

Strategies for Managing Volunteers during Incident Response: A Systems Approach

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INTRODUCTION

During disasters, large numbers of people with no pre-planned role arrive at the scene to offer assistance. “Convergence,” which is mass movement or attempted movement towards a disaster site, is not a new phenomenon. In his dissertation, Samuel Prince described the convergence of people and supplies in response to the 1917 Halifax shipping explosion.¹ This same phenomenon was recently observed after the 2004 Indian Ocean Tsunami, Hurricane Katrina in the United States, and the Kashmir Earthquake of 2005. Although estimates of the number of volunteers are pending for these events, other recent disasters document substantial volunteer response. After the 1985 Mexico City earthquake, ten percent of the population (over two million people) assisted others.² In 1989, sixty percent of the population of San Francisco and seventy percent of the population in Santa Cruz, California responded to the Loma Prieta Earthquake.³ Following 9/11, over 40,000 unsolicited volunteers arrived at Ground Zero in New York.⁴

Volunteers* can be a significant resource of timely manpower, skills, and abilities, while providing valuable insight on a community’s needs. Often, volunteer assistance is important because it can be quickly provided by people living or working close to damaged areas. Especially in the case of collapsed structures, the actions of volunteers can save lives.⁵ Volunteers can also augment emergency staff with basic skills and support activities, allowing responders to focus their efforts on specialized work.⁶ Volunteers may bring skills that are lacking or provide them at an economic savings. Florida emergency management professionals determined that the economic advantages alone are significant enough to justify making volunteers a part of emergency plans, and regularly incorporate them during hurricane clean-up.⁷ In addition to helping others, some believe that participating in volunteer service is helpful to disaster victims. Volunteerism has been suggested as an avenue to reduce stress, as an outlet for rage, as part of the healing process, and as a means of empowering victims.⁸

Although the media often present volunteer efforts as exclusively positive, serious issues and risks are commonly associated with massive convergence. Spontaneous volunteers can actually hinder disaster response by creating health, safety, and security

*Volunteers can be categorized by their relationship with the incident command system. *Volunteers on an assigned resource* have a specific assignment within the incident command system (e.g. a volunteer member of a rescue squad). *Recruited volunteers* are personally requested by the incident command system to assist in the effort due to their unique and needed skills (e.g. an owner/operator of rare equipment needed for search operations). Spontaneous volunteers are not on assigned resource nor have they been specifically recruited (e.g. a citizen that wishes to help by distributing supplies). Spontaneous volunteers agree to provide service without additional or specific compensation. Unless otherwise noted, the term ‘volunteer’ is used generically in this paper to refer to individuals and groups that were spontaneous or recruited.

issues, distracting responders from their duties, and interfering with response operations. Volunteer efforts can be ineffective because organizations and management systems have not prepared for nor considered how to integrate the volunteer resources. As a result, response personnel are diverted from their primary duties to consider how spontaneous volunteers will be used, to create and assign tasks, to manage logistics related to volunteers, and to supervise actions. This commonly occurs in an ad hoc manner and because of that can be very inefficient.⁹ Large numbers of volunteers can overwhelm the capacity of an unprepared organization to effectively engage them.¹⁰ Often, there are more volunteers than defined tasks for them to perform.¹¹ As Tom Weidemeyer, chief operating officer of United Parcel Service and president of UPS Airlines, stated, “It is a paradox — people’s willingness to volunteer versus the system’s capacity to use them effectively.”¹²

In the absence of a strong volunteer management system, individuals seek to perform services using only their own judgment and narrow view of the incident. This can result in health and medical issues caused by activities such as medical freelancing and contaminated food dissemination.¹³ Individuals who fill response roles in the early stages of an incident may later be unwilling to recognize official response leaders. These individuals, referred to as “rogue volunteers,” can cause safety problems.¹⁴

Although volunteers do not receive financial compensation, they do incur costs and stress limited resources. Volunteers may arrive ill-equipped, requiring logistical support such as food, shelter, and protective equipment.¹⁵ Well-meaning individuals can cause roadway congestion that prevents the movement of emergency vehicles.¹⁶ They can also endanger themselves and others in hazardous environments. It is not surprising that formal responders can find spontaneous volunteers to be, as depicted by Walter Green, “more effort on the part of a strained system than they contribute to the resolution of the problem.”¹⁷ At the same time, significant ill-will can be generated by brusquely turning away volunteer assistance, particularly when personnel shortages are obvious to the media and the public.

The challenge for incident managers is to capitalize on the availability of volunteer resources while ensuring safety and maximizing the responders’ ability to effectively perform tasks within the established incident command system.¹⁸ A search of the literature reveals that even though sociologists have been documenting this issue for almost a century, a comprehensive model for a disaster volunteer management system, from incident recognition through recovery, has not been published. Existing plans have contributed a great deal, but gaps remain.

We found that many existing systems are limited in scale, scope, and operational detail. Some examples of under-addressed elements include how the volunteer management system is integrated with the incident management system, how volunteers are channeled (physically or through information) to avoid unsafe conditions, how spontaneous volunteers requiring advanced credentialing are processed, how transition to recovery related to volunteers is addressed, and what volunteer follow-up is needed post-incident. Existing volunteer management plans and systems are also limited in that they often focus on processing volunteers to work for only one organization, or focus primarily on pre-incident volunteer registration.

If we are to advance our ability to manage the consequences of disaster, it is important to examine the use of volunteer assistance in a careful, systems-based manner. To accomplish this, the following questions may serve as guidance:

- What is the impact of a massive volunteer response?
- What are the essential disaster volunteer management functions that will leverage opportunities and manage volunteer-related risks?
- What strategy can be used to organize the volunteer management functions so they can be managed effectively during emergency response?
- What resources are required to support a volunteer management system?

This article presents a systems-based approach to planning for volunteer management in disasters.¹⁹ Through analysis of existing volunteer management literature, systems, and plans, a comprehensive model is developed to address pre-response, response management, and post-response issues relating to volunteers. The methodology is also applied to develop and test a real-world volunteer management system for public health emergencies in Arlington County, Virginia. There are two driving motivations for Arlington's system: (1) after 9/11, the county experienced a considerable number of people who wanted to volunteer assistance and (2) the county's plans for responding to a mass public health event require extensive manpower that exceeds county resources. The county plans to use volunteers in the operation of a mass dispensing/ immunization clinic and for telephonic monitoring during quarantine and isolation.

Methodology

A "systems approach" as defined in *Emergency Management Principles and Practices for Healthcare Systems* is a "management strategy that recognizes that disparate components must be viewed as inter-related components of a single system, and so employs specific methods to achieve and maintain the overarching system. These methods include the use of standardized structure and processes and foundational knowledge and concepts in the conduct of all related activities."²⁰ The systems approach described in this paper involves analysis to understand the domain and frame the problem, and then develops a system based on the analysis to achieve the defined objectives.

SYSTEMS-BASED ANALYSIS

We first recognized the issues associated with spontaneous volunteer management through professional experience.²¹ From an incident management perspective, the benefits and risks that accompany this spontaneous response are evident. Although various adaptations of volunteer management protocols occur to address the risks and issues, they are generally not addressed in a systemic manner. We conducted a literature review and then structured the findings for system development.

Literature Review

A comprehensive literature review of the domain revealed specific risks, issues, and opportunities that could be categorized into three major areas: spontaneous volunteer behaviors, disaster volunteer management issues, and existing volunteer management systems and plans. Topics of the literature review appear in Table 1. Sources included field studies, after-action reports, news articles, interviews, existing system descriptions, and unstructured interviews with emergency managers and disaster volunteer management practitioners. The literature review is documented in greater detail in other papers,²² but some highlights are provided here.

Table 1. Literature Review Subject Areas

Spontaneous Volunteer Behavior	Disaster Volunteer Management Issues	Existing Volunteer Management Systems and Plans
<ul style="list-style-type: none"> - Who Volunteers - Why They Volunteer - How They Volunteer - Will Volunteers Respond if there is a Perceived Threat? 	<ul style="list-style-type: none"> - Matching Volunteers to Needs can be Challenging - Volunteer Coordination Requires a “Common View” of the Incident - Disaster Response Needs are Dynamic - Volunteer Health and Safety Issues - Security and Access Issues - Volunteer Response will occur Regardless of a Request for their Assistance - Perception of Volunteer Response 	<ul style="list-style-type: none"> - Voluntary Agency Volunteer Management Planning - State Volunteer Management Planning - Federal Volunteer Management Planning - National Initiatives

Spontaneous volunteer behavior is documented in a number of incident-specific papers and a handful of retrospective studies. The literature revealed that predicting who will volunteer is difficult. There is no consistent evidence that gender, ethnicity, wealth, or community involvement affects disaster volunteerism;²³ however, close proximity to the site and personal identification with the victims may increase volunteerism. The reason many people volunteer is to meet a perceived need. Immediately after a disaster, traditional emergency responders are often affected themselves and are needed to organize incident management. This period can be characterized by perceived poor coordination and a “vacuum of authority” during which a number of spontaneous volunteers self-organize to address apparent needs.²⁴

Important disaster volunteer management issues identified through experience and literature search include:

- *Volunteer Response will occur regardless of a request for their assistance.* The urge to “do something” can be overwhelming for those who do not have a formal role in the response.¹⁸ Even if they were not requested, people will respond if they perceive a need or are unable to confirm that what they can offer is not needed. Communication of response needs can break down as the complexity and magnitude of a disaster grows.

- *Matching volunteers to needs can be challenging.* Organizations that are a part of the formal response often turn away spontaneous volunteers because the organization is unprepared and has not considered how to integrate them.
- *Volunteer Health and Safety Issues.* Spontaneous volunteers at a disaster site can cause confusion, compromise response efficiency, and create complications for scene safety.²⁵ Although exposed to the same hazards as traditional emergency responders, spontaneous volunteers often have less training and protective equipment.

Planning for spontaneous volunteers generally exists at three different levels:

- Some individual organizations have systems to directly incorporate volunteers. The American Red Cross has been a leader in spontaneous volunteer management. These systems are limited, however, in that they focus on processing volunteers to work for their own organization. (For example, the Red Cross processes volunteers to support mass care operations, but it may not be able to integrate citizens to assist in pet rescue.)
- A small number of states and local areas have systems to direct spontaneous volunteers to one or more volunteer agencies. Florida and California have strong plans and guidance in this area.²⁶
- At a federal level, the National Response Plan identifies supporting roles and functions of the federal government in volunteer management, but notes the primary responsibility lies with state and local government.²⁷

As discussed in the introduction, these systems and plans provide excellent practices and concepts, but are also limited in scale, scope, and operational detail.

Structuring (Developing the Issues and Functions Model)

In the next step, the literature review findings were structured to support systems development. Risks and opportunities were mapped against the stages of an incident. We then analyzed the risks and opportunities to document interventions (activities that mitigate the risks or leverage the opportunities) from existing plans and systems and to develop new interventions that we did not find in the literature. This technique (depicted in Figure 1 and applied with examples in Figure 2) is an adaptation of a causal-chain framework developed by Johan van Dorp et al. for a maritime risk assessment.²⁸

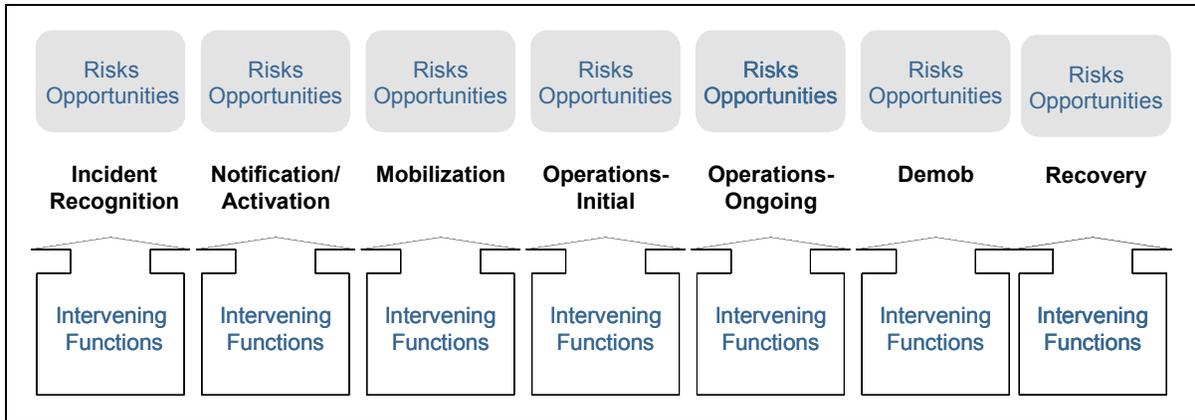


Figure 1: Issues and Functions Model

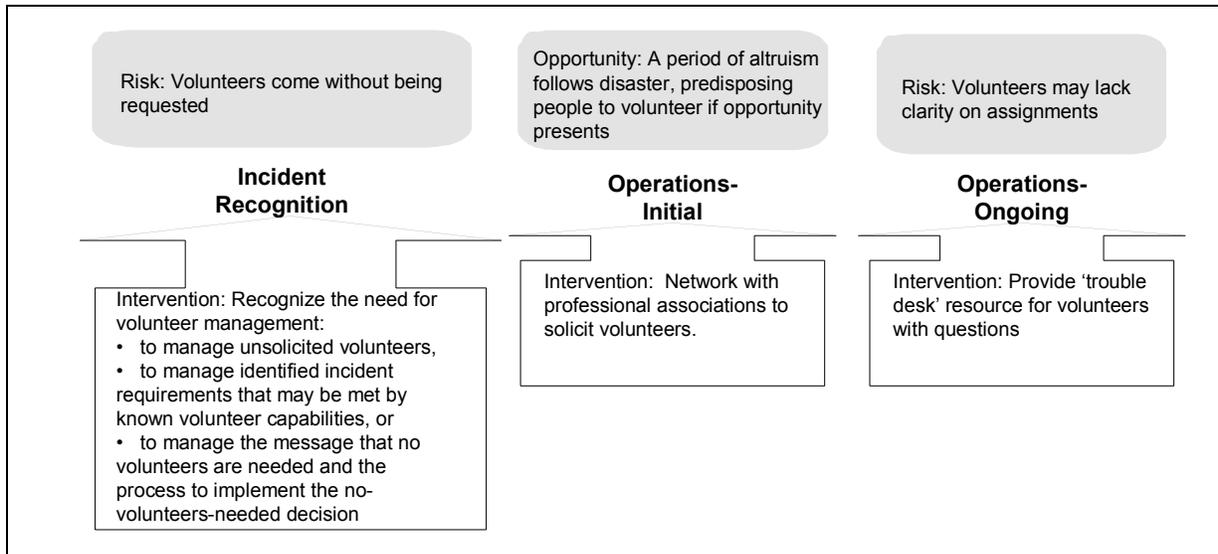


Figure 2: Example Issues and Functions

Once high-level functions are identified, functional decomposition was used to identify sub-functions and processes for the disaster volunteer management system.²⁹ Functional decomposition is the “breakdown of the activities of an enterprise into progressively [finer] increasing detail.”³⁰ Additional requirements tables are developed to document the inputs, outputs, and resource requirements of each function.

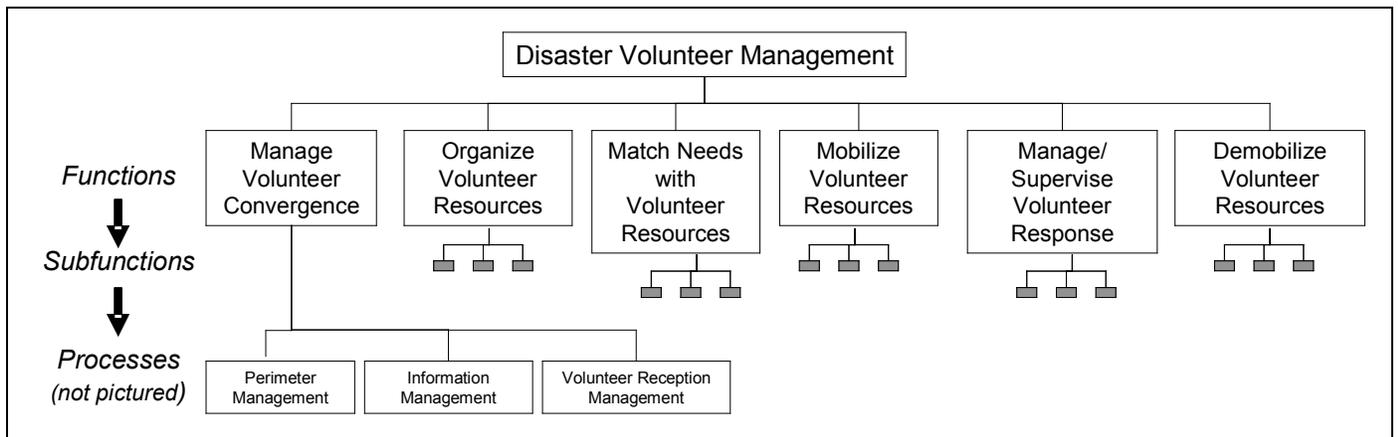


Figure 3: Example of Functional Requirements Diagram

As previously discussed, the literature review revealed that volunteer response will occur regardless of a request for assistance. An intervention was identified to recognize the need for volunteer management to manage unsolicited volunteers and/or the message that no volunteers were needed (see example in Figure 2) and then decomposed in the “manage volunteer convergence” function. This function contains sub functions for perimeter management, information management, and volunteer perception management. Figure 3 provides a high-level depiction of functional decomposition.

SYSTEMS DEVELOPMENT

The systems-based analysis provided an understanding of the problem domain and assisted in identifying the major functions of the system. This general model was then used to develop a comprehensive system for managing volunteers.

Identification of Goals and Objectives

It is easy to get carried away in developing many processes/activities to better manage disaster volunteers. However, every activity has associated costs and benefits. A clear description of system goals and objectives can be used to evaluate the impact of different management strategies and associated activities. This step is at the heart of “systems” development because it defines the intended effects of the overarching system. Volunteer management goals and objectives were documented in an objectives tree (see Figure 4).

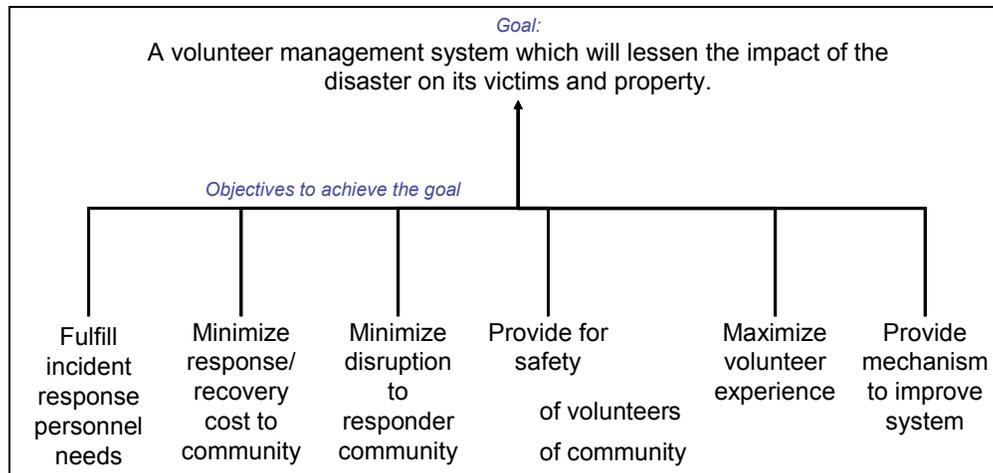


Figure 4: Goals and Objectives Tree

Concept of Operations

The concept of operations describes a strategy behind organizing the multiple volunteer management functions into a system. Several alternate strategies that expand upon current programs and practices were considered:

- a) *Pre-incident, citizens could develop autonomous networks that would be able to respond in their community.* The citizens would receive training to work in a hazardous environment, provide aid, and have access to appropriate equipment and supplies. This strategy is largely that of the Community Emergency Response Team (CERT) program. CERT members are trained to assist in their neighborhoods following an event when traditional emergency responders are not immediately available.³¹ This strategy was not selected because it was found that a large number of citizens are motivated to assist *after* an event has occurred.³² Increasing the preparedness of citizens is very important; however, having a relatively small number of pre-trained citizens would likely not minimize the disruption to the responder community, nor provide for the safety of large numbers of untrained spontaneous volunteers. Any network such as this must still be integrated into the incident through credentials verification, specific job assignment, a briefing on the job tasks and connection to the job supervisor. In 2005, the Harris County, Texas Citizen Corps responded to the need to shelter 15,000 people in the Houston Astrodome. Keys to success did not point to the individual preparedness of its membership, but rather the Citizen Corps' ability to organize pre-registered and spontaneous volunteers and integrate with the incident management system.³³
- b) *During a disaster, articulate needs and encourage emergence of independent efforts.* This strategy is an outgrowth of what has largely occurred in the past. Appeals for assistance are observed or made through the media, and independent organizations work to meet those needs. This type of response was documented after Hurricane Andrew.³⁴ Uncoordinated efforts can lead to misconcentration of

aid and duplication of resources.³⁵ To reduce duplication and foster coordination, researchers found it is important to have defined organizational roles, task management, division of labor, and an overarching management system.³⁶ The strategy of encouraging independent efforts may leave critical response needs unfilled and result in health and safety issues where too many resources converge.

- c) *Develop a system coordinated by the “formal” responders and pre-trained volunteers that can integrate a large number of spontaneous volunteers.* This strategy essentially transforms spontaneous volunteers (individuals with or without specialized skills) into an assigned resource. We have seen this strategy implemented by individual organizations,³⁷ but less often are volunteer needs and resources coordinated across organizations. There are often barriers to inter-organizational coordination such as differences in terminology, procedures, and operating structures.³⁸ Potential volunteers may have to search several organizations before being able to contribute their skills. This strategy seeks to coordinate a wide variety of volunteer resources against incident needs being met by different organizations.

It is important to note that this strategy is predicated on the following assumptions:

- The emergency management community can recognize that volunteers will come;
- Mechanisms can be created to inform volunteers, and volunteers will act on this information;
- Volunteers will respond to authoritative direction and act responsibly within their assigned area.

System Modeling

One of the core contributions of this systems approach is that it provides ways to operationalize, measure, and test the various strategies and procedures to implement them. It allows empirical examination of the complex interactions of the system, identifies process options that lead to different outcomes, and helps to validate the effectiveness of proposed plans before field exercises or an unfortunate accumulation of real disasters. The functional analysis (described above in the Systems Based Analysis section) provides a wide array of functions and procedures that can be included in a volunteer management system. However, it may not be feasible to incorporate *all* identified functions due to cost, timeliness, staff resources, political acceptability, and other constraints. While the functions mitigate risks, implementing too many functions can also significantly impair the ability of volunteers to quickly contribute to the response. For example, implementing background checks of *all* volunteers may contribute to the safety of responders and the community, but the resources needed to conduct background checks and the delay it would cause in filling response personnel needs may not be worth the “cost.” Spontaneous volunteers may also personally decide to circumvent the volunteer management system if they feel it is delaying needed assistance they can provide. Systems modeling can be used to evaluate these tradeoffs.

We provide an example of this systems modeling in Figure 5. This is a model for Arlington County’s volunteer management system for public health emergencies. It begins by translating the concept of operations and system functions into an operational flow. Note that the functional analysis was performed from the stage of incident recognition through recovery. The modeling work discussed here covers only the operations phase and does not depict critical functions such as integration with logistics in the incident command system. A full description of the Arlington County Volunteer Management System can be found at <http://www.gwu.edu/~icdrm/projects/VMS/index.htm>.

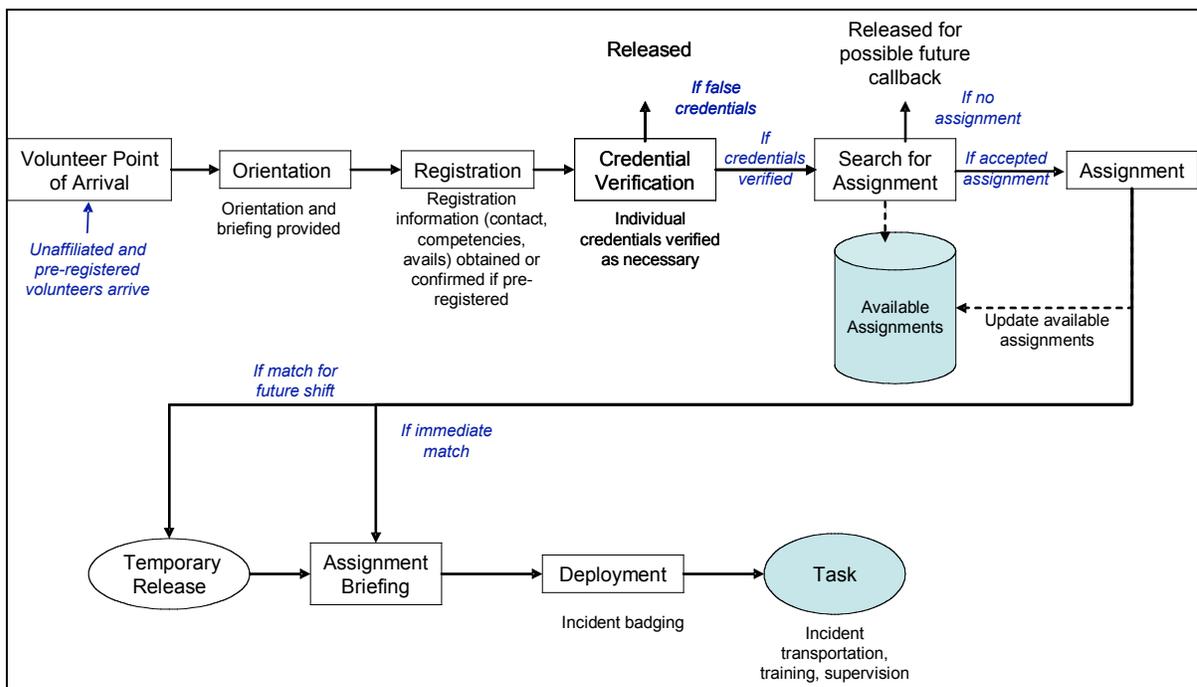


Figure 5: Process Flow Chart

This operationalization of the model allows for both the further decomposition of the various management steps and provides an opportunity to measure the inputs and outputs. These estimates can be derived from comparable industry studies and may be obtained from subject matter experts. Analytically, this representation of the volunteer management system can be used in the following ways:

- The model can help pose “what if” questions that are essential to policy and tactical decision-making. For example, by altering the rate of at which volunteers arrive, processing times, and other design parameters, the model can provide an estimate of the end result or impact on the disaster response.
- This model provides a way to inexpensively experiment with the design that may become very useful during a real event. By developing generalized estimates or rules of thumb on resource requirements for processing volunteers under various

conditions, the model provides a tool to adjust the various parts of the response system on the fly, as it were, during incident management.³⁹ For example, if managers know that the system can process thirty volunteers per hour with a given set of resources, but the incident needs many more volunteers, it can decide to devote additional resources for volunteer processing in a calculated manner.

- The model may identify gaps in the previous requirements analysis, which should be incorporated in the plan.

DISCUSSION

An adage of disaster management is that planning must be based on valid assumptions of the actions people are likely to take.⁴⁰ It has been repeatedly demonstrated that spontaneous volunteers will respond to disasters regardless of a request for assistance, and this response is significant. Registration of volunteers pre-incident can help to catalog personnel with relevant skills to be called upon in an emergency. However, the planning cannot stop there. It must also consider how these individuals will “plug in to” the incident management system, how oversight of their actions will be maintained, how their safety and security will be assured, and especially how to manage the many volunteers who will spontaneously respond even though they never pre-registered. If a specific system is designed before analyzing potential issues, risks, and opportunities, there is a danger it will not be realistic and fail. By developing an all-encompassing and realistic model, these issues can be anticipated and pre-planned for various scenarios, and each volunteer-related activity can be established as an integrated component of a single, coordinated system. The strategic approach to model development can also pay dividends in training volunteer management staff, because the concepts and objectives of the systems can be succinctly presented before delving into task-specific details. Providing this “big picture” can be a powerful training tool.

A comprehensive systems approach is useful not only for pre-plans, but as mentioned above may also be used during an incident (i.e., the “incident action planning” described in Incident Command System training). Incident managers can rapidly develop alternative strategies because the comprehensive model has identified decision points and available options/alternative actions, making incident planning more efficient. For example, the registration and credentialing of volunteers can be designed one way for an event that requires many people with general skills, and differently for an event that requires many people with highly specialized skills. For an event that requires general skills, basic information (name, address) could be gathered by the volunteer processing center using a driver’s license or other acceptable form of identification. For incidents requiring specialized skills, procedures can be implemented to confirm medical certifications and employment before being credentialed for the incident. If approximate processing times for the different types of personnel are known, informed decisions can be made “on the fly” about whether to register and credential highly skilled personnel separately or together in one queue.

Resources to register specialized personnel can also be increased or decreased based on the quantity and timing of response needs.

The strategy selected to provide this illustration of a systems-approach to planning – “Develop system coordinated by the “formal” responders and pre-trained volunteers that can integrate a large number of spontaneous volunteers” – seeks to ‘fit’ volunteers into the broader incident management system. During disasters, of course, many volunteers are organized in alternate ways that may complement or undermine the goals of the incident management team. By having a holistic set of expectations about how one strategy affects the entire incident’s response, the model will quickly identify these alternate activities and highlight potential areas of both positive and negative consequences. Exceptions to the model – or alternate forms of spontaneous behavior – may then be incorporated into the planning model rather than treated as aberrant or unproductive behavior.

CONCLUSION

Paradoxically, one of the most important new challenges in incident management is to plan for the unplanned. Spontaneous volunteers, who represent a significant and flexible asset in disaster response, also represent a clear management problem if a system does not exist to incorporate them through established procedures. The challenge for incident managers is to capitalize on the available volunteer resources while ensuring safety and the responders’ ability to effectively perform tasks within the established incident command system.

In this article, we have described a systems-based approach to planning for spontaneous volunteers that provides a clear analytical roadmap for identifying opportunities for intervention and the associated costs and consequences. Intervention can occur at various stages in the incident. This systems-based approach identifies ways to engage in pre-planning activities, operational actions during the incident, and throughout the recovery phase.

Our current model needs to be implemented and tested against a wide variety of disaster scenarios. Currently, the model provides a framework for organizing the many disparate findings reported by other researchers and emergency managers. It also highlights and makes transparent the planning goals and assumptions. In the end, the proposed systems approach challenges emergency managers to reconsider their current volunteer management capabilities. At the same time, it provides a pathway for managers to think more broadly about the problems of managing spontaneity and guidance to prepare their systems to capitalize on the sometimes chaotic, but predictably spontaneous, behavior of volunteers.

The opinions and findings in this article are those of the authors and should not be construed as official policies and positions of the George Washington University nor the United States Department of Homeland Security.

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¹ T. Drabek and D. McEntire, "Emergent Phenomena and Multiorganizational Coordination in Disasters: Lessons from the Research Literature," *International Journal of Mass Emergencies and Disasters* 20, no. 2 (2002): 197-224.

² Russell Dynes, E.L. Quarantelli, D. Wenger, *Individual and Organizational Response to the 1985 Earthquake in Mexico City, Mexico* (Newark, DE: Disaster Research Center, University of Delaware, 1990).

³ P. O'Brien and D. Mileti, "Citizen Participation in Emergency Response Following the Loma Prieta Earthquake," *International Journal of Mass Emergencies and Disasters* 10, no. 1 (1992): 71-89.

⁴ Illinois Terrorism Task Force Committee on Volunteers and Donations, *Community Guidelines for Developing a Spontaneous Volunteer Plan* (February 2005). <http://www.illinois.gov/security/preparedness/volunteer.htm>.

⁵ E.K. Noji, "Earthquakes," in E.K. Noji, ed. *The Public Health Consequences of Disasters* (New York: Oxford University Press, 1997), 135-178.

⁶ J.M. Kendra and T. Wachtendorf, *Rebel Food...Renegade Supplies: Convergence after the World Trade Center Attack* (Newark, DE: Disaster Research Center, University of Delaware, 2002), Preliminary Paper 316.

⁷ Volunteer Florida, *Unaffiliated Volunteers in Response and Recovery* (February 27, 2005) <http://www.volunteerflorida.org/publications/docs/unaffiliatedvolunteers.pdf>.

⁸ R.E. Kasperson and K.D. Pijawka, "Societal Response to Hazards and Major Hazard Events: Comparing Natural and Technological Hazards," *Public Administration Review*, Special Issue, *Emergency Management: A Challenge for Public Administration* 45 (January 1985): 7-18; J. Forsyth, "Volunteer Management Strategies: Balancing Risk and Reward," *Nonprofit World* 17, no. 3 (May/June 1999): 40-43; W.L. Rosse, "Volunteers and Post-Disaster Recovery: A Call for Community Self-Sufficiency," in R.D. Allen, ed., *Handbook of Post Disaster Interventions* Vol. 8 (Corte Madera, CA: Select Press, 1993), 261-266; S. Lowe, *Community Response in a Terrorist Disaster. Quick Response Research Report #144* (Colorado: Natural Hazards Research and Applications Information Center, University of Colorado, 2002).

⁹ Kendra, *Rebel Food...Renegade Supplies*; E.L. Quarantelli, *Major Criteria for Judging Disaster Planning and Managing and their Applicability in Developing Societies* (Newark, DE: Disaster Research Center, University of Delaware, 1998).

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- ¹⁰ Drabek, "Emergent Phenomena"; Meeting Summary, *National Leadership Forum on Disaster Volunteerism* Volume 2004 (Washington, D.C., 2002).
- ¹¹ Quarentelli, *Major Criteria for Judging Disaster Planning*; E.L. Quarantelli, *How Individuals and Groups React During Disasters: Planning and Managing Implications for EMS Delivery*, Preliminary Paper #138 (Newark, DE: Disaster Research Center, University of Delaware, 1989).
- ¹² Points of Light Foundation, *Preventing a Disaster within the Disaster: The Effective Use and Management of Unaffiliated Volunteers* (Washington, D.C., 2002).
- ¹³ Kendra, *Rebel Food...Renegade Supplies*; J.L. Delmuth, "A Summary to the Natural Disasters Roundtable," *Countering Terrorism: Lessons Learned from Natural and Technological Disasters* (Washington, D.C.: National Academy of Sciences, 2002).
- ¹⁴ Staff, "When Volunteers Turn Rogue," *National Post*, June 25, 2003.
- ¹⁵ Dynes, et al., *Individual and Organizational Response*; W.G. Green, "Freeland Response to the Site – Medical Staff Option of Choice?" *American Academy of Medical Administrators* (March 2005) [<http://www.aameda.org/MemberServices/Exec/Articles/spg03/freelance-%20Green.pdf>].
- ¹⁶ K.J. Tierney, "Practical Lessons from the Loma Prieta Earthquake," *Emergency Preparedness and Response* (Washington, D.C.: National Research Council, 1994), 105-128.
- ¹⁷ Green, "Freelance Response to the Site."
- ¹⁸ L. Fernandez, *Volunteer Management System Design and Analysis for Disaster Response and Recovery* [Dissertation Proposal], George Washington University, 2005.
- ¹⁹ This methodology is a part of ongoing dissertation research, with the goal of developing a disaster volunteer management system that is comprehensive, adaptable, and goal-centric.
- ²⁰ The Institute for Crisis, Disaster and Risk Management (ICDRM) at the George Washington University (GWU) for the Veterans Health Administration (VHA)/U.S. Department of Veterans Affairs (VA), *Emergency Management Principles and Practices for Healthcare Systems* (Washington, D.C., 2006). Available at <http://www1.va.gov/emshg/>.
- ²¹ As a member of a wilderness search and rescue organization, Ms. Fernandez responds to missing person incidents in the mid-Atlantic region. Most missing person incidents involve the participation of spontaneous volunteers to aid in the search for a community member.
- ²² A more robust review of volunteer management issues is available in L. Fernandez, J. Barbera, and J. van Dorp, "Spontaneous Volunteer Response to Disasters: The Benefits and Consequences of Good Intentions," *Journal of Emergency Management* (In press).
- ²³ K.J. Tierney, M.K. Lindell and R.W. Perry, *Facing the Unexpected: Disaster Preparedness and Response in the United States* (Washington, D.C: Joseph Henry Press, 2001).
- ²⁴ S. Lowe and A. Fothergill, "A Need to Help: Emergent Volunteer Behavior after September 11th," in Natural Hazards Research and Applications Information Center PERI and Institute for Civil Infrastructure Systems, eds., *Beyond September 11th: An Account of Post-Disaster Research*, Special Publication No. 39 (Boulder, CO: Natural Hazards Research and Applications Information Center, University of Colorado, 2003), 293-314.
- ²⁵ K. Ettenger, "FEMA Coordination with NVOAD during the September 11th Disaster," *The George Washington University Crisis and Emergency Management Newsletter* (2004); J. Kendra and T. Wachtendor, "Creativity in Emergency Response to the World Trade Center Disaster," in Natural Hazards Research and Applications Information Center, *Beyond September 11th: An Account of Post-Disaster Research*, 121-146.
- ²⁶ Volunteer Florida, *Unaffiliated Volunteers*; California Service Corps, *Spontaneous Volunteer Management Plan: Guidance for Local Government and Operational Areas* (November 15, 2004 draft). www.csc.ca.gov/cc/ccFiles/VPguidance.doc.
- ²⁷ Department of Homeland Security, *National Response Plan* (2004).
- ²⁸ J.R. van Dorp, J.R. Merrick, J.R. Harrald, T.A. Mazzuchi, and M. Grabowski, "A Risk Management Procedure for the Washington State Ferries," *Journal of Risk Analysis* 21, no. 1 (2001).

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- ²⁹ This technique was successfully used in the development of the Medical and Health Incident Management (MaHIM) System. See Joseph A. Barbera and Anthony G. Macintyre, *Medical and Health Incident Management (MaHIM) System: A Comprehensive Functional System Description for Mass Casualty Medical and Health Incident Management* (Washington, D.C.: Institute for Crisis, Disaster, and Risk Management, The George Washington University, December 2002).
- ³⁰ J. Martin, *Information Engineering, Planning and Analysis* (Englewood Cliff, NJ: Prentice Hall, 1990).
- ³¹ Citizen Corps, "Community Emergency Response Teams (CERT)" (September 2006). <http://www.citizencorps.gov/cert/index.shtm>.
- ³² S. Kim, "Volunteers Present Challenge," *disasternews.net*, August 27, 2005. <http://www.disasternews.net/news/news.php?articleid=1536>; Federal Emergency Management Agency, *Responding to Incidents of National Consequence* (2004) <http://www.usfa.fema.gov/downloads/pdf/publications/fa-282.pdf>.
- ³³ Citizen Corps, "Harris County, Texas Citizen Corps' Response to Hurricane Katrina" (October 2006). www.citizencorps.gov/pdf/llis/lessons-learned-tx-katrina-response.pdf.
- ³⁴ J.R. Harrald, J. Barbera, I. Renda-Tanali, D. Coppola, and G.L. Shaw, *Observing and Documenting the Inter-Organizational Response to the September 11th Attack on the Pentagon* (NSF Report, July 2002).
- ³⁵ G.B. Siegel, "Human Resource Development for Emergency Management," *Public Administration Review*, Special Issue: *Emergency Management: A Challenge for Public Administration* (January 1985), 107-117.
- ³⁶ Points of Light Foundation, *Preventing a Disaster within the Disaster*; National Voluntary Organizations Active in Disaster, *Organizing Protocols for Community Disaster Recovery Mechanisms* (2004) at <http://www.nvoad.org/articles/recovery.php>; National Leadership Forum on Disaster Volunteerism, "Exhibit Two: Envisioning the Future of Disaster Volunteerism (March 2005) http://www.nvoad.org/articles/vision_chart.pdf"; E.L. Quarantelli, *Research Based Criteria for Evaluating Disaster Planning and Managing*, Preliminary Paper 246 (Newark, DE: Disaster Research Center); Harrald, et al., *Observing and Documenting the Inter-Organizational Response*.
- ³⁷ American Red Cross, "Annex F – Disaster Services Spontaneous Volunteer Management," July 2003 <http://www.tallytown.com/redcross/dsp/form3020F.pdf>.
- ³⁸ D. Paton, D. Johnston, and B.F. Houghton, "Organizational Response to a Volcanic Eruption," *Disaster Prevention and Management* 7, no. 1 (1994): 5.
- ³⁹ This is part of ongoing doctoral dissertation work. See L. Fernandez, *Volunteer Management System Design and Analysis for Disaster Response and Recovery* [Dissertation Proposal] (George Washington University, 2005).
- ⁴⁰ Russell Dynes, "Community Emergency Planning: False Assumptions and Inappropriate Analogies," *International Journal of Mass Emergencies and Disasters* 12 (1994): 141-158.