ability to evacuate due to issues of **physical mobility**. Many would need **emergency responder assistance** to leave their house, as well as assistance with transportation out of the area.



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## What We Found: Leverage Trusted Messengers

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- Adults who have dementia or other cognitive disabilities and a caregiver(s) who would evacuate with them have evacuation rates that are the same as, or lower than, others.
- Caregivers were concerned with the potential for those in their care to be exposed to **stigma and lack of privacy** in a shelter. They were also concerned that unfamiliar settings would **exacerbate their symptoms**. Family and friends (the social network) tended to play an important role in determining whether to evacuate or not.



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## What We Found: Leverage Trusted Messengers

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- Seeing neighbors evacuate or others leave was a predictor of increased evacuation.
- Receiving messages from family and friends in addition to local authorities was a major positive influence on evacuation decision making.
- Those who shared information with others about evacuation warnings or visual cues of storm risk were more likely to themselves evacuate.



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## Recommendations: Leverage Trusted Messengers

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- Help individuals validate the threat by **sharing the authoritative forecasts** from NWS and local trusted meteorologists. Individuals should follow the local NWS Forecast Office social media accounts.



- Coordinate with **advocacy organizations** for those with access and functional needs. Ask them to support evacuation decisions and describe how shelters can provide appropriate care and services. Involve these advocacy organizations in the evacuation and shelter planning process.



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## Recommendations: Leverage Trusted Messengers

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- When evacuation orders are issued, **ask neighbors to check in on individuals with access and functional needs to see if they need help to evacuate, and if so, alert authorities that these individuals need evacuation assistance.**
  
- Encourage individuals to **share the alerts and warning messages they receive and the responsive protective actions they take with their friends and their community.**



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# **Help People Overcome Barriers to Action**

## Findings and Recommendations



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## What We Found: Helping People Overcome Barriers to Action

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Impediments include:

- **Traffic congestion and availability of gasoline.** Individuals facing hurricanes and wildfires want reliable information about alternative routes to help overcome worries about traffic congestion. Residents at risk of wildfire were especially concerned with the capacity of the road system to handle the traffic.
- The greater the number of pets in the household, the greater the barrier to departure.
- Many studies noted **concerns about the ability to re-enter** the evacuation zone after the disaster to quickly take care of any damage, as a **reason not to evacuate**. These concerns were prominent in the hurricane research, as delays in repairs to water damage could lead to mold. Some studies noted fear of looting in evacuated neighborhoods.



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## What We Found: Helping People Overcome Barriers to Action

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- Costs of evacuation, including travel costs.
- Legal status of undocumented immigrants.
- Stress and anxiety surrounding evacuation decision-making including unknowns related to the evacuation (potential destination, space at shelters, travel issues) as well as separation from family, pets, and the home.
- Individuals faced with a public shelter as their primary destination had more reluctance to evacuate. Their concerns include crowding with strangers and being located farther away from social networks.
- Some individuals could not leave because of ongoing job responsibilities.
- Lack of agreement among family members about the stay/leave decision could delay or inhibit evacuation decision-making.



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## Recommendations: Help People Overcome Barriers to Action

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- To motivate people to leave when evacuation orders are issued, messages should include information about the risk of the hazard and its probable effect on individual safety, property damage and community functions. Include descriptions of prolonged impact on quality-of-life considerations (e.g., water, electricity, food).



- Because many individuals do not want to go to public shelters, provide information about the shelters associated with comfort (e.g., availability of power, air conditioning, rest rooms, and space for families and pets) as well as services for individuals with access and functional needs.



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## Recommendations: Help People Overcome Barriers to Action

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- In messaging to those who want to stay and defend their property (more likely to be men), clearly define the risks and communicate the likely inability of first responders to help them once the threat has reached a certain severity threshold.
  
- Those who have purchased generators may feel more secure in staying, so if there is loss of power, messaging should address how to use generators safely to avoid carbon dioxide poisoning.



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## Recommendations: Help People Overcome Barriers to Action

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- Stress the benefits that will encourage individuals to evacuate early, including avoiding traffic congestion, driving during daylight hours, and having more assurance regarding availability of gasoline along routes. Provide up-to-date information on evacuation routes, alternatives, and services available, including availability of gasoline.
- To reduce the number of evacuation unknowns which can delay decision making, provide as much **detailed information** as possible on evacuation routes, traffic, shelters and re-entry plans.



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# **Improve Effectiveness of Alert and Warning Messages**

## Findings and Recommendations



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## What We Found: Improve Effectiveness of Alert and Warning Messages

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- Mandatory evacuation orders significantly increase evacuation rates.
- Changing the type or area of the order causes confusion and delay.
- Messages that clearly describe the tangible personal impact of the hazard motivate protective action.
- Messages that compared the current storm to similar storms from the past helps individuals understand the risk.
- Adding visuals, such as maps or photos, improves message comprehension and decision-making.



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## What We Found: Improve Effectiveness of Alert and Warning Messages

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- Attention-getting language and describing storm impacts is effective. However, language designed to scare people did not seem to further increase the motivation to act.
- There may be a risk of “over-warning,” for hazards like tornadoes. Warning areas are typically much larger than the area at risk which desensitizes individuals to future warnings.
- Individuals do not understand that the hurricane category and NWS warning “cone” only address wind damage, not surge, and that an increase in category represents an exponential rise in the risk of damage.



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## Recommendations: Improve Effectiveness of Alert and Warning Messages

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- Use language that will capture attention but is not overly dramatic.



- When communicating about hurricane risk, ensure that the message includes flood and storm surge risk as well as the hurricane category.



- Use mandatory, timestamped evacuation orders associated with specific evacuation zones when possible. Understand that changing the geographic area of evacuation orders will cause confusion.



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## Recommendations: Improve Effectiveness of Alert and Warning Messages

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- Use the Integrated Public Alert and Warning System's **Wireless Emergency Alert (WEA)** capability for messages, as WEAs are not constrained by the same bandwidth limitations as general text messages.



- Provide **interactive maps** to help individuals locate their home and work addresses and know their zone before an event.



- Provide easy and quick ways for individuals to corroborate information through **hyperlinks** to other authoritative sources.



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## Recommendations: Improve Effectiveness of Alert and Warning Messages

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- Compare the potential impact of an upcoming storm to other storms that have posed similar threats and post visual cues.



- Given increased forecasting accuracy for tornadoes, use the smallest map polygon possible, associated with local landmarks, to increase people's understanding that the warning forecast is specific to their area.



- Highlight probable impacts to individuals who stay and the potential duration of those impacts. Address the urgency for immediate action by noting when it will no longer be safe to evacuate or for emergency personnel to attempt rescues as the storm gets close.



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## Recommendations: Improve Effectiveness of Alert and Warning Messages

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- When issuing evacuation orders, **explain the risks** that led to the decision to evacuate some zones and why other zones are not evacuating.



- Always encourage individuals to **share information** with family and friends.



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# **Review the Jurisdiction Evacuation and SIP Plan**

## Findings and Recommendations



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## What We Found: Review the Jurisdiction Evacuation and SIP Plan

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- Receiving several warning messages from multiple, credible, trusted sources, such as NWS, local authorities and local media, increased rates of evacuation. NWS was specifically seen as a trusted source of information.
- Households with multiple vehicles not only evacuated in multiple vehicles but tended to split their evacuation times. One study found that the odds that a household would evacuate in two or more groups is 2.7 times higher for households with multiple vehicles.



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## **What We Found: Review the Jurisdiction Evacuation and SIP Plan**

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- Studies noted that multiple-vehicle evacuation increases highway congestion. Households see the ability to evacuate with multiple vehicles as a benefit, as one person can delay leaving to safeguard property.
- Individuals who lacked knowledge of their community plan, or who didn't know if their community had an emergency management plan, tended to be less willing to comply with evacuation directives.



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## **What We Found: Review the Jurisdiction Evacuation and SIP Plan**

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- Homebound adults indicated a lack of ability to evacuate due to issues of physical mobility. Many would need emergency responder assistance to leave their house, as well as assistance with transportation out of the area.
- Many studies highlighted concerns about shelters accepting pets, the added cost of evacuating with pets and the logistics of having a pet at a shelter as impediments to evacuation. A greater number of pets exacerbated the difficulties associated with evacuation, leading more individuals to decide not to evacuate.



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## What We Found: Review the Jurisdiction Evacuation and SIP Plan

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- Facilitators for evacuation include:
  - Evacuation notifications issued **early in the day or at other trigger points**, such as school dismissal making it easier to pick up children.
  - Evacuation orders scheduled to provide **sufficient time** for individuals to complete preparation and still leave before traffic became congested.
  - The ability to leave at a time that allowed travel to be completed during **daylight hours**.
  - Early notification that supported a household's choice of preferred destination (e.g., family, friends, hotel) rather than a public shelter.



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## **What We Found: Review the Jurisdiction Evacuation and SIP Plan**

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- Studies noted the high level of stress and anxiety surrounding evacuation decision making. Sources of stress included the many unknowns related to the evacuation (e.g., potential destination, space at shelters, shelter safety, travel issues) as well as separation from family, pets and the home.



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## Recommendations: Review the Jurisdiction Evacuation and SIP Plan

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- Plan to use all communication channels that can provide information, especially if cell bandwidth becomes constrained. This includes highway advisory radio, highway signs, amateur radio and NWS weather radio.
- For jurisdictions where many households have multiple vehicles, evacuation model assumptions should include the added volume from multiple cars and multiple departure times.
- Work with shelters in advance to prepare for individuals with access and functional needs. Involve representatives of advocacy organizations for these health conditions in these preparations.



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## Recommendations: Review the Jurisdiction Evacuation and SIP Plan

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- Work with first responders and other agencies to plan for evacuation transportation assistance for those who cannot evacuate on their own.



- Have and promote behavioral health services available at shelter locations to support those who are feeling anxious and stressed.



- Encourage shelters and hotels to publish relevant policies regarding pets to their website and social media channels.



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# Questions?

Please email:  
[FEMA-TARRequest@fema.dhs.gov](mailto:FEMA-TARRequest@fema.dhs.gov)



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