Effective Communications for People with Disabilities: Before, During, and After Emergencies

National Council on Disability
May 27, 2014

National Council on Disability
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Effective Communications for People with Disabilities: Before, During, and After Emergencies

This report is also available in alternative formats upon request and on the National Council on Disability (NCD) Web site (www.ncd.gov).

May 27, 2014

An independent federal agency making recommendations to the President and Congress
to enhance the quality of life for all Americans with disabilities and their families.

Letter of Transmittal

May 27, 2014

President Barack Obama
The White House
1600 Pennsylvania Avenue, NW
Washington, DC 20500

Dear Mr. President:

The National Council on Disability (NCD) is pleased to submit the enclosed report, *Effective Communications for People with Disabilities Before, During, and After Emergencies*. Effective communications is critical and can save lives during emergencies.

The need for effective communications for people with disabilities was brought home by a news account in the case of a survivor of Hurricane Sandy. "When police with megaphones rolled through Carole Lazorisak's Oakwood Beach neighborhood in the hours before the hurricane thrust ashore, she did not hear their announcement about evacuation help. In the days after the surge ripped her Tarlton Street home off its foundation, filled it with water to a depth of 5 feet and tossed her shed nearly a block away, she joined the thousands of other dazed victims at Miller Field in New Dorp, seeking some answers and a measure of comfort. But for Ms. Lazorisak, who has been deaf since birth, walking through the bustling relief center was like being in a movie on silent. There were no signs providing information for the deaf or directing people to translation services. She left feeling more isolated than ever."*

Unfortunately, history has repeatedly shown that the concerns of people with disabilities and others with access and functional needs in emergency situations are frequently overlooked or minimized, notwithstanding the great urgency that surrounds the need to respond to the disability community's concerns in all phases of emergency management, including mitigation, preparedness, response, and recovery. Effective communications must be provided to all people with disabilities and others with access and functional needs.

During the writing of this report, the United States experienced several major disasters, both natural and manmade, including Hurricane Sandy and the Boston Marathon bombings. Stories of inadequate or unavailable communications for people with disabilities, such as Ms. Lazorisak, were common. These recent experiences reinforce the need to focus attention on accessible emergency communications at the local, state, tribal, and federal levels.

This report identifies barriers, facilitators, and successful practices to providing effective emergency-related communications. The report examines the current state of affairs concerning the accessibility of emergency-related communications; reviews the enforcement

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of disability laws and regulations as they pertain to effective communications before, during, and after emergencies. Information on the experiences and perceptions of people with disabilities as they relate to emergency-related communications is also provided. Based on the findings of the report, NCD recommends that:

- Emergency managers ensure that the communications needs of people with disabilities and others with access and functional needs are integrated into all parts of emergency planning at the local, state, tribal, and federal levels.

- Emergency managers increase outreach efforts to the disability community.

- DOJ, in collaboration with other agencies as appropriate, increases monitoring and enforcement of federal laws, such as the Americans with Disabilities Act (ADA) and the Rehabilitation Act, which require that emergency communications be fully accessible to people with disabilities, and funding should be appropriated accordingly.

- The FCC increases its monitoring and enforcement of federal laws and regulations that require that emergency communications be fully accessible to people with disabilities, and funding should be appropriated accordingly.

- The FCC and FEMA continue to work toward ensuring that alerts and warnings are fully accessible to people with disabilities.

NCD is committed to helping ensure complete communication access for all people with disabilities before, during, and after emergencies, and promoting inclusive emergency management practices on the local, state, tribal, and federal levels. To that end, it is NCD's expectation that the experiences of people with disabilities, proven strategies, and recommended practices detailed in this report will help guide stakeholders as they work together to ensure inclusive emergency management practices, including full communication access for all people with disabilities before, during, and after emergencies.

NCD looks forward to working with the Administration, Congress, and the emergency management community in continuing to ensure that all people with disabilities are provided effective communications before, during, and after emergencies.

Respectfully,

/s/

Jeff Rosen
Chairperson

* Young, D. 2012 (Dec. 8). "Deaf Staten Island victim of Hurricane Sandy says pleas go unheeded." Staten Island Advance. Accessed June 6, 2013.
http://www.silive.com/eastshore/index.ssf/2012/12/deaf_staten_island_victim_of_h.html

(The same letter of transmittal was sent to the President Pro Tempore of the U.S. Senate and the Speaker of the House of Representatives.)

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Executive Summary

The National Council on Disability (NCD) plays a critical role in promoting successful disability policies regarding emergency management through the publication of information and policy recommendations. Through its emergency management work, NCD has identified numerous instances of inaccessible communication before, during, and after emergencies. Examples of barriers to effective communication include the following:

- Televised emergency announcements by officials that do not include American Sign Language (ASL) interpreters

- Inaccessible emergency notification systems

- Inaccessible evacuation maps

- Web sites with emergency information that is not accessible to screen readers used by people who are blind or who have low vision

- Shelters at which no one is able to communicate with people who are deaf or hard of hearing

- Emergency communication in language that is inaccessible to people with intellectual or developmental disabilities and people with limited English proficiency

- 911 systems that do not allow people with disabilities to contact them via text-based communication

The legitimate concerns of people with disabilities and others with access and functional needs in emergency situations are frequently overlooked or minimized, notwithstanding the great urgency that surrounds the need to respond to the disability community's concerns in all phases of emergency management, including mitigation, preparedness,

response, and recovery. Effective communication must be provided to all people with disabilities. This research examines communication before, during, and after emergencies for people with sensory disabilities (deaf, hard of hearing, blind, low vision, deaf-blind, and speech disabilities) as well as people with mobility, intellectual, developmental, and psychiatric disabilities. The study documents successful practices and identifies facilitators and barriers to providing effective emergency-related communication; reviews the enforcement of current disability laws and regulations as they pertain to effective communication before, during, and after emergencies; and surveys the emergency management community to identify challenges and best practices for effective communications for people with disabilities.

The research and anecdotal evidence for this report unequivocally demonstrate that people with disabilities must be an integral part of emergency communication activities before, during, and after an emergency or disaster, small or large, natural or manmade. This report and its recommendations focus on how to help make that integration happen, in particular through planning activities at the local level.

Summary of Key Findings and Recommendations

Key Findings

- The communication needs of people with disabilities are not being fully integrated by emergency managers in planning efforts.

- There is a lack of consolidated, consistent, and coordinated guidance available to emergency managers on the communication needs of people with disabilities.

- There is an ongoing need for increased outreach to the disability community by emergency managers.

- Technology plays an increasingly vital role in emergency communications yet remains largely inaccessible for many people with disabilities.

- Despite legal mandates to provide effective communication to people with disabilities before, during, and after emergencies, emergency communications remain largely inaccessible.

- Alerts and warnings that are multimodal are better able to reach people with disabilities.

Key Recommendations

- Emergency managers must ensure that the communications needs of people with disabilities and others with access and functional needs are integrated into all parts of emergency planning at the local, state, tribal, and federal levels.

- The Federal Emergency Management Agency (FEMA), Department of Justice (DOJ), and Federal Communications Commission (FCC) should collaborate to create specific guidance for local officials regarding effective communication before, during, and after emergencies.

- Emergency managers must increase outreach efforts to the disability community.

- States, in collaboration with FEMA as appropriate, should provide guidance and training to local emergency managers on effective communications for people with disabilities, and funding should be appropriated accordingly.

- DOJ, in collaboration with the FCC as appropriate, should closely monitor the inaccessibility of social media and strongly consider issuing regulations to ensure accessibility.

- DOJ, in collaboration with other agencies as appropriate, must increase its monitoring and enforcement of federal laws, such as the Americans with Disabilities Act (ADA) and the Rehabilitation Act, which require that emergency communications be fully accessible to people with disabilities, and funding should be appropriated accordingly.

- The FCC must increase its monitoring and enforcement of federal laws and regulations that require that emergency communications be fully accessible to people with disabilities, and funding should be appropriated accordingly.

- DOJ, in collaboration with the FCC, must address Web site accessibility, particularly Section 508 compliance.

- The FCC and FEMA must continue to work toward ensuring that alerts and warnings are fully accessible to people with disabilities.

Conclusion

Effective communication is critical and can save lives during times of emergency. Emergency managers must address the needs of the whole community, including people with sensory disabilities (deaf, hard of hearing, blind, low vision, deaf-blind, and speech disabilities) as well as people with intellectual or developmental disabilities and people with psychiatric disabilities. Planners must communicate with everyone in ways that are easy to access and understand. Planners must also use communication methods that reach everyone in the community.

NCD is committed to ensuring complete communication access for all people with disabilities before, during, and after emergencies, and promoting inclusive emergency management practices on the local, state, tribal, and federal levels. To that end, it is NCD's hope that the experiences of people with disabilities, proven strategies, and recommended practices detailed in this report will guide stakeholders as they work together to ensure inclusive emergency management practices, including full communication access for all people with disabilities before, during, and after emergencies.

Introduction: Origins of the Research and Description of the Problem

The National Council on Disability (NCD) plays a critical role in promoting successful disability policies regarding emergency management through the publication of information and policy recommendations. For example, following Hurricanes Katrina and Rita, the Federal Communications Commission (FCC) implemented changes to the emergency alert requirements that paralleled NCD's recommendations in the 2005 report *Saving Lives: Including People with Disabilities in Emergency Planning*.

NCD publications that address emergency management and effective communications include the following:

- *National Disability Policy: A Progress Report* (issued annually)

- *Effective Emergency Management: Making Improvements for Communities and People with Disabilities* (2009)

- *Homeland Security, Emergency Preparedness, Disaster Relief and Recovery Public Consultation* (2007)

- *The Need for Federal Legislation and Regulation Prohibiting Telecommunications and Information Services Discrimination* (2006)

- *The Impact of Hurricanes Katrina and Rita on People with Disabilities: A Look Back and Remaining Challenges* (2006)

- *The Needs of People with Disabilities with Psychiatric Disabilities During and After Hurricanes Katrina and Rita: Position Paper and Recommendations (2006)*

- *Emergency Management and People with Disabilities: Before, During, and After Congressional Briefing* (2005)

- *National Council on Disability on Hurricane Katrina Affected Areas* (2005)

- *Saving Lives: Including People with Disabilities in Emergency Planning, News Conference Transcript* (2005)

As a result of this work, NCD was given responsibilities in the 2006 Post-Katrina Emergency Reform Act. As part of these responsibilities, NCD participated in two events that illustrated the need to place additional emphasis on effective communication. In September 2011, NCD held an all-day meeting with the Federal Emergency Management Agency's (FEMA's) regional disability integration specialists, at which they discussed the current state of emergency management as well as barriers and facilitators to the inclusion of people with disabilities. Also in September 2011, NCD cosponsored FEMA's Getting Real II conference, which highlighted promising practices in inclusive emergency management. During both meetings, critical issues related to effective communication were raised.

Through its emergency management work, NCD has identified numerous instances of inaccessible communication before, during, and after emergencies. Examples of barriers to effective communication include these:

- Televised emergency announcements by officials that do not include American Sign Language interpreters

- Inaccessible emergency notification systems

- Inaccessible evacuation maps

- Web sites with emergency information that is not accessible to screen readers used by people who are blind or have low vision

- Shelters at which no one is able to communicate with people who are deaf or hard of hearing

- Emergency communication in language that is inaccessible to people with intellectual or developmental disabilities and people with limited English proficiency

- 911 systems that do not allow people with disabilities to contact them via text-based communication

During the writing of this report, the United States experienced several major disasters, both natural and manmade, including Hurricane Sandy and the Boston Marathon bombings. Unfortunately, stories of inadequate or unavailable communications for people with disabilities were common.[1] These recent experiences reinforce the need to focus attention on accessible emergency communication at the local, state, tribal, and federal levels.

Effective communication is critical and can save lives during emergencies. Emergency managers must address the needs of the whole community, including people with sensory disabilities (deaf, hard of hearing, blind, low vision, deaf-blind, and speech disabilities) as well as people with intellectual or developmental disabilities and people with psychiatric disabilities. Planners must communicate with everyone in ways that are easy to access and understand. Planners must also use communication methods that reach everyone in the community.

The legitimate concerns of people with disabilities and others with access and functional needs in emergency situations are frequently overlooked or minimized, notwithstanding the great urgency that surrounds the need to respond to the disability community's concerns in all phases of emergency management, including mitigation, preparedness, response, and recovery. Effective communication must be provided to all people with disabilities and others with access and functional needs. This report examines communication before, during, and after emergencies for people with sensory disabilities

(deaf, hard of hearing, blind, low vision, deaf-blind, and speech disabilities) as well as people with mobility, intellectual, developmental, and psychiatric disabilities.

The report documents successful practices and identifies facilitators and barriers to providing effective emergency-related communication; it examines the current state of affairs concerning the accessibility of emergency-related communication; reviews the enforcement of disability laws and regulations as they pertain to effective communication before, during, and after emergencies; and collects information on the experiences and perceptions of people with disabilities as they relate to emergency-related communication.

SECTION 1. Providing Effective Emergency-related Communications: Facilitators and Barriers

1.1. Introduction: People with Disabilities and Emergency Communications

1.1.1. Expanding the Definition of Disability

According to the United States Census Bureau, in 2010, an estimated 56.7 million people (18.7% of the civilian noninstitutionalized population) had a disability (Brault, 2012). The Census Bureau breaks down the term "disability" among people ages 15 and older as follows:

- Difficulty seeing: 8.1 million (3.3%)

- Difficulty hearing: 7.6 million (3.1%)

- Difficulty speaking: 2.8 million (1.2%)

- Upper and lower body limitations: 30.6 million (12.6%)

- Difficulty with at least one activity of daily living: 9.4 million (3.9%)

- Limited mental or cognitive function: 10.6 million (4.4%)

    o Intellectual disability: 1.2 million (0.5%)

    o Developmental disability: 944,000 (0.4%)

    o Learning disability: 3.9 million (1.6%)

This report will broaden the Census description of disability because, as stated in the NCD report *Saving Lives*, "In disaster management activities, it is important to think about disability broadly" (NCD, 2005, p. 11). This broad approach is reflected in the language used by FEMA and others in the emergency management community: "People with disabilities and others with access and functional needs" is intended to include broad and diverse groups of people who benefit from physical, communication, and program access. We have chosen to use this expanded definition of disability in this report for the following reasons.

The term includes people who may or may not meet the definitions of civil rights laws or some of the other 60-plus diverse and sometimes conflicting definitions of disability (Kailes & Enders, 2007). The first National Response Framework specified that people with disabilities and others with access and functional needs includes "populations whose members may have additional needs before, during, and after an incident in functional areas, including but not limited to maintaining independence, communication, transportation, supervision, and medical care" (DHS, 2008c, p. 17). Those functional areas may have different imperatives; for example, communications before an emergency (receiving warning information) will likely differ from communications during the emergency.

The term also encompasses some of the cross-disability and cross-cultural issues regarding emergency communications, including individuals with more than one disability or with limited English proficiency. FEMA says, "When communities integrate the access and functional needs of children and adults with and without disabilities in all phases of community-wide emergency management, they strengthen their ability to prepare for, protect against, respond to, recover from and mitigate all hazards" (FEMA, 2011b, p. 40).

Finally, when the needs of people with disabilities and others with access and functional needs are included and accommodated in planning and services, many more people will benefit from accessible communications—an estimated 50 percent of the population (Kailes, 2007, p. 236).

1.1.2. The Importance of Emergency Communications

Emergency communications are critical in emergency management; they make the difference between life and death on some occasions. When alerts and warnings are timely and accurate, and the proper preparedness information is provided, the first steps in managing the emergency effectively and mitigating the effects of a disaster have been taken.

At the same time, such communications are a process. The individual's response to emergency communications can be affected by factors external to the emergency communication: by the disseminator and the individual's trust in the disseminator; by the way the communication is issued; by the individual's ability to understand the communication; and much more. For people with disabilities and others with access and functional needs, the list of such factors grows exponentially. In the words of Marcie Roth, director of the Office of Disability Integration and Coordination at FEMA, "Information has to be accessible to be actionable" (Roth, 2013).

The literature abounds with studies and anecdotes concerning emergency communications for people with access and functional needs, especially questions of accessibility. NCD's *Saving Lives* report found that people with disabilities and others with access and functional needs are often left out of emergency planning, meaning that their needs might not be met when the plan is implemented (NCD, 2005). A recent study by the Wireless Rehabilitation Engineering Research Center (Wireless RERC) found that the first nationwide test of the Emergency Alert System, in November 2011, was often inaccessible due to the lack of captioning and inadequate verbal communications (Wireless RERC, 2012b).

Inaccessibility of emergency communications diminishes the effectiveness of these communications, and emergency managers at the local, state, tribal, and federal levels must remember that people with access and functional needs comprise over half the population, meaning that accessible emergency communication goes far beyond reaching a small proportion of the public. Simple, easy-to-understand instructions in

clear, large print and audible form should be the communication norm, not the exception and not just when providing emergency information for people with vision disabilities. Such mandates for the accessibility of information benefit everyone. For example, people who are in a different room at the time of an emergency broadcast will be able to hear alerts and warnings if they are spoken, while people who have lowered the volume on their televisions will benefit from large captions illuminating the details of the emergency message. In short, the solutions to accessibility needs are of potential benefit to the great majority.

Table 1. Some Solutions to Accessible Communication Needs

Need Type	Solution
Technical	- Amplified telephones - ASL (American Sign Language) - Assistive listening devices - Audio warnings - Braille - Computer-assisted real-time transcription (CART) - Captions (display of text on screen, usually a transcription of audio) - Large print - Magnifiers - Multimedia - Raised print signs - Text-to-speech - Video description
Physical/Content	- Interpreters - Plain language/instructions - No jargon, acronyms, truncated, or abbreviated text

1.1.3. Defining Communications

While communication can be defined as "to make common to many," it can denote two different processes: (1) the transmission of information (a one-way process), and

(2) sharing information (a common or mutual process) (Williams, 1985). Both are included in current emergency communication strategies (see Figure 1).

In the transmission of information, communication more closely follows the Shannon and Weaver model, which implies that communication is a linear and essentially one-way process from sender to receiver (Leaf, 2005; Shannon & Weaver, 1963; Targowski & Bowman, 1988). Targowski and Bowman note that although the transmission model of communication does allow for feedback, this model is essentially "static": The goal of the transmission model is to get the message across to the receiver (p. 15). This process is in line with current government communications, in which local, state, tribal, or federal organizations act as gatekeepers and determine the content, timing, and method of dissemination of the emergency message. Typically, this model is less about communication and more about the dissemination of information, as in alerts and warnings (De Marchi, 1993).

Figure 1. Two Models of Communication

Transmission model

| Sender | → Message → | Receiver |

Sharing model

| Sender | ← Message → | Receiver |
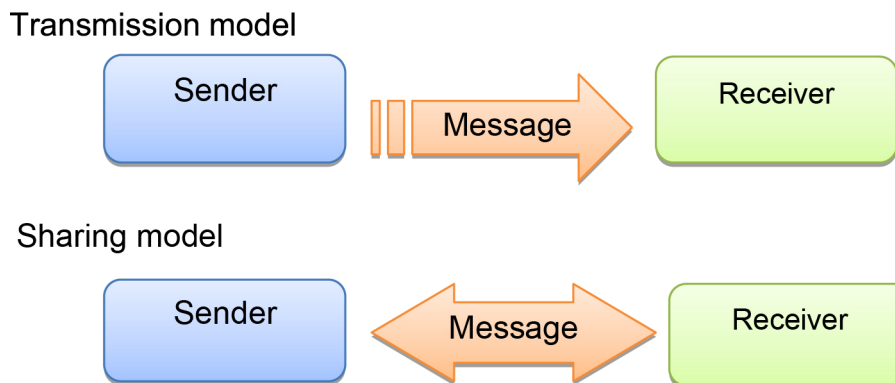
In contrast, the idea of *sharing* information implies a common or mutual process. As described in the interactional or transactional model of communication, the sender and receiver exchange messages. The National Research Council (NRC) notes this dichotomy, seeing typical risk communication as a transmission or one-way process "from experts to non-experts" but describing this view as "too limiting" and arguing for a "distinction between risk messages and the risk communication process" (NRC, 1989, p. 2). The NRC says that risk communication (e.g., emergency communication) "[is] an

interactive process of exchange of information and opinion among individuals, groups and institutions" (p. 21). For Mileti, an individual's response to a public warning is a social process (Mileti, 1995; Mileti and Sutton, 2009).

1.1.4. Characteristics of Effective Emergency Communications

In a report on public alerts and warnings, the Partnership for Public Warning[2] provided a comprehensive overview of the various promising practices of public warning systems, emphasizing warning systems that provide "the ability for government authorities to communicate with individuals prior to, through and after the emergency event. In addition to alerting individuals, an effective public warning system provides information on how to prevent and protect against disasters, and information to assist in recovery efforts" (2004, p. 3). The report calls for public warning systems that disclose as much information to the public as possible during all phases of an emergency, including specifics about the nature of the threat, who may or may not be at risk, and potential protective actions. The system should have the capability to continually repeat and update all warnings to ensure that as many people as possible are exposed to them and that the warnings are "disseminated via as many channels as possible" (p. 18). In addition, the report advises that those issuing warnings "recognize that 'the public' is not a homogenous entity" (p. 9). Therefore, multiple warning systems may be needed to properly disseminate comprehensive warnings to the various entities that make up the public, including people with disabilities and others with access and functional needs. For this reason and to capture the notion of sharing information, this report refers to "communications" throughout.

Emergency communications relating to preparedness, response, or recovery efforts can occur in a variety of ways. Official sources issue television, radio, or print alerts and warnings, or outgoing notification systems, also known as Reverse 911; individuals call 911 to report an emergency; officials and individuals may have face-to-face conversations; or individuals may use social media to let others know they are safe. Typically, emergency communications are transmitted with more urgency and

importance than day-to-day communications. Emergency communications are effective when they are timely, accurate, and clear (FEMA, 2010b).

During an emergency, the goal of effective communication is to elicit a response that will minimize a person's vulnerability or risk; for example, people may need to evacuate, take shelter, or gather supplies before a storm (Aguirre, 2004). De Marchi (1993) notes that desired behavioral response during an emergency is not attained by simply issuing instructions via what Mileti (1995) calls a stimulus-response model. Instead, many personal and external factors will affect an individual's response during an emergency. If people experience emergencies as part of a group (either permanent or temporary), they watch what others do, work together, experience panic, and so on. Where are people with disabilities in such a situation? How are they perceived by others in the group? Are they part of the emergency response social process or outside of it?

According to De Marchi (1993), because behavioral response depends on many social and psychological factors, official emergency communications "must be based on a long-term strategy where a stable communicative relationship is established between the public and those in charge of managing the hazard and the aftermath of a disaster" (p. 185). Continual communication or the sharing of information between officials and individuals before, during, and after an emergency will enhance the effectiveness of communication, especially during the emergency.

Effective emergency communications are essential for all individuals, but communication requirements for people with disabilities and others with access and functional needs are often unmet. Kailes (2008) says, "The challenge is that most disaster response systems are designed for people who can walk, run, see, drive, read, hear, speak and quickly understand and respond to instructions and alerts" (p. 10). As the Department of Justice (DOJ) stated regarding the Americans with Disabilities Act, effective communication for people with disabilities means that "whatever is written or spoken must be as clear and understandable to people with disabilities as it is for people who do not have disabilities. This is important because some people have disabilities that affect how they communicate" (DOJ, 2007a, p. 1). Therefore, in order for emergency communications to

be effective for all individuals, they must be accessible. Public entities, including state and local governments, have to ensure that communications with applicants, participants, members of the public, and companions with disabilities are as effective as communications with others (28 C.F.R. § 35.160(a)(1)). Among other things, public entities are required to "furnish appropriate auxiliary aids and services where necessary to afford qualified individuals with disabilities . . . an equal opportunity to participate in, and enjoy the benefits of, a service, program, or activity of a public entity," including emergency management (28 C.F.R. § 35.160(b)(1)). Examples include captioning or use of American Sign Language interpreters for people who are deaf or hard of hearing; verbal communication, large print, or braille for people who are blind or have low vision; and accessible Web sites and multimedia. Under Title VI of the Civil Rights Act of 1964, culturally competent translations for people with limited English proficiency are also required (this means that translations must actually make sense in the target language).

It should be emphasized here that accessibility is not a suggestion, but a requirement. The Americans with Disabilities Act of 1990 (ADA), as amended; the 21st Century Communications and Video Accessibility Act (CVAA); the Post-Katrina Emergency Management Reform Act (PKEMRA); the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended; the Rehabilitation Act of 1973, as amended; the Communications Act of 1973, as amended; Executive Orders #13407 and #13347; and regulations from DOJ and the Federal Communications Commission (FCC) all require accessible communications for people with disabilities before, during, and after an emergency or disaster (see Section 2).

1.2. The Structure of Emergency Communications

The needs of emergency communications differ depending on whether communication occurs at the local, state, tribal, or federal level. For the most part, this report will focus on a communication approach that separately considers effective emergency communications to, from, and among individuals at the local level, as explained below. This includes government-initiated emergency alerts, recovery information, and other

urgent communications and one-way information from official sources, as well as emergency plans and evacuation routes from businesses or places of interest.

1.2.1. Emergencies Are Local

The Department of Homeland Security (DHS) says that effective emergency response "depends on integration of the whole community and all partners executing their roles and responsibilities," especially through a unified response (DHS, 2013b, p. 7). Although emergencies can require cooperative response efforts (local, state, tribal, and federal emergency management, as well as nongovernment organizations (NGOs) and the private sector), the National Response Framework (NRF) emphasizes that organizational preparation for, response to, and recovery from a disaster are to follow a tiered response, in which emergency management begins at the local level and moves upward to the state and federal levels if "additional resources or capabilities are needed" (DHS, 2013b, p. 6).

An old adage states that "all emergencies are local" (Col, 2007; DHS, 2008b; DHS, 2013b; Matherly and Mobley, 2011; Partnership for Public Warning, 2004). The NRF is explicit: "The responsibility for responding to natural and manmade incidents that have recognizable geographic boundaries generally begins at the local level—with individuals and public officials in the county, parish, city or town affected by the incident" (DHS, 2013b, p. 11). According to the Partnership for Public Warning (2004), "Local government has the primary responsibility to warn its citizens and to assist them in preparing, responding and recovering from disasters," but it "requires the cooperation and assistance of State governments, the Federal government and the private sector" (pp. 2,4).

The DHS's National Mitigation Framework (NMF) (2013a) and NRF (2013b) emphasize that, in addition to local, state, and federal government, NGOs, private sector entities, communities, and individuals are important stakeholders in emergency preparedness and response. As stated in the NMF, "Those who play a role in mitigation range from an individual making decisions about how to manage the risks in his or her life, to local jurisdictions and large metropolitan regions working to manage their community

members' risks from threats and hazards, to state and Federal agencies administering large, multi-purpose programs" (DHS, 2013b, p. 2).

1.2.2. Coordination Is Key

At all levels, authorities have a responsibility to effectively communicate with individuals, providing "information on how to prevent and protect from disasters, and information to assist in recovery efforts" (Partnership for Public Warning, 2004, p. 3). Although the primary responsibility to ensure the safety of individuals begins with local authorities, for emergency communications, coordination is key. The NRF states:

> Those who lead emergency response efforts must communicate and support engagement with the whole community by developing shared goals and aligning capabilities to reduce risk of any jurisdiction being overwhelmed in times of crisis. Layered, mutually supporting capabilities of individuals, communities, the private sector, NGOs, and governments at all levels allow for coordinated planning in times of calm and effective response in times of crisis. Engaged partnership and coalition building includes ongoing clear, effective, and culturally appropriate communication and shared situational awareness about an incident to ensure appropriate response (DHS, 2013b, pp. 5–6).[3]

Because resources are limited at the local level, communication and coordination among local authorities and neighboring jurisdictions, the state government, NGOs, and private sector organizations are critical and can help ensure that local areas have adequate resources. Private sector organizations may provide services such as communication networks, transportation, or medical care; NGOs can provide local governments with information regarding various populations in the community or resources to aid in disaster recovery. Table 2 lists emergency communications that may occur among stakeholders at the local level. To the extent possible, this knowledge should be harvested in advance through preparedness activities. Effective emergency communications begin well before an emergency and continue during recovery and mitigation efforts. Fluid communications among all stakeholders, especially before and after an emergency, will help increase the effectiveness of communication during response efforts.

Table 2. Emergency Communications Among Stakeholders

Initiator of ➡ Communications:	Local Government	Individuals	NGOs	Private Sector
Local Government	Branches of local government must coordinate with each other during an emergency.	Individuals communicate with local governments for help (911) or to get emergency-related information.	NGOs communicate with local governments to offer supplies, shelter, and other support for individuals.	Private sector communicates with local governments to offer supplies and infrastructure support (water, power, communication networks, etc.).
Individuals	Local government distributes preparedness, response, and recovery information to individuals.	Individuals communicate, coordinate preparedness efforts, warn others, get recovery information, offer help, and validate warnings.	NGOs distribute preparedness, response, and recovery information and supplies to individuals.	Private sector delivers preparedness, response, and recovery information to individuals. Businesses plan emergency response for employees.
NGOs	Local government distributes preparedness, response, and recovery information, and may request supplies from NGOs.	Individuals communicate with NGOs, requesting help or providing emergency-related information.	NGOs communicate with each other regarding preparedness, response, and recovery information and supplies.	Private sector communicates with NGOs, offering supplies or requesting assistance.
Private Sector	Local government distributes preparedness, response, and recovery information, and may request supplies from private sector.	Individuals communicate with local government to request help or provide emergency-related information.	NGOs communicate with private sector regarding preparedness, response, and recovery information and supplies.	Private sector communicates with other private sector entities to offer or coordinate supplies.

In order for emergency communications to be effective, it is important to consider all the stakeholders involved. At any time, emergency communications may occur between or among two or more stakeholders with varying levels of urgency and locality. Figure 2 is based on observations from Wardell and Su (2011) that domestic response should be treated as "a large-scale system—an enterprise consisting of numerous stakeholders, inputs, and processes that work together to save lives" (p. 1).

Figure 2. Stakeholders in Emergency Communications
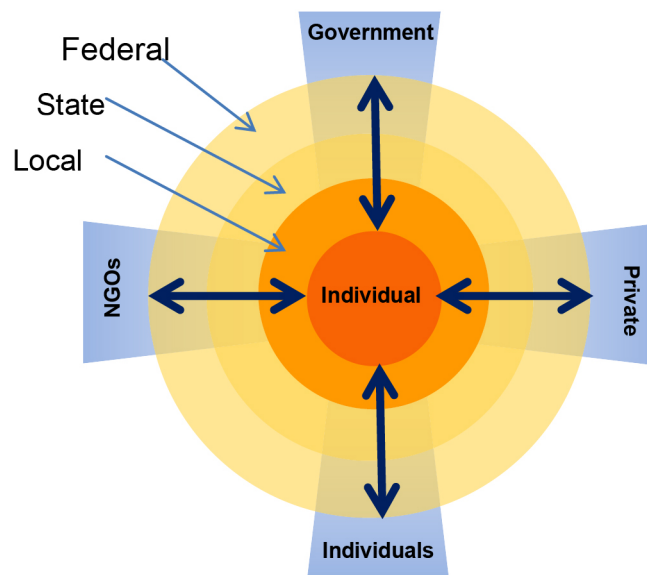
Source: Adapted from Wardell & Su, 2011.

The figure illustrates that unidirectional and bidirectional emergency communications can occur between an individual and any of the four stakeholder groups (government, individual, NGO, or private sector) at the local, state, tribal, or federal (national) level. The NRF specifies stakeholders as local, state, and federal government; individuals, families, households, and communities; NGOs; and private sector entities (DHS, 2008b; DHS, 2013b). What is not captured by the graphic, however, is the added layer of communications that can occur between and among each of these groups; for example, between NGOs and local governments or the private sector.

Although NGOs and private sector businesses are often left out of the emergency communications literature, they can play a major role in preparedness, response, and recovery from an emergency. The NRF says that "private-sector organizations and NGOs contribute to response efforts through partnerships with each level of government" (DHS, 2013b, p. 10). Private sector organizations not only need to issue emergency communications for employees but also play a critical role in "protecting critical infrastructure systems and implementing plans for the rapid restoration of normal commercial activities and critical infrastructure operations following a disruption" (p. 9). NGOs can offer support services including but not limited to "identifying physically accessible shelter locations"; "providing search and rescue, transportation, and logistics services"; and "assisting, coordinating, and providing disability-related assistance and functional needs support" (p.11).

1.3. Communications Approaches: Focus on the Individual and the Local Level

The needs of emergency communications will differ depending on whether communication occurs at the local, state, tribal, or federal level. This report will use a communication approach that separately considers effective emergency communications to individuals, from the individual, and among individuals at the local level. This includes government-initiated alerting for an emergency, recovery information, and other urgent communications and one-way information from official sources. It also includes emergency plans or evacuation routes from businesses or places of interest.

1.3.1. Types of Emergency Communication at the Local Level

Communication to the Individual

According to the National Organization on Disability (NOD), emergency communications to individuals are not confined to alerts and warnings about impending disasters. Effective emergency communications must be ongoing, providing information well before

an event (typically preparedness outreach), directly preceding an event (typically alerts and warnings), during an event (instructions), and following an event (recovery information) (NOD, 2009). The Partnership for Public Warning (2004) notes that effective warning systems provide "the ability for government authorities to communicate with citizens prior to, through and after the emergency event. In addition to alerting citizens, an effective public warning system provides information on how to prevent and protect against disasters, and information to assist in recovery efforts" (p. 3). Thus, effective emergency communications will include preparedness, response, recovery, and mitigation communications. It is important to recognize the social context in which those communications occur. The poor have fewer resources to spend on preparation, suffer the greatest disaster losses, and have the most limited access to public and private recovery assets (Pawar, Simon, & Epstein, 2009; Scola, 2009; Tierney, 1993).

Preparedness

Effective communications begin long before an actual emergency by preparing both emergency personnel and citizens for potential emergencies and aid in reducing the impact of an emergency. FEMA sees preparedness as a continuous cycle of "planning, organizing, training, equipping, exercising, evaluating, and taking corrective action" (FEMA, 2010a, pp. 1-4). Preparedness efforts include identifying hazards, preparing emergency response and emergency communication plans, disseminating information concerning potential hazards, testing the Emergency Alert System (EAS), testing emergency plans and warning systems, training first responders, informing and educating the public, and procuring supplies. Preparedness, like emergency response, begins with the individual and extends to local, state, tribal, and federal authorities.

Community involvement for risk communications is another key strategy. Beckjord et al. (2008) suggest that in order to maximize an individual's trust in emergency communication, each community should involve people with disabilities and others with access and functional needs not only as representatives in emergency planning but also to help develop communication strategies. This will ensure that the needs of people with disabilities and others with access and functional needs are properly considered and that

solutions are implemented. This approach is described in NCD's 2005 report *Saving Lives* and in the National Mitigation Framework (DHS, 2013a), and is a theme of this report.

In its *ADA Best Practices Tool Kit for State and Local Governments*, the Department of Justice advises that the ADA requires planning ahead for effective communication with people with disabilities and identifying resources for auxiliary aids and services. This includes planning ahead to make information available in alternative print formats such as large print and braille, and electronic formats such as CDs or thumb drives. It also includes finding qualified interpreters and training all employees to recognize the need for effective communication with people with disabilities (DOJ, 2007a). All public safety answering points (PSAPs), such as 911 and other emergency services, must be able to directly receive TTY calls without relying on an outside relay service or a third party service (DOJ, 1998, p. 4). Currently, legislation is being developed for a Next Generation 911 system. This system will implement text-to-911, allowing individuals to send text messages to PSAPs. This is especially beneficial for people who are deaf or hard of hearing and who may traditionally have relied on TTY to contact 911.

Response

According to Tierney (2001), "Emergency response consists of actions taken a short period prior to, during and after disaster impact to reduce casualties, damage, and disruption" (p. 19). Tierney further explains that response can include "detecting threats, disseminating warnings, evacuating threatened populations, searching for and rescuing trapped disaster victims, providing emergency medical care, taking action to contain ongoing threats, and providing emergency food and shelter" (p. 19). The Partnership for Public Warning (2004) reiterates the emphasis on responsibility at the local level: "Even though some warnings may originate outside of the local community (e.g., hurricane warnings from the National Weather Service or terrorist alerts from the Federal government), it is primarily the responsibility of the local authorities to ensure that citizens are provided with the information they need to protect themselves and their families" (p. 4).

The most common way individuals receive alerts and warnings is through television (Hammer & Schmidlin, 2002). However, with the upswing in the use of alternative technologies (such as email and text messaging) for alerting, reliance on television as the primary source is declining. In 2009, research on emergency alerting methods found that 95 percent of participants with disabilities received alerts via television (Mitchell, 2010). Today, that percentage has dropped to 55 percent, and text messages, which once placed sixth, now place second at 31 percent (Morris, Mueller and LaForce, 2013).[4]

For the time being, television remains the most popular reception device, but as noted by the Wireless RERC (2011), serious accessibility problems exist for television emergency communications. The nationwide EAS test revealed that alerts via television broadcasts were inconsistent in their use of audio and therefore not reliable or accessible to people who are blind or have low vision. Some people with low vision have said that the text crawl is too small and goes by too fast to decipher. Some people who are hard of hearing found the quality of the audio poor and the attention signal not in a frequency they could hear well, and respondents who are deaf said they would probably miss a televised EAS alert because it does not include a visual alert mechanism (Wireless RERC, 2012b).

In an effort to implement the provisions of the CVAA, the FCC released a report and order (2013d) that address the accessibility of televised emergency information for people who are blind or have low vision. The rule requires that emergency information conveyed visually during non-newscast programming also be presented aurally and represents a positive step toward enabling people who are blind or have low vision to receive emergency information. However, the rule is not applicable to EAS messages (p. 9) and does not address the accessibility barriers experienced by people who are deaf or hard of hearing when emergency information is televised. Furthermore, there is a two-year compliance deadline, so the impact of the rule on industry practice will not be known for some time. Unfortunately, laws, rules, and regulations do not in themselves guarantee the removal of access barriers; enforcement is necessary.

Shelters and Relief Services

Under the ADA, shelters must provide equal access, including "safety, food, services, comfort, information, a place to sleep until it is safe to return home, and the support and assistance of family, friends and neighbors" (DOJ, 2007d, p.1). In emergency situations, the responsibility to provide accessible services often falls on a third party (such as the American Red Cross), which operates the shelter for the local government agency. These third party agencies are required to ensure accessibility unless these actions "would result in a fundamental alteration in the nature of a service, program, or activity or that would cause undue financial and administrative burdens" (DOJ, 2007d p. 1).

The ADA Best Practices Tool Kit for State and Local Governments (DOJ, 2007d, p. 8) states that "from the moment people begin to arrive at a shelter, good communication between staff, volunteers and residents is essential Accessible communications are required, but the reality often differs from the requirement. Sullivan and Hakkinen (2006) described the lack of accessibility in shelters during Hurricane Katrina: "At the Super Dome, deaf individuals were confined to an area designated as 'Deaf Area' without adequate support for their information needs; their isolation was compounded by the lack of signing translators, and public address announcements never reached them" (p. 4). The National Organization on Disability (NOD, 2009) noted that, after Hurricane Katrina, "over 80 percent of the shelters did not have access to TTY; 60 percent of the shelters did not have captioning TV capabilities. Less than 30 percent had access to sign language interpreters" (p. 14).

In its report *The Needs of People with Disabilities with Psychiatric Disabilities During and After Hurricanes Katrina and Rita*, NCD (2006b) was alarmed to find that "first responders and emergency managers such as shelter operators often violated the civil rights requirements of the Americans with Disabilities Act and Section 504 of the Rehabilitation Act. . . . Some of the most common forms of discrimination included: People with disabilities were segregated from the general population in some shelters while other shelters simply refused to let them enter. People with psychiatric disabilities were denied access to housing and other services because of erroneous fears and

stereotypes of people with psychiatric disabilities" (p. 3). Time has not improved the situation. The Division of Disability Services for the New Jersey Department of Human Service reported that in the three weeks after Hurricane Sandy, it received 647 calls from disabled residents looking for assistance, mostly with accessible shelter and medical needs (D'Amico, 2013). Alarmingly, the 2013 National Preparedness Report (DHS, 2013c) stated that "despite FEMA's efforts to issue communication accessibility kits and ensure physical accessibility, Sandy disaster recovery centers lacked the necessary features and equipment to serve all survivors until several weeks or months after opening" (p. 6).

In several of the interviews carried out for Section 4 of this report, respondents commented that emergency managers often set up "special medical needs" shelters at which people with disabilities are to be housed during an emergency. Most people with disabilities do not have "special medical needs" and prefer to go to a general population shelter so they can be with their family and peers. In addition, the *ADA Best Practices Tool Kit* (DOJ, 2007d) points out that while some communities may open shelters specifically for people with disabilities (e.g., a local school for the deaf opening a shelter for people who are deaf or hard of hearing), people with disabilities are not required to take shelter in such locations. In short, the ADA requires that general population shelters be fully accessible and ensure accessible communications. This is also a preparedness issue, in that the public should be aware in advance of what the options are going to be and should have the right to say how and where they want to shelter.

Recovery

As noted in NCD's 2009 report *Effective Emergency Management: Making Improvements for Communities and People with Disabilities*, "The recovery time period is the least well researched phase in the emergency management life cycle" (p. 137). Interviews with emergency management carried out for Section 3 and Section 4 of this report echoed the view that communities often plan for the disaster to come but not for the "then what?" This represents a missed opportunity: The recovery phase provides the

opportunity for communities to ensure that they are complying with federal law and are fully accessible as they rebuild.

Anecdotal evidence from Hurricane Katrina and Hurricane Sandy reflects numerous instances of inaccessible shelters and unmet needs (NCD, 2009; personal communications). The recovery process moves from short-term to long-term resolutions, and accessible and effective communications are needed at every step (NCD, 2009). Acquiring shelter and housing, whether temporary or permanent; ensuring transportation and the ability to return to work; and accessing basic supplies—all involve communications. Individuals must have a way to communicate their needs to officials and the surrounding community, and officials must effectively communicate the availability of solutions to individuals. Kailes and Enders (2007) note that before emergency response and the ensuing recovery, emergency management needs to understand the demographics of the area in order to better meet anticipated needs, especially relative to shelters and subsequent recovery efforts.

According to Mileti and Gailus (2005), losses from a disaster are typically not unpredictable; rather, they stem from the "predictable result of interactions among three major systems: the physical environment (the events themselves); the social and demographic characteristics of the communities that experience them; and the buildings, roads, bridges and other components of the built environment" (p. 493). NCD's 2009 report *Effective Emergency Management* notes that when people with disabilities are added to the social and demographic characteristics mentioned by Mileti and Gailus, and when the built environments are inaccessible to people with disabilities, "the complexity of the issue expands" (p. 193).

Mitigation

While mitigation at the emergency level is one of the first steps in preparedness, it is also often incorporated into the recovery phase. FEMA uses disaster recovery centers as both recovery and mitigation facilities. The centers are readily accessible facilities or mobile offices where applicants may go for information about FEMA or other disaster

assistance programs (FEMA, 2012b). Not only do the centers offer general recovery information and support, including registration for federal assistance and information on community resources, but they also offer information on how to mitigate the effects of future disasters. For example, FEMA uses mitigation representatives to help show people how to "rebuild [their] homes to be more flood resilient, or how to build a safe room" (FEMA, 2012b).

FEMA defines mitigation as "capabilities necessary to reduce loss of life and property by lessening the impact of disasters" (DHS, 2013a, p. 1), while NCD's 2009 report *Effective Emergency Management* says the purpose of mitigation is "to reduce risk, create a more disaster-resilient built environment through structural measures, and enhance individual resilience through nonstructural measures" (p. 186). FEMA stresses that in order for mitigation strategies to work effectively, it is imperative that we understand all threats and hazards, and the "associated vulnerabilities and risks" (DHS, 2013a, p. 2).

NCD's 2009 *Effective Emergency Management* report outlines two forms of mitigation: nonstructural and structural. Nonstructural mitigation involves reducing the potential damage from a disaster through the use of information, education, and other programs, including insurance. Structural mitigation includes reducing risk within the built environment; for example, through the use of automatic sprinklers or by retrofitting buildings to withstand earthquakes (NCD 2009). NCD says that mitigation may be the "most powerful tool to reduce risks for people with disabilities," but such efforts must actually "consider the needs of people with disabilities" in order to be effective (p. 185). To grasp the relevancy of mitigation, imagine the impact of a flood on a community. The flood might wipe away many ramps, especially if they are add-ons, and could result in the loss of Internet or mobile wireless connectivity (meaning a communications breakdown) or of all power (with loss of mobility or of the ability to recharge a host of accessories, some of them of critical importance). Mitigation is unlikely to anticipate all possible eventualities, but it can greatly lessen the negative impacts of a disaster.

The recently released National Mitigation Framework (NMF) states that mitigation encompasses "the capabilities necessary to reduce the loss of life and property by

lessening the impact of disasters" (DHS, 2013a, p. 1) and emphasizes that "advanced planning to ensure disability-related assistance/access and functional needs support services, durable medical equipment, and consumable medical supplies mitigates the adverse effects that disasters have on individuals with disabilities and others with access and functional needs" (p. 18). The NMF includes seven core capabilities that are needed for mitigation; one of these is Public Information and Warning. Under that capability, the NMF is explicit about the need to inform the public, including the disability community, how to connect preparedness to resilience:

> Information and messaging should ensure effective communication with individuals who have disabilities or access and functional needs, including those who are deaf, hard of hearing, blind, or have low vision, through the use of appropriate auxiliary aids and services, such as sign language and other interpreters and the captioning of audio and video materials. (DHS, 2013a, p. 23)

1.4. Emergency Communications and Behavioral Response

1.4.1. What Is a "Typical" Behavioral Response?

Misconceptions about behavioral response during disasters abound. Often there is an assumption that individual response is irrational and may result in mass panic, severe shock, helplessness, social disorganization, low morale, and even looting (Helsoot & Ruitenberg, 2004; NRC, 2011; Perry & Lindell, 2003; Trainor & McNeil, 2008; Trainor et al., 2008). However, a countervailing view suggests that during and after an emergency, people will respond rationally, often exhibiting initiative to assist others during emergency situations (NRC, 2011; Trainor et al., 2008). Trainor and McNeil (2008) stress that it is important for policymakers and emergency managers to understand that people do not necessarily exhibit irrational behavior during emergencies, so they can "move beyond the notion that the problem with warning and response is 'getting people to be rational and do what we say.'" Instead, policymakers need to ask themselves, "How can we change our approach so that it takes into account how people process warning information?" (p. 1).

Mileti (1995) argues that behavioral response does not follow a traditional stimulus-response model, so the desired response cannot necessarily be elicited simply by issuing instructions. People process emergency communication, especially alerts and warnings, based on a social-psychological process (Goltz & Mileti, 2011; Helsoot & Ruitenberg, 2004; Mileti, 1995; Wood et al., 2012). First, an emergency communication is disseminated and received by an individual. The assumption here is that the individual must actually be able to receive and comprehend the message as the transmitter intended, which may not necessarily be the case. People might not be paying attention; cannot access the message because of some level of disability; or do not understand the message because of extraneous factors such as high levels of noise. People's behavioral responses will depend on many factors, including their personal understanding of the warning, their belief in impending risk, and their personalization of that believed risk (Mileti, 1995). Also, the alert or warning occurs in a larger context, one that encompasses how the meaning of the message relates to previous messages and to information from other sources (NRC, 2011). Although the essence of behavioral response is the reaction and the ability to act on information provided about a certain risk, response will depend on the ability to access and process information, as laid out by Mileti (1995) and supported by Wood et al. (2012) and Goltz and Mileti (2011). This includes the role played by the technology used to deliver the alert or warning; different population groups will have different levels of access to or acceptance of different technologies, according to variables that include such factors as age and income (NRC, 2011). For example, not everyone owns a smart phone or uses social media.

1.4.2. Social Capital and Trust

Behavioral response is a dynamic process affected by many factors. As shown in Table 3, these factors can be separated into two categories: (1) influences of the warning disseminator (external factors), and (2) influences of the warning receiver (personal factors) (Mileti, 1995; NRC, 2011; Wood et al., 2012). Trainor and McNeil (2008) concluded that behavioral response is not only a personal prerogative but is based on many factors, including social power, resources, culture, gender, characteristics of the

warning message, characteristics of the hazard, social networks, experience with the hazard, credibility of the person/agency issuing the warning, knowledge, and ability to take action.

Table 3. Factors Influencing Public Response

External Factors	Personal Factors
Source	Environmental Cues
Consistency	Social setting and Social Ties
Accuracy and Clarity	Pre-warning Perceptions
Level of Information	Socio-demographic and Psychological Characteristics
Frequency	Access or Functional Need
Method/Channel of Dissemination	
Accessibility	

Similar to behavioral response, communication barriers cited by Beckjord et al. (2008) include "emotional interference, trust, resources to disseminate communication, inconsistent or ambiguous messaging, preconceived assumptions based on prior experiences with the type of emergency addressed, cultural beliefs, interpretations, language barriers, and specific disability-related issues" (p. 57).

Emotional Interference, Social Capital

According to Rooney and White (2007), a person's social capital is important during an emergency, as "coworkers, family friends, neighbors and strangers often [form] spontaneous networks during and after disasters that provide needed assistance" (p. 209). Beaudoin (2007), who defines social capital as the intangible resources of social connections and social networks that can be accessed and mobilized in purposive action, states that social capital has exhibited "positive associations with important outcomes, such as the health, safety, and education of individuals and communities alike" (p. 637). Prior to an emergency situation, people with disabilities are typically predisposed to have lower levels of social capital (White, 2012), which can affect their

ability to confirm alerts, find transportation for evacuation, have access to supplies, and find shelter locations. This may be especially true for people who rely on caregivers.

Going forward, there is a question of whether new technology will have an effect on the social capital of people with disabilities and others with access and functional needs. Phones are now equipped with social media apps that provide easy access to contacting others, crowdsourcing resources,[5] and receiving information in general. NCD's 2011 report *The Power of Digital Inclusion* suggested that the social capital deficit has effectively disappeared for the younger generation of people with disabilities, who typically use new digital technology at close to the same rate as the general population, although this finding may not be generalizable to some specific categories of disability.

Trust

Research by Wray et al. (2006) describes the relationship between emergency communications disseminated by local or federal officials and trust in the communications. Wray determined that although there is a general lack of trust in government, individuals were more likely to trust local officials than federal officials. As NCD's 2009 report *Effective Emergency Management* noted, "Many authorities have little credibility in the disability community, owing in part to a history of circumventing the disability community in planning for disasters" (p. 93). Mileti 1995) pointed out that effective communication during an emergency depends on the effectiveness of the communication before the emergency. If people with disabilities and others with access and functional needs are included in the planning process, they will likely have a higher level of trust in emergency officials.

1.4.3. "Hearing" the Warning

Before an individual can respond to an alert or warning, that person must actually receive and understand it. The Partnership for Public Warning (2004) emphasizes that the public is not a homogenous entity and calls for multiple communication/warning

systems that redundantly send the same message in order to get the message to all members of the public.

In Mileti's 1995 analysis, behavioral response occurs in the steps illustrated in Figure 3 (comments added).

In addition, the medium matters, whether it be television, telephone (fixed or mobile), radio, the Internet, word of mouth, or a combination. Individuals must be actively engaged with the medium through which the alert or warning is disseminated. For people with disabilities and others with access and functional needs, this is an imperative consideration, as they may need alternative means of "hearing" emergency

Figure 3. How People Behave in Responding to Emergency Communications

"Hear" the Warning
- People with disabilities may face barriers when receiving a warning if communication channels are not accessible.

Understand the Warning
- Different people might have a different understanding of what emergency is being communicated.

Develop Belief in the Risk
- People with disabilities and others with access and functional needs must have an established trust in the disseminator of the alert or warning.

Personalize the Risk
- Verification of an alert or warning is often part of the personlization process and often depends on social capital.
- People with disabilities must be able to access their most trusted sources in order to verify alerts and warnings.

Decide on a Course of Action
- Behavioral response is personal.
- Communication that is effective and accessible during normal times is more likely to be effective during an emergency.

communication if they are deaf, hard of hearing, blind, have low vision, intellectual or developmental disabilities, or limited English proficiency (Waugh, 2008).

In general, inconsistent or ambiguous messaging must be avoided. For emergency communications to be "heard" effectively, messages must be timely, consistent, accurate, accessible, and clear. People who are deaf or hard of hearing may rely on television captioning to receive communications during an emergency. Errors and inconsistency in captioning can cause confusion in an emergency situation (Stout, Heppner, & Brick, 2004). For example, a news network may eliminate captioning once the initial shock of an emergency has passed, leaving people who are deaf or hard of hearing without access to the information. Or TV stations might choose to scroll updates on the emergency at the bottom of the screen, making them inaccessible to people who are blind or have low vision.

The following are some of the challenges in responding to emergency communications that people with specific disabilities might face, as well as some disability-specific solutions.

Deaf and Hard of Hearing

People who are deaf or hard of hearing may have limited access to emergency communication disseminated via television if there is no captioning and American Sign Language (ASL) interpretation, or if closed captioning of the regular programming blocks the weather crawl or vice versa (Wood & Weisman, 2003). The FCC requires that all stations abide by its rules on closed captioning or face stiff fines. The rules are comprehensive, having been expanded to cover analog television in 1993, digital television in 2002, and emergency messages in 2013 (FCC, 2013d). Research shows that emergency information is best understood in one's first language; for many deaf people, ASL is their first language. Thus, the FCC should require that ASL interpreters be present during all emergency broadcasts.

Also, people who are deaf or hard of hearing may not hear weather sirens or the alert tone at the beginning of a television alert, causing them to miss vital information. The National Research Council (2011) notes that one challenge for people who are deaf or hard of hearing is that of the "'eye-busy' situation in which the attention of a person with impaired hearing is focused elsewhere" (p. 40).

Accessibility solutions:

People who are deaf or hard of hearing will vary in their degree of hearing ability, so one accessibility solution will not fit all. To ensure that communications are accessible for all individuals who are deaf or hard of hearing, emergency management officials should make their messages and methods of dissemination robust and redundant. Solutions include ensuring that television alerts are captioned and that captions do not block weather crawls (or vice versa) that may be used to communicate updated weather alerts during a news cycle (Wood & Weisman, 2003). ASL interpretation must be provided "onscreen during emergencies" and "captioning of any kind should not block it" (Stout et al., 2004, p. 7). Personal warnings can also be used, such as warnings issued through Reverse 911 or the Wireless Emergency Alert/Commercial Mobile Alert System.

"Hear" the Warning: Accessibility Solutions			
Closed captions	Weather crawls that do not block the captions	American Sign Language	Personal warnings

Blind and Low Vision

NCD's 2009 report *Effective Emergency Management* notes that people who are blind or have low vision may not be able to access all information presented via television due to reliance on "graphics and crawling text to communicate disaster warnings." Recent research by the Wireless RERC following the November 9, 2011, national test of the Emergency Alert System found that the test was completely inaccessible to people who were blind or had low vision, owing to a lack of auditory warnings. For such people, emergency communications must be auditory, in large print, or in braille. If information is conveyed online, screen readers may be ineffective if Web sites are not accessible.

Weather maps, which project storm location and path, are also ineffective without an auditory aid (NCD, 2009).

Accessibility solutions:

People who are blind or have low vision vary in their ability to see, so not all accessibility solutions will work for everyone. Emergency management officials or entities need to ensure that alerts, warnings, and other communications are accessible and complete, which may mean that redundancy is necessary. Alerts and warnings, especially those on television, need to be auditory and the tone must be followed by comprehensive emergency information, including what action should be taken. When only captioning or a weather crawl is used, people who are blind or have low vision might miss the warning altogether. Print information should be available in large print and braille, while signs should include raised lettering as well as braille. Video descriptions of key visual elements should be provided for TV programming to increase accessibility (FCC, 2013d; Oklahoma City Health Department, 2013). The FCC is addressing the accessibility of televised emergency information for people who are blind or have low vision, although challenges remain.

"Hear" the Warning: Accessibility Solutions					
Auditory alerts	Large print	Braille	Video description	Text-to-speech	Raised-print signs

Deaf-Blind

For people who are deaf-blind, the universal symbol for an emergency is an "X" tactilely "drawn" on the individual's back. The person then knows to follow another individual to safety (Huebner et al., 2003). However, NCD's 2009 report *Effective Emergency Management* notes that communication can range from sign language near the person's face to sign language in the palm to words written on the palm with a finger. Another common method in which deaf-blind people can receive emergency communication is through the use of a vibrating pager, which alerts them to receive follow-up information from a rewritable braille machine.

Accessibility solutions:

For people who are deaf-blind, essential warning systems tend to be personal and may be indirect (i.e., delivered through a third party). It is important that alerts and warnings be routed through devices that will notify people who are deaf-blind; this often means tactile devices, such as vibrating pagers or bed shakers. It is also important to ensure that after the individual is alerted, he or she is provided with information, which may be done either through a rewritable braille machine or through tactile sign language, perhaps by a caregiver. National Public Radio (NPR) engineers are working on the Captioned Braille Radio Initiative for people who are deaf-blind. This project has been designed to incorporate new Common Alerting Protocol (CAP) technology, the implementation of the Integrated Public Alert and Warning System (IPAWS) aggregator, and recent technology upgrades from the Public Radio Satellite System.

"Hear" the Warning: Accessibility Solutions			
Personal warnings	Bed shakers	Vibrating pagers	Rewritable braille machine

Mobility

For people with mobility disabilities, effective emergency communication means communicating a pertinent message. Although people with mobility disabilities may not have an issue receiving and understanding emergency communication, they may have a problem if the communication is not pertinent and omits the needs of people with mobility disabilities. Kailes (2008) points out how common that omission may be: Emergency communications are generally aimed at "people who can walk, run, see, drive, read, hear, speak and quickly understand and respond to instructions and alerts" (p. 10). The evacuation needs of people with mobility issues may not be addressed or may be overlooked in the planning stages. If a stairway is the only means of evacuating a building, people with mobility disabilities may not be able to vacate the location, requiring other evacuation means to be planned and properly communicated (NCD, 2009).

Accessibility solutions:

For people with mobility disabilities, it is important to ensure that emergency information, including alerts and warnings, is pertinent to their needs. One way to ensure this is to include people with mobility disabilities in emergency planning. Another is to note accessible evacuation routes in advance and provide wall notices or plaques. The information must be accessible to those with mobility disabilities; for example, wheelchair users might not see signage that is high on a wall, and a person with limited use of his or her arms might use computer and dictation software. It should be noted that people with other access or functional needs, such as someone on crutches or a person who is using a dual stroller, can face similar difficulties during an evacuation.

"Hear" the Warning: Accessibility Solutions	
Pertinent information	Proper planning

Intellectual and Developmental Disabilities

NCD's 2009 report *Effective Emergency Management* notes that people with intellectual or developmental disabilities "may have difficulty understanding or processing" emergency messages (p. 112). To alleviate this situation, communications must be clear, use plain language, and employ pictures when appropriate. Kailes (2011) suggests that written messages be offered at a third grade reading level for the sake of simplicity. This recommendation is also relevant for those with limited English proficiency.

Accessibility solutions:

People with intellectual or developmental disabilities will vary in their understanding of an alert or warning, and in some cases may rely on a caregiver during an emergency to receive or relay information. Communications must be clear, use plain language, repeat the directions at least three times, deliver instructions often at an elementary school reading comprehension level, and integrate pictures if possible. A new strategy being implemented in California is the *Feeling Safe, Being Safe* training, which is facilitated by people with intellectual and developmental disabilities to help their peers prepare for an emergency.

"Hear" the Warning: Accessibility Solutions		
Plain language/instructions	Picture boards	Instructions for caregivers

Psychiatric Disabilities

NCD's 2005 report *The Needs of People with Disabilities with Psychiatric Disabilities During and After Hurricanes Katrina and Rita* noted that at the time of Hurricane Katrina, "Some people with psychiatric disabilities had difficulty comprehending the evacuation messages and other essential communications and some were treated roughly because they could not follow the instructions" (p. 12). Once again, this indicates an imperative for clear, jargon-free, plain language and the use of pictures when appropriate.

Accessibility solutions:

The Independent Living Resource Center of San Francisco (ILRCSF) recommends that people with psychiatric, intellectual, and developmental disabilities prepare for emergencies by practicing how to communicate their needs and keeping instructions for treatment on hand; for example, "I have a panic disorder. If I panic, give me one green pill (name of medication) located in my (purse, wallet, pocket, etc.)" or "I forget easily. Please write down information for me" (ILRCSF, 2013).

"Hear" the Warning: Accessibility Solutions		
Plain language/instructions	Communications practice	Instructions for treatment

Limited English Proficiency

When emergency alerts and warnings are communicated solely in English, people with limited English proficiency (LEP) are at a disadvantage. Emergency planners and managers are required by law (e.g., Title VI of the Civil Rights Act) to ensure that people with LEP are not at risk during an emergency due to a lack of communication.

Accessibility solutions:

Emergency management should try to determine what languages are spoken in the community, but it can be difficult to provide information in all target languages, especially during an emergency. The Limited English Proficiency Federal Interagency Group has provided information for emergency management stakeholders.[6] Solutions for communicating with people with LEP include ensuring alerts and warnings use simple language, with pictures when appropriate. In addition, when possible, ensure that language is translated (and culturally understood), either through onsite interpreters or by using previously translated information. Often during emergencies, organizations such as chambers of commerce and consulates will assist with translation and dissemination to their constituent communities.

"Hear" the Warning: Accessibility Solutions			
Simple language/ instructions	Picture boards	Interpreters for people with LEP	Translated information

1.4.4. Understanding What the Warning Means and Acting On It

With reference to how people behave in response to emergency communications (see Figure 3), Mileti (1995) makes two key points: (1) Preparedness is a key factor in an individual's response, and (2) alerts and warnings must be designed so that everyone benefits from them. Mileti suggests that understanding depends on the person attaching a personal meaning to the message (p. 2). Understanding depends on previous experience and knowledge of the hazard (Trainor & McNeil, 2008). Mileti illustrates this by the example of a warning of a potential flood that may impart mental images of "a high wall of inundating water" for some individuals and only "ankle-high runoff" for others (Mileti, 1995, p. 2). On the basis of personal understanding (which may be insufficient or inaccurate), individuals may opt not to closely follow instructions in an emergency message, leaving them open to greater risk. Effective preparedness efforts such as public education on specific hazards may help standardize people's assessments of emergency messages. Mileti (2010) also notes that preparedness is related to a person's

previous disaster or emergency experience; he says that approximately two years following a disaster or emergency is the "window of opportunity" to promote survivor preparedness (p. 48).

Believing in the Warning

An individual's response to emergency communication depends in part on the level of trust he or she has in both the accuracy of the message and its source. Trust can depend on who issues the communication (e.g., local or federal authorities, experts, the media, trusted NGOs, cultural or other affinity groups); how the message is communicated; and social effects (e.g., whether other people seem to trust the message). People are more likely to take action if emergency communication is received from more than one source or if they are able to verify the original alert or warning (Hayes, 2009; Wimberly & Bristow, 2010; Wireless RERC, 2011).

All individuals, especially people with disabilities and others with access and functional needs, need to be able to trust the disseminator of the warning. However, NCD's 2009 report *Effective Emergency Management* notes that "many authorities have little credibility in the disability community, owing in part to a history of circumventing the disability community in planning for disasters" (p. 93).

Personalizing the Risk and Verifying It

Once people have received an alert or warning, they must believe that it was meant for them before they will respond to the emergency (Mileti, 1995; Wood et al., 2012). The process of personalizing the risk often includes verification of the alert or warning (Mileti, 1999; NCD, 2009). Regardless of the initial form of notification, confirmation from at least one secondary source is needed before action is taken in an emergency situation (White & Fu, 2011; Wimberly & Baristow, 2010). White and Fu note that in the United States, "Distrust of government, in particular the federal, is at historic highs," meaning that individuals will use other information channels to verify alerts and warnings. White and Fu also note that in an emergency situation, verification of alerts and warnings via face-

to-face interaction among individuals is important but not always feasible, especially for people with disabilities and others with access and functional needs, who may lack social capital or may need a specific disability-related accommodation, such as an ASL interpreter or caregiver. This raises communication priority issues—the need for some way of making sure that people with disabilities have access to confirmation and explanations.

Interpreting Relevancy

People interpret emergency communication through a psychological process that considers their past experiences with a certain hazard or emergency and whether they believe this hazard or warning is pertinent to them. For example, if people with disabilities have experienced inaccessible shelters or mistreatment (for example, the inappropriate institutionalization people with psychiatric disabilities experienced during and after Katrina), they may be understandably reluctant to evacuate.

Language Barriers

According to the Migration Policy Institute, approximately 25.2 million Americans—9 percent of the U.S. population—have limited English proficiency (Pandya et al., 2011). This can have profound effects on emergency communications. In order for emergency communications to be fully understood, not only is translation often needed, but the translations must be culturally competent (Beckjord, 2008). People who are deaf or hard of hearing may also need ASL interpreters or other modes of communication—such as captioning, assistive listening devices, or amplification—to fully understand emergency communications. A 2011 study conducted by the Wireless RERC found that while ASL interpretation proved useful in alerts and warnings, the signs used to portray each alert and warning must be culturally competent. For example, participants in the study said that phrases typically used in alerts, such as "take cover" or "low-lying area," do not translate directly to ASL.

Experiencing and Responding to Emergency Communications

Behavioral response is personal and based on experience. Mileti (1999) suggests that the effectiveness of previous emergency communication—whether related to preparedness, response, or recovery—will either facilitate or attenuate the response, and that a predictor of effective emergency communication is the level at which communication occurs during normal times. Specifically, according to Mileti, "People who know each other will work together in a crisis" (p. 183). Thus, a key recommendation of this report involves the importance of including people with disabilities and others with access and functional needs in the disaster planning process, at the level of the office building evacuation plan as well as the city emergency planning board.

Mileti stresses that effective emergency communication will depend on the level of communication that occurs before an emergency. If communication is ongoing between emergency responders and people with disabilities and others with access and functional needs before disaster strikes, this could enhance the level of trust and thus response. Unfortunately for people with disabilities and others with access and functional needs, who are historically left out of the emergency preparedness process, levels of trust in government are low (NCD, 2009). To maximize an individual's trust in emergency communication, each community should include people with disabilities and others with access and functional needs as representatives to help formulate communication strategies overall and as stakeholders in planning groups, not only in emergency planning (Beckjord et al., 2008; NCD, 2005). This will help ensure that their needs are properly considered and met.

Although not all emergency communications will reach everyone (Partnership for Public Warning, 2004; Waugh, 2008), there is evidence that when the needs of people with disabilities and others with access and functional needs are met, everyone benefits. For example, people who are in a noisy room benefit from scrolling captions relaying emergency information, and people who are not currently watching television but have the television on may benefit from auditory emergency alerts. Many people can benefit from large print or pictures on signs. One example that captured the public's interest was

that of Lydia Callis, the ASL interpreter for Mayor Michael Bloomberg during Hurricane Sandy. Her expressiveness and ability to pictorially convey what the mayor was saying were noteworthy and highlighted the importance of providing fully accessible communication before, during, and after an emergency (Peters, 2012).

Resources to Disseminate Communications

Organizations that disseminate emergency communications need adequate resources to effectively reach people. This is a primary concern for people with disabilities and others with access and functional needs, especially with regard to accessibility. Examples include culturally competent translations of emergency communications for people with limited English proficiency, captions and ASL for people who are deaf or hard of hearing, verbal emergency communications for people who are blind or have low vision, and easily understood emergency communications for people with intellectual or developmental disabilities. Unfortunately, as the experience with Hurricane Sandy showed, even when the resources are supposedly present, the reality can be different (Young, 2012).

1.5. Conclusion

Emergency communication is a social *process* that must be initiated long before an emergency begins. From the emergency management perspective, the main goal of emergency communication traditionally is to elicit a response from an individual, often to take shelter or evacuate. However, that response depends on complex variables, especially trust. Unfortunately, a sense of trust in authorities has been historically lacking among people with disabilities, due to the "history of circumventing the disability community in planning for disasters" (NCD, 2009, p. 93). If emergency management has never involved people with disabilities in planning or actively considered their needs, how can they feel sure that emergency management has their best interests in mind?

Again, the focus needs to be on the *process*. Emergency managers need to ensure that communication is accessible before, during, and after an emergency. As Mileti (1999) notes, the effectiveness of communication during the emergency will depend on how effective (and accessible) communication is the rest of the time.

FEMA has encouraged emergency managers to consider a "whole community" approach. Emergency plans should involve the whole community in the planning process, so that everyone is included in the plan (FEMA, 2010a). In addition, FEMA administrator Craig Fugate has urged emergency managers to consider the fundamental role community organizations, including disability organizations, can play before, during, and after an emergency to engage their members (Fugate, 2011). If emergency managers engage disability organizations as stakeholders, it will not only help ensure that accessibility is considered in emergency planning but also may help overcome some of the feelings of mistrust people with disabilities have toward emergency management.

SECTION 2. The Emergency Management Landscape

2.1. Key Stakeholders

This section identifies all the players—major and minor, government and nongovernment—with an interest in the nexus of disability and emergency communications legislation and policy development, and a special focus on accessible emergency communications.

2.1.1. Government

Department of Justice, Civil Rights Division, Disability Rights Section

The Civil Rights Division of the Department of Justice (DOJ) was established in 1957. The Division is responsible for enforcing federal statutes prohibiting discrimination on the basis of race, sex, disability, religion, and national origin. Among the many Acts the Division enforces are the Americans with Disabilities Act of 1990 (ADA) and Section 504 of the Rehabilitation Act of 1973, as amended. The Division's Disability Rights Section (DRS) carries out enforcement actions.

In addition to enforcing federal statutes prohibiting discrimination, in 2007 DOJ released a technical assistance document entitled *ADA Best Practices Toolkit for State and Local Government, Chapter 7, Emergency Management Under Title II of the ADA*, designed to help local and state governments ensure the civil rights of people with disabilities in the design and implementation of emergency management programs, services, activities, and facilities.

Civil Rights Division Guides

DOJ's Civil Rights Division helps state and federal agencies identify and remove discriminatory provisions from their policies and programs, and has released several relevant guides.

- *An ADA Guide for Local Governments, Making Community Emergency Preparedness and Response Programs Accessible to People with Disabilities* (http://www.ada.gov/emergencyprepguide.htm). Making programs accessible is a requirement of the ADA, and this guide is meant to be used as a tool by local governments when planning and initiating such programs and the policies that accompany them. The guide identifies emergency notification as one of the most significant issues affecting people with disabilities in emergency planning. Recommendations are made for the inclusion of people with multiple types of disabilities in any planning efforts and the use of multiple types of alerting mechanisms (e.g., text messaging, email, auto-dialed TTY messages, and door-to-door notification (DOJ 2006).

- *Chapter 3, General Effective Communication Requirements under Title II of the ADA* (http://www.ada.gov/pcatoolkit/chap3toolkit.htm). Provides information on effective communication through auxiliary aids and services, and describes the circumstances under which a state or local government is required to provide such services (DOJ, 2007a).

- *Chapter 3, Addendum: Title II Checklist* (http://www.ada.gov/pcatoolkit/chap3chklist.htm). An assessment tool to measure a state or local government's provision of effective general communications (DOJ, 2007a).

- *Chapter 4, 911 and Emergency Communications Services* (http://www.ada.gov/pcatoolkit/chap4toolkit.htm). Focuses on the requirements established by the ADA for 911 and other emergency communication services that are operated by or for state or local governments. Also provides details on voice and hearing carryover, the suggested training necessary for emergency call takers, how technological

changes are affecting the means by which individuals who are hard of hearing communicate, and the impact these changes have on emergency communication services (DOJ, 2007b).

- *Chapter 4, Addendum: Title II Checklist* (http://www.ada.gov/pcatoolkit/ [chap4chklist.htm](http://www.ada.gov/pcatoolkit/chap4chklist.htm)). Helps identify common problems with the accessibility of a state or local government's 911 and emergency communication services (DOJ, 2007b).

- *Chapter 7, Emergency Management under Title II of the ADA* (http://www.ada.gov/pcatoolkit/chap7emergencymgmt.htm). Focuses on some of the common accessibility barriers people with disabilities encounter in accessing emergency and disaster-related services, programs, activities, and facilities, and proposes ways state and local governments can address these issues (DOJ, 2007c).

- *Chapter 7, Addendum 1: Title II Checklist* (http://www.ada.gov/pcatoolkit/ [chap7emergencymgmtadd1.htm](http://www.ada.gov/pcatoolkit/chap7emergencymgmtadd1.htm)). A preliminary assessment of emergency management programs, policies, procedures, and shelter facilities, to identify areas of noncompliance with ADA requirements (DOJ, 2007c).

- *Chapter 7, Addendum 2: The ADA and Emergency Shelters: Access for All in Emergencies and Disasters* http://www.ada.gov/pcatoolkit/chap7shelterprog.htm). Identifies fundamental issues facing emergency managers and shelter operators when they organize and provide shelter during emergencies and disasters in order to be compliant with the ADA (DOJ, 2007d).

- *Chapter 7, Addendum 3: ADA Checklist for Emergency Shelters* (http://www.ada.gov/pcatoolkit/chap7shelterchk.htm). An emergency shelter guide to ensure that they are accessible and functional for people with disabilities (DOJ, 2007d).

- *Effective Communication* (http://www.ada.gov/effective-comm.htm). Provides guidance on the 2010 regulations provisions relating to communicating effectively with people who have vision, hearing, or speech disabilities. (DOJ, 2014)

Project Civic Access

DOJ's Project Civic Access is an effort to ensure that local governments are in compliance with the ADA by ensuring the elimination of physical and communication barriers that prevent people with disabilities from participating fully in the community. Since 2000, DOJ has reached over 203 settlement agreements in 50 states, the District of Columbia, and Puerto Rico (DOJ, 2012b). The settlements often include provisions related to effective communication before, during, and after an emergency. A typical issue addressed in these compliance reviews is strengthening of 911 services by ensuring a 1:1 ratio of TTY and answering positions, training to recognize "silent calls," and accountability through performance evaluations. DOJ also issues national reports on the state of compliance with the ADA and Rehabilitation Act Sections 504 and 508 that typically include recent settlement agreements and any recommendations for the future.

United States Access Board

The United States Access Board (Access Board) was created in 1973 to ensure the accessibility of federally funded facilities. The Access Board develops and maintains design criteria for the built environment, transit vehicles, telecommunications equipment, and electronic and information technology. It also provides technical assistance and training on these requirements and on accessible design, and enforces accessibility standards that cover federally funded facilities. Strategies for achieving accessibility to telecommunication equipment and electronic and information technology are prescribed in the *Telecommunications Act Accessibility Guidelines and Electronic and Information Technology Accessibility Standards*[7] While they do not specifically address emergency communications, the guidelines require that manufacturers design and develop equipment that is accessible to people with disabilities. This equipment includes devices capable of receiving and sending emergency communications. The guidelines can be considered the minimum baseline for the enforceable standards.

The Access Board is in the process of updating the standards and guidelines for accessible electronic information technology (EIT) procured by federal agencies under Section 508 of the Rehabilitation Act and Section 255 of the Telecommunications Act. In

2010, the Board issued the first Advance Notice of Proposed Rulemaking (ANPRM); from the 348 comments, it was determined that significant revisions needed to be made to the structure and content of the 2010 ANPRM. Modifications were made and the Board issued a second ANPRM in December 2011; comments were received until March 7, 2012. The Board planned to review the comments and issue a proposed rule seeking additional public comment, followed by a final rulemaking (US Access Board, 2013b). As of the writing of this report, the final report has yet to be issued.

The proliferation of mobile devices, their significant computing power, and the seemingly inevitable transition to an Internet protocol (IP)–based telephone system mean that the design of EIT will affect the accessibility of emergency communications. Today, emergency alerts and notifications can be received in myriad ways: outgoing notification systems, sometimes called "reverse 911" (landline); Wireless Emergency Alerts (WEAs); mobile text messages; email; radio and television; and social media. It is imperative that these channels, the devices that connect to them, and the information shared over them be accessible to people with disabilities in order to ensure a robust emergency communication system.

The Access Board has developed and released additional guides related to emergency communications. Examples include the following:

- *Technical Bulletin on Visual Alarms*. The bulletin discusses why visual alarms (i.e., flashing lights) are required and important to ensure that all individuals, including those with a disability, can receive a warning signal and alarm. Information is provided on when and where visual alarms are required (U.S. Access Board, 2003).

- *Guide to Understanding Section 508* (http://www.access-board.gov/ sec508/guide/index.htm). The Board organized a resource that outlines the purpose of Section 508, who and what is covered in the provision, and the important dates associated with the implementation of the regulation (U.S. Access Board, 2001).

Department of Homeland Security, Federal Emergency Management Agency

The general purpose and mission of FEMA is to coordinate the federal government's role in the preparation, prevention, and mitigation of the effects from natural and manmade disasters, including acts of terror, responding to individuals and areas in need, and assisting in the disaster recovery process (FEMA, 2012a). FEMA can trace its origins to the Congressional Act of 1803, but emergency and disaster relief activities remained fragmented until 1979, when an Executive Order from President Jimmy Carter merged several separate disaster-related responsibilities into FEMA. In March 2003, 22 other federal agencies, programs, and offices joined FEMA to become the Department of Homeland Security. FEMA underwent a significant reorganization under the Post-Katrina Emergency Reform Act (PKEMRA) signed by President George W. Bush in response to Hurricane Katrina in August 2005. This provided FEMA with an increase in both responsibility and authority in disaster response and recovery activities.

FEMA is not required to assist local, state, or tribal governments unless a state requests assistance. As authorized by the Stafford Act, once a disaster has occurred, a state can request FEMA's assistance but must agree to a cost-share plan between FEMA and the state. The state then has to decide whether this is a cost-effective approach. Traditionally, FEMA could be characterized as a reactive agency, as it was not involved with disaster response until the president declared a state of emergency. However, it has become more proactive and now assists in disaster preparedness.

An example of this active approach was the 2010 release of Version 2.0 of FEMA's *Comprehensive Preparedness Guide 101: Developing and Maintaining Emergency Operations Plans (CPG 101)* (FEMA 2010a), which provides guidance to all levels of emergency management at the local, state, territorial, and tribal levels for developing standardized emergency operations plans. This includes guidance on ensuring that all aspects of emergency preparation, communication, and response are accessible to all individuals. This guidance created some debate among emergency managers, with the National Emergency Management Association (NEMA) requesting that FEMA clarify whether all shelters had to be compliant with the ADA or Functional Needs Support

Services (FNSS) requirements and define when reasonable accommodations must be met before and after a disaster (DeMarsh, 2012). FEMA turned to DOJ to address these issues and DOJ responded, stating that local governments are required to comply with Title II of the ADA and that FEMA's FNSS guidance is a useful tool for doing so.

Office of Disability Integration and Coordination

FEMA, under the leadership of Administrator Craig Fugate, has made important strides toward promoting inclusive emergency management. FEMA's Office of Disability Integration and Coordination (ODIC) was created in 2009 to integrate and coordinate access for people with disabilities in emergency management. ODIC is led by Marcie Roth and provides information, training, specialists, and other resources to regions and states.

In 2010, ODIC hired 10 regional disability integration specialists (RDISs), who were placed in FEMA's 10 regional offices in the United States. The position of RDIS was created as a belated result of the 2006 PKEMRA, to provide a regional presence and to work with state and local jurisdictions to integrate the needs of people with disabilities into all emergency management efforts. The specialists provide guidance, tools, and methods for integrating people with disabilities and others with access and functional needs into the region's emergency management activities.

During an emergency or disaster, RDISs are deployed to the site as disability integration advisors (DIAs). They are part of the command staff of the Incident Management Assistance Team, with the primary function of ensuring that disaster recovery centers are in compliance with the ADA. For example, the DIA might provide the center with disability accessibility kits, so that a person with a disability can effectively communicate with FEMA officials at the center. In addition, the DIA works with both state and local disability organizations to ensure that people with disabilities are included in long-term recovery planning.

FEMA is now hiring reservists to act as DIAs; this will limit deployment time for the 10 RDISs. DIAs will train local hires, who will take over for the long term.

Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities

The Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities (ICC), which reports to the FEMA Office of Disability Integration and Coordination, was established by Executive Order (EO) 13347 (2004) to ensure that federal agencies appropriately support the safety and security of their employees with disabilities and others with access and functional needs in emergencies (DHS, 2012). Specifically, the ICC "facilitates the cooperation and the sharing of best practices and lessons learned among member agencies," as noted by EO 13347, and provides additional coordination for "governmental and nongovernmental partners and stakeholders [to] maintain awareness with regard to an anticipated event" (D. Scott, personal communication, April 24, 2013). The ICC is required to submit an annual report to the President describing its achievements in implementing this policy; best practices among local, state, and federal governments; and recommendations going forward.

Federal Communications Commission

The Federal Communications Commission (FCC), established by the Communications Act of 1934, is a regulatory agency responsible for rules and regulations governing the provision of interstate and international communications and media by way of radio, television, wire, wireless, satellite, and cable systems. The FCC enforces various communications laws and regulations, including the 21st Century Communications and Video Accessibility Act of 2010 (CVAA), the Telecommunications Act, and Title IV of the ADA. The FCC also issues public notices and other guidance for industry and governmental entities. The FCC's Disability Rights Office (DRO), located within the Consumer and Governmental Affairs Bureau, initiates rulemakings, where appropriate, for the development of disability access policy. DRO coordinates with other bureaus in the FCC to develop recommendations and policies to ensure accessible communications for people with disabilities in accordance with disability laws and regulations. The Emergency Access Advisory Committee, created by the CVAA, publishes reports and makes recommendations to the FCC to ensure equal access to emergency

communications by people with disabilities as part of the migration to Next Generation 911. The CVAA established the Video Programming Accessibility Advisory Committee (VPAAC), which, among other things, is charged with developing technical, policy, procedural, and operational recommendations for the provision of accessible televised emergency information.

Moreover, on January 30, 2014, the FCC adopted a policy statement setting forth goals for achieving text-to-911 and a Further Notice of Proposed Rulemaking (FNPRM) (FCC, 2014). The policy statement highlighted the nation's four largest wireless telephone providers' commitment to make text-to-911 available to all their customers nationwide by May 15, 2014. The FCC encourages other text providers to offer text-to-911 as well and asks for comment on proposals to meet the goals of (1) making sure that people with disabilities have direct access to 911 services and (2) enabling people in situations from which it might be impossible or dangerous to make a voice call (e.g., hostage situation, domestic violence) to make text-to-911 calls. In his statement at the FCC's Open Commission Meeting, Chairman Tom Wheeler said it is now up to the public safety answering points (PSAPs), to make themselves ready to accept these texts.

2.1.2. NGOs

Several NGOs have direct involvement with FEMA and the federal government in emergency communications; they are described below. For a partial list of NGOs with a general interest in the inclusion of people with disabilities and others with access and functional needs, see Appendix A.

American Red Cross

As described in the National Response Framework (DHS, 2013b), the American Red Cross is chartered by Congress to provide relief to survivors of disasters and help people prevent, prepare for, and respond to emergencies. The Red Cross has a legal status of a "federal instrumentality" and maintains a special relationship with the federal

government. In this capacity, it supports several Emergency Support Functions (ESFs) and the delivery of multiple core capabilities.

In 2004, in collaboration with FEMA, the Red Cross created and distributed a booklet entitled *Preparing for Disaster for People with Disabilities and Other Special Needs*. The booklet provides people with disabilities and caregivers with tips and guidance for staying informed, developing a plan, assembling an emergency kit, and managing communications during emergencies.

In the aftermath of Hurricane Katrina, the Red Cross was criticized by the disability community for refusing to admit people with disabilities to shelters or inappropriately referring them to special needs shelters. NCD's 2006 report *The Impact of Hurricanes Katrina and Rita on People with Disabilities: A Look Back and Remaining Challenges* found that "many evacuees with disabilities could not access shelter services, including medical care, communication, restrooms, food and shuttle services" (p. 11). In response to this gap in coverage and appropriate accommodation, some states (e.g., California and Washington) have established Functional Access Support Teams that work in shelter environments; they serve as a resource for people with disabilities and others with access and functional needs to help them obtain the accommodations they need, including communication aids.

National Council on Independent Living

The National Council on Independent Living (NCIL) is the oldest national grassroots cross-disability organization run by and for people with disabilities. Founded in 1982, NCIL represents thousands of organizations and individuals, including Centers for Independent Living (CILs), Statewide Independent Living Councils (SILCs), people with disabilities, and other organizations that advocate for the human and civil rights of people with disabilities throughout the United States.

NCIL has a long-standing commitment to emergency management; its ongoing subcommittee on emergency preparedness works to ensure that the needs of people

with disabilities are met before, during, and after emergencies. In 2010, NCIL signed a Memorandum of Agreement (MOA) with FEMA. The MOA defined the commitment and coordinated efforts of NCIL and FEMA to provide guidance and support to people with disabilities in the preparation, response, and recovery stages of a disaster. The MOA allows NCIL access to disaster recovery centers for the purpose of offering disaster assistance services to individuals and households, and gives NCIL senior managers (through coordination with FEMA's individual assistance branch director or designee) access to the Joint Field Office for meetings related to issues covered in the agreement.

NCIL is currently negotiating a similar MOU with the American Red Cross with the intention of further cultivating the relationship between CILs and the Red Cross, and providing CILs with greater access to Red Cross–operated shelters (K. Buckland, personal communication, Sept. 18, 2013).

Centers for Independent Living

There are more than 400 CILs in the United States; they play an integral role in emergency management and are invaluable resources for people with disabilities as well as state and local emergency managers. CILs are community-based, cross-disability, nonprofit organizations designed and operated by people with disabilities. CILs provide peer support, information and referral, individual and systems advocacy, and training in independent living skills (National Council on Independent Living, 2013b).

As noted in NCD's 2006 report *The Impact of Hurricanes Katrina and Rita on People with Disabilities*, CILs were instrumental during Hurricane Katrina. They quickly provided people with disabilities in shelters the resources that the shelters lacked, such as teletypewriters, wheelchairs, walkers, oxygen, and other essential supports. CILs were also instrumental in outreach to affected people and dissemination of targeted information to communities. Before Hurricane Katrina, CILs played an invaluable role following the 9/11 attacks (K. Buckland, personal communication, Sept. 18, 2013).

Today, many CILs are actively involved in emergency management. For instance, The Independent Living Center (TILC) in Joplin, Missouri, began its emergency management work several years ago, after realizing that the needs of people with disabilities would be overlooked if they were not at the table. TILC began by having a dialogue with its consumers to identify needs before, during, and after an emergency, and to determine what services and resources TILC could provide. TILC worked with each consumer to develop an emergency plan. TILC also developed a database of consumers who are at risk during an emergency, such as those who are dependent on ventilators, those who live in rural areas, and those whose first language is not English. TILC began educating local emergency managers on the needs of people with disabilities and the role TILC could play.

Following the devastating tornado that hit Joplin in 2011, TILC played an invaluable role for many people with disabilities. Referencing its database of people who might be at risk, TILC sent teams to check on them. The center also worked closely with FEMA's regional disability integration specialists (RDISs) to ensure that disaster recovery centers could provide sign language interpreters and information in alternative formats. TILC collaborated with city and state emergency managers to ensure that their Web sites were accessible to people with disabilities and that information was available in alternative formats.

TILC remains very active in emergency management and has received funding from the Centers for Disease Control and Prevention (CDC) and FEMA. TILC staff members continue to help consumers develop emergency plans to meet their specific needs in a variety of potential emergency situations. TILC provides adaptive alerting devices and weather radios for people with disabilities, as well as Red Cross Go Kits and Vial of Life Kits provide important medical information to first responders in the event of an emergency. TILC staff members provide community education to help other agencies and the public make plans to assist people with disabilities. TILC staff members have trained first responders, family members, and other nonprofit organizations on the needs of people with disabilities in emergencies (S. Brady, personal communication, Sept. 16, 2013).

Likewise, since 2005, the Center for Independent Living of South Florida (CILSF) has been active in emergency management. CILSF has advocated for the availability of

qualified sign language interpreters in Miami Dade County shelters, and for sign language interpreters during emergency news broadcasts, accessible cots in shelters, accessible transportation for people with disabilities during evacuations, and full compliance with the ADA by state and local emergency managers. CILSF actively seeks opportunities to engage with emergency managers on the needs of people with disabilities before, during, and after emergencies (M. Dubin, personal communication, Sept. 12, 2013).

Many CILs throughout the country are very engaged in emergency management. State and local emergency managers must actively collaborate with their local CILs to ensure that the needs of people with disabilities are being appropriately met before, during, and after emergencies. Moreover, all CILs must make emergency management a priority, and funding should be appropriated accordingly.

National Disabilities Rights Network

The National Disabilities Rights Network (NDRN) is the nonprofit membership organization for the federally mandated Protection and Advocacy (P&A) systems and Client Assistance Programs (CAPs). Collectively, the P&A/CAP network is the largest provider of legally based advocacy services to people with disabilities in the United States. NDRN maintains a *Disaster Preparedness Checklist*[8], which provides guidance to people with disabilities on how and what to prepare in the event of a hurricane. P&As play a critical role in emergency management, and in 2011, NDRN and FEMA entered into an MOA affirming their commitment to work together on emergency management response to provide for the short- and long-term recovery needs of people with disabilities in the event of a natural or manmade disaster, including acts of terror. The agreement ensures that advocates from NDRN's 57 state and territory affiliates will have access to FEMA disaster response offices—including workspace and logistical support—before, during, and after a disaster, and that they will be involved in policy decisions and coordinate directly with the entire emergency management team. This partnership will help FEMA leverage the resources of the whole community, including those NDRN and its member organizations can offer, to better meet the needs of the entire population affected by a disaster. In addition, an MOU was established in 2010 between NDRN and

the American National Red Cross, in which the organizations established a nonbinding understanding to cooperate before, during, and after disaster events in the United States to provide services and assistance to people with disabilities.

National Organization on Disability

The National Organization on Disability (NOD) focuses on the promotion and incorporation of people with disabilities in all aspects of life. In response to the attacks of September 11, 2001, NOD organized the Emergency Preparedness Initiative to address the needs of people with disabilities in emergency planning, response, and recovery (NOD, 2013). Emergency preparedness materials developed and provided by NOD include the following:

- *Partners in Preparedness Brochure* (2009)

- *Guide for Emergency Planners, Managers and Responders* (2009)

- *Disaster Readiness Tips for People with Disabilities* (2009)

- *Preparing Makes Sense* brochure series—developed with the U.S. Department of Homeland Security, the American Red Cross, and AARP

- *Special Needs for Katrina Evacuees Project*—NOD sent specialists to areas hit by Hurricane Katrina and, from their assessments, released two congressional briefings discussing the specific needs and living conditions of people with disabilities who survived Katrina.

2.1.3. Private Sector

National Association of Broadcasters

The National Association of Broadcasters (NAB) is the primary advocacy organization for radio and television broadcasters. The association lobbies the FCC, the Administration,

and Congress on behalf of broadcasters. Currently, the NAB is promoting radio-enabled mobile phones to allow EAS alerts to be made available to mobile phone users via an embedded FM chip (NAB, 2013). In July 2012, the FCC hosted a roundtable event including radio broadcasters, wireless carriers, and mobile phone manufacturers to explore the possibility of using broadcast radio receivers in mobile devices. The use of FM chips for mobile EAS is a major point of contention between the broadcast industry and the wireless industry. The Cellular Telecommunications Industry Association (CTIA) is opposed to any regulatory mandates concerning the use of FM chips, and without the cooperation of the wireless industry, it will never happen on a large scale.

Cellular Telecommunications Industry Association

CTIA is the international association for the wireless telecommunications industry; it advocates for wireless industry positions at all levels of government and regularly submits filings to the FCC regarding regulation of the wireless industry. CTIA recently created AccessWireless.org, a Web site designed to enable people with disabilities to search for accessible wireless devices and services. In 2011, the FCC recognized CTIA's efforts with the Award for Advancement in Accessibility. Mobile devices are integral to the lives of U.S. citizens, and this is as true for people with disabilities as it is for their nondisabled peers. With the increased use of wireless devices by people with and without disabilities, it is important to ensure that a broad range of these devices is accessible by all users, especially in emergency situations.

Consumer Electronics Association

The Consumer Electronics Association (CEA) is the industry authority on market research and forecasts, consumer surveys, legislative and regulatory news, engineering standards, and training resources. CEA produces the International Consumer Electronics Show (CES), the world's largest annual innovation event, which unites more than 150,000 retail buyers, distributors, manufacturers, market analysts, importers, and exporters, as well as press from 150 countries. CEA member companies receive discounted floor space and other benefits when they exhibit at the CES.

National Cable and Telecommunications Association

Today, cable provides video entertainment, Internet connectivity, and digital telephone service to more than 56 million consumers. What began more than a half century ago among a few visionary pioneers has led to the creation of approximately 800 programming networks viewed by over 93 percent of Americans.

Telecommunications Industry Association

The Telecommunications Industry Association is the leading trade association representing the global information and communications technology industry through standards development, policy initiatives, business opportunities, market intelligence, and networking events.

2.2. The Current Legal Landscape

This section examines enforcement of relevant laws and regulations, with a focus on identifying regulatory gaps at the federal level. Numerous laws address the rights of people with disabilities in general and accessibility issues and requirements with regard to emergency communications. Laws have become more focused in the past few years; for example, laws that include people with disabilities in the evolution and utilization of technology with regard to 911 services.

2.2.1. Rehabilitation Act of 1973, 29 U.S.C. § 701 et seq.

The first federal civil rights law protecting people with disabilities was the Rehabilitation Act of 1973. The intent of the Rehabilitation Act is to "empower individuals with disabilities to maximize employment, economic self-sufficiency, independence and inclusion and integration into society through . . . the guarantee of equal opportunity."

The best-known provision of the Rehabilitation Act is Section 504, which states,

> No otherwise qualified individual with a disability . . . shall, solely by reason of her or his disability, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.

Section 504 prohibits discrimination against people with disabilities by programs conducted by federal agencies or any program or activity that receives federal financial assistance. Section 504 requires any state or local government, private company, or NGO that receives federal funds to effectively communicate with people with disabilities.

Section 508 requires electronic and information technology that is developed, maintained, procured, or used by the federal government to be accessible to people with disabilities, including employees and members of the public.

Both Section 504 and Section 508 are self-enforced by the federal agencies implementing them; enforcing actions are reactive and punitive rather than proactive and incentivizing. Each federal agency is required to have its own policy and complaint process regarding Section 504/508 compliance. A person may file a civil action suit only after all administrative remedies are exhausted. The prevailing party in a civil action suit receives injunctive relief and attorney's fees, but compensatory and punitive damages are not available.

Stafford Act of 1988, 42 U.S.C. § 5121 et seq.

Section 616 of the Stafford Act requires the director of FEMA to ensure that information made available to people with disabilities is in accessible formats. Section 689, as amended by the Post-Katrina Emergency Management Reform Act of 2006, directs the administrator of FEMA to develop guidelines to accommodate people with disabilities, including the accessibility of and communications and programs in shelters, recovery centers, and other facilities.

Americans with Disabilities Act of 1990, 42 U.S.C. § 12101 et seq.

On July 26, 1990, President George W. Bush signed the Americans with Disabilities Act (ADA), which extends the protections and prohibitions of the Rehabilitation Act to private conduct with the goal of reducing the social discrimination and stigma experienced by people with disabilities. The ADA is divided into five Titles that cover the various protections afforded by the law. Titles II, III, and IV have emergency communications implications.

Title II of the ADA prohibits discrimination by public entities run or funded by state or local governments.[9] Title II mandates that

> no qualified individual with a disability shall, by reason of such disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of a public entity, or be subjected to discrimination by any such entity.[10]

The ADA defines public entity to include "any department, agency, special purpose district, or other instrumentality of a State or States or local government."[11]

Pursuant to Title II and its regulations, state and local governments must ensure that their communications, including emergency communications, are fully accessible to people with disabilities. This requirement covers public television programs, videos produced by a public entity, shelters, and telephone communications, including direct access to 911 services. Specifically, public entities, including state and local governments, must provide accessible communications and appropriate auxiliary aids and services.[12] In addition, Title II requires all public entities to "ensure that interested persons . . . can obtain information as to the existence and location of accessible services, activities, and facilities."[13]

Title III of the ADA prohibits any public accommodation from discriminating against people with disabilities by denying them access to the full and equal enjoyment of goods, services, or facilities. Public accommodations include all areas open to the public,

including restaurants, stores, banks, pharmacies, legal offices, doctors' offices, and hospitals. Title III mandates that

> No individual shall be discriminated against on the basis of disability in the full and equal enjoyment of the goods, services, facilities, privileges, advantages, or accommodations of any place of public accommodation by any person who owns, leases (or leases to), or operates a place of public accommodation.[14]

Title III has effective communication requirements similar to those in Title II. Specifically, Title III requires places of public accommodation and commercial facilities to provide auxiliary aids and services where necessary to ensure effective communication with people with disabilities (DOJ, 2012a).

Title IV requires a national telecommunications relay service (TRS) that operates in every state 24 hours a day, 7 days a week. TTY-based TRS providers must use a system for incoming emergency calls that, at a minimum, automatically and immediately transfers the caller to an appropriate public safety answering point (PSAP). An appropriate PSAP is one that the caller would have reached if he or she had dialed 911 directly or one that is capable of enabling the dispatch of emergency services to the caller in an expeditious manner.[15] Additional emergency calling requirements are applicable to Internet-based TRS providers. As of December 31, 2008, each provider of Internet-based TRS must accept and handle emergency calls and must access, either directly or via a third party, a commercially available database that will allow the provider to determine an appropriate PSAP, designated statewide default answering point, or appropriate local emergency authority that corresponds to the caller's location and to relay the call to that entity.[16] Title IV also requires closed captioning of federally funded public service announcements.

As technology has evolved and the prominence and use of the Internet has increased, there has been increased focus on accessibility. The Internet has changed the way government interacts with and serves the public, including the way it conveys emergency communications to the public (DOJ, 2003). In 2007, DOJ published Chapter 5 of the

ADA Tool Kit, which provides technical assistance for public entities to make their Web sites more accessible (DOJ 2007f). In 2010, DOJ released an Advance Notice of Proposed Rulemaking (28 CFR Parts 35 and 36), in which it considered promulgating specific regulations for public and private entities under Title II and Title III of the ADA concerning Web site accessibility[17].DOJ has announced its intention to amend Title II ADA regulations to address the obligations of state and local governments to make their Web sites accessible to and usable by people with disabilities and, separately, to address the obligation of public accommodations (entities that do business with the public) to provide accessible Web sites and the technical standards that they must follow.[18]

No single agency is responsible for enforcing the ADA. Enforcement is typically split among four agencies: the U.S. Equal Employment Opportunity Commission (EEOC), DOJ, the Department of Transportation, and the FCC. Title I relates to employment and is enforced by the EEOC. Titles II and III are generally enforced by DOJ and the federal courts, through lawsuits and both formal and informal settlement agreements. The Department of Transportation enforces regulations governing transit. The FCC enforces Title IV of the ADA through administrative complaints and civil action suits. All administrative complaints must be filed with the agency in question, and anyone who wishes to take civil action must first exhaust all administrative remedies.

Telecommunications Act of 1996, 47 U.S.C. § 609 et seq.

Section 255 and Section 251(a)(2) of the Telecommunications Act of 1996 require telecommunications products and services to be accessible to people with disabilities, if readily achievable. If accessible products are not readily achievable, manufacturers must make their products compatible with existing adaptive devices used by people with disabilities, where readily achievable. "Readily achievable" is defined as easily accomplished and able to be carried out without much difficulty or expense.

The Telecommunications Act of 1996 also requires closed captioning. Closed captioning allows people who are deaf or hard of hearing to have access to television programming;

it displays the audio portion of a television program as text on the television screen. In 1996, Congress required video programming distributors (VPDs) (cable operators, broadcasters, satellite distributors, and other multichannel video programming distributors) to close caption their television programs. Closed captioning provides a critical link to news, entertainment, and information for people who are deaf or hard of hearing. For people whose native language is not English, English language captions improve comprehension and fluency. Captions also help improve literacy skills. Closed captions can be turned on through the television remote control or onscreen menu. The FCC does not regulate captioning of home videos, DVDs, or video games.[19]

As a natural progression from the requirement for closed captioning, the FCC established rules that require broadcasters and cable operators to make local emergency information accessible to persons who are deaf or hard of hearing and those who are blind or have visual disabilities. This rule means that emergency information must be provided both aurally and in a visual format.[20]

For people who are deaf or hard of hearing, emergency information that is provided in the audio portion of programming must be provided using either closed captioning or other methods of visual presentation, such as open captioning or crawls or scrolls that appear on the screen. Emergency information provided by means other than closed captioning should not block any closed captioning, and closed captioning should not block any emergency information provided by other means. Closed captions are visual text displays that are hidden in the video signal. Open captions are an integral part of the television picture, like subtitles in a movie. In other words, open captions cannot be turned off. Text that advances very slowly across the bottom of the screen is referred to as a crawl; displayed text or graphics that move up and down the screen are said to scroll.

For people who are blind or have low vision, emergency information provided in the video portion of a regularly scheduled newscast or a newscast that interrupts regular programming must be accessible. This requires the aural description of emergency information in the main audio. If the emergency information is being provided in the video portion of programming that is not a regularly scheduled newscast or a newscast that

interrupts regular programming (e.g., the programmer provides the emergency information through crawls or scrolls during regular programming), this information must be accompanied by an aural tone. The tone is meant to alert people who are blind or have low vision that the broadcaster is providing emergency information and they should tune to another source, such as a radio, for more information. While the auditory tone is important, it must be followed by verbal information on the emergency.

The FCC enforces the Telecommunications Act.

Executive Order 13347

Executive Order 13347 (2004), which established the Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities (ICC), directs federal agencies to (a) consider people with disabilities in their own emergency preparedness planning; (b) encourage local, state, and tribal governments and private organizations and individuals to consider people with disabilities in their emergency preparedness planning; and (c) facilitate cooperation among all levels of government as well as private organizations and individuals in implementing these plans as related to people with disabilities. Although the ADA and the Rehabilitation Act have the same requirements, the Executive Order specifically emphasizes nondiscrimination in emergency planning. However, because the Executive Order has not been codified into law, there are no legal consequences for noncompliance. FEMA's Office of Disability Integration and Coordination oversees the ICC as well as administration of and compliance with Executive Order 13347.

Executive Order 13407

Executive Order 13407 (2006) established a policy to create FEMA's Integrated Public Alerts and Warning System (IPAWS) and for that system to include the capability to alert and warn all Americans, including those with disabilities and those with limited English proficiency. The system is meant to aggregate and disseminate emergency alerts that are location-specific through the Emergency Alert System (EAS), the Commercial Mobile

Alert System (CMAS), National Oceanic and Atmospheric Administration (NOAA) weather radios, and other dissemination modes.

Warning, Alert, and Response Network Act of 2006, 47 U.S.C. §§ 151, 332

The Warning, Alert, and Response Network (WARN) Act enables commercial mobile service (CMS) providers to transmit emergency alerts to their subscribers if they choose to do so. To ensure that people with disabilities have access to alerts, CMS providers must provide a unique audio attention signal and vibration cadence on CMAS-compatible handsets. These Wireless Emergency Alerts (WEAs) are short, geographically targeted text messages to cell phones when both the wireless service provider and the subscriber have opted into the system. WEAs are required to have distinctive, accessible attention-getting mechanisms (i.e., a distinctive vibration alert for people who are deaf or hard of hearing and a distinctive auditory or ring cadence for people who are blind or have low vision).

The FCC is responsible for regulating the WARN Act. Participating wireless service providers were required to deploy the CMAS by April 7, 2012. Most of the major wireless service providers (AT&T, Verizon, Sprint, and T-Mobile) originally stated that they would participate "in part," meaning that only certain devices in specified areas of the country would have access to CMAS alerts. Currently, the vast majority of newly released phones are CMAS-enabled. Sprint claims that CMAS will be standard in all its releases; other companies may follow suit if they have not done so already. Any wireless service provider who chooses not to participate is required to notify its customers.

Post-Katrina Emergency Management Reform Act of 2006, 6 U.S.C. §§ 311-21m, 701

The Post-Katrina Emergency Management Reform Act (PKEMRA) amends the Stafford Act by directing the administrator of FEMA to develop guidelines for accommodating people with disabilities, including "the accessibility of, and communications and programs in, shelters, recovery centers, and other facilities." FEMA issued its *Guidance on Planning for Integration of Functional Needs Support Services in General Population*

Shelters in November 2010; it provides guidance to emergency managers and shelter planners on the requirements associated with sheltering people with functional support needs in general population shelters. The guidance advises states to identify providers of accessible communications technologies and services, including sign language interpreters, computers, captioned telephones, Computer-Assisted Real-Time Translation (CART) operators and equipment, captioned televisions, and notetakers. Pursuant to PKEMRA, NCD has several responsibilities, including interaction and coordination with FEMA. Congress provided $300,000 in the FY 2007 appropriations bill to enable NCD to fulfill its assigned duties under PKEMRA. That funding has enabled NCD to complete this report.

New and Emerging Technologies 911 Improvement Act of 2008, Pub. L. No. 110-283

The purpose of the New and Emerging Technologies 911 Improvement (NET) Act is to improve public safety through the deployment of Internet protocol (IP)–enabled 911 and enhanced 911 (E911) services, to promote a national transition to an IP-enabled emergency network, and to upgrade access to 911 and E911 by people with disabilities. IP-enabled voice service providers must provide E911 service to their subscribers. Violations are enforced by the FCC under the jurisdiction of the Communications Act of 1934. Provisions in Public Law 110-283 amend the Wireless Communications and Public Safety Act of 1999, the Communications Act of 1934, and the National Telecommunications and Information Administration (NTIA) Organization Act of 1992. In the latter amendment, NTIA was required to develop a national migration plan to an "IP-enabled emergency network capable of responding to all citizen-activated emergency communications and improving information sharing among all emergency response entities." (NTIA 2009 1-1). The migration plan identified solutions for the provision of 911 and E911 to people with disabilities and an implementation plan for the solutions. The plan included the benefits of migration and mechanisms for ensuring national availability across all communities, identified location technology for itinerant devices, analyzed public safety answering point (PSAP) best and worst practices in their deployment of IP-enabled emergency networks, recommended legislative language or changes that would

unencumber entities involved in efforts to migrate, and analyzed efforts and provided legislative language that would facilitate the provision of automatic location for E911 services. NTIA's plan was required to be developed in consultation with the disability community, public safety community, providers of technology, telecommunications relay services, telecommunications, and IP-enabled voice services. Public Law 110-283 also required the FCC to develop technology-neutral standards for the implementation of E911, such as PSAP certification, testing requirements, and validation procedures for location information.

21st Century Communications and Video Accessibility Act of 2010,
Pub. L. No. 111-260

The 21st Century Communications and Video Accessibility Act (CVAA) updates existing communication laws, including the Communications Act of 1934 and the Rehabilitation Act of 1973. Title I requires communications products and services using broadband to be fully accessible to people with disabilities. Title II requires video programming on both television and the Internet to be accessible by those with disabilities. Both titles include provisions to ensure that people with disabilities have access to emergency information and services such as Next Generation 911 (NG911) and televised emergency information (FCC, 2011 a and b).The CVAA is enforced through complaints filed with the FCC and civil action suits against companies the FCC has found to be in violation. If a company is found to have violated the CVAA and the complaint is not resolved, the company may be liable for financial penalties (to be paid to the United States Treasury Department) and/or required to alter its practices to ensure accessibility in the future. In October 2012, the FCC granted waivers to three industry trade associations: the Consumer Electronics Association (CEA), the National Cable Television Association (NCTA), and the Entertainment Software Association (ESA). The waivers were granted until October 8, 2015, and confined to devices or services that might provide advanced communications features but whose primary purpose was something other than advanced communications (e.g., gaming devices and IP-enabled television sets).

FCC enforcement actions can be in response to written complaints from entities or individuals that point to infractions of the rules and regulations or to industry reports to the FCC as required by certain rules and regulations (such as the case with hearing aid compatibility). This causes enforcement to be primarily reactive, which can be an issue in emergency communications, as messages often contain information relevant to people's immediate safety.

Table 4 summarizes legislation that addresses the rights and accessibility issues of people with disabilities generally and regarding emergency communications specifically.

Table 4. Relevant Laws That Address Rights and Accessibility of People with Disabilities and Others with Access and Functional Needs

	Enforcing Agency*	Enforcement Tools Available	Primary Purpose
Rehabilitation Act Sec. 504, 508	Self-enforced by all federal agencies	• Internal complaint process • Civil action suits, injunctive relief, and attorney's fees	***General Disability Regulation*** • All federally funded programs and activities (Sec. 504) • All electronic and information technology developed and maintained by the federal government must be accessible to people with disabilities (Sec. 508)
Stafford Act Sec. 616	FEMA (self-enforced)	None	***Communication and Access to Information*** • Information provided by FEMA is accessible to people with disabilities.

	Enforcing Agency*	Enforcement Tools Available	Primary Purpose
ADA Title II, III	DOJ, EEOC, and federal courts	• Lawsuits in federal court • Compensatory damages and back pay • Title III allows DOJ to obtain civil penalties • Investigations and compliance reviews by Attorney General	***Communication and Access to Information*** • State and local governments, and private entities must effectively communicate with people with disabilities (Title II)
Title IV	FCC	• Not specified; FCC is required to resolve complaints within 180 days if not resolved by state in question	• Requirement of national telecommunications relay service in every state and closed captioning of federally funded public service announcements (Title IV)
Communications Act of 1934, as amended** Sec. 251 (a)(2), 255**	FCC	• Administrative complaint process • Civil action suits • Financial penalties paid to the U.S. and/or required to alter their practices	***Communication and Access to Information*** • Accessibility of telecom products and services, and advanced communications services; • Requires fully accessible communications products and services using broadband and video programming on television and Internet • Requires an Emergency Access Advisory Committee to ensure that Next Generation 911 (NG911) is fully accessible
E.O. 13347 (2004)	DHS/FEMA	None	***Emergency Preparedness and Alerts*** • Include people with disabilities in state, local, and tribal government emergency preparedness plans

	Enforcing Agency*	Enforcement Tools Available	Primary Purpose
E.O. 13407 (2006)	DHS/FEMA	None	***Emergency Preparedness and Alerts*** • Created IPAWS • System has capability of alerting and warning people with disabilities
WARN Act (Warning, Alert, and Response Network Act)	FCC	N/A	***Emergency Preparedness and Alerts*** • CMS providers transmit emergency alerts that are accessible to people with disabilities through CMAS-compatible handsets (WEA)
PKEMRA (Post-Katrina Emergency Management Reform Act) Sec. 212	FEMA and POTUS (self-enforced)	None	***Emergency Preparedness and Alerts*** • FEMA disaster assistance does not discriminate against people with disabilities • Information and communication provided in emergency shelters and recovery centers are fully accessible
Net 911 Act (New and Emerging Technologies 911 Improvement Act) Sec. 102	FCC	National migration plan to IP-enabled emergency network	***Emergency Preparedness and Alerts*** • Deploy IP-enabled 911 and E911 and make them fully accessible

* Only includes enforcing agencies for the laws and regulations pertaining to emergency communications.

** Includes as amended by 21st Century Communications and Video Accessibility Act of 2010

2.3. Relevant Lawsuits

2.3.1. Brooklyn Ctr. for Independence of the Disabled v. Bloomberg, 2013 U.S. Dist. LEXIS 159532 (S.D.N.Y. Nov. 7, 2013)

In September 2011, the Brooklyn Center for Independence of the Disabled (BCID) and the Center for Independence of the Disabled, New York (CIDNY) brought suit against the City of New York for discriminating against people with disabilities by failing to include their needs in emergency planning. During Hurricane Irene, televised emergency announcements by city officials did not include American Sign Language (ASL) interpreters and evacuation maps were inaccessible to people who are blind or have low vision (DRA, 2012b). The plaintiffs cited noncompliance with the ADA and Section 504 of the Rehabilitation Act. In November 2012, Federal District Court Judge Jesse Furman granted the plaintiffs' class action status, citing Hurricane Sandy's detrimental impact on people with disabilities in New York City (*Weiser*, 2012). The federal court trial began in New York on March 11, 2013. On May 10, 2013, the U.S. Attorney for the Southern District of New York, on behalf of the United States Department of Justice, filed a statement of interest that supported the plaintiffs' position in the federal class action.

On November 7, 2013, the U.S. District Court for the Southern District of New York ruled that New York City discriminated against people with disabilities in its failure to plan for their needs in large-scale disasters, such as Hurricane Sandy. The ruling came in the first case of its kind to go to trial and followed Hurricane Sandy when many of the city's residents with disabilities were left stranded. This ruling is expected to have national implications.

2.3.2. Giacopini v. City of Richmond

In 2008, Disability Rights Advocates (DRA) wrote a letter to the City of Richmond on behalf of Doris Giacopini, a person with a mobility disability, concerning the need to include people with disabilities in its emergency planning. The city used as a model the

approach adopted by the City of Oakland and designed by an expert in the field, June Kailes (DRA, 2011). The city also hired Sally Swanson Architects, a firm that specializes in meeting the needs of people with disabilities, to assist in preparing a plan. Using those two resources, Richmond created and adopted a new emergency plan in 2011 that addresses cross-disability needs. The effective communication components of the plan include qualified sign language interpreters and/or real-time captions on one of Richmond's local channels, fully accessible emergency information on the city's Web sites, and training and communication aids (such as pictograms and loudspeakers) for first responders.

2.3.3. Communities Actively Living Independent & Free v. City of Los Angeles, 2011 U.S. Dist. LEXIS 118364 (C.D. Cal. Feb. 10, 2011)

In February 2011, a federal judge found that the City of Los Angeles violated the ADA by failing to include the needs of residents with disabilities in emergency planning. The Justice Department filed a Statement of Interest brief supporting the plaintiffs' position that the city's emergency plans failed to adequately include people with disabilities. With regard to communication, the plaintiffs noted that the city failed to ensure that emergency notification plans included accessibility. An independent living center found that during one of the city's disaster drills, their deaf and hard of hearing constituents could not understand the announcements. The judge ordered Los Angeles to hire independent experts to review and revise its plan to address the needs of people with disabilities. The city has three years to complete the process. At the end of the three years, the expert will present the new plan to the court.

2.3.4. California Foundation for Independent Living Centers v. City of Oakland, C07-04608 EDL

In 2007, the California Foundation for Independent Living Centers (CFILC), Californians for Disability Rights, Inc., and Marian Gray (an Oakland taxpayer) filed suit against the City of Oakland for failing to include the needs of people with disabilities in its emergency

planning. Soon after the lawsuit was filed, the city entered cooperative negotiations with Disability Rights Advocates (DRA), the legal center representing the plaintiffs. A consultant was hired to evaluate and make recommendations to address the needs of people with disabilities and other access and functional needs in Oakland's emergency planning. These recommendations became the basis for the new plan the city adopted in January 2010, known as the Functional Needs Annex for Mass Care and Shelter (DRA, 2012a). The plan states that the city's emergency notification system, which currently contacts people to alert them about an emergency in their area via standard telephones, will interface with various electronic and wireless devices used by people with disabilities. Additionally, the city will provide specific information during an emergency on locations of open shelters and which of these shelters are accessible to those with mobility disabilities. People will be able to access this information by calling 211 on a voice telephone or TTY.

2.3.5. *Disability Policy Consortium v. Commonwealth of Massachusetts*

In 2010, the Disability Policy Consortium, Inc. (DPC) filed a complaint with DOJ's Civil Rights Division against the State of Massachusetts for failing to include the unique needs of people with disabilities in its planning and response to a water crisis experienced by the state that year.[21] DPC noted that the state did not provide ASL interpreters in televised press conferences by government officials and that video clips of the press conferences were posted on the state's Web site without closed captioning, making them inaccessible to people who are deaf or hard of hearing. DPC cited noncompliance with Title II of the ADA and Section 504 of the Rehabilitation Act.

2.4. Conclusion

Emergencies can occur with little or no notice. It is critical that everyone involved in emergency planning and management comply with applicable laws and regulations at all times. In an essentially reactive response to issues, DOJ and other government

agencies enforce the laws and regulations outlined above primarily through complaints, compliance reviews, lawsuits, and settlement agreements. NCD recommends (1) increased outreach to people with disabilities and other access and functional needs in the community, and (2) increased enforcement of federal laws and regulations.

SECTION 3. Emergency-related Communications: The Individual Perspective

3.1. Planning Is Key

According to Comfort (1994), information flow can make the difference between order and chaos before, during, and after a disaster situation. An effective flow allows individuals and groups to choose among alternatives according to the environment at the time. When people with disabilities are part of a good information flow, they can make those choices and, to an extent, self-organize in disaster situations or during recovery. Such self-organization is a continuous process that occurs in a social context through communicative acts, whether written, verbal, signed, or electronic.

Disaster researchers have found that citizen-to-citizen communication activity often helps ameliorate tragic situations and is a necessary component in disaster response and recovery (Vieweg et al., 2008). When people are deprived of information, the level of threat that the disaster represents may increase because of delays caused by the search for necessary information (Mileti, 1999). Groups that are excluded to some extent from the community self-organizing process are vulnerable and at risk.[22] As a result of inadequate levels (or even complete lack) of information provided to people with disabilities, they may not be able to participate in the social interactions that take place during an emergency or disaster.

In addition, effective communications in a disaster situation can only exist with good planning. At the local level, where disasters are usually experienced most keenly, disaster planning and preparedness may be a low priority because they are infrequent. Mileti (1999) suggests that local governments tend to use generalized plans that do not accurately reflect the needs of their communities. Some emergency plans are developed

by nonspecialists, who can underestimate the magnitude of emergency situations, especially when they spiral up to the level of a disaster.

3.1.1. Disaster Planning

Disaster planning is complex. A disaster is a "sudden, calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community's or society's ability to cope using its own resources" (International Federation of the Red Cross, 2013). A disaster (D) occurs when a triggering agent (T) interacts with vulnerability (V): T + V = D. (McEntire, 2004). For this equation, McEntire uses the definition of disaster taken from Foster (1984): consequences of extreme events. The triggering agent is an extreme event that may have natural or human causes. The triggering agent (T) usually cannot be controlled, but reducing vulnerability (V) can significantly change the outcome of an incident.

Local communities may not be aware of this equation for many reasons, mainly because disasters are infrequent for most of them (Foster, 1984). The lack of experience with disasters and the low priority given to disaster planning are clear barriers to adoption of good preparedness practices. Local communities with public agencies that have experience handling disasters have better preparedness practices, and higher priority is given to disaster planning (Kartez & Lindell, 1987).

A vital part of effective disaster planning is an understanding of the diverse populations that make up the community, including their strengths and their weaknesses, as a basis for developing policies, programs, and practices to protect them (Heinz Center, 2002) An understanding of differences in social vulnerability and of disaster emergency management protocols before a disaster occurs can significantly reduce its impact. Reducing loss of life and property damage and encouraging recovery requires a proactive rather than a reactive approach (Kartez & Lindell, 1987). Local communities that customize planning and preparedness rather than following a one-size-fits-all

strategy can reduce vulnerabilities (Cutter & Emrich, 2006; Mileti, 1999). This is especially true when the needs of people with disabilities are part of the picture. In fact, as June Kailes emphasizes, when people with disabilities participate in emergency communication planning, the whole community benefits (Kailes, 2005, 2008; Kailes and Enders, 2007). Including people with access and functional needs in the disaster lifecycle introduces a vital perspective: that all disasters are personal, and all plans need to be adaptable. Disaster planning cannot capture only one perspective; all diverse groups should be involved. At the very least, local communities should have an understanding of community communications needs and capabilities. That understanding can be achieved quite simply, by involving representatives of the community in planning (Kailes and Enders 2007).

Local communities tend to be reactive and to base their emergency plans on lessons learned; thus, communities that do not experience disasters tend to have general plans. There is a relationship between the experience of recent disasters or emergencies and effective preparedness and planning. Communities that include advocacy groups and people with disabilities and others with access and functional needs in the planning process tend to have emergency plans that reflect diverse input.

In addition to these general observations, the following are specific barriers to local adoption of customized emergency communications.

Barrier 1. Coordinating Across Boundaries

Emergencies do not follow jurisdictional lines. Neighboring jurisdictions need to ensure that they are communicating before an emergency so that things run smoothly during the emergency. Smaller jurisdictions often have fewer capabilities to communicate over jurisdictional boundaries, making the response to an emergency or disaster uncoordinated. This subject is covered in detail in Section 4.

Barrier 2. Technological Challenges

Depending on the location, technological challenges may include a mix or lack of communications infrastructure, challenges of equipment interoperability, and the need for redundancy in systems and equipment. Examples abound, including such diverse challenges as the need to ensure communications with paratransit drivers and the potential that NG911 offers for redundancy and reliability.

Barrier 3. Competing Pressures on Local Budgets

Local governments such as cities and counties operate from a tax base provided by the residents, which supports local services such as sanitation, education, transportation, and public safety (Pagano, 2012). In a sense, the need for inclusive emergency communication must be balanced with the need for better roads and better schools. In recent years, many cities and counties have had to cut programs as a result of state funding cuts and a reduced local tax base, and local government officials and managers have had to make tough decisions about which programs will benefit citizens the most (Ammons, Smith, & Stenberg, 2012). Emergency communications do not necessarily do well in this competition for resources, as revealed through personal communications for Section 4.

Barrier 4. Sociological and Organizational Challenges

Sharing and dissemination of information is at once critical and problematic, beginning with questions of whom to trust in unfamiliar settings and confusing situations (Mileti & O'Brien, 1992). Even after trust and security have been established, fear and stress can be aggravated by inadequate information flows (White and Fu, 2012). Such emotions in turn may trigger panic and confusion. Often, panic can be reduced or eliminated if local communities adopt simple communication strategies. For example, during an emergency, information must be complete, allowing people to have control and make personal decisions concerning the level of risk they face. Incomplete or insufficient information will also reduce trust in the information source (CDC, 2012). To best deliver

information, communications strategies must be redundant, multimodal, and accessible to the largest possible number of people, embracing, for example, the use of iPad apps.

The level of affordability, availability, and applicability of solutions determines their impact on emergency communications and the likelihood that they will be used during a crisis (Manoj & Baker, 2007). Increasingly, communication tools and processes have to be flexible enough to meld traditional emergency communication hierarchies with the horizontal communication potential of new technologies such as social networks and social media (p. 52).

Barrier 5. The Problem of Registries

Registries are a controversial mechanism for identifying people with disabilities in emergency situations. Many cities and counties encourage the elderly and citizens with disabilities—especially those in need of transportation assistance—to give their information to one or more registries maintained by the local government. In this limited sense, local governments may have some record of the locations of such citizens, but these are passive records with limited utility. The majority of people with disabilities, like the general public, take part in day-to-day activities such as going to school, working, traveling, exercising, and volunteering (Kailes, 2008). Local governments cannot depend on registries alone, nor place the responsibility on individuals to register themselves as a means of planning. Also, many of these registries are not maintained properly or even made available for emergency management (Kailes, 2008). Thus, registries tend to be ineffective and should not be relied on.

The Global Public Inclusive Infrastructure (GPII) suggests a more imaginative approach: Instead of a single-purpose registry for emergencies, GPII has the potential to enable people with disabilities to identify their across-the-board preferences for information and communication functions, including all the context-of-use information now being built into the infrastructure.[23]

Barrier 6. The Need for Comprehensive Integration

With budget cuts and even the elimination of some programs, the focus of local government should shift from developing plans based on registries (i.e., the possibility of knowing where individuals are) to integrating disability service providers, both community-based organizations and government agencies, in planning and assisting during disasters and recovery (Matherly and Mobley 2011). Advocacy groups and the local community can work together to maintain constant communication. For example, Luzerne County, Pennsylvania, has the Arc, an advocacy group for people with intellectual and developmental disabilities. The Arc is a partner and committee representative at the emergency management agency, which means that the county understands the needs and concerns of people with developmental and intellectual disabilities. Of course, local governments must go a step further and include people with disabilities in the process.

3.2. Federal, State, and Local Emergency Communications

3.2.1. How the System Works

Alerts and warnings are often first disseminated by national government organizations such as the National Weather Service or FEMA. Communication infrastructure is typically provided at the state and national levels, often by private sector organizations (DHS, 2008b). The federal government provided a blueprint for emergency communications by developing a National Communication Plan and the structure for emergency response plans at the state and local levels. The federal government also institutes laws and regulations by which emergency communications, and communications in general, are to be accessible for people with disabilities and others with access and functional needs (see Section 2). Beyond these roles, state and federal governments provide a supporting role for local governments during an emergency, as described in the National Response Framework (DHS 2013b). Specifically, state governments "supplement local efforts before, during and after incidents by supplying in-

state resources," and "assistance from other states or the Federal government can also be requested if needed" (p. 13). State and federal officials can communicate with local officials through the Incident Command System (ICS). (See Appendix B for a detailed discussion of the ICS.)

The ICS is complex and, at the point where it interacts with the public, often problematic. Problems with interoperability or communications terminology may directly affect the flow of information to the public, which in turn may have an impact on people with disabilities and others with access and functional needs.

As is the case with all parts of the ICS, the process to disseminate information to the public during an emergency is scalable. When an incident is small, the incident commander may be the chief information source for the public. However as an incident grows in size and severity, public information officers (PIOs) might be included in the Incident Command Team. If an area is experiencing multiple incidents or one incident crosses jurisdictions, a Joint Information Center (JIC) might be formed. Within the JIC, PIOs consolidate information from all incident command posts and present the information to the public. If an Emergency Operations Center (EOC) has been formed, the JIC will receive all information from the EOC. (See Figure 4.)

Figure 4. Dissemination of Information through the Incident Command System

Incident Command Post → Incident Command → Emergency Operations Center → Joint Information Center → Media and Public
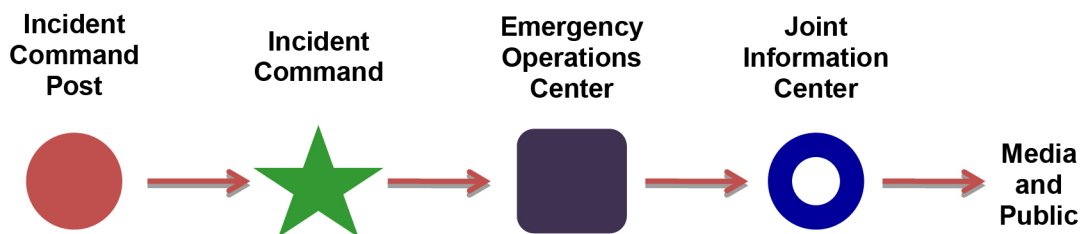
Terminology

Within the ICS, communication is critical. Various agencies may not be accustomed to communicating with one another, so the ICS requires everyone to use common

terminology or plain language. For example, "EMT" could mean emergency medical treatment, emergency medical technician, electron microscope tomography, or Eastern Mediterranean Time, depending on who is using the term (FEMA, 2010b).

Interoperability

Of equal importance is interoperability of communications among agencies and jurisdictions. The National Emergency Communications Plan states, "More than 50,000 independent agencies across the Nation routinely use emergency communications. Each of these agencies is governed by the laws of its respective jurisdiction or area of responsibility. No single entity is, or can be, in charge of the Nation's entire emergency communications infrastructure. In such an environment, collaborative planning among all levels of government is critical for ensuring effective and fully coordinated preparedness and response" (DHS, 2008a, p. 11).

While the technology exists for interoperable communications among agencies and jurisdictions, the ability to easily use this technology (especially during an emergency) is often absent. Mendonca, Jefferson, and Harrald (2007) note that "despite improvements in information and communication technology (ICT), the role of improvisation, adhocracy and other emergent phenomena in emergency response has not diminished" (p. 44). Several themes emerged from interviews with emergency preparedness administrators for this report:

- There appears to be a stigma attached when one agency uses another's radio channels.

- It takes a lot of training for first responders and emergency managers to figure out how to change to the correct channel to communicate with other agencies.

- If a first responder or emergency manager changes radio frequencies to communicate with another agency, there is a risk of missing important information being disseminated on the original frequency.

- It is extremely difficult to figure out what channel another agency is using on its radio. One emergency management professional gave the example that if a firefighter saw a police officer sitting in his patrol car a couple hundred yards away and wanted to communicate with him, it would be easier for the firefighter to just walk over to the patrol car, because the firefighter would likely have no idea what radio channel the police officer was using.

Accessibility Issues and Communications Involving Individuals

Emergency communications disseminated from government authorities will concern preparedness, response, and recovery. This includes alerts and warnings issued by local, state, or federal governments, private sector organizations, or NGOs, and direct verbal and nonverbal communications between local authorities and individuals. One of the major concerns for people with disabilities and others with access and functional needs is the level of accessibility of those communications. The public is not a "homogenous entity" (Partnership for Public Warning, 2004, p. 9). Therefore, multiple forms of emergency communication may be needed to properly disseminate a comprehensive message. For diverse populations, emergency communications are more likely to succeed when messages and their presentation are tailored to be locally and personally (including linguistically) relevant, and when there is community involvement (Beckjord et al., 2008).

Before, during, and after an emergency, people often look to officials for guidance. This can include calling 911, 311, or 211; talking to an official on the phone or in person at a shelter or disaster recovery center; contacting an official via email or Web site; and even calling out to an official during search and rescue. People will want to verify the emergency communication information, often by checking with partners, friends, neighbors, or others in their social contact circle. They may confirm alerts; let others know they are safe; or provide information to others about shelters, transportation, supplies, or general response and recovery. Communications redundancy is a necessity; its importance is increasingly being recognized.

To better understand how people with disabilities and others with access and functional needs receive and process public emergency alerts, the NCD research team accessed recent survey research work by the Wireless RERC (see Section 3.3. below). What follows is a brief discussion of some contemporary public alert systems and tools.

Some Communication Systems and Tools

WebEOC

WebEOC is a tool used by more than 35 states and U.S. territories, and by emergency managers working at the county or city level in 43 states. (EOC stands for Emergency Operations Center under the Incident Command System.) WebEOC is a secure online tool that enables those who are authorized to use the system to log in and either enter or view information regarding an incident. WebEOC works by creating "boards" where users can track tasks that need to be completed; manage resources; track the status of critical infrastructure such as roads, waterways, pipelines, and bridges; create incident action plans; and track first responders. Boards are originally confined to the local level (city/county), but they can be made accessible at the state, FEMA regional, or federal level. When boards are made available for other levels, any information that is entered at the local level will automatically be uploaded to those who have access (similar to a Twitter feed).

IPAWS

The Integrated Alert and Warning System program (IPAWS) was established by Presidential Executive Order 13047 to "modernize and enhance alert and warning delivery to the American Public" (FEMA, 2012c, p. 2). The overarching goal of IPAWS is to create an "effective, reliable, flexible, and comprehensive system to alert and warn the American people," including people with disabilities and others with access and functional needs (p. 17). Ideally, IPAWS will help save time when alerting and warning the public during an emergency by allowing authorities to deliver their messages from a single portal to multiple communication pathways, including the Emergency Alert System (EAS), Wireless Emergency Alerts (WEAs), and the National Weather Service Dissemination Systems (FEMA, 2013). In addition, the use of multimodal alerts and

warnings has the potential to enhance accessibility. The IPAWS Program Management Office is working with industry partners and researchers to ensure accessibility and interoperability, "specifically for devices and services for people with disabilities" (FEMA, 2012c, p. 12).

Common Alerting Protocol

IPAWS uses Common Alerting Protocol (CAP) alerts to disseminate emergency information. FEMA notes that the CAP "is a digital format for exchanging emergency alerts that allows a consistent alert message to be disseminated simultaneously over many different communications systems" (FEMA, 2012d). CAP allows for messages to include a variety of content such as "photographs, maps, and streaming video" which "is limited only by the capacity of the delivery system used" (FEMA, 2012d). CAP also ensures accessibility through its ability to provide information in both text and audio formats, and in multiple languages.

Wireless Emergency Alerts (WEAs)

WEA is a system that allows geographically targeted alerts and warnings in the form of text-like messages that are distributed to wireless phones and other mobile devices (FCC, 2013a). WEAs are broadcast "only from cell towers in the zone of an emergency" and are "accompanied by a unique attention signal and vibration, which is particularly helpful to people with hearing or vision-related disabilities" (p. 2).

Social Media

A relatively new avenue that has opened up in emergency communications is the use of social media. Social media are somewhat controversial, in part because they tend to challenge the traditional top-down method of emergency communications and allow individuals to take a more active role in alerting others of emergencies, including providing information directly, uploading photos and videos, and communicating in real time during an emergency.

Examples of the use of social media during an emergency abound; they include the 2011 Japan earthquake and tsunami, the Haiti earthquake in 2010, the 2007 San Diego

wildfires, and the 2007 Virginia Tech shootings (Acar & Muraki, 2011; Frank, 2010; Palen & Hughes, 2009; Sutton & Palen, 2008). More recently, social media played a significant role when Hurricane Sandy hit the East Coast in 2012. In the 24 hours after the storm made landfall, there were 3.5 million tweets with the hashtag #sandy; Facebook reported that the top 10 words used in that period were all Sandy-related; and about 10 pictures per second were being uploaded to Instagram with the #sandy hashtag. FEMA tweeted directions for finding shelters using short messaging service (SMS messages). The Fire Department of New York tweeted incidents of major fires throughout the night via Twitter and had a dedicated person monitoring its Twitter account to respond to people tweeting emergencies (Ngak, 2012).

Social media not only potentially provide an additional means of contacting emergency management but also provide a means for crowd sourcing information among individuals, as was the case during the Southern California wildfires of 2007.[24] Surveys by the Red Cross indicate that between 2010 and 2011, people not only increased their use of social media but also increasingly expected emergency management to use social media. Twenty-two percent of respondents to a 2011 Red Cross survey stated that if they were unable to contact local emergency management by phone, they would try to contact emergency management services via an online channel; 35 percent of respondents expected that if they posted a request for help on a social media site, help would arrive within an hour.

However, the use of social media can pose potential problems for people with disabilities and others with access and functional needs as well as emergency managers. One challenge is that social media are poorly defined, leading to confusion over what the term exactly refers to (White, Fu, & Benson, 2013). Social media represent more of an emerging issue than a current reality; 2012 survey results from the Wireless RERC indicate that overall use levels of social media by people with disabilities during emergency situations are low, although they are higher among the younger generation (see Section 3.3 below).

A primary issue for people with disabilities and others with access and functional needs is that not all social media are accessible (Borrino, Furini, & Roccetti, 2009; Coltham 2012). For example, for people with intellectual and developmental disabilities, "accessibility" has to include a simple design with few options, simple text, and pictures to convey meaning. Social media sites may be too busy and cluttered.

People with decreased motor skills may require that the site be keyboard accessible. In the case of Twitter, "The keyboard cannot access Favorite, Reply and Delete links" (Lembree, 2010).[25] Videos (for example, in YouTube) must include captions and ASL interpretation for accessibility for people who are deaf or hard of hearing, as well as audio description of relevant visuals for people who are blind or have low vision (Henry, 2008).

If online information cannot be accessed via screen readers, people who are blind or have low vision will not be able to receive the information appropriately. In addition, any image on a Web site that lacks ALT text[26] to describe the image and the semantic meaning of the image will also be inaccessible to people who are blind or have low vision (Pennick, 2005).[27]

Other potential problems are more directly related to emergency managers. Currently there are no laws specifying potential liability if people provide misinformation about emergencies via social media. In addition, if the government were to use social media to gather information, would that violate privacy laws, as many people have personally identifiable information on their social media sites? The Department of Homeland Security currently has privacy impact assessments (PIAs) relating to this idea, but the problem is compounded by the lack of a definitive definition of social media. In the DHS assessments, social media are defined as either unidirectional or bidirectional, although they do not always fit into one category or the other.

The Role of the Media

Emergency communications are often disseminated through media channels. The literature indicates that media channels have the ability to help instill trust in emergency

communication (i.e., people are likely to trust emergency communications from local news sources), but they also can insert bias, which can affect the way people process emergency communications (White & Fu, 2012). This relates to Mileti's (1995) social-psychological process for processing emergency communications. The media must be sure to relay all emergency communications in an accessible manner for people with disabilities and must comply with federal disability laws, which often does not happen.

3.3. How Individuals Handle Alerts

Throughout this report, the NCD research team has tried to focus on the person with a disability as an individual, to better understand the situation such a person faces when disaster strikes. In 2012, the Wireless RERC's user research team launched a survey of people with diverse disabilities. This work built on previous survey research conducted by the Wireless RERC in December 2010/January 2011 on emergency communications and people with disability.[28] The NCD research team referenced findings from that research that are relevant to communications.

The survey was conducted from November 2012 through March 31, 2013. One focus was on how people with disabilities receive public alerts, whether and how they verify the information in public alerts, and whether they pass on those alerts or related information to others. Because the survey sample included a substantial number of people who reported having no disability, the two groups were compared.

3.3.1. Methodology

Convenience sampling was used to recruit participants to the survey. Respondents were contacted either directly through the Wireless RERC's Consumer Advisory Network (CAN) or indirectly through numerous national, state, and local organizations working in the area of disability, accessibility, communications, and public safety.

A total of 1,772 individuals completed the survey, of whom 1,179 reported having at least one disability; 429 reported having no disability; and the remainder did not indicate whether they did or did not have a disability. Among the respondents, 387 reported being a caregiver for a person with a disability.

Data Analysis 1. Receiving, Verifying, and Passing on Information

For the three key behaviors related to emergency communications (receiving, verifying, and passing on emergency alert information) there was little difference between the disability and nondisability groups.

While a substantially higher percentage of respondents with no disability reported having received a public alert (regardless of medium), the difference was not great (Table 5). There was no statistically significant difference in the percentages of respondents with and without disabilities who verified public alert information or passed it on to others.

Table 5. Have you ever received, verified, and/or passed on emergency alert information?

	Has a Disability	No Disability
Received Public Alert	78%	85%
Verified Alert Info	63%	65%
Passed on Alert Info to Others	62%	62%

Television remains by far the most common communications medium for people with disabilities, as it does for those without disabilities, both for receiving alerts and for verifying the emergency information (Table 6).

Table 6. How were you alerted, and how did you verify the emergency information?

	Alerted		Verified	
	Has Disability	No Disability	Has Disability	No Disability
Television	55%	52%	57%	52%
Text Message	32%	38%	13%	10%
Email	32%	31%	16%	14%
Phone Call (landline, mobile phone)	23%	29%	16%	17%
Sirens or Other Alarms	23%	23%	20%	13%
Radio (regular radio)	21%	26%	21%	27%
Direct Observation of Your Surroundings	20%	17%	38%	38%
Internet News	19%	16%	33%	31%
Direct Contact with Someone Nearby	12%	10%	26%	19%
NOAA Weather Radio	14%	18%	15%	15%
Social Media Posting from Federal, State, or Local Emergency Management Agency	13%	12%	14%	11%
Social Media Posting from Friends and Family	11%	12%	10%	9%
Emergency App Installed on Smartphone	10%	13%	8%	10%
Instant Messaging/Chat	2%	3%	5%	2%
Personal Alerting Device	2%	3%	1%	2%
TTY	<1%	1%	1%	<1%

Similarly, there was no statistically significant difference between those with a disability and those without in terms of using social media to receive or verify public alerts (Table 7). This was the case for use of official federal, state, or local social media outlets, as well as for personal social media networks. There was a statistically significant,

though small, difference in the use of social media to pass on public alert information—respondents with disabilities use social media for this purpose more than respondents with no disability (Table 8). Still, levels of use were low for both groups.

Table 7. Have you ever received, verified, and/or passed on emergency alert information via social media?

	Has a Disability	No Disability
Received **Public Alert via Social Media** (official channels)	11%	11%
Received **Public Alert via Social Media** (personal network)	10%	10%
Verified **Alert Info via Social Media** (official channels)	9%	7%
Verified **Alert Info via Social Media** (personal network)	6%	5%
Passed On **Alert Info To Others via Social Media** (personal network)	12%	8%

Table 8. How did you pass on or forward the emergency alert information?

	Forwarded (yes)	
	Has Disability	No Disability
In Person to Someone Nearby	52%	53%
Phone Call (landline, mobile phone)	45%	54%
Text Message (on mobile phone)	38%	42%
Email	33%	30%
Shared on Social Media	22%	13%
Instant Messaging/Chat	8%	7%
Telephone Relay Service	3%	<1%
TTY	1%	0%

This is the second survey of the alerting methods used to receive emergency alerts run by the Wireless RERC. In a survey conducted in 2010–11, traditional broadcast media in the form of television and radio were the most frequently used media by which respondents with disabilities received emergency alerts (41% and 25% of respondents, respectively). Email (20%), direct observation (18%), and phone calls (18%) rounded out the top five (see Table 9). Text messaging ranked sixth, with 13 percent of respondents reporting having received alerts via this medium. At that time, "social media" was not listed as a choice in the general alerting methods question because of its very limited use for emergency communications.

In the 2012–13 survey,[29] television remained the most common medium for receiving alerts (55%), but text messages, which previously ranked sixth (13%), ranked second at 32 percent, tying with email and followed by phone calls (landline or mobile) and sirens and alarms (23%), radio (21%), and direct observation (20%). This indicated a decline in the popularity of some traditional means of communication (notably radio). Social media ranked sixth for receiving and seventh for verifying, implying that they still rank relatively low as emergency communication tools.

Table 9. Methods of Receiving and Verifying Alerts

Ranking	Received Alert (2010–11)	Received Alert (2012–13)	Verified alert (2010–11)	Verified Alert (2012–13)
1st	Television	Television	Television	Television
2nd	Radio	Text message and email (equally)	Direct observation	Direct observation
3rd	Email	Phone calls and sirens (equally)	Radio and Internet news (equally)	Internet news
4th	Direct observation and phone calls (equally)	Radio	Phone calls	A person nearby
5th	Sirens	Direct observation	Email	Radio

Ranking	Received Alert (2010–11)	Received Alert (2012–13)	Verified alert (2010–11)	Verified Alert (2012–13)
6th	Text message	Social media and Internet news (equally)	Other	Sirens
7th	Internet news	A person nearby	Text message	Social media

Data Analysis 2. Impact of Age on the Use of Various Media to Receive and Share Public Alert Information

Two questions in the Emergency Communications Survey shed particular light on patterns of technology use by people with disabilities during public disasters and emergencies across age cohorts:

1. For the most recent instance when you received a public emergency alert, how were you alerted?

2. If you shared the alert information for the most recent public alert you received, how did you share it?

The questionnaire focused on the most recent instance of receiving public alert information so that respondents would not have to consider every time they had ever received public alert information. Also, the questions focus attention on recent experience rather than experience years earlier.

Receiving Alerts

Table 10 shows data on the percentages of respondents who used any of a list of possible means and media for the most recent public alert they received. Respondents could choose all that applied.

Table 10. For the most recent instance when you received a public emergency alert, how were you alerted?

Respondents with a Disability by Age Group	18–35	36–45	46–55	56–65	66+
Sirens or Other Alarms	25%	24%	21%	27%	21%
Direct Observation of Your Surroundings	24%	21%	17%	21%	15%
Direct Contact with Someone Nearby	19%	12%	12%	12%	8%
Phone Call (Landline, Mobile Phone)	21%	17%	23%	27%	22%
Television	55%	54%	53%	57%	51%
Radio (regular radio)	19%	22%	21%	24%	22%
NOAA Weather Radio	15%	12%	15%	13%	21%
Text Message	48%	44%	34%	19%	23%
Email	40%	30%	32%	27%	32%
Internet News	27%	25%	15%	20%	9%
Social Media Posting from Federal, State, or Local Emergency Management Agency	20%	22%	12%	9%	8%
Social Media Posting from Friends and Family	24%	17%	12%	5%	2%
Emergency App Installed on Smartphone	16%	17%	8%	8%	7%
Instant Messaging/Chat	1%	6%	<0%	1%	1%
TTY	0%	2%	0%	0%	1%
Average for All Items	24%	22%	20%	18%	16%
Average for Communications Media (everything but the first three items at the top)	24%	22%	20%	18%	17%

Television remained by far the most commonly used medium for the most recent instance in which respondents received emergency alert information. Roughly the same percentage (low to mid-50% range) received alert information via television. Regular broadcast radio was used at less than half the rate of television (low to mid-20% range), but, like television, at roughly equal rates across the five age groups shown.

Among the three nontechnology-based means of receiving alert information shown (sirens and alarms, direct observation, and direct contact with someone nearby), the last stands out because of the substantial variation at both ends of the age range. The youngest and oldest age cohorts reported receiving alert information at substantially higher and lower rates, respectively, than the middle three age cohorts. This suggests that the youngest group is much more socially connected than the rest of the respondents. It also suggests that the oldest age cohort (66 and older) is more socially isolated than the rest.

In general, younger age groups are more likely than older groups to use social media. In particular, there is a big gap in the use of social media by the two younger cohorts (i.e., from 18 to 45), whether official or involving friends or family, compared with the older age groups. Media used primarily (or increasingly) on mobile platforms show substantial and progressive age effects, with younger respondents showing greater rates of use than older respondents. The use includes text messaging, emergency apps, Internet news, and social media from either official emergency organizations or personal networks. While Internet news and social media can be and often are used on nonmobile platforms such as desktops and laptops, they are increasingly used on mobile platforms.

Sharing Alert Information

With regard to sharing emergency alert information, some interesting aspects of the impact of age on the use of communications means and media are evident (see Table 11). First, there was no pattern of age effects on sharing emergency information in person with someone nearby. Such sharing was most commonly reported, and ranged from a low of 42 percent of respondents age 66 and older to a high of 55 percent for the next two younger age groups. The same lack of a distinct age pattern applies to email

sharing of alert information, which was used by approximately 30 percent of the respondents during their most recent public emergency experience.

Voice calling shows a strong positive relationship with age: As age increases, voice calling increased, from 35 percent of respondents 18–35 years old to 55 percent of respondents age 66 and older. The opposite pattern held true for sharing on a social media site, which was a common activity for the youngest cohort (42% for the 18–35 years old), but rare for those over 66.

Three media—text messaging, social media, and instant messaging/chat—all showed substantial inverse age effects; their use increased as age decreased. This effect is strongest for sharing on social media and somewhat less so for text messaging and instant messaging. Respondents in the two youngest age groups used text messaging

Table 11. If you shared the alert information for the most recent public alert you received, how did you share it?

Respondents with a Disability by Age Group	18–35	36–45	46–55	56–65	66+
In Person to Someone Nearby	49%	46%	55%	55%	42%
Phone Call (landline, mobile phone)	35%	39%	48%	47%	55%
Text Message	54%	53%	37%	33%	14%
Email	28%	38%	28%	34%	30%
Shared on Social Media Site	42%	36%	24%	9%	2%
Instant Messaging/chat	11%	18%	7%	5%	2%
TTY	0%	4%	1%	1%	2%
Telephone Relay Service	1%	6%	2%	4%	3%
Average for All Items	37%	38%	33%	31%	24%
Average for Communications Media (everything but the first item at the top)	34%	37%	29%	26%	21%

and social media for sharing emergency information at relatively high rates, while the oldest age group (66 years and older) used them at low rates.

Analysis

Results from the Wireless RERC's emergency communications survey show pronounced age effects on the use of some communications media during emergencies but no age-related pattern for others. Three general observations can be made from these results:

1. Television still rules—TV was the most commonly used medium for receiving alert information across all age groups. Slightly more than half of respondents in all age groups reported receiving alert information via television.

2. There is no age effect on the use of traditional broadcast media—TV and regular radio (non-NOAA) are used by similar percentages of respondents across all age groups for receiving alert information.

3. Use of mobile communications other than voice calling is inversely related to age—for both receiving alerts and sharing alert information, younger age groups use text messaging and social media at substantially higher rates than older age groups. Use of mobile apps to receive alerts is also inversely associated with age, with younger age groups using mobile apps for these purposes at much higher rates than older groups.

3.4. Conclusion

Perhaps the strongest finding to emerge from the survey results was that there is little or no difference between the disability and nondisability groups for the three key behaviors related to emergency communications (receiving, verifying, and passing on emergency alert information). This is perhaps the best argument for the view that the emergency management community should stop regarding people with disabilities or access and functional needs as in any way separate from other members of the communities with which they communicate.

Comparing the results of the surveys carried out in 2010–11 and 2012–13, there is a decline in the popularity of some traditional communications means, notably radio. Television remains the most common means for both receiving and verifying alerts, regardless of age cohort. However age is a factor in mobile communications. For both receiving alerts and sharing alert information, younger age groups use text messaging and social media at substantially higher rates than older age groups. Use of mobile apps to receive alerts is also inversely associated with age, with younger age groups using mobile apps for these purposes at much higher rates than older groups.

SECTION 4. Emergency-related Communications: The Local Emergency Management Perspective

The United States has sophisticated, professional emergency management and communications in place throughout the nation. At the same time, every new disaster seems to produce fresh incidents in which the communications needs of people with disabilities are not met. To better understand this disconnect, the NCD research team investigated the realities of what happens in emergency situations at the county level and separately sought out examples of promising practices that have the potential to aid in the provision of effective emergency communications for people with disabilities and others with access and functional needs. This was accomplished through a series of interviews in a two-step process:

1. Interviews with local emergency management officials in 10 locations across the nation, chosen for diversity of geography and of potential disaster.

2. A series of in-depth interviews designed to identify stages in the disaster management development and planning process at which effective communications could be achieved or improved, including some specific examples of communities that are working to achieve integration of people with disabilities in the emergency management process.

4.1. Planning Is Key: Interviews with County-level Emergency Management

A major focus of this report was to understand the realities of what happens at the city or county level. This was accomplished through a series of phone interviews with local emergency management officials.

Initially, population reports from the American Community Survey were used to identify the disabled populations in each of the FEMA regions by county. This information was cross-referenced with FEMA regional maps and NOAA state and territory Web sites to understand the unique characteristics of emergencies and disasters in the 10 regions at the county or equivalent administrative subdivision level. NCD's 2005 report *Saving Lives* and FEMA's *Developing and Maintaining Emergency Operations Plans* (2010a) were used to develop interview questions for emergency managers, public affairs officers, and those responsible for emergency communication planning in the selected counties.

The selection of counties in each region was based on an effort to capture the unique differences of potential disasters and emergency situations. For example, a county near a port on the Atlantic Coast faces a different range of potential emergencies than communities located near an earthquake fault or in a region prone to tornadoes. Table 12 is the list of locations.

Table 12. Counties by Characterization and Region

Urban	Suburban	Coastal/Riverine	Rural
Providence, RI (I)	**Broome, NY** (II)	**Portsmouth, VA** (III)	**Luzerne, PA** (III)
Berkeley, WV (III)	**Brevard, FL** (IV)	**Harrison, MS** (IV)	**Sauk, WI** (V)
St. Louis, MN (V)	**Chippewa, MI** (V)	**Scott, IA** (VII)	**Limestone, TX** (VI)
Maricopa, AZ (IX)	**Laramie, WY** (VIII)	**San Luis Obispo, CA** (IX)	**Union, SD** (VIII)
Clark, NV (IX)	**Pierce, WA** (X)	**Ketchikan, AK** (X)	**Bonner, ID** (X)

Note: FEMA region designated in parentheses.

Figure 5. Map of Counties Interviewed

4.1.1. Results of Analysis and Findings by Research Question

The researchers chose two major categories of questions—"Barriers" and "Involvement"—with which to evaluate local emergency-related communications.

Question 1. Barriers

Given the opportunities for all citizens, including those with disabilities, to have real-time access to information during a disaster or emergency, what are the barriers at the local community level to inclusive emergency communications?

Funding and staff

According to the interviewees, the primary barrier to providing effective emergency communications for people with disabilities is limited funding and staff. Although a lack of funding was mentioned in all geographic locations (*Coastal/Riverine:* Scott, IA, Harrison, MS, Portsmouth, VA; *Urban:* Union, SD, and Pierce, WA; *Rural:* Limestone, TX, and Sauk, WI; *Suburban:* Chippewa, MI), smaller and more rural areas stressed that staffing

was an additional issue. For example, Chippewa, MI, and Union, SD, noted that they are either a one-person office or that they rely on volunteers.

Need for involvement

Another primary barrier mentioned was the lack of involvement in emergency management by people with disabilities and others with access and functional needs. Interviewees said, "It's a two-way street," and people with disabilities need to take an active role in letting emergency management know their needs so those needs can be met.

It should be noted here that, while the need for people with disabilities to take an active role in emergency management is a legitimate concern, people with disabilities (like the general population) might place a higher priority on other concerns, such as medical care or transportation. Emergency managers and advocacy groups can help people with disabilities understand that emergency preparedness and response are important, and encourage them to take a more active role in emergency planning.

Reverse or outgoing notification systems

Another potential barrier is the use of outgoing notification systems, sometimes called "reverse 911." These systems are used by many of the counties and cities interviewed (13 out of 20). They enable emergency managers, law enforcement, and the fire department to alert individuals, typically through landline phones or TTYs associated with addresses in a specified geographic area. This system is meant to target individuals and ensure that they get the message, alert, or warning. Most reverse notification systems use calls to landline telephone numbers; however, some commercial products are designed for wireless cell phones, for which a person must register his or her cell phone number and create a profile to be included in the system.

Some areas, such as Portsmouth, VA, mentioned this as a barrier—as of June 2011, there were 130,000 landlines in its system and only 6,000 cell phones (Foden-Vencil, 2011). While the capability to reach cell phones seems to offer a solution to personal notification, in that people with disabilities often have cell phones, barriers remain for the

deaf or hard of hearing. Recently the FCC has become aware that some outgoing notification systems are not designed to successfully reach deaf and hard of hearing people who rely solely on video relay services (VRSs) for their telephonic communication. Not all systems offer text capabilities, and for those that do it is important that messages be in plain language and easily understandable. Some outgoing notification systems must be specifically calibrated to revert to text-based messages when a Baudot (TTY) signal is received from the called telephone number or to wait for a VRS provider to answer the call.

One additional drawback to outgoing notification systems is that these systems may be too expensive for some locations.

Inaccessible Web sites

Although not mentioned as a barrier, interviews indicated that emergency management departments tend to rely on the county government to ensure that their Web sites are accessible. This is significant, as many people look to these Web sites for information in a time of emergency. Inadequate Web accessibility results in people with disabilities and others with access and functional needs not being able to get the information they need. In addition, local and state governments that have inaccessible Web sites are violating federal disability laws. Only Maricopa, AZ, Clark, NV, and Sauk, WI, mentioned that their Web sites were accessible.

General communications may be a problem

The ability to communicate with everyone in the city/county or between counties was also mentioned as a potential barrier. Each county or local jurisdiction is different (demographics, population density, geographic location, and potential hazards), so they will have different challenges when they try to communicate with the community in general or people with disabilities specifically. For example, Clark County, NV, includes Las Vegas, a major urban center, as well as rural and federal lands. The main challenge for Clark is communicating with people who live in rural areas. On the other hand, Ketchikan, AK, located on an island north of Vancouver, is isolated and especially vulnerable in an emergency or disaster situation. The area has limited access to radio

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towers, and if they were to go down, Ketchikan would be cut off. In some states, there is a trust issue that must be overcome when communicating with local tribes. Union, SD, borders two other states and faces challenges in communicating interjurisdictionally because of the different systems used.

Potential and existing barriers to effective emergency communications for people with disabilities and others with access and functional needs vary. While some areas seem to lack necessary staff, others seem to face greater risks because of their location and potential hazards. Some areas mentioned a lack of engagement on the part of people with disabilities and others with access and functional needs. Nonetheless, some counties interviewed stood out for their proactive approach to effective emergency communications for people with disabilities and others with access and functional needs, which can be seen below.

Examples

Maricopa County, Arizona: Maricopa is probably the most prepared and proactive county of those interviewed in terms of emergency planning for people with disabilities. The Emergency Management Department works closely with the statewide independent living council (AZSILC) to ensure that people with disabilities are included in emergency planning, particularly with regard to accessibility of emergency communications. AZSILC is prepared to serve as a functional assessment service team (FAST) during an emergency, to provide initial triage and support at shelters, as well as ASL interpretation. In addition, the Emergency Management Department has conducted a review of every shelter in its database to ensure accessibility of the facilities.

The department works proactively to ensure that people are prepared. For example, the department recently administered a survey in the community to identify individual preparedness efforts and determine where outreach efforts needed to be targeted. In order to include people with disabilities in the planning process, the department hosted emergency preparedness events at the Arizona Disability Empowerment Center. Emergency management planners seek guidance from the disability community on what

types of technology and equipment to purchase, such as wheelchairs and adaptive equipment in shelters.

The department reports conducting outreach to people with disabilities by going to advocacy group meetings, such as those for people who are deaf or hard of hearing. They receive direct feedback from those communities; for example, that the county is perceived as helpful, but too many types of technology can be confusing and hard to keep up with.

Clark County, Nevada: Although the county's emergency plan focuses primarily on "traditional" disabilities (such as people who are blind, deaf, hard of hearing or have speech or mobility disabilities), it also includes people with intellectual and developmental disabilities as well as those with chemical sensitivities. The Department of Emergency Management provides ASL interpreters for meetings and upon request, and the emergency management coordinator mentioned that many news stations in the area also provide ASL interpreters with emergency alerting programming. One of the biggest communication challenges in the county is the diversity of the large geographic area, which contains the city of Las Vegas and a substantial portion of both "empty" and federal land. The Department of Emergency Management reports paying close attention to after action reports to ensure that it is always improving with regard to emergency communication.

In putting together a planning team, the department includes representatives from advocacy groups for people with disabilities who can make recommendations throughout the planning process. One concern raised by the department was that although these advocacy groups do well at the organizational level, there are questions about their effectiveness at the individual level. Currently, they strive to reach a broader audience of people with disabilities, especially those with invisible disabilities such as autism, because it is harder to identify them and understand their needs.

San Luis Obispo County, California: San Luis Obispo County contains a nuclear power plant, which poses special risks for the area and is the main focus of the county's

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emergency response plan. The Office of Emergency Services maintains a list of self-identified people with disabilities who may need assistance with evacuation and to ensure that the needs of people with disabilities are represented in the Emergency Operations Center in cooperation with the Public Health Center. The office recently completed a 400-page resources guide to help ensure that resources, including ASL interpreters, can be contacted during an emergency. The office also provides training courses and workshops for people with disabilities.

Question 2: Involvement

How are local communities working to ensure effective emergency communication for people with disabilities and others with access and functional needs during emergency planning?

The primary way that the locations report working to ensure effective emergency communications for people with disabilities and others with access and functional needs was to include them in the planning process. Typically, this involvement was through a planning committee or advisory group. There did not appear to be one common method of including people with disabilities and others with access and functional needs or advocacy groups in emergency planning. In some counties—such as Ketchikan, AK, and Providence, RI—a member of the emergency planning team has a disability. Some areas—such as Berkeley, WV, and Luzerne, PA—rely on input from local agencies such as the board of education or human service agencies during planning, while other areas have formed advisory committees, as seen in Portsmouth, VA, Clark, NV, and Saint Louis, MN.

4.1.2. Result of Analysis and Findings by Research Theme

The following is the analysis of the interviews with the emergency managers, grouped according to themes.

Emergency Plan

What specific populations are reflected in the emergency plan?

Although many interviewees mentioned that people with disabilities and others with access and functional needs were included in planning, when they were asked whether people with disabilities were covered in the plan, the answer was much more vague. If advocacy groups were involved, they often mentioned those groups specifically. Almost all responses to the interviews indicated that specific populations, (e.g., seniors, children, people with disabilities and others with access and functional needs, people with limited English proficiency, tourists, isolated/rural populations) were reflected in the emergency planning process.

However when a follow-up question was asked about specific populations, the answer often lacked concrete examples. Only after the question was reworded or elaborated did some of the respondents provide details or describe specific services and planning procedures designed for people with disabilities. The most commonly addressed populations were seniors and people with mobility disabilities, and medical services and sheltering facilities relevant to those populations were the most widely available.

What large-scale hazards are reflected in the emergency plan?

Most of the hazards listed (e.g., severe weather, fires, earthquakes, landslides or mudslides, terrorist or other manmade events, crime alerts, health threats) were addressed in the counties, with a few exceptions. Geography and environment were important factors; for example, coastal areas tend to emphasize planning for hurricanes, while a county that has a nuclear power plant focuses on that. The responses also demonstrate that many counties tend to be reactive rather than proactive, basing their planning on hazards that have already been experienced.

Analysis

Even if the respondents claimed to have addressed the needs of people with disabilities and others with access and functional needs in the plan, there was generally a lack of detail. For example, most mentioned medical services for seniors and for wheelchair

users, but they could not specify requirements for other types of disability. Clark County, NV, was the only county that included multiple types of disabilities, including intellectual and developmental.

Communications Plan

Does the jurisdiction have an emergency plan, and how often is it updated?
All counties interviewed stated that they had a specific emergency communications plan. The majority of the counties go through a four- or five-year emergency plan review cycle, and many also make minor updates when needed.

What are the long-term goals for emergency communications?
Every county reported that it is constantly improving, although very few could provide details on how this was being achieved. Examples of those that did were Luzerne, PA, which is working to improve interjurisdictional communications with the surrounding counties, and San Luis Obispo, CA, which is working to improve the capabilities of its new outgoing notification system.

Analysis
The five-year update cycle seems to be the norm. Only a few counties described initiatives to develop ongoing updates. Some shorter-term plans included developing partnerships with other counties or agencies, and technology transition or upgrades.

Interestingly, while most counties described transitions to a higher level of technology, the Maricopa, AZ, respondent described a policy of "getting back to the basics." The justification was that technology often fails during emergency situations, while a focus on the basics can really work. One example given was of power outages, during which emergency workers use flashlights to notify and alert people. Because the population knows this, when people see these flashlights coming to their houses, they consider it to be a personal and nonthreatening approach. However, this would not be accessible for people who are blind or have low vision.

Emergency Information

What system is used to disseminate alerts and warnings?

Directly or indirectly, most counties use an outgoing notification system. These systems usually tie cell phones, text messages, and emails together to send out alerts during emergencies. Among the interviewees, TTY seems to be rarely used. This is problematic, as there are still TTY users, especially in rural areas, and TTY can be useful during power outages. The National Association of the Deaf (NAD) explicitly advises users to keep TTY as an important redundancy device:

> TTYs, however, are still used by many people who are deaf or hard of hearing; particularly by people who do not have access to available, affordable broadband and Internet access. TTYs also continue to play an important role by providing direct access to 911 emergency services.[30]

Sirens are also not so common, especially to cover a large geographic area. Most counties do not favor the use of social media, owing to the need to have specialized staff on standby who can manage them. One county representative mentioned "special services" for people with disabilities at nursing facilities: the beds can vibrate and there are flashing lights during emergencies.

Are American Sign Language interpreters provided for emergency information?

The majority of the counties report having the ability and resources to provide ASL interpreters; however, they are used only when requested or in special circumstances, such as press conferences. Notably, Maricopa County in Arizona works with the State Independent Living Council's functional assessment service teams (FAST) to provide ASL interpreters during initial triage and at shelter reception areas.

Is emergency information provided in any additional languages?

Many counties can provide emergency communication in other languages when requested and during emergency situations. Depending on the local population, Spanish is the most common language provided. Based on the interviews, language translation appears to be a more common service than ASL interpretation.

How do first responders communicate with one another?

The communication usually starts as a relay through 911 centers to a dispatch through radio systems. Law enforcement and medical services are often included in the system.

Social Media

Are social media used to communicate emergency information?

For the majority of counties, Facebook and Twitter are the most commonly used social media. Several counties also use Nixle, a notification service designed for law enforcement and government agencies. Of course, the accessibility of social media remains an issue for many people with disabilities.

Outreach

Are people with disabilities and others with access and functional needs included in emergency planning?

Most counties reported involving people with disabilities and others with access and functional needs in some capacity. Often, involvement is through a planning committee or advisory group with which people with disabilities are involved. However, there does not seem to be one common method of including advocacy groups or people with disabilities and others with access and functional needs in emergency planning. Some counties—such as Ketchikan, AK, and Providence, RI—have a person with a disability as a member of the planning team. Some areas—such as Berkeley, WV, and Luzerne, PA—use input from local agencies such as the board of education or human service agencies during planning, while others—such as Portsmouth, VA, Clark, NV, and Saint Louis, MN—have formed an access and functional needs advisory committee.

Are advocacy groups or people with disabilities and others with access and functional needs asked for guidance in developing emergency communications methods?

The involvement of people with disabilities is usually through certain committees or groups.

Has emergency management reached out to advocacy groups for people with disabilities and others with access and functional needs?

A little over half the respondents mentioned that the emergency management department has solicited input from advocacy groups and people with disabilities and others with access and functional needs. (Although this question is related to the previous question, not all of the areas that said they had received input from people with disabilities and others with access and functional needs had reached out to advocacy groups) .

Do advocacy groups or people with disabilities and others with access and functional needs offer advice on Web site accessibility?

A common response was that the county manages the Web site and it is not sure whether people with disabilities and others with access and functional needs are involved. Only Maricopa, AZ, Clark, NV, and Sauk, WI, mentioned that their Web sites were accessible.

Analysis

The counties that include people with disabilities in the planning process usually do so through an advocacy group or an external agency that has representatives of people with disabilities. Clark and Maricopa Counties are the best examples. Clark County includes advocacy groups representing various types of disabilities and access and functional needs, including people with intellectual and developmental disabilities. Maricopa includes people with disabilities in the process of selecting and purchasing equipment for shelters and emergency communication in general, to ensure that the equipment is practical and useful for people with disabilities.

Federal Laws and Regulations

What guidance is provided in emergency planning? What laws and regulations are considered in emergency planning?

Every county reported receiving some form of guidance from the state and federal government, including FEMA; funding and grants from government agencies are usually

accompanied by mandatory guidance. Many counties also have partnerships with nonprofit organizations (schools, the Red Cross, the Coast Guard) and the private sector (hospitals, utility companies, banks).

All counties reported that they comply with all federal and state laws and regulations. Many counties mentioned that this is a requirement for federal or state funding. The Stafford Act and the ADA were the two laws most commonly mentioned.

Barriers

What challenges have been experienced with emergency communication?
The interesting pattern here was that if the respondent had a very positive response, it usually was not supported with much content or evidence. However, if the answer was more neutral, with an admission that there was room for improvement, the subsequent conversation usually showed a more comprehensive understanding of the local emergency communication as it related to people with disabilities and others with access and functional needs.

Almost all counties use after action reports (AARs), mandated under funding requirements. While many counties mentioned that they use AARs to identify problems, only two (Clark, NV, and Ketchikan, AK) mentioned specifically that emergency communications were addressed in these reports. The only area that specifically mentioned not using AARs was Brevard, FL, with the justification that they have never had an incident that required an AAR.

What are the obstacles for including emergency communications for people with disabilities and others with access and functional needs?
The answers were diverse. Some mentioned that it is a "two-way street" and people with disabilities and others with access and functional needs must take an active role by informing emergency management officials of their needs to ensure that they are met. A common response was to mention the shortage of funding and staff.

4.2. Promising Practices

Part of the research for this report involved identifying promising practices in the provision of effective emergency communications for people with disabilities and others with access and functional needs before, during, and after an emergency. Through a series of interviews with emergency managers and other stakeholders, the researchers identified stages in the development and planning process at which effective communications could be achieved or improved. The key concept to emerge from the interviews and analysis was the importance of the emergency planning stage at both the agency level (including emergency management and other stakeholders) and the individual level (including people with disabilities themselves). At the agency level, the emphasis is on ensuring that the needs of people with disabilities are fully integrated into the emergency plan and emergency preparedness activities (i.e., thinking about people with disabilities and others with access and functional needs not as separate or special groups but as an integral part of the community). At the individual level, this means encouraging people with disabilities to recognize their communication needs and prepare accordingly. A secondary theme that emerged from the interviews was the importance of engaging community partners, disability organizations, and people with disabilities to help emergency management understand the need for accessible emergency communications and how to implement them. Subsidiary themes to help build effective emergency communication for people with disabilities included training and tools for first responders, the use of technology and social media, and ensuring sustainable practices.

The following section discusses these five themes:

- emergency planning at the agency level;

- emergency planning at the individual level;

- technology and social media;

- training and tools; and

- sustainability.

4.2.1. Emergency Planning at the Agency Level

When people with disabilities and others with access and functional needs are included and accommodated in planning and services, a much larger portion of the population typically benefits. Assessing the needs of people with disabilities and others with access and functional needs must be an essential part of the emergency planning stages. When creating or updating an emergency plan—specifically, an emergency communications plan—emergency managers, planners, and other stakeholders must actively consider and incorporate such needs into the plan before an emergency or disaster situation. Additionally, when the needs of people with disabilities and others with access and

Figure 6. Five Themes for Promising Practices

functional needs are included during planning, those needs can be addressed in emergency drills, allowing emergency managers and first responders to strengthen skills and identify issues that may require additional planning or training.

While all emergencies are essentially local, two caveats are pertinent: (1) emergencies do not follow jurisdictional lines, and (2) the agencies and institutions with stakes in emergency management are diverse and many. This means that getting emergency information to the individual depends on coordination among emergency managers and other stakeholders both within the community and across jurisdictional lines. In addition to the first responders (i.e., emergency management, fire department, police, and emergency medical services), private organizations, NGOs, community groups, and advocacy groups also have an important role to play in emergency management and must be considered during the planning stages. Coordination among all stakeholders *before* an emergency is crucial for the emergency response to run smoothly and effectively. If the first time these agencies communicate is at the time of an emergency, confusion is most likely to occur, which could result in a lack of communication and information at the individual level, particularly for people with disabilities and others with access and functional needs.

Interviews for this report revealed that planning is the most essential step in ensuring effective emergency communications for people with disabilities and others with access and functional needs. Interviewees focused on two themes: (1) the need for coordination at the agency and jurisdictional level, and (2) the need for coordination with the community. The following promising practices reveal strategies emergency managers and other stakeholders use to ensure that communication flows at all levels.

Interagency/Interjurisdictional/Intercommunity Communications

Emergency management is interdisciplinary, involving emergency management professionals, the fire department, law enforcement, and public health officials. Many of these groups work closely with NGOs, community and advocacy groups, private sector businesses, and hospitals. To ensure that information and communications are

accessible for people with disabilities and others with access and functional needs, all agencies need to work together and draw on resources such as disability groups to help provide information. This level of communication among agencies and between jurisdictions is often lacking, which has negative consequences for emergency communications for people with disabilities and others with access and functional needs before, during, and after an emergency.

The Need for Coordination

Emergencies do not follow jurisdictional lines. Neighboring jurisdictions need to ensure that they are communicating before an emergency so that things run smoothly during the emergency. One interview revealed that when members of incident management teams were deployed to fight major fires around the country, the teams quickly become aware of interjurisdictional problems when no formal communications strategy was in place (T. Fike, personal communication, Jan. 24, 2013). This is a recurring issue: NCD pointed out in *The Impact of Hurricanes Katrina and Rita on People with Disabilities* (2006) that the lack of coordination and communication was not only between levels of government or between agencies at the same level of government, but also between people at different levels in the same agency. Smaller jurisdictions often have fewer capabilities to communicate over jurisdictional boundaries, which makes the response to an emergency or disaster uncoordinated and negatively affects communicating with and responding to people with disabilities and others with access and functional needs. In one example, this lack of coordination among jurisdictions affected people during evacuation, when one jurisdiction lacked dialysis equipment and the neighboring jurisdiction, unaware of the need, was unable to provide the equipment in a timely manner. Norwood, Gerber, and Zakour (2011, p. 6) suggest that "areas need to think regionally," especially when considering people with disabilities. Ideally, local jurisdictions should be ready to share communications strategies and resources, and all agencies in a jurisdiction with a stake in emergency response should be coordinated.

An example of how this can be achieved is offered by the Texas Disability Task Force, a high-level group of representatives from 16 agencies—including the Texas Division of

Emergency Management, Department of Aging and Disability Services, American Red Cross, Department of Assistive and Rehabilitative Services, Emergency Management Association of Texas, Salvation Army of Texas, Texas Association of the Deaf, Department of State Health Services, and Governor's Committee on People with Disabilities—as well as disability advocates. Subcommittee activities include "effective communication, preparedness and outreach, and training related to the Texas community with disabilities (Texas Governor's Committee on People with Disabilities 2013, p.10).

Promising Practice: Coordination

Seattle, WA, takes an integrated approach to emergency planning and management. For example, the emergency management planning and development specialist in the Seattle Human Services Department coordinates with the Office of Emergency Management on disability issues relevant to emergency planning in general and specifically regarding Emergency Support Function (ESF) 6: mass care and housing.[31] The Office of Emergency Management holds twice-monthly meetings for all ESF groups, which may involve representatives from all first responder agencies as well as emergency managers and other stakeholders (both traditional and nontraditional), including fire, police, information technology, public utilities, public health, facility services, electricity, human services, and the Office of Immigrant and Refugee Affairs. Each area has an assigned ESF focus. Because of the number of agencies that are included in the meetings, response can be coordinated among all agencies, and when the needs of people with disabilities and others with access and functional needs are discussed, all agencies become aware of them.

In Nevada County, CA, there is a monthly emergency services meeting with fire and law enforcement chiefs, and a quarterly emergency services council meeting that includes representatives from the Red Cross, utility departments, the cities within the county, county transportation, and local community organizations, including disability advocacy organizations. All fire chiefs and Office of Emergency Services coordinators meet regionally each year to ensure cooperation in response within the region (for Nevada County, the regional meeting includes 12 counties). As a result, counties are aware of the response plans for neighboring jurisdictions and are better able to communicate and coordinate during an emergency.

Community partnerships

The phrase "engage the whole community" is often used in emergency management and planning, but many interviewees noted that it is not well understood or realized. In addition, as Norwood et al. (2011) point out, "The problem remains that too often emergency management and disability organizations and providers do not know one another. They can be in the same town, housed on the same road . . . but have not yet connected" (p. 8). FEMA's *Comprehensive Preparedness Guide 101 Version 2.0* (2010a) states that emergency plans that represent the whole community must also involve the whole community in the planning process. Craig Fugate, the administrator of FEMA, further notes how fundamental the whole community can be during and after a disaster:

> A government-centric approach to disaster management will not be enough to meet the challenges posed by a catastrophic incident. That is why we must fully engage our entire societal capacity, leveraging trade associations, non-governmental organizations—including those that represent different linguistic and ethnic minority groups—faith-based organizations, private industry, and social and fraternal organizations. These are the organizations that provide the bulk of services to communities every day, and to the extent that they are able, they should continue to be the primary provider of such services in a disaster. The quicker these entities are able to get back on their feet, the faster communities as a whole will be able to recover. (Fugate, 2011, p. 7)

A clear theme that emerged from the interviews was the importance of engaging community partners to help emergency management understand the need for accessible communications and how to implement accessible emergency communications. Local jurisdictions have developed a variety of ways to include the "whole community" in the planning process for effective emergency communications. Jurisdictions use partnerships to understand what the communications needs are and how best to address them.

Promising Practice: Community Partnerships 1

In order to include people with disabilities and others with access and functional needs in emergency plan development, the planners for Stearns County, MN, used C-MIST as a guide. C-MIST stands for Communication, Medical, Independence, Supervision, and Transportation, and is based on a functional needs framework (Kailes and Enders, 2007). It identifies people's actual needs during an emergency, including people with temporary needs and those who do not identify themselves as having a disability. The planners organized a series of meetings for people from the community who represented each letter of C-MIST to identify what was missing from the emergency annex plan in each category. From these meetings, the emergency management team was able to create a more comprehensive plan that reflects the needs of the entire community, integrating the needs of people with disabilities and others with access and functional needs, and establishing community partnerships to disseminate information in the ways that are most accessible. Chatham County, GA, holds roundtable meetings with emergency managers and other stakeholders, such as the local American Red Cross and the health department, in addition to citizens with disabilities. Stakeholders are made aware of communication barriers that exist for their citizens with disabilities and what is needed to overcome those barriers. For example, one meeting brought to light the need for ASL interpretation

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and closed captioning in emergency messages directed at people who are deaf or hard of hearing. For individual citizens, the process is one of personal preparedness and creating an emergency plan.

The County of San Diego Office of Emergency Services (OES) partners with local deaf community groups (in addition to many other disability organizations) to ensure that people who are deaf or hard of hearing are receiving effective emergency communications. Following the 2007 wildfires, the OES worked extensively with Deaf Link and the county's Public Health Services and Aging and Independence Services to create an integrated mass notification system, Accessible Alert San Diego, which provides individuals who have signed up for the service the option of receiving alerts via text, voice, video, ASL, and braille.

Promising Practice: Community Partnerships 2

Functional assessment service teams (FASTs) were created in California following Hurricane Katrina to support people with access and functional needs in general population shelters. FASTs have two key functions: (1) to perform a functional assessment of people with disabilities and others with access and functional needs as they arrive at shelters, "to distinguish between people who need assistance in maintaining their health, safety and independence, from those who need acute medical help," and (2) to determine and acquire materials and resources needed for people with access and functional needs so they are able to remain at the shelter, including resources for accessible communication (California Department of Social Services, 2007; Kailes, 2012b).

FASTs are created through partnerships between emergency management and other stakeholders, such as the American Red Cross, and community and disability organizations. The strength of a FAST is the diversity of skills and experience among team members. FAST members must have at least two years of experience working with people with intellectual, developmental, or psychiatric disabilities, or hearing, vision, physical, or mobility disabilities. They receive 16 hours of DHS-approved training in addition to their "knowledge of the cultures and service networks of the people they serve" (Kailes, 2012b, p. 30). FAST members must be able to deploy quickly so they can begin assessments as soon as shelters open after a disaster. As Kailes noted, this model not only helps ensure that "people maintain health, mobility and [are able to] successfully manage in shelters and other locations" but also helps "reduce use of scarce, expensive and intensive medical services and institutionalization" (p.44).

Other states that use the FAST concept include Oregon, Texas, Minnesota, Michigan, Hawaii, and Maryland. Additionally, some areas implement the concept under different names, including San Diego with rapid assessment teams (RATs) and Los Angeles with disaster assistance response teams (DARTs).

The Need for Integration

Interviews revealed that a key element to ensure effective emergency communication for people with disabilities and others with access and functional needs is the integration of their needs into the emergency plan. In the past, people with disabilities and others with access and functional needs have often been relegated to a separate "special needs" annex of the emergency plan. However, by the time such an annex is pulled off the shelf, people with disabilities and others with access and functional needs have already been overlooked. Both San Diego County, CA, and Stearns County, MN, have integrated the communication needs of people with disabilities and others with access and functional needs into the general emergency plan. The result is that these needs are considered an

integral part of overall planning and not after the fact (S. Place, personal communication, Feb. 4, 2013).

4.2.2. Emergency Planning at the Individual Level

Challenges

Many interviewees stressed that emergency preparedness must begin with the individual. A common mantra in considering emergency preparations is "You're On Your Own" (YOYO) for 72 hours. Some interviewees suggested that people with disabilities and others with access and functional needs have low levels of interest in emergency preparedness, but in fact such apathy is reflected in the general population. The FEMA Citizen Corps National Survey (2009) revealed that while 57 percent of people had disaster supplies set aside in their homes, only 44 percent had a household disaster plan. In addition, for those who did have disaster supplies, preparations were inadequate, mostly including prepackaged foods and bottled water, and with lower percentages for such essentials as a flashlight (42%), first aid kit (39%), batteries (27%), battery-powered radio (20%), and medications (11%) (FEMA, 2009).

Levels of preparation also decrease with income (FEMA, 2009). This is a relevant factor to consider, in light of the fact that the poverty rate for people with a disability is 27 percent, compared with 11.9 percent for people without a disability (Erickson, von Schrader, & Lee, 2012). A significant proportion of people with disabilities and others with access and functional needs are at the low end of the socioeconomic scale and do not have disposable income to stockpile emergency-related supplies. Additionally, according to Kailes (2012a), for these people, emergency preparedness falls below many other items in their hierarchy of day-to-day survival needs. Thus, while it is important to emphasize personal preparedness for people with disabilities, specific challenges must be acknowledged.

Making Preparation Inclusive

All preparedness material should include content that directly addresses the concerns of people with disabilities and others with access and functional needs, as well as relevant links and referrals to more specific information. As stated by Kailes (2012a),

> General emergency preparedness information is critical for everyone. However, sometimes these resources have to be supplemented with more specific information for people with hearing, vision, mobility, speech, emotional and cognition limitations. Advice for the general population is not always equally applicable for some people with disabilities and others with access and functional needs. For example, many wheelchair users cannot take cover under tables and desks, advice that is commonly given regarding how to respond immediately to an earthquake. (p. 107)

Preparedness information should be comprehensive and proactive, and as much as possible, suggest measures that have little or no cost, such as these:

- **Establish support teams.** Kailes (2009) says that support teams should include a variety of people (not just a buddy system). Teams should be established where the person spends most of his or her day, which might include work, home, school, or a volunteer site.

- **Learn how to use communication tools and identify the tools that will be available during an emergency.** During an emergency, power outages may cause some communication tools to fail, making redundancy important. Being prepared with a variety of tools will ensure that one is able to receive information and communicate with one's family and support team. Preparedness information should emphasize that cell phones should be kept charged, extra batteries should be on hand for radios, and people should be able to use all the emergency capabilities on their cell phones.

- **Be able to quickly communicate lifesaving information.** In an emergency, Kailes says (2009, p. 5), "In spite of [the] best planning, sometimes [people] have

to build a support team on the spot." It is imperative that people with disabilities are able to communicate information about their needs to others who may be trying to help. For example, "Connect the battery by the window to my vent by following the instructions attached to the battery." If the person is unable to communicate verbally, information may be prewritten: "I cannot speak, but I do hear and understand. I use a communication device, and I can point to simple pictures or key words. You will find a communication sheet in my wallet."

● **Create an emergency plan.** Preparedness information should emphasize that everyone needs to create an emergency plan. For a person with a disability, this plan might include information about ensuring a supply of electricity for life-support devices such as home dialysis or breathing machines, or information about accessible evacuation plans. In addition, preparedness information should emphasize the importance of keeping copies of prescriptions and insurance cards on hand, as well as the model name and serial number of any essential equipment.

Promising Practice: Inclusive Personal Preparedness Trainings

The FEMA Getting Real II Conference (2011) highlighted the benefits of inclusive preparedness training such as that offered through community emergency response team (CERT) classes, which can give people with disabilities and others with access and functional needs a boost toward emergency preparedness and a stake in emergency management (Carter, 2011). Conference presentations noted that there is potentially a job for everyone in emergency response (Boyce, 2011; Carter, 2011). Recommended measures to ensure accessibility included using local interpreters, especially for ASL, arranging for caregivers to be included in training, and ensuring that all materials are accessible; for example, captions, large print, and information that can be read via screen readers. In addition, the need to teach

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everyone involved in emergency situations how to respond to the needs of people with disabilities and others with access and functional needs was emphasized; for example, teaching rescue activities for service animals (Carter, 2011).

Promising Practice: Feeling Safe, Being Safe Training

Feeling Safe, Being Safe is a train-the-trainer approach for sharing personal preparedness information. All the trainers are people with disabilities. The trainers must first be prepared themselves and then learn how to share preparedness materials with others. Originating in California with the California Department of Developmental Services, and with assistance from the Department of Homeland Security, Feeling Safe, Being Safe training aims to activate participants to take charge in their own safety planning. The training employs a simple learning strategy to work toward "enhancing personal emergency preparedness" and "creating opportunities for persons with disabilities to be viewed not merely as potential victims but as community assets who may assist others in their advanced preparations" (Board Resource Center, 2009, p. 4). The training strategy is described as "Think-Plan-Do" and is meant to help people think about what they want to accomplish, identity specific steps to accomplish their goals, and then carry out the plan (Board Resource Center, 2009). During the training, which is often given by people with disabilities, individuals can learn about creating a personal safety plan, and how to "use their community resources and agencies" and "reach out for assistance from neighbors" (p. 14). Finally, the training allows individuals to complete graphically illustrated worksheets, "which become the emergency plan and lists personal items that should be included in the emergency kit" (p. 15).

4.3. Technology and Social Media

New tools are always emerging for effective emergency communications for people with disabilities and others with access and functional needs. A number of interviewees referred to the role of technology in modern communications. The following are a few examples.

4.3.1. Smart911 and SmartPrepare

Smart911 is a commercial service that local jurisdictions can install at their public safety answering points (PSAPs).[32] When people fill out a Smart911 profile online, the information is connected to their phone number, so that when they call 911, the information will appear on the screen at the PSAP. People can create a free and secure Smart911 profile online, divulging as little or as much information as they want, including the following:

- Additional telephone numbers

- Personal information, including age, gender, and a physical description

- A personal photo

- Addresses (e.g., home, work)

- Medical conditions, disabilities, or access and functional needs, including language and needs

- Medications, allergies, or any additional rescue notes

- Information about pets or service animals

- Emergency contacts

- Vehicle information

- Location of "safe places" for hiding or sheltering in place

- Information concerning the best way to access the house

- Make, serial, and model numbers of durable medical equipment or assistive technology, including the vendor who supplied it and the funding source—this will be very valuable for people who have to leave equipment behind or whose equipment is damaged during a disaster

When a person calls PSAPs that have Smart911, the 911 operator is able to access within seconds the information linked to that particular phone number, which is stored securely in the cloud. People can visit www.smart911.com to see whether Smart911 is available in their area and to create a Smart911 profile. Even if it is not currently available their area, profiles travel with the designated phone number, which means that the profile is available to dispatchers in any area with Smart911 capabilities.

The concept behind Smart911 is to better prepare first responders before they arrive on the scene, giving them more situational awareness and answering questions such as: Who are they trying to help? What does that person look like? What additional needs does the person have? Is he or she a wheelchair user? Does the person need an ASL interpreter or text to communicate with the first responder? Do the first responders have the correct equipment or personnel for the situation?

The following additional uses for the system are specifically related to people with disabilities and others with access and functional needs:

- Attaching photographs of people who may wander, such as children with autism or adults with dementia.

- Indicating possible hiding places of children or adults with disabilities.

- Indicating a place for a hidden key (e.g., for people who are elderly and may have fallen but do not want their door broken in).

- Identifying existing medical conditions so that first responders can bring essential medical equipment.

- Identifying people who are deaf or hard of hearing and may need to use texting as a form of communication with the dispatcher.

- Including the microchip number for companion animals or service animals.

SmartPrepare is a similar system, although information is gathered specifically for emergency managers, allowing them to properly prepare for the needs of their community. SmartPrepare can be used to target the needs of residents or even commuters, which may be beneficial in large urban centers such as Atlanta, where the population increases by over 60 percent during the workday (Christie, 2005).

A key feature of both Smart911 and SmartPrepare is that they are not registries specifically for people with disabilities. Instead, these programs aim to provide for the entire community, in accordance with the principles of universal design and universal inclusion. This can be important for a person with a disability or access and functional needs who may not identify as having a disability. For example, when the person is filling out a profile, he or she might check the box "has a pacemaker." While this condition is important to be aware of, especially during an emergency, this person might not have self-identified as having a disability on a traditional registry.

Interviews with emergency managers and public safety officials revealed that they would prefer to have no information rather than out-of-date information, as old information can create dangerous situations or inappropriate responses, which is a constant criticism of registries. Smart911 requires that people log in to their profiles once every six months to ensure that information is up to date. If, after receiving a reminder phone call or text message, the person does not log in, the information is no longer accessible.

Interviewees mentioned a number of methods employed by local jurisdictions to fund implementation of Smart911. Smart911 is generally fundable through the Access

Recovery Charge (ARC) because it plays a critical role in the 911 call-taking process by providing additional information. (The ARC is a surcharge applied to landline and mobile phone bills and used to fund the 911 system.) In addition, some jurisdictions have used RICO (Racketeer Influenced Corrupt Organizations) funds or seized asset funds to offset the startup costs for Smart911, as these funds typically must be used for one-time expenses. Some jurisdictions have applied for grants to cover the costs.

SmartPrepare is based on population size and usually is not ARC-fundable, as it is more of an emergency management tool. SmartPrepare is normally funded from emergency management budgets, city or county budgets, or one-time grants.

4.3.2. Next Generation 911

In 2012, legislation was passed to create the Next Generation 9-1-1 Advancement Act (Wireless RERC, 2012c). The Act allows for the creation of a new 911 system that will use Internet Protocol (IP)–based technology to deliver and process 911 traffic; this will allow for the potential to support nonvoice emergency messages such as text, image, and video messages. This is especially beneficial for people who are deaf or hard of hearing, who may traditionally have relied on TTY or other people to contact emergency services. Frederick County, Maryland, the home of the main campus of the Maryland School for the Deaf, has begun to implement text-to-911 (DeMetrick, 2013).

The potential for NG911 was highlighted by the FCC during its review of the failure of the 911 system in areas hit by the June 2012 *derecho*, a fast-moving windstorm that left many people without power in the Midwest and Mid-Atlantic regions. The loss of power disrupted 911 communications, causing 77 PSAPs to lose at least some connectivity. For example, some PSAPs were unable to reroute calls, while others were unable to gather accurate location information (FCC, 2013b). The new system would allow for redundancy and more reliability, and would enable more people to contact emergency services in such a situation. In its follow-up report assessing communications during the *derecho*, the FCC noted that NG911 systems will be able to reroute calls automatically to

other PSAPs, including those that are out of the area, and will be able to draw from more sources to obtain automatic location information (FCC, 2013b).

4.3.3. Video Remote Interpreting and Video Relay Services

Video remote interpreting (VRI) and video relay services (VRS) provide two important but different functions for emergency communication and are funded by two entirely different sources. Both services provide ASL interpretation for people who are deaf or hard of hearing; however, they do so in different ways. VRS is a form of telecommunication relay service (TRS) that was created by Title IV of the ADA and is regulated by the FCC. Someone who wants to make a telephone call to a person who is deaf or hard of hearing connects with a VRS provider via an Internet-based video camera that then provides ASL interpretation of the call to the person on the other end.

VRI is a remote commercial interpretation service. If two or more individuals in the same room need an ASL interpreter and a live interpreter is not immediately available, they can use VRI via Internet-based video conferencing equipment. VRI is not considered a phone call and is thus not regulated by the FCC. It can be a form of accommodation required under Title II and Title III of the ADA.

Promising Practice: New VRS Technology

The state of Texas is currently piloting the use of VRS to communicate emergency information for people who are deaf or hard of hearing. Under the system, emergency management can send an emergency message to the VRS provider, who interprets it and sends it back to the emergency management office, which can then upload the video to YouTube, where it can be captioned. The original emergency message will include a link to the video.

Promising Practice: New DeafLink Technology

DeafLink is an all-hazards alert system that can create emergency messages in ASL format for dissemination to people who have signed up for this service. DeafLink is currently used in San Diego as the Accessible Alert San Diego System. The system sends accessible alerts and information to Internet- and video-capable devices such as computers, cell phones, smart phones, tablet computers, and wireless braille readers (Ready San Diego, 2013). Alerts also include ASL interpretation (K. Chiodo, personal communication, Jan. 21, 2013).

4.3.4. Apps

The application industry is booming, and because it is an area of such rapid development, this report can offer only a partial list. The Institute on Disabilities at Temple University in Pennsylvania and an affiliate of the Pass It On Center provided information on apps to aid in emergency communication. Additional tips concerning apps include making sure the individuals or first responders are familiar with the app before an emergency and preparing additional chargers, such as solar-powered or car chargers, for emergency situations.

- **Apps for people who are blind or have low vision:** Braille Touch, Zoomreader, Text Enlarger, Eyeglasses, Dragon Dictation, Access Note, Speakit, Ideal Group Reader

- **Apps for people with speech disabilities or low English proficiency:** EC4ALL, Proloquo2Go, TaptoTalk, Picture Card Maker, Free Translator, Google Translate

- **Sign language:** Let's Sign, Sign4me, iSignLite, ASL Translate

- **VRS and VRI:** Sorenson Video Center, IP-Relay, Hamilton Mobile Captel

- **Personal preparedness:** iMPrepared, FEMA app, American Red Cross apps, Red Cross Shelter View

- **Additional apps:** ViA by Braille Institute, SoundAMP, Sprint ID Accessibility Packs, Braille Touch

4.3.5. Social Media

The professionals interviewed for this section considered social media to be additional informational tools. For example, the Stearns County emergency management team in Minnesota said social media were good tools for both information dissemination and feedback for emergency communication, although their effectiveness depends on local demographics; for example, an area with a large population of college students might derive greater benefit from social media than an area with an older population.

Interviewees stressed that social media are not "one-way"; for example, in addition to being used as an information dissemination resource, they can be used effectively to determine when needs are not being met in the community, especially during an emergency. During Hurricane Sandy, people with disabilities used social media to ask for help. For example, Daniel Florio, who uses a ventilator to breathe, used Facebook to find additional fuel for the generator to power his ventilator, and Crystal Evans-Pradhan used Facebook to ask for donations to buy another Sandy survivor, Nick Dupree, more sustainable batteries for his ventilator (Boatman, 2013).

Even though social media seem to offer additional tools for emergency communications, problems with accessibility can prevent the information from reaching people with disabilities. Coltham (2012) and Hollier (2012) identified the following accessibility issues:

- Color contrast

- Font size

- Keyboard navigation

- Use of CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart)

- Dynamic pages and rich Internet applications

- Missing text alternatives

- Lack of captions (or of meaningful captions)

- Lack of ASL interpreters

- Screen reader inoperability

The Emergency 2.0 Wiki Accessibility Toolkit offers resources to overcome accessibility barriers in social media and to help emergency managers and other stakeholders ensure that messages are accessible when they are disseminated through social media. HowTo.gov provides tips for "Improving the Accessibility of Social Media in Government."

4.3.6. Digitization of Medical Records

Jan and Lurie (2012) noted that "the first strategy for building community resilience for people with functional needs is to continue to support the development of health information systems" (p. 2272). Emergencies and disasters can result in records being destroyed, lost, or displaced. When records are digitized, they remain accessible and easily transferrable (NCD, 2009). When a devastating tornado hit St. John's Regional Medical Center in Joplin, MO, in May 2011, records were scattered 75 miles away, but backup copies were available thanks to a switch to electronic patient records just weeks before the traumatic event (Zagier, 2011). Following such an event, it is often difficult for patients to reconstruct and communicate their medical history and prescription regime. This may be especially true for people with intellectual, developmental, or psychiatric

disabilities: After Hurricanes Katrina and Rita, "Some people did not know what medications they were taking nor did they remember the dosage level" if they even had been able to bring their medications at all (NCD, 2006, p. 18). In addition, "Some doctors and health professionals reportedly declined to serve people with psychiatric disabilities because they were unfamiliar with the evacuees' mental health and medical histories" (p. 18). Jan and Lurie further note that "supporting the development of interoperable electronic records for use among agencies will not only allow them to obtain critical information in the event of a power outage, but also enhance routine coordination of care for people with functional needs" (p. 18).

4.3.7. Replacing Durable Medical Equipment and Assistive Technology

Durable medical equipment (DME) and assistive technology (AT), including communications devices, may be lost or damaged during an emergency. Emergency management will need to help provide or replace this equipment, so AT and DME providers need to be part of the emergency planning process. One of the key challenges is how people in need of assistive equipment can communicate that need to emergency managers and other stakeholders who may already be working to get the assistive equipment to the people with disabilities. The challenge is multifaceted:

- People with disabilities and others with access and functional needs must know exactly what AT or DME they need.

- People with disabilities and others with access and functional needs need a systematic way to request and receive AT or DME following an emergency or disaster.

- Emergency managers and other stakeholders must be able to identify consumer needs. After an emergency or disaster, it might not be possible to meet all customized needs immediately.

- Emergency managers and other stakeholders must be able to coordinate and communicate with each other in order to provide people with disabilities and others with access and functional needs with the assistive equipment they need.

4.3.8. Multimodal Alerts and Warnings

The Wireless RERC (2005) describes a multimodal approach to increase accessibility of alerts and warnings by providing emergency information in many different formats. For example, the Rochester (NY) Institute of Technology provides students and faculty with an opt-out alert and warning system that can send emergency messages via instant message, text message, voice message, email, and Alertus beacons and desktop notifications. The multimodal approach to alerting allows for redundancy, which helps meet the needs of people with various disabilities. In addition, the Alertus beacons (which are also used by Gallaudet University) provide in-building emergency notification through strobe lights and audio signals. The device also has an LCD display to convey the emergency message via text and has the ability to connect with text-to-speech speakers and video switches.

The implementation of the Integrated Public Alert and Warning System (IPAWS) is a promising practice for delivering multimodal alerts and warnings. The system aggregates alerts and warnings from local, state, tribal, and federal authorities, and disseminates alerts via the Emergency Alert System, Wireless Emergency Alerts, NOAA's HazCollect, Internet services, and state and local alert systems. The Government Accounting Office (GAO) notes that IPAWS will use the Common Alerting Protocol to disseminate alerts and warnings to a larger portion of the population via many formats, including radio, television, mobile alerts, and "messages to specialized alerting devices for individuals with disabilities" (GAO, 2013, p. 21).

Emerging Practice: Captioned Radio

NPR Labs has partnered with Towson University, the Helen Keller National Center, and the National Federation of the Blind to develop captioned radio, including a prototype that converts radio data into braille (Sheffield & Starling, 2011). The projects allow for public radio broadcasts, which reach over 95 percent of Americans, to relay important emergency information to people who are deaf, hard of hearing, or deaf-blind through the use of digital radio. Captioned radio, specifically, allows for live speech-to-text transcriptions to provide a way to read the broadcast. The Captioned Braille Radio Initiative builds on this technology to convert the text-data into braille, which can be read through a refreshable braille display developed by Towson University and NPR Labs. The refreshable braille prototype also supports bed shakers to alert individuals during an emergency.

4.4. Training and Guides

Training is necessary to ensure that first responders are effectively communicating with people with disabilities and others with access and functional needs. As noted by DOJ (2014), "A critical and often overlooked component of ensuring success is comprehensive and ongoing staff training. Covered entities may have established good policies, but if front line staff are not aware of them or do not know how to implement them, problems can arise. Covered entities should teach staff about the ADA's requirements for communicating effectively with people who have communication disabilities."

4.4.1. Guidebooks

Some interviewees—such as those from Decatur, GA, and Stearns County, MN— provide their first responders with a pocket-sized guidebook. In Stearns, the guidebook

contains tips on communicating with people with disabilities; in Decatur, it is a picture manual that first responders can give to a person who is not able to communicate verbally. The person can then search the manual for a picture that corresponds to his or her current problem (Springer & E. Hausauer, personal communication, Dec. 17, 2013; T. Washington, personal communication, Feb. 20, 2013). The New York State Office for People with Developmental Disabilities has created a guidebook titled *On the Scene and Informed: First Response and Autism* (2102), which provides first responders with information on how to identify, communicate with, and interact with people with autism during an emergency situation.

4.4.2. Classes

First responders receive extensive annual training, and NCD's 2009 report *Effective Emergency Management* recommended incorporating training in effective emergency communications for and recognizing the needs of people with disabilities and others with access and functional needs. As an incentive, the report suggested that courses such as effective emergency communications for people with disabilities could be certificate courses.

In New Jersey, the Rutgers University Office of Continuing Education has created an online course to provide first responders with a baseline understanding about developmental disabilities and best practices for interactions (McHugh, 2010). The training uses real-world scenarios and walks first responders through modules to provide education on developmental disabilities and how to anticipate and proactively deal with the potential challenges of these encounters, including using simple, direct language and avoiding jargon and expressions that can have more than one meaning. New York's Niagara University has developed a training curriculum that provides first responders with the knowledge necessary to serve and respond to people with disabilities (Niagara University, 2013). The training has been developed for all stakeholders in emergency management, including law enforcement, fire, EMS, 911 operators and dispatchers, and emergency management. The curriculum discusses types of disabilities, as well as

etiquette and interaction skills, how specific disabilities present, first-person language, and overcoming communication barriers.

4.5. Sustainability

For any practice to be described as truly promising, it must also be sustainable. Interviewees were asked what is required to ensure that effective emergency communications for people with disabilities and others with access and functional needs are developed as sustainable practices.

4.5.1. Making Accessibility a Priority

Many interviewees noted that sustaining effective emergency communications for people with disabilities and others with access and functional needs requires that this issue be brought to the forefront and made a priority. In San Diego County, this is done by integrating the needs of people with disabilities and others with access and functional needs into the overall emergency plan instead of addressing them in a separate annex. When the needs of people with disabilities and others with access and functional needs are integrated into the plan, communication needs will be considered collectively and not after the fact (S. Place, personal communication, Feb. 4, 2013).

Sustainability of effective and accessible emergency communications also relies on agency head buy-in, meaning leadership behind these practices. Support from the governor, city council, or mayor can affect the sustainability of accessible communications. For example, the Texas Governor's Committee on People with Disabilities offers policy recommendations; one policy area addresses emergency management. Realizing the impact emergencies and disasters can have on people with disabilities and others with access and functional needs, the committee created a taskforce to develop a functional needs support services toolkit. The toolkit is specifically designed to "provide first responders and emergency manager professionals [with] information about interacting with Texans with disabilities during a disaster and to identify

disability leaders in local communities" (State of Texas, 2013, p. 2). Specific to communications, the toolkit offers tips for interacting and communicating with people with disabilities during a disaster and provides talkboards, pictograms, and basic emergency sign language. The task force and the Office of the Governor realize that accessibility before, during, and after an emergency is not only extremely important but also a legal requirement. Because these issues are important at the state level, local jurisdictions now have a resource when they are trying to implement accessible emergency communications at the local level (W. O'Neill, personal communication, Feb. 25, 2013).

Continual Reevaluation of Plans

Many interviewees suggested that in order to make effective emergency communications for people with disabilities a priority, emergency managers and other stakeholders need to meet periodically to discuss the issue. One sentiment that was echoed in many of the interviews was "If you don't talk about it, you forget about it." For example, the Nevada County Consolidated Fire District in Northern California meets every spring, right before fire season, to refresh preparedness efforts, including emergency communications plans. Interviews revealed that many areas review emergency plans at least every four years and especially after a disaster. In Stearns County, MN, emergency management ensures that the needs of people with disabilities and others with access and functional needs are a priority by continuing to include these people in emergency planning. Since 2008, the county has held meetings with individuals and disability organizations to ensure that their needs are met in the emergency plan.

SECTION 5. **Findings and Recommendations**

The research and anecdotal evidence for this report clearly demonstrate that people with disabilities and others with access and functional needs must be an integral part of emergency communication activities before, during, and after an emergency or disaster, small or large, natural or manmade. This is so for multiple reasons, whether the justification is legal (the laws are explicit in this regard); social (communication is a social process that must be inclusive to be effective); pragmatic (there is no effective difference in the mechanisms of engagement and response between those with and without disabilities); or demographic (the definition of people with disabilities and others with access and functional needs covers a large population who can benefit from attention to access, including accessible communication).

The focus of this report is on how to make that integration happen, especially through planning activities at the local level. The following findings and recommendations underpin that emphasis.

FINDING 1. The communication needs of people with disabilities are not being fully integrated by emergency managers in planning efforts.

Emergency communication is a social process that must be initiated long before an emergency begins; it continues during the emergency and after it ends. From the emergency management perspective, the main goal of emergency communication traditionally is to elicit a response from an individual, often to take shelter or evacuate. However that response depends on complex variables; in particular, it relies on achieving a basic level of trust.

It is essential for emergency management to involve people with disabilities and others with access and functional needs in local planning and to consider their needs in actual plans, including them in training exercises and incorporating their needs in final

emergency planning documents. This is emphasized in the National Mitigation Framework, which states, "Local governments that integrate the rights of individuals with disabilities and others with access and functional needs into mitigation planning reduce adverse consequences and barriers that create risk for them and those associated with them and increase independence" (DHS, 2013a, p. 18).

Recommendations

- ***Emergency managers must ensure that the communications needs of people with disabilities and others with access and functional needs are integrated into all parts of emergency planning at the local, state, tribal, and federal levels.*** NCD recommends that accessible communications be considered as part of a basic emergency plan, not as an annex. While Version 2.0 of FEMA's *Comprehensive Preparedness Guide 101* (2010a) makes numerous references to the imperative to incorporate the needs of people with disabilities and others with access and functional needs into all parts of emergency planning, communications needs are not explicitly mentioned. Communications are listed as one of 9 core functions "critical to successful emergency response" and one of 15 emergency support functions (ESFs), which appear as part of a model Functional Annex Structure. A table showing possible relationships among the core functions, departments and agencies, and ESFs indicates that ESF #2, Communications is one of the few ESFs to appear alongside all the core functions, with the surprising exception of the resource management function (FEMA, 2010a, Sections 3-17, 3-18). NCD recommends that the importance of communications be recognized as part of "agency roles and responsibilities" as described in the Basic Plan in Version 2.0, and expanded upon to explicitly acknowledge the communications needs of people with disabilities and others with access and functional needs.

- ***FEMA must urge emergency managers to include the communications needs of people with disabilities and others with access and functional needs as an integral part of planning activities and training exercises, and ensure that they are integrated into local-level emergency planning.***

NCD recommends that FEMA explicitly recommend that the communications needs of people with disabilities and others with access and functional needs be an integral, core part of planning activities and training exercises, and be integrated into local-level emergency planning.

FINDING 2. There is a lack of consolidated, consistent, and coordinated guidance available to emergency managers on the communication needs of people with disabilities.

Historically, local emergency managers have had to draw from an array of different sources in creating their emergency operations plans and integrating communication needs. With the publication of the new National Planning Frameworks in May 2013 and FEMA's *Comprehensive Preparedness Guide 101 Version 2.0*, the process of integrating the needs of people with disabilities and others with access and functional needs has begun, and emergency managers do not have to find separate guidance for people with disabilities or access and functional needs. The need now is to further emphasize and develop integrated comprehensive guidance at the local level, which consolidates existing critical elements of emergency operations planning, specifically including people with disabilities and others with access and functional needs.

Recommendations

- ***FEMA, in collaboration with states as appropriate, should provide consolidated, consistent, and coordinated guidance to local emergency managers on the communication needs of people with disabilities.***
  NCD recommends that FEMA, in collaboration with states as appropriate, provide more integrated, hands-on guidance to local officials who are activated during emergencies. This should be coordinated with the FEMA regional offices' public information cadres, with special training by the FEMA regional disability integration specialist, state-level disability workgroups, and state ADA coordinators. The guidance that is currently provided tends to be vague or

generalized and is not necessarily reaching the right people: local first responders and emergency personnel.

- ***FEMA, DOJ, and the FCC should collaborate to create specific guidance for local officials regarding effective communication before, during, and after emergencies.***

  NCD recommends that FEMA, DOJ, and the FCC collaborate to create specific guidance for local officials regarding effective communication before, during, and after emergencies, which should be provided during their training and repeated regularly.

- ***There must be increased collaboration among local, state, tribal, and federal governments to ensure effective communications for people with disabilities before, during, and after emergencies.***

  NCD recommends increased coordination among local, state, tribal, and federal governments. A coordinating mechanism between FEMA and the local authorities should be created to increase coordination between the two entities and make local entities more comfortable receiving assistance from FEMA. The aim should be for all local agencies to have the ability to provide consolidated, consistent, and coordinated guidance concerning inclusion of accessible and effective emergency communications for people with disabilities and others with access and functional needs at all stages of an emergency.

FINDING 3. There is an ongoing need for increased outreach to the disability community by emergency managers.

It is essential to help people with disabilities and others with access and functional needs take the proper steps to mitigate and prepare for disasters. As Mileti (1999) notes, the effectiveness of communication during the emergency will depend on how effective (and in this case accessible) communication is during times of nonemergency. FEMA has encouraged emergency management to consider a "whole community" approach to

emergency management. Emergency plans should involve the entire community in the planning process, so that the needs of all constituents are reflected in the plan (FEMA, 2011a). In addition, FEMA administrator Craig Fugate has urged emergency management to consider the fundamental role community organizations, including disability organizations, can play before, during, and after an emergency to engage their members (Fugate, 2011). There is an ongoing need for outreach to people with disabilities and other access and functional needs; this would aid in the dissemination of emergency preparedness information. The National Mitigation Framework states that "leadership should foster inclusion of the whole community, including members with disabilities and others with access and functional needs, limited English proficiency, and ethnically and racially diverse groups" (DHS, 2013a, p. 20). This will not only ensure that accessibility is considered in emergency planning but may help overcome some of the feelings of mistrust people with disabilities and others with access and functional needs experience when interacting with emergency personnel and services.

Recommendations

- ***Emergency managers must increase outreach efforts to the disability community.***

  NCD recommends increased outreach by emergency management to people with disabilities and other access and functional needs in the community, along the lines indicated in the National Mitigation Framework (DHS, 2013a).[33] Emergency management and disability advocacy groups must educate people with disabilities and other access and functional needs on the importance of emergency preparedness and response, so they are able to become stakeholders and take an active role in emergency planning, in particular to acknowledge and plan for the fact that they might be on their own for the first 72 hours after the emergency—commonly referred to as the YOYO (You're On Your Own) effect. As far as possible, this should be a two-way activity; interviews for this report indicated that in many cases emergency management professionals still have a way to go to raise their awareness of the challenges faced by people with disabilities.

- *FEMA must assist in increasing outreach efforts to the disability community by local emergency managers.*

  NCD recommends that FEMA develop a guide, both print and online, for local emergency management that explains the benefits of a proactive approach to the local community of people with disabilities and other access and functional needs. This guide should be based on many of the research elements contained in this report, including incorporating the advice contained in "Making Preparation Inclusive" (see Section 4.2.2) that directly addresses the concerns of people with disabilities and others with access and functional needs. This advice includes the importance of redundancy in the selection of communication and tools for people with disabilities, as power outages during an emergency may cause some communication tools to fail; the importance of being able to quickly communicate potential life-saving information; and the need to create a personal emergency plan that takes into account the individual situation of the person with disabilities or access or functional needs.

FINDING 4. There is a lack of state guidance for local emergency managers on effective communications for people with disabilities.

Interviews revealed that state guidance is also needed to implement effective emergency communications at the local level. Some states have a state-level group—for example, the Texas Disability Task Force on Emergency Management, the Virginia Statewide Emergency Planning Working Group, and the Georgia Emergency Preparedness Coalition—that tries to provide local jurisdictions with a guide for including people with disabilities and others with access and functional needs in the local-level emergency operations plan. Appropriate state guidance is needed to implement effective emergency communications at the local level to ensure the inclusion of people with disabilities and others with access and functional needs in the development of a local emergency operations plan.

Recommendation

- ***States, in collaboration with FEMA as appropriate, should provide guidance and training to local emergency managers on effective communications for people with disabilities, and funding should be appropriated accordingly.*** NCD recommends that state-level groups provide guidance for local jurisdictions to ensure accessible emergency communications. Working with FEMA external affairs experts, regional disability integration specialists should help coordinate field efforts to train local entities on how best to ensure accessible emergency communications. Creating a model template for training might include a partnership with the state department of emergency management and other organizations. Extensive training of local practitioners should be conducted. State ADA coordinators, in collaboration with FEMA's regional disability integration specialists, should conduct this training for local practitioners, and funding should be allocated for this purpose. It is important that the training occur several times during the year, as personnel turnover can have an impact on the effectiveness of the training, especially during deployment to emergency sites.

FINDING 5. Technology plays an increasingly vital role in emergency communications yet remains largely inaccessible for many people with disabilities.

Technology is having an ongoing impact on emergency communications (such as Next Generation 911 systems) and the general surge in the use of alternative technologies for alerting (such as email and text messages). There are also a number of migratory trends; for example, the rate at which people with disabilities rely on television as their primary source is shifting. In 2009, research on emergency alerting methods revealed that 95 percent of participants with disabilities received alerts via television; in 2013, that percentage had dropped to 55 percent. Text messages, which once placed fifth, now place second at 31 percent.

Age is a factor in mobile communications. For both receiving alerts and sharing alert information, younger people with disabilities use text messaging and social media at substantially higher rates than older age groups. The use of mobile apps to receive alerts is also inversely associated with age, with younger age groups using mobile apps for these purposes at much higher rates than older groups. Another notable difference is in the use of social media to pass along public alert information: Respondents with disabilities use social media for this purpose more than respondents with no disability. This accords with previous research that indicated that the younger cohort of people with disabilities (ages 18–29) socializes with close friends, relatives, or neighbors more than the equivalent group without disabilities (Kessler Foundation/NOD, 2010).

However, despite the decline in the popularity of some traditional communications means, notably radio, television remains the most common means for both receiving and verifying alerts, regardless of age cohort.

Further, social media remain largely inaccessible for many people with disabilities. For example, for people with intellectual and developmental disabilities, social media Web sites may be too busy and cluttered. Many people with decreased motor skills require that the Web site be keyboard-accessible. Videos—for example, in YouTube—often lack captions or ASL interpretation for people who are deaf or hard of hearing, and audio descriptions of relevant visuals for people who are blind or have low vision.

If online information cannot be accessed via screen readers, people who are blind or have low vision will not be able to receive it appropriately on the site. Any image on a Web site that lacks ALT text[34] to describe the image and the semantic meaning of the image will also be inaccessible to people who are blind or have low vision.

Recommendations

- ***FEMA's Office of Disability Integration and Coordination should develop a social media campaign directed at younger people with disabilities.***
  NCD recommends the development of a social media campaign directed at the younger generation in the disability community, specifically people with disabilities

between the ages of 15 and 30. Initially this could be run as a pilot program, focusing on one or two local communities in areas prone to or under likely threat of a natural disaster, such as an area prone to tornadoes or major storm systems. The intention would be to work with local emergency management to develop a model of how to achieve the proactive involvement of people with disabilities and other access and functional needs in an emergency communications program, with a focus on the use of electronic and social media–based communications. The model should be offered through FEMA's Office of Disability Integration and Coordination as a disaster resource for local government. NCD recommends that FEMA explore the possibility of creating a nationwide competition, possibly with commercial sponsorship, intended to develop working models or examples of social media being used to involve people with disabilities and other access and functional needs in an emergency communications program.

- ***DOJ, in collaboration with the FCC as appropriate, should closely monitor the inaccessibility of social media and strongly consider issuing regulations to ensure accessibility.***
  NCD recommends that DOJ, in collaboration with the FCC as appropriate, closely monitor the inaccessibility of social media and strongly consider issuing regulations to ensure accessibility.

FINDING 6. People with disabilities are often not engaged in emergency preparedness activities.

Low levels of personal preparedness are common among people with and without disabilities or access and functional needs. However, the percentage of prepared individuals decreases with income, a pertinent issue for many people with disabilities and others with access and functional needs. A significant proportion of people with disabilities and others with access and functional needs are at the low end of the socioeconomic scale and do not have disposable income for emergency-related supplies. This is compounded by the reality that for some people with disabilities and

others with access and functional needs, emergency preparedness falls below many other items in the hierarchy of day-to-day survival needs.

Emergency managers and other stakeholders need to focus not only on integrating the needs of people with disabilities and others with access and functional needs into preparedness information but also on highlighting free and low-cost preparedness measures, such as building a support team.

Recommendation

- ***FEMA and other relevant federal agencies should jointly develop a model for working with local emergency management to achieve the proactive involvement of people with disabilities and other access and functional needs in an emergency communications program.***
  NCD recommends that FEMA and other relevant federal agencies, working with local emergency management, explore the development of a model for achieving the proactive involvement of people with disabilities and other access and functional needs in an emergency communications program, offering support to the local community of people with disabilities and others with access and functional needs, with a specific focus on outreach to those at the low end of the socioeconomic scale, who may be isolated in terms of communications for a variety of reasons. This outreach should be coordinated with local NGOs, faith-based organizations, and other interest groups, and could be run as part of the social media campaign recommended under Finding 5. Again, the model should be offered through FEMA's Office of Disability Integration and Coordination as a disaster resource for local government.

FINDING 7. Despite legal mandates to provide effective communication to people with disabilities before, during, and after emergencies, emergency communications remain largely inaccessible.

Although several federal laws, such as the ADA and the Rehabilitation Act, require that emergency communications be fully accessible to people with disabilities, significant barriers remain. This is due to a lack of oversight by federal agencies and to noncompliance and limited understanding of mandates by states and localities.

Recommendations

- ***DOJ, in collaboration with other agencies as appropriate, must increase its monitoring and enforcement of federal laws such as the ADA and the Rehabilitation Act, which require that emergency communications be fully accessible to people with disabilities, and funding should be appropriated accordingly.***
  NCD recommends increased investigation and enforcement of federal laws and regulations related to accessible emergency communications. DOJ, in collaboration with other federal agencies where appropriate, should conduct regular evaluations of compliance with disability laws and regulations as they pertain to effective communication before, during, and after emergencies. They should specifically monitor compliance by local, state, and tribal emergency managers and planners, as well as television broadcasters. Funds should be appropriated to DOJ, and other federal agencies as appropriate, for this enforcement.

- ***The FCC must increase its monitoring and enforcement of federal laws and regulations that require that emergency communications be fully accessible to people with disabilities, and funding should be appropriated accordingly.***
  NCD recommends that the FCC increase its enforcement of requirements for captioning and access to critical emergency information on TV, and should regulations to require sign language interpreters during emergency broadcasts.

The FCC should also consider requiring video description during all emergency broadcasts. Further, the FCC should actively enforce the 21st Century Communications and Video Accessibility Act as it relates to emergency-related communications. In addition, the FCC Consumer and Governmental Affairs Bureau, Office of Disability, must continue to send out reminders on rules and regulations to ensure compliance.

- ***DOJ, in collaboration with the FCC, must address Web site accessibility, particularly Section 508 compliance.***
  NCD recommends that DOJ, in collaboration with the FCC, address Web site accessibility, particularly Section 508 compliance. All emergency communications Web sites should be fully accessible, including adjustable font size and an option to use screen-reading technology to read the information out loud.

- ***DOJ, the FCC, and FEMA should collectively issue guidance to local emergency managers on accessible Web sites and legal mandates.***
  NCD recommends that DOJ, the FCC, and FEMA collectively issue guidance to local emergency managers on accessible Web sites and legal mandates. Although some jurisdictions use these types of media aggressively and others do not, it is imperative that the legal obligation to use media in the most accessible format possible be acknowledged and accepted.

FINDING 8. Alerts and warnings that are multimodal are better able to reach people with disabilities.

When alerts and warnings are multimodal, they will reach more people. The Wireless RERC (2005) highlights the use of a multimodal approach to increase accessibility of alerts and warnings by providing emergency information in many different formats. Traditionally, the public has been primarily alerted through the Emergency Alert System (EAS); however, in 2004, "FEMA initiated [the Integrated Public Alert and Warning System] IPAWS to integrate EAS and other public-alerting systems into a larger, more

comprehensive public alerting system" (GAO, 2013, p. 6). According to the GAO, the effectiveness of the national-level EAS is lost when alerts and warnings are disseminated through limited channels. For example, if alerts and warnings are disseminated only via television and radio, the GAO says that "large portions of the population would likely not be reached by a national-level alert—specifically all those who are not watching television or listening to the radio" (p. 20). As noted in Section 3, people with disabilities and others with access and functional needs tend to receive alerts and warnings through the same channels as people without such disabilities or needs, so multimodal alerts and warnings would benefit all; however, ensuring accessibility of alerts and warnings for people with disabilities is still necessary. The GAO notes that IPAWS will help disseminate consistent (due to Common Alerting Protocol) alerts and warnings to a larger proportion of the population via radio, television, mobile alerts, and "messages to specialized alerting devices for individuals with disabilities" (p. 21).

However, although IPAWS has the ability to disseminate consistent multimodal alerts and warnings, potentially enhancing accessibility for people with disabilities and others with access and functional needs, barriers to its implementation remain. The GAO noted that challenges include a lack of guidance for state and local public-alerting authorities, inability to test the IPAWS system, insufficient public outreach, and limited resources to implement IPAWS (GAO, 2013). Outreach activities should be scaled up to better inform individuals of IPAWS capabilities and to provide information so that public-alerting authorities can begin providing IPAWS alerts.

Recommendation

- ***The FCC and FEMA must continue to work toward ensuring that alerts and warnings are fully accessible to people with disabilities.***
  NCD recommends that FEMA and the FCC establish guidance so that public-alerting authorities are able to "fully implement and test IPAWS components and ensure integration and interoperability" (GAO, 2013, p. 29). In addition, NCD recommends that FEMA and the FCC begin to regularly test the capabilities of the

EAS and IPAWS to ensure the accessibility of alerts and warnings for people with disabilities. Finally, NCD recommends that FEMA create a campaign to better educate the public on the capabilities of IPAWS, ensuring that all outreach is accessible to people with disabilities. Elements of such a campaign are already in place, but NCD believes that such outreach can be improved; for example, by making FEMA funding available to disability advocacy organizations to engage in the campaign.

References

Acar, A., Muraki, Y. 2011. "Twitter for Crisis Communication: Lessons Learnt from Japan's Tsunami Disaster." *International Journal of Web Based Communities*, Volume 7 Issue 3, July 2011: 392-402.Aguirre, B. E. 2004. "Homeland Security Warnings: Lessons Learned and Unlearned." *International Journal of Mass Emergencies and Disasters* 22(2): 103–115.

American Red Cross. 2004. "Preparing for Disaster for People with Disabilities and Other Special Needs." Accessed November 5, 2013. http://www.redcross.org/images/MEDIA_CustomProductCatalog/m4240199_A4497.pdf.

American Red Cross. 2011. "Social Media in Disasters and Emergencies." [PowerPoint slides]. Accessed November 5, 2013. http://www.scribd.com/doc/63022972/SURVEY-DATA-Social-Media-in-Emergencies-2011

Ammons, D. N., Smith, K. W., Stenberg, C. W. 2012. "The Future of Local Government: Will Current Stresses Bring Major, Permanent Changes?" *State and Local Government Review* 44(1 Supplement): 64S–75S.

Beaudoin, C. E. 2007. "Mass Media Use, Neighborliness, and Social Support: Assessing Causal Links with Panel Data." *Communication Research* 34(6): 637–664.

Beckjord, E. B., Stern, S., Meredith, L. S., Shugarman, L. R., Chandra, A., Tanielian, T., Taylor, S. L., Parker, A. M. 2008. "Enhancing Emergency Preparedness, Response, and Recovery Management for Vulnerable Populations." Working Paper. RAND Corporation, Santa Monica, CA: 2–31.

Board Resource Center. 2009. "Feeling Safe, Being Safe." Sacramento, CA, 1–22.

Boatman, M. (January 1) 2013. "Superstorm Stories: Where was the plan?" *New Mobility*. Accessed December 4, 2013. http://www.newmobility.com/2013/01/superstorm-stories-where-was-the-plan/

Borrino, R., Furini, M., Roccetti, M. 2009. "Augmenting Social Media Accessibility." *18th International World Wide Web Conference*, Madrid, Spain54–57.

Boyce, C. 2011. "Inclusion of People with Disabilities into CERT." Proceedings from: *Getting Real II: Promising Practices in Inclusive Emergency Management for the Whole Community*. Arlington, Virginia. September 12–14, 2011.

Boyd, A., Lazaro, R., Pankratz, D., Lazaro, V. 2013. "Paratransit Emergency Preparedness and Operations Handbook." Washington, DC: Transportation Research Board, 1–95.

Brault, M. W. 2012. "Americans with Disabilities: 2010." Washington, DC: U.S. Census Bureau. Accessed October 12, 2012. http://www.census.gov/prod/2012pubs/p70-131.pdf

California Department of Social Services (CDSS). 2007. "People with Access and Functional Needs/Functional Needs Assessment Service Teams." Accessed May 22, 2013. http://www.cdss.ca.gov/dis/PG1909.htm

Carter, L. 2011. "CERT and the Disability Community." Proceedings from *Getting Real II: Promising Practices in Inclusive Emergency Management for the Whole Community*. Arlington, Virginia. September 12–14, 2011.

Centers for Disease Control and Prevention. 2012. "Crisis and Emergency Risk Communication Manual." Department of Health and Human Services, Atlanta, Georgia. 1-440. Accessed March 10, 2014. http://emergency.cdc.gov/cerc/pdf/CERC_2012edition.pdf.

Christie, L. 2005. "Biggest Commuter Cities." CNNMoney. Accessed March 12, 2013. http://money.cnn.com/2005/10/21/real_estate/buying_selling/daytime_population_cities

Coalition of Organizations for Accessible Technology. 2012. "About COAT." Accessed November 6, 2012. http://www.coataccess.org/node/51

Col, J. M. 2007. "Managing Disasters: The Role of Local Government." *Public Administration Review* 67(s1): 114–124.

Coltham, J. 2012. "Accessibility and Social Media—An Overview*." G3ict: The Global Initiative for Inclusive ICTs*. Accessed October 22, 2012. http://g3ict.org/resource_center/newsletter/news/p/id_297

Comfort, L. K. 1994. "Self-Organization in Complex Systems. *Journal of Public Administration Research and Theory* 4(3): 393–410.

Cutter, S. L., Emrich, C. T. 2006. "Moral Hazard, Social Catastrophe: The Changing Face of Vulnerability Along the Hurricane Coast." *ANNALS of the American Academy of Political and Social Science* 604(1): 102–112.

D'Amico, D. 2013 (April 25). "Sandy Hard on Disabled, Who Have More Needs, Less Money." *Press of Atlantic City*. Accessed May 17, 2013. http://www.pressofatlanticcity.com/news/breaking/sandy-hard-on-disabled-who-have-more-needs-less-money/ article_066874ca-ad57-11e2-a2dc-001a4bcf887a.html?mode=story

De Marchi, B. 1993. "Effective Communication Between the Scientific Community and the Media." *Prediction and Perception of Natural Hazards* 15(3): 183–191.

DeMarsh, Stephen E. 2012. "Emergency Shelters, ADA, and FNSS Compliance" [PowerPoint slides]. Accessed November 20, 2014. http://www.fl-counties.com/docs/faca/emergency-shelters-ada-and-fnss-compliancepp.pdf?sfvrsn=2

DeMetrick, A. 2013 (March 22). "Frederick County to Offer 911 Texting for Speaking, Hearing Impaired." *CBS Baltimore*. Accessed May 6, 2013. http://baltimore.cbslocal.com/2013/03/22/frederick-co-to-offer-911-texting-for-those-who-cant-speak-or-hear

Department of Health and Human Services. (February 14) 2012. "Emergency Support Functions." Accessed September 10, 2013. http://www.phe.gov/Preparedness/support/esf8/Pages/default.aspx.

Department of Homeland Security (DHS). 2012. "Interagency Coordinating Council on Emergency Preparedness and Individuals with Disabilities Homeland Security." Accessed November 6, 2012. http://www.dhs.gov/interagency-coordinating-council-emergency-preparedness-and-individuals-disabilities

Department of Homeland Security (DHS). 2008a. "National Emergency Communications Plan." Washington, DC: 1–41.

Department of Homeland Security (DHS). 2008b. "National Response Framework." Washington, DC: 1–81.

Department of Homeland Security (DHS). 2008c. "National Response Framework: Glossary and Acronyms." Washington, DC: 1–20.

Department of Homeland Security (DHS). 2013a. "National Mitigation Framework." Washington, DC: 1–35.

Department of Homeland Security (DHS). 2013b. "National Response Framework, Second Edition." Washington, DC: 1–48.

Department of Homeland Security (DHS). 2013c. "National Preparedness Report" Washington, D.C. 1–66.

Department of Justice (DOJ). 1998. "Americans with Disabilities Act: Access for 9-1-1 and Telephone Emergency Services." Washington, DC: 1–10.

Department of Justice (DOJ). 2003. "Accessibility of State and Local Government Websites to People with Disabilities." Accessed November 5, 2012. http://www.ada.gov/websites2.htm

Department of Justice (DOJ). 2006. "Americans with Disabilities Act: An ADA Guide for Local Governments Making Community Emergency Preparedness and Response Programs Accessible to People with Disabilities." Accessed September 3, 2013. http://www.ada.gov/emergencyprep.htm

Department of Justice (DOJ). 2007a. "Title II Checklist: General Effective Communication." *ADA Best Practices Tool Kit for State and Local Governments*. Accessed September 3, 2013. http://www.ada.gov/pcatoolkit/chap3chklist.htm

Department of Justice (DOJ). 2007b. "Title II Checklist: 9-1-1 and Emergency Communications Services." *ADA Best Practices Tool Kit for State and Local Governments*. Accessed September 3, 2013. http://www.ada.gov/pcatoolkit/chap4chklist.htm

Department of Justice (DOJ). 2007c. "Title II Checklist: Emergency Management under Title II of the ADA." *ADA Best Practices Tool Kit for State and Local Governments*. Accessed September 3, 2013. http://www.ada.gov/pcatoolkit/noticetoolkit.htm

Department of Justice (DOJ). 2007d. "The ADA and Emergency Shelters: Access for All in Emergencies and Disasters." *ADA Best Practices Tool Kit for State and Local Governments*. Accessed September 3, 2013. http://www.ada.gov/pcatoolkit/chap7shelterprog.htm

Department of Justice (DOJ). 2007e. "Americans with Disabilities Act: Chapter 3: General Effective Communication Requirements Under Title II of the ADA." Accessed October 1, 2012. www.ada.gov/pcatoolkit/chap3toolkit.htm

Department of Justice (DOJ). 2007f. "Americans with Disabilities Act: Chapter 5: Americans with Disabilities Act: Chapter 3: General Effective Communication Requirements Under Title II of the ADA." Accessed September 3, 2013. http://www.ada.gov/pcatoolkit/ch5_toolkit.pdf

Department of Justice (DOJ). 2008. "Americans with Disabilities Act: Access for 9-1-1 and Telephone Emergency Services." Accessed May 15, 2013. http://www.ada.gov/911ta.pdf

Department of Justice (DOJ). 2009. "A Guide to Disability Rights Laws." Accessed September 3, 2012. http://www.ada.gov/cguide.htm

Department of Justice (DOJ). 2012a. "Department of Justice ADA Enforcement." Accessed November 5, 2012. http://www.ada.gov/enforce_footer.htm

Department of Justice (DOJ). 2012b (October 16). "Project Civic Access Fact Sheet." Accessed November 5, 2012. http://www.ada.gov/civicfac.htm

Department of Justice (DOJ). 2012c. "Section 508 Report to the President and Congress: Accessibility of Federal Electronic and Information Technology." Accessed November 5, 2012. http://www.ada.gov/508/508_Report.htm

Department of Justice (DOJ). 2014. "Effective Communication." Accessed February 21, 2014. http://www.ada.gov/effective-comm.htm

Disability Rights Advocates (DRA). 2011 (June 8). "City of Richmond Adopts New Emergency Plan to Address the Needs of People with Disabilities and the Elderly." Accessed March 4, 2013. http://www.dralegal.org/pressroom/press-releases/city-of-richmond-adopts-new-emergency-plan-to-address-the-needs-of-people

Disability Rights Advocates (DRA). 2012a. "Oakland Adopts Emergency Plan to Include People with Disabilities in Disaster Planning." Accessed November 15, 2012. http://www.dralegal.org/cfilc-v-city-of-oakland

Disability Rights Advocates (DRA). 2012b. "Brooklyn Center for Independence of the Disabled (BCID) et al. v. Mayor Bloomberg et al." Accessed November 4, 2012. http://www.dralegal.org/bcid-v-bloomberg

Erickson, W., von Schrader, S., Lee, C. 2012. "2010 Disability Status Report, United States." Cornell University ILR School. Accessed May 22, 2013. http://digitalcommons.ilr.cornell.edu/cgi/viewcontent.cgi?article=1561&context=gladnetcollect

Federal Communications Commission (FCC). 2011a. "21st Century Communications and Video Accessibility Act of 2010." Accessed November 14, 2012. http://www.fcc.gov/guides/21st-century-communications-and-video-accessibility-act-2010

Federal Communications Commission (FCC). 2011b. "Implementing the Provisions of the Communications Act of 1934 as Enacted by the Twenty-First Century Communications and Video Accessibility Act of 2010." Accessed November 27, 2012. http://www.gpo.gov/fdsys/pkg/FR-2011-12-30/pdf/2011-31162.pdf

Federal Communications Commission (FCC). 2013a. "Consumer Guide: Wireless Emergency Alerts." Consumer and Governmental Affairs Bureau, FCC. 1–4.

Federal Communications Commission (FCC). 2013b. "Impact of the June 2012 Derecho on Communications Networks and Services: Report and Recommendations." Public Safety and Homeland Security Bureau, FCC. 1–53.

Federal Communications Commission (FCC). 2013c. "Pursuant to the Next Generation 911 Advancement Act of 2012 (Pub. L. No. 112-96 (2012): Legal and Regulatory Framework for Next Generation 911 Services)." Accessed April 29, 2013. http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0227/DOC-319165A1.pdf

Federal Communications Commission (FCC). 2013d. "In the Matter of Accessible Emergency Information, and Apparatus Requirements for Emergency Information and Video Description: Implementation of the Twenty-First Century Communications and Video Accessibility Act of 2010." Accessed May 16, 2013. http://transition.fcc.gov/Daily_Releases/Daily_Business/2013/db0411/FCC-13-45A1.pdf.

Federal Communications Commission (FCC). 2014. "Text-to-911 Policy Statement and Second FNPRM." Accessed February 21, 2014. http://www.fcc.gov/document/text-911-policy-statement-and-second-fnprm

Federal Emergency Management Agency (FEMA). 2004. "Are You Ready? An In-depth Guide to Citizen Preparedness." Washington, D.C. 1–203.

Federal Emergency Management Agency (FEMA). 2009. "Personal Preparedness in America: Findings from the 2009 Citizens Corps National Survey." Washington, D.C.. 1–83.

Federal Emergency Management Agency (FEMA). 2010a. "Developing and Maintaining Emergency Operations Plans: Comprehensive Preparedness Guide 101 Version 2.0." Washington, D.C.. Intro,1–D-2.

Federal Emergency Management Agency (FEMA). 2010b. "Effective Communication: Independent Study 242.a." Washington, D.C. 1–8.7.

Federal Emergency Management Agency (FEMA). 2011a. "A Whole Community Approach to Emergency Management: Principles, Themes, and Pathways for Action." Washington, D.C. 1–23.

Federal Emergency Management Agency (FEMA). 2011b. "Planning for the Whole Community: Integrating and Coordinating the Access and Functional Needs of Children and Adults with Disabilities in Preparedness, Response, Recovery, and Mitigation." PowerPoint Presentation. Washington, D.C. 1-42.

Federal Emergency Management Agency (FEMA). 2012a. "About the Agency." Accessed November 14, 2012. http://www.fema.gov/about

Federal Emergency Management Agency (FEMA). 2012b. "Disaster Recovery Centers." Washington, D.C.. Accessed January 4, 2013. http://www.fema.gov/disaster-recovery-centers

Federal Emergency Management Agency (FEMA). 2012c. "Integrated Public Alert and Warning System (IPAWS) Outreach Plan for Communications and Partner Engagement." Washington, D.C.. 1–24.

Federal Emergency Management Agency (FEMA). 2012d. "Common Alerting Protocol." Accessed May 5, 2013. http://www.fema.gov/common-alerting-protocol

Federal Emergency Management Agency (FEMA). 2013. "Alerting Authorities." Washington, D.C.. Accessed May 14, 2013. http://www.fema.gov/alerting-authorities

Foden-Vencil, K. 2011 (June 30). "Few Receiving Reverse 911 Calls on Cell Phones." Oregon Public Broadcasting. Accessed May 11, 2013. http://www.opb.org/news/article/few-receiving-reverse-911-calls-cell-phones

Foster, H. D. 1984. "Reducing Vulnerability to Natural Hazards. *Geneva Papers on Risk and Insurance* 9(30): 27–56.

Fox, M. H., White, G. W., Rooney, C., and Rowland, J. L. 2007. "Disaster Preparedness and Response for Persons with Mobility Impairments." *Journal of Disability Policy Studies* 17(4): 196–205.

Frank, T. 2010. "Social Media Play Part in Haiti's Recovery Efforts." *USA Today*. http://www.usatoday.com/tech/news/2010-02-01-haiti-monitor-social-media_N.htm.

Fugate, C. 2011. (March 30). Administrator Craig Fugate, Federal Emergency Management Agency, before the United States House Transportation and Infrastructure Committee, Subcommittee on Economic Development, Public Buildings, and Emergency Management, "Improving the Nation's Response to Catastrophic Disasters: How to Minimize Costs and Streamline Our Emergency Management Programs." Rayburn House Office Building, Washington, DC.

Goltz, J. D., Mileti, D.S. 2011. "Public Response to a Catastrophic Southern California Earthquake: A Sociological Perspective." *Earthquake Spectra* 27(2): 487–504.

Government Accountability Office (GAO). 2013. "Emergency Alerting: Capabilities Have Improved, But Additional Guidance and Testing Are Needed." Washington DC. 1–40.

Governor's Committee On People with Disabilities. 2013. "Background, Purpose, and Policy Recommendations Related to the Governor's Committee on People with Disabilities." Austin, Texas. P. 1-24.

Hammer, B., Schmidlin, T. W. 2002. "Response to Warnings during the 3 May 1999 Oklahoma City Tornado: Reasons and Relative Injury Rates." *Weather Forecast* 17: 577–581.

Hayes, J. L. 2009. "Service Assessment of the Super Tuesday Tornado Outbreak of February 5–6, 2008." Silver Spring, MD: U.S. Department of Commerce National Oceanic and Atmospheric Administration.

Heinz Center. 2002. "Human Links to Coastal Disasters." Heinz Center for Science, Economics, and Environment. Accessed October 11, 2012. https://adapt.nd.edu/resources/462/download/Human_Links_to_Coastal_Disasters.pdf

Helsoot, I., Ruitenberg, A. 2004. "Citizen Response to Disasters: A Survey of Literature and Some Practical Implications." *Journal of Contingencies and Crisis Management*, 12(3): 98–111.

Henry, S. L. 2008. "Multimedia Accessibility FAQ." W3C. Accessed December 18, 2012. http://www.w3.org/2008/06/video-notes

Hollier. S. 2012. "SociABILITY: Social Media for People with a Disability." Ultimo, NSW, Australia. Media Access Australia. 1–36.

Huebner, K. M., Prickett, J. G., Welch, T. R., Joffee, E. 2003. "Hand in Hand: Essentials of Communication and Orientation and Mobility for Your Students Who Are Deaf-Blind." New York: AFB Press.

Independent Living Resource Center San Francisco (ILRCSF). "Tips for People with Psychiatric Disabilities." Accessed May 20, 2013. http://www.ilrcsf.org/wp-content/uploads/2012/08/Psychiatric.pdf

International Federation of the Red Cross and Red Crescent Societies. "What is a Disaster?" Accessed October 3, 2013. http://www.ifrc.org/en/what-we-do/disaster-management/about-disasters/what-is-a-disaster/

Jan, S., Lurie, N. 2012. "Disaster Resilience and People with Functional Needs." *New England Journal of Medicine* 367(24): 2272–2273.

Kailes, J. I. 2005. "Disaster Services and 'Special Needs': Term of Art or Meaningless Term?" *Nobody Left Behind: Disaster Preparedness for Persons with Mobility Impairments*. Ponoma, California. Research and Training Center on Independent Living: University of Kansas. 1–13.

Kailes, J. I. 2008. "Southern California Wildfires After Action Report." *Access to Readiness Coalition*. September 2008. 1–150.

Kailes, J. I. 2009. "Emergency Power Planning for People Who Use Electricity and Battery Dependent Assistive Technology and Medical Devices V2." Published and distributed by June Isaacson Kailes, disability policy consultant. 1–13.

Kailes, J.I. 2011. "Checklist for integrating people with disabilities and others with access and functional needs into emergency planning, response and recovery." Harris Family Center for Disability and Health Policy. Ponoma, California. 1-32.

Kailes, J. I. 2012a. "Be Real, Specific and Current: Emergency Preparedness Information for People with Disabilities and Others with Access and Functional Needs V1.7." Ponoma, California. Harris Family Center for Disability and Health Policy.

Kailes, J. I. 2012b (June 29). "Functional Assessment Service Team: An Overview." [PowerPoint slides].

Kailes, J. I., Enders, A. 2007. "Moving Beyond 'Special Needs': A Function-based Framework for Emergency Management and Planning." *Journal of Disability Policy Studies* 17(4): 230–237.

Kartez, J. D., Lindell, M. K. 1987. "Planning for Uncertainty: The Case of Local Disaster Planning." *Journal of the American Planning Association* 53(4): 487–498.

Landers, M. 2013 (April 11). "For Disabled in Chatham County, Emergency Plans Need Tweaks." *Savannah Morning News*. Accessed May 6, 2013. http://savannahnow.com/news/2013-04-11/disabled-chatham-county-emergency-plans-need-tweaks#.UZIvdbXvufJ

Leaf, M. J. 2005. "The Message Is the Medium: Language, Culture, and Informatics*." Cybernetics and Systems: An International Journal* 36: 903–917.

Lembree, D. 2010. "Twitter and Web Accessibility." Accessed December 18, 2012. http://www.weboverhauls.com/web_axe_podcast/twitter_and_web_accessibility_indata_july2010.html

Manoj, B. S., Baker, A. H. 2007. "Communication Challenges in Emergency Response." *Communications of the ACM* 50(3): 51–53.

Matherly, D., Mobley, J. 2011. "Transportation and Emergency Management Tool Kit for Communications with Vulnerable Populations." *Journal of the Transportation Research Board*: 62–70.

McEntire, D. A. 2004. "The Status of Emergency Theory: Issues, Barriers and Recommendations for Improved Scholarship." Denton, Texas. University of North Texas Department of Public Administration, Emergency Administration and Planning.

McHugh, M. 2010. "The Glee Effect: Sensitizing Emergency Responders to the 'R' Word." Rutgers University Office of Continuing Professional Education. Accessed May 13, 2013. http://www.cpe.rutgers.edu/stories/Developmental-Disabilities-Training-Course-Developed-by-Rutgers.html

Mendonca, D., Jefferson, T., Harrald. J. 2007. "Emergency Response Information Systems: Emerging Trends and Technologies: Collaborative Adhocracies and Mix-and-Match Technologies in Emergency Management." *Communications of the ACM* 50(3): 44–49.

Mileti, D. S. 1995. "Factors Related to Flood Warning Response." Perugia, Italy: U.S.-Italy Research Workshop on the Hydrometeorology, Impacts, and Management of Extreme Floods. 1–17.

Mileti, D. S. 1999. *Disasters by Design: A Reassessment of Natural Hazards in the United States*. Washington DC: Joseph Henry Press.

Mileti, D. S. 2010. "The State of Knowledge in the Social Sciences About How to Motivate the Public to Prepare for Floods." In *Managing Risk to Humans and to Floodplain Resources*. Gilbert F. White National Flood Policy Forum, 2010 Assembly Washington, D.C.. 48–49

Mileti, D. S., Galius, J. L. 2005. "Sustainable Development and Hazards Mitigation in the United States: Disasters by Design Revisited." *Mitigation of Natural Hazards and Disasters: International Perspectives* 10(3): 159–172.

Mileti, D. S., O'Brien, P. W. 1992. "Warnings During Disaster: Normalizing Communicated Risk." *Social Problems* 39(1): 40–57.

Mileti, D. S., Peek, L. 2000. "The Social Psychology of Public Response to Warnings of a Nuclear Power Plant Accident." *Journal of Hazardous Materials* 75: 181–194.

Mileti, D. S., Sutton, J. 2009 (July). "Social Media and Public Disaster Warnings. Social Science Research Findings and Applications for Practice." [PowerPoint slides]. Accessed February 28, 2013. http://www.jeannettesutton.com/uploads/ WARNINGS_Social_MediaMileti_Sutton.pdf.

Mitchell, H. 2010. "Strategies for Accessible Emergency Communications Adoption." Presented at the International Conference on Aging and Disability, Newcastle, UK, September 9, 2010.

Morris, J., Mueller, J., LaForce, S. 2013. "Social Media, Public Emergencies and People with Disabilities." Presented at the International Technology and Person with Disabilities Conference, San Diego, CA, February 28, 2013.

National Association of Broadcasters (NAB). 2013. "Equipping Mobile Phones with Broadcast Radio Capability for Emergency Preparedness." Accessed January 28, 2013. http://www.nab.org/advocacy/issue.asp?id=2354&issueid=1082

National Council on Disability (NCD). 2013. "About Us." Accessed January 28, 2013. http://www.ncd.gov/about

National Council on Disability (NCD). 2005. *Saving Lives: Including People with Disabilities in Emergency Planning*. Washington, DC.

National Council on Disability (NCD). 2006. *The Impact of Hurricanes Katrina and Rita on People with Disabilities: A Look Back and Remaining Challenges*. Washington, DC. 1–28.

National Council on Disability (NCD). 2006b. *The Needs of People with Disabilities with Psychiatric Disabilities During and After Hurricanes Katrina and Rita: Position Paper and Recommendations*. Washington, DC.

National Council on Disability (NCD). 2009. *Effective Emergency Management: Making Improvements for Communities and People with Disabilities*. Washington, DC.

National Council on Disability (NCD). 2011. *The Power of Digital Inclusion: Technology's Impact on Employment and Opportunities for People with Disabilities*. Washington, DC.

National Council on Independent Living (NCIL). 2013a. "About NCIL." Accessed January 14, 2013. http://www.ncil.org/about

National Council on Independent Living (NCIL). 2013b. "About Independent Living." Accessed September 17, 2013. http://www.ncil.org/about/aboutil

National Disability Rights Network (NDRN). 2012. "About NDRN." Accessed October 23, 2012. http://www.ndrn.org/en/about/about-ndrn.html

National Emergency Number Association. 2012. "About NENA." Accessed October 16, 2012. http://www.nena.org/?page=AboutNENA

National Organization on Disability (NOD). 2009. "Functional Needs of People with Disabilities: A Guide for Emergency Managers, Planners, and Responders." Washington, DC: NOD Emergency Preparedness Initiative.

National Organization on Disability (NOD). 2013. "A Catalyst for Disability Employment Movement." Accessed January 29, 2013. http://www.nod.org/about_us

National Research Council (NRC). 1989. *Improving Risk Communication*. Washington, DC: National Academies Press.

National Research Council (NRC). 2011. *Public Response to Alerts and Warnings on Mobile Devices: Summary of a Workshop on Current Knowledge and Research Gaps*. Washington, DC: National Academies Press.

National Telecommunications and Information Administration (NTIA). 2009. *A National Plan for Migrating to IP-Enabled 9-1-1 Systems*. The National E9-1-1 Implementation Coordination Office. Washington, D.C.

New York State Office for People with Developmental Disabilities. 2012. "On the Scene and Informed: First Response and Autism." Accessed May 16, 2013. http://www.opwdd.ny.gov/opwdd_community_connections/autism_platform/Autism_Initiative_Training_Series

Ngak, C. 2012. "Social Media a News Source and Tool During Superstorm Sandy." *CBS News*. October 30, 2012. http://www.cbsnews.com/8301-205_162-57542474/social-media-a-news-source-and-tool-during-superstorm-sandy

Niagara University. 2013. "First Responders-Disability Awareness Training." Accessed May 5, 2013. http://www.fr-dat.com/.

Norwood, F., Gerber, B. J., Zakour, M. 2011 (January). "Promising Practices for Evacuating People with Disabilities." Inclusion Research Institute. Washington DC. 1–49.

Oklahoma City Health Department. 2013. "People with Disabilities and Other Access/Functional Needs: Preparedness for Persons who are Blind/Low Vision." Oklahoma City, Oklahoma.

Pagano, M. A. 2012. "Financing Infrastructure in the 21st Century City." *Public Works Management and Policy* 17: 238–255.

Palen, L., Hughes, A. L. 2009. "Twitter Adoption and Use in Mass Convergence and Emergency Events." In *Proceedings 6th International Conference on Information Systems for Crisis Response and Management*. Gothenburg, Sweden: ISCRAM.

Pandya, C., McHugh, M., and Batalova, J. (2011). "Limited English Proficient Individuals in the United States: Number, Share, Growth, and Linguistic Diversity." Washington, D.C. Migration Policy Institute. 1-12.

Partnership for Public Warning. 2004. "Protecting America's Communities: An Introduction to Public Alert and Warning." McLean, VA.

Pawar, A., Simon, S., Epstein, C. 2009. "Guess Who's Coming to Dinner: Social Intelligence, Poverty Data, and a Comprehensive Approach to All Hazards." FEMA. http://training.fema.gov/EMIWeb/edu/09conf/report/Pawar%20-%20Guess%20Whos%20Coming%20To%20Dinner.doc

Pennick, T. 2005. "ENABLED—Enhancing Network Access for the Blind and Visually Impaired." Supported by the 6th Framework Programme for Research and Development in Europe. http://www.hft.org/HFT06/paper06/11_Pennick.pdf

Perry, R. W., Lindell, M. K. 2003. "Understanding Citizen Response to Disasters with Implications for Terrorism." *Journal of Contingencies and Crisis Management* 11(2): 49–60.

Peters, J. W. 2012 (October 30). "During Storm Updates, Eyes on an Interpreter." *New York Times*. Accessed November 29, 2012. http://www.nytimes.com/2012/10/31/nyregion/lydia-callis-sign-language-interpreter-gains-fans-during-hurricane-sandy.html?_r=0

Ready San Diego. 2013. Accessed November 10, 2013. http://www.readysandiego.org/

Rooney, C., White, G. W. 2007. "Narrative Analysis of a Disaster Preparedness and Emergency Response Survey from Persons with Mobility Impairments." *Journal of Disability Policy Studies* 17(4): 206–215.

Roth, M. 2005. "Emergency Management and People with Disabilities: Before, During and After." Congressional Briefing, Rayburn House Office Building, Washington, DC. November 10, 2005.

Roth, M. 2013 (March). "Planning for and with the Whole Community." Slide 21 in FEMA slide presentation *Disability Inclusive Emergency Management*. Accessed November 10, 2013. http://sis.nlm.nih.gov/dimrc/disabilityinclusiveness.pdf

Scola, N. 2009 (Nov. 24). "An Interview with Craig Fugate, Director of the Federal Emergency Management Agency (FEMA)." TechPresident. http://techpresident.com/blog-entry/interview-craig-fugate-director-federal-emergency-management-agency-fema

Shannon, C. E., Weaver, W. 1963. *The Mathematical Theory of Communication*. Urbana, IL: University of Illinois Press.

Sheffield, E., Starling, M. 2011. "Captioned Braille Radio Initiative: Providing Emergency Information for Individuals Who Are Deaf-Blind." International Center for Accessible Radio Technology (ICART).

State of Texas. 2013. "Functional Needs Support Services Tool Kit." Accessed October 10, 2013. https://www.preparingtexas.org/preparedness.aspx?page=32137bc8-eed7-42bb-ad7e-2765fd8abdb9

Stout, C., Heppner, C. A., and Brick, K. 2004. "Emergency Preparedness and Emergency Communication Access: Lessons Learned Since 9/11 and Recommendations." Deaf and Hard of Hearing Consumer Advocacy Network.

Sullivan, H., Hakkinen, M. 2006. "Disaster Preparedness for Vulnerable Populations: Determining Effective Strategies for Communicating Risk, Warning, and Response." NJ: Rider University.

Sutton, J. L., Palen, I. S. 2008. "Backchannels on the Front Lines: Emergent Uses of Social Media in the 2007 Southern California Wildfires." In *Proceedings, 5th International Conference on Information Systems for Crisis Response and Management*. Washington, DC: ISCRAM.

Targowski, A. S., Bowman, J. P. 1988. "The Layer-Based, Pragmatic Model of the Communication Process." *Journal of Business Communication* 25(1): 5–24.

Tierney, K. J. 1993. "Disaster Preparedness and Response: Research Findings and Guidance from the Social Science Literature." Newark, University of Delaware, Disaster Research Center. 1–45.

Tierney, K. J. 2001. *Facing the Unexpected: Disaster Preparedness and Response in the United States*. Washington, DC: Joseph Henry Press.

Trainor, J. E., McNeil, S. 2008. "A Brief Summary of Social Science Warning and Response Literature: A Report to COT Netherlands." Newark, University of Delaware, Disaster Research Center. 1–12.

Trainor, J. E., Aguirre, B. E., Barnshaw, J. 2008. "Social Scientific Insights on Preparedness for Public Health Emergencies." Newark, University of Delaware, Disaster Research Center.

Trainor, J. E., Donner, W., and Torres, M. R. 2006. "There for the Storm: Warning, Response, and Rescue among Nonevacuees." In *Learning from Catastrophe: Quick Response Research in the Wake of Hurricane Katrina*. Boulder, CO: Institute of Behavioral Science, University of Colorado. 307–326.

U.S. Access Board. 2001. "Guide to the Section 508 Standards for Electronic and Information Technology." Washington, DC. Accessed February 4, 2013. http://www.access-board.gov/sec508/guide/index.htm

U.S. Access Board. 2003. "Bulletin #2: Visual Alarms." Washington, DC. 1–6.

U.S. Access Board. 2013a. "Board Rulemaking." Washington, DC. Accessed February 4, 2013. http://www.access-board.gov/the-board/rulemaking

U.S. Access Board. 2013b. "About the ICT Refresh > Background." Washington, DC. Accessed February 4, 2013. http://www.access-board.gov/guidelines-and-standards/communications-and-it/about-the-ict-refresh/background

Vieweg, S., Palen, L., Liu, S. B., Hughes, A. L., Sutton, J. 2008. "Collective Intelligence in Disaster: An Examination of the Phenomenon in the Aftermath of the 2007 Virginia Tech Shootings." *Proceedings, 5th International Conference on Information Systems for Crisis Response and Management*. Washington, DC: ISCRAM.

Wardell, C., Su, Y.S. 2011. "2011 Social Media + Emergency Management Camp: Transforming and Response Enterprise." *CNA Analysis & Solutions*. 1–43.

Waugh Jr., W. L. 2008. "Access to Warnings by People with Disabilities: A Review of the Social Science Warning Literature." Report for the WGBH Working Group on Access to Warnings.

Weiser, B. 2012. "Suit May Go on in Disaster Plan for the Disabled." *New York Times*. Accessed November 16, 2012. http://www.nytimes.com/2012/11/09/nyregion/suit-proceeds-over-citys-disaster-planning-for-disabled-people.html?_r=1&

White, J., Fu, K., Benson, B. 2013. "Social Media: Approaches to Defining an Ill-defined Phenomenon." In *Online Communities and Social Computing*. Part of the Proceedings of the HCI International, Las Vegas, NV, July 21–26.

White, J. 2012. "Employment Prospects in a Digital World." Paper presented at California State University, Northridge (CSUN) International Technology and Persons with Disabilities Conference, San Diego, CA, Feb. 29–March 3, 2012.

White, J., Fu, K. 2011."Who Do You Trust? Comparing People-Centered Communications in Disaster Situations in the United States and China." *Journal of Comparative Policy Analysis: Research and Practice* 14:2, 126–142

Williams, R. 1985. *Keywords: A Vocabulary of Culture and Society*. New York: Oxford University Press.

Wimberly, R., Bristow, L. 2010. "People Will Trust but Verify Emergency Notifications." *Emergency Management*. Accessed October 15, 2012. http://www.emergencymgmt.com/emergency-blogs/alerts/People-will-trust-but.html

Wireless RERC. 2005. Comments filed In the Matter of the Review of the Emergency Alert System [EB Docket 04-296].

Wireless RERC. 2011. "Emergency Communications and People with Disabilities: 911 Communication, Public Alerts, and Social Media." Atlanta, Georgia: 1–16.

Wireless RERC. 2012a. "Emergency Communications (D2)." Atlanta, Georgia: October 18, 2012. http://www.wirelessrerc.org/content/emergency-communications-d2

Wireless RERC. 2012b. "Report on the National EAS Test On-line Survey and Focus Group Findings." Atlanta, Georgia: Accessed May 1, 2013. http://apps.fcc.gov/ecfs/document/view?id=7021902859

Wireless RERC. 2012 (May 2). "President Signs NG911 Legislation." Atlanta, Georgia: Accessed May 1, 2013. http://www.wirelessrerc.org/content/newsroom/president-signs-ng911-legislation

Wood, V. T., Weisman, R. A. 2003. "A Hole in the Weather Warning System." *American Meteorological Society* 84(2): 187–194.

Wood, M. W., Mileta, D.S., Kano, M., Kelley, M. M., Regan, R., Bourque, L. B. 2012. "Communicating Actionable Risk for Terrorism and Other Hazards." *Risk Analysis* 32(4): 601–615.

Wray, R., Rivers, J., Whitworth, A., Jupka, K., Clements, B. 2006. "Public Perceptions about Trust in Emergency Risk Communication: Qualitative Research Findings*." International Journal of Mass Emergencies and Disasters* 24(1): 45–75.

Young, D. 2012 (Dec. 8). "Deaf Staten Island victim of Hurricane Sandy says pleas go unheeded." *Staten Island Advance*. Accessed June 6, 2013. http://www.silive.com/eastshore/index.ssf/2012/12/deaf_staten_island_victim_of_h.html

Zagier, A. S. 2011 (Aug. 2). "Sebelius Touts Electronic Health Records in Joplin." *NewsTribune.com*. Accessed May 16, 2013. http://www.newstribune.com/news/2011/aug/02/sebelius-touts-electronic-health-records-joplin

APPENDIX A. Partial List of NGOs and Disability-specific Organizations Interested in the Social Inclusion of People with Disabilities and Others with Access and Functional Needs

Non-governmental Organizations

American Association of People with Disabilities (AAPD)

AAPD is the nation's largest disability rights organization. It promotes equal opportunity, economic power, independent living, and political participation for people with disabilities. AAPD's members—including people with disabilities and their families, friends, and supporters—are a powerful force for change.

Coalition of Organizations for Accessible Technology (COAT)

The primary mission of the coalition is to ensure accessible technology for people with disabilities. Although emergency communications is just one of the aspects of accessible technology COAT addresses, the coalition is proactive in providing and sharing timely information on the subject. It disseminates all FEMA notices, FCC actions, insightful state and NGO updates, and partner items of interest.

Consortium for Citizens with Disabilities (CCD)

The CCD is a coalition of approximately 100 national consumer, advocacy, provider, and professional disability organizations. Since 1973, the consortium has advocated for national public policy that ensures the self-determination, independence, empowerment, integration, and inclusion of children and adults with disabilities in all aspects of society.

National Emergency Number Association (NENA)

NENA is the primary organization focused on 911 policy, technology, and operations (NENA, 2012). NENA creates standards, files comments on rulemakings, and conducts outreach and training related to 911. The association has been involved in all aspects of Next Generation 911 and is pushing for state and regional implementation of interim text-to-911. Text-to-911 would improve access for deaf and hard of hearing individuals, and would enable text communication for people for whom voice communication is not an option. NENA's Accessibility Committee offers assistance in all accessibility-related issues and provides subject matter experts on NENA's committees and workgroups.

Wireless RERC

The Wireless RERC (Rehabilitation Engineering Research Center) focuses on identifying issues and providing solutions related to accessibility and usability of mobile wireless products and services by people with disabilities. Currently, the center is working on three prototype "lifelines" on wireless platforms, each of which will undergo trials for people with disabilities. The prototypes are an augmentative and alternative communication (AAC) app for emergency communications; a Commercial Mobile Alert System (CMAS) video platform; and TTY-like access to NG 911 via a wireless interface (Wireless RERC, 2012). The Wireless RERC's policy center provides substantive input into policymaking to help reduce barriers and accelerate adoption of accessible wireless products, services (including emergency alerts), and software applications. Of particular interest is parity of access to emergency information and ensuring that people with disabilities who require nonvoice communication (e.g., deaf, speech-disabled) have equivalent access to emergency services as analog-based communications are phased out in favor of fourth generation/Internet Protocol (4G/IP) technology.

Disability-Specific Organizations

The American Council of the Blind (ACB)

ACB strives to increase the independence, security, equality of opportunity, and quality of life for all blind and visually impaired people. Since its inception, ACB and its affiliates have been instrumental in the creation of policies that have shaped the opportunities available to people with disabilities in our country.

American Foundation for the Blind (AFB)

As a national nonprofit with offices in five U.S. cities, the AFB is a leader in expanding possibilities for the more than 20 million Americans living with vision loss.

The Arc

The Arc is the largest national community-based organization advocating for and serving people with intellectual and developmental disabilities and their families. It encompasses all ages and all spectrums: autism, Down syndrome, Fragile X, and various other developmental disabilities.

Association of Late-Deafened Adults (ALDA)

ALDA is about communication and acceptance of every deafened individual. What is most important about ALDA is that there are no membership restrictions and no ties to a specific mode of communication. ALDA reaches out to deafened individuals regardless of age of onset who are seeking their place as a deafened person.

Autistic Self-Advocacy Network (ASAN)

ASAN was created to provide support and services to people on the autism spectrum while working to educate communities and improve public perceptions of autism. ASAN activities include public policy advocacy, community engagement to encourage inclusion and respect for neurodiversity, quality of life oriented research, and the development of Autistic cultural activities.

Easter Seals

Easter Seals provides services, education, outreach, and advocacy so that people living with autism and other disabilities can live, learn, work, and play in the community. From child development centers to physical rehabilitation and job training for people with disabilities, Easter Seals offers a variety of services to help people with disabilities address life's challenges and achieve personal goals.

Hearing Loss Association of America (HLAA)

HLAA has an impact on communication access, public policy, research, public awareness, and service delivery related to hearing loss. Its national support network includes an office in the Washington, DC, area; 14 state organizations; and HLAA chapters and organizations across the country.

National Association of the Deaf (NAD)

NAD is a civil rights organization of, by, and for deaf and hard of hearing people in the United States. NAD's advocacy scope is broad, covering the human lifetime and affecting future generations in the areas of early intervention, education, employment, health care, technology, telecommunications, youth leadership, and more.

National Federation of the Blind (NFB)

NFB is the oldest and largest nationwide membership organization of blind people in the United States. It advocates for the civil rights and equality of blind Americans, and develops innovative education, technology, and training programs to provide the blind and those who are losing vision with the tools they need to be independent and successful.

Telecommunications for the Deaf and Hard of Hearing, Inc. (TDI)

TDI provides leadership in achieving equal access to telecommunications, media, and information technologies for deaf and hard of hearing people. It focuses its energies and resources to address equal access issues in telecommunications and media for four constituencies in deafness and hearing loss: people who are deaf, hard-of-hearing, late-deafened, or deaf-blind.

United Cerebral Palsy (UCP)

UCP educates, advocates, and provides support services to ensure a life without limits for people with a spectrum of disabilities

References

National Emergency Number Association. 2012. "About NENA." Accessed October 16, 2012. http://www.nena.org/?page=AboutNENA

Wireless RERC. 2012. October 18, 2012. "Emergency Communications (D2)." Accessed March 10, 2014. http://www.wirelessrerc.org/content/emergency-communications-d2

APPENDIX B. Communication Among Emergency Management and First Responders

Incident Command System

All emergency information and communications that are disseminated to the public are preceded by communication among emergency officials. Response efforts are mandated through the National Response Framework (NRF) and the National Incident Management System (NIMS) as mandated by the Incident Command System (ICS), which is a "standardized, on-scene, all-hazards incident management concept" that allows emergency managers and first responders to respond to incidents of any scale in a consistent manner (FEMA, 2009). Although the ICS was first created in the 1970s, the institution of a unified incident response system followed Homeland Security Presidential Directives 5 (Management of Domestic Incidents) and 8 (National Preparedness) (FEMA, 2009). All incidents are to be handled locally, unless local resources are exhausted, meaning that the incident command begins, and often remains, at the local level, with state and federal agencies offering supporting roles when required.

Organization under the ICS begins by using unique ICS position titles and organizational structures; thus, a person's job title (as assigned by his or her agency) might be modified under the ICS to avoid confusion over different position titles and organizational structures that may occur between agencies or jurisdictions (FEMA 2009). In addition, the ICS requires that all responders use common terminology to avoid confusion that may occur when different agencies are communicating with one another.

Under the ICS, when an incident occurs, response begins with an incident command post at the site. An incident is defined as "an occurrence, caused by either human or natural phenomena, that requires response actions to prevent or minimize loss of life, or damage to property and/or to the environment" (FEMA, 2009). Incidents can involve one jurisdiction or multiple jurisdictions, functional agencies, and emergency responder disciplines, and the severity of the incident often determines the amount of time that will need to be dedicated to the response and recovery phases (i.e., more complex incidents may require longer response or recovery phases) (FEMA 2009).

At the scene of an incident, the most qualified person is designated as the incident commander. He or she may decide to assume command, maintain command as is, or transfer command to a third party (FEMA, 2009). The incident commander can create an incident management team, which might include a public information officer, liaison officer, and safety officer, as well as an Operations Section, Planning Section, Logistics Section, and Finance/Administration Section (see Figure B-1). Because the ICS is scalable, the scope of the incident will determine what sections are included on the team. For example, a single car crashing into a pole will not require the same ICS structure as a tornado that causes major damage in a large city. The scale of the incident management team will also depend on how the incident affects "life, property, and the

economy, community and responder safety, likelihood of cascading events, political sensitivity, external influences and media relations, the area involved, jurisdictional boundaries, and the availability of resources" (FEMA, 2009).

Figure B-1. Incident Command Structure
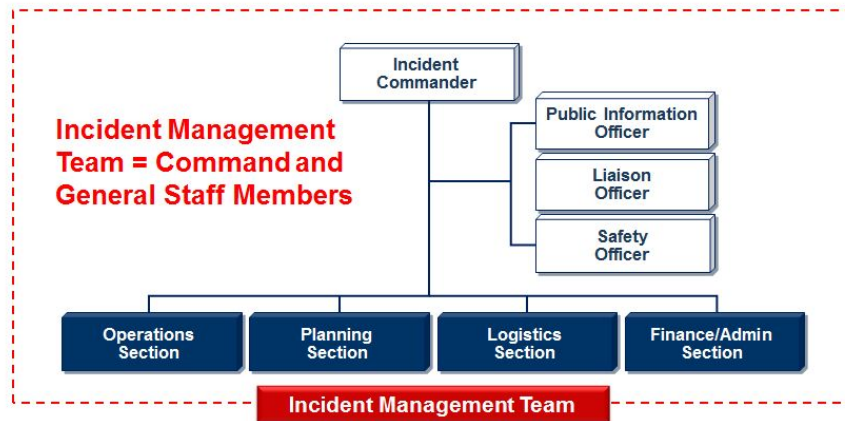
Source: FEMA, 2009.

Each incident requires an incident action plan (IAP), which can be either verbal or written, again depending on the scale of the incident. The IAP will describe all actions that need to be completed during the operational period (determined by the incident commander—anywhere from an hour to many days) and will include information such as "what needs to be done, who is responsible, how information will be communicated, and what should be done if someone is injured" (FEMA, 2009).

Another structure often used in conjunction with the ICS is provided by the emergency support functions (ESFs). These functions include (1) transportation; (2) communications; (3) public works and engineering; (4) firefighting; (5) emergency management; (6) mass care, housing, and human services; (7) resource support; (8) health and medical services; (9) search and rescue; (10) hazardous materials; (11) agricultural and natural resources; (12) energy; (13) public safety and security; (14) long-term community recovery and mitigation; and (15) external affairs (Chatham County Emergency Management Agency, 2012). Various emergency plans may have more ESF categories or list them in a different order. When ESFs are instituted under the ICS, they are typically under the Emergency Operations Center (EOC); each ESF category coordinates the efforts for its department and reports to the emergency manager in charge of the EOC. Under this system, the manager of the EOC does not have to directly coordinate all agencies.

Figure B-2. A Hybrid ICS/ESF Structure
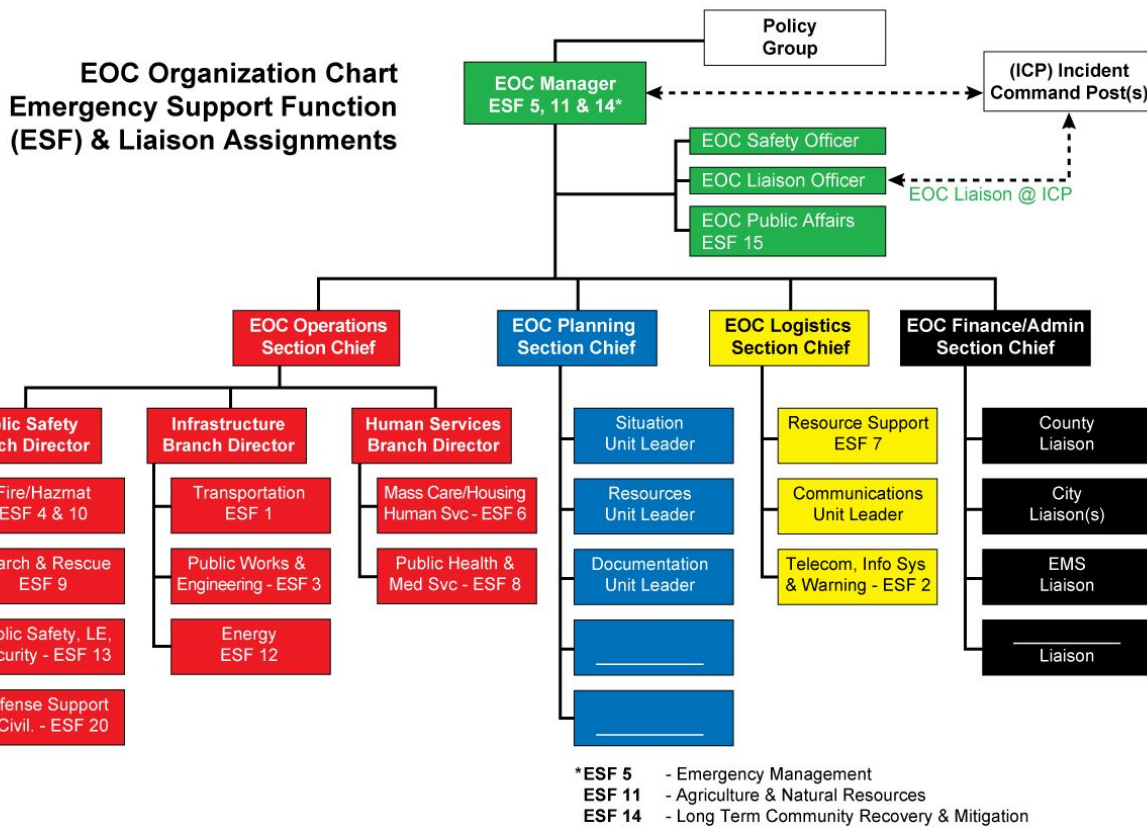
Source: Skamania County (Washington) Emergency Management, 2012.

Area Command

Area Command is used to oversee either multiple incidents that are being handled separately or one incident that spans a large geographical area. According to FEMA (2009), "Area Command ensures that agency policies, priorities, constraints, and guidance are being made known to the incident commanders and implemented consistently across incidents"

At an incident command post, "The focus is on tactics to deal with the immediate situation." (FEMA, 2012). However, incident command posts are scalable to the size of the emergency. For example, if a tornado were to touch down in multiple cities in Atlanta—like the 2008 tornado that traveled through Vine City, downtown Atlanta, Cabbagetown, and East Atlanta Village—each city might have a command post that would be communicating with the Emergency Operations Center (EOC). The EOC is "a physical (e.g., conference room) or virtual (e.g., teleconference call) location designed to support emergency response, business continuity, and crisis communications activities" (FEMA, 2012). EOCs can be formed at the local, state, or federal level. The EOC coordinates the efforts of different agencies that may be involved in response to an emergency. This includes collecting and evaluating information from the field,

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coordinating information flow and resources from complex incidents or multiple incidents occurring simultaneously, prioritizing response and resources in order to make the effort more efficient and effective, and ensuring that communications are interoperable among responders (FEMA, 2011).

References

Chatham County Emergency Management Agency Emergency Operations Plan. Accessed November 1, 2013. http://www.chathamemergency.org/documents/ EOP_0312.pdf

Federal Emergency Management Agency (FEMA). 2009. "Personal Preparedness in America: Findings from the 2009 Citizens Corps National Survey." Washington, D.C. Federal Emergency Management Agency (FEMA). 2011. "A Whole Community Approach to Emergency Management: Principles, Themes, and Pathways for Action." Washington, D.C. 1–23.

Federal Emergency Management Agency (FEMA). 2012. "Disaster Recovery Centers." Washington, D.C.. Accessed January 4, 2013. http://www.fema.gov/disaster-recovery-centers

Skamania County Emergency Management, 2012. Accessed November 1, 2013. http://www.skamania-dem.org/EOC.html

APPENDIX C. Some Useful Links for Section 4.2: Promising Practices

Interagency and Interjurisdictional Communication

Item	Link
Alert San Diego	http://www.readysandiego.org/alertsandiego
DHS Center for Faith-based and Neighborhood Partnerships	http://www.dhs.gov/dhs-center-faith-based-neighborhood-partnerships
Explanation of C-MIST	http://www.jik.com/KailesEndersbeyond.pdf
Functional Assessment Service Team (FAST)	http://www.cdss.ca.gov/dis/PG1909.htm
Georgia Emergency Management Interpreting Initiative, Inc. (GEMINI)	http://teamgemini.org/
Paratransit Handbook	http://www.trb.org/Main/Blurbs/168321.aspx
Stearns County Integrated Emergency Plan	http://www.co.stearns.mn.us/LawPublicSafety/EmergencyServices/EmergencyPreparedness
Texas Functional Needs Support Services Toolkit	https://www.preparingtexas.org/Resources/documents/FNSS/FNSS%20Tool%20Kit%20v4.pdf

Individual Preparedness

Training	Link
Autism Speaks	http://www.autismspeaks.org/family-services/autism-safety-project
Feeling Safe, Being Safe Training	http://www.dds.ca.gov/ConsumerCorner/fsbs/
FEMA Citizen Corps Preparedness Survey	http://www.ready.gov/personal-preparedness-survey-2009
FEMA Getting Real II Conference Proceedings	http://gettingreal-ii.webcaston.tv/home/homepage.php
PA Ready.gov	http://www.portal.state.pa.us/portal/server.pt/community/readypa/21271
Ready Now!	http://www.ohsu.edu/xd/outreach/occyshn/upload/ReadyNowToolkit.pdf
Ready.gov	http://www.ready.gov/sites/default/files/documents/files/PrinterFriendly_Disabilities_1.pdf

Technology and Social Media

Item	Link
Accessible Alert San Diego	http://www.readysandiego.org/alertsandiego
Alertus	http://www.alertus.com/
Apps: American Red Cross	http://www.redcross.org/prepare/mobile-apps
App: BrailleTouch	http://brailletouchapp.com/
App: EC4ALL	http://disabilities.temple.edu/aacvocabulary/e4all Android.shtml
App: FEMA App	http://www.fema.gov/smartphone-app
App: Google Translate	http://www.google.com/mobile/translate/
App: Hamilton Mobile Captel	https://itunes.apple.com/us/app/hamilton-mobile-captel/id370615084?mt=8
App: iMPrepared	https://itunes.apple.com/us/app/imprepared/id396912356?mt=8
App: IP-Relay	https://itunes.apple.com/us/app/ip-relay/id351385414?mt=8
App: Picture Card Maker PLUS	https://itunes.apple.com/us/app/picture-card-maker-plus/id417882424?mt=8
App: Proloquo2go	http://www.assistiveware.com/product/proloquo2go
App: Red Cross Shelter View	http://www.redcross.org/mobile-apps/shelter-finder-app
App: Sorenson Video Center	http://www.sorensonvrs.com/mobile_apps
App: SoundAMP	https://itunes.apple.com/us/app/soundamp-r/id318126109?mt=8
App: Sprint Accessibility Packs	http://www.sprintrelay.com/doc/press_releases/03182013/index.php
App: TaptoTalk	http://www.taptotalk.com
App: ViA by Braille Institute	https://itunes.apple.com/us/app/via-by-braille-institute/id528499232?mt=8
Deaf Link	http://www.deaflink.com

Item	Link
Emergency 2.0 Wiki Accessibility Toolkit	http://emergency20wiki.org/wiki/index.php/Accessibility_Toolkit
Howto.gov Improving Social Media Accessibility	http://www.howto.gov/social-media/using-social-media-in-government/improving-accessibility
Mobile Site: Tips for First Responders	http://disabilitytips.tamu.edu/index.html
Pass It On Center	http://www.passitoncenter.org/EmergencyManagement.aspx
Rochester Institute of Technology Alert System	http://www.rit.edu/fa/buscont/content/rit-alert-emergency-notification-system
Smart911	http://www.smart911.com
SmartPrepare	http://www.smartprepare.com

Tools and Training

Item	Link
Communication Boards	http://rems.ed.gov/docs/TempleUniv_FeelingSafe.pdf
First Responder Disability Awareness Training	http://www.fr-dat.com
First Response and Autism	http://www.opwdd.ny.gov/opwdd_community_connections/autism_platform/documents/brochures_firstresponders_autism
Rutgers University Developmental Disability Training	http://www3.uch.edu/Videos/DevDisabilitiesAwarenessTraining/player.html
Tips for First Responders	Web site: http://disabilitytips.tamu.edu
	Book: http://www.anaheim.net/images/section/202/TIPS%20Guide%20for%20First%20Responders.pdf

Endnotes

[1] For a detailed example from Hurricane Sandy, see http://www.silive.com/eastshore/index.ssf/2012/12/deaf_staten_island_victim_of_h.html.

[2] The Partnership for Public Warning—a nonprofit public-private partnership—was established in 2002 and dissolved in March 2005; however, its Web site continues to be maintained and periodically updated.

[3] This concept has developed over the two generations of the National Response Framework. In 2008, the language described an essentially hierarchical system of organization and integration by senior officials and their emergency managers, with businesses and NGOs mentioned in additional capacities. The 2013 NRF emphasizes the engagement of the whole community.

[4] This trend is encouraging as wireless emergency alerts (WEAs) grow in popularity. The WEA system (formerly known as the Commercial Mobile Alert System or CMAS) refers to emergency messages sent by authorized government entities alerting authorities through the mobile carrier and designed to get attention with a unique sound and vibration.

[5] "Crowdsourcing" is defined here as receiving services, ideas, or help from a large group of people, especially from an online community rather than from traditional sources of support.

[6] See http://www.lep.gov/resources/resources.html#EP.

[7] For the Unified Agenda current as of Spring 2013, see https://www.federalregister.gov/regulations/3014-AA37/telecommunications-act-accessibility-guidelines-electronic-and-information-technology-accessibility-

[8] See http://www.ndrn.org/images/Documents/Issues/Disaster_Preparedness/NDRN_Disaster_Preparedness_Checklist.pdf

[9] 42 U.S.C. § 12131 et seq.

[10] 42 U.S.C. § 12132.

[11] 42 U.S.C. § 12131 (1)(B).

[12] 28 C.F.R. § 35.160(a)(1); 28 C.F.R. § 35.160(b)(1)-(2).

[13] 28 C.F.R. § 35.163(a).

[14] 42 U.S.C. § 12182

[15] 47 C.F.R section 64.404 (a)(4).

[16] See 47 C.F.R. section 64.605.

[17] See http://www.ada.gov/anprm2010/web%20anprm_2010.htm

[18] See http://www.reginfo.gov/public/do/eAgendaViewRule?pubId=201210&RIN=1190-AA65.

[19] See http://www.fcc.gov/encyclopedia/closed-captioning-video-programming-television.

[20] See http://www.fcc.gov/guides/emergency-video-programming-accessibility-persons-hearing-and-visual-disabilities.

[21] The DOJ complaint is available at http://www.dpcma.org/News/DOJTitleII/tabid/800/Default.aspx.

[22] A 2010 Harris Interactive poll of people with disabilities conducted for the Kessler Foundation and the National Organization on Disability revealed that they are less likely than those without disabilities to report that they socialize with friends, relatives, or neighbors (79% versus 90%) and that this gap (11%) has remained basically constant since surveys in 2004 (10%) and 2000 (11%). (Kessler Foundation/NOD. 2010).

[23] The GPII aims to ensure that everyone who faces accessibility barriers can access and use the Internet. The aim is to combine cloud computing, Web, and platform services to make accessibility simple, ubiquitous, more inclusive, and more affordable. See http://gpii.net/index.html.

[24] The advantage of using community reports during an emergency is that information can be posted online instantaneously, often well ahead of official reports. The disadvantage, of course, is that such asserted information carries the risk of error, potentially of critical importance in an emergency.

[25] This applies to only the standard Twitter interface, as there are accessible Twitter clients. These are not mentioned here, as the list is constantly changing.

[26] The "ALT" attribute is used in HTML and XHTML documents to specify alternative text that serves the same purpose and conveys the same essential information as, for example, an image. It is used by screen reader software so that a person who is blind can listen to and interact with this element.

[27] A comprehensive guide to improving the accessibility of social media can be found at http://www.howto.gov/social-media/using-social-media-in-government/improving-accessibility#part-1.

[28] http://www.wirelessrerc.org/content/publications/emergency-communications-survey-full-report-june-2011.

[29] In the 2010–11 survey, respondents were asked if they *ever* received an alert via any of these media or platforms. In the 2012–13 survey, respondents were asked how they received and verified the *most recent* alert.

[30] http://www.nad.org/issues/telephone-and-relay-services/relay-services/tty.

[31] According to the Department of Health and Human Services (2012), Emergency Support Functions are "the groupings of governmental and certain private sector capabilities into an organizational structure to provide support, resources, program implementation, and services that are most likely needed to save lives, protect property and the environment, restore essential services and critical infrastructure, and help victims and communities return to normal following domestic incidents."

[32] The cost for a Smart911 system depends on the number of call-taking stations in a PSAP. The jurisdiction purchases an annual license, which includes the installation of Smart911 on each call-taking station and maintenance of the program (both of which can be done remotely). The fee also covers the secure storage of individuals' information in the cloud. The system is free to the public; anyone may create a Smart911 profile.

[33] The National Mitigation Framework identifies "building the capacity within communities to assess, analyze, and apply the knowledge of risk and resilience" as a critical task for education and training. Planning tasks include "collaborate, cooperate, and build consensus across other disciplines that impact plans"; "understand the demographics and systems that make up the community and their vulnerabilities and interdependencies with each other"; and "include disability and other access and functional needs subject matter experts in mitigation planning" (DHS, 2013a, p.18).

[34] The ALT attribute is used in HTML and XHTML documents to specify alternative text that serves the same purpose and conveys the same essential information as, for example, an image. It is used by screen reader software so that a person who is blind can listen to and interact with this element.

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