FOREWORD

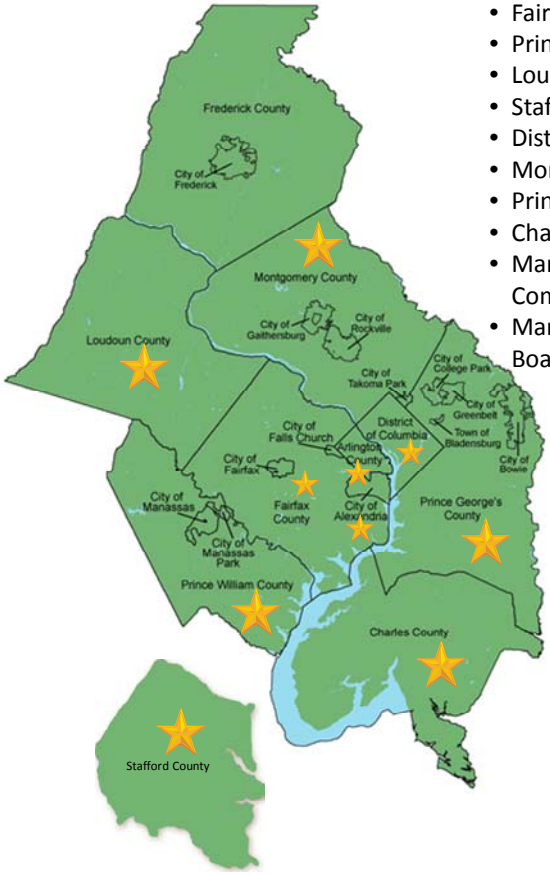
On July 11, 2012, at its regular meeting, the COG Board of Directors unanimously adopted R36-2012 - Resolution to Encourage Steps to Address Verizon 9-1-1 Service Gaps During and Following the Derecho Storm on June 29, 2012.

The resolution was focused on identifying the 1) Cause of Verizon's 9-1-1 failure; (2) Existing redundancy and backup capabilities; (3) Vulnerability of newer technologies that required battery or back-up power, including home and business service; (4) Opportunities for COG localities to influence and strengthen regulatory oversight and remedies at the state and federal levels, and (5) Verizon's communication and messaging to the public and local emergency response officials concerning 9-1-1 services.

Jurisdictions involved in preparing and providing input to this report are depicted below.

Involved Parties in MWCOG 9-1-1 Report

- Arlington County,
- City of Alexandria,
- Fairfax County,
- Prince William County,
- Loudoun County,
- Stafford County,
- District of Columbia,
- Montgomery County,
- Prince George's County,
- Charles County,
- Maryland Public Safety Commission,
- Maryland 9-1-1 Services Board



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EXECUTIVE SUMMARY

The 9-1-1 Emergency Call System is the vital link to public safety assistance across the country, providing access to police, fire and emergency medical services. Residents and visitors in cities, towns and rural communities are confident that accessing 9-1-1 will result in saving lives and property. It is the public's expectation that the responsibility of public safety and local and state government officials is to assure that the fees and charges assessed for 9-1-1 service are used to provide continuous and reliable public safety service. The National Capital Region (NCR), as the nation's capital and a major urban center, must have a reliable 9-1-1 system.

Figure 1: Basic 9-1-1- Call Flow

Late on the evening of Friday, June 29, 2012, a severe storm (Derecho) hit the Mid-Atlantic region with unusually intense straight-line winds. The storm caused widespread commercial electric power and communications outages in Washington D.C., Virginia, Maryland and additional states. At approximately 7:30 AM on Saturday, June 30, 2012, the 9-1-1 centers in Fairfax County, Prince William County, Cities of Manassas and Manassas Park experienced a complete failure of Verizon's 9-1-1 and telephone service. Three additional 9-1-1 centers, Arlington County, City of Alexandria and Loudoun County experienced a partial failure of these services. Verizon's restoration of 9-1-1 service began at approximately noon on Saturday, but some of the issues continued for over 5 days until July 4th, 2012.

Metropolitan Washington Councils of Governments Response

While the states and federal government regulate telecommunication utilities, 9-1-1 connects people in need with local governments. Thus, the failure of this system as a result of the Derecho became an issue of great concern to the Metropolitan Washington Council of Governments (COG), an association of 22 local governments that represent over 5 million residents. In addition, there have been previous issues with 9-1-1 service, that have been brought to Verizon's attention as indicated in a letter to Verizon from COG dated July 21, 2011.

On July 11, 2012, at its regular meeting, COG Board of Directors unanimously adopted R36-2012 Resolution to Encourage Steps to Address Verizon 9-1-1 Service Gaps During and Following the Derecho on June 29, 2012 which included the five items below

- Cause of Verizon's 9-1-1 failure;
- Existing redundancy and backup capabilities;
- Vulnerability of newer technologies that required battery or back-up power, including home and business service;

- Opportunities for COGCOG localities to influence and strengthen regulatory oversight and remedies at the state and federal levels;
- Verizon's communication and messaging to the public and local emergency response officials concerning 9-1-1 services

COG formed a task force of 9-1-1 Center Directors and other interested parties to address the five items in the resolution. The following are the preliminary findings of the task force.

1. Cause of Verizon's 9-1-1 Failure

The loss of commercial power and the subsequent failure of one of two backup generators in each of Verizon's Arlington and Fairfax Central Offices (CO) were the predominant causes of the 9-1-1 service outages.

- The Derecho impact on the electrical infrastructure caused the loss of commercial power to the Verizon facilities located in Arlington and Fairfax, Virginia and elsewhere.
- The back-up generator, in the Fairfax CO, that supported 9-1-1 systems did not start
- In addition, the back-up generator in the Arlington CO, that supports Verizon's ability to view, monitor and identify problems in its network, did not start.
- Verizon had failed to identify or resolve previously identified maintenance issues with these generators; air in the fuel lines or faulty automatic fail-over switches, incorrect log entries and corrective action.
- Verizon's technician dispatched to Fairfax CO, on the morning of Saturday, June 30, 2012, did not realize, and took several hours to identify, that the generator supporting the 9-1-1 infrastructure was not operating. The delay allowed the batteries to drain resulting in the loss of 9-1-1 services.
- Both the Verizon Arlington and Fairfax facilities were supported by back-up battery power, but these batteries drained.
- Verizon failed to successfully implement any mitigating action to restore these two generators prior to the battery back-ups expiration.
- Once the battery supplies were exhausted both the ability to view and identify problems and 9-1-1 systems at the Verizon Arlington and Fairfax facilities failed.
- In addition, damage and failure of other 9-1-1 supporting systems within the Verizon network and infrastructure, such as the ability to receive the callers location, severely contributed to the 9-1-1 outage. However, these were largely cascading effects related to the loss of adequate backup power in Arlington and Fairfax COs.

2. Existing Redundancy and Backup Capabilities

This report addresses the three major components of 9-1-1 services from both the 9-1-1 Service Provider (Verizon) and Public Safety Agencies perspective to include Power, Network and 9-1-1 center

- Power

Verizon and other telecommunications providers and many of the 9-1-1 centers have designed and implemented backup power systems in most of their critical facilities that include generators and backup battery supplies in case of commercial power failure. In some cases they have worked with the local power companies to implement dual power sources from separate power feeds.

In the case of the Derecho on June 29, 2012, the 9-1-1 center and other telecommunications providers' backup power systems generally operated as designed and continued to provide required power until commercial power was restored. The generator issues experienced by Verizon, however, had significant impacts.

- Network

Verizon's network to provide 9-1-1 services includes multiple levels of diversity and redundancy, as well as back-up power in critical facilities, to optimize resiliency during a crisis.

- 9-1-1 Centers

Most of the critical systems and facilities, including servers, workstations, and databases, within the 9-1-1 centers have redundant components that are designed to provide continuous service and mitigate any downtime. In addition, many of the 9-1-1 centers have backup locations where calls can be routed in the case of major outages or the loss of the primary 9-1-1 center. In the case of the Derecho event, many of the backup 9-1-1 centers' services were provided through the Verizon Arlington and Fairfax locations, and thus were also unable to receive emergency calls.

3. Vulnerability of Newer Technologies that Require Battery or Back-Up Power, Including Home and Business Service

For many decades, power for traditional telephone service for most residences and small businesses was supplied via the hard wire connection through the telephone lines and therefore the loss of commercial power often did not result in the loss of dial tone or telephone service. Today, the widespread use of cordless phones which depend on commercial and limited battery power, results in the loss of telephone service during power outages.

Certain more recent technologies such as Voice over Internet Protocol (VoIP) or Standard Internet Protocol (SIP) rely on a modem or router located on premise or within a computer. With the use of these technologies, the loss of power causes the loss of telephone service and access to 9-1-1 once the back-up battery contained within the equipment, drains.

Some commercial or business telephone systems, primarily for smaller businesses, might also require power to operate properly. In addition, mobile telephone service, when a high volume of calls are being attempted into the mobile network at the same time, can cause network congestion and/or blockage. Also, the loss or failure of the mobile infrastructure, such as physical damage to cell sites, or network connectivity, can impact the ability to make and receive mobile calls and therefore access to 9-1-1.

4. Opportunities for COG Localities to Influence and Strengthen Regulatory Oversight and Remedies at the State and Federal Levels

At the time of this preliminary report there are five proceedings related to the Derecho and its impact on 9-1-1 services.

It is anticipated that reports will be issued by these various groups which will be incorporated into the final version of this report.

Within the proceedings, listed below, authorities in the COG region should encourage the adoption of new rules that would require Verizon, and other 9-1-1 service providers to adhere to high standards of operation to better ensure and support 9-1-1 service or face penalties.

1. Virginia SCC Case No. PUC-2012-00042
2. FCC PS Docket No. 11-60
3. Virginia Secure Commonwealth Panel – 9-1-1 Sub Panel
4. Maryland Public Service Commission Case No. 9298
5. Maryland Emergency Number Systems Board (ENSB) Inquiry

5. Verizon's Communication and Messaging to the Public and Local Emergency Response Officials Concerning 9-1-1 Services

Public messaging was needed not only from the public information officers (PIOs) supporting the 9-1-1 centers, but from the utility itself. As part of the overall system of disseminating information to the public, Verizon needed to be part of the many voices with the common message that the 9-1-1 system was down. Verizon should have pointed to the local officials' guidance on what the public should do in case of an emergency, especially during this event, when everyone was challenged by lack of electricity, phones and connectivity. Officials needed a more robust public messaging response on Verizon's part to complement local government efforts. In these reports, Verizon states it is mobilizing a more robust emergency response communications process to ensure that media outlets and other channels are provided relevant information on a timely basis.

Verizon's first responsibility, in a service interruption, is to notify the 9-1-1 center. Then in its role as a local utility, in cooperation with local government, Verizon has the responsibility in providing enhanced customer service, to inform the public of 9-1-1 interruptions. This should include dissemination of information about the extent of the problem and when it will be resolved. PIOs and 9-1-1 centers should remain the primary source of guidance to the public during an emergency.

Recommendations

On July 19, 2012 the Northern Virginia 9-1-1 Directors (City of Alexandria, Arlington County, Fairfax County, Prince William County and Stafford County), and subsequently all of the 9-1-1 Directors in the COG Region, concurred on five recommendations which were accepted by Verizon and are in various stages of completion.

1. Adoption of the National Incident Management System (NIMS) Model (www.fema.gov/national-incident-management-system)
2. 9-1-1 Interruption Notification
3. Semi-annual 9-1-1 Outage Drill
4. Monthly update of contact list
5. Verizon Emergency Operations Center (EOC) Representative

In addition to the recommendations of COG 9-1-1 Directors released in the aftermath of the Derecho event, which Verizon should continue to implement, there are several other recommendations from COG 9-1-1 Telecommunications Network Steering Group and 9-1-1 Directors that should be considered and are outlined below.

1. Federal and State Regulatory Authorities should strongly encourage Verizon and other 9-1-1 service providers to perform a comprehensive independent audit of **the entire** infrastructure, processes and procedures that support 9-1-1 service and related systems, to assure the reliability and continuity of 9-1-1 service under any circumstance. Based on the results of these audits, comprehensive plans and strategies should be developed to immediately resolve any findings. The results of these audits and resolution plans should be made available to the 9-1-1 stakeholders.
2. It is highly recommended, that Verizon and other 9-1-1 service providers should provide subject matter expertise and make recommendations to the 9-1-1 centers and their stakeholders to assure reliability and continuity of 9-1-1 service. This should include, but not be limited to, network redundancy, 9-1-1 center equipment and systems, and best practices and procedures.
3. It is critical, that Verizon review their communications and public notification plans with each 9-1-1 center's communicators and/or Public Information Officers (PIO) regarding the dissemination of emergency messages (using both traditional and social media) to the public during 9-1-1 outages and update as needed. This process should also explore alternative methods to communicate with the public in case of widespread power and telephone outages. Verizon should coordinate with National Capital Region communicators/PIOs during any future outages, to inform and keep the public updated, and amplify the 9-1-1 center-specific public messages and information.
4. Verizon should keep the public informed of any service issues, the extent of the outage and time for resolution.
5. Federal and State Regulatory Authorities should evaluate the steps and actions of Verizon, related to this event, and the above audits, to ensure Verizon has adequately resolved all issues

and continues to improve their processes and infrastructure to ensure reliability and continuity of 9-1-1 service.

6. COG members and localities should work with their State and Federal regulatory authorities and Legislators, as needed, to assure, through proper oversight, best practices and procedures by establishing service level agreements to ensure reliability and continuity of 9-1-1 service.
7. It is recommended that there be further investigation by State and Federal Regulators, on whether the 9-1-1 supporting infrastructure of other telecommunications providers other than Verizon, was also impacted by the Derecho. As an example, AT&T Wireless in their comments to FCC PS Docket No. 11-60, indicated there was some impact to their infrastructure during and after the Derecho.

By all indications during this event, the systems and processes in place by the public safety agencies in the COG region, operated as designed, and the 9-1-1 centers were fully prepared to provide service to the public. But, there are some items, which need to be considered, by local and state government officials, to ensure future reliability and continuity of 9-1-1 services which are as follows.

1. State and local 9-1-1 authorities should be encouraged to perform a full assessment of their current 9-1-1 systems and operations to assure reliability and continuity of 9-1-1 service.
2. It is recommended that State and Federal regulatory authorities, review current laws and regulations related to 9-1-1 service, to assure it places emphasis and favors public safety versus the 9-1-1 service providers or telecommunications providers. The interest of the public and public safety should come first over the interest of commercial providers.
3. State and local 9-1-1 authorities should work with their Legislators to ensure that the funding required to support the current 9-1-1 services and future Next Generation 9-1-1 are adequate and available, and that the fees and funds collected from the citizens of their States for 9-1-1 services are dedicated and used solely for the purpose as intended for the implementation, operation and maintenance of 9-1-1 emergency telephone services as required by the Enhance911 Act of 2004(Pub. Law 108-494). In addition, the fees collected should be fairly and equally distributed to the 9-1-1 authorities.

Outstanding Issues

There appears to be no standards for 9-1-1 service providers to adhere to public safety grade requirements for backup power related to the systems that support 9-1-1 services.

Next Steps

1. COG should formalize a committee of 9-1-1 Directors that can address specific issues related to 9-1-1 emergency telecommunications service for the NCR
2. COG, with the assistance of the 9-1-1 authorities, should take the lead to work cooperatively in the development of a multi-year 9-1-1 strategic plan to include Next Generation 9-1-1

Conclusion

The Derecho's impact on 9-1-1 services and the ensuing public and industry reaction has been one of the most significant events in the history of enhanced 9-1-1 services in the United States. It is conclusive that there were many areas in which Verizon could have performed better related to their initial response to the issues the Derecho storm created. Questions still remain about the current reliability, age and condition of the Verizon infrastructure local governments rely on to provide life-saving 9-1-1 public services.

In the aftermath of the storm, Verizon has taken steps to address the issues of June 29, 2012. Verizon, however, has a responsibility to follow-up on the additional recommendations of this and other recommendations made to the FCC hearings. Verizon must continue to evaluate their ongoing operations, processes and best practices to mitigate the impacts of this type should it happen again. There is much Verizon must do to regain the confidence of the public safety community and citizens that their part in providing vital 9-1-1 communications service is highly reliable and sufficiently redundant on an ongoing basis.

There were no identifiable issues for the 9-1-1 centers during this event and all of their systems operated as designed. The public safety community, however, must also shoulder the responsibility to determine where improvements can be made and make plans for continuous improvements to meet new operational and technology challenges. State and federal government officials need to provide resources to the public safety community, and proper oversight, to allow the technology and human resources that are necessary to support the operations of the current 9-1-1 services as well as Next Generation 9-1-1 services.