

COMMUNICATIONS DEPENDENCIES CASE STUDY: NASHVILLE “CHRISTMAS DAY” BOMBING



EVENT SUMMARY

An explosion in front of a commercial communications facility on December 25, 2020, caused damage to the structures in the immediate area and caused consumer telephone and internet outages, as well as 911 outages as far as Alabama and Kentucky. The 911 outages impacted some centers for over a week.



While many in the area were without wireline, wireless, and data connections, land mobile radio proved to be a reliable and effective method of communication for first responders during this incident.

In the early morning hours of December 25, 2020, residents of downtown Nashville, Tenn., began calling 911 to report the sound of gun shots. When officers arrived, they located a recreational vehicle (RV) parked in front of a commercial communications building playing a pre-recorded message for residents to evacuate the area with a countdown to an explosion. As officers began to evacuate the area, the RV exploded. The explosion caused a fire within the building, as well as flooding on the first and second floors following two water main breaks.¹ According to a source familiar with the incident, it disrupted about 170 public safety answering points (PSAPs) in the immediate and neighboring areas, and as far as Kentucky and Alabama. Telephone, data, and internet outages were seen as far as Atlanta, Ga.²

PSAPs began notifying residents of the outages and provided alternative numbers using social media, news outlets, AM/FM radio broadcasts, and other means. Residents were also encouraged to use Hub Nashville, an online dashboard that was monitored in real time to request law enforcement assistance.³ Officials even suggested going to the nearest police or fire station if they were unable to get through to 911.⁴ Other PSAPs reported additional problems too; by 7:00 p.m. on December 25, Smyrna, Tenn., reported their phone lines were working, however, callers would need to provide their names and locations immediately as it wasn't available to dispatchers.⁵

¹ Associated Press, “Nashville bombing spotlights vulnerable voice, data networks,” Fox 43, December 31, 2020, <https://www.fox43.com/article/news/nation-world/nashville-bombing-spotlights-vulnerable-data-networks/507-28b63032-2cf7-45ae-b56b-f702d957c969>. Accessed June 4, 2021.

² Ibid.

³ Natalie Allison and Yihyun Jeong, “Nashville bombing froze wireless communications, exposed ‘Achilles’ heel’ in regional network,” USA Today, December 29, 2020. <https://www.usatoday.com/story/news/nation/2020/12/29/nashville-bombing-area-communications-network-exposed-achilles-heel/4070797001/>. Accessed June 11, 2021.

⁴ Associated Press, “Nashville bombing spotlights vulnerable voice, data networks,” Fox 43, December 31, 2020, <https://www.fox43.com/article/news/nation-world/nashville-bombing-spotlights-vulnerable-data-networks/507-28b63032-2cf7-45ae-b56b-f702d957c969>. Accessed June 4, 2021.

⁵ Mariah Timms, “AT&T outage: Internet, 911 disrupted, planes grounded after Nashville explosion,” Tennessean, December 25, 2020, <https://www.tennessean.com/story/news/local/2020/12/25/att-outage-internet-down-hours-after-nashville-explosion/4045278001/>. Accessed January 6, 2021.

The response to this explosion required partnerships from local utility companies, local-level public safety agencies including PSAPs, local and federal law enforcement agencies, multiple communications service providers, local government representatives and county code enforcement, and regional healthcare facilities.

The building was considered a crime scene,⁶ keeping technicians from entering the building to restore services. At 5:00 p.m. on the day of the explosion, the service provider reported that they had “rerouted significant traffic” from the Nashville facility and they had deployed multiple cell sites that were being delivered to the area but they were facing “logistical challenges.”⁷ Due to the nature of the incident, the service provider increased security at all of their facilities nationwide in preparation for additional attacks, though, none were reported.⁸ Further difficulties arose after a fire rekindled in the building, causing an evacuation,⁹ and again when additional damage was discovered near the building’s power connections, causing a delay in power restoration to critical infrastructure. According to one report, the service provider had deployed temporary cell towers and disaster trailers across the region to assist with wireless network and consumer broadband services restoration.¹⁰ Nashville Police Department reported that their radio communications were not impacted, citing their Primary, Alternate, Contingent, Emergency (PACE) method as their redundancy plan.¹¹

Commercial services were restored within three days and by January 1, 2021, the last of PSAP services returned to normal operations.¹² Even though the building had suffered significant damage, FirstNet reported that their infrastructure was not damaged in the explosion. However, following two water main breaks, their onsite generators flooded causing an outage of less than five hours.¹³

The service provider began restoring services. FirstNet was able to provide first responders with services within hours to ensure responders could communicate effectively during this complicated incident. The effective coordination between first responders, commercial service providers, government officials, PSAPs, and public works agencies contributed to the full restoration of services.



LESSONS LEARNED AND KEY TAKEAWAYS

Reliance on a Single Commercial Communications Provider

The impacted service provider produced much of the voice, data, and internet service in the region. The outage impacted local and regional PSAP operations, impacted hospital communications, civilian communications, and even commercial business operations.

⁶ Danny Ramey, “AT&T Details How Nashville Explosion Affected FirstNet Service, Restoration Efforts,” MissionCritical Communications, January 5, 2021, <https://www.rrmediagroup.com/News/NewsDetails/NewsID/20356>. Accessed January 6, 2021.

⁷ “Nashville Recovery Efforts,” AT&T, December 25, 2020, https://about.att.com/pages/disaster_relief/nashville.html. Accessed January 6, 2021.

⁸ Danny Ramey, “AT&T Details How Nashville Explosion Affected FirstNet Service, Restoration Efforts,” MissionCritical Communications, January 5, 2021, <https://www.rrmediagroup.com/News/NewsDetails/NewsID/20356>. Accessed January 6, 2021.

⁹ “Nashville Recovery Efforts,” AT&T, December 25, 2020, https://about.att.com/pages/disaster_relief/nashville.html. Accessed January 6, 2021.

¹⁰ “Nashville Recovery Efforts,” AT&T, December 25, 2020, https://about.att.com/pages/disaster_relief/nashville.html. Accessed January 6, 2021.

¹¹ Natalie Allison and Yihyun Jeong, “Nashville bombing froze wireless communications, exposed ‘Achilles’ heel’ in regional network,” USA Today, December 29, 2020, <https://www.usatoday.com/story/news/nation/2020/12/29/nashville-bombing-area-communications-network-exposed-achilles-heel/4070797001/>. Accessed April 6, 2021.

¹² Laken Bowles, “Murfreesboro 911 lines fully functional after Christmas explosion,” News Channel 5, January 1, 2021, <https://www.newschannel5.com/news/murfreesboro-911-lines-fully-functional-after-christmas-explosion>. Accessed January 6, 2021.

¹³ Donny Jackson, “FirstNet Authority releases new details about impact of Nashville explosion on broadband system,” Urgent Communications, January 4, 2021, <https://urgentcomm.com/2021/01/04/firstnet-authority-releases-new-details-about-impact-of-nashville-explosion-on-broadband-system/>. Accessed January 6, 2021.

Key Takeaways	Communications Dependencies Best Practice
Local and regional agencies relied on a single service provider for their emergency and non-emergency operations	<ul style="list-style-type: none"> ✓ Work with communications vendors to establish network redundancy and consider a multi-vendor redundancy plan ✓ Consider utilizing alternate communications during outages, such as land mobile radio or satellite internet ✓ Place communications switches in geographically diverse areas ✓ Require redundancy at known single points of failure for 911 systems ✓ Coordinate with communications providers to understand the provider's routing and resiliency practices to develop solutions for short- and long-term outages
Network congestion impacted the ability to complete cellular and landline calls and some responders relied on priority services accounts to complete calls	Establish priority services accounts—including Government Emergency Telecommunications Service (GETS) and Wireless Priority Service (WPS) ¹⁴ —for responders and vendors to ensure the ability to complete calls during times of extreme network congestion
Local hospitals used a secondary communications provider for their hot spots and backup phones to ensure staff could remain connected	Establish communications redundancy by implementing secondary or even tertiary communications backup plans
Land mobile radio remained a consistent and reliable form of communication while others were unavailable	Establish multiple backup systems for power (e.g., generators and battery power) and communication (e.g., buried fiber lines or other wireline connections, microwave backhaul)
The service provider used a mass notification platform to communicate outages to PSAPs; however, some centers did not receive the alerts because of damage to the transmission links ¹⁵	Establish communications redundancy by implementing secondary or even tertiary communications backup plans

Reliance on Commercial Power and Generator Backup Power

The company's pre-planning had accounted for a power outage by providing backup generators. However, a cluster of interdependent and cascading effects delayed response and recovery efforts.

Key Takeaways	Communications Dependencies Best Practice
Communications outages were a direct result of commercial power outages; while backup generators were in place, they were flooded and unusable	<ul style="list-style-type: none"> ✓ Work with commercial electric partners before and during an incident to identify and understand power resiliency weaknesses ✓ Consider diversifying generator and backup power locations throughout properties ✓ Harden power infrastructure from outside influences, such as flooding ✓ Utilize alternative power sources and flexible power routing options
The service provider had personnel and equipment available onsite to restore backup power; however, the building was deemed a crime scene, and personnel were not permitted to enter	Consider enhancements to generator location, capability, and resiliency
Responders and commercial providers had pre-planned for these events, though had not planned for a series of related incidents	Consider enhancements to response plans, including frequent exercises for gray and black sky events

¹⁴ Information on Cybersecurity and Infrastructure Security Agency Priority Telecommunications Services is available at <https://www.cisa.gov/about-pts?msclkid=64b576e7c0a911ec8338c592d0722228>.

¹⁵ Donny Jackson, "Tennessee board reports Nashville bombing impact on 911, future plans," Urgent Communications, May 21, 2021, <https://urgentcomm.com/2021/05/21/tennessee-board-reports-nashville-bombing-impact-on-911-future-plans/>. Accessed August 24, 2021.