2016 GATLINBURG WILDFIRES

LESSONS LEARNED

RISK & CRISIS COMMUNICATIONS

Future practice and implementation in
the emergency management community

PAST | FUSION CELL

PUBLIC AFFAIRS SCIENCE AND TECHNOLOGY

ABSTRACT

The purpose of this study is to collect and analyze data associated with lessons learned from the 2016 Gatlinburg wildfires. The study used face-to-face and telephone interviews with those who had firsthand knowledge and experience with the Gatlinburg wildfires, such as business owners; federal, local, and state officials; residents; tourists; faith-based community leaders; and non-English-speaking populations. Existing literature on the subject was also analyzed, including newspaper articles, television reports, and internet resources such as Twitter, Facebook, and YouTube. Data from interviews were analyzed and synthesized to create recommendations for improving multidisciplinary communication and notification processes. These recommendations are aligned with best industry practices, and with roles and responsibilities required to protect the health and safety of stakeholders. Emergent themes surfacing during this study include (1) training, (2) collaboration, and (3) communication. The study is intended to add to the body of knowledge and to deepen the understanding of the importance of multidisciplinary communication and notification processes. The results and recommendations from this study have generalizability for future practice and implementation of emergency management notifications and communications for business and industry, residents, tourists, and local, state, and federal authorities.

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INTRODUCTION

On November 28, 2016, wildfires ravaged the Gatlinburg, Tennessee, area killing 14, injuring 191, and damaging or destroying more than 2,400 homes and businesses. For nearly two months, local, state, and federal agencies worked to quell the fires. According to a Tennessee Emergency Management Agency (TEMA) statement by Director Patrick Sheehan, **"The Sevier County wildfire is the most catastrophic wildland-urban interface fire event in the history of Tennessee, and the most devastating fire in the state since the 1916 East Nashville fire"** (TEMA Statement, January 25, 2017). This event of historical proportions provides many lessons to be learned in the areas of emergency notifications, protective action communications, plans and procedures, and risk and crisis communications.

Argonne National Laboratory's Public Affairs Science and Technology (PAST) Fusion Center conducted this study to (1) add the body of existing knowledge in risk and crisis communication principles, (2) provide the opportunity for greater information sharing and identification of risk and crisis communications best practices, and (3) identify lessons learned from the 2016 Gatlinburg wildfires. Using event timelines, news reports, social media data, and interviews provided by government officials, emergency managers, and local media, residents, tourists, faith leaders, and business owners, the study captured a list of lessons learned to share with communication professionals, first responders, and their respective communities.

Photo of Gatlinburg Welcome Sign after Wildfires

Interview comments were analyzed and synthesized to (1) create lessons learned about notification processes, regarding the use, or lack thereof, of social media platforms; (2) enhance stakeholder notification processes; and (3) identify proactive versus reactive risk and crisis communication planning. Recommendations were developed based on lessons learned from stakeholder experiences, media reports, eye-witness accounts, and social media accounts. The goal of this study is to enhance the response community's capabilities and roles and responsibilities with required emergency notifications necessary to protect the health and safety of stakeholders during wildfire events or with other natural, manmade, or technical disasters.

Emergent themes surfacing during this study include (1) training, (2) collaboration, and (3) communication. The results and recommendations from this study can be generalized for future practice and the implementation of emergency management notifications for business and industry, residents, tourists, and local, state, and federal authorities.

METHODOLOGY

This research project used triangulated qualitative research methods centered on the use of risk and crisis communications. Two researchers local to the Gatlinburg, Tennessee, area were deployed to research and conduct interviews relative to the wildfire event. The primary research method was face-to-face interviews using purposeful critical case sampling to gather information and first-hand accounts of communication processes used during the event. Researchers interviewed stakeholders such as federal, local and state officials; faith leaders; residents; tourists; and business owners affected by the wildfires. Interviewees were asked open-ended questions regarding their emergency management experience, the disaster, their role in the disaster, their perceptions of how risk and crisis communications during the disaster were handled, and their general opinions about how the disaster was managed. The research team conducted a total of ten interviews, representing a cross-section of stakeholders, and participated in informal conversations with emergency responders and volunteer organization representatives.

Content analysis was used to examine documentation of the disaster response in the news media. A literature review included newspaper articles, television reports, and Internet resources such as Twitter, Facebook, and YouTube, as well as interviews with emergency management response experts, residents, faith leaders, tourists, and business owners. Finally, the researchers used participants' observations regarding response and recovery efforts to gain additional insight. In the areas where disaster response and recovery activities were coordinated, the research team noted those practices and included them as part of the research.

The goal of the study was twofold: (1) to conduct a gap analysis regarding notification and communication to the public during the Gatlinburg wildfires, and (2) to gain insight on how to improve and maximize future communication response assets during emergency events. This study is intended to add to the body of knowledge and to deepen the understanding of the importance of risk and crisis communication during an emergency event.

Research Questions

Interviewees were selected based on their experiences with the wildfires event. The following questions were designed to assist the researchers in understanding the notification and communication processes during the Gatlinburg wildfires:

1. How were coordination, collaboration, and communication maintained throughout the event with other agencies/colleagues?

2. What communication channels/technology were used to notify and communicate with stakeholders?

3. What key messages were most effective/ least effective?

4. What circumstances were not anticipated?

5. Did any useful workarounds or solutions to problems appear during the event?

6. What type of training (courses) helped prepare responders for this event? What type of training do responders wish they had before this event?

7. For any problems that went unresolved, what preventative/planning measures can responders invent now that can help things go more smoothly next time?

8. Are there any new "best practices" that can be derived from this event?

9. Were there any resources not available, such as job aids, checklists, or guidebooks, that would have been helpful?

10. What recommendations can be made to other Public Affairs Officers/Public Information Officers (PAOs/PIOs) in similar situations?

Ethics in Research

Prior to the beginning of any study involving the human element, the researchers' and approving institution's utmost priority is conducting research in an ethical manner. The researchers instituted the following provisions in all interviews:

☐ Assured anonymity of the interviewees;

☐ Coded data to maintain anonymity;

☐ Reported only aggregate data;

☐ Kept personally identifiable information (PII) confidential; and

☐ Ensured no personally identifiable information was reported in the analysis or in the narrative.

For this study, the researchers were aware of their biases, formed from their technical knowledge in emergency management, and took the following steps to ensure an unbiased process in conducting, interpreting, and reporting the data:

☐ Ensured none of the survey data contained any of the experts' PII;

☐ Maintained objectivity throughout the process; and

☐ Represented all responses provided by the experts.

PREPAREDNESS, EMERGENCY MANAGEMENT, AND ALL-HAZARDS PLANNING

"Ever-changing environments such as natural, manmade, or technical disasters present many challenges for emergency management programs and their managers. Natural disasters such as floods, snow storms, and wildfires are somewhat predictable within a given timeframe. Manmade and technical disasters, however, are highly unpredictable. Emergency managers acknowledge the probability that natural and manmade disasters can occur anywhere and anytime, but their occurrence is not predictable. Regardless of whether the event is natural, manmade, or technical, emergency events impact both infrastructure and human systems" (Edmond 2011).

Specific needs for all-hazards emergency management programs include the following:

1. Developing and training volunteers;

2. Developing programs that are modular and adaptable to community-specific events;

3. Enhancing stakeholder literacy regarding emergency management programs;

4. Strengthening stakeholder outreach through the use of the Internet, social media, radio, and television;

5. Capturing the uniqueness of stakeholder communities and preparing training accordingly; and

6. Developing a standardized tool to measure preparedness.

Emergency management (EM) programs are designed to implement comprehensive requirements as they apply to locations, facilities, activities, and the surrounding environment, commensurate with the hazards present. General requirements include development and implementation of a comprehensive EM system designed to protect the health and safety of all the public posed by natural and manmade disasters and to minimize the consequences of all emergencies involving or affecting residents, business and industry, and tourists.

PLAN FOR THE REAL

Plan for what communities will really need, should a severe event occur, and not just for the existing resources that are on hand.

EM programs are based on the results of hazard assessment surveys associated with credible scenarios such as wildfires, floods, high winds, snow storms, transportation events, or other technical hazards that may impact a tourist-centric environment like Gatlinburg and the Great Smoky Mountains National Park (GSMNP). The hazards associated with these scenarios have the potential to cause emergencies that would be classified as Alerts or Site Area Emergencies.

The status of hazards surveys is unclear for the wildfires that occurred during November and December of 2016 in Gatlinburg and the GSMNP. This is the first major wildfire to impact the GSMNP in modern history. Months of severe drought conditions in the Eastern United States are uncommon. Meteorologically speaking, East Tennessee and the GSMNP are located within a temperate rainforest that stretches from the Appalachian Mountains to New England. Changes to typical operating process for combatting small fires within the community and in the GSMNP were not effective for the wildfires. **As a result of the wildfires, severe drought conditions, response efforts, and lack of timely notification to the public, significant changes must be analyzed and integrated into existing emergency plans and procedures.**

This study investigated the need for all-hazards planning as a reference point from which to develop, evaluate, or enhance existing plans. All-hazards planning provides authorities a process for maintaining resiliency during an emergency event. The framework suggested is aligned with the National Response Framework (NRF). The NRF (2008) is an all-hazards planning guide that describes best practices for incident response from local-level incidents to large-scale incidents such as manmade or natural disasters. The framework was built on the National Incident Management System (NIMS), which prescribed standardized practices for managing emergency incidents. The NRF's intent was to standardize the ability of community responders and organizations to develop scalable, flexible, and adaptable coordinating plans and procedures. In so doing, alignment of the key roles and responsibilities became standardized across the nation

Only the shell of a motel office remains after being destroyed by a forest fire in Gatlinburg and the Smoky Mountains in late 2016.

(NRF 2008). The NRF's ultimate goal is to protect the health and safety of the public, protect property and the environment, and meet basic human needs. Much like the NRF (2008), an all-hazards plan for the Gatlinburg area can accomplish the same goals.

Since the area is tourist-centric, a variety of emergencies are possible. These emergencies should be identified and addressed in an all-hazards plan. In this case, an all-hazards plan may include event-specific appendices such as fires, industrial accidents, hazardous material (HAZMAT) releases, natural phenomenon events (tornados, earthquakes, severe weather, storms, etc.) security-related events (bomb threats, demonstrations, work place violence, etc.). In addition, all-hazard plans for Gatlinburg, Pigeon Forge, and Sevierville should be aligned with the Sevier County Emergency Management Agency (EMA) plan, with appendices added for jurisdiction-specific issues.

CRISIS PLANNING

According to Coombs (1999), "a crisis can be defined as an event that is an unpredictable, major threat that can have a negative effect on the organization, industry, or stakeholders if handled improperly. A crisis is unpredictable but not unexpected. This definition suggests organizations should expect crises, and therefore

| PROCEDURES |
| PROTOCOLS |
| POLICIES |
| PLANS |

be prepared for them. However, it is also understood that agencies cannot be prepared for all eventualities. Coombs (1999) creates a master list of crisis typologies to help explain the different ways in which crises manifest themselves. The list includes nine categories of emergencies: (1) natural disasters, (2) malevolence, (3) technical breakdowns, (4) human breakdowns, (5) challenges, (6) mega-damage, (7) organizational misdeeds, (8) workplace violence, and (9) rumors.

Once the crisis level has been determined and the factual information to be communicated has been confirmed, it is time to begin planning. A communication response strategy is twofold: (1) communicate critical information and (2) respond to potential stakeholder questions during this planning stage. The Crisis Communications Team should:

☐ Develop a script for conveying key information points.

☐ Develop or refer to a list of questions that could be asked by a variety of audiences (families, media, partner, organizations) about the crisis.

☐ Modify pre-scripted messages or develop new messages.

☐ Be prepared to address the company's or the operation's record for the relevant crisis situation (e.g., mine safety, financial integrity, treatment of employees).

☐ Determine how the company will manage inquiries regarding a CEO's or other senior management's activities that are unrelated to the crisis situation (e.g., political activities).

☐ Identify the best delivery methods for key messages.

☐ Monitor crisis and update messages based on the crisis.

TIME OF THE GATLINBURG WILDFIRES

Communication events between the dates of November 23–28, 2016

WED., NOV. 23, 2016
@GSMNationalParkinfo tweets that a new fire approximately 1.5 acres in size is burning in a steep location on Chimney Tops.

SUN., NOV. 27, 2016
NWS-Morristown issues "Urgent Weather Message" for high-wind watch.

MON., NOV. 28, 2016 12:00 P.M.
Gatlinburg Fire Department issues a countywide request for mutual aid from other fire departments and activates the Sevier County Wildland Task Force.

12:00 P.M.
Gatlinburg authorities go door to door notifying people in the Mynatt Park Neighborhood of a voluntary evacuation.

1:48 P.M.
The Gatlinburg Community Center is designated as the evacuation shelter and the American Red Cross is asked to manage the site.

2:02 P.M.
GSMNP holds news conference carried on Facebook Live from the lawn of park headquarters.

2:30 P.M.
Gatlinburg Fire Department issues regional request for mutual aid from other fire departments.

6:30 P.M.
Gatlinburg Fire Department issues statewide request for mutual aid from other fire departments. Three minutes later, a news release issued announcing voluntary evacuation underway.

8:03 P.M.
Sevier County EMA Director contacts TEMA to request a WEA be sent announcing a mandatory evacuation for Gatlinburg. Due to a "communication failure," the alert was not sent.

9:03 P.M.
NWS issues EAS for immediate evacuation at the request of Sevier County EMA Director.

10:40 P.M.
TEMA uses Integrated Public Alert and Warning System to send wireless alert to mobile devices asking people in the Gatlinburg area to stay off mobile devices unless it's an emergency.

11:47 P.M.
NWS issues EAS message to area TV and radio stations relaying immediate evacuation message at the request of Pigeon Forge.

There are many factors that affect, alter, or influence how organizations respond to disaster. A combination of disaster characteristics and information flow are important elements of disaster response (Comfort et al. 2004). Perceptions of response also matter; therefore, the handling of public information and the media cannot be ignored during the response (Jensen 2008). According to Wenger et al. (1986, p. 21), a successful response includes the following characteristics:

☐ Excellent information collection and distribution;

☐ A fully staffed and functioning emergency operations center (EOC);

☐ Adequate human and material resources;

☐ Specialized division of labor among responding units and a single agency that coordinates those units;

☐ A legitimized authority structure, integrated and coordinated relationships with outside organizations;

☐ Mutually beneficial and effective relationships between emergency officials and mass media representatives; and

☐ "Reality-based" activities.

Gatlinburg fire damage.

TRAINING

An effective response to any hazard involves a combination of planning, pooling of resources, training, exercises, and organizing to build, sustain, and improve operational capabilities. Training is essential to the success of any implementable disaster response.

Training was clearly identified as an emergent theme in this study. In their comments, stakeholders expressed the importance of a more integrated approach to emergency response training, especially for high-tourist environments such as Gatlinburg, Pigeon Forge, Sevierville, and the GSMNP. Comments indicated the need for trained personnel, capable of making decisions, to address protective actions such as shelter-in-place or evacuation, and deployment of effective communication/ notification strategies. In addition, the importance of exercising with multiple agencies was noted; this would allow them to identify and establish scalable, manageable response activities.

Gatlinburg Residents and Tourists Leave the Downtown Area due to Fire Conditions

Public Education and Training

An important component of emergency preparedness is directing, advising, and issuing appropriate notification regarding specific actions, such as shelter-in-place or evacuation, to protect stakeholders. A multidisciplinary notification plan includes social media, reverse 911 or equivalent system, and outreach from the Local Emergency Planning Committee (LEPC), Chamber of Commerce, law enforcement, radio, and television. During the Gatlinburg wildfires, law enforcement went door to door notifying business owners and residents to evacuate. Identifying and integrating notification processes for stakeholders is important. Developing a list of points of contact responsible for developing and distributing notification (e.g., local fire departments, sheriff/police departments, ambulance services, hospitals, utility companies [electric, gas, water], local emergency management agency) would be beneficial. As an example, the manager of a restaurant in Gatlinburg left his establishment at 4:00 p.m. because of the density of smoke. The restaurant remained open, with customers, until 9:00 pm, at which time the police notified the establishment about the necessity of evacuating. A consolidated emergency notification system decreases the risk of miscommunication and potential untimely delays in emergency notifications associated with having several organizations, all or some of which may employ differing emergency notification systems, disseminating a message. Maintaining multiple notification systems could result in unnecessary risk to the health and safety of the public and the environment.

Public outreach and emergency notification training opportunities in technology and processes were noted. The mountainous terrain of the Gatlinburg area hampers signal strength, and cable systems must be used to reach remote resort cabins in the area. Most phones have an FM chip already installed, which ultimately turns cell phones into an FM radio. If a power failure occurs where cable systems and cellular tower signals are interrupted, FM chips in cell phones provide an alternative for information dissemination. This eliminates the need for a cell tower or satellite. Likewise, GPS technology can be used to send messages to cell phones within a certain geographic area. The public may be are unaware of alternative communication platforms such as FM radio chips and GPS that can be used for emergency notification. Appropriate and dedicated public outreach must be a priority to educate the public on how to maximize technology and existing equipment during emergency events.

RECOMMENDATIONS
Implement a public awareness campaign about emergency notifications and technology.

1. Conduct public outreach and education on how to use a cell phone FM chip for over over-the the-air signal and on how to sign up for emergency alerts (i.e., CodeRed, Nixle, etc.).

2. Instruct the public on in the use of cell phone GPS technology to receive weather updates and other emergency messages.

3. Members of the public should be active participants in their own safety. Encourage the public to sign up for the "ready.gov" Federal Emergency Management Agency (FEMA) app or other appropriate emergency notification apps.

Exercises and Responder Training

Most organizations plan for events such as earthquakes, weather-related events, system failures, and workplace violence. However, unpredictable events such as the Gatlinburg wildfires, which were accelerated by tornadic winds and severe drought conditions, exemplify the confluence of three natural disasters coming together to form the perfect storm. Coombs (1999) points out that most organizations can conduct a "crisis audit" to determine which crises a specific organization is most likely to encounter. Therefore, crisis management is a "process of strategic planning for a crisis or negative turning point, a process that removes some of the risk and uncertainty from the negative occurrence and thereby allows the organization to be in greater control of its own destiny" (Fearn-Banks 1996, p.2). Control is an operative word in crisis management. Although crisis preparedness and management are important, it would seem that they are a means to an end—managing the crisis.

In 2016, emergency broadcasters exercised with local emergency management agencies and the state. On September 1, 2016, an Integrated Public Alert Warning System (IPAWS) Common Alerting Protocol (CAP) test was conducted. IPAWS is an internet-based capability federal, state, territorial, tribal, and local authorities can use to issue critical public alerts and warnings. This was the first and only test in the state of Tennessee as of February 2017. Exercises such as these provide emergency managers opportunities to become familiar with existing systems, test plans, and procedures, and to hone their skills. In addition, exercise participation provides emergency managers and

communicators an understanding of how Emergency Alert Service (EAS) messages are coded and disseminated. In reference to EAS, one expert stated, **"It's a terribly underused system we know that works and nobody takes advantage of it."**

In 2013, the Tennessee Emergency Management Agency (TEMA) conducted a series of statewide catastrophic exercises, one which focused on wildfires. The exercise scenario mirrored many of the issues that transpired in the 2016 Gatlinburg wildfires. In this exercise, known communication challenges, such as not having pre-scripted messages or unified playbooks between the state and the counties were noted. As a result of TEMA's involvement in other exercises across the state, such as Tennessee Valley Authority (TVA) nuclear plant exercises, pre-scripted message development became a priority in order to meet the National Regulatory Commission's 15-minute notification and communication requirement. The process used to develop messages for the TVA exercise is a model that is well adapted to a wildfire response—even with limited information from the field.

TEMA's commitment to a robust exercise program exemplifies the importance of planning and participating in exercises. Participation provides community stakeholder opportunities to test policies, procedures, and systems. One stakeholder noted, **"If you don't practice them, you don't how to use them."** A seasoned emergency manager also emphasized the need for agencies to plan on limited credible scenarios. It is important for agencies to strategically and routinely exercise and drill to the worst-case scenario. As a result of this practice, response becomes more scalable and manageable.

Regardless of the emergency, stakeholders expressed the importance of an integrated notification plan, knowing roles and responsibilities, and updating and testing notification processes annually.

The importance of an adequate and well-trained staff was also identified. A one-person communication shop is difficult to maintain, especially in a fast-paced information landscape ruled by social media and quick bytes of online information. Two PIOs provide a more well-rounded communication response. In a two-person shop, one PIO can serve as the primary and the other as a backup, especially during emergency response efforts. With more than one PIO at the helm, agencies are better positioned to think proactively and utilize an array of communication and technology tools. At one time TEMA operated as a two-person communication shop, which allowed them

to plan proactively, deploy to the field, and staff the Emergency Operations Center (EOC) 24/7. However, in 2014, one PIO position was eliminated. Having a full-time dedicated position for communication, notification, and warning systems is essential. Participating and planning builds staff confidence in operating these systems during actual emergencies.

Personnel from a given agency may not be sufficient to handle the demands placed upon them, particularly in crisis situations that involve multi-day rescue and/ or recovery operations or environmental catastrophes. Further, in addition to federal and state authorities that have statutory responsibilities onsite during a crisis, elected officials, including the governor and members of congressional delegations, may want to play a role in press briefings and/or in meetings with family members. These possibilities all require coordination and will further tax additional communication personnel. As part of the planning process for creating a crisis communication team (or multiple teams), outside resources that could supplement or fill gaps in the team(s) should be considered and relationships, either formal or informal, should be developed as appropriate. Cross-training also provides an excellent return on investment and ensures enough personnel are available to respond.

A seasoned PIO who has knowledge related to the Gatlinburg wildfires identified a gap in the staffing of trained personnel who knew how to use TEMA's communication and warning systems (e.g., IPAWS). Understanding IPAWS and other notification systems, and how they work, is imperative. Even when pre-scripted messages have already been developed, users of these communication and warning systems must understand how to integrate and maximize these messages effectively. In addition, these systems must be exercised and staff must be trained in order to build confidence for operating during emergencies. For example, CodeRED, a reverse 911 system purchased by Sevier County, is an emergency notification system that has been in place since 2011. However, on the night of the wildfires, this system was not employed due to communication issues.

Employing crisis and risk communication strategies provides organizations opportunities to communicate with stakeholders, provide direction, and articulate a vision for recovery and reentry. By their nature, emergency events are reactive. Employing a proactive training and exercise program must be a priority for response agencies.

RECOMMENDATIONS
Personnel assigned to the Emergency Response Organization (ERO) should be required to satisfactorily complete an initial training program prior to assignment. Annual, continuing, or refresher training should be required.

1. Develop and train volunteers;

2. Develop programs that are modular and adaptable to community-specific events;

3. Enhance stakeholder literacy regarding emergency management programs;

4. Strengthen stakeholder outreach through the use of the internet, social media, radio, and television;

5. Capture the uniqueness of stakeholder communities and preparing training accordingly; and

6. Develop a standardized tool to measure preparedness.

RECOMMENDATIONS
Conduct evaluations, appraisals, and assessments in collaboration with multiple agencies and exercise scalable scenarios.

1. Conduct notification self-assessments quarterly, bi- annually, or annually. Since social media changes so quickly, quarterly self-assessments are recommended.

2. Conduct an annual exercise with the LEPC/ stakeholders/community partners to identify strengths, improvement opportunities, and best practices.

3. Establish tracking mechanisms to address corrective actions, agency/person responsible, and target dates for completion.

4. Establish routine collaboration among state, locals, businesses, and broadcasters for system testing, personnel training, and identification of improvements.

COLLABORATION

A recognized challenge in the effectiveness of disaster management is information sharing across organizations. In addition, lack of collaboration with community members and lack of stakeholder engagement often result in increased barriers and often add to the overall challenges of process improvement and information sharing among agencies and community members. Collaboration offers emergency management officials and stakeholders, such as business and industry, residents, and other government entities, opportunities to recognize, assess, and plan for community needs during emergency events. Collaboration helps to ensure appropriate resources—which may be jurisdictionally specific—are addressed, and that all stakeholders understand how to work together during an emergency event. Disasters require people and organizations to work together and effective collaboration is essential.

Interoperability

Stakeholders discussed issues at the emergency planning level that may have affected failures in emergency notifications on the night of November 28. Stakeholders noted that no centralized notification processes or technologies were used. Under-utilization of existing notification technology (i.e., social media and CodeRED) were also noted. One business owner noted that adding automated voice calls to business owners in the Chamber of Commerce's directory would be a recommended improvement. Another recommendation is the development of an emergency website and/or dark site to quickly post emergency information that would be accessible to the community. Although Gatlinburg often sees its share of snow storms and flooding, it had never experienced a fire of historic proportions as it did in this event. However, emergency notifications and communications should be handled consistently regardless of the hazard.

Public Outreach and Leveraging Community Resources

Under-utilization of the LEPC and a lack of community education outreach were identified as opportunities for improvement. Participation in LEPCs provides opportunity for community stakeholders to develop congruent preparation, mitigation, response, recovery, and reentry processes. It is recommended that the Gatlinburg Chamber of Commerce and LEPC coordinate a community-wide education campaign. For example, one local business owner was not aware LEPCs existed and did not know what capabilities they can offer to a community's preparedness. Upon learning about LEPCs and their mission, the business owner indicated an interest

in becoming a member of the local LEPC. Likewise, a local faith leader was not familiar with LEPCs, but indicated an interest becoming active in the local LEPC after learning about its mission.

Adding an "emergency planning" section and/or connection to the LEPC on the Gatlinburg Chamber of Commerce website is also recommended. In addition, both of these organizations should provide a community education campaign and training opportunity for community members. For example, the Gatlinburg Chamber of Commerce website does not provide information on emergency planning, or information on the LEPC. In fact, using the search function on the Chamber's website for terms such as "Emergency," "Local Emergency Planning Committee," "LEPC," or "Safety" renders no relevant emergency information related to public safety. Coordination between the LEPC and the Chamber of Commerce can be enhanced if they engage local business owners and other stakeholders through community outreach and education for public safety. Business and industry need to engage collaboratively in emergency planning efforts to maximize and increase stakeholder participation with the LEPCs to enhance community preparedness.

Technology Tools

Collaborative opportunities using new technology were also under-utilized. **Technology tools make collaborating easier by reducing inefficiencies and enabling new methods of working together. Virtual Operations Support Teams (VOSTs) can leverage these technologies to support efficient, consistent, and timely response during an emergency event. Social media is an integrated technology that allows users to generate their own content and share that content through various connections.** A VOST is a team of emergency managers and disaster volunteers around the country who lend virtual support to those on the site of a disaster, or those who may be overwhelmed by the volume of incoming data. Under the leadership of an assigned leader, the VOST is activated to perform specific functions during an incident in which the emergency management team needs additional support. The team leader reports directly to the affected jurisdiction. VOSTs remotely leverage social media, mobile, and online technologies to assist emergency managers in handling the massive amount of information being generated, while also meeting the expectations of constituents who are demanding information. VOSTs exist as an option to assist state and local agencies during an event. Ultimately, "a well-developed Virtual Operations Support Team is made up of trusted agents (volunteer

or otherwise) selected and activated by the affected jurisdiction for the specific purpose of supplementing an existing social media program through enhanced innovative uses of social media, new communication technology and other online tools" (Trost 2015).

According to an expert in the field, it is imperative to build bridges and social media capabilities before an emergency occurs. It is important to connect and partner with stakeholders and agencies to fill social media support gaps. It is also important to utilize Emergency Management Assistance Compacts (EMACs) with stakeholders and other agencies.

Volunteers

Opportunities for collaboration were also identified in terms of volunteer recovery efforts. FEMA worked with the state and local Voluntary Organizations Active in Disasters (VOAD) to provide recovery summaries and key information to all partners, in addition to assisting volunteer registration and FEMA grant applicants. During this time, FEMA processed thousands of applicants, approved millions of dollars in housing assistance, and committed funds for other assistance grants. Even though it is geographically separated from Gatlinburg, FEMA provided technical support for the disaster via remote technologies.

Volunteer East Tennessee exhibited successful use of collaboration and technology. This organization provides services for organizations to mobilize and connect volunteers. Using a combination of quick response (QR) codes, Google-shared cloud resources, and other free and low-cost technology, Volunteer East Tennessee developed a volunteer registration tracking process and a shared database for volunteer organizations to provide resource assets and needs. This process is still being refined and proceduralized, but the use of technology and collaboration is noteworthy.

Overall, stakeholders noted a need for greater collaboration among official agencies, LEPCs, and other community stakeholders. This need for collaboration also extends to recovery and faith-based organizations. For example, during the wildfire response, Sevier County Emergency Management Agency and members of the East Tennessee VOAD were unaware of the services and support Volunteer East Tennessee could provide. Volunteer East Tennessee provided on-the-spot education to response officials in the EOC concerning resources and volunteer management capabilities, as well as other collaborative efforts to maximize communication efforts and proactively manage volunteer efforts.

Engagement with the community must be a priority and instilling an attitude of preparedness within a community is crucial. With technology changing rapidly and the use of social media increasing, community members are plugged into disasters and the disaster management process in a more efficient manner (White et al. 2009). Organizations must make a concerted effort to increase interagency and cross-agency collaboration.

In summary, FEMA's A Whole Community Approach to Emergency Management: Principles, Themes and Pathways for Action (December 2011) discusses the benefits of collaboration. The following are some potential strengths of collaborative efforts:

☐ Shared understanding of community needs and capabilities

☐ Greater empowerment and integration of resources from across the community

☐ Stronger social infrastructure

☐ Establishment of relationships that facilitate more effective prevention, protection, mitigation, response, and recovery activities

☐ Increased individual and collective preparedness

☐ Greater resiliency at both the community and national levels

RECOMMENDATIONS

1. Work collaboratively with LEPCs to ensure congruency of notification and communication plans and systems with existing community response plans.

2. Implement the Virtual Operations Support Team (VOST) concept to assist with social media messaging and monitoring.

3. Leverage EMACs.

4. Work collaboratively with LEPCs to ensure congruency of notification and communication plans and systems with existing community response plans.

5. Develop notification, communication, and system plans collaboratively with community assets and other stakeholders to ensure emergency management is inclusive.

COMMUNICATION AND EMERGENCY PUBLIC INFORMATION

Stakeholders recognized developing integrated communication and notification plans are critical to the emergency response process. An integrated notification plan, including the use of social media, centralizes and accelerates notification, reduces redundancies, and connects with a wider range of stakeholders during an emergency event, especially in a high tourist environment. Reflecting on the Gatlinburg wildfires, one expert stated, **"Communication was the first causality."**

A crisis communication plan is a vital part of emergency preparedness and response. An organization's success is dependent, in part, upon its reputation. Having a solid crisis communication plan—which has been integrated with the crisis management or operations plan, and is well-tested and understood and practiced by agency employees—can not only save an organization's reputation, but also save lives.

From a practical application standpoint, a crisis communications plan does the following:

☐ Defines and assigns the crisis team.

☐ Outlines roles and responsibilities of the crisis team.

☐ Details steps to take in a crisis event.

☐ Indicates who to contact, resources that are available, and procedures to follow.

☐ Provides a platform for training, testing, and improvement.

General requirements include development and implementation of a comprehensive emergency management system, specifically focused on communication and notification activities. The communication and notification activities are designed to minimize the consequences of emergencies involving or affecting Sevier County, specifically the City of Gatlinburg, the GSMNP business and industries, residents, and tourists. In addition, a robust communication system aids in the coordination of assets such as transportation, fire, law enforcement, emergency management agencies, and city, county, and state officials, as well as federal assets that may be needed for response efforts. Interagency communication coordination is essential for a robust emergency notification system. The purpose of a notification is to protect the health and safety of the public from hazards associated with credible emergency events such as wildfires, snowstorms, high winds, and floods.

Initial notification and warning offered areas for improvement. Stakeholders identified three key communication links as being important: (1) business and industry; (2) residents and tourists; and (3) response agencies—fire, police, and emergency medical services.

Initial Notification with Stakeholders

One prominent gap in communication identified in the wildfires event was under-utilization of existing systems including the EAS. According to the Tennessee Statewide EAS Plan, which was revised in January 2013:

"The Emergency Alert System (EAS) is designed so that agencies with an emergency message need transmit that message only once, and it will be received by all area broadcasters and video providers simultaneously. The most accessible method to do this is via the State/Local Emergency Management Agency. The EAS is tested on a monthly basis. There are a number of mandated FCC codes, including an 'EVI' code for 'evacuation immediate.' NWS [National Weather Service] personnel issue EAS Weather Alerts via the NOAA Weather Wire Service (NWWS) and on NOAA Weather Radio (NWR) using the NOAA-SAME/EAS Codes. NOAA Weather Radio has been an 'all hazards' network in Tennessee since the establishment of a Memorandum of Understanding (MOU) with Tennessee EMA. Alerts for other than weather emergencies originate with State or Local EMAs and are broadcast by NWS personnel over NWR at the request of State EMA" (Tennessee Statewide EAS Plan 2013).

The following lists of event codes are a minimum required list of events for activation of EAS units in Tennessee:

☐ "TOR" (Tornado Warnings)— Must be re-transmitted immediately.

☐ "FFW" (Flash Flood Warnings)— Must be re-transmitted immediately.

☐ "CEM" (Civil Emergency Message)— Must be re-transmitted immediately.

☐ "STA" (State Priority Message)— Must be re-transmitted immediately.

The emergency alert system was triggered by the NWS, in Morristown, Tennessee, through the area emergency management offices around 9:00 p.m. Eastern Standard Time (EST) on November 28, 2016, the night of the wildfires. The notification was an "EVI" (Evacuate Immediately) message sent to broadcast stations. Only one area radio station, WUOT, set the EVI code for auto-relay. If a Civil Emergency Message (CEM) code had been issued instead of the EVI code, the message would have been disseminated throughout the area immediately, because most broadcasters have "CEM" coded for immediate dissemination. EAS-coded messages, along with corresponding codes and the content, are open-ended and can be customized and disseminated via EAS.

Lack of collaboration and communication throughout the state and with the disseminators of the information may have contributed to the evacuation message not being auto-relayed. For example, a CEM could have been sent with the evacuation message, triggered by the NWS, with authority from a local county or state approver. These messages are typically approved at the local level, not the state level. Therefore, a customized, immediate notification for evacuation could have been disseminated for auto-relay, if it had been used this way.

Some radio stations do forward social media messaging to individual subscribers. However, the Tennessee EAS Plan does not require this. Social media tools can be integrated to enhance risk and crisis communication during emergency events. When combined with traditional notification measures, social media tools create redundant notification systems. Individuals, communities, and organizations use social media for day-to-day communication, and social media has also been extremely useful during disasters. Social media enhances risk and crisis communication, is agile, and promotes resiliency during disasters.

Any system has strengths and weaknesses, but redundant communication and warning systems were in place at TEMA. For example, WebEOC can send wireless and EAS messages through the IPAWS gateway. In 2014, TEMA operated a multiagency Joint Information Center in conjunction with Middle Tennessee State University's satellite uplink to provide live broadcast capability. If it still exists, this capability would enable TEMA to broadcast live, to any stations across the state, for any emergency. The Tennessee Advanced Communications Network also provides push-to-talk portable radio capability for emergency communications. Using the correct frequency, responders can communicate anywhere across the state. After the 2010 Tennessee flood event, Tennessee was awarded a grant that was used to purchase a new National Warning System to replace its antiquated analog warning

system. Once it had been installed, the National Warning System ultimately provided connectivity across Tennessee. It is unclear how many of the available tools were used during the Gatlinburg wildfires. It is also unclear how many staff were trained to use these tools. Conversely, some previously available communication and warning system capabilities at TEMA are no longer operational. For example, TEMA's 24-hour operations capability was eliminated prior to the Gatlinburg wildfires.

Dynamic Message Signs and Highway Advisory Radio were not used to provide notifications on November 28, for travelers on roads near the affected areas. If this capability exists, integrating public warning systems would help increase the number of populations reached, especially in high-tourist areas.

RECOMMENDATIONS

1. Set and standardize specified warning codes, statewide, to auto-relay. Most stations hold about six codes for immediate dissemination.

2. Add "evacuate immediately" (EVI) to the list of auto-relay EAS messages.

3. Integrate public warning systems for greater reach.

Communication with Businesses, Residents, and Tourists

Several statements referenced the need for customized stakeholder communication as a preemptive step. One business owner acknowledged a stark contrast in notification and communication pre-wildfire versus post-wildfire. Ultimately, the business owner thought that risk communications and emergency notifications before the wildfire were lacking, while communication post-wildfire was managed much better. After the mandatory evacuation order was issued, the Gatlinburg Chamber of Commerce communicated with local business owners via email about evacuation status and recovery efforts. After the wildfires were extinguished, city officials and first responders came together quickly to conduct search-and-rescue operations, to direct residents and tourists to shelters, and to begin the response and reentry process.

One business owner identified gaps in the notification process and pre-evacuation communication. This individual specifically mentioned officials' inability to thwart the wildfires prior to the subsequent wind storm, which quickly fed the wildfire as it skipped across the Chimney Tops, and moved into the downtown Gatlinburg city limits and into surrounding areas outside the presumed containment of the GSMNP. The business owner believes the Chimney Tops attempted controlled burn missed the mark before the wind storms swept through the area. The business

owner acknowledged a lack of awareness of the Chimney Tops fire until after it had moved into the Gatlinburg area the night of November 28. However, the business owner was aware of the extreme drought and burn ban warnings in the area. According to one resident, the burn ban notification was emailed and was the only "official" notification they received from authorities during the entire wildfire event.

It is unclear if this information would have changed this business owner's actions the evening of November 28, when this stakeholder opted to voluntarily close two restaurants early due to the severe smoke and ash in downtown Gatlinburg. One restaurant remained open because it had a different air conditioning system that prevented smoke and ash from affecting this particular restaurant. In addition, managers of the restaurant that remained open indicated they wanted to remain open because patrons were still coming into the restaurant. The restaurant remained open until 8 or 9 p.m. EST, when the police told the people inside to evacuate. Although police told restaurant staff and patrons to evacuate immediately, they did not receive any social media or text message evacuation notifications. This business owner also noted that they did not receive information from the Gatlinburg Chamber of Commerce via email, phone, or text on the night of November 28.

According to one resident who also owns several cabins for rent, the only "official" notification they received to evacuate was from a cleaning crew indicating the mountain was on fire. Before abandoning their home, the resident called or sent texts to neighbors and renters notifying them to evacuate as soon as possible. This resident was surprised that no notification was sent by authorities. **"I expected an Amber Alert or something similar as a warning."** Because no official warning had been issued, the resident called the local fire department and identified themselves as residents in hopes of getting direction or obtaining additional information. The resident said, **"the person answering the phone said evacuate now and they hung up on me. They didn't give me a chance to ask where or how to evacuate."** The same resident noted that they did not use social media platforms but depended on cell phone calls or text messages as their primary mode of communication. Because of the mountainous terrain, the resident indicated reception was "spotty." The cabins owned by the resident are managed by a realty management company and some are listed with online services. The resident indicated that the management company did not issue warnings to guests residing in their cabins. In summary, the resident stated "**Even if we all had been prepared, I don't know if we would have been prepared."**

In discussing response to the Gatlinburg wildfires, the manager of a prominent Gatlinburg hotel indicated that the hotel's seasoned staff made the decision to evacuate the hotel about two hours prior to receiving official notification from authorities. The 205-room hotel was almost completely booked with tour groups, a bus group, and individual tourists. Because of the management's proactive notification, occupants had time to pack their belongings and evacuate the hotel without any problems. Management staff went from room to room to insure no one was left behind. The manager of this property stated, **"City officials did the best they could with what they knew at the time."** However, this 23-year hotel industry veteran would have liked to have had information sooner, "so people would know what to do." The manger credits their proactive management and staff response for minimizing impacts on the hotel and their guests.

A tourist and his family, who frequently visit Gatlinburg and GSMNP, received mixed messages about wildfire conditions from officials on November 28. Calling the fire station around 7:00 p.m., the tourist spoke with the Fire Chief's wife, who told him there were voluntary evacuations for an area named Mynatt Park. The Fire Chief's wife did not provide a reference point as to the location of Mynatt Park in relation to the tourist's location. At 7:41 p.m., approximately 40 minutes after the tourist's first call to the fire station, the tourist received a phone call from the owner of the rental cabin the tourist's family was residing in, informing the tourist he had about 40 minutes to evacuate. The cabin owner's call was not prompted by official notification from Gatlinburg authorities, but rather by notification from the cabin owner's cleaning crew, stating "the mountain is on fire [...] come get me." After talking with the cabin owner, the tourist called the fire station back seeking additional information and was told there were no evacuations for his area. The tourist was not directed to any other information outlets for timely or official information updates.

The tourist and his family caravanned down a mountain to escape from their cabin, maintaining contact via cell phone. Once reaching the main road in downtown Gatlinburg, the tourist noted there was no traffic control present, which created a secondary emergency: a traffic jam. Although sympathetic to the plight of the responders who were consumed with the primary disaster response, the tourist notes that, with approximately 14,000 people fleeing Gatlinburg, the inability of response officials to manage traffic control points could have created a secondary disaster.

It must be noted that this tourist was not just a typical tourist spending the weekend in Gatlinburg, but a tourist with 35 years' experience in emergency management. Based on his 35 years' experience, the tourist indicated Gatlinburg should have been evacuated no later than 6:30 p.m. That order was not given until 8:30 p.m., and then the order was delayed because of an outage of electrical and cell-phone service at the command center.

This stakeholder raised a number of issues in addition to the lack of notifications. Official agencies offered no actionable messaging throughout the day. The tourist states, **"Public safety officials must provide specific, concrete, and actionable information to residents."** At noon that day, officials requested additional response assets but failed to notify the public that fires were spotting in the park. This unwillingness to be transparent was a key issue for the tourist. The tourist opines, "There was a failure on their part to comprehend the benefit of communication." The tourist believes officials only thought in terms of traditional wildfire fighting response rather than approaching the wildfires from different vantage points. According to the tourist, "paradigm paralysis" put responders and official agencies in a constant reactive stance rather than allowing them to think proactively. He summarized by stating, "People live and die on what comes out of a good public information system."

Based on his emergency management background, the tourist stated, **"Responsible people and the public often get caught up in disasters for these four reasons:**

1. It won't happen.

2. If it does happen, it won't happen to me.

3. If it happens and does happen to me, it won't be as bad as they say.

4. If it does happen and happens to me and is as bad as they say, I couldn't have done anything anyway."

RECOMMENDATIONS
1. Develop a robust emergency preparedness campaign to educate the public.

2. Engage in an exchange of information between officials and homeowners about each other's roles and responsibilities during an emergency event.

3. Use multiple channels of communication and build for redundancy.

4. Enhance emergency preparedness for property owners by developing neighborhood watch groups, call trees for notification, and emergency preparedness information packets which can be placed in cabins or presented at check-in.

Social Media

Social media was largely underutilized for notification and communication. More than 33,000 people talked about the fire on Facebook. It became a trending topic on the night of November 28, when the wildfires spread causing mandatory evacuations for almost 14,000 people residing in Gatlinburg and the GSMNP. However, official agencies did not disseminate any notifications, evacuation messages, or communication via social media channels. In fact, the wildfires even triggered Facebook's safety check-in feature for those located near the wildfires in Gatlinburg.

Social media is the media channel through which users collaborate, share, and discuss in real time. Social media is distinctly different from traditional media. Social media provides anyone with Internet access the ability to engage in real-time collaboration, sharing, and discussion. **There are numerous social media tools available, with different characteristics, user demographics, and functionalities. Examples of social media tools include blogs, social networking sites, microblogging sites, photo-and-video sharing sites, wikis, and podcasting.** Social media plays a major role in the emergency management community. It can often shape how crises are communicated and how response is coordinated. It can also provide new and accessible communication platforms that offer the opportunity to reach more people than ever before. In a time of crisis, social media also provides a mechanism for communicators to quickly relay critical information to both the public and each other. It is a proven and invaluable resource for emergency management across the world. For example, within 10 minutes of the April 15, 2013, Boston Marathon bombings, the Boston Police Department used social media to let people know what had happened. Social media technologies have largely become the standard for information dissemination and can enhance an agency's information network efforts to reduce the impact of emergencies and disasters on life and personal property. Social media can best be leveraged during time-critical response efforts if most participants have already built a history and trust with a given social media platform. Social networks can be used as notification systems, in recovery efforts, in emergency information gathering, and as information repositories.

One business owner noted he would not have used social media to search for emergency information. The business owner states, **"I wouldn't even know where to go to look for social media updates,"** citing the world of social media is "just too big to go and find this information." However, post-wildfire the business owner's staff created a closed-group Facebook page to share information with restaurant management and staff. The business owner indicated the employee Facebook page will be a valuable platform for future internal communication. When asked about using

a social media–centric notification system for emergency public information purposes, the business owner indicated such a system would be utilized by the business and on a personal level in the future. The business owner adds, **"it's the people who get paid to do this [provide emergency public information] to get the information out in the quickest and most efficient way [...] Official agencies should be aggressively sending us information any way they can get it to us."** Using multiple channels, in multiple ways (i.e., social media, text messages, and automated voice calls, which schools often utilize for parental notifications), should all be used to get messages out and to direct receivers of the information to a single source, such as a website, for additional information. This business owner indicates a preference for text messages and believes text messaging is the most efficient method by which to receive emergency information. The business owner also indicated that emails from the Chamber of Commerce would be helpful.

Fires in Gatlinburg Burn near Roads

The manager of a realty management firm in the Gatlinburg area, whose properties were not impacted by the wildfires, monitored social media to see what local residents were saying and observe their reaction to the event. Most of the posts were inquisitive in nature, with residents wondering about the status of the event and its impact on the community. Although this firm's properties were within a mile of the actual event, they received no official notification from officials. However, the manager did send a mass email to clients informing them that their properties were unaffected. The manager opined that **"it would have been helpful if officials could have sent a timely, mass text warning."** The manager indicated the reality management's properties did not use social media but instead opted to use email and phone calls. Once reason the manger gave for not using social media was that, "You don't know what is true and what is not. That's why I don't use it." Nevertheless, we came together as a community."

Misinformation was identified on social media. Photos circulated throughout Facebook, Twitter, and Instagram that depicted wildfires from previous events, yet were represented as photos from the Gatlinburg wildfires. Most of these photos were quickly identified as false and corrected by other social media users. On November 29, social media was used to counter erroneous information shared by TEMA that Ober Gatlinburg, a popular tourist destination, had been lost to the fires. TEMA issued the misinformation on its state website, but corrected it after it was debunked by social media users. According to a TEMA spokesperson, the inaccurate information was retweeted on a Twitter account identified as Gatlinburg's (Jacobs 2016). On the same day, Ober Gatlinburg used its Facebook page and Twitter account to inform people it had not been lost to the fires, and an employee even provided a video of the area on social media to prove it was unaffected by the wildfires.
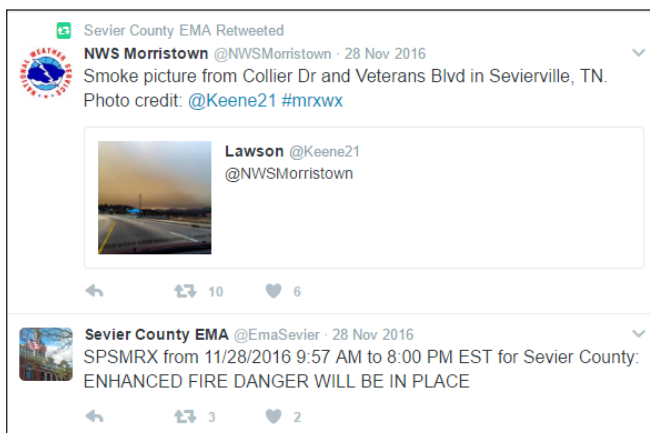
A Twitter account called @GatlinburgTN, with 23,500 followers, provided information relative to the wildfire on November 28. However, it was discovered after the wildfires that the City of Gatlinburg did not own or manage this Twitter account. According to a spokesperson for the City of Gatlinburg, they did not know who the administrators of the site were, but they appreciated the attempt to use social media to share the message.

One tourist with a high level of proficiency in social media noted his concern with a lack of any official social media information from public safety agencies. Throughout the day, the tourist unsuccessfully used multiple hashtags checking Twitter for information on the wildfires. The tourist did discover one post on Twitter with the hashtag #GSMNP. Unfortunately the Twitter hashtag failed to provide any protective actions or details related to the wildfires. In hindsight, the tourist indicated regret for not creating and posting a wildfire hashtag for others to follow.

Prior to November 28, the City of Gatlinburg did not have any social media accounts. Since the wildfires, the City of Gatlinburg created a Facebook page to share information with the community. The City of Pigeon Forge did not use social media to warn or alert the public. However, the City of Pigeon Forge Department of Tourism used its Facebook page on November 28 to share several GSMNP social media postings. At 8:39 p.m. on November 28, the City of Pigeon Forge Department of Tourism provided information about the evacuated areas and available shelters, as did the City of Pigeon Forge Fire Department's Facebook page. The GSMNP continuously updated information on its Facebook page and Twitter account throughout the day on November 28, warning the public of the erratic movement of the fires. At 2:00 p.m. EST, park officials posted video of a news conference on its Facebook

page in which the National Park spokesperson indicated outlying communities had been alerted to the danger that wildfires could burn structures near the park's boundaries. According to a GSMNP spokesperson, the National Park Service has a social media policy. However, the GSMNP does not use social media platforms as a warning system due to "spotty cellular coverage." Instead, the park's websites are used to provide emergency information (Jacobs 2016).

According to one stakeholder, TEMA typically uses Twitter because it provides the ability to disseminate information quickly. However, TEMA's lack of staffing and training was not sufficient to support the two-way communications required by other social media sites such as Facebook. During the floods in 2010, TEMA had a limited social media presence. In response to the floods, TEMA and FEMA collaborated to create and manage a joint Facebook page. At that time, TEMA was also a one-person communications shop and lacked social media monitoring capability. When the value of social media became apparent to TEMA, TEMA established a social media monitoring position. However, this responsibility was assigned to a high-turnover position in the 24-hour operations center and has not worked as well as expected. The only social media post from TEMA the night of the wildfires came from Twitter at 11:04 p.m. EST, asking people to stay off mobile devices. According to TEMA's spokesperson, **"TEMA has always used its social media sites to provide public information. We have not used social media as a public warning platform, either statewide or locally."** The TEMA spokesperson also provided the news media with an internet link to Tennessee's restrictions on employees engaging in political activities with social media, but did not address a social media policy or strategy (Jacobs 2016).

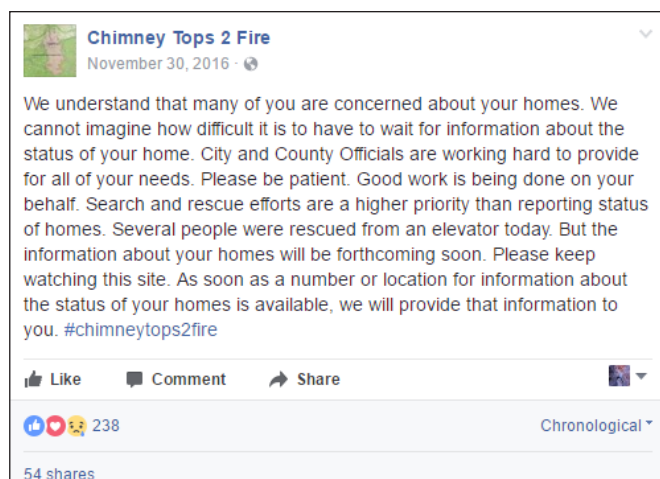

Sevier County EMA Retweet on November 28

Sevier County EMA utilized some social media with their communication outreach. According to a spokesperson for Sevier County, a retweet of the National Weather

Service by Sevier County EMA Director noting "enhanced fire danger" was the only social media post the agency sent the day of the wildfires. According to the Sevier County spokesperson, Sevier County has no policy about using social media during emergencies. The official @SevierCounty Twitter account was established in 2015. However, the Twitter account was not linked to the Sevier County website at the time of the wildfires. The Sevier County EMA Director indicated his staff was overwhelmed and unable to focus on using social media during the response to the wildfires. In fact, the threat of fires forced the command post to evacuate and relocate to a building without power, thus prohibiting access to technology such as mobile data and the internet.
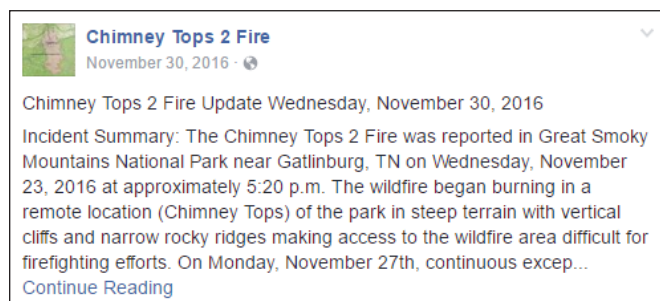
On November 30, firefighters from Colorado who deployed to the wildfires created a Chimney Tops 2 Facebook page. The Facebook page provided current fire conditions, a map of affected areas, information about homes and businesses affected, and a platform to report missing people. The Facebook page created the hashtag #chimneytops2. It eventually gained traction on Twitter as social media users began using the hashtag in their online posts, although no official ChimneyTops2 Twitter account was established or used. Weeks after the initial fire, the Facebook page was still being used to maintain condition updates, post press conference videos and news releases, and provide general information related to recovery efforts and responder highlights. The Facebook page would eventually grow to over 45,000 "likes."

Chimney Tops 2 Fire Facebook Page Post was created on November 30

Chimney Tops 2 Fire
November 30, 2016 · 🌐

We understand that many of you are concerned about your homes. We cannot imagine how difficult it is to have to wait for information about the status of your home. City and County Officials are working hard to provide for all of your needs. Please be patient. Good work is being done on your behalf. Search and rescue efforts are a higher priority than reporting status of homes. Several people were rescued from an elevator today. But the information about your homes will be forthcoming soon. Please keep watching this site. As soon as a number or location for information about the status of your homes is available, we will provide that information to you. #chimneytops2fire

👍 Like 💬 Comment ➡ Share

🙂❤️😢 238

54 shares

Chronological ▾

Chimney Tops 2 Fire Facebook Page Post

Chimney Tops 2 Fire
November 30, 2016 · 🌐

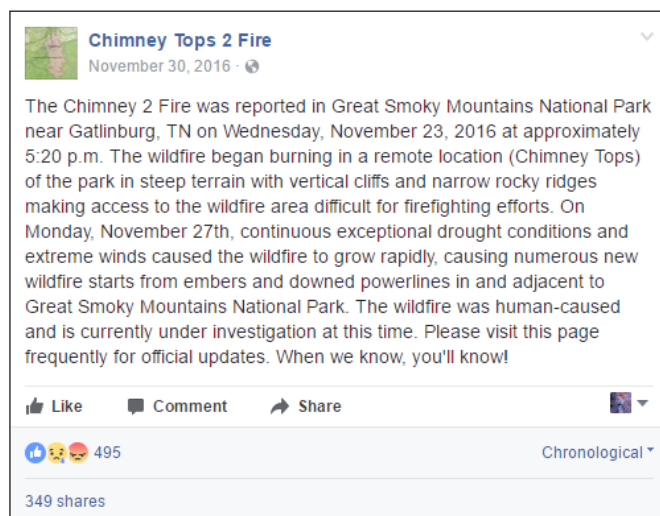Chimney Tops 2 Fire Update Wednesday, November 30, 2016

Incident Summary: The Chimney Tops 2 Fire was reported in Great Smoky Mountains National Park near Gatlinburg, TN on Wednesday, November 23, 2016 at approximately 5:20 p.m. The wildfire began burning in a remote location (Chimney Tops) of the park in steep terrain with vertical cliffs and narrow rocky ridges making access to the wildfire area difficult for firefighting efforts. On Monday, November 27th, continuous excep...
Continue Reading

Chimney Tops 2 Fire Facebook Page Post

Chimney Tops 2 Fire
November 30, 2016 · 🌐

The Chimney 2 Fire was reported in Great Smoky Mountains National Park near Gatlinburg, TN on Wednesday, November 23, 2016 at approximately 5:20 p.m. The wildfire began burning in a remote location (Chimney Tops) of the park in steep terrain with vertical cliffs and narrow rocky ridges making access to the wildfire area difficult for firefighting efforts. On Monday, November 27th, continuous exceptional drought conditions and extreme winds caused the wildfire to grow rapidly, causing numerous new wildfire starts from embers and downed powerlines in and adjacent to Great Smoky Mountains National Park. The wildfire was human-caused and is currently under investigation at this time. Please visit this page frequently for official updates. When we know, you'll know!

👍 Like 💬 Comment ➡ Share

🙂😢😡 495

349 shares

Chronological ▾

Chimney Tops 2 Fire Facebook Page Post

Social media is an integral communication tool during emergencies. To assist with surge support, monitoring efforts, and message amplification, a VOST comprised of emergency managers and disaster volunteers around the country can lend virtual support to those onsite or to those who may be overwhelmed by the volume of incoming data. Under the leadership of an assigned manager, the VOST activates to perform specific functions during an incident when the emergency management team needs additional support. The team leader reports directly to the affected jurisdiction. VOSTs leverage social media, mobile, and online technologies to assist emergency managers in handling the massive amount of information being generated, while also meeting the expectations of constituents who are demanding information (Trost 2015). VOSTs exist as an option to assist state and local agencies during an event.

Social media is not just a response tool. It also has significant applications before and after events that may ultimately provide cost-effective, efficient solutions for preparing local communities for emergencies and disasters. Before an emergency or disaster strikes is the best time for communicators to engage their community in public education, community preparedness activities, training, and exercises. Social media provides a valuable opportunity to help bridge communication gaps and maintain preparedness and response at appropriate levels. Technology tools such as social media make collaborating easier by reducing inefficiencies and enabling new methods of working together remotely. Professional communicators can leverage these technologies to support efficient, consistent, and timely information management before, during, and after an emergency event. Technology tools provide emergency management professionals the knowledge they need to make informed decisions while ensuring the safety and health of the public.

RECOMMENDATIONS
1. Leadership should take a more proactive approach in social media planning and implementation to include provisions for adequate staffing and resources for social media management.
2. Integrate digital communications and social media into existing communication plans to include planning and funding for staff training.
3. Implement a social media policy and strategy.
4. Leverage Virtual Operations Support Teams (VOSTs) to assist with social media monitoring and message amplification.

Communication with Responders

Responders noted communication issues during the wildfire incident. The mountainous terrain of Gatlinburg added to the communication challenges. According to a first responder, there were intermittent cell phone and radio communication disruptions. These disruptions depended on the strength of the signal and the location of the responder trying to access the signal. According to the first responder, **"You expect to lose cell service when it's inundated with calls, but not in this situation."**

Workarounds were put in place so text messages could be sent. Mutual aid strike teams maintained contact with their home counties and provided updates whenever possible. However, the first responder noted that cell phone and radio communications never became completely unusable. The first responder also opined that most responders did not use social media, even for personal reasons, because they were too busy responding to the wildfires.

Firefighting Efforts during the Gatlinburg Wildfires

> **RECOMMENDATION**
> Use the concept of "backfilling and mutual aid" for notification and communication processes.

Communication with Non-English-Speaking Communities

Gatlinburg's thriving tourist industry is a mecca for immigrants seeking employment in the service industry. Jobs such as housekeeping, restaurant staffing, outdoor maintenance, and agriculture support the year-round tourist industry. Many of these positions are filled by members of the Spanish-speaking community. According to the U.S. Census Bureau, 5% of Sevier County's population, or approximately 5,000 people, are Spanish-speaking.

Notification and communication to the English-speaking population was a challenge and notification to the Spanish-speaking population was nonexistent. According to a

local, Spanish-speaking clergyperson, no notifications were issued in Spanish. Many in the Spanish-speaking community fled to Red Cross shelters, friends or relatives homes, fire departments, or to Spanish-speaking churches. In addition, no official agency websites offered a translation feature or a dedicated Spanish-speaking website.

One manager of a Gatlinburg hotel indicated that approximately 85% of the housekeeping staff at the hotel is Spanish-speaking. However, among the Spanish-speaking staff, there are a few who are more proficient in English. Those who were proficient in English translated the urgency to others with less proficient English-speaking skills.

Recovery efforts did try to address Spanish-speaking individuals who were in need. The Red Cross shelters had two volunteers who were fluent in Spanish. The local Spanish-speaking church sent their bilingual clergy and others to the shelters and other locations to translate.

Since the wildfires, every two weeks, the church calls those to whom they ministered to ensure needs are being met. If no one answers the call, a follow-up text is sent. The clergy stressed the importance of sending notifications in Spanish and stated, **"Most everyone in the Spanish-speaking community has access to cell phones."** The clergy indicated the most prudent way to reach the Spanish-speaking community would be through phone calls or text messaging.

> **RECOMMENDATIONS**
> 1. The Spanish-speaking community should become involved with the LEPC.
> 2. Develop pre-scripted texts/messages, tweets, and Facebook messaging in Spanish.
> 3. Include a translation component on official websites/blogs.
> 4. Plan for, exercise, and integrate translation services for news conferences.

Volunteer Communication

Volunteers are a key resource in disaster management, and communication is essential to ensure a comprehensive volunteer management system that works well. Volunteer management activities should be planned and integrated into the disaster management cycle.

Volunteer agencies successfully used communication technologies during the wildfires. For example, Volunteer East Tennessee activated a dark site to assist with the influx of volunteers. A dark site is a website or series of web pages that have been pre-prepared and are ready to publish quickly to the internet in the event of a crisis. Their

main purpose is to keep the public and the media informed and updated about the crisis. During the first week, over 20,000 people registered as volunteers and at the end of two months, registration exceeded 100,000. In addition, by utilizing social media platforms, Volunteer East Tennessee leveraged social media and traditional media successfully.

The Mountain Tough website was created and operational eight days after the fires. This website provided a one-stop shop for information related to the fires, including information on ways to help, ways to ask for help, press releases, and area information. The website also included videos of the devastation and a map of affected areas. However, no non-English-speaking components were noted on the website, nor were any resources available for non-English-speaking populations.

At the federal level, communications were well planned and implemented sound use of technology. FEMA's Mass Care and Emergency Assistance Region IV Recovery Division worked with TEMA and East Tennessee VOAD to provide technical support. As a best practice, FEMA provided social media tracking, news reports, and situational and recovery summary reports with East Tennessee VOAD leadership. To support local response and recovery efforts, FEMA provides an external affairs component for every disaster. During disaster operations, FEMA's External Affairs Public Affairs Officers offer social media support by leveraging established FEMA regional Twitter and Facebook accounts. They also provide access to other FEMA-owned social media channels that relay information about trending news stories, misinformation, and rumors. As trends, resource needs, and other information items of relevance are identified, these are elevated to the appropriate section within FEMA's structure.

FEMA's Mass Care and Emergency Assistance Region IV Recovery Division indicated donations are being affected by social media. FEMA recognized the importance of targeted messaging such as messaging focused on limiting the donation of unwanted goods like clothing, which would be more efficient, cost-effective, and foster better response efforts. Taking a more aggressive approach with social media messaging may also assist all aspects of emergency response. A FEMA representative stated, **"Targeted, pre-scripted lists and social media messaging are a key part of our emergency management strategy moving forward."**

However, duplicating effort on social media can be an issue and reduce the effectiveness of messaging. FEMA notes use of social media by VOADs and other response agencies must be adaptable, flexible, and have clear relationship-building skills for outreach. It is also important to learn from previous events such as Superstorm Sandy. Studying lessons learned from previous disaster events and implementing improvement actions from after-action reports provides insight into innovative and creative risk and crisis communication approaches.

RECOMMENDATIONS

1. Develop a comprehensive social media strategy for VOAD members. A social media strategy can maximize resources and improve communication efforts.

2. Create a one-stop shop for messaging and social media such as a dark site or blog.

3. Develop a VOAD working group developed to analyze social media, create plans, and identify improvement areas.

CONCLUSIONS AND RECOMMENDATIONS

This study investigated the need for more robust notification and communication systems during the Gatlinburg wildfires as seen through the lens of Gatlinburg business owners, faith-based agencies, tourists, residents, survivors, emergency management experts, and public information officers. The interviewees as a whole provide insight and opinions regarding elements needed in developing a more robust notification and communication system for future catastrophic disasters.

The intent of this study is to assist those responsible for developing and deploying notification and communication systems during an emergency event. These systems maintain resiliency during an atypical event such as the Gatlinburg wildfires. The unique evolution of the wildfires required planning for, responding to, and recovering from an atypical disaster that presented new, unique, and different challenges. These challenges required organizations to recast their understanding and thinking about disasters.

This study specifically focused on planning for a jurisdiction's capacity and capability to provide emergency notifications and communications during an emergency event. As previously discussed, notification and communication gaps existed between local, county, and state agencies. Leadership requires that organizations work cross-jurisdictionally with local, county, and state, authorities before, during, and after a disaster. This study discusses approaches and makes recommendations for areas of practice and future studies related to improving and maximizing notification and communication tools for community resiliency and leadership.

Fires Engulf the Mountainous Areas Behind Downtown Gatlinburg's Main Road

During a catastrophic event, emergency management officials need to be prepared to provide guidance to the public on how best to protect themselves. This guidance is based on the general rule that emergency management officials have pre-planned and prepared. Preparedness also involves one of two protective actions for recommendation to the public—evacuate, or shelter-in-place (Glotzer et al. 2007, p. 8). Protective actions are dependent on local, state, and federal authorities' abilities to analyze, synthesize, and implement protective actions in a timely manner. Authorities should be well versed on (1) the appropriateness of the protective actions; (2) when, where, who, what, why, and how protective actions will be determined and articulated; and (3) protecting the health and safety of the greatest number of residents, utilizing the best available resources.

Recommendations for expanding emergency management practices and future research, within the context of notification and communication systems, are based on the findings and conclusions from interviews with stakeholders.

RECOMMENDATIONS FOR EXPANDING NOTIFICATION AND COMMUNICATION PLANS AND SYSTEMS

RECOMMENDATION 1
Evaluate notification and communication plans and systems to ensure alignment with local, state, and federal requirements.
Although most jurisdictions have notification and communication system plans, these plans typically are incomplete, lack coordination with local response agencies, are rarely updated, and are seldom used. Each jurisdiction should review its notification and communication plans and systems and coordinate with local and state response agencies to ensure alignment with community response plans. Reviews are conducted annually for congruency and alignment with state plans and the National Response Framework (NRF). The annual review process ensures notification and communication plans and systems are up to date, communicated to local response agencies, and included in the local command structure. Emergency plans are living documents that evolve, rather than documents that are stagnant.

RECOMMENDATION 2
Conduct tabletop exercises, drills, and exercises centered on atypical emergency events, such as manmade disasters, active shooters, natural disasters, shelter-in-place, and evacuation.
Many types of exercises can be used to expand the knowledge, capabilities, and capacities of emergency response assets including notification and communication plans and systems. Drills test the usefulness and effectiveness of response assets with different scenarios. They provide participants with opportunities that test, maintain, or develop a response-specific procedure. Exercises provide participants with opportunities to demonstrate tactical and operational capabilities. Tabletop exercises provide participants with opportunities to discuss emergency scenarios and to base plans on existing emergency management plans. Functional exercises are interactive and test several emergency responses functions simultaneously during a specific timeframe. Full-scale exercises involve emergency response organizations that have a response role and simulate real-time response efforts. At a minimum, jurisdictions should conduct one annual tabletop exercise and one semi- annual drill to ensure stakeholders know how to respond during an emergency. The adage of "practice makes perfect" has significant relevance in emergency response.

RECOMMENDATION 3
Work collaboratively with local emergency planning committees (LEPCs) to ensure congruency of notification and communication plans and systems with existing community response plans.
Aligning notification and communication plans and systems with LEPCs strengthens the jurisdiction's resiliency to disasters. Developing a comprehensive all-hazards notification and communication plan and system requires stakeholders to work collaboratively with LEPCs, including local emergency management officials, elected officials, fire/rescue, police, emergency EMS, public works, utility and telephone companies, internet service providers, local business and industry, public health, and the medical community. Working with LEPCs provides jurisdictions the opportunity to become involved in community-wide emergency planning and preparation processes; networking with like-minded, community-based organizations; and opportunities for input, feedback, guidance, evaluation, enhancement, and testing of the emergency response plans.

RECOMMENDATION 4
Partner with local, state, and federal associations who can lobby for additional funding to support plan development, system upgrades, and training.
The funding should be targeted toward evaluation, enhancement, or development of plans, procedures, and systems by qualified emergency planners. The planning process should be regulated by experts who are well versed in the intricacies of notification and communication plans and systems, rather than by unqualified staff. Emergency preparedness is one of many components jockeying for funding from state and federal agencies. At any given time, hundreds or thousands of people can be affected by an emergency event. Planning and preparation are keys to lessening the impacts of emergencies.

RECOMMENDATION 5
Collaborate with community assets and other stakeholders to ensure emergency management is inclusive.
Through the LEPC or the Chamber of Commerce, convene a working group of business and industry, residents, clergy, and federal, state, and emergency management officials to discuss notification and communication plans and systems through the lens of emergency response. Planning for sustaining and maintaining notification and communication plans and systems is an important factor in community resiliency. Developing a three-part action plan—(1) what can be done, (2) what should be done, and (3) what must be done—provides structure as well as direction and control during an emergency event.

RECOMMENDATION 6
Leverage communication technology such as social media and mobile applications to enhance internal and external communications.
Professional communicators should leverage technology to support efficient, consistent, and timely information management before, during, and after an emergency event. Technology tools provide emergency management professionals the information they need to make informed decisions when ensuring the safety and health of the public. Likewise, social media is an integral communication tool during emergencies.

RECOMMENDATIONS FOR FUTURE RESEARCH

RECOMMENDATION 1
Share results from this study with stakeholders, especially those who are located in high- risk/ vulnerable areas.
Sharing results from this study, with stakeholders, provides an opportunity for those jurisdictions to prepare for an atypical emergency event, such as wildfires. Catastrophic events, such as the wildfires, clearly impact this tourist-centric area. As witnessed, catastrophic wildfires caused by extreme drought conditions in, near, or around Sevier County, are an issue that responders are typically unprepared to address. Residents, business owners, and tourists were required to evacuate for days. Perhaps results from this study will spur city, county, and state officials to increase coordination with local response agencies as a proactive approach for proactively planning for an atypical emergency event.

RECOMMENDATION 2
Conduct notification and communication-focused training with stakeholders.
The level of knowledge about notification and communication plans and systems greatly affects a jurisdiction's ability to plan, mitigate, respond, and recover from a disaster. Proper planning ensures rational planning, appropriate estimation of risks, and the ability to manage emergency response, based on credible scenarios that might impact community resiliency. Increased staff knowledge assists jurisdictions with pre-event assessment directed toward hazard vulnerability and mitigation, provides a realistic view of pre- and post-event emergency management capabilities, and focuses on realistic expectations.

IMPLICATIONS

The practice of emergency management, especially of atypical emergency events, is an overwhelming obstacle for most jurisdictions. This study finds most stakeholders are unprepared to address atypical events such as the wildfires. Officials must recognize the need to be prepared for such events to protect their communities, to remain operationally functional, and to be self-sustaining for an extended period of time. Mitroff and Alpaslan's (2003) research concluded that 75% of Fortune 500 companies do not prepare to manage atypical crises, which leaves these companies vulnerable. In addition, the study indicates that crisis-prepared companies are more likely to survive not only the crisis but also business in general, because of their atypical approach to problem resolution. Mitroff and Alpaslan's bias is that a high percentage of officials are not prepared to respond to out-of-the box emergencies either. Many studies have been conducted and articles written on the subject of preparedness. Those reported in this study are confined to conventional preparedness activities, such as intervention programs, active shooter, and natural disasters, rather than unconventional, atypical emergency events. Increasingly, emergency preparedness is becoming more and more complex and this complexity cannot be ignored. Tourist-centric locations should consider publishing shelter-in-place/evacuation plans, conducting educational outreach campaigns, and working with local responders to ensure all stakeholders recognize the importance of these materials.

CONCLUSION

Traditionally, emergency preparedness is community-centered and focuses on natural, regionally-based disasters, such as hurricanes along the Gulf and East Coasts, earthquakes/tsunamis along the west coast, and tornados in the South and Midwest. It is unclear what the status of hazards surveys is for the wildfires that occurred during November and December 2016 in Gatlinburg and the GSMNP. This is the first major wildfire to affect the GSMNP. Months of severe drought conditions in the eastern United States are uncommon. Changes to typical operating process for combatting small fires within the community and in the GSMNP were not effective for the wildfires. As a result of the wildfires, severe drought conditions, response efforts, and lack of timely notification to the public, significant changes must be analyzed and integrated into existing emergency plans and procedures.

This study also finds that most stakeholders are unprepared to address atypical events such as the wildfires. Emergent themes surfacing during this study include (1) training, (2) communication, and (3) collaboration. The results and recommendations from this study have generalizability for future practice and implementation of emergency management notifications for business and industry, residents and tourists, and local, state, and federal authorities. It is important to build capabilities and capacities focused on protecting stakeholders and the environment by developing response-appropriate notification and communication plans and systems so that when and if the day comes, response entities will be well-trained and well-versed in deploying the appropriate system.

It is also important to note processes people use to gather and create information continues to evolve. Likewise, PIOs and PAOs must take the initiative to continuously examine the ways in which they disseminate information, engage stakeholders, and monitor information. New technologies are constantly in flux, creating challenges for how emergency professionals do their jobs. Ensuring responders are trained to effectively and efficiently manage information and social media is imperative when completing the most important mission—saving lives.

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