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**Guide Brief 6 –
How Communities Can Work with
Communication Service Providers to
Understand Communication Systems**

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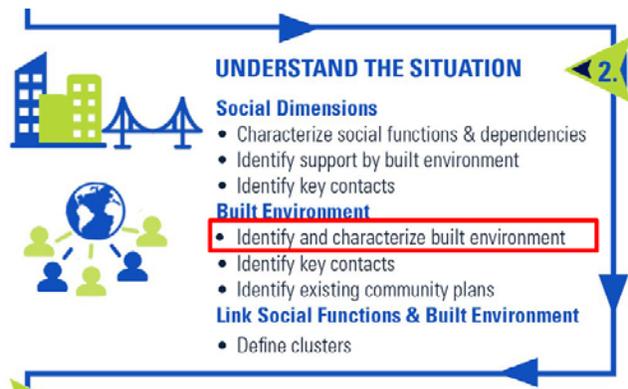
Guide Brief 6 – How Communities Can Work with Communication Service Providers to Understand Communication Systems

Applicable Section(s) of Guide: Volume 1, Section 3.2, Characterize the Built Environment, p. 35

Guide Briefs supplement the Community Resilience Planning Guide
for Buildings and Infrastructure Systems (NIST SP1190)

Purpose and Scope

This Guide Brief focuses on assisting communities with Step 2 – Understand the Situation – with respect to communication systems. When characterizing communication systems in a community, communities need to gain an understanding of both the service provider systems and their own systems. In some situations, communities may need to leverage communication service provider systems and their capabilities. In other cases, communities may have the capability to provide their own recovery resources. The primary intended audience for this Guide Brief is the portion of the collaborative planning team focused on understanding and improving recovery of communication systems.



1. Introduction

Communities should consider inviting representatives from service providers of local communication systems to be on the collaborative planning team. Including these subject matter experts is essential to understanding the possible roles that their industry can play in facilitating recovery of the community following a hazard event, and to developing effective and reliable plans. Their participation will also help develop a shared understanding of community resilience for communication systems and an understanding of the community’s desired communication requirements and objectives. However, different types of communication systems may have varying functional requirements, depending on their role in the community infrastructure.

A unique aspect of communication systems is that the service providers are all privately owned and operated corporations that operate in a regulated, competitive environment. Given the competitive nature of their business, representatives from competing organizations may not be able or willing to share information about operations and recovery plans in a public setting. While their participation on the planning team is important, separate meetings and agreements to protect their information may be needed



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Sharing Information

for more detailed discussions. This approach, in turn, will help the planning team better understand the capabilities and limitations of each communication systems.

There are actions that the planning team can take to work with the communication service providers to gain a better understanding of the communication systems. These actions include sharing information and functionality goals, understanding the needs and limitations of communication systems during recovery efforts, leveraging service provider expertise and experience in recovery planning, and working together to educate the community on best practices and manage expectations following hazard events. The following sections discuss these actions.

2. Sharing Information

Since communication service providers are responsible for the systems used by the public, it is important for the collaborative planning team and communication representatives to work together to define the capabilities and limitations of the communication systems within the community. The planning team and communication representatives should consider sharing the following information.

Critical Facilities. Critical facilities in the community that restoration of communication services immediately following a hazard event need to be identified. A communication company may treat restoration of service to customers equally unless special arrangements are in place or managed services are identified prior to an event. Sharing community priorities will help support recovery of functions in the sequence that the community desires.

First Responder Communication Capabilities. The communication capabilities of the community’s first responders – both stand-alone systems and those that depend on the communication infrastructure – need to be evaluated. The communication continuity objectives and alternative (backup) methods used by first responders can be prioritized for recovery options based on local needs and capabilities.

Risk Assessments. The planning team should discuss risk assessments (e.g., projected long-term sea level rise, areas subject to liquefaction from seismic or rain events, flood zones) so that communication assets are either designed for these hazards or plans can be made to relocate them from vulnerable areas of the community. Existing assets that are located in potentially vulnerable areas (now or in the future) may be addressed by developing alternative plans to mitigate or recover from anticipated damage. This allows the community and the service providers to develop compatible plans for their anticipated risks.

Discussions of risk assessments may include Present Mode of Operation (PMO) and Future Mode of Operation (FMO) plans by the service providers to enable a dialog on how communication service providers can contribute to improving the resilience of the community communication systems.

What are PMO and FMO?

PMO is the Present Mode of Operation. PMO is a term used by communications service providers in reference to the way that their systems currently operate, the technology they use, and how recovery operations are executed.

FMO is the Future Mode of Operation. This term is used by communications service providers in reference to the way their systems will work in the future, anticipated changes in their technology, and how recovery operations will be executed.

Since technology in the communications industry changes rapidly, it is important to understand how changes in communications systems will impact performance and recovery of the communication systems when a hazard event does occur.



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Support Communication Service Providers**

Coordination with Other Infrastructure Service Providers. Communication systems rely on other infrastructure systems such as energy and transportation. The planning team may be able to facilitate coordination among service providers for infrastructure systems while addressing community recovery priorities. These discussions may identify important dependencies to be considered in planning so that all parties understand and plan for the desired sequence of events for recovery.

Continuity of Operation (COOP) Plans. Communities often develop COOP plans for people, essential applications, and key businesses. The planning teams can review their COOP plans with communication representatives to ensure that appropriate communication solutions are in place or can be made available to support other infrastructure systems.

It is also important to discuss incident response plans for both the communication providers and the community to ensure that both parties are aware of the other’s plans and are collaborating when executing those plans.

Local Knowledge. The planning team can provide knowledge of local requirements and concerns, such as franchise rights, permit issues, coverage gaps, system robustness, and historical and preservation areas. The service providers can provide input and options for expanding coverage or improving service after an event, and for improving long-term resilience. For example, a cell tower may need to be built to improve community resilience, but community residents may resist its construction for various reasons (e.g., “not in my back yard”).

Contact Information. The planning team and service providers can document key contacts for business as usual (BAU) or non-emergency situations and for emergency or recovery situations after a damaging hazard event. For example, emergency contacts for the communication service provider are with local and State Emergency Operations Centers (EOCs) representing the Emergency Support Function (ESF-2) role whereas contacts for BAU may include sales, customer care or technology roles. Back up contacts are needed in case primary contracts are unavailable.

Relationship Between EOC and ESFs

Local and state EOCs are activated to appropriate levels as needed when a potential hazard event is identified. The EOC director will then activate emergency support functions (ESFs) in response to the hazard event [Florida Division of Emergency Management 2016]. ESFs are identified under the National Response Framework [Federal Emergency Management Agency 2016a] and are organized to coordinate among the necessary parties (county agencies, non-governmental organizations, private sector service providers, state agencies, and the Federal government) and complete tasks that support recovery of the community [Hamilton County Emergency Management and Homeland Security Agency 2016]. ESF-2 is specific to communications [Federal Emergency Management Agency 2016b]. Ensuring that the collaborative planning team has a current list of contacts in ESF-2 will help the planning team coordinate with ESF-2 and get recovery off to a quick start when a hazard event occurs.

3. Support Communication Service Providers

In addition to sharing pertinent information with communication service providers, it is important for the collaborative planning team to gain an understanding of how communities can provide support to service providers to facilitate the recovery of the communication systems.



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Leverage Communication Service Provider Expertise

Support During Recovery. Communities may consider taking the following actions to provide collaborative support mechanisms when deemed appropriate to support communication service providers following a hazard event:

- Establish a consistent process for issuing identification badges to emergency communication responders and other personnel needing to access places within a controlled area, such as a damaged roadway with limited access.
- Provide security forces and establish protective measures around the impacted site, critical infrastructure, and/or critical facilities.
- Provide protection of emergency communication responders and other workers operating in a high-threat environment.

Regulations and Ordinances Impact on Recovery. Communities establish rules and regulations for normal business that can either help or hinder recovery of communication systems following a hazard event. For example, rules that encourage the protection or mitigation of communication systems can aid recovery. Discussing how different rules might impact the recovery process for communication service providers will be helpful in understanding what to expect when a hazard does occur. This discussion would allow communities to consider what regulations it has that may unintentionally slow down recovery of communication systems following a hazard event.

For instance, the planning team can discuss whether the communication service providers can restore service without a permit to prevent delays following a hazard event and to file the appropriate paperwork after recovery of critical facilities. These permitting processes can directly impact the rate of recovery following a hazard event.

Impact of Other Infrastructure Regulations on Recovery. Dependencies of communication systems on other infrastructure system such as energy, water and wastewater for cooling and sanitary needs, and transportation need to be identified. Some dependencies may be based on codes and regulations required for each infrastructure system. For instance, communication system restoration in a community typically follows restoration of electric power. Data centers may also require water for cooling systems, and truckers carrying recovery equipment for communication providers may be subject to hours by service rules (e.g., maximum hours of driving per day/week).

Impact of Delaying Community Decisions on Communication Infrastructure Needs. Service provider capital planning and operational expense planning processes may differ from those made by the community. Unlike community plans, which are typically annual, five year, and ten-year plans, communication service providers typically plan on an annual basis. For instance, if a community delays its decision to approve a cell site at a given location by a year, building the cell site may not be a priority in the service provider’s capital plan for the following year. If a community delays decisions, a service provider may redirect its investment to other places as their own priorities change. Service provider plans are also driven by shareholder value, brand value, growing market share and competition, in addition to a community’s resilience plans.

4. Leverage Communication Service Provider Expertise

It is important for the collaborative planning team to take advantage of communication service providers expertise and experience, and understand the capabilities that each service provider brings to the table. Although it is more strenuous for the planning team, holding additional individual discussions with communication representatives from each company may be more productive than general planning sessions. Separate discussions allow service provider representatives to discuss their capabilities and solutions without disclosing important information to competitors. These conversations can be further

Leverage Communication Service Provider Expertise

facilitated by holding them under a non-disclosure environment. The planning team should consider discussing the following topics with service provider representatives.

Alternative Communication Services. Before discussing services and capabilities, it is important for a community to research and understand the various communication services available in their area. For example, wireline services may be used as a back-up to wireless services in many areas.

System Design and Planning. Communication service providers need to consider many issues (legal, technical, performance, and other proprietary topics) when designing and planning its communication systems. The planning team may have concerns about placement or types of assets and how they may impact long-term community resilience. These are important discussions and both sides need to articulate the potential impacts and related concerns.

Proven Communication System Solutions. There are a large number of solutions that can be used to recover services and meet performance goals set by the community. The planning team needs to understand what service providers already provide, or can provide, for aiding community recovery.

Communication representatives can help recommend appropriate solutions to support community recovery plans using diverse methods of communication technologies (i.e., wireless, e-mail, instant messaging, social media platforms, etc.), to improve community resilience, and to meet the community's private and public infrastructure continuity objectives. For example, cell phone charging stations can be deployed to provide responders and evacuees with a way to charge their devices. Communities can develop a strategy to acquire charging facilities for cell phones in urban locations. Each service provider may have an engagement process that would need to be identified and documented in a COOP plan.

Building Redundancy into the Plan. The planning team can work with communication representatives to identify where additional redundancy in the communication system may be beneficial to improving community recovery and long-term resilience. Redundancy needs to be carefully evaluated by understanding the infrastructure used by each service provider. In some cases, service providers may use the same infrastructure (e.g., fiber optic cables), so that contracts with two service providers may not provide redundancy in communication services. Redundancy of service for critical facilities will minimize communication system outages by eliminating single points of failure.

Staging of Recovery Assets, Supplies, and Personnel. Communication service providers can use community recovery plans to coordinate staging of assets, supplies, and personnel prior to an anticipated hazard event. Service providers have resources to aid communication system recovery, and tools to protect, mitigate, and restore communication quickly. For example, a service provider may be able to provide a fleet of mobile generators following a hazard event. However, safe access to a community may not be available following a hazard event. By coordinating recovery plans, community leaders can prioritize resources to clear designated access routes to enable the service provider to quickly restore communication services.

Service providers also have temporary recovery capabilities that may be available for responding to a hazard event. For example, a communication service provider may be able to augment cellular service at evacuation centers using a Cell on Light Truck (COLT), Cell on Wheels (COW), or by adjusting existing antennas. Additionally, there may be various wireline technology recovery assets for outside distribution systems or central office/switching locations.

Foster Greater Community Awareness. The community and service providers can establish communication mechanisms and periodic meetings for education, outreach, and routine information for community awareness of recovery planning and long-term resilience plans. Promoting more effective public education can best be achieved through a collaborative effort by a variety of government and private sector stakeholders, including the emergency management community, communication industry, and business community at large.



5. Maintain Communication Following a Hazard Event

As identified in an All-Hazards Consortium/Regional Catastrophic Preparedness Grant Program report (http://www.ahcusa.org/uploads/2/1/9/8/21985670/draft_rcpgp_report_layout.pdf), government agencies, communication providers, and the business community need to recognize that effective and reliable communication and messaging for the general public is extremely important to emergency management and recovery efforts. The collaborative planning team should discuss options with communication representatives about maintaining communication services for first responders and helping the community understand how to access temporary support or maintain their services.

Emergency Communication Capabilities. Communities can use tools such as Telecommunications Service Priority (TSP - <https://www.fcc.gov/general/telecommunications-service-priority>), Government Emergency Telecommunications Service (GETS - <https://www.dhs.gov/publication/getswps-documents#>), Wireless Priority Service (WPS - <https://www.dhs.gov/publication/getswps-documents#>.) and wireless data priority schemes that are available for first responder communications. Communication systems are more likely to be overloaded during and after a significant hazard event, particularly in the immediate area where the greatest impacts are felt. These tools will help prioritize communications.

What are TSP, GETS, and WPS?

TSP is a Federal Communications Commission program that enables service providers to give service priority to users enrolled in the program when they need additional lines or need service to be restored after a disruption [FCC 2016]. TSP should be considered for high priority services identified by the community.

GETS and **WPS** enable critical users in communities to have priority when networks are congested due to a hazard event. GETS and WPS are wireline and wireless services, respectively, intended for use to support national security and emergency response immediately following hazard events when there the network is partially damaged or congested. GETS works through a series of enhancements of the wireline network. WPS is supported by nine service providers: AT&T Spire, Cellcom, Southern LINC, Sprint, T-Mobile, GCI, US Cellular, and Verizon Wireless [DHS 2016].

These services are discussed in more detail in Section 15.6.3 in Volume 2 of the Guide.

Communication Services Following a Hazard Event. Communities can work with communication service providers to develop plans to promote awareness of best practices and manage expectations. This knowledge will decrease the likelihood that commercial systems will be overloaded following a hazard event. Improving the availability of communication services for everyone will help emergency management and recovery personnel in performing their tasks. For example, using text services instead of trying to make a voice call following a hazard event requires fewer system resources.

6. References

Department of Homeland Security. *GETS/WPS Documents*. Washington, DC, <https://www.dhs.gov/publication/getswps-documents#>. Viewed November 21, 2016.

Federal Communications Commission. *Telecommunications Service Priority*. Washington, DC. <https://www.fcc.gov/general/telecommunications-service-priority>. Viewed November 21, 2016.

Federal Emergency Management Agency (2016a). *National Response Framework, Third Edition*. Washington, D.C. <https://www.fema.gov/media-library-data/1466014682982->

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References

[9bcf8245ba4c60c120aa915abe74e15d/National_Response_Framework3rd.pdf](https://www.fema.gov/pdf/emergency/nrf/nrf-esf-02.pdf). Viewed November 29, 2016.

Federal Emergency Management Agency (2016b). *Emergency Support Function #2 – Communications Annex*, <https://www.fema.gov/pdf/emergency/nrf/nrf-esf-02.pdf>. Viewed November 29, 2016.

Florida Division of Emergency Management (2016). *Emergency Support Functions*. Tallahassee, FL. <http://www.floridadisaster.org/EMTOOLS/esf.htm>. Viewed November 29, 2016.

Hamilton County Emergency Management and Homeland Security Agency (2016). *Hamilton County Emergency Operations Plans, Annex B – Emergency Function #2 – Communications*. Cincinnati, OH. <http://www.hamiltoncountyohioema.org/wp-content/uploads/2015/09/ESF-2-Communications.pdf>. Viewed November 29, 2016.

Regional Catastrophic Preparedness Grant Program (2014). *Summary Report: The Regional Catastrophic Grant Program, Mid-Atlantic Region*. Washington, DC. http://www.ahcusa.org/uploads/2/1/9/8/21985670/draft_rcpgp_report_layout.pdf.



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