

NECP Spotlight: Improving Emergency Communications Resiliency through Redundancies

INTRODUCTION

Resilient and redundant technology coupled with risk management are key to maintaining operations when technology fails, the unexpected happens, or natural and man-made disasters threaten to disrupt communications. To prepare for these potential threats, it is critical that public safety organizations have redundant systems and back-up plans in place to ensure continuity of service to their communities.

The National Emergency Communications Plan (NECP) advocates for the inclusion of risk management strategies in plans to protect against and mitigate disruptions to mission-critical communications. This spotlight will examine how three public safety agencies in Colorado, Maryland, and Ohio incorporated resiliency into their emergency communications plans as a result of communications failures.

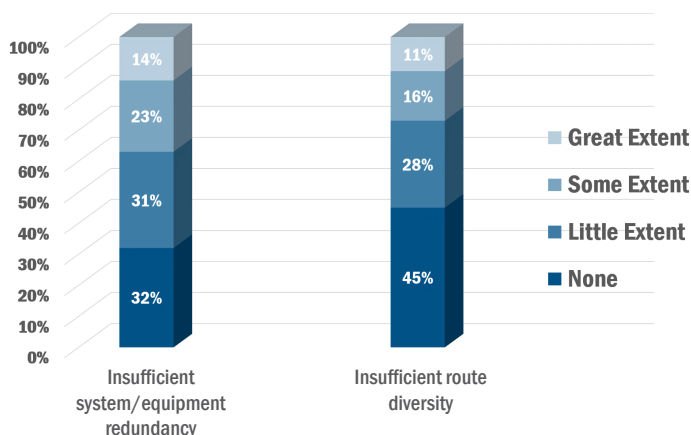
AN IN-DEPTH LOOK

In November 2020, a city contractor accidentally cut a fiber line that disrupted cell and Internet service in Gunnison and Hinsdale counties in Colorado.¹ 911 services were also impacted for about 10 hours while county officials scrambled to restore connectivity and offer alternative emergency communications services. Despite these outages, county emergency services were able to rely on backup communications systems and plans, falling back on handheld radios to communicate with one another and relying on public radio stations to share information with the community.

Following this event, the region's Fire Protection District chief executive officer created a steering committee that brought together public safety officials and representatives from local hospitals and utility companies to build communications redundancies into their network in order to prevent and prepare for unplanned future outages. As a result, the steering committee developed a plan to diversify its communications technology by investing in over-the-air TV and radio alert and warning notifications, analog phone lines, and satellite phones to ensure emergency communications capabilities in the event

Factors that Affect an Organization's Ability to Communicate

*Survey results from the 2018 SAFECOM Nationwide Survey



of an outage. The committee is currently planning to install an additional fiber line to help create redundancy in case of a similar incident.²

Malfunctioning technology can easily disrupt an agency's ability to communicate during emergencies. In May 2019, 75% of the radio channels used by dispatchers and first responders in Montgomery County, Maryland were unavailable for 13 hours due to a malfunction in the equipment that transmits radio signals between towers.³ In response, county officials relied on a backup plan that detailed alternative methods of communication and reduced the use of the radio system. Fortunately, Montgomery County had previously entered into agreements with surrounding jurisdictions to use their radio systems should there be any failure to its network. In addition, patrol officers were given cell phones so non-emergency communications could be taken offline as needed.

In December 2020 the Butler County Ohio Sheriff's Office realized its communications system had been the target of a cyber attack.⁴ The computer aided dispatch (CAD) system took the brunt of the impact,

“We can’t be reliant on a single piece of infrastructure for 911 service...”

- Gunnison County Fire Protection District chief executive officer⁴

AN IN-DEPTH LOOK CONTINUED

which affected 911 dispatchers and call takers’ ability to prioritize and record incident calls, identify the status and location of responders in the field, and effectively dispatch personnel. Thanks to its resiliency planning, Butler County was able to turn to the backup communications plan it had created for use during outages or when systems were offline due to scheduled maintenance. During the week-long incident, dispatchers reverted back to paper and charts in order to send emergency units. Although the switch to manual dispatching was a challenge, it did not affect overall functionality.

NECP ALIGNMENT

Public safety agencies must be able to rely on their back-up emergency communications plans and build redundancy into their technology and operations in order to ensure critical continuity of service. The NECP offers recommendations to help public safety officials identify vulnerabilities and implement resiliency strategies. The following chart details specific NECP recommendations and aligns them to the actions taken to improve communications resiliency in Colorado, Maryland, and Ohio.

| NECP Goal | Objective | Objective Description | Real World Example |
|---|-----------|---|---|
| Goal 2: Planning and Procedures | 2.3 | Incorporate risk management strategies to protect against and mitigate disruptions to mission-critical communications | Montgomery County incorporated risk management strategies into its backup plans, including walkie talkie phone apps, in case of ‘total failure’ of systems in the future. |
| Goal 3: Training, Exercises, and Evaluation | 3.1 | Update and ensure the availability of training and exercise programs to address gaps in emergency communications | Following a cyber attack, public safety officials in Butler County were able to tap into the training they had previously received and seamlessly transition to the manual process of dispatching emergency units using paper and charts, highlighting the importance of maintaining training and exercise programs to ensure resiliency. |
| Goal 4: Communications Coordination | 4.2 | Enhance coordination and effective usage of public safety communications resources at all levels of government | Montgomery County relied on existing communications policies and agreements documented in its backup communications plan to re-route incoming calls to neighboring jurisdictions in case its primary system failed. |
| Goal 4: Communications Coordination | 4.4 | Strengthen resilience and continuity of communications throughout operations | Gunnison and Hinsdale counties analyzed their primary emergency communications systems (Internet provided by a single set of fiber optic cables) and identified the need for an additional fiber line as well as secondary assets like handheld radios, satellite phones, and analog phone lines to prevent future interruptions. |

RESOURCES

The NECP encourages the public safety community to train personnel on the use and implementation of their resiliency plans and regularly revisit, test, and update them to ensure continuity of service during emergency communications disruptions. To maintain operable and interoperable communications capabilities, incorporating redundancies into resiliency plans will ensure that public safety agencies can continue to provide critical services in the face of technical issues.

For more information on the NECP, visit: cisa.gov/necp

Want to share your organization’s successes and alignment to the NECP? Email us at: necp@cisa.dhs.gov

To view the results of the 2018 SAFECOM Nationwide Survey, visit: cisa.gov/publication/sns

For more information on resiliency, visit: cisa.gov/publication/communications-resiliency

¹ Reaman, Mark (2020). “Internet/Cell Service Outage in County Shows Fragility and Cooperation” Crested Butte News. [crestbuttenews.com/2020/11/internet-cell-service-outage-in-county-shows-fragility-and-cooperation/](https://www.crestedbuttenews.com/2020/11/internet-cell-service-outage-in-county-shows-fragility-and-cooperation/)

² Reaman, Mark (2020). “The Quest for Fiber Line Redundancy Continues in Gunnison County” Crested Butte News. [crestbuttenews.com/2020/11/the-quest-for-fiber-line-redundancy-continues-in-gunnison-county/](https://www.crestedbuttenews.com/2020/11/the-quest-for-fiber-line-redundancy-continues-in-gunnison-county/)

³ Peetz, Caitlynn (2020). “After major outages, Montgomery County ready to switch...” Bethesda Magazine. [bethesdamagazine.com/bethesda-beat/police-fire/after-major-outages-montgomery-county-ready-to-switch-to-new-emergency-communication-system/](https://www.bethesdamagazine.com/bethesda-beat/police-fire/after-major-outages-montgomery-county-ready-to-switch-to-new-emergency-communication-system/)

⁴ Callahan, Denise G. (2021). “Butler County police adjusted to paper maps dispatching after hack...” Journal-News. [journal-news.com/news/butler-county-police-adjusted-to-paper-maps-dispatching-after-hack-of-sheriffs-communication-system/7FYH73QE3RC6LKUAD222L0ZEIE/](https://www.journal-news.com/news/butler-county-police-adjusted-to-paper-maps-dispatching-after-hack-of-sheriffs-communication-system/7FYH73QE3RC6LKUAD222L0ZEIE/)