PRELIMINARY REPORT of 9-1-1 SERVICE GAPS DURING and FOLLOWING the DERECHO STORM on JUNE 29, 2012

Metropolitan Washington Council of Governments
9-1-1 Telecommunications Network Steering Group

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Preliminary Report of 9-1-1 Service Gaps
During and Following the Derecho Storm on June 29, 2012

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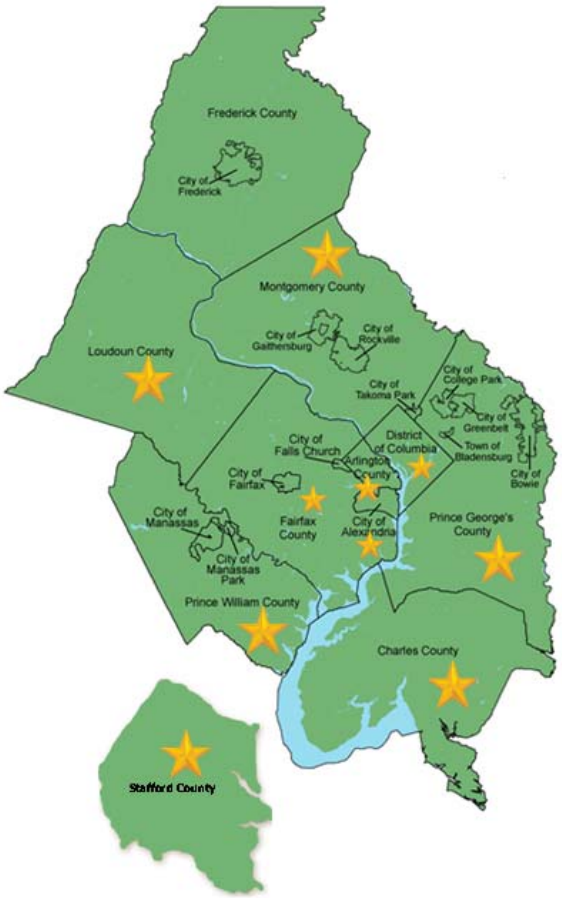
FOREWORD

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 COG 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 Service Commission
- Maryland Emergency Number Systems Board

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 COG 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
http://www.scc.virginia.gov/case/PublicComments.aspx
2. FCC PS Docket No. 11-60
http://www.fcc.gov/document/pshsb-seeks-comment-effects-derecho-storm-communications)
3. Virginia Secure Commonwealth Panel – 9-1-1 Sub Panel
4. Maryland Public Service Commission Case No. 9298
http://webapp.psc.state.md.us/Intranet/Casenum/CaseAction_new.cfm?CaseNumber=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.

INTRODUCTION

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 every city, town and rural community 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.

The Metropolitan Washington Council of Governments (COG) is the regional organization that has played a major role in public safety and emergency preparedness for more than 50 years. COG has addressed or assisted in the coordination of action following airline and rail crashes in 1982, the 2001 terrorist attacks of September 11, the Beltway sniper incident in 2002, Hurricane Isabel in 2003, "Snowmageddon" in 2010 and the East Coast earthquake in 2011. Because of the regional planning process initiated after the September 11 terrorist attacks, the region now has access to a Regional Incident Communication and Coordination System (RICCS), which allows local leaders and emergency officials to coordinate on messages and actions before, during and after a regional emergency.

On June 29, 2012 however, an unusual storm - known as a Derecho, characterized by very strong, straight-line winds – caused widespread power outages and infrastructure damage that led to the failure of the 9-1-1 call system in much of Northern Virginia and adjoining areas. Elected officials across the region were concerned about the loss of 9-1-1 service and the impact of the failure across such a large area. The incident also revealed important areas for improvement in procedures utilized by Verizon related to backup power and 9-1-1 center and public notifications.

At its July 11, 2012 meeting, COG Board of Directors adopted two resolutions.

1. R35-2012 (Appendix 3) was a Resolution Directing After-Action Report on the Derecho Storm on June 29, 2012.
2. R36-2012 (Appendix 2) was a Resolution to Encourage Steps to Address Verizon 9-1-1 Service Gaps During and Following the Derecho on June 29, 2012. This resolution directed relevant committees to assess and identify actions required to address issues including: the cause of the 9-1-1 failures, the state of existing redundancy and backup capabilities, and opportunities for COG localities to influence the strengthening of regulatory oversight at state and federal levels. The Board also directed its committees to find ways to ensure improved messaging from Verizon officials to the public and local emergency response officials concerning the 9-1-1 emergency network service. In response to this resolution, COG hired a consultant to assist in the preparation this after-action report.

COG's 9-1-1 Telecommunications Network Steering Group met with Verizon officials for the first time on July 24, 2012 in Fairfax County's Emergency Operations Center. On this date, the Steering Group

received an initial report from Verizon and voiced their immediate concerns. Because the Federal Communications Commission (FCC) had already begun an inquiry into several 9-1-1 failures around the country, an FCC representative was invited and attended the meeting. Officials from the Virginia State Corporation Commission, Maryland State Public Service Commission and Washington, DC, also participated. Officials responsible for each of the local 9-1-1 centers - called Public Safety Answering Points (PSAPs), attended this meeting and had an opportunity to articulate their concerns about the event and Verizon's practices.

On July 26, 2012, Verizon officials identified the failure of backup generators in their facilities in Arlington and Fairfax Counties as the key to losing both the 9-1-1 service itself, as well as the ability to view the status of the service (Telemetry) in many locations around the region. Subsequent to the July meeting, Verizon officials met with the local 9-1-1 center officials as a group on several occasions and with each one of the local 9-1-1 representatives individually. In addition, Verizon has met with the FCC on several occasions, has briefed various COG Committees and has had several meetings and conversations with COG's consultant.

Following are some of the actions by various agencies in response to this event.

- Verizon completed an initial review and analysis of the 9-1-1 outages and released a preliminary report on August 13, 2012.
- The Virginia State Corporation Commission (SCC) released its interim staff review of the incident on September 14, 2012.
- The Maryland Public Service Commission established Case No. 9298
- The Maryland Emergency Number Systems Board (ENSB) issued an interim report on October 23, 2012
- The Federal Communications Commission and the Virginia State Corporation Commission have indicated their final reports will be issued by the end of 2012.

It should be noted that there are other reports, studies and inquiries being conducted by various groups, outside of the impact on 9-1-1 by the storm, related to such items as power and electrical infrastructure and emergency operations and management.

The following information reflects the preliminary report required by COG resolution R36-2012. A final report will be issued in January 2013.

BACKGROUND

Late in the evening of Friday June 29, 2012, a severe derecho storm traveled across the country and hit the Mid-Atlantic region with unusually intense straight-line winds. In its aftermath, the storm left widespread commercial power and communications outages in the Washington D.C., Virginia, Maryland and West Virginia area. Various news agencies reported that in excess of 1 million citizens were without power.

At approximately 10:30 PM on June 29, 2012 several area 9-1-1 centers lost commercial power. As designed, the affected 9-1-1 centers immediately switched to their various power back-up systems, and believed that this would enable them to continue handling emergency calls.

In the early morning hours of June 30, 2012 service interruptions continued to progress and many 9-1-1 centers in the region began experiencing sporadic issues related to 9-1-1 service, including calls without Automatic Location Information (ALI) and a significant decrease in the number of calls. At approximately 7:30 AM on June 30, the 9-1-1 centers in Fairfax County, Prince William County, Manassas and Manassas Park experienced a complete failure of the delivery of 9-1-1 and 10-digit emergency number calls. As of the date of this report, Verizon has identified a total of 26 9-1-1 centers in Virginia and Maryland (Appendix 4) that experienced 9-1-1 service issues related to this incident. Some of these issues persisted for almost five days, up until the 4th of July, 2012.

It should be noted, although not of this magnitude, there have been other service-affecting events that have impacted 9-1-1 service in the past, which have been brought to Verizon's attention. See COGCOG June 21, 2011 letter to Verizon and Verizon's response (Appendix 5 & 6).

ANALYSIS

In COG Resolution R36-2012, there were five areas the Board of Directors instructed the 9-1-1 Telecommunications Response Steering Group to consider.

A. Cause of Verizon's 9-1-1 failure;
B. Existing redundancy and backup capabilities;
C. Vulnerability of newer technologies that required battery or back-up power, including home and business service;
D. Opportunities for COG localities to influence and strengthen regulatory oversight and remedies at the state and federal levels
E. Verizon's communication and messaging to the public and local emergency response officials concerning 9-1-1 services

Cause of Verizon's 9-1-1 Failure

On Friday June 29, 2012, at approximately 10:30 PM the Derecho hit the Mid-Atlantic region causing widespread commercial power and communications outages including in the Washington D.C., Virginia and Maryland area. Various news agencies reported that in excess of 1 million citizens were without power. Verizon reported there were more downed poles and it generated more commercial trouble tickets than Hurricane Irene, which impacted the east coast in August of 2011. They also indicated that power failures affected more than 100 Verizon locations, and that more than 1,900 network transport systems were damaged and/or failed. The report indicates that in most of these locations, the power back-up systems worked as designed, but nine generators out of 136, failed to operate properly, including facilities in Arlington, Virginia, where Verizon's network telemetry for the region is located,

and Fairfax, Virginia, which is the location of one of the regions 9-1-1 tandem switches. At each of these locations one of two back-up generators failed to start.

The SCC findings state, "The cause of the 9-1-1 service outages in Northern Virginia from the June 29 Derecho began with the failure of two backup generators that did not start automatically when commercial power was lost. Specifically, a generator in each of Verizon's Arlington and Fairfax central offices did not start."

The loss of commercial power and the failure of the two backup generators may have been the predominant causes of the 9-1-1 service outage, but there were additional contributing factors that led to the failure and are outlined below.

1. 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.
2. Two back-up generators that supported 9-1-1 systems and Verizon telemetry did not start. Verizon failed to either identify or resolve previous maintenance issues with these generators, such as air in the fuel lines or faulty automatic fail-over switches.
3. Verizon technicians dispatched to at least one of the locations (Fairfax) where the generators failed to start did not identify that the generator supporting the 9-1-1 infrastructure was not operating.
4. Both the Arlington and Fairfax facilities were supported by back-up battery supplies, but these batteries drained.
5. Verizon failed to successfully implement any mitigating action to restore these two generators prior to the battery back-ups expiration.
6. Once the battery supplies were exhausted both the telemetry and 9-1-1 systems at the Arlington and Fairfax facilities failed.
7. In addition, damage and failure of other 9-1-1 supporting systems within the Verizon network and infrastructure, such as ALI links, STPs and end offices, severely contributed to the 9-1-1 outage, although these were largely cascading effects of the loss of primary and backup power in Arlington and Fairfax.

Existing Redundancy and Backup Capabilities

There are three areas related to the 9-1-1 infrastructure that should be considered in the evaluation of existing redundancy and backup capabilities which are summarized below.

- 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 centers and 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

In the report released on August 13, 2012, Verizon states, "Verizon designs its network to provide 9-1-1 services even during disasters…our 9-1-1 network designs include multiple levels of diversity and redundancy, as well as back-up power in critical facilities, to optimize resiliency during a crisis."

Additionally, the report indicates that 9-1-1 center-specific routing issues compounded the generator-starting problems. Verizon's 9-1-1 design provides multiple diversities or redundancies "inside the network." There are multiple tandem offices providing routing so that, if one fails, the calls to the failed office are routed through the other(s). Verizon's ALI databases and links to each ALI database are redundant, as are Verizon's signaling systems, which route calls to their destinations. Verizon's analysis of the network impacts following the Derecho identified areas for improvement, especially with ALI diversity, with specific 9-1-1 center configurations.

Verizon has indicated they have met with each individual 9-1-1 center Director and continues to work directly with the specific 9-1-1 center to decide on improvements.

- 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 9-1-1 services were provided through the Verizon Arlington and Fairfax locations, and thus were also unable to receive emergency calls.

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

Power for traditional and legacy telephone service for most residence 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. However, the near-ubiquitous presence of cordless phones – particularly by consumers – as well as power-reliant elements in the communications network such as digital loop carrier systems often has negated that benefit.

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 back-up battery provided by some carrier's drains.

Some commercial or business telephone systems such as a PBX or VoIP systems might also require power to operate properly.

In addition, mobile telephone service during an emergency situation wherein multiple calls are being attempted into the mobile network can cause network congestion and/or blockage. Also, the loss or failure of the mobile infrastructure, such as cell sites, during a severe storm or some other natural or manmade disaster, can impact the ability to make and receive mobile calls and therefore access to 9-1-1.

Citizens should be aware of the benefits and limitations of all technologies and take these into consideration as part of their advance preparation for severe weather events or in times of emergency, if they lose commercial power and battery supply, they will lose access to 9-1-1 service, when they may need to make a 9-1-1 call. Business should develop contingency plans and assure all of their employees are aware of the procedures to follow in the event they may need emergency services in the event of a power failure.

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

COG localities have several opportunities in formal proceedings, outlined below, to influence regulatory oversight and seek remedies as it relates to the impact of the Derecho on 9-1-1 services.

Within the formal proceedings, listed below, and through contractual relationships with Verizon, the authorities in COG region should encourage the implementation of regulations, requirements and best practices that requires Verizon and other 9-1-1 service providers and telecommunications carriers to adhere to strict service level agreements, standards and processes regarding response to outages and adverse conditions that impact 9-1-1 service and for penalties in the event of non-compliance.

1. Virginia SCC Case No. PUC-2012-00042
http://www.scc.virginia.gov/case/PublicComments.aspx
2. FCC PS Docket No. 11-60
http://www.fcc.gov/document/pshsb-seeks-comment-effects-derecho-storm-communications)
3. Virginia Secure Commonwealth Panel – 9-1-1 Sub Panel
4. Maryland Public Service Commission Case No. 9298
http://webapp.psc.state.md.us/Intranet/Casenum/CaseAction_new.cfm?CaseNumber=9298
5. Maryland Emergency Number Systems Board (ENSB) Inquiry

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, and they 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 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 provider 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
2. COG, with the assistance of the 9-1-1 authorities, should take the lead to work cooperatively in the develop a multi-year 9-1-1 strategic plan to include Next Generation 9-1-1

Conclusion

The impact the Derecho, had on 9-1-1 services and the ensuing reaction has been one of the most significant events in the history of enhanced 9-1-1 services in this country. 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 created, but questions remain about the current reliability, age and condition of the Verizon infrastructure that supports a critical service such as 9-1-1.

In the aftermath of the storm, Verizon has taken steps to address the issues of June 29, 2012. But, they also have a responsibility to follow-up on the additional recommendations and continue to evaluate their on-going operations, processes and best practices to assure an event of this type never happens again. There is still a lot to be done on the part of Verizon to regain the confidence of public safety and the citizens in assuring reliability and continuity of this very vital service

Even though there were no identifiable issues for the 9-1-1 9-1-1 centers during this event, and all of their systems operated as designed, it is also the responsibility of the public safety community, local, state and federal governments to assure all the required resources and proper oversight, are made available to continue the operations of the current 9-1-1 services and to look to the future in Next Generation 9-1-1 to ensure every citizen and visitor has access to 9-1-1 services in their time of need.

GLOSSARY

1. **Automatic Location Identification (ALI)** - An electronic system that automatically relays a caller's location when that call is placed to a 9-1-1
2. **Automatic Number Identification (ANI)** - is a service that provides the 9-1-1 9-1-1 center with the telephone number of the calling phone
3. **Competitive Local Exchange Carrier (CLEC)** - Any company or person authorized to provide local exchange services in competition with an incumbent telephone company
4. **Derecho** (from Spanish: " meaning "straight") - A line of intense, widespread, and fast-moving windstorms and sometimes thunderstorms that moves across a great distance and is characterized by damaging winds
5. **E9-1-1 Tandem -** The telephone central office that provides the switching of 9-1-1calls and controls delivery of the voice call with ANI to the 9-1-1 center and provides certain functions such speed calling and call transfer.
6. **Federal Communications Commission (FCC) -** Independent US government agency, directly responsible to Congress, and charged with regulating interstate and international communications by radio, television, wire, satellite and cable.
7. **National Incident Management System (NIMS)** - A system mandated by Homeland Security Presidential Directive 5 that provides a consistent nationwide approach for governments, the private sector, and non-governmental organizations to work effectively and efficiently together to prepare for, respond to, and recover from domestic incidents, regardless of cause, size, or complexity.
8. **NG9-1-1** - An initiative aimed at updating the 9-1-1 service infrastructure to improve public emergency communications services in a wireless mobile society that enables the public to transmit text, images, video and data to the 9-1-1 center
9. **Public Branch Exchange (PBX)** – A private telephone switching system
10. **Public Safety Answering Point (9-1-1 center)** – 9-1-1 Call Center that receives emergency calls from the public.
11. **Reverse 9-1-1®** - A public safety communications system developed by Cassidian Communications used public safety organizations to deliver recorded emergency notifications to a selected set of telephone service subscribers or groups of people in a defined geographic area.
12. **Session Initiation Protocol (SIP**) - an application protocol that establishes, manages, and terminates a multimedia session.
13. **Telemetry** - A technology that allows remote measurement and reporting of information about a telecommunications providers network and related infrastructure
14. **Virginia State Corporation Commission (SCC)** – The Virginia commission that provides oversight and regulations of the Commonwealth's telecommunications industry
15. **Voice over Internet Protocol (VoIP)** - A communications protocol that allows for telephonic communication via the Internet

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APPENDICIES

9-1-1 Network Diagram

R36-2012 COG RESOLUTION TO ENCOURAGE STEPS TO ADDRESS VERIZON 9-1-1 SERVICE GAPS DURING AND FOLLOWING THE DERECHO STORM ON JUNE 29, 2012

R35-2012 COG RESOLUTION DIRECTING AFTER-ACTION REPORT ON THE DERECHO STORM ON JUNE 29, 2012

Enhanced 911 Act of 2004 (Pub. Law 108-494)

COG 9-1-1 Outage Map

9-1-1 Centers Impacted by the Outage

COG July 21, 2011 Letter to Verizon

Verizon Response to COG July 21, 2011 Letter

9-1-1 Service Component Overview

Vulnerability of New Technologies

Impact on Virginia 9-1-1 Infrastructure

Verizon, 9-1-1 Service and the June 29, 2012, Derecho

Virginia SCC Case No. PUC-2012-00042 – Preliminary Report

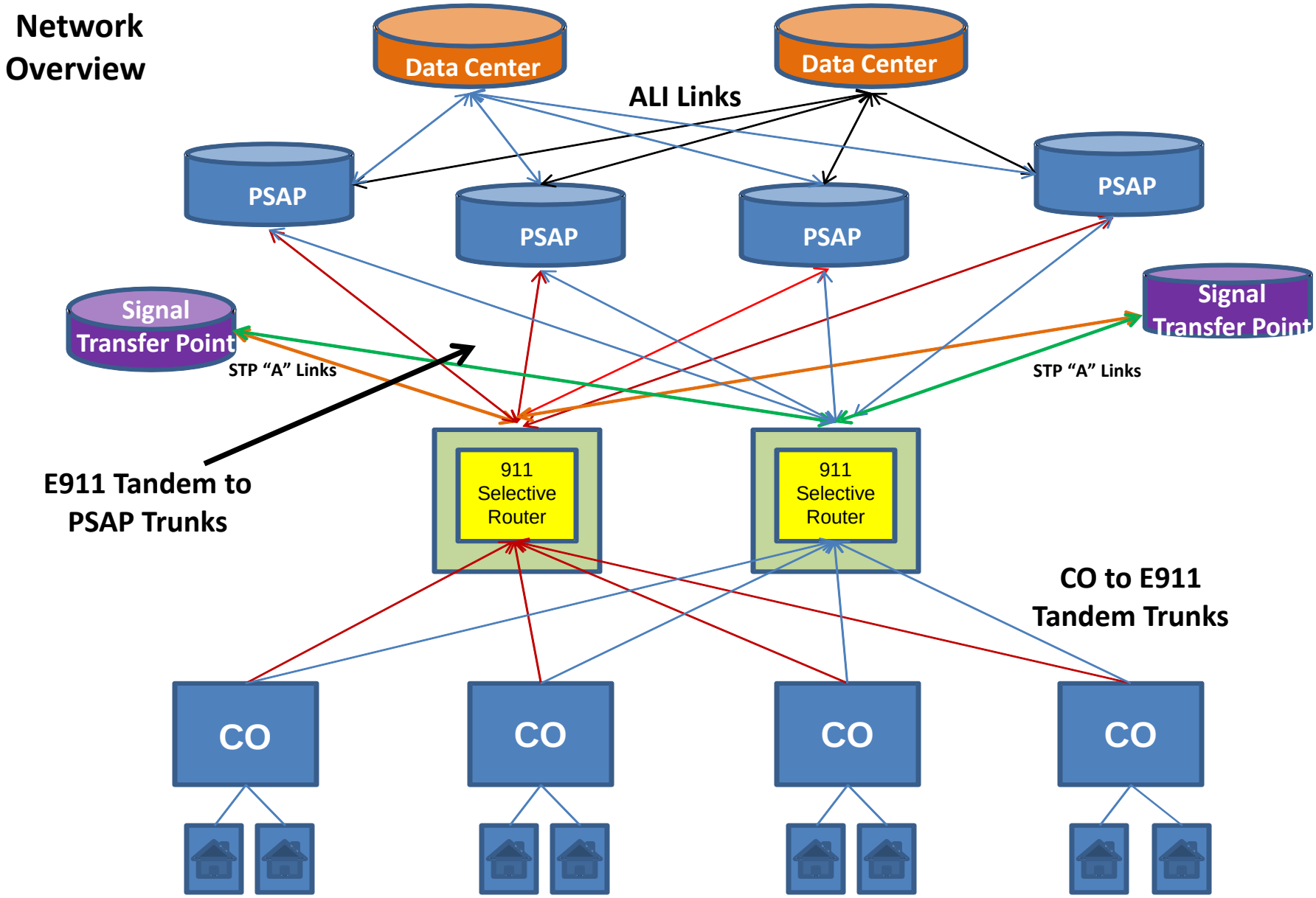
FCC PS Docket No. 11-60

MD PSC Case 9298

Interim Report on the June 29, 2012 Derecho Storm Impact on 9-1-1 in Maryland

Verizon, 9-1-1 Service and the June 29, 2012, Derecho – “Moving Forward – Corrective Actions Update”

E911 Network Ecosystem



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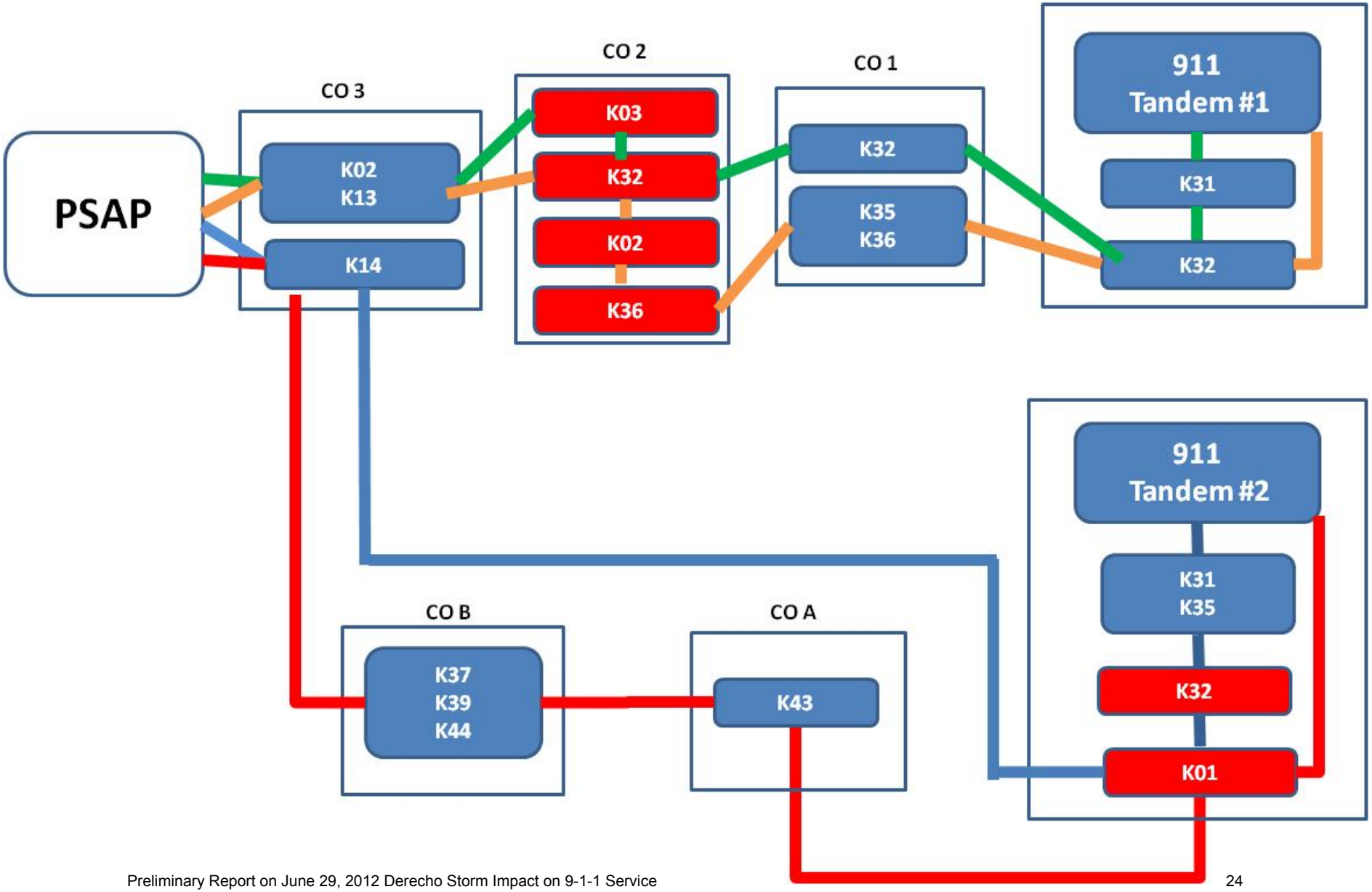
E911 to Tandem Routing



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METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS
777 North Capitol Street, N.E.
Washington, D.C. 20002

RESOLUTION TO ENCOURAGE STEPS TO ADDRESS VERIZON 9-1-1 SERVICE GAPS DURING AND FOLLOWING THE DERECHO STORM ON JUNE 29, 2012

WHEREAS, on June 29, 2012, the National Capital Region experienced unusually severe weather from Derecho storms which necessitated substantial mobilization of emergency personnel and equipment on that date and during subsequent days; however, both the public and local 9-1-1 offices were frustrated in obtaining and providing emergency responses by the periodic and extended failure of 9-1-1 service, on which the region depends; and

WHEREAS, Verizon's 9-1-1 service has previously and periodically failed, and local governments of the National Capital Region, their 9-1-1 centers and emergency managers, and the public have not been assured that the problems causing it to do so have been fixed; and

WHEREAS, the Board of Directors is extremely concerned that such gaps have occurred and increased the risks to the safety and lives of residents of the National Capital Region who have come to rely on such service; and

WHEREAS, COG has learned that the Commonwealth of Virginia State Corporation Commission has entered an order establishing an investigation regarding problems with 9-1-1 emergency call services within the Commonwealth from the June storms, and also that the Federal Communications Commission's staff will meet with carriers to explore the cause of service issues to 9-1-1 centers; and

WHEREAS, COG, through the work of its Chief Administrative Officers Committee and area 9-1-1 managers previously advised Verizon of its concerns with gaps in 9-1-1 service in 2011; and

WHEREAS, constant, reliable 9-1-1 service is a necessity for the National Capital Region, and the COG Board desires to strongly encourage steps which it believes will expedite addressing the gaps which have been experienced in such service at the Verizon, regional, state and national levels; and

WHEREAS, by separate resolution, the Board of Directors is addressing the need for an after-action report as a matter of preventive practice for future emergencies;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS (COG) THAT

1. LOCAL AND STATE GOVERNMENT TECHNICAL INPUT – The COG Board directs its technical and other committees with expertise in 9-1-1 service, telecommunications and related matters to compile, assess and identify actions required to address the 9-1-1 service issues during and following the June 29 storms. Participating committees include but are not limited to 9-1-1 directors, public information officials, chief information/technology officers and emergency management directors.

2. COMMITTEE WORK SCOPE AND OUTCOMES – The 9-1-1 Telecommunications Network Response Steering Group, comprised of technical committee representatives shall finalize and manage a scope of work that includes:

    a. Determine cause of Verizon's 9-1-1 failure;
    b. Examining existing redundancy and backup capabilities;
    c. Examine vulnerability of newer technologies that required battery or back-up power, including home and business service;
    d. Pursue opportunities for COG localities to influence and strengthen regulatory oversight and remedies at the state and federal levels; and
    e. Ensure improved communication or messaging from Verizon 9-1-1 to the public and to local emergency response officials concerning 9-1-1 Emergency Network service.

    The Steering Group shall Include participation and input by Verizon and state and federal regulatory and oversight agencies, and report its findings and recommendations to the COG Board no later than October 31, 2012.

3. FUNDING RESOURCES – The COG Board authorizes the Executive Director or his designee to spend an amount not to exceed $50,000 in FY 2013 contingency reserve funding.

4. TRANSMITTAL – Copies of this resolution shall be transmitted to the Federal Communications Commission, the Mayor of the District of Columbia and Governors of the State of Maryland and Commonwealth of Virginia, state telecommunications regulatory and oversight agencies, the COG Chief Administrative Officers Committee, and the National Capital Region Emergency Preparedness Council.

The foregoing resolution was unanimously approved and adopted by the COG Board of Directors at its regular meeting held on July 11, 2012.

Barbara J. Chapman
Executive Board Secretary

METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS
777 North Capitol Street, N.E.
Washington, D.C. 20002

RESOLUTION DIRECTING AFTER-ACTION REPORT ON THE DERECHO STORM ON JUNE 29, 2012

WHEREAS, on June 29, 2012, the National Capital Region experienced unusually severe weather from Derecho storms which necessitated substantial mobilization of emergency personnel and equipment on that date and during subsequent days; and

WHEREAS, by separate resolution, the Board of Directors is taking action to address Verizon 9-1-1 service gaps in the National Capital Region; and

WHEREAS, as a matter of preventive practice for future emergencies, COG should build on and partner with local, state and federal government officials to review and implement findings and recommendations concerning the June 29, 2012, storm and its aftermath;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF THE METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS (COG) THAT

REGIONAL AFTER-ACTION REPORT – To examine and broadly identify opportunities for improvement in emergency preparedness, coordination and response associated with the June 29 storm, the National Capital Region Emergency Preparedness Council, and the Senior Policy Group and Chief Administrative Officers Committee are requested to identify relevant outcomes from past after-action reports and/or support a new Urban Area Security Initiative grant-funded after-action report. The new after-action report, if required, should be inclusive of key regional and local issues, including weather notification, emergency coordination and response, and critical infrastructure such as electric power, telecommunications and water, and notification to the public. The compilation of past after-action report outcomes and/or new after-action outcomes should be completed and made available to the EPC and the COG Board no later than December 15, 2012.

TRANSMITTAL – Copies of this resolution shall be transmitted to the Mayor of the District of Columbia and Governors of the State of Maryland and Commonwealth of Virginia, state telecommunications regulatory and oversight agencies, the COG Chief Administrative Officers Committee, and the National Capital Region Emergency Preparedness Council.

The foregoing resolution was unanimously approved and adopted by the COG Board of Directors at its regular meeting held on July 11, 2012.

Barbara J. Chapman
Executive Board Secretary

PUBLIC LAW 108–494—DEC. 23, 2004

ENHANCE 911 SERVICES

Public Law 108–494
108th Congress

An Act

Dec. 23, 2004
[H.R. 5419]

To amend the National Telecommunications and Information Administration Organization Act to facilitate the reallocation of spectrum from governmental to commercial users; to improve, enhance, and promote the Nation's homeland security, public safety, and citizen activated emergency response capabilities through the use of enhanced 911 services, to further upgrade Public Safety Answering Point capabilities and related functions in receiving E–911 calls, and to support in the construction and operation of a ubiquitous and reliable citizen activated system; and to provide that funds received as universal service contributions under section 254 of the Communications Act of 1934 and the universal service support programs established pursuant thereto are not subject to certain provisions of title 31, United States Code, commonly known as the Antideficiency Act, for a period of time.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,

TITLE I—E–911

Ensuring Needed Help Arrives Near Callers Employing 911 Act of 2004.
47 USC 901 note.

SEC. 101. SHORT TITLE.

This title may be cited as the "Ensuring Needed Help Arrives Near Callers Employing 911 Act of 2004" or the "ENHANCE 911 Act of 2004".

47 USC 942 note.

SEC. 102. FINDINGS.

The Congress finds that—

(1) for the sake of our Nation's homeland security and public safety, a universal emergency telephone number (911) that is enhanced with the most modern and state-of-the-art telecommunications capabilities possible should be available to all citizens in all regions of the Nation;

(2) enhanced emergency communications require Federal, State, and local government resources and coordination;

(3) any funds that are collected from fees imposed on consumer bills for the purposes of funding 911 services or enhanced 911 should go only for the purposes for which the funds are collected; and

(4) enhanced 911 is a high national priority and it requires Federal leadership, working in cooperation with State and local governments and with the numerous organizations dedicated to delivering emergency communications services.

47 USC 942 note.

SEC. 103. PURPOSES.

The purposes of this title are—

(1) to coordinate 911 services and E–911 services, at the Federal, State, and local levels; and

(2) to ensure that funds collected on telecommunications bills for enhancing emergency 911 services are used only for the purposes for which the funds are being collected.

SEC. 104. COORDINATION OF E–911 IMPLEMENTATION.

Part C of title I of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 901 et seq.) is amended by adding at the end the following:

"SEC. 158. COORDINATION OF E–911 IMPLEMENTATION. 47 USC 942.

"(a) E–911 IMPLEMENTATION COORDINATION OFFICE.—

"(1) ESTABLISHMENT.—The Assistant Secretary and the Administrator of the National Highway Traffic Safety Administration shall—

"(A) establish a joint program to facilitate coordination and communication between Federal, State, and local emergency communications systems, emergency personnel, public safety organizations, telecommunications carriers, and telecommunications equipment manufacturers and vendors involved in the implementation of E–911 services; and

"(B) create an E-911 Implementation Coordination Office to implement the provisions of this section.

"(2) MANAGEMENT PLAN.—The Assistant Secretary and the Administrator shall jointly develop a management plan for the program established under this section. Such plan shall include the organizational structure and funding profiles for the 5-year duration of the program. The Assistant Secretary and the Administrator shall, within 90 days after the date of enactment of this Act, submit the management plan to the Committees on Energy and Commerce and Appropriations of the House of Representatives and the Committees on Commerce, Science, and Transportation and Appropriations of the Senate. Deadline.

"(3) PURPOSE OF OFFICE.—The Office shall—

"(A) take actions, in concert with coordinators designated in accordance with subsection (b)(3)(A)(ii), to improve such coordination and communication;

"(B) develop, collect, and disseminate information concerning practices, procedures, and technology used in the implementation of E–911 services;

"(C) advise and assist eligible entities in the preparation of implementation plans required under subsection (b)(3)(A)(iii);

"(D) receive, review, and recommend the approval or disapproval of applications for grants under subsection (b); and

"(E) oversee the use of funds provided by such grants in fulfilling such implementation plans.

"(4) REPORTS.—The Assistant Secretary and the Administrator shall provide a joint annual report to Congress by the first day of October of each year on the activities of the Office to improve coordination and communication with respect to the implementation of E–911 services.

"(b) PHASE II E–911 IMPLEMENTATION GRANTS.—

"(1) MATCHING GRANTS.—The Assistant Secretary and the Administrator, after consultation with the Secretary of Homeland Security and the Chairman of the Federal Communications

Commission, and acting through the Office, shall provide grants to eligible entities for the implementation and operation of Phase II E–911 services.

"(2) MATCHING REQUIREMENT.—The Federal share of the cost of a project eligible for a grant under this section shall not exceed 50 percent. The non-Federal share of the cost shall be provided from non-Federal sources.

"(3) COORDINATION REQUIRED.—In providing grants under paragraph (1), the Assistant Secretary and the Administrator shall require an eligible entity to certify in its application that—

"(A) in the case of an eligible entity that is a State government, the entity—

"(i) has coordinated its application with the public safety answering points (as such term is defined in section 222(h)(4) of the Communications Act of 1934) located within the jurisdiction of such entity;

"(ii) has designated a single officer or governmental body of the entity to serve as the coordinator of implementation of E–911 services, except that such designation need not vest such coordinator with direct legal authority to implement E–911 services or manage emergency communications operations;

"(iii) has established a plan for the coordination and implementation of E–911 services; and

"(iv) has integrated telecommunications services involved in the implementation and delivery of phase II E–911 services; or

"(B) in the case of an eligible entity that is not a State, the entity has complied with clauses (i), (iii), and (iv) of subparagraph (A), and the State in which it is located has complied with clause (ii) of such subparagraph.

Regulations. Deadlines.

"(4) CRITERIA.—The Assistant Secretary and the Administrator shall jointly issue regulations within 180 days after the date of enactment of the ENHANCE 911 Act of 2004, after a public comment period of not less than 60 days, prescribing the criteria for selection for grants under this section, and shall update such regulations as necessary. The criteria shall include performance requirements and a timeline for completion of any project to be financed by a grant under this section.

"(c) DIVERSION OF E–911 CHARGES.—

"(1) DESIGNATED E–911 CHARGES.—For the purposes of this subsection, the term 'designated E–911 charges' means any taxes, fees, or other charges imposed by a State or other taxing jurisdiction that are designated or presented as dedicated to deliver or improve E–911 services.

"(2) CERTIFICATION.—Each applicant for a matching grant under this section shall certify to the Assistant Secretary and the Administrator at the time of application, and each applicant that receives such a grant shall certify to the Assistant Secretary and the Administrator annually thereafter during any period of time during which the funds from the grant are available to the applicant, that no portion of any designated E–911 charges imposed by a State or other taxing jurisdiction within which the applicant is located are being obligated or expended for any purpose other than the purposes for which

such charges are designated or presented during the period beginning 180 days immediately preceding the date of the application and continuing through the period of time during which the funds from the grant are available to the applicant.

"(3) CONDITION OF GRANT.—Each applicant for a grant under this section shall agree, as a condition of receipt of the grant, that if the State or other taxing jurisdiction within which the applicant is located, during any period of time during which the funds from the grant are available to the applicant, obligates or expends designated E–911 charges for any purpose other than the purposes for which such charges are designated or presented, all of the funds from such grant shall be returned to the Office.

"(4) PENALTY FOR PROVIDING FALSE INFORMATION.—Any applicant that provides a certification under paragraph (1) knowing that the information provided in the certification was false shall—

"(A) not be eligible to receive the grant under subsection (b);

"(B) return any grant awarded under subsection (b) during the time that the certification was not valid; and

"(C) not be eligible to receive any subsequent grants under subsection (b).

"(d) AUTHORIZATION; TERMINATION.—

"(1) AUTHORIZATION.—There are authorized to be appropriated to the Department of Transportation, for the purposes of grants under the joint program operated under this section with the Department of Commerce, not more than $250,000,000 for each of the fiscal years 2005 through 2009, not more than 5 percent of which for any fiscal year may be obligated or expended for administrative costs.

"(2) TERMINATION.—The provisions of this section shall cease to be effective on October 1, 2009.

"(e) DEFINITIONS.—As used in this section:

"(1) OFFICE.—The term 'Office' means the E–911 Implementation Coordination Office.

"(2) ADMINISTRATOR.—The term 'Administrator' means the Administrator of the National Highway Traffic Safety Administration.

"(3) ELIGIBLE ENTITY.—

"(A) IN GENERAL.—The term 'eligible entity' means a State or local government or a tribal organization (as defined in section 4(l) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b(l))).

"(B) INSTRUMENTALITIES.—Such term includes public authorities, boards, commissions, and similar bodies created by one or more eligible entities described in subparagraph (A) to provide E–911 services.

"(C) EXCEPTION.—Such term does not include any entity that has failed to submit the most recently required certification under subsection (c) within 30 days after the date on which such certification is due.

"(4) E–911 SERVICES.—The term 'E–911 services' means both phase I and phase II enhanced 911 services, as described in section 20.18 of the Commission's regulations (47 C.F.R. 20.18), as in effect on the date of enactment of the ENHANCE

911 Act of 2004, or as subsequently revised by the Federal Communications Commission.

"(5) PHASE II E–911 SERVICES.—The term 'phase II E–911 services' means only phase II enhanced 911 services, as described in such section 20.18 (47 C.F.R. 20.18), as in effect on such date, or as subsequently revised by the Federal Communications Commission.

"(6) STATE.—The term 'State' means any State of the United States, the District of Columbia, Puerto Rico, the Northern Mariana Islands, and any territory or possession of the United States.".

SEC. 105. GAO STUDY OF STATE AND LOCAL USE OF 911 SERVICE CHARGES.

Deadline.

(a) IN GENERAL.—Within 60 days after the date of enactment of this Act, the Comptroller General shall initiate a study of—

(1) the imposition of taxes, fees, or other charges imposed by States or political subdivisions of States that are designated or presented as dedicated to improve emergency communications services, including 911 services or enhanced 911 services, or related to emergency communications services operations or improvements; and

(2) the use of revenues derived from such taxes, fees, or charges.

(b) REPORT.—Within 18 months after initiating the study required by subsection (a), the Comptroller General shall transmit a report on the results of the study to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Energy and Commerce setting forth the findings, conclusions, and recommendations, if any, of the study, including—

(1) the identity of each State or political subdivision that imposes such taxes, fees, or other charges; and

(2) the amount of revenues obligated or expended by that State or political subdivision for any purpose other than the purposes for which such taxes, fees, or charges were designated or presented.

SEC. 106. REPORT ON THE DEPLOYMENT OF E–911 PHASE II SERVICES BY TIER III SERVICE PROVIDERS.

Within 90 days after the date of enactment of this Act, the Federal Communications Commission shall submit a report to the Committee on Energy and Commerce of the House of Representatives and the Committee on Commerce, Science, and Transportation of the Senate detailing—

(1) the number of tier III commercial mobile service providers that are offering phase II E–911 services;

(2) the number of requests for waivers from compliance with the Commission's phase II E–911 service requirements received by the Commission from such tier III providers;

(3) the number of waivers granted or denied by the Commission to such tier III providers;

(4) how long each waiver request remained pending before it was granted or denied;

(5) how many waiver requests are pending at the time of the filing of the report;

(6) when the pending requests will be granted or denied;

(7) actions the Commission has taken to reduce the amount of time a waiver request remains pending; and

(8) the technologies that are the most effective in the deployment of phase II E–911 services by such tier III providers.

SEC. 107. FCC REQUIREMENTS FOR CERTAIN TIER III CARRIERS.

(a) IN GENERAL.—The Federal Communications Commission shall act on any petition filed by a qualified Tier III carrier requesting a waiver of compliance with the requirements of section 20.18(g)(1)(v) of the Commission's rules (47 C.F.R. 20.18(g)(1)(v)) within 100 days after the Commission receives the petition. The Commission shall grant the waiver of compliance with the requirements of section 20.18(g)(1)(v) of the Commission's rules (47 C.F.R. 20.18(g)(1)(v)) requested by the petition if it determines that strict enforcement of the requirements of that section would result in consumers having decreased access to emergency services.

(b) QUALIFIED TIER III CARRIER DEFINED.—In this section, the term "qualified Tier III carrier" means a provider of commercial mobile service (as defined in section 332(d) of the Communications Act of 1934 (47 U.S.C. 332(d)) that had 500,000 or fewer subscribers as of December 31, 2001.

TITLE II—SPECTRUM RELOCATION

Commercial Spectrum Enhancement Act.
47 USC 901 note.

SEC. 201. SHORT TITLE.

This title may be cited as the "Commercial Spectrum Enhancement Act".

SEC. 202. RELOCATION OF ELIGIBLE FEDERAL ENTITIES FOR THE REALLOCATION OF SPECTRUM FOR COMMERCIAL PURPOSES.

Section 113(g) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 923(g)) is amended by striking paragraphs (1) through (3) and inserting the following:

"(1) ELIGIBLE FEDERAL ENTITIES.—Any Federal entity that operates a Federal Government station assigned to a band of frequencies specified in paragraph (2) and that incurs relocation costs because of the reallocation of frequencies from Federal use to non-Federal use shall receive payment for such costs from the Spectrum Relocation Fund, in accordance with section 118 of this Act. For purposes of this paragraph, Federal power agencies exempted under subsection (c)(4) that choose to relocate from the frequencies identified for reallocation pursuant to subsection (a), are eligible to receive payment under this paragraph.

"(2) ELIGIBLE FREQUENCIES.—The bands of eligible frequencies for purposes of this section are as follows:

"(A) the 216–220 megahertz band, the 1432–1435 megahertz band, the 1710–1755 megahertz band, and the 2385–2390 megahertz band of frequencies; and

"(B) any other band of frequencies reallocated from Federal use to non-Federal use after January 1, 2003, that is assigned by competitive bidding pursuant to section 309(j) of the Communications Act of 1934 (47 U.S.C. 309(j)), except for bands of frequencies previously identified by

the National Telecommunications and Information Administration in the Spectrum Reallocation Final Report, NTIA Special Publication 95–32 (1995).

"(3) DEFINITION OF RELOCATION COSTS.—For purposes of this subsection, the term 'relocation costs' means the costs incurred by a Federal entity to achieve comparable capability of systems, regardless of whether that capability is achieved by relocating to a new frequency assignment or by utilizing an alternative technology. Such costs include—

"(A) the costs of any modification or replacement of equipment, software, facilities, operating manuals, training costs, or regulations that are attributable to relocation;

"(B) the costs of all engineering, equipment, software, site acquisition and construction costs, as well as any legitimate and prudent transaction expense, including outside consultants, and reasonable additional costs incurred by the Federal entity that are attributable to relocation, including increased recurring costs associated with the replacement facilities;

"(C) the costs of engineering studies, economic analyses, or other expenses reasonably incurred in calculating the estimated relocation costs that are provided to the Commission pursuant to paragraph (4) of this subsection;

"(D) the one-time costs of any modification of equipment reasonably necessary to accommodate commercial use of such frequencies prior to the termination of the Federal entity's primary allocation or protected status, when the eligible frequencies as defined in paragraph (2) of this subsection are made available for private sector uses by competitive bidding and a Federal entity retains primary allocation or protected status in those frequencies for a period of time after the completion of the competitive bidding process; and

"(E) the costs associated with the accelerated replacement of systems and equipment if such acceleration is necessary to ensure the timely relocation of systems to a new frequency assignment.

"(4) NOTICE TO COMMISSION OF ESTIMATED RELOCATION COSTS.—

"(A) The Commission shall notify the NTIA at least 18 months prior to the commencement of any auction of eligible frequencies defined in paragraph (2). At least 6 months prior to the commencement of any such auction, the NTIA, on behalf of the Federal entities and after review by the Office of Management and Budget, shall notify the Commission of estimated relocation costs and timelines for such relocation.

"(B) Upon timely request of a Federal entity, the NTIA shall provide such entity with information regarding an alternative frequency assignment or assignments to which their radiocommunications operations could be relocated for purposes of calculating the estimated relocation costs and timelines to be submitted to the Commission pursuant to subparagraph (A).

"(C) To the extent practicable and consistent with national security considerations, the NTIA shall provide the information required by subparagraphs (A) and (B)

by the geographic location of the Federal entities' facilities or systems and the frequency bands used by such facilities or systems.

"(5) NOTICE TO CONGRESSIONAL COMMITTEES AND GAO.—The NTIA shall, at the time of providing an initial estimate of relocation costs to the Commission under paragraph (4)(A), submit to Committees on Appropriations and Energy and Commerce of the House of Representatives for approval, to the Committees on Appropriations and Commerce, Science, and Transportation of the Senate for approval, and to the Comptroller General a copy of such estimate and the timelines for relocation. Unless disapproved within 30 days, the estimate shall be approved. If disapproved, the NTIA may resubmit a revised initial estimate.

Deadline.

"(6) IMPLEMENTATION OF PROCEDURES.—The NTIA shall take such actions as necessary to ensure the timely relocation of Federal entities' spectrum-related operations from frequencies defined in paragraph (2) to frequencies or facilities of comparable capability. Upon a finding by the NTIA that a Federal entity has achieved comparable capability of systems by relocating to a new frequency assignment or by utilizing an alternative technology, the NTIA shall terminate the entity's authorization and notify the Commission that the entity's relocation has been completed. The NTIA shall also terminate such entity's authorization if the NTIA determines that the entity has unreasonably failed to comply with the timeline for relocation submitted by the Director of the Office of Management and Budget under section 118(d)(2)(B).".

Notification.

SEC. 203. MINIMUM AUCTION RECEIPTS AND DISPOSITION OF PROCEEDS.

(a) AUCTION DESIGN.—Section 309(j)(3) of the Communications Act of 1934 (47 U.S.C. 309(j)(3)) is amended—

(1) by striking "and" at the end of subparagraph (D);

(2) by striking the period at the end of subparagraph (E) and inserting "; and"; and

(3) by adding at the end the following new subparagraph:

"(F) for any auction of eligible frequencies described in section 113(g)(2) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 923(g)(2)), the recovery of 110 percent of estimated relocation costs as provided to the Commission pursuant to section 113(g)(4) of such Act.".

(b) SPECIAL AUCTION PROVISIONS FOR ELIGIBLE FREQUENCIES.—Section 309(j) of such Act is further amended by adding at the end the following new paragraph:

"(15) SPECIAL AUCTION PROVISIONS FOR ELIGIBLE FREQUENCIES.—

"(A) SPECIAL REGULATIONS.—The Commission shall revise the regulations prescribed under paragraph (4)(F) of this subsection to prescribe methods by which the total cash proceeds from any auction of eligible frequencies described in section 113(g)(2) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 923(g)(2)) shall at least equal 110 percent of the total estimated relocation costs provided to the Commission pursuant to section 113(g)(4) of such Act.

"(B) CONCLUSION OF AUCTIONS CONTINGENT ON MINIMUM PROCEEDS.—The Commission shall not conclude any auction of eligible frequencies described in section 113(g)(2) of such Act if the total cash proceeds attributable to such spectrum are less than 110 percent of the total estimated relocation costs provided to the Commission pursuant to section 113(g)(4) of such Act. If the Commission is unable to conclude an auction for the foregoing reason, the Commission shall cancel the auction, return within 45 days after the auction cancellation date any deposits from participating bidders held in escrow, and absolve such bidders from any obligation to the United States to bid in any subsequent reauction of such spectrum.

Deadline.

"(C) AUTHORITY TO ISSUE PRIOR TO DEAUTHORIZATION.—In any auction conducted under the regulations required by subparagraph (A), the Commission may grant a license assigned for the use of eligible frequencies prior to the termination of an eligible Federal entity's authorization. However, the Commission shall condition such license by requiring that the licensee cannot cause harmful interference to such Federal entity until such entity's authorization has been terminated by the National Telecommunications and Information Administration.".

(c) DEPOSIT OF PROCEEDS.—Paragraph (8) of section 309(j) of the Communications Act of 1934 (47 U.S.C. 309(j)) is amended—

(1) in subparagraph (A), by inserting "or subparagraph (D)" after "subparagraph (B)"; and

(2) by adding at the end the following new subparagraph:

"(D) DISPOSITION OF CASH PROCEEDS.—Cash proceeds attributable to the auction of any eligible frequencies described in section 113(g)(2) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 923(g)(2)) shall be deposited in the Spectrum Relocation Fund established under section 118 of such Act, and shall be available in accordance with that section.".

SEC. 204. ESTABLISHMENT OF FUND AND PROCEDURES.

Part B of the National Telecommunications and Information Administration Organization Act is amended by adding after section 117 (47 U.S.C. 927) the following new section:

47 USC 928.

"SEC. 118. SPECTRUM RELOCATION FUND.

"(a) ESTABLISHMENT OF SPECTRUM RELOCATION FUND.—There is established on the books of the Treasury a separate fund to be known as the 'Spectrum Relocation Fund' (in this section referred to as the 'Fund'), which shall be administered by the Office of Management and Budget (in this section referred to as 'OMB'), in consultation with the NTIA.

"(b) CREDITING OF RECEIPTS.—The Fund shall be credited with the amounts specified in section 309(j)(8)(D) of the Communications Act of 1934 (47 U.S.C. 309(j)(8)(D)).

"(c) USED TO PAY RELOCATION COSTS.—The amounts in the Fund from auctions of eligible frequencies are authorized to be used to pay relocation costs, as defined in section 113(g)(3) of this Act, of an eligible Federal entity incurring such costs with respect to relocation from those frequencies.

"(d) FUND AVAILABILITY.—

"(1) APPROPRIATION.—There are hereby appropriated from the Fund such sums as are required to pay the relocation costs specified in subsection (c).

"(2) TRANSFER CONDITIONS.—None of the funds provided under this subsection may be transferred to any eligible Federal entity—

"(A) unless the Director of OMB has determined, in consultation with the NTIA, the appropriateness of such costs and the timeline for relocation; and

"(B) until 30 days after the Director of OMB has submitted to the Committees on Appropriations and Energy and Commerce of the House of Representatives for approval, to the Committees on Appropriations and Commerce, Science, and Transportation of the Senate for approval, and to the Comptroller General a detailed plan describing specifically how the sums transferred from the Fund will be used to pay relocation costs in accordance with such subsection and the timeline for such relocation. Unless disapproved within 30 days, the amounts in the Fund shall be available immediately. If the plan is disapproved, the Director may resubmit a revised plan. Deadline.

"(3) REVERSION OF UNUSED FUNDS.—Any auction proceeds in the Fund that are remaining after the payment of the relocation costs that are payable from the Fund shall revert to and be deposited in the general fund of the Treasury not later than 8 years after the date of the deposit of such proceeds to the Fund. Deadline.

"(e) TRANSFER TO ELIGIBLE FEDERAL ENTITIES.—

"(1) TRANSFER.—

"(A) Amounts made available pursuant to subsection (d) shall be transferred to eligible Federal entities, as defined in section 113(g)(1) of this Act.

"(B) An eligible Federal entity may receive more than one such transfer, but if the sum of the subsequent transfer or transfers exceeds 10 percent of the original transfer—

"(i) such subsequent transfers are subject to prior approval by the Director of OMB as required by subsection (d)(2)(A);

"(ii) the notice to the committees containing the plan required by subsection (d)(2)(B) shall be not less than 45 days prior to the date of the transfer that causes such excess above 10 percent; Deadline.

"(iii) such notice shall include, in addition to such plan, an explanation of need for such subsequent transfer or transfers; and

"(iv) the Comptroller General shall, within 30 days after receiving such plan, review such plan and submit to such committees an assessment of the explanation for the subsequent transfer or transfers. Deadline.

"(C) Such transferred amounts shall be credited to the appropriations account of the eligible Federal entity which has incurred, or will incur, such costs, and shall, subject to paragraph (2), remain available until expended.

"(2) RETRANSFER TO FUND.—An eligible Federal entity that has received such amounts shall report its expenditures to OMB and shall transfer any amounts in excess of actual relocation costs back to the Fund immediately after the NTIA has Reports.

notified the Commission that the entity's relocation is complete, or has determined that such entity has unreasonably failed to complete such relocation in accordance with the timeline required by subsection (d)(2)(A).".

SEC. 205. TELECOMMUNICATIONS DEVELOPMENT FUND.

Section 714(f) of the Communications Act of 1934 (47 U.S.C. 614(f)) is amended to read as follows:

"(f) LENDING AND CREDIT OPERATIONS.—Loans or other extensions of credit from the Fund shall be made available to an eligible small business on the basis of—

"(1) the analysis of the business plan of the eligible small business;

"(2) the reasonable availability of collateral to secure the loan or credit extension;

"(3) the extent to which the loan or credit extension promotes the purposes of this section; and

"(4) other lending policies as defined by the Board.".

47 USC 921 note.

SEC. 206. CONSTRUCTION.

Nothing in this title is intended to modify section 1062(b) of the National Defense Authorization Act for Fiscal Year 2000 (Public Law 106–65).

47 USC 928 note.

SEC. 207. ANNUAL REPORT.

The National Telecommunications and Information Administration shall submit an annual report to the Committees on Appropriations and Energy and Commerce of the House of Representatives, the Committees on Appropriations and Commerce, Science, and Transportation of the Senate, and the Comptroller General on—

(1) the progress made in adhering to the timelines applicable to relocation from eligible frequencies required under section 118(d)(2)(A) of the National Telecommunications and Information Administration Organization Act, separately stated on a communication system-by-system basis and on an auction-by-auction basis; and

(2) with respect to each relocated communication system and auction, a statement of the estimate of relocation costs required under section 113(g)(4) of such Act, the actual relocations costs incurred, and the amount of such costs paid from the Spectrum Relocation Fund.

SEC. 208. PRESERVATION OF AUTHORITY; NTIA REPORT REQUIRED.

47 USC 923 note.

(a) SPECTRUM MANAGEMENT AUTHORITY RETAINED.—Except as provided with respect to the bands of frequencies identified in section 113(g)(2)(A) of the National Telecommunications and Information Administration Organization Act (47 U.S.C. 923(g)(2)(A)) as amended by this title, nothing in this title or the amendments made by this title shall be construed as limiting the Federal Communications Commission's authority to allocate bands of frequencies that are reallocated from Federal use to non-Federal use for unlicensed, public safety, shared, or non-commercial use.

(b) NTIA REPORT REQUIRED.—Within 1 year after the date of enactment of this Act, the Administrator of the National Telecommunications and Information Administration shall submit to the Energy and Commerce Committee of the House of Representatives and the Commerce, Science, and Transportation Committee

of the Senate a report on various policy options to compensate Federal entities for relocation costs when such entities' frequencies are allocated by the Commission for unlicensed, public safety, shared, or non-commercial use.

SEC. 209. COMMERCIAL SPECTRUM LICENSE POLICY REVIEW.

Reports. Deadline.

(a) EXAMINATION.—The Comptroller General shall examine national commercial spectrum license policy as implemented by the Federal Communications Commission, and shall report its findings to the Senate Committee on Commerce, Science, and Transportation and the House of Representatives Committee on Energy and Commerce within 270 days.

(b) CONTENT.—The report shall address each of the following:

(1) An estimate of the respective proportions of electromagnetic spectrum capacity that have been assigned by the Federal Communications Commission—

(A) prior to enactment of section 309(j) of the Communications Act of 1934 (47 U.S.C. 309(j)) providing to the Commission's competitive bidding authority,

(B) after enactment of that section using the Commission's competitive bidding authority, and

(C) by means other than competitive bidding,

and a description of the classes of licensees assigned under each method.

(2) The extent to which requiring entities to obtain licenses through competitive bidding places those entities at a competitive or financial disadvantage to offer services similar to entities that did not acquire licenses through competitive bidding.

(3) The effect, if any, of the use of competitive bidding and the resulting diversion of licensees' financial resources on the introduction of new services including the quality, pace, and scope of the offering of such services to the public.

(4) The effect, if any, of participation in competitive bidding by incumbent spectrum license holders as applicants or investors in an applicant, including a discussion of any additional effect if such applicant qualified for bidding credits as a designated entity.

(5) The effect on existing license holders and consumers of services offered by these providers of the Administration's Spectrum License User Fee proposal contained in the President's Budget of the United States Government for Fiscal Year 2004 (Budget, page 299; Appendix, page 1046), and an evaluation of whether the enactment of this proposal could address, either in part or in whole, any possible competitive disadvantages described in paragraph (2).

(c) FCC ASSISTANCE.—The Federal Communications Commission shall provide information and assistance, as necessary, to facilitate the completion of the examination required by subsection (a).

TITLE III—UNIVERSAL SERVICE

Universal Service Antideficiency Temporary Suspension Act.

SEC. 301. SHORT TITLE.

This title may be cited as the "Universal Service Antideficiency Temporary Suspension Act".

SEC. 302. APPLICATION OF CERTAIN TITLE 31 PROVISIONS TO UNIVERSAL SERVICE FUND.

Effective date. Termination date.

(a) IN GENERAL.—During the period beginning on the date of enactment of this Act and ending on December 31, 2005, section 1341 and subchapter II of chapter 15 of title 31, United States Code, do not apply—

(1) to any amount collected or received as Federal universal service contributions required by section 254 of the Communications Act of 1934 (47 U.S.C. 254), including any interest earned on such contributions; nor

(2) to the expenditure or obligation of amounts attributable to such contributions for universal service support programs established pursuant to that section.

(b) POST-2005 FULFILLMENT OF PROTECTED OBLIGATIONS.—Section 1341 and subchapter II of chapter 15 of title 31, United States Code, do not apply after December 31, 2005, to an expenditure or obligation described in subsection (a)(2) made or authorized during the period described in subsection (a).

Approved December 23, 2004.

LEGISLATIVE HISTORY—H.R. 5419 (S. 1250):

SENATE REPORTS: No. 108–130 accompanying S. 1250 (Comm. on Commerce, Science, and Transportation).

CONGRESSIONAL RECORD, Vol. 150 (2004):
Nov. 20, considered and passed House.
Dec. 8, considered and passed Senate.

WEEKLY COMPILATION OF PRESIDENTIAL DOCUMENTS, Vol. 40 (2004):
Dec. 23, Presidential statement.

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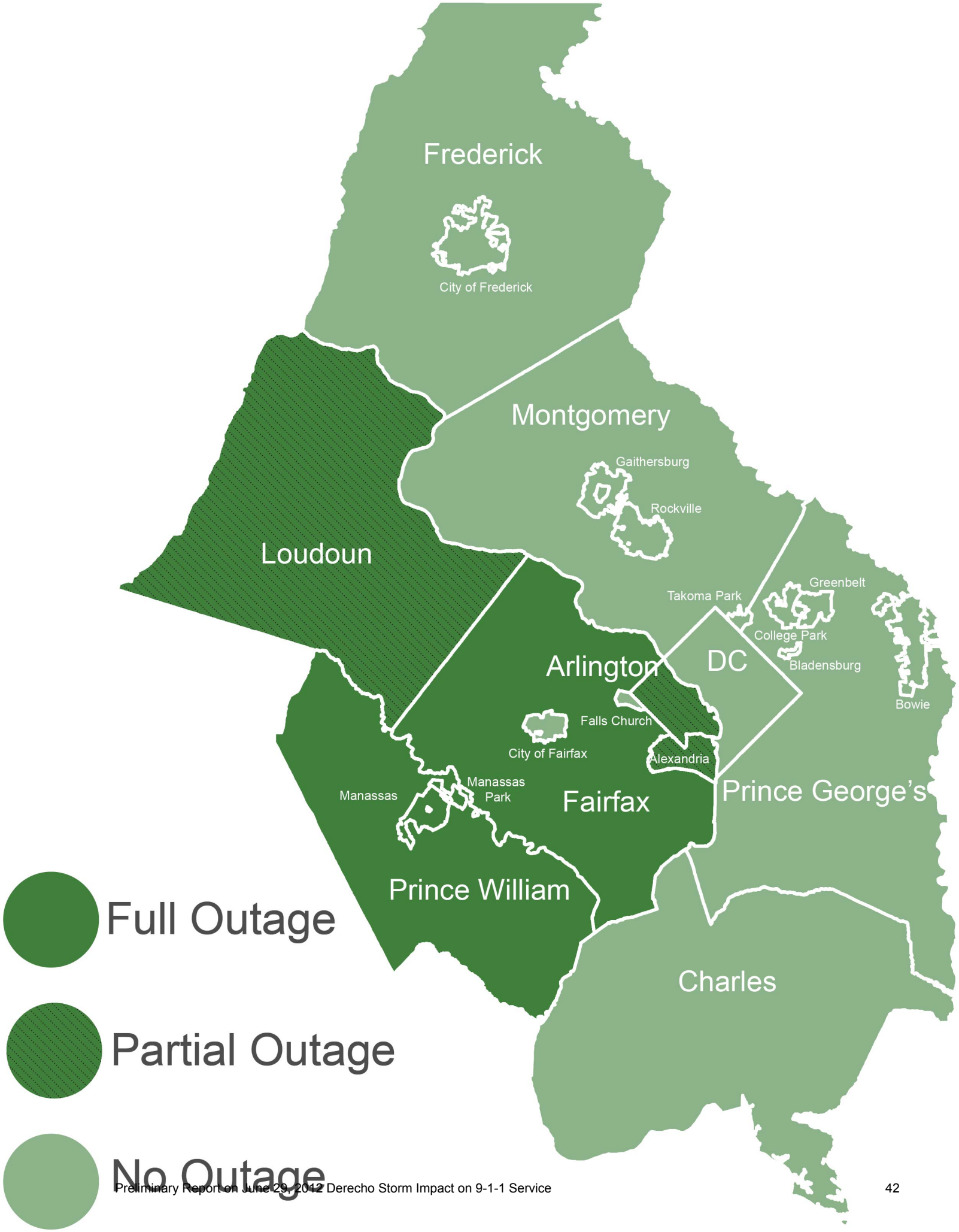
Frederick
City of Frederick
Montgomery
Gaithersburg
Rockville
Loudoun
Takoma Park
Greenbelt
College Park
Bladensburg
Bowie
DC
Arlington
Falls Church
City of Fairfax
Alexandria
Manassas
Manassas Park
Fairfax
Prince George's
Prince William
Charles
Full Outage
Partial Outage
No Outage

9-1-1 CENTERS IMPACTED BY THE OUTAGE

Virginia PSAPs

Amelia County PSAP 2094 –PSAP experienced a loss of both ALI links.

Arlington County Primary PSAP 6008 – PSAP experienced a failure of their 911 Fairfax tandem trunks, a sporadic loss of ANI and loss of three PRI spans that carry administrative traffic.

Arlington County Backup PSAP 6002 – PSAP experienced a loss of all four ALI links..

Bedford County PSAP 2001 – PSAP experienced a loss of ALI, issue was determined to be CPE caused..

Fairfax PSAP 6009 – PSAP experienced a loss of 911 trunk groups for Wireless, Wireline, and Voice over IP (VoIP) and the loss of all four ALI links.

Fairfax County Alternate PSAP 6000 – PSAP experienced loss of ALI at backup site.

Fairfax City Secondary PSAP 6007 – PSAP experienced a loss of ALI at backup site..

Fauquier County (Warrenton) PSAP 2053 – PSAP lost commercial power and after commercial power was restored, the PSAP then lost ALI and all four 911 trunks were out of service in the Fairfax and Alexandria tandems.

Giles County (Pearisburg) PSAP 2057 – Non-Verizon maintained CPE server had failed. Loss of ALI.

Gloucester County PSAP 2127 – PSAP lost commercial power impacting CPE. .

Herndon Town Secondary PSAP 6003 – PSAP experienced a loss of both ALI links.

Langley Air Force Base Secondary PSAP 2013 – PSAP experienced a loss of both ALI links

Loudon County (Leesburg) PSAP 2068 - PSAP experienced loss of Automatic Number Identification (ANI) on wireless calls. PSAP is dual served from Fairfax/Alexandria mated pair selective routers in Northern VA, and Fredericksburg/Winchester mated pair in Culpeper LATA. All trunks from Fairfax and Alexandria failed.

City of Manassas PSAP 2136 – PSAP experienced all ALI links were out of service. 911 wireline calls to the Fairfax tandem failed due to the Fairfax central office SS7 isolation, and 911 wireline calls that would have been routed through the Alexandria tandem from the Manassas local switch failed because the 911 trunks connecting the two were down.

Manassas Park PSAP 2137 – PSAP experienced a loss of all ALI links.

Mathews County PSAP 2209 - PSAP experienced a loss of all ALI links.

Middlesex County (Saluda) PSAP 2138 - PSAP experienced trunk OOS condition

9-1-1 CENTERS IMPACTED BY THE OUTAGE

New Kent County PSAP 2073 – PSAP experienced loss of both ALI links along with a CPE issue.

Prince William County PSAP 2135 – PSAP experienced a loss of all ALI links. PSAP activates network controls to re-reroute wireless and wireline calls through the Alexandria tandem but the re-routes failed.

Southampton County PSAP 2125 –PSAP experienced a loss of both ALI links. This event was determined to be related to the loss of transport gear due to power loss and hardware damage.

Stafford County PSAP 2189 – PSAP experienced 911 Wireline and Wireless trunk impact.

Vienna Town PSAP 6004 – PSAP experienced a loss of both ALI links and impact to the Alexandria and Fairfax tandem trunks which were down.

Sussex County PSAP 2102 - PSAP experienced a power surge on their CPE. The PSAP requested a reroute to 10-digit administrative lines.

Metropolitan Washington Airport Authority PSAP 6010 - PSAP experienced their Private Line (PL) circuits were down and indicated that intermittent 911 call receipt occurring.

Maryland PSAPs

Caroline County (Denton) PSAP 7005 - PSAP experienced that both of the PSAP's wireless trunks were down.

Garrett County (Oakland) PSAP 7011 - Verizon's investigation found that only wireless carrier US Cellular had a routing problem as all other Wireless carriers calls were coming into PSAP with ALI.

METROPOLITAN WASHINGTON COUNCIL OF GOVERNMENTS

One Region Moving Forward

June 21, 2011

District of Columbia
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Bowie
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Frederick
Frederick County
Gaithersburg
Greenbelt
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Prince George's County
Rockville
Takoma Park
Alexandria
Arlington County
Fairfax
Fairfax County
Falls Church
Loudoun County
Manassas
Manassas Park
Prince William County

**Adjunct Member*

Ivan G. Seidenberg
Chairman of the Board and CEO
Verizon
140 West Street
New York, NY 10007

Dear Mr. Seidenberg:

I am writing on behalf of the Metropolitan Washington Council of Governments (COG) Chief Administrative Officers Committee to bring to your attention significant concerns about Verizon 9-1-1 service in the National Capital Region. Specifically, there were serious service problems with 9-1-1 service on Memorial Day, May 30, 2011 that impacted residents in the National Capital Region and the larger Mid-Atlantic area.

The CAOs Committee is comprised of city and county managers from COG's 21 member local governments in the National Capital Region. Collectively we have made great progress, in partnership with federal and state agencies and the private sector, to strengthen emergency preparedness and response following the terrorist attacks of September 11, 2001. Any compromise in the integrity of 9-1-1 service threatens response to public safety and health and medical emergencies, as well as natural disasters or acts of terrorism.

On May 30, for approximately three hours, calls to 9-1-1 placed via phone cell phone and VoIP phones were received by the 9-1-1 centers without the associated E9-1-1 data. The Automatic Number Identification (ANI) and the Automatic Location Identification (ALI) for these calls failed. Additionally, Verizon's notification to impacted 9-1-1 centers, consistent with adopted policies and procedures, was inadequate and centers encountered great difficulty in reporting the failure to Verizon officials.

This incident was unfortunately the latest in a series of incidents during the past year, the most recent being January 26, 2011, when Verizon 9-1-1 service failed to meet the needs of the public and the 9-1-1 centers that serve the public. These failures are a matter of public record, have been acknowledged in the media, and are inconsistent with federal and state regulations and oversight.

777 North Capitol Street, NE, Suite 300, Washington, D.C. 20002
202.962.3200 (Phone) 202.962.3201 (Fax) 202.962.3213 (TDD)

www.mwcog.org

The public is dependent on 9-1-1 and it is the gateway through which every emergency is initially reported, including critical homeland security and emergency incidents. Although area local governments in the National Capital Region and their 9-1-1 centers have previously expressed frustration concerning past service failures, Verizon actions to date have not adequately addressed the problems. As of June 14, some 15 days after the May 30 failure, Verizon has yet to provide to the 9-1-1 centers the reason for the outage or actions they have taken to correct the root cause.

We are seeking swift Verizon action to examine and fully address the problem encountered most recently on Memorial Day and strengthen the 9-1-1 public-private partnership that is the foundation of health, medical, public safety and emergency response in the National Capital Region and throughout the United States.

COG and its public officials and first-responders stand ready to assist you in restoring confidence in this vital emergency response capacity.

Please contact David Robertson at 202-962-3260 or drobertson@mwcog.org if you have questions or need additional information.

Sincerely,

Timothy L. Firestine
Chief Administrative Officer, Montgomery County, MD
Chairman, COG Chief Administrative Officers Committee

Cc:
Hon. Janet Napolitano, Secretary, U.S. Dept. of Homeland Security
Hon. Julius Genachowski, Chairman, Federal Communications Commission
Hon. Betty Ann Kane, Chairman, DC Public Service Commission
Hon. Douglas Nazarian, Chairman, Maryland Public Service Commission
Hon. Judith Williams Jagdmann, Chairman, Virginia State Corporation Commission
National Capital Region Congressional Delegation
COG Board of Directors

Mr. Timothy L. Firestine
Chairman, Chief Administrative Officers Committee
Metropolitan Washington Council of Governments
777 North Capitol Street, NE
Suite 300
Washington, DC 20002

Dear Mr. Firestine:

Thank you for your letter to Mr. Seidenberg dated June 21, 2011. I was asked to respond to your letter because working with 9-1-1 centers is a key part of my responsibilities as Vice President of Verizon for Global Service Assurance. Verizon understands the critical importance of providing reliable 9-1-1 services to 9-1-1 centers, also known as Public Safety Answering Points ("PSAPs"), and the community. We recognize that 9-1-1 services are a key component of comprehensive efforts to address public safety and health and medical emergencies, as well as natural disasters or acts of terrorism. For this reason we devote significant resources to support 9-1-1 services, as well as work closely with PSAPs on 9-1-1 issues. We work proactively to ensure that our network facilities are reliable, but when events occur, we alert affected PSAPs as soon as possible. As detailed below, Verizon also is an industry leader in working comprehensively to address new technical issues that could impact 9-1-1 services across the country.

As you may know, Verizon has been working for over five months with the Federal Communications Commission, the Maryland Public Service Commission, the Maryland Emergency Number Systems Board, hundreds of PSAPs across the country, and industry groups such as the National Emergency Number Association ("NENA") and the Alliance for Telecommunications Industry Solutions ("ATIS") Network Reliability Steering Committee ("NRSC") on a variety of issues related to 9-1-1 and on a technical issue that arose in a specific incident referenced in your letter. Verizon and others have undertaken a significant amount of activity in this area, and we would welcome the opportunity to meet with you further to discuss these efforts and to include a representative from your organization in appropriate activities going forward.

May 30 Location and Number Information Issues

Your letter refers to a specific event on May 30 affecting location and telephone number information on certain wireless and VoIP calls to 9-1-1 in the Washington, D.C. area. A power outage at a New Jersey central office affected the delivery of such information on certain wireless and VoIP 9-1-1 calls in Maryland and Virginia. There was no impact on the delivery of such information on wireless or VoIP 9-1-1 calls in Washington, D.C., nor was there any impact on the delivery of such information on landline 9-1-1 calls. Importantly, though, the problems

did not prevent wireless or VoIP calls to 9-1-1 in Maryland or Virginia from being completed to PSAPs. But location and number information is a key aspect of 9-1-1 service, and Verizon investigated what happened in order to help prevent similar problems in the future.

Central Office Power Failure. The power outage at a Verizon central office in New Jersey was caused by a malfunctioning circuit breaker that tripped on the evening of May 29. Although the central office was supplied with ample and redundant power, technicians failed to follow Verizon procedures to discharge the appropriate personnel to fix the problem upon receipt of an alarm. As a result, batteries in the central office drained slowly (over approximately 12 hours) until they caused certain transport equipment to fail. Once Verizon's power team became aware of the issue, they worked quickly to replace the malfunctioning circuit breaker and to restore power to the affected transport equipment. Had Verizon's procedures been followed, the circuit breaker likely would have been replaced before the batteries in the central office drained to that point. As a result of the incident, Verizon disciplined the technicians who failed to follow procedures, reviewed the procedures again with all technicians and added additional contact points to be notified when central office batteries discharge.

Impact on Location/Number Information Delivery. As to how such a central office power failure in New Jersey could affect location and number information delivery in Maryland and Virginia, the answer lies in the mechanics of the delivery of such information for wireless and some VoIP calls to 9-1-1. Wireless and some VoIP providers typically hire a third-party vendor to deliver the information, known as Automatic Location Identification ("ALI") and Automatic Number Identification ("ANI"), for wireless and VoIP calls to 9-1-1. Such calls, because they do not have a fixed service location, have an extra step in the ALI process because they must use a "Pseudo Automatic Number Identification" or "P-ANI" to link the phone number information to the appropriate ALI record. In this case, circuits that third party providers of ALI information on wireless and VoIP calls utilized were routed through the New Jersey central office that had the power outage. Once power was restored to the central office, network transport elements began to restore automatically and Verizon personnel closely monitored the restoration process to make technical adjustments (e.g., making manual adjustments to assist with equipment restoration) to help ensure that ALI services were restored.

After the event, Verizon performed a further review of the ALI network design to determine whether any modifications or enhancements would help to avoid similar issues in the future. Based on that review, Verizon determined that further diversification of existing circuits through multiple central offices would help avoid or mitigate similar problems in the future. As a result, Verizon is adding additional diversity to the circuits serving third party vendors providing ALI services to wireless and some VoIP providers.

Communication with PSAPs. Communicating with Washington, D.C. area PSAPs at the outset of this event was a challenge because ALI/ANI delivery is handled by third party vendors hired by wireless and VoIP carriers. As a result, isolated problems with ALI/ANI on wireless and VoIP 9-1-1 calls are not apparent to Verizon unless others notify us. Once we understood that there were ALI/ANI issues on certain wireless and VoIP 9-1-1 calls, Verizon worked hard to communicate with all PSAPs that were potentially affected. We were in close communication with all PSAPs in the Washington, DC area, including communicating with the Washington,

D.C. PSAP to confirm that ALI/ANI was being delivered on all of its 9-1-1 calls.[1] And realizing the potential widespread impact, we sent out broadcast messages to all potentially affected PSAPs regarding the issue; these broadcast communications used a fax notification server, and in Maryland, we supplemented such communications by sending emails to Maryland PSAPs informing them of the issue and inviting them to join an informational conference bridge.

I also personally met with Maryland PSAPs in Annapolis on June 1, and we discussed the May 30 event at the meeting. As a result of the feedback from the PSAPs (including Montgomery County) at the meeting, we are expanding email address information for any broadcast message that may need to go out in the future.

Your letter indicates that Verizon has yet to provide PSAPs with an explanation of the outage or actions taken to address root causes. That is not accurate. In addition to discussing the incident with Maryland PSAPs in Annapolis on June 1, after Verizon completed its investigation of the incident, it provided the results of this review to all requesting PSAPs on June 23. As outlined above, we also have taken actions to address the root cause of this specific event, and are implementing additional network enhancements to protect against similar events in the future.

Other Issues

Your letter also refers to the event of January 26, 2011, in which a severe snowstorm snarled much of the Washington, D.C. metropolitan region, stranding many motorists on area roadways during the evening rush hour. The circumstances of the January 26 event are not related to the May 30 event described above. The apparent cause of the January 26 event was a technical issue associated with the way in which certain equipment deployed on the premises of the PSAPs to receive calls interacted with Verizon's network switching equipment during a mass calling event that resulted in an extremely high volume of wireless 9-1-1 calls. This technical issue appears to be industry-wide. Nevertheless, Verizon has taken the lead in having the issues considered by industry groups such as NENA and the NRSC. Verizon is also working directly with numerous PSAPs, and has instituted a number of improvements to processes for communicating with PSAPs during 9-1-1 events.

Industry-wide Technical Issue. We would welcome an opportunity to explain the technical issues in more detail if COG would like. To summarize, the issue arises during mass call events, and affects the connections between the network switches, known as "selective routers," and the PSAP equipment that receives calls, known as private branch exchanges ("PBXs"). An extreme volume and concentration of simultaneous calls can cause issues with the signaling that is passed back and forth between a selective router and a PBX during the process of setting up a call. When a PBX becomes inundated with incoming calls, it may not respond to the signals from the selective router within the allotted time to set up a call. When this occurs, it is referred to as a "wink failure," and, under certain circumstances, may cause the system to determine incorrectly that the trunks connecting the selective router to the PBX are not able to complete calls and thus take the trunks out of service for analysis and repair, if necessary.

[1] We contacted the District of Columbia PSAP, 126 PSAPs in Virginia, and 25 PSAPs in Maryland.

Verizon has done – and is continuing to do – extensive testing of this phenomenon in its laboratory. As a result of its initial findings, Verizon recommended a technical remediation to address the issues and, in February and March, engaged in extensive outreach efforts to all PSAPs in its service territory to alert them of the issue and the recommended solution. Because the technical issues are not limited to Verizon, though, Verizon also initiated industry consideration of these issues through NENA. NENA has formed a sub-group to study the issue. Included in the sub-group are representatives from area PSAPs, including Prince George's and Montgomery counties. With the encouragement of the Federal Communications Commission, Verizon also brought the issue to ATIS for consideration. In the meantime, as Verizon completes its testing, it plans to follow up its communications to all PSAPs with updated findings.

Communications Improvements. Since January 26, Verizon also has devoted extensive resources to work with the PSAPs to improve communications during 9-1-1 events. The improvements focus on having Verizon's 9-1-1 Customer Care Center ("CCC") contact PSAPs as soon as possible when particular situations arise that could affect 9-1-1 services. Those situations, which we have identified through extensive consultations and data reconciliations with various PSAPs, including Montgomery County, include:

- When a single 9-1-1 trunk is out of service and does not restore remotely on the first try.

- If a "wink failure" occurs between the Verizon and PSAP equipment more than a threshold number of times in any five-minute period.

- When a threshold number of 9-1-1 calls receive busy signals within a period of time.

In addition, again based on consultations with Washington, D.C. area PSAPs, Verizon has implemented more automated ways of communicating with PSAPs. For example, Maryland PSAPs receive an email notification from the CCC when a 9-1-1 ticket is opened and closed, as well as for status updates. Verizon offered the same notification process to all PSAPs in the Washington, D.C. area (including those in Northern Virginia and Washington, DC), and those electing to receive them now do as well.

* * *

Verizon takes these issues very seriously, and has demonstrated its commitment with concrete actions and ongoing dialogue with PSAPs. We share COG's view on the critical importance of these issues and would welcome the opportunity to strengthen the 9-1-1 public-private partnership that is the foundation of health, medical, public safety and emergency response in the National Capital Region and throughout the United States. To that end, we would appreciate an opportunity to meet directly with your organization to further address our efforts to improve 9-1-1 service in the face of new technology driven issues and answer any questions you may have.

Sincerely,

Maureen P. Davis
Vice President – Verizon
Global Service Assurance
maureen.p.davis@verizon.com
908 559 6150

cc:
Hon. Janet Napolitano, Secretary, U.S. Department of Homeland Security
Hon. Julius Genachowski, Chairman, Federal Communications Commission
Hon. Betty Ann Kane, Chairman, DC Public Service Commission
Hon. Douglas R. M. Nazarian, Chairman, Maryland Public Service Commission
Hon. Judith Williams Jadgmann, Chairman, Virginia State Corporation Commission
National Capital Region Congressional Delegation
COG Board of Directors

9-1-1 SERVICE COMPONENTS OVERVIEW

To establish basic terminology and background concepts for this report a brief primer on 9-1-1 service is provided below.

9-1-1 Service – Basic Overview of Components and Participants

There are three main participants involved in providing 9-1-1 service:

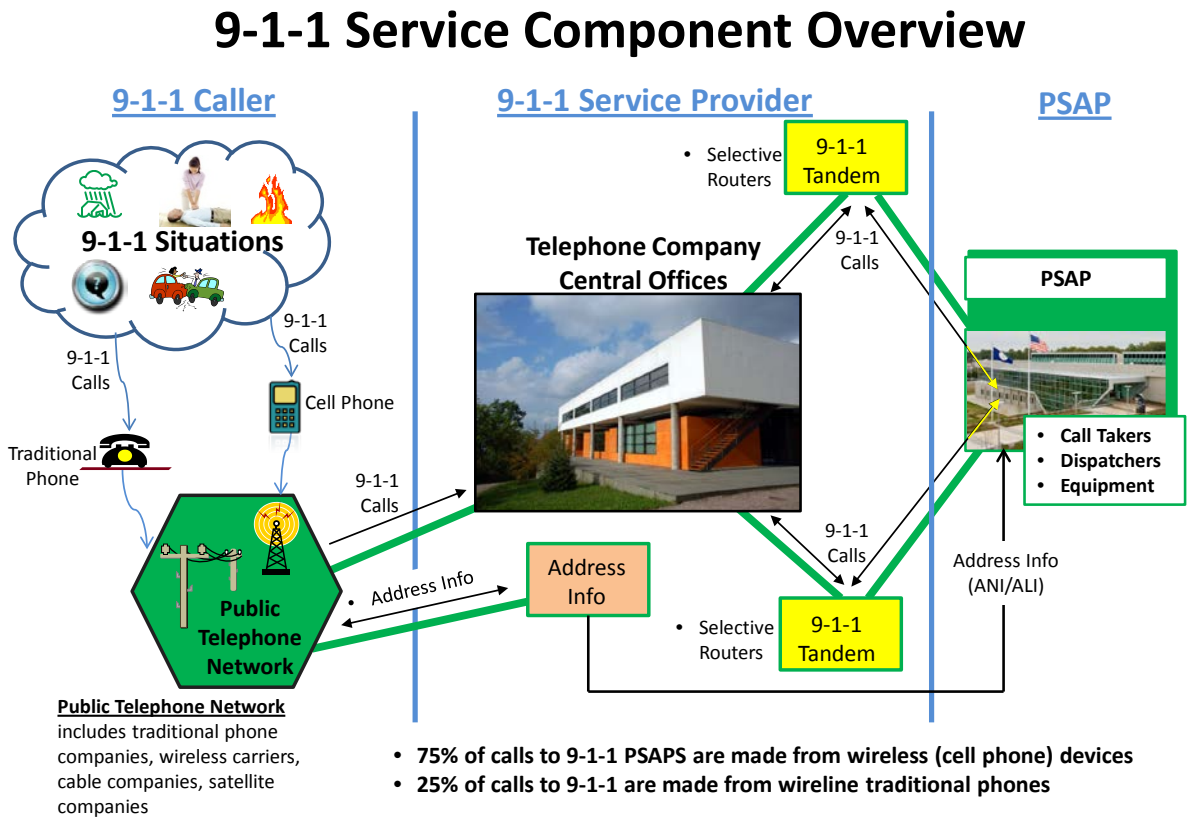
9-1-1 Caller – The callers for 9-1-1 service can be citizens, businesses, even other local jurisdictions asking for mutual aid and assistance for an emergency. A 9-1-1 call is automatically identified by the equipment in the Public telephone network as requiring specialized handling and is sent to the local 9-1-1 Service Provider's specialized 9-1-1 9-1-1 Tandem Routers for answering by the appropriate local jurisdiction Public Safety Answering Point (PSAP). There are PSAPs in each local Jurisdiction such as Arlington County, Alexandria City, the Virginia counties of Fairfax, Loudoun, Prince William, Stafford, and in Maryland the counties of Montgomery, Prince George's. The District of Columbia also has a PSAP.

Service Providers – In the case of Virginia and Maryland, Verizon handles the collection of all 9-1-1 calls from the Public Telephone network and processes the 9-1-1 call through a network of specialized equipment referred to as either 9-1-1 Tandems or Selective Routers. For redundancy, the Tandems are typically deployed in pairs to provide alternate network paths for the 9-1-1 voice call to reach the PSAP. The 9-1-1 Tandems pass the voice call to the PSAP where the call is answered by a call taker/dispatcher. Concurrent to passing the voice call, the Service Provider equipment is collecting address information (called ANI/ALI) from the originating source in the Public Telephone network and passing the address information to the PSAP with the voice call over what are called ANI/ALI links. This is known as Enhanced 9-1-1 (E9-1-1). There are typically up to four redundant paths over the network for the address information to reach the PSAP.

PSAPs – Often referred to as the 9-1-1 Center, local government jurisdictions dedicate resources to receive calls from the 9-1-1 Service Provider over specialized telephone lines called trunks. The PSAPS also receive caller address information from the Service Provider over other specialized Service Provider lines commonly referred to by the acronym ANI/ALI links. The PSAP has an interface point with the Service Provider where the 9-1-1 voice call and the address information (ANI/ALI) passes from the Service Provider's network and onto the equipment owned by the PSAP. This is stated to point out that the PSAP equipment can be fully operational within their premise but if the 9-1-1 call ~~or address information for the call~~ is not provided to the interface point by the Service Provider, the PSAP is unable to answer 9-1-1 calls from the public. If the ANI/ALI interface only is not operational, then the PSAP will receive a 9-1-1 call but as "basic" 9-1-1 rather than "enhanced" 9-1-1.

Calls for 9-1-1 service come primarily from citizens or businesses using standard wireline telephones or more frequently using wireless telephones or devices. The 9-1-1 Service Component Diagram below

depicts the overall call flow from a citizen initiating a call, showing it pass through the 9-1-1 Service Provider network where it is ultimately answered by the PSAP responsible for the area where the call originates. Approximately 75% of all 9-1-1 calls are made from cell phones through the wireless network and the remaining 25% are made from traditional telephone handsets, referred to as a wireline calls.



Vulnerability of Newer Technologies to loss of Commercial Power

POTS

- Verizon Central Office Network powers the phone to make and receive calls.
- Verizon has multiple levels of backup power available at network locations.

FIOS/Cable

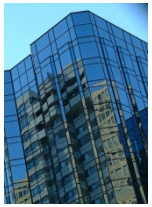
- Verizon installs battery backup power in each home – lasts eight hours depending on usage. Homeowner is responsible for maintaining the battery.
- Cordless phones require home electrical and battery

Cell Phone

- Cell Tower has varying levels of backup generator or battery power.
- User's cellphone has limited battery power based on phone usage pattern.
- Emergencies can cause network congestion and/or blockage.
- Cell phone depends on POTS

VOIP

- Voice over Internet Protocol phone relies on computer router and phone handset to connect to data network on internet to make calls.
-Loss of power means loss of phone service.
-Homeowner may or may not have generator or UPS to maintain power to



Business

- Businesses have combination s of most of available technologies.
- Some have wherewithal to have independent UPS systems for backup power.

Satellite Phone

User's SAT phone has limited battery power based on phone usage pattern.
- SAT phone depends on POTS network to complete a call except t other SAT phones.

Network Infrastructure of multiple carriers (copper, fiber, coaxial cable, cell tower, satellite)

Dependencies:

- Other carriers (AT&T, Cox, Vonage, DirectTv, etc.) have potential power issues which would limit access through the Public Telephone network to Verizon's 9-1-1 service.
- Residences and businesses alike have combinations of the above technologies inside one location.

IMPACT ON VIRGINIA'S 9-1-1 INFRASTRUCTURE

Verizon Failures during the Derecho Caused 9-1-1 Disruption across the National Capital Region

The network diagrams on the following pages provide a representation of the impact of the Derecho on the Verizon 9-1-1 network as it relates to Fairfax County. Elements of this diagram apply to other jurisdictions, however, some jurisdictions had little to no impact from the Derecho. Representing all combinations of Verizon's network status for each jurisdiction in one overall diagram is not practical but this diagram is illustrative of the impact. The diagrams are notional representations and are not descriptive of exactly how the networks are engineered.

The first diagram (subtitled "Normal Operations 24/7/365") shows the Normal State of Operations where power is available to all network components both for the citizen, the Public Telephone network and the 9-1-1 Service Provider. Green linkages between various components of the Verizon 9-1-1 network indicates full availability of the normal network connections to complete 9-1-1 calls among and between the various carriers (e.g., from an AT&T cell phone, through the Public telephone Network, and into Verizon's 9-1-1 Network for the Northern Virginia area. All 9-1-1 calls in Fairfax County are passed from the originating carrier into a specialized 9-1-1 Verizon network ring through various Central Offices. The Verizon network knows the ultimate destination of the PSAP for the call, and passes the call through a variety of Verizon Central Offices to a specialized piece of equipment (a Tandem switch) which then routes the call to a PSAP where a call taker answers the 9-1-1 call for processing.

While various 9-1-1 calls are traversing the outer green network ring (depicted in the diagram), Verizon has other **specialized** equipment that monitors the health of their network by polling the equipment on a routine basis. This monitoring, or telemetry network is depicted by the captain's wheel inside the ring and the main Telemetry location for Northe**rn** Virginia is located at a facility in Arlington, Virginia. When equipment problems occur, automated alarms are sent to a Network Operating Center, run by Verizon on a 24/7/365 basis for further investigation and resolution.

The second Verizon network diagram, (subtitled "During Outage Sat June 30,2012"), attempts to represent where failures occurred when the power and other problems Verizon encountered began to affect the network in terms of processing 9-1-1 calls into the Fairfax County, **VA** PSAP. Red represents some level of interruption of capabilities to pass a call in a normal fashion. Red "interruptions" could be homeowner specific (tree knocked their landline telephone wire off of their home), power specific (loss of power at a Verizon facility or at the caller's home or place of business), or other combinations of situations (a cell tower could have been knocked out of service due to a power loss or other storm damage limiting the ability to make or complete a cell phone call). Multiple reasons exist for why a call for 9-1-1 service **might not** have been completed. The diagram focuses on showing a general picture of how power problems incapacitated the Verizon network as it relates to processing 9-1-1 calls. Some Verizon capabilities (COs) were totally in the "red", some COs, were partially in the "red", and some COs were "green" but were limited, or isolated, by other components of the network being "red".

Early on, the telemetry network for Verizon was operating in the “red” so the visibility of problems and the capability to understand the complete extent of the impact was not available which added to the difficulties in dispatching assistance to areas where attention was needed on a priority basis (e.g., The Fairfax Central Office as one example). For some jurisdictions, Alexandria City, their ability to process 9-1-1 calls was not disrupted as the linkages into the Alexandria Tandem (see diagram) remained green. The linkages into the Tandems that would allow Fairfax to receive its 9-1-1 calls were not operational, thus the diagram has a large “X” to illustrate where network communication linkages were broken for periods of time.

Verizon's Provision of 9-1-1 Service to Fairfax County (Normal Operations – 24/7/365)

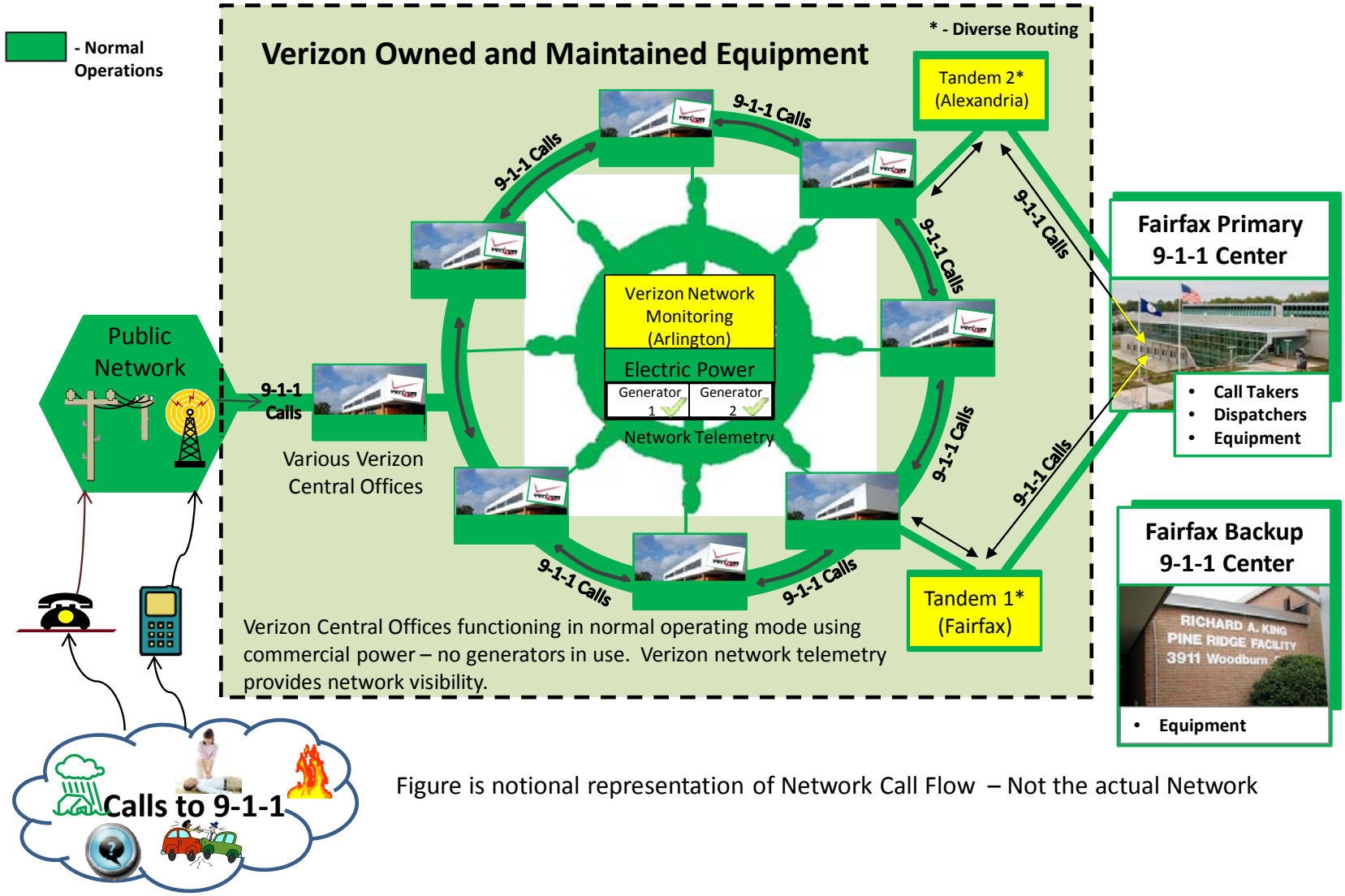


Figure is notional representation of Network Call Flow – Not the actual Network

Verizon's Provision of 9-1-1 Service to Fairfax County (During Outage Sat June 30, 2012)

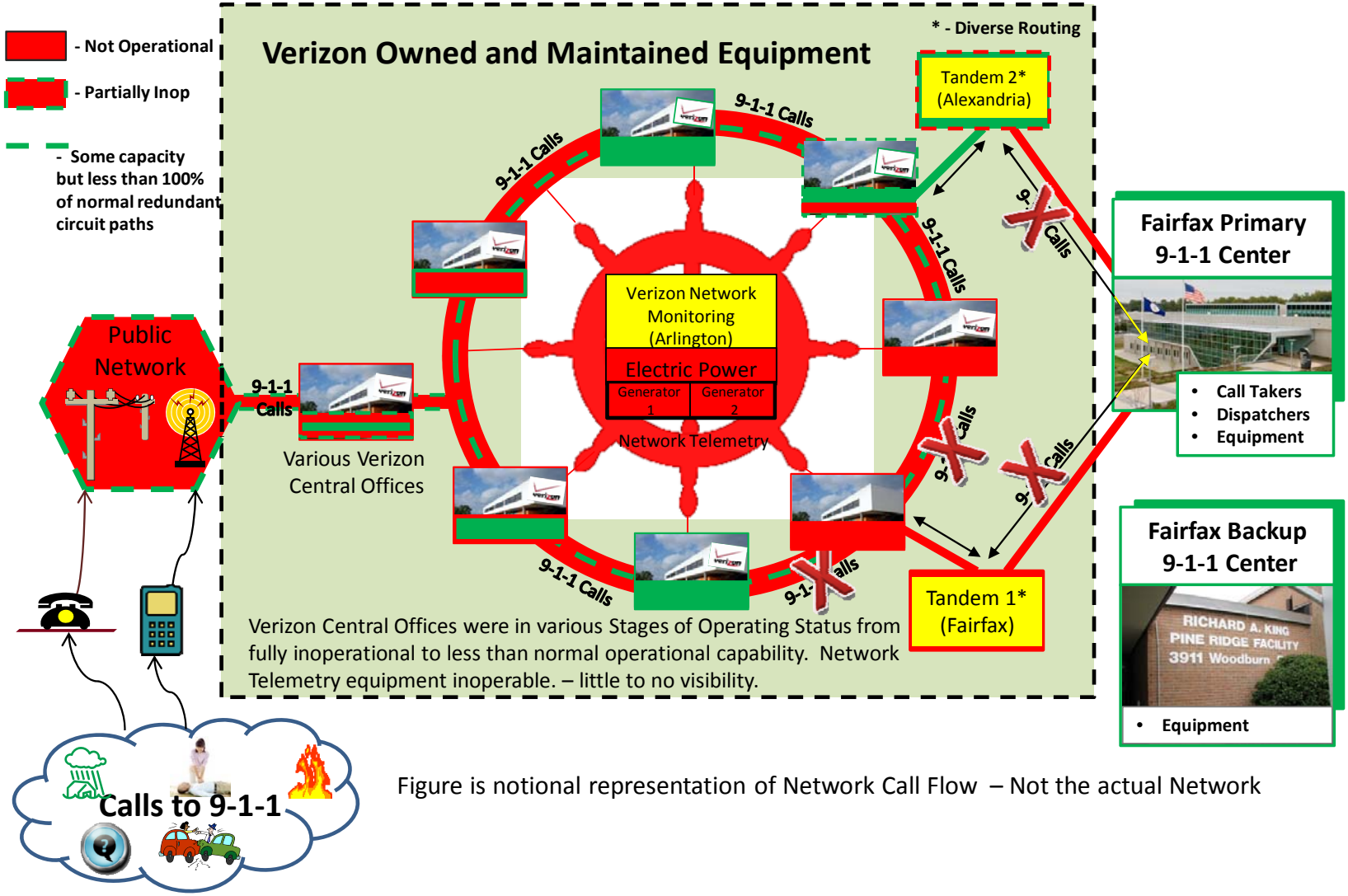


Figure is notional representation of Network Call Flow – Not the actual Network

Verizon, 911 Service

and the June 29, 2012, Derecho

August 13, 2012

Verizon, 911 Service, and the June 29, 2012 Derecho

Late in the evening of Friday June 29, 2012, a severe storm hit the Mid-Atlantic region with unusually intense straight-line winds. This "Derecho" caused widespread commercial power outages in the Washington D.C., Virginia and Maryland area, and widespread damage to Verizon's networks. Indeed, the Derecho downed more poles and generated more commercial trouble tickets for Verizon than Hurricane Irene. External power failures affected more than 100 Verizon locations. At each of these locations, batteries and nearly all the back-up generators worked as designed, allowing us to continue service. However, at two of these locations, generators failed to start, disabling hundreds of network transport systems, and causing Verizon to lose much of its visibility into its network in the impacted area.[1]

Verizon designs its network to provide 911 services even during disasters. As explained further below, our 911 network designs include multiple levels of diversity and redundancy, as well as back-up power in critical facilities, to optimize resiliency during a crisis. Nevertheless, generator failures caused a temporary loss of 911 service to four of the more than two hundred 911 centers (referred to as Public Safety Answering Points, or PSAPs) that Verizon serves across the storm's path. As a result, three PSAPs (Fairfax County, Prince William County, and Manassas) did not receive 911 calls for several hours Saturday, June 30, and another (Manassas Park) did not receive 911 calls for much of that weekend. In addition, a number of area PSAPs (including those four) faced other 911-related problems, consisting primarily of a lack of delivery of location information on 911 calls and the loss of administrative and back-up phone

[1] Across the impacted area, more than 1,900 network transport systems were damaged and failed. A very significant percentage of those systems were in Arlington and Fairfax, where the two generators failing to start caused the 911 issues. Across the impacted area, nine generators failed to operate properly out of 136 in total.

lines.[2] This document describes Verizon's final analysis of what happened and identifies important corrective actions to minimize the risk of future problems.

* * *

Two Generator Starting Failures Caused the 911 Outages

Our investigation has determined that the failure of one of two back-up generators to start at each of our Arlington and Fairfax central offices following the loss of commercial power caused the Northern Virginia 911 disruptions. Multiple failures cascading from these specific generator problems and damage to the transport network combined to cause the outages for the four PSAPs. Included among those failures were systems that enable us to monitor the condition of our network facilities in Northern Virginia, and that loss of visibility over our network hindered our initial efforts to assess and repair damages.

At critical facilities, Verizon deploys a combination of batteries and generators to support critical operations during a commercial power failure. The batteries provide an immediate source of power following the loss of commercial power until the generators go online (which is designed to occur automatically), and then the batteries act as the back-up power source should the generators fail.

At more than 100 locations, Verizon's back-up batteries and generators worked as designed. However, one of two back-up generators did not start at each of the Fairfax and Arlington facilities, and these failures caused the four PSAPs' 911 call completion problems.

[2] Location information, referred to as Automatic Location Identifier ("ALI") information, automatically provides the PSAP with the address of 911 callers using landlines. Callers can dial 911 and reach the PSAP even if the ALI systems are not operating, and the PSAP can dispatch the appropriate public safety response. In these cases, however, a 911 call-taker must obtain location information from the caller rather than the information appearing automatically. In addition, the Arlington County PSAP's regular business lines (which could also be used during emergencies) were not working because of the problems at the Arlington central office, explained in more detail below.

Arlington Facility

The Arlington facility has two generators that must operate in tandem to support the site. At 10:55 PM on June 29, 2012, the Arlington facility lost commercial power. One of the two generators started, but the other did not. The single running generator could not support the entire site load, became overloaded and shut down as designed. Back-up batteries served the office's equipment into the morning of June 30. A power technician arrived at 12:28 AM on June 30, but despite best efforts throughout the night, could not get the second generator started. At approximately 5 AM on June 30, the batteries drained completely and network equipment failed.[3] We deployed additional resources, working in parallel both to start the second generator and prepare a replacement mobile generator. Commercial power was restored at 12:45 PM before those efforts were completed.

Significantly, during the period while power was out in Arlington, we lost our telemetry systems and thus our ability to monitor parts of our network and facilities in Northern Virginia, including the Fairfax facility. Once Arlington was restored, our visibility into the network began to restore.

Fairfax Facility

The Fairfax facility has two generators that each support specific components of the network when commercial power is lost. At approximately 10:35 PM on June 29, the Fairfax facility lost commercial power. One of the generators started and supported its equipment as designed. The other generator did not start, so back-up batteries served the corresponding equipment into the morning of June 30. At approximately 6:15 AM, the batteries completely drained and the network equipment in the specific section of the facility served by the inoperable

[3] Some network equipment is more sensitive to low voltage and failed before the batteries were completely exhausted.

generator failed. Throughout this period, the other generator supported its network equipment in the rest of the building. That morning, because we had lost visibility to the network at large, the decision was made to send technicians to various facilities, including Fairfax. A central office technician arrived at the site at 7:30 AM but did not immediately recognize that one section of the facility was not on generator. At approximately 9:45 AM, the central office technician realized there was an issue in one section of the building and called for a power technician. The power technician arrived at the Fairfax facility at approximately 11:30 AM, investigated the power plant, determined that the second generator had failed to start, initiated the starting procedures, and brought the generator back on manually by 12:15 PM. We immediately started restoring the equipment in the office and bringing services back on line.

We have since conducted extensive testing using third-party experts to determine why the second generator in the Arlington facility did not start. We determined that air had entered the fuel system, resulting in a lack of fuel in the lines. We have since replaced the fuel lines for both of the back-up generators at the Arlington facility (even though no leaks were found in the generator that started).

In Fairfax, Verizon's investigation has determined that the Fairfax generator did not start because the auto-start mechanisms failed. Those mechanisms are designed to automatically start the generator once commercial power is lost, but they did not operate correctly and have since been replaced.

Proactive Improvements

While the back-up power systems in place should have withstood the Derecho without the resulting 911 problems, our investigation has identified issues for which we are undertaking corrective action:

Issues	Corrective Actions
Generator system failures As described above, we suffered key generator system failures that were different in each location. The specific failures have been repaired but we are extending our review of critical locations to address potential issues.	• Conduct backup power system audits in the mission-critical Verizon facilities supporting 911 in Virginia, Maryland and Washington, D.C. • Institute any corrective measures identified in those power audits. • For example, we have already completed the Arlington audit and are instituting automated controls to prioritize system loads (e.g., telemetry) in case one of the two generators fails.
Emergency Practices and Procedures Our investigation determined we could have improved our restoration of service had we (i) recognized more quickly the partial power outage in Fairfax and (ii) been able to power some network equipment (e.g., telemetry systems) on the one generator in Arlington that was working.	• Develop and post site-specific backup power system assessment procedures that can be used by any employee to assess if there is a loss of power to an area of a building. • Develop and post site-specific manual generator start and transfer procedures, including serving system loads on a prioritized basis. • Enhance our critical facility "Black Out" testing. We test our back-up power systems regularly but will enhance this testing to include "failed automated controls" and "prioritized system load transfer" scenarios.
Communication and Mobilization We have a standard practice of internal mobilization based on actual or potential service impacts. These are triggered by alarms. The loss of visibility prevented us from receiving these alarms and delayed our response.	• Create two new event criteria for notification and mobilization purposes. We have enhanced our notification and mobilization procedures to trigger activity more quickly when batteries are activated or when telemetry is lost.
Loss of visibility to multiple sites	• Redesign the telemetry network. We are redesigning the telemetry network to include more diverse connections and failover (alternative) locations.

PSAP-Specific Routing Issues Compounded the Generator-Starting Problems

Verizon's 911 design provides multiple diversities or redundancies "inside the network." There are multiple tandem offices providing routing so that, if one fails, the calls to the failed

office are routed through the other(s). Verizon's ALI databases and links to each ALI database are redundant, as are Verizon's signaling systems, which route calls to their destinations. Verizon's analysis of the network impacts following the Derecho has identified areas for improvement, especially with ALI diversity, with specific PSAP configurations. Verizon will work directly with the specific PSAP partners to decide on improvements.[4]

Communication Improvements Are Being Addressed

PSAP Communications

Over the past few years, Verizon has established robust processes to communicate with PSAPs during an emergency or system failure, particularly during high-volume (also known as "mass calling" or "focused overload") situations. In fact, we have a large team entirely dedicated to communicating with PSAPs. These new processes generally worked well during the Derecho, as Verizon stayed in constant communication with PSAPs during the 911 outages, including sending automatic notifications to PSAPs when certain alarms were triggered. But once Verizon lost its telemetry, we did not have the specific information needed by the PSAPs to understand the impact of the event and plan for alternatives. And certain automatic notifications that go to PSAPs stopped when the alarms stopped. As discussed above, Verizon is working to develop a better design to retain its visibility into the network, which will improve the utility of the communications in the face of catastrophic failures.

As an example of how the lack of network visibility hindered communications, certain PSAPs, when they were no longer receiving 911 calls the morning after the storm, activated "network controls" to re-route calls through different paths or to a pre-designated alternate

[4] Verizon is obliged to maintain the confidentiality of its specific PSAP customers' network arrangements and is not free to share those details publicly; in addition, sharing such network design information would create security vulnerabilities.

location. Verizon has since determined that certain of these PSAPs would have been better off not doing so (i.e., they would have started receiving 911 calls earlier if they had not re-routed calls through different paths), but without the appropriate information, they were unable to make that determination at the time. We will discuss the network control process with the individual PSAPs to determine if improvements can be made (e.g., PSAPs may want to deactivate such controls if they do not improve call completion).

The 911 Directors of the City of Alexandria, and the Counties of Arlington, Fairfax, Loudoun, Prince William and Stafford have recommended that Verizon adopt five steps in response to the storm, primarily focused on communications. The recommendations are constructive suggestions, and we look forward to working with the 911 Directors to most effectively implement these concepts. Specifically:

Recommendation	**Assessment**
Verizon adopt, embrace, instruct, train and utilize the National Incident Management System (NIMS) model, to address and mitigate any and all significant events/incidents impacting providing 9-1-1 service to the aforementioned jurisdictions.	**Positive.** Verizon employs an "all hazards approach" to its Business Continuity, Disaster Recovery, Facility Preparedness and Emergency Management programs. These are essential to the protection of its employees, critical business processes and structural facilities located around the globe. Verizon today employs an Incident Management System (IMS) along with the concept of Crisis Management Centers to standardize control of certain emergency situations. When invoked, that process utilizes the National Incident Management System (NIMS) principles as published by the Department of Homeland Security. Verizon offers internal training and orientation courses on its National Emergency Command Center (NECC) Process, and an Introduction to the National Incident Management System. (In this event, Verizon did not activate its Emergency Command Center process; as noted above, thresholds for

	invoking that process have been strengthened to more readily bring those procedures to bear in similar situations.)
Verizon obtain and utilize a Reverse 911® type system to notify, via voice and text, those persons identified by the above jurisdictions, as soon it is known or suspected by Verizon that there is or may be an interruption of 9-1-1 service to any or all of the above jurisdictions. The immediately transmitted voice and text message should contain, in plain language, the nature of the problem, current or potential impact of the problem, what Verizon is doing to address the problem, recommend actions the impacted 9-1-1 center(s) should take and other appropriate information and include the name of the sender and the telephone number (business and mobile) at which the sender can be reached, and their email address.	**Positive.** Since March 2011, Verizon has employed a broadcast email process to provide specific ticket information to individual PSAPs, and also to provide general information and updates on issues that affect multiple PSAPs. Verizon will expand that process to include texting and will work with 911 Directors to establish the correct contact lists and process details. Based on experience with the email process, it is evident that there is no one common standard vehicle that is universally desired by all PSAPs. Verizon will work with the 911 Directors to accommodate specific needs within a standard process. Verizon will make every effort to share actionable information with PSAPs as soon as we are aware of service interruptions. For events that may impact multiple PSAPs, we will recommend that conference bridges will be established to brief PSAPs on the situation and allow for questions and discussion. Recommended actions would be specific to each PSAP (based on their back-up configuration and event impact) and need to be developed jointly between Verizon and the PSAP.
Verizon work with the jurisdictions to develop, by no later than December 31, 2012, a method to semi-annually conduct a drill/exercise with each jurisdiction on actions to be taken by Verizon and the impacted jurisdiction(s) in the event of a potential or actual 9-1-1 outage.	**Positive.** Verizon will engage the assistance of its Business Continuity Emergency Management (BCEM) team to work with Verizon's 911 Customer Care Center organization to develop and exercise procedures for drills that model potential or actual 911 outages with any of the jurisdictions that request such a joint exercise.
Verizon provide the above jurisdictions, during the first week of each month, a current contact list; beginning with the name and contact information (email, business telephone number, business	**Positive.** A draft will be provided to PSAPs for comment and concurrence by August 17, 2012.

mobile telephone number and any other appropriate information) for the Verizon account manager assigned to the jurisdiction and four immediately escalating Verizon personnel up to a Vice President level.	
Verizon, if/when requested by any of the above jurisdictions, have a Verizon representative with authority to act/react; respond to and to be present at the jurisdictions' Emergency Operations Center (EOC), to provide current accurate information concerning 9-1-1 service and outages, other telephone service, etc. and liaison with other parties staffing the EOC, when the EOC is activated.	**Positive.** Verizon will work with the 911 Directors to explore ways in which we can accommodate this request. We have discussed options for virtual participation in any EOC via an "instant messaging - like" application with the Virginia Commonwealth emergency management leaders. We have discussed joint training with Fairfax Emergency Management personnel and would welcome the opportunity to participate in that activity. If PSAP discussions regarding a joint regional 911 EOC become the strategy, that would present an excellent vehicle for Verizon to be present with multiple jurisdictions in an emergency situation.

Public Communications

In the future, when we face significant network-related issues like those caused by the Derecho, Verizon will share additional information about our restoration efforts more quickly to provide greater insight regarding the extent of the impact to our subscribers and the expected duration of the restoral efforts. We are mobilizing a more robust emergency response communications process to ensure that media outlets and other channels are provided relevant information on a timely basis.

Conclusion

Verizon understands the critical role of 911 services to the community, and is committed to making improvements to avoid the performance of the 911 system during the Derecho. We will work directly with the PSAPs, as well as the various governmental bodies considering these important matters, to implement the lessons learned. And we will look to apply improvements and lessons learned from the Washington metropolitan area to other areas in our service territory as well.

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COMMONWEALTH OF VIRGINIA

STATE CORPORATION COMMISSION

STAFF REPORT OF PRELIMINARY FINDINGS

DIVISION OF COMMUNICATIONS

CASE NO. PUC-2012-00042

IN THE MATTER OF INVESTIGATING 911 EMERGENCY CALL SERVICE OUTAGES AND PROBLEMS

September 14, 2012

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PUC-2012-00042

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EXECUTIVE SUMMARY

The purpose of this report is to present the preliminary findings of the analysis performed by the Virginia State Corporation Commission Staff ("Staff") regarding the 911 service outages following the June 29, 2012 storm ("June 29 Derecho"). The primary focus of our investigation thus far has been on determining the causes of the 911 service outages. The findings show that there were numerous and compounding errors, failures, and deficiencies on the part of Verizon that multiplied into a potentially catastrophic event exposing inherent weaknesses in Verizon's service and associated 911 network design and maintenance.

Late in the evening of June 29, a severe and destructive storm impacted significant portions of Virginia, Maryland, and the District of Columbia with severe straight-line wind speeds reported as high as 87 mph. In Virginia, over one million customers lost electric power with many of those located in Northern Virginia. On the morning of June 30, 2012, Governor McDonnell declared a state of emergency in response to the severe weather. By the morning of June 30, there was an unprecedented and critical loss of 911 services primarily impacting citizens in the Northern Virginia area.

According to Verizon, it lost commercial power to over 100 locations in its Mid-Atlantic region. In most instances, the central office batteries and backup generators continued to work as designed to support operations. Verizon acknowledges multiple problems starting with the failure of two backup generators to start in the Fairfax central office and the Arlington central office.

Ultimately there was a total loss of 911 telephone service to four public safety answering points ("PSAPs") (Fairfax County, Prince William County, Manassas and Manassas Park) for a significant period of time. In addition, 21 other Virginia PSAPs were impacted and experienced

such problems as the failure to receive Automatic Location Information ("ALI") and the loss of administrative and back-up telephone lines.

The goal of our investigation is to prevent such a serious event from occurring again. Verizon recognizes that it made many mistakes and has initiated numerous actions to correct those deficiencies and weaknesses. We intend to evaluate those efforts on a going-forward basis for our final report, and are hopeful that those initiatives will prove to be effective.

As the June 29 Derecho situation makes clear, timely responsiveness is critical in such an emergency. However, the fact remains that, in this instance, if the generators had not failed to start in the Arlington and Fairfax central offices, there would not have been a 911 service outage (or associated problems) in Northern Virginia. As our preliminary findings indicate, we are particularly concerned that the generators in these two offices may not have been properly maintained or tested. Moreover, the concern extends to whether such is indicative of a systematic deficiency throughout Verizon's network.

In summary, the 911 service outages and associated problems following the June 29 Derecho should not have happened. Verizon's 911 network was engineered, designed, and constructed to withstand such a storm. Verizon has acknowledged that it failed to meet the expectations of the residents and PSAPs in the Northern Virginia area, and we concur. On a positive note, this event has highlighted many areas that need attention and improvement, and has done so without significant negative harm to the public and public safety. As a result, Verizon has taken, and is continuing to take, corrective action to prevent this from happening again should there be another similar or more serious weather event or disaster.

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INTRODUCTION

Early in the afternoon on June 29, 2012, a severe and destructive storm with widespread wind gusts of over 70 mph ("June 29 Derecho") tracked across a large section of the Midwestern United States. The storm progressed into the Mid-Atlantic States in the afternoon and evening. Late in the evening, the storm continued to expand and impacted significant portions of Virginia, Maryland, and the District of Columbia with severe straight-line wind speeds reported as high as 87 mph. The June 29 Derecho continued eastward during the very early morning of June 30 affecting Delaware and New Jersey, and ultimately dissipated around 4:00 a.m. in the Atlantic Ocean.

In Virginia, over one million customers lost power with many of those located in Northern Virginia. On the morning of June 30, Governor McDonnell declared a state of emergency. His announcement stated that "last night's thunderstorms caused the broadest non-hurricane related power outage in Virginia history."

By the morning of June 30, there was an unprecedented and critical loss of 911 services primarily impacting public safety answering points ("PSAPs") and citizens in the Northern Virginia area. Subsequently, the Virginia State Corporation Commission ("Commission") started receiving reports of 911 emergency call outages in the areas of Virginia served by Verizon Virginia LLC and Verizon South Inc. (collectively, "Verizon"), and unconfirmed reports of 911 service problems in the service territories of other providers. On July 3, the Commission issued an Order Establishing Investigation ("July 3, 2012 Order") directing its Staff ("Staff") to investigate the loss of 911 emergency call services from the June storms. The July 3, 2012 Order requires the Staff to report its preliminary findings by September 14, 2012, and to file a report with its final findings and recommendations by December 31, 2012.

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In addition, on July 13, 2012, the Federal Communications Commission's ("FCC") Public Safety and Homeland Security Bureau released a Public Notice ("PSHSB Notice") seeking comment on 911 resiliency and reliability in wake of the June 29 Derecho in PS Docket No.11-60. The PSHSB Notice recognized that the impact of the storm was particularly severe in Northern Virginia, notably in Fairfax County, parts of Prince William County, Manassas Park, and Manassas "where over 1 million people faced the possibility of not being able to call 9-1-1 successfully" and where "...media reports and local government officials indicate that public safety answering points ...failed as did backup systems."[1]

IMPACT ON 911 SERVICES

Telecommunications networks traditionally have been designed to continue to operate after commercial power outages and disasters. Central office plant utilizes automatic backup power sources (i.e., batteries and generators) to take over instantaneously when there is a commercial power loss to the facility.[2] As many citizens have experienced, when their power goes out they are able to report their outage to the power company over their home telephone and also reach 911 if necessary (as well as place and receive other calls). However, the capability to have uninterrupted telephone service during a power outage has been changing for some time. For example, a traditional wireline customer[3] must use a corded phone during a power outage (instead of a cordless phone used in most households today). In fact, consumers are often

[1] PSHSB Notice, p.1. Comments were filed in this proceeding by a number of parties, including Verizon, wireless carriers, Fairfax County and other localities, as well as public safety associations or entities. Reply comments were also filed by a number of parties. http://apps.fcc.gov/ecfs/proceeding/view?name=11-60

[2] Central office batteries are always in use and are charged by rectifiers connected to commercial power or generators. Whenever commercial power is interrupted, automatically-started generators are activated.

[3] For example, a customer served over copper facilities.

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advised to have a corded phone available during power outages. However, more recently, as a result of various technological advances and available alternatives, a customer's wireline or Voice over Internet Protocol ("VoIP") service[4] may not continue to work during a power outage without an on-site backup power supply that is sufficient and sustainable. In those instances, the telephone network may be operational but the customer may not always be able to access it using their available telephone devices. Of course, many customers have wireless telephone devices which can provide additional flexibility for making necessary and emergency calls during a power outage or disaster if the telephone network remains operational.

However, starting late on June 29, there were a number of very critical events involving Verizon's facilities in Northern Virginia which resulted in the total loss of 911 telephone service to four PSAPs (Fairfax County, Prince William County, Manassas, and Manassas Park) for a significant period of time. In addition, 21 other PSAPs in Virginia were impacted and experienced such problems as the failure of Verizon to deliver Automatic Location Information ("ALI")[5] and the loss of administrative and backup telephone lines. All citizens in the affected communities served by the four PSAPS were unable to reach those PSAPs during a very critical period following the June 29 Derecho. According to Verizon, the Fairfax County, Prince William County, and Manassas PSAPS were unable to receive 911 calls until the afternoon of June 30, 2012, while Manassas Park was unable to receive calls until July 1, 2012. ALI links remained down. The primary ALI links were not fully restored to all the impacted PSAPs until July 4, 2012, while the redundant ALI links were not fully restored until several days later.

[4] For example, Verizon's FIOS service and cable company telephone service require battery backup at the customer's home.

[5] ALI provides the PSAP with the caller's physical location, which enables the PSAP to assist the caller more effectively and quickly.

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Northern Virginia officials have expressed grave concerns regarding this (and other recent) Verizon 911 system failures and have offered various resolutions and recommendations.[6]

VERIZON TIMELINE

Verizon's network is designed to provide 911 services during the type of storm that occurred on June 29, 2012, as it has publicly acknowledged through press releases and reports.[7] According to Verizon, it lost commercial power as a result of the June 29 Derecho to over 100 locations in its Mid-Atlantic region. In most instances, the batteries and backup generators continued to work as designed to support operations. However, Verizon describes multiple problems starting with the failure of two backup generators to start in the Fairfax central office and the Arlington central office.

The Arlington central office lost commercial power at approximately 10:55 p.m. on June 29. This office has two generators that must run in tandem to support the load. One started and one did not. The generator that started soon shut down after it became overloaded. A power technician arrived at 12:28 a.m. on June 30, but was unable to start the second generator. As the batteries began discharging, equipment that was sensitive to low voltage conditions began failing. By approximately 5:00 a.m. on June 30, the batteries had drained completely. Verizon was not able to get the second generator started at the Arlington office before commercial power

[6] For example, see the July 11, 2012 Resolution to Encourage Steps to Address Verizon 9-1-1 Service Gaps During and Following the Derecho Storm on June 29, 2012 adopted by the Metropolitan Washington Council of Governments; the August 1, 2012 letter and enclosures to William Irby from G. Mark Gibb, Executive Director of the Northern Virginia Regional Commission; and the August 28, 2012 letter and enclosures to William Irby from Edward L. Long, County Executive of Fairfax County. These letters (without enclosures) are included as Attachment 1. The comments of Fairfax County filed on August 17, 2012 in response to the PSHSB Notice can be viewed at http://apps.fcc.gov/ecfs/comment/view?id=6017106601

[7] For example, see the report Verizon released on August 13, 2012 "Verizon, 911 Service and the June 29, 2012, Derecho" ("Verizon Derecho 911 Report"). This report is attached as Attachment 2.

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was restored at 12:45 p.m. on June 30. According to Verizon's internal investigation, the generator in the Arlington central office failed because "air had entered the fuel system, resulting in the lack of fuel in the lines."[8]

The Fairfax central office lost commercial power at approximately 10:35 p.m. on June 29. This office also has two generators. One started and one did not. These generators do not work in tandem as those in the Arlington office. The working generator operated its associated equipment as designed. The equipment tied to the nonworking generator was supported by the batteries until 6:15 a.m. on June 30 when they completely drained. A central office technician arrived at the Fairfax central office at 7:30 a.m. on June 30 but did not recognize that a portion of the office was not operating on either batteries or a generator. At 9:45 a.m. a power technician was called for and subsequently arrived at 11:30 a.m. The second generator was started manually at 12:15 p.m. on June 30. Subsequent investigation revealed that this generator did not start because its auto-start mechanism failed.

In addition, Verizon's telemetry (alarm monitoring) system for the area is housed in the Arlington office. This telemetry system failed within an hour of the commercial power outage.

The resulting damage to equipment and transport systems in the Arlington and Fairfax central offices[9] caused other significant problems within Verizon's network beyond the lack of 911 call completions. For example, because some interoffice transport systems failed, a number of additional switches became Signaling System 7 ("SS7")[10] isolated and customers served by those switches were unable to originate or receive any interoffice calls (including 911).

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[8]Verizon Derecho 911 Report, p. 4.

[9] The transport systems in these offices provide voice and signaling connectivity to switches from other switches and customers, hub and multiplexing arrangements for through-routed circuits, and private line circuit terminations.

[10] SS7 is an out-of-band inter-switch signaling network used to determine called line idle/busy status and trunk availability.

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VERIZON CORRECTIVE ACTIONS

Verizon has identified a number of problems and has already undertaken initiatives to correct the deficiencies highlighted by events from the June 29 Derecho. For example, Verizon has completed specific maintenance activities in both the Arlington and Fairfax central offices. In the Verizon Derecho 911 Report, at page 5, it describes that it is undertaking corrective actions on several issues as follows:

Issues	Corrective Actions
Generator system failures As described above, we suffered key generator system failures that were different in each location. The specific failures have been repaired but we are extending our review of critical locations to address potential issues.	• Conduct backup power system audits in the mission-critical Verizon facilities supporting 911 in Virginia, Maryland and Washington, D.C. • Institute any corrective measures identified in those power audits. • For example, we have already completed the Arlington audit and are instituting automated controls to prioritize system loads (e.g., telemetry) in case one of the two generators fails.
Emergency Practices and Procedures Our investigation determined we could have improved our restoration of service had we (i) recognized more quickly the partial power outage in Fairfax and (ii) been able to power some network equipment (e.g., telemetry systems) on the one generator in Arlington that was working.	• Develop and post site-specific backup power system assessment procedures that can be used by any employee to assess if there is a loss of power to an area of a building. • Develop and post site-specific manual generator start and transfer procedures, including serving system loads on a prioritized basis. • Enhance our critical facility "Black Out" testing. We test our back-up power systems regularly but will enhance this testing to include "failed automated controls" and "prioritized system load transfer" scenarios.
Communication and Mobilization We have a standard practice of internal mobilization based on actual or potential service impacts. These are triggered by alarms. The loss of visibility prevented us from receiving these alarms and delayed our response.	• Create two new event criteria for notification and mobilization purposes. We have enhanced our notification and mobilization procedures to trigger activity more quickly when batteries are activated or when telemetry is lost.

Loss of visibility to multiple sites	• Redesign the telemetry network. We are redesigning the telemetry network to include more diverse connections and failover (alternative) locations.

In addition, Verizon has been working with the PSAPs to address their concerns (in particular, the lack of communications) and has responded to some specific recommendations.[11]

PRELIMINARY FINDINGS

Verizon has acknowledged that many failures occurred in the aftermath of the June 29 Derecho resulting in four PSAPs in Northern Virginia (Fairfax County, Prince William County, Manassas Park, and Manassas) being unable to receive 911 calls for some time after the storm. In addition, Verizon identified a total of 25 PSAPs (including the four above) throughout Virginia that experienced other 911 problems, primarily the lack of ALI delivery.

We are presently evaluating the numerous interrogatory responses, documents, and reports that we have obtained from Verizon and other local exchange carriers ("LECs").[12] Verizon has been open and forthcoming in our investigation, and the other LECs have been cooperative as well. Our analysis is ongoing to enable us to file a final report with our findings and recommendations on December 31, 2012. Our initial focus has been on identifying the causes for the 911 outages. Our investigation thus far has indentified the following preliminary findings:

- Commission Rule 20VAC 5-425-40 A 1 requires a LEC providing 911 service to "design, construct, maintain, and operate its facilities to minimize interruptions to E-911

[11] Verizon Derecho 911 Report, p.6-9.

[12] We sent a letter requesting certain information from all Virginia LECs that report lines in service to the Staff. The template letter is attached as Attachment 3.

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services."

- Verizon was the only LEC in Virginia that experienced significant 911 service problems following the June 29 Derecho.
- The total loss of 911 capabilities to the Prince William County, Fairfax County, Manassas, and Manassas Park PSAPs was an extremely serious event and it is very fortunate that there were not catastrophic consequences to any citizens in Northern Virginia
- The Prince William County, Fairfax County, Manassas, and Manassas Park PSAPs were fully prepared to respond to the June 29 Derecho and were not responsible for the 911 service failures.
- The cause of the 911 service outages in Northern Virginia from the June 29 Derecho began with the failure of two backup generators that did not start automatically when commercial power was lost. Specifically, a generator in each of Verizon's Arlington and Fairfax central offices did not start.
- A review of the maintenance logs for the backup generators in the Arlington and Fairfax central offices shows a lack of compliance with Verizon's maintenance and testing procedures.
- The generator that failed to start in the Arlington office did not start during routine testing conducted two days before the June 29 Derecho. The maintenance log indicated that work to the generator was needed.
- A total of nine generators (out of 136) failed to operate properly during the commercial power outages from the June 29 Derecho in Verizon's Mid-Atlantic region.
- The scope of 911 problems went well beyond the calling areas served by the Arlington

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and Fairfax central offices.

- ALI is an important component of 911 service. The lack of delivery of ALI to many PSAPs could have put citizens across Virginia at greater risk.
- The initial battery on discharge ("BOD") alarm[13] for the Fairfax central office was sent to the National Power Network Operation Center ("NPNOC") at 10:29 p.m. on June 29, 2012 when the one generator failed to start. Under Verizon's procedures, any BOD alarm should have been seen as a **critical** power alarm requiring immediate action. However, according to Verizon, this alarm was incorrectly categorized as a **major** power alarm condition when sent to the NPNOC.
- The Regional Network Center ("RNC") received a repair ticket (identified as a **major** alarm as mentioned above) from the NPNOC for the Fairfax central office at 10:32 p.m. on June 29, 2012. At that time, and on the morning of June 30, the RNC was only working **critical** alarms and a power technician was not dispatched to the office until after the backup batteries had drained completely.
- The telemetry system (alarm monitoring) in the Arlington central office was only supported by the Uninterruptable Power Supply ("UPS") (i.e., battery power source) which was designed with a 30 minute reserve. The UPS failed at 11:23 p.m. on June 29, 2012.
- The very early failure of the telemetry system resulted in Verizon being unable to receive further alarms and remotely access its switches to monitor, test, or reroute traffic to 34 sites in the area. Verizon's inability to monitor its facilities and network in the Northern

[13] BOD or battery on discharge usually indicates one of two conditions. One is an all rectifier failure with or without a generator or commercial power failure, and second is a commercial power failure with generator failure. In each situation the office batteries are being depleted and the alarm condition is a CRITICAL indicator that network service is in jeopardy.

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Virginia area significantly impacted the restoral process from the June 29 Derecho.

- The delay in identifying and repairing the critical conditions in the Fairfax and Arlington offices resulted in unnecessary damage to Verizon's network and extended the 911 problems and outages. There were hundreds of damaged or impacted pieces of equipment in those two offices (i.e., circuit cards and digital cross connects).
- The loss of the transport systems in the Arlington and Fairfax central offices was profound and collectively resulted in 17 switches becoming SS7 isolated, and therefore incapable of completing (originating or terminating) any interoffice local, long distance, or 911 emergency calls. The loss of those transport systems was also responsible for the loss of ALI to the PSAPs.
- Verizon did not activate its emergency Area Control Center located in Maryland until 10 a.m. on June 30, 2012.
- Verizon did not always provide sufficient, accurate, or timely communications to the affected PSAPs regarding its 911 problems and outages following the June 29 Derecho.
- Some battery reserves supporting major equipment systems in the Arlington (other than telemetry) and Fairfax central offices were depleted within approximately 3 to 5 hours. In addition, some equipment in those offices failed even before the batteries exhausted because of sensitivity to low voltage conditions.
- In many instances, Verizon's workforce was not timely dispatched, prepared, or trained to recognize or correct the critical conditions from the June 29 Derecho.
- Verizon is making progress in implementing its corrective action plan, however, at this time, not all items have been fully defined or timelines determined.

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ISSUES THAT WARRANT FURTHER ANALYSIS

The events surrounding the June 29 Derecho raise concerns about Verizon's preparedness to react to emergency and storm situations that may arise in the future. We are aware that Verizon has already initiated numerous efforts to address the problems, and we will more fully evaluate Verizon's corrective action plans going forward. However we have identified the following areas of concern that may warrant further review:

- Evaluate the sufficiency and regularity of maintenance and testing of backup power sources in all Verizon's facilities.
- Evaluate compliance with engineering practices for battery reserves.
- Evaluate the scope of authority and responsibility to identify and address critical emergency conditions on a local basis.
- Evaluate the PSAP recommendations and Verizon's response.

CONCLUSION

The ultimate goal of this investigation, to the extent possible, is to prevent such a serious and potentially life threatening event from occurring again. To determine if that is possible, we must first fully understand why it happened. As many of our preliminary findings indicate, there were numerous and compounding serious errors on the part of Verizon that multiplied into a potentially catastrophic event exposing weaknesses in Verizon's 911 service and associated network design and maintenance. Verizon recognizes that it made many mistakes and has initiated numerous actions to correct those deficiencies and weaknesses. We are hopeful that those initiatives will prove to be effective. As the June 29 Derecho situation makes clear, timely responsiveness is critical in such an emergency. However, the fact remains that, in this instance,

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if the generators had started in the Arlington and Fairfax central offices, there would not have been a 911 service outage (or associated problems) in Northern Virginia.

Therefore, as our preliminary findings indicate, we are particularly concerned that the generators in these two offices may not have been properly maintained or tested. Moreover, the concern extends to whether such is indicative of a systematic deficiency throughout Verizon's network.

Attachment 1

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3060 Williams Drive, Suite 510
Fairfax, Virginia 22031
www.novaregion.org

Northern Virginia Regional Commission

Voice: 703-642-0700
Fax: 703-642-5077

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Hon. Robert W. Lazaro, Jr.
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Town of Leesburg
Hon. Fernando "Marty" Martinez

Town of Purcellville
Hon. Robert W. Lazaro, Jr.

Town of Vienna
Hon. M. Jane Seeman

(as of February 2, 2012)

August 1, 2012

Mr. William Irby
Director, Division of Communications
State Corporation Commission
P.O. Box 1197
Richmond, VA 23218

Dear Mr. Irby:

At its regular meeting of July 19, 2012, the Northern Virginia Regional Commission discussed the operational issues of the aftermath of the damaging Derecho storm on Friday, June 29, 2012, as well as the 9-1-1 problems associated with the storm. These discussions were jointly held with Verizon, Dominion Power and the Northern Virginia Electric Cooperative (NOVEC).

The elected leadership of the Commission passed a resolution authorizing the body to send a letter of concern and recommendations to Virginia Governor Robert McDonnell addressing the state's study of the storm and its implications on homeland security.

That letter, recommendations and resolution are enclosed to help you understand our region's issues with Verizon's actions related to the storm and to assist you in your analysis as part of your investigation.

Thank you for your important work on this matter of shared concern. If you have any questions please don't hesitate to contact me.

Sincerely,

G. Mark Gibb
Executive Director

GMG/DS/ls
Enclosures

County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

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August 28, 2012

William Irby, Director
Division of Communications
Virginia State Corporation Commission
Tyler Building, 9th floor
1300 E. Main St.
Richmond, Virginia 23219

Re: *In the Matter of Investigating 911 Emergency Call Service Outages and Problems* (Case No. PUC-2012-00042)

I am writing regarding the Commission's Order directing staff to investigate outages of Verizon's 9-1-1 services after the derecho storm of June 29, 2012. To our knowledge, the outage in Fairfax County lasted longer and affected more people than any other derecho-related 9-1-1 outage in Virginia, and probably in the nation.

Reliable 9-1-1 service is an essential element of public safety. Fairfax County applauds the Commission for initiating this investigation and for directing Verizon and any other local exchange carrier to cooperate and provide information. Fairfax County also has a great deal of information the Commission may find useful in its investigation. Most of it already has been compiled in the comments the County filed in response to the Federal Communications Commission's request for public comments about the outages. *In the Matter of Continuity and Reliability of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60. The County's comments to the Federal Communications Commission describe the impact of the 9-1-1 outage on public safety officials and the public generally, explain how the County notified the public of the outage, provide information about the causes of the outage, comment on how Verizon responded, and recommend a number of actions that Verizon should take to improve 9-1-1 service in the metropolitan Washington, D.C. area. A copy is enclosed. The County would be happy to formally submit these comments into the Commission's Case No. PUC-2012-00042 if it would be useful.

Fairfax County is ready and willing to provide the Commission any other information or assistance it may need to conduct its investigation. Please do not hesitate to contact me or Steve Souder, the Director of the County's Department of 9-1-1/Public Safety Communications at 571-350-1701, if further input from the County would be beneficial.

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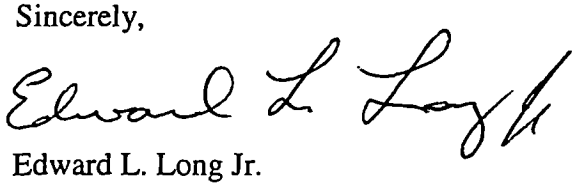
Sincerely,



Edward L. Long Jr.
County Executive

cc: Members, Board of Supervisors (w/o att.)
David J. Molchany, Deputy County Executive (w/o att.)
Robert A. Stalzer, Deputy County Executive (w/o att.)
Catherine A. Chianese, Assistant County Executive (w/o att.)
David P. Bobzien, County Attorney (w/o att.)
Steve Souder, Director, Department of 9-1-1/Public Safety Communications (w/o att.)
Michael Liberman, Director, Department of Cable and Consumer Services (w/o att.)
Wanda Gibson, Director, Department of Information Technology (w/o att.)
Merni Fitzgerald, Director, Office of Public Affairs (w/o att.)
David McKernan, Director, Office of Emergency Management (w/o att.)

Attachment: Comments of Fairfax County, Virginia, filed August 17, 2012, *In the Matter of Continuity and Reliability of Communications Networks, Including Broadband Technologies*, PS Docket No. 11-60.

Attachment 2

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Verizon, 911 Service and the June 29, 2012, Derecho

August 13, 2012

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Verizon, 911 Service, and the June 29, 2012 Derecho

Late in the evening of Friday June 29, 2012, a severe storm hit the Mid-Atlantic region with unusually intense straight-line winds. This "Derecho" caused widespread commercial power outages in the Washington D.C., Virginia and Maryland area, and widespread damage to Verizon's networks. Indeed, the Derecho downed more poles and generated more commercial trouble tickets for Verizon than Hurricane Irene. External power failures affected more than 100 Verizon locations. At each of these locations, batteries and nearly all the back-up generators worked as designed, allowing us to continue service. However, at two of these locations, generators failed to start, disabling hundreds of network transport systems, and causing Verizon to lose much of its visibility into its network in the impacted area.[1]

Verizon designs its network to provide 911 services even during disasters. As explained further below, our 911 network designs include multiple levels of diversity and redundancy, as well as back-up power in critical facilities, to optimize resiliency during a crisis. Nevertheless, generator failures caused a temporary loss of 911 service to four of the more than two hundred 911 centers (referred to as Public Safety Answering Points, or PSAPs) that Verizon serves across the storm's path. As a result, three PSAPs (Fairfax County, Prince William County, and Manassas) did not receive 911 calls for several hours Saturday, June 30, and another (Manassas Park) did not receive 911 calls for much of that weekend. In addition, a number of area PSAPs (including those four) faced other 911-related problems, consisting primarily of a lack of delivery of location information on 911 calls and the loss of administrative and back-up phone

[1] Across the impacted area, more than 1,900 network transport systems were damaged and failed. A very significant percentage of those systems were in Arlington and Fairfax, where the two generators failing to start caused the 911 issues. Across the impacted area, nine generators failed to operate properly out of 136 in total.

lines.[2] This document describes Verizon's final analysis of what happened and identifies important corrective actions to minimize the risk of future problems.

* * *

Two Generator Starting Failures Caused the 911 Outages

Our investigation has determined that the failure of one of two back-up generators to start at each of our Arlington and Fairfax central offices following the loss of commercial power caused the Northern Virginia 911 disruptions. Multiple failures cascading from these specific generator problems and damage to the transport network combined to cause the outages for the four PSAPs. Included among those failures were systems that enable us to monitor the condition of our network facilities in Northern Virginia, and that loss of visibility over our network hindered our initial efforts to assess and repair damages.

At critical facilities, Verizon deploys a combination of batteries and generators to support critical operations during a commercial power failure. The batteries provide an immediate source of power following the loss of commercial power until the generators go online (which is designed to occur automatically), and then the batteries act as the back-up power source should the generators fail.

At more than 100 locations, Verizon's back-up batteries and generators worked as designed. However, one of two back-up generators did not start at each of the Fairfax and Arlington facilities, and these failures caused the four PSAPs' 911 call completion problems.

[2] Location information, referred to as Automatic Location Identifier ("ALI") information, automatically provides the PSAP with the address of 911 callers using landlines. Callers can dial 911 and reach the PSAP even if the ALI systems are not operating, and the PSAP can dispatch the appropriate public safety response. In these cases, however, a 911 call-taker must obtain location information from the caller rather than the information appearing automatically. In addition, the Arlington County PSAP's regular business lines (which could also be used during emergencies) were not working because of the problems at the Arlington central office, explained in more detail below.

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Arlington Facility

The Arlington facility has two generators that must operate in tandem to support the site. At 10:55 PM on June 29, 2012, the Arlington facility lost commercial power. One of the two generators started, but the other did not. The single running generator could not support the entire site load, became overloaded and shut down as designed. Back-up batteries served the office's equipment into the morning of June 30. A power technician arrived at 12:28 AM on June 30, but despite best efforts throughout the night, could not get the second generator started. At approximately 5 AM on June 30, the batteries drained completely and network equipment failed.[3] We deployed additional resources, working in parallel both to start the second generator and prepare a replacement mobile generator. Commercial power was restored at 12:45 PM before those efforts were completed.

Significantly, during the period while power was out in Arlington, we lost our telemetry systems and thus our ability to monitor parts of our network and facilities in Northern Virginia, including the Fairfax facility. Once Arlington was restored, our visibility into the network began to restore.

Fairfax Facility

The Fairfax facility has two generators that each support specific components of the network when commercial power is lost. At approximately 10:35 PM on June 29, the Fairfax facility lost commercial power. One of the generators started and supported its equipment as designed. The other generator did not start, so back-up batteries served the corresponding equipment into the morning of June 30. At approximately 6:15 AM, the batteries completely drained and the network equipment in the specific section of the facility served by the inoperable

[3] Some network equipment is more sensitive to low voltage and failed before the batteries were completely exhausted.

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generator failed. Throughout this period, the other generator supported its network equipment in the rest of the building. That morning, because we had lost visibility to the network at large, the decision was made to send technicians to various facilities, including Fairfax. A central office technician arrived at the site at 7:30 AM but did not immediately recognize that one section of the facility was not on generator. At approximately 9:45 AM, the central office technician realized there was an issue in one section of the building and called for a power technician. The power technician arrived at the Fairfax facility at approximately 11:30 AM, investigated the power plant, determined that the second generator had failed to start, initiated the starting procedures, and brought the generator back on manually by 12:15 PM. We immediately started restoring the equipment in the office and bringing services back on line.

We have since conducted extensive testing using third-party experts to determine why the second generator in the Arlington facility did not start. We determined that air had entered the fuel system, resulting in a lack of fuel in the lines. We have since replaced the fuel lines for both of the back-up generators at the Arlington facility (even though no leaks were found in the generator that started).

In Fairfax, Verizon's investigation has determined that the Fairfax generator did not start because the auto-start mechanisms failed. Those mechanisms are designed to automatically start the generator once commercial power is lost, but they did not operate correctly and have since been replaced.

Proactive Improvements

While the back-up power systems in place should have withstood the Derecho without the resulting 911 problems, our investigation has identified issues for which we are undertaking corrective action:

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Issues	Corrective Actions
Generator system failures As described above, we suffered key generator system failures that were different in each location. The specific failures have been repaired but we are extending our review of critical locations to address potential issues.	• Conduct backup power system audits in the mission-critical Verizon facilities supporting 911 in Virginia, Maryland and Washington, D.C. • Institute any corrective measures identified in those power audits. • For example, we have already completed the Arlington audit and are instituting automated controls to prioritize system loads (e.g., telemetry) in case one of the two generators fails.
Emergency Practices and Procedures Our investigation determined we could have improved our restoration of service had we (i) recognized more quickly the partial power outage in Fairfax and (ii) been able to power some network equipment (e.g., telemetry systems) on the one generator in Arlington that was working.	• Develop and post site-specific backup power system assessment procedures that can be used by any employee to assess if there is a loss of power to an area of a building. • Develop and post site-specific manual generator start and transfer procedures, including serving system loads on a prioritized basis. • Enhance our critical facility "Black Out" testing. We test our back-up power systems regularly but will enhance this testing to include "failed automated controls" and "prioritized system load transfer" scenarios.
Communication and Mobilization We have a standard practice of internal mobilization based on actual or potential service impacts. These are triggered by alarms. The loss of visibility prevented us from receiving these alarms and delayed our response.	• Create two new event criteria for notification and mobilization purposes. We have enhanced our notification and mobilization procedures to trigger activity more quickly when batteries are activated or when telemetry is lost.
Loss of visibility to multiple sites	• Redesign the telemetry network. We are redesigning the telemetry network to include more diverse connections and failover (alternative) locations.

PSAP-Specific Routing Issues Compounded the Generator-Starting Problems

Verizon's 911 design provides multiple diversities or redundancies "inside the network." There are multiple tandem offices providing routing so that, if one fails, the calls to the failed

office are routed through the other(s). Verizon's ALI databases and links to each ALI database are redundant, as are Verizon's signaling systems, which route calls to their destinations. Verizon's analysis of the network impacts following the Derecho has identified areas for improvement, especially with ALI diversity, with specific PSAP configurations. Verizon will work directly with the specific PSAP partners to decide on improvements.[4]

Communication Improvements Are Being Addressed

PSAP Communications

Over the past few years, Verizon has established robust processes to communicate with PSAPs during an emergency or system failure, particularly during high-volume (also known as "mass calling" or "focused overload") situations. In fact, we have a large team entirely dedicated to communicating with PSAPs. These new processes generally worked well during the Derecho, as Verizon stayed in constant communication with PSAPs during the 911 outages, including sending automatic notifications to PSAPs when certain alarms were triggered. But once Verizon lost its telemetry, we did not have the specific information needed by the PSAPs to understand the impact of the event and plan for alternatives. And certain automatic notifications that go to PSAPs stopped when the alarms stopped. As discussed above, Verizon is working to develop a better design to retain its visibility into the network, which will improve the utility of the communications in the face of catastrophic failures.

As an example of how the lack of network visibility hindered communications, certain PSAPs, when they were no longer receiving 911 calls the morning after the storm, activated "network controls" to re-route calls through different paths or to a pre-designated alternate

[4] Verizon is obliged to maintain the confidentiality of its specific PSAP customers' network arrangements and is not free to share those details publicly; in addition, sharing such network design information would create security vulnerabilities.

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location. Verizon has since determined that certain of these PSAPs would have been better off not doing so (i.e., they would have started receiving 911 calls earlier if they had not re-routed calls through different paths), but without the appropriate information, they were unable to make that determination at the time. We will discuss the network control process with the individual PSAPs to determine if improvements can be made (e.g., PSAPs may want to deactivate such controls if they do not improve call completion).

The 911 Directors of the City of Alexandria, and the Counties of Arlington, Fairfax, Loudoun, Prince William and Stafford have recommended that Verizon adopt five steps in response to the storm, primarily focused on communications. The recommendations are constructive suggestions, and we look forward to working with the 911 Directors to most effectively implement these concepts. Specifically:

Recommendation	**Assessment**
Verizon adopt, embrace, instruct, train and utilize the National Incident Management System (NIMS) model, to address and mitigate any and all significant events/incidents impacting providing 9-1-1 service to the aforementioned jurisdictions.	**Positive.** Verizon employs an "all hazards approach" to its Business Continuity, Disaster Recovery, Facility Preparedness and Emergency Management programs. These are essential to the protection of its employees, critical business processes and structural facilities located around the globe. Verizon today employs an Incident Management System (IMS) along with the concept of Crisis Management Centers to standardize control of certain emergency situations. When invoked, that process utilizes the National Incident Management System (NIMS) principles as published by the Department of Homeland Security. Verizon offers internal training and orientation courses on its National Emergency Command Center (NECC) Process, and an Introduction to the National Incident Management System. (In this event, Verizon did not activate its Emergency Command Center process; as noted above, thresholds for

	invoking that process have been strengthened to more readily bring those procedures to bear in similar situations.)
Verizon obtain and utilize a Reverse 911® type system to notify, via voice and text, those persons identified by the above jurisdictions, as soon it is known or suspected by Verizon that there is or may be an interruption of 9-1-1 service to any or all of the above jurisdictions. The immediately transmitted voice and text message should contain, in plain language, the nature of the problem, current or potential impact of the problem, what Verizon is doing to address the problem, recommend actions the impacted 9-1-1 center(s) should take and other appropriate information and include the name of the sender and the telephone number (business and mobile) at which the sender can be reached, and their email address.	**Positive**. Since March 2011, Verizon has employed a broadcast email process to provide specific ticket information to individual PSAPs, and also to provide general information and updates on issues that affect multiple PSAPs. Verizon will expand that process to include texting and will work with 911 Directors to establish the correct contact lists and process details. Based on experience with the email process, it is evident that there is no one common standard vehicle that is universally desired by all PSAPs. Verizon will work with the 911 Directors to accommodate specific needs within a standard process. Verizon will make every effort to share actionable information with PSAPs as soon as we are aware of service interruptions. For events that may impact multiple PSAPs, we will recommend that conference bridges will be established to brief PSAPs on the situation and allow for questions and discussion. Recommended actions would be specific to each PSAP (based on their back-up configuration and event impact) and need to be developed jointly between Verizon and the PSAP.
Verizon work with the jurisdictions to develop, by no later than December 31, 2012, a method to semi-annually conduct a drill/exercise with each jurisdiction on actions to be taken by Verizon and the impacted jurisdiction(s) in the event of a potential or actual 9-1-1 outage.	**Positive.** Verizon will engage the assistance of its Business Continuity Emergency Management (BCEM) team to work with Verizon's 911 Customer Care Center organization to develop and exercise procedures for drills that model potential or actual 911 outages with any of the jurisdictions that request such a joint exercise.
Verizon provide the above jurisdictions, during the first week of each month, a current contact list; beginning with the name and contact information (email, business telephone number, business	**Positive.** A draft will be provided to PSAPs for comment and concurrence by August 17, 2012.

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mobile telephone number and any other appropriate information) for the Verizon account manager assigned to the jurisdiction and four immediately escalating Verizon personnel up to a Vice President level.	
Verizon, if/when requested by any of the above jurisdictions, have a Verizon representative with authority to act/react; respond to and to be present at the jurisdictions' Emergency Operations Center (EOC), to provide current accurate information concerning 9-1-1 service and outages, other telephone service, etc. and liaison with other parties staffing the EOC, when the EOC is activated.	**Positive.** Verizon will work with the 911 Directors to explore ways in which we can accommodate this request. We have discussed options for virtual participation in any EOC via an "instant messaging - like" application with the Virginia Commonwealth emergency management leaders. We have discussed joint training with Fairfax Emergency Management personnel and would welcome the opportunity to participate in that activity. If PSAP discussions regarding a joint regional 911 EOC become the strategy, that would present an excellent vehicle for Verizon to be present with multiple jurisdictions in an emergency situation.

Public Communications

In the future, when we face significant network-related issues like those caused by the Derecho, Verizon will share additional information about our restoration efforts more quickly to provide greater insight regarding the extent of the impact to our subscribers and the expected duration of the restoral efforts. We are mobilizing a more robust emergency response communications process to ensure that media outlets and other channels are provided relevant information on a timely basis.

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Conclusion

Verizon understands the critical role of 911 services to the community, and is committed to making improvements to avoid the performance of the 911 system during the Derecho. We will work directly with the PSAPs, as well as the various governmental bodies considering these important matters, to implement the lessons learned. And we will look to apply improvements and lessons learned from the Washington metropolitan area to other areas in our service territory as well.

Attachment 3

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COMMONWEALTH OF VIRGINIA

WILLIAM IRBY
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KATHLEEN A. CUMMINGS
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23218-1197

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STATE CORPORATION COMMISSION
DIVISION OF COMMUNICATIONS

July 31, 2012

Re: ***Commonwealth of Virginia, ex rel. State Corporation Commission, Ex Parte: In the matter of investigating 911 emergency call service outages and problems*, Case No. PUC-2012-00042**

Dear Company Regulatory Representative:

As you are aware, the State Corporation Commission ("Commission") has opened the above-captioned formal investigation in response to reports of 911 emergency call service outages and problems as a result of the storms that struck parts of the Commonwealth in June of 2012. In the Order establishing this investigation, the Commission directed the Staff of the Commission ("Staff"), pursuant to §§ 56-35, 56-36, 56-247, and 56-249 of the Code of Virginia, to investigate this matter and file a report regarding the same. Our investigation is focusing on the storms that crossed parts of the Commonwealth on June 29 and 30, 2012 ("June 29/30 storms").

To assist the Staff in this investigation, please send a written response to the following:

1) Did any of your customers experience problems with making 911 calls as a result of the June 29/30 storms?

2) Did any Public Safety Answering Point ("PSAP") in your service territory have any problems receiving 911 calls from your customers as a result of the June 29/30 storms?

3) If your answer to 1) or 2) is yes, please describe the nature of the problem(s), including whether the problem was a complete loss of 911 access or a partial disruption of any aspects of 911 emergency call services (for example, Automatic Location Identification or Automatic Number Identification). Also, please include as you are able the geographic location and number of your customers affected by the disruption(s).

4) Finally, if your answer to 1) or 2) is yes, please describe the steps taken to rectify the problem(s) experienced by your customers, and when 911 emergency call services returned to normal.

Responses may be sent via email to Larry.Kubrock@scc.virginia.gov or mailed to the Division of Communications at the address set forth above. We would appreciate your response by August 17, 2012. Please contact me or Larry Kubrock if you have questions about any aspect of this investigation. Thank you in advance for your cooperation.

Very truly yours,

William Irby

William Irby

TYLER BUILDING, 1300 EAST MAIN STREET, RICHMOND, VA 23219-3630 • http://www.scc.virginia.gov • TDD/VOICE: (804) 371-9206

PUBLIC NOTICE

Federal Communications Commission
445 12th St., S.W.
Washington, D.C. 20554

News Media Information 202 / 418-0500
Internet: http://www.fcc.gov
TTY: 1-888-835-5322

DA 12-1153
Released: July 18, 2012

PUBLIC SAFETY AND HOMELAND SECURITY BUREAU SEEKS COMMENT ON 9-1-1 RESILIENCY AND RELIABILITY IN WAKE OF JUNE 29, 2012, DERECHO STORM IN CENTRAL, MID-ATLANTIC, AND NORTHEASTERN UNITED STATES

PS Docket No. 11-60

Comments Due: August 17, 2012
Reply Comments Due: September 4, 2012

Introduction

On June 29, 2012, a fast-moving weather storm called a derecho brought a wave of destruction across wide swaths of the United States, beginning in the Midwest and continuing through the mid-Atlantic and Northeastern regions of the country. Millions of Americans lost electrical power during the storm for periods ranging from a few hours to over a week in the middle of a heat wave, and the storm caused billions of dollars in physical damage. The storm had a significant adverse effect on communications services generally and 9-1-1 facilities particularly.[1] From isolated breakdowns in Ohio, Kentucky, Indiana, and Pennsylvania, to systemic failures in northern Virginia and West Virginia, it appears that a significant number of 9-1-1 systems and services were partially or completely down for several days.

The impact of the storm in northern Virginia was particularly severe, notably in Fairfax County, parts of Prince William County, Manassas Park and Manassas, where over 1 million people faced the possibility of not being able to call 9-1-1 successfully.[2] In those jurisdictions, media reports and local government officials indicate that public safety answering points (PSAPs), which process calls to 9–1–1 facilities, failed, as did backup systems. Multiple access technologies appear to have been affected by the outages, including traditional networks, broadband networks, and wireless networks.

The Public Safety and Homeland Security Bureau (PSHSB or Bureau) of the Federal Communications Commission (FCC or Commission) responded immediately, closely coordinating with the Federal Emergency Management Agency (FEMA) and constantly communicating with service providers and other stakeholders from the time the storm hit and throughout the period impacts were felt by the public. At noon on Saturday, June 30, the Commission granted an emergency special temporary authorization allowing a Missouri power company crew to use certain frequencies to assist in the restoration of electric power within the Ohio disaster area.

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[1] *See, e.g.*, Sullivan, Pat, *911 Failure Affected 2.3 Million in Northern Virginia*, WASH. POST, Jul. 11, 2012.

[2] *See, e.g.*, Sullivan, Pat, *After Storm, 9-1-1, Phone Service Remains Spotty*, WASH. POST, Jul. 2, 2012.

Utilizing the Commission's Operations Center, which is staffed 24 hours a day/7 days a week, and supplementing it with direct outreach and pre-established reporting protocols, the Commission obtained important information on communications outages related to 9-1-1 centers, broadcast stations, and public safety communications systems that it shared with its Federal partners (*e.g.*, FEMA). Vital information on outages also came through the Commission's mandatory Network Outage Reporting System (NORS) and voluntary Disaster Information Reporting System (DIRS). At 5:15 p.m. on Saturday, June 30, the Commission activated DIRS, targeting selected providers with systems in the disaster area, in this case the District of Columbia and certain counties in Maryland, Virginia, and West Virginia. Through DIRS, the Commission received regular updates on the status of wireline, wireless, and 9-1-1 communications outages and restoration efforts. As company maintenance crews largely restored communications services in certain areas, the Commission de-activated DIRS for those areas on July 3, 2012 and completely deactivated it on July 4, 2012. The Commission also issued on its website and distributed through social media a consumer tip sheet for the public about communicating after the derecho, while the effects of the storm were still being felt.

Immediately after communications and 9-1-1 services were restored, the Bureau began an inquiry focused on learning all of the facts and circumstances of the various outages, including the causes and, importantly, ways to make the public safer and avoid future outages. The Bureau began an ongoing series of meetings with stakeholders, such as communications service providers, public safety officials, and others, and continues to seek and obtain relevant information. The Bureau is assessing and evaluating the storm-related information received through NORS or DIRS, and still coming in through NORS. The Bureau is also coordinating with state and local governments, which are responsible for establishing and operating 9-1-1 facilities, providing first responder services, and regulating certain relevant communications services.

By this Public Notice, the Commission and the Bureau further expand the ongoing inquiry. The Public Notice broadens the inquiry in two ways, by expanding those who may contribute relevant information to include the public, and focusing not only on issues directly surrounding the derecho and what happened during and after it, but also on other experiences associated with natural disasters throughout the nation that involve outages or are otherwise related to the resiliency and reliability of communications services and networks of all kinds that are used to seek, process or obtain emergency assistance. Especially in the face of events that lead more people than usual to need emergency help, they must be able to connect to get it. It is vital to seek focused comments broadly on what happened during and after this or other storms, and what can be done to better address these issues going forward.

Congress has given the Commission a particular responsibility under the Communications Act to ensure communications networks of all types "promot[e] safety of life and property."[3] Central to this important responsibility is ensuring the reliability, resiliency and availability of communications networks in times of emergency, including and especially during and immediately after a natural disaster such as a derecho. Recognizing this, last year the Commission initiated a proceeding on the reliability and

[3] *See* 47 U.S.C. § 151; *see also* 47 U.S.C. § 154 (o) ("For the purpose of obtaining maximum effectiveness from the use of radio and wire communications in connection with safety of life and property, the Commission shall investigate and study all phases of the problem and the best methods of obtaining the cooperation and coordination of these systems.") In addition, the Commission recently strengthened its outage reporting requirements by extending them to interconnected VoIP services. *See* In the Matter of the Proposed Extension of Part 4 of the Commission's Rules Regarding Outage Reporting To Interconnected Voice Over Internet Protocol Service Providers and Broadband Internet Service Providers, PS Docket No. 11-82, 27 FCC Rcd 2650 (2012).

continuity of communications networks, including broadband technologies.[4] Information received in connection with this Public Notice will add important information that will inform the Commission's action in this proceeding.

Request for Comment

The Bureau seeks comment on the background, causes, and restoration efforts related to communications services and facilities impacted directly or indirectly by the storm and after. It seeks to develop a complete and accurate record of all the facts surrounding the outages during this storm as well as outages resulting from natural disasters in order to evaluate the overall resiliency and reliability of our Nation's 9-1-1 systems and services. We also seek comment on the impact these outages had on the various segments of the public, including consumers, hospitals, and public safety entities.

The Bureau's review is also intended to further develop the record in the Commission's ongoing examination of issues in the April 2011 notice of inquiry (NOI) on the resiliency, reliability and continuity abilities of communications network, including broadband technologies,[5] and comments received in response to this Public Notice will become part of the record of the NOI. In that proceeding, the Commission initiated a comprehensive examination of these issues with the goal of determining what action, if any, the Commission should take to ensure that our Nation's communications infrastructure is as reliable as possible and able to continue to function in times of emergency. In its NOI, the Commission also focused on 9-1-1 reliability and stated that "[p]eople dialing 9-1-1, whether using legacy or broadband-based networks, must be able to reach emergency personnel for assistance; and when networks dedicated to public safety become unavailable, first responders must have access to commercial communications, including broadband technologies, to coordinate their rescue and recovery efforts."[6]

Questions Regarding Derecho Impact, Effects, and Restoration Efforts

Below, the Bureau poses a series of questions related to the impact of the storm on emergency and 9-1-1 communications accessed by traditional communications networks, broadband communications networks, and wireless communications networks. The Bureau also requests comment on the storm's impact on various user groups. PSHSB seeks comment on the following issues:

Causes of Outages. What were the specific causes of the outages that occurred during or after the storms? Which network elements and components, such as Public Switched Telephone Network (PSTN) trunks, Internet-Protocol (IP) broadband access lines, databases and PSTN switches, were out of service and for how long? For example, to what extent were issues like powering, physical damage, and power surges contributing factors to the outages? To what extent are there industry best practices that address these, and any other, contributing causes? To what extent were they followed?

In what ways was physical damage due to the storm a major cause of outages? What could be done to improve the resiliency of communications infrastructure in the face of physical damage like what was seen during the storm? Are there actions the communications industry can take to avoid or mitigate

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[4] *See* In the Matter of Reliability and Continuity of Communications Networks, Including Broadband Technologies, *et al*., *Notice of Inquiry*, PS Docket No. 11-60, *et al*., 26 FCC Rcd 5614 (2011) ("*Reliability NOI*").

[5] *See generally, Reliability NOI.*

[6] *See Reliability NOI*, 26 FCC Rcd at 5616 ¶ 5.

these outages in future similar events? Should the FCC take other steps to improve communications resiliency during strong storms like this?

In what ways was the derecho an "extraordinary" event? For example, compared to other types of disasters, did it occur with unusually short notice, affect an unusually large area, and was it unusually intense? How did these factors inhibit service providers in responding to the event and restoring service? How did these factors affect consumers' need for communications services and ability to obtain emergency services? What could be done to better prepare for events like this in the future? Specifically, what actions should communications service providers and PSAPs take to better prepare for similar events in the future?

How did service providers become aware that 9-1-1 outages had occurred? What types of monitoring systems were in place for various types of assets, both in the field and inside buildings? How well did these monitoring systems perform during the storm?

What role did the availability or absence of back-up power for network equipment play in the 9-1-1 outages that occurred during the storm? What could be done to improve the ability of communications assets to operate longer when commercial power is lost? Are there new technologies, such as solar and fuel cells, which provide promise in this area? What maintenance practices are in place to compensate for the loss of commercial power? How did these methods perform during the storm? Are there actions the FCC should take to improve the ability of communications networks to survive commercial power outages? What types of measures could be taken to improve the robustness of communications infrastructure in response to failures of commercial power? Should the Commission consider taking action, either voluntary or mandatory, that would address back-up power?

What forms of network interconnection, both PSTN and IP, were affected by the storm or loss of power? How and why were they affected? Did these disruptions affect communications seeking 911 or other emergency assistance and how? What carrier and public safety facilities have multiple means or forms of interconnection and which do not? Which of these facilities are essential for 911 communications? What monitoring of interconnection was in place and how did it perform? To what extent are there industry best practices addressing forms of interconnection and diversity and redundancy? To what extent were they followed?

Effect on 9-1-1 Systems and Services. What could be done to improve the reliability of the 9-1-1 network when faced with storms like the derecho or other threats? Are there actions the FCC should take to improve the reliability of 9-1-1 services during strong storms like this? What actions should communications service providers take? Are there actions that communications service providers and/or PSAPs should take to improve the 9-1-1-restoration process? What, if anything, can the FCC do to better assist communications service providers and PSAPs in the restoration process?

How was 9-1-1 call completion affected by outages caused by the storm? Is there an estimate of how many 911 calls could not be completed at all or only through alternate means, such as ten-digit numbers? To what extent do industry best practices exist that relate to these events, and were these best practices followed? Were there instances where PSAPs went offline due to failures on their own premises? To what extent did the storm affect Automatic Number Identification (ANI) and Automatic Location Identification (ALI)? What were the primary causes of failures to ANI and ALI services? To what extent were vital 9-1-1 facilities and network elements deployed redundantly by service providers? For example, were selective routers routinely deployed in a diverse manner? Likewise, were facilities

that carry ALI and ANI information routed in a diverse manner? What should be done to improve the diverse provisioning of 9-1-1 facilities and elements?[7]

Effect of 9-1-1 Outages. What impact did the 9-1-1 outages have on the public? For example, how were consumers affected? How did the outages affect the ability of public safety officials to perform their duties? How was the public alerted of the 9-1-1 outages and what alternatives were provided? How effective were these alternatives? To what extent was social media used to spread the word about the 9-1-1 outages and alternatives? What impact did the 9-1-1 outages have on other sectors of the user community, including businesses and providers of critical services, such as hospitals?

Effect of Communications Outages on Access to 9-1-1 Services. Outages in the 9-1-1 network itself are only one way that users can be denied access to 9-1-1 services. For example, if the PSAP is operational and the 9-1-1 network is functioning, users in a local area will still be unable to reach the PSAP if they lack access to the communications network due to a local outage. To what extent did users find that the general unavailability of communications service impaired their ability to access 9-1-1 service? In these instances, were multiple methods of reaching the PSAP available, like cell phones or other types of communications services? How effective were these alternative communications services in overcoming outages affecting one access platform? What should be done to improve the diversity of access to 9-1-1 services so that communications outages are less likely to result in an inability to access 9-1-1?

Questions Regarding 9-1-1 Resiliency and Reliability Generally

The 9-1-1 communications failures experienced as a result of the derecho also give rise to concerns and questions about the reliability and resiliency of our 9-1-1 communications networks nationwide, particularly in the event of a severe weather or other type of high-impact natural disaster. We seek comment on how 9-1-1 communications has fared during other recent natural disaster events. Please describe any lessons learned from those events, in particular improvements that were recommended to improve 9-1-1 service reliability and survivability. Commenters should address the impact on communications relying on the PSTN- and IP-based communications, as well as fixed and mobile wireless communications.

We also seek comment on the most common causes of failure in the 9-1-1 network that result in the following types of 9-1-1 outages: i) complete isolation of the PSAP; ii) failure to pass ALI and/or ANI; iii) loss of the ability to re-route traffic to an alternate PSAP or administrative lines. What could be done to reduce the incidence of outages in each category? What actions, if any, should the FCC take to address this problem?

In what ways does the practice of deploying redundant facilities or systems used in the 9-1-1 network promote 9-1-1 reliability? How does the service provider ensure that these practices are followed routinely and remain in place over time, even as changes are made to the networks? What, if anything, should the FCC do to promote the application of such methods?

How do service providers routinely monitor 9-1-1 facilities and the availability of 9-1-1 service? How quickly do service providers become aware of 9-1-1 failures of various kinds? Do service providers

[7] *Public Notice*, FCC's Public Safety and Homeland Security Bureau Reminds Telecommunications Service Providers of the Importance of Implementing Established 9-1-1 and Enhanced 9-1-1 Best Practices, DA 12-891, rel. June 6, 2012.

routinely notify PSAPs of 9-1-1 outages? How are they alerted, under what conditions, and how quickly? What steps does the service provider take routinely to prioritize restoration of 9-1-1 service? What standard operating procedures and systems does the service provider have in place to facilitate the detection and restoration of 9-1-1 service after an outage? Are these resources adequate?

PSAPs are typically small operations playing a large role in protecting the safety of the public. The failure of a few trunks into a PSAP could affect public safety for an entire community, but the failure of just a few trunks might not attract much attention from a service provider. Do provider alarm systems provide adequate visibility to relatively small outages that can have a large impact on PSAPs, especially when demand may spike, such as during or after a major storm? Do providers provide appropriate urgency to handling such outages?

To what extent is the availability of multiple access platforms (*e.g.*, residential telephone line, whether legacy or IP-based, cell phone, *etc.*) to reach networks services creating greater richness of diversity that would tend to improve 9-1-1 reliability? Stated differently, to what extent does the public have more than one way to reach 9-1-1 that are not reliant on each other? To what extent are available access platforms reliant on each other or another common point of failure?

The legacy communications network uses a hierarchical architecture, whereby failures of network elements located deeper in the network will result in a larger number of customers being denied network service. For this reason, elements deeper in the network (*e.g.*, switches) were often designed to very high reliability specifications. To what extent has the legacy infrastructure retained this characteristic? Today's networks are quickly migrating to broadband IP technology. To what extent does the migration to IP-based networks reduce or increase the level of concentration deeper in the network? What is the resultant impact on communications reliability?

What other steps might service providers take? What actions should PSAPs take? What other actions, if any, should the Commission take to encourage those steps? What actions should the public and other institutions like hospitals take, if any? We seek comment on whether the deployment of Next Generation (NG911) will improve the reliability of 9-1-1 services and, if so, how? Would NG911 make it easier to have more than one backup PSAP and provide additional redundancy of transmission facilities, *e.g.*, via satellite or microwave point-to-point links? Did commercial data centers in the affected areas experience outages and for how long? Would it increase reliability if critical components of the NG911 system are housed or replicated in commercial data centers?

NG911 will create the ability to utilize a "virtual PSAP." Today's 9-1-1 system generally requires a call taker to answer a 9-1-1 call from within the walls of a single physical ("brick and mortar") PSAP. In a NG911 network, however, a call taker will be able to answer a 9-1-1 call from virtually any location. We seek comment on the potential for development of virtual PSAPs. Are current technologies sufficient to support virtual PSAPs? Are there specific steps that service providers should take to ensure that they have adequate reliability when implementing NG9-1-1? How would the addition of a 9-1-1 text capability provide substantial improvement in the ability of consumers to contact PSAPs?

Procedural Matters

Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

  - All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
  - Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.
  - U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer and Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (tty).

Parties wishing to file materials with a claim of confidentiality should follow the procedures set forth in section 0.459 of the Commission's rules. Casual claims of confidentiality are not accepted. Confidential submissions may not be filed via ECFS but rather should be filed with the Secretary's Office following the procedures set forth in 47 C.F.R. § 0.459. Redacted versions of confidential submissions may be filed via ECFS. Parties are advised that the Commission looks with disfavor on claims of confidentiality for entire documents. When a claim of confidentiality is made, a public, redacted version of the document should also be filed.

The proceeding of which this Notice is a part is a "permit-but-disclose" proceeding conducted in accordance with the Commission's *ex parte* rules.[8] Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing

[8] 47 C.F.R. §§ 1.1200 *et seq.; see also Reliability NOI,* 26 FCC Rcd at 5630-31 ¶ 53.

oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

For further information regarding this proceeding, contact Michael Connelly, Cybersecurity and Communications Reliability Division, Public Safety and Homeland Security Bureau at (202) 418-0132 or michael.connelly@fcc.gov. News media contact: Lauren Kravetz, Public Safety and Homeland Security Bureau at (202) 418-7944 or lauren.kravetz@fcc.gov.

The Public Safety and Homeland Security Bureau issues this Public Notice under delegated authority pursuant to Sections 0.191 and 0.392 of the Commission's rules, 47 C.F.R. §§ 0.191, 0.392.

- FCC –

ORDER NO. 85013

IN THE MATTER OF THE ELECTRIC SERVICE INTERRUPTIONS IN THE STATE OF MARYLAND DUE TO THE JUNE 29, 2012 DERECHO STORM.	* * * * * * * *	BEFORE THE PUBLIC SERVICE COMMISSION OF MARYLAND CASE NO. 9298

Issued: July 6, 2012

To: Maryland Investor-Owned Electric Companies; Southern Maryland Electric Cooperative; Choptank Electric Cooperative; Office of People's Counsel; Technical Staff of the Maryland Public Service Commission; and Interested Persons

The Public Service Commission ("Commission") notes that the June 29, 2012 Derecho storm severely impacted electrical service to a significant portion of the State of Maryland beginning on June 29, 2012 and, in some instances, the lack of electrical service continues as of the date of this Order.

Pursuant to the Code of Maryland Regulations ("COMAR") 20.50.12.13, a utility is required to file a written report with the Commission within three weeks of the end of a major outage event.[1] Based on the definition of "major outage event" in this regulation, most of the electric utilities in the State had an interruption of service to a sufficient number of customers in each of their service territories to classify the outages resulting from the June 29, 2012 Derecho storm as a "major outage event." Accordingly, the

[1] "Major outage event" is defined as "an event during which: (a) Both: (i) More than 10 percent or 100,000, whichever is less, of the electric utility's Maryland customers experience a sustained interruption of electric service; and (ii) Restoration of electric service to these customers takes more than 24 hours; or (b) The federal, State, or local government declares an official state of emergency in the utility's service territory and the emergency involves interruption of electrical service." COMAR 20.50.01.03B(27).

Commission hereby directs that the Maryland Investor-Owned Utilities,[2] Southern Maryland Electric Cooperative, Inc., and Choptank Electric Cooperative, Inc., to the extent required by COMAR 20.50.12.13, submit an original and 17 paper copies, and an electronic copy, of a major outage event report pursuant to COMAR 20.50.12.13 to the Commission within three weeks after the end of this major outage event.[3]

The Commission will issue a separate notice to establish dates and locations for legislative-style and evening public hearings that the Commission may conduct in this matter.

IT IS THERFORE, this 6th day of July, in the year Two Thousand Twelve by the Public Service Commission of Maryland,

ORDERED: (1) That, within three weeks of the end of the major outage event in this matter, the utilities identified in this Order, to the extent applicable, shall each deliver to the Commission an original and 17 copies of a major outage event report pursuant to COMAR 20.50.12.13.

By Direction of the Commission,

/s/ David J. Collins

David J. Collins
Executive Secretary

[2] The Maryland Investor-Owned Utilities are: Baltimore Gas and Electric Company; Delmarva Power & Light Company; Potomac Electric Power Company; and The Potomac Edison Company.

[3] The reports shall be submitted to: the Executive Secretary, Maryland Public Service Commission, William Donald Schaefer Tower, 6 St. Paul Street, Baltimore, Maryland 21202. Five of the paper copies shall be three-hole punched. The public version of the electronic copy may be submitted via the Commission's "e-file" system, which can be accessed via the Commission's website, www.psc.state.md.us.

COMMISSIONERS

DOUGLAS R. M. NAZARIAN
CHAIRMAN

HAROLD D. WILLIAMS
LAWRENCE BRENNER
KELLY SPEAKES-BACKMAN
W. KEVIN HUGHES

STATE OF MARYLAND

PUBLIC SERVICE COMMISSION

July 11, 2012

In the Matter of the Electric Service Interruptions in the State of Maryland due to the June 29, 2012 Derecho Storm.	* * * *	Case No. 9298

** *** **

NOTICE OF HEARINGS

Pursuant to Order No. 85013, issued July 6, 2012, the Maryland Public Service Commission ("Commission") will conduct legislative-style hearings on Thursday, September 13, 2012 and Friday, September 14, 2012 (if needed) to review the major outage event reports to be filed by the applicable electric distribution utilities pursuant to COMAR 20.15.12.13 to better understand the utilities' performance associated with the June 29, 2012 Derecho storm. The hearing on each day shall begin at 10:00 a.m. in the Commission's 16th Floor Hearing Room, William Donald Schaefer Tower, 6 St. Paul Street, Baltimore, Maryland 21202.

For the purpose of receiving public comment in this matter, the Commission is currently in the process of scheduling a total of eight evening public hearings to be held during August, 2012 in the service territories of Baltimore Gas and Electric Company, Potomac Electric Power Company, Potomac Edison Company, and Southern Maryland Electric Cooperative, Inc. The Commission will issue a separate notice identifying the dates and locations of such public evening hearings as soon as possible. In addition, written public comments in this proceeding may be submitted by September 10, 2012 to David J. Collins, Executive Secretary, Maryland Public Service Commission, William Donald Schaefer Tower, 6 St. Paul Street, 16th Floor, Baltimore, Maryland 21202.[1]

By Direction of the Commission,

/s/ David J. Collins

David J. Collins
Executive Secretary

[1] The Commission encourages participants to use the Commission's "e-Filing" system for electronic filing. Details of the "e-Filing" system are on the Commission's web page, www.psc.state.md.us.

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STATE OF MARYLAND

PUBLIC SERVICE COMMISSION

July 19, 2012

IN THE MATTER OF THE ELECTRIC SERVICE INTERRUPTIONS IN THE STATE OF MARYLAND DUE TO THE JUNE 29, 2012 DERECHO STORM.	* * * * * * *	BEFORE THE PUBLIC SERVICE COMMISSION OF MARYLAND CASE NO. 9298

NOTICE OF EVENING HEARINGS FOR PUBLIC COMMENT

In response to major outages caused by the June 29, 2012 Derecho Storm, evening hearings for the purpose of receiving public comment on the performance of Baltimore Gas and Electric Company, Potomac Electric Power Company, The Potomac Edison Company and Southern Maryland Electric Cooperative, Inc. (each "Utility") have been scheduled as follows:

Potomac Electric Power Company

Tuesday, August 7, 2012 Beginning at 7:00 p.m.	-	Third Floor Large Hearing Room Montgomery County Office Building 100 Maryland Avenue Rockville, Maryland 20850
Wednesday, August 8, 2012 Beginning at 7:00 p.m.	-	Rennie Forum Prince George's Community College 301 Largo Road Largo, Maryland 20772

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Baltimore Gas and Electric Company

Monday, August 13, 2012 Beginning at 7:00 p.m.	-	Joint Hearing Room Legislative Services Building 90 State Circle Annapolis, Maryland 21401
Tuesday, August 14, 2012 Beginning at 7:00 p.m.	-	Paul C. Wolman Assembly Room War Memorial Building 101 N. Gay Street Baltimore, Maryland 21202
Wednesday, August 15, 2012 Beginning at 7:00 p.m.	-	Banneker Room George Howard Building 3430 Court House Drive Ellicott City, Maryland 21043
Thursday, August 16, 2012 Beginning at 7:00 p.m.	-	Hearing Room No. 106 Baltimore County Office Building 111 West Chesapeake Avenue Towson, Maryland 21202

Potomac Edison Company

Monday, August 20, 2012 Beginning at 7:00 p.m.	-	Winchester Hall 12 East Church Street Frederick, Maryland 21701

Southern Maryland Electric Cooperative, Inc.

Wednesday, August 22, 2012 Beginning at 7:00 p.m.	-	Commissioners Hearing Room Charles County Government Building 200 Baltimore Street La Plata, Maryland 20646

Each Utility is directed to: (1) cause a display advertisement to be published in a newspaper(s) of general circulation throughout its service area at least once two weeks prior to the hearing date(s) in its service area; and (2) place on its home page a notice of the evening hearings in a manner that a customer need not click on a link to determine the time, date, location and the purpose of the hearing.

Written public comments in this proceeding may also be submitted by September 10, 2012 to David J. Collins, Executive Secretary, Maryland Public Service Commission, William Donald Schaefer Tower, 6 St. Paul Street, 16th Floor, Baltimore, Maryland 21202.[1]

By Direction of the Commission,

Robert Cain
Assistant Executive Secretary

[1] The Commission encourages participants to use the Commission's "e-Filing" system for electronic filing. Details of the "e-Filing" system are on the Commission's web page, www.psc.state.md.us.

MARYLAND
9-1-1
EMERGENCY
NUMBER SYSTEMS BOARD

STATE OF MARYLAND

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Emergency Number Systems Board
115 Sudbrook Lane – Suite 201, Pikesville, Maryland 21208-4199
(410) 585-3015 • FAX (410) 764-4136 • www.dpscs.state.md.us/ensb/

October 23, 2012

Mr. David McMillion
Director, Department of Public Safety and Health
Metropolitan Washington Council of Governments
777 North Capitol Street, NE
Suite 300
Washington, DC 20002-4290

RE: Interim Report on the June 29, 2012 Derecho Storm Impact on 9-1-1 in Maryland

Dear Mr. McMillion:

Attached please find an interim report outlining the Maryland Emergency Number Systems Board's efforts to date relative to the June 29, 2012 Derecho storm. I am also attaching various items from the Maryland Public Service Commission's docket regarding its ongoing investigation into the Derecho Storm Electric Service Interruptions (Case No. 9298).

If you have any questions or require any additional information, please feel free to contact at (410) 585-3019.

Sincerely,

Gordon Deans, Executive Director
Emergency Numbers Systems Board

cc: Anthony Myers, Chair ENSB
ENSB Members (Electronic Distribution)

Emergency Number Systems Board

Derecho Storm - Maryland Interim Report

October 23, 2012

Introduction

On June 29, 2012, the State of Maryland was struck by a fast moving storm with high winds known as a Derecho. The storm rapidly moved through Maryland and other parts of the Mid-Atlantic Region, causing widespread damage and disruptions of public utilities. This report summarizes the efforts of Maryland's Emergency Number Systems Board (Board), working in cooperation with Maryland counties, to understand the impact of the storm and how to improve the resiliency and redundancy of Maryland's 9-1-1 system. The report examines issues that occurred in Maryland as well as those occurring in Northern Virginia due to 9-1-1 architecture similarities. Also outlined are the efforts of the Board and counties to work with Verizon to fashion intermediate and permanent solutions to issues that arose. This report further examines a series of procedures and policies that were implemented in Maryland over the past several years, in cooperation with Verizon, intended to mitigate outages and enhance service delivery.

County Impact

Following the storm, the Board queried each of Maryland's counties to determine if any county suffered outages or disruptions to their 9-1-1 operations. Of the twenty-four (24) counties, only four reported that they had issues during or immediately after the Derecho.

Garrett County reported that two (2) of thirty-two (32) US Cellular of Cumberland cellular trunks were routed to the county's wireline 9-1-1 trunks, rather than the wireless trunks. Verizon assisted the county in contacting US Cellular, and the issue was resolved. Verizon reports that there was no loss of Phase II automatic location information (ALI). There was no impact to the public's ability to reach 9-1-1 services.

Caroline County reported issues with their wireless 9-1-1 trunks, which caused their wireless 9-1-1 calls to be routed to Talbot County through a predefined back-up routing scheme. The county attempted to contact the Verizon Customer Care Center (CCC) but experienced longer than normal hold times resulting from a high volume of calls to the CCC. In response to previous trouble reporting issues, an escalation process was collectively developed by Verizon, Maryland counties, and the Board. Utilizing this procedure, the PSAP employee was able to reach the service manager for the region and open a trouble ticket. The problem was corrected following a restart of the Caroline County PSAP's phone system.

Montgomery County experienced a high volume of calls in a short period of time, also known as a "mass call event", as a result of this storm. During a mass call event, requests for available trunks occur so frequently that there is a "wink failure" between the telephone switch and available 9-1-1 trunks. As a result of the wink failure, the Verizon network automatically takes the trunk out of service under the belief that the trunk is compromised. This can become a cascading failure that disables all of the trunks. Following a similar event in 2011, the Board worked with Verizon to develop a "mass call mitigation" plan. This plan allows only one trunk in a group to be taken out of service automatically during a mass call event, so that there is no cascading failure of all the 9-1-1 trunks going to a PSAP. As a result of this previously established mitigation procedure, Montgomery County experienced little impact on their 9-1-1 services.

A deficiency was discovered with the mass call mitigation plan where there was no follow-up by Verizon to ensure that all trunks were returned to service subsequent to the mass call event. This was discovered by Montgomery County when they determined that four 9-1-1 trunks (each from a separate trunk group) remained out of service several days after the storm. The trunks were returned to service by Verizon, and Verizon has since updated their mass call mitigation plan to include making sure all trunks are restored prior to closing the trouble ticket.

Prince George's County reported the loss of certain non 9-1-1 lines following the storm. It was determined that the Bowie Central Office had a power disruption, which took an optical carrier network card out of service. Verizon technicians reseated the card and service was restored on June 30. The same problem recurred on July 1, and was also remedied in a similar fashion.

Regional Issues

The effects of the Derecho storm also affected other jurisdictions in the Mid-Atlantic region, specifically Northern Virginia. The Board is sensitive to these outages due to similarities that may exist between Maryland and Virginia 9-1-1 architectures. In large measure, the outages in Northern Virginia were caused by commercial power outages, and failures with emergency power in the Arlington and Fairfax central offices.

Board Actions

This section outlines a series of meetings that the Board has conducted with the counties and Verizon.

- The Maryland Emergency Number Systems Board has met with Verizon at each monthly public meeting.
    - Verizon appeared at the July 26, August 31 and September 27 meetings to provide the Board with an update of the issues that occurred in Maryland, as well as the issues and remediation efforts that occurred in Northern Virginia.

- The Board has issued a series of data requests to Verizon to gain a better understanding of what occurred in Maryland and Virginia, and to remediate any potential problems in Maryland.
- The Board has participated in a number of meetings held by the Metropolitan Washington Council of Governments (COG).
    - Chairman Anthony Myers has provided updates to the COG relative to the activities of the Board and the Maryland Public Service Commission (PSC) with regards to Verizon 9-1-1 service, as well as the power utilities regulated by the PSC.
    - The Board has shared best practices and lessons learned from previous Verizon outages with both Virginia and the District of Columbia.
- The Board has met with representatives from the Office of the Governor and the Maryland Emergency Management Agency (MEMA) to provide updates regarding the efforts of the Board, and an overview of Maryland's 9-1-1 network.

Verizon Activities

This section outlines the actions taken by Verizon since the storm, in cooperation with the Board.

- Verizon responded to a host of written and oral data requests made by the Board.
- The Board has requested Verizon to examine and report on their electrical power backup systems in Maryland's central offices.
    - Verizon related that there are no issues like those discovered in Virginia, nor are there any outstanding issues with emergency power in Maryland.
        - Verizon is conducting a series of power audits in Maryland to determine vulnerabilities, and to remedy those vulnerabilities when discovered.
        - The audits are scheduled to be completed by October 31, 2012.
- Verizon will enhance their emergency power practices and procedures
    - Site specific back-up power system procedures at critical facilities will be done so that anyone entering such a facility will be able to determine if the site is on emergency power. This will be completed in the first quarter of 2013.
    - Verizon has created site specific manual generator starting procedures, including prioritized system loads, to ensure a rapid start in case of the failure of automatic starting systems.
    - Verizon has improved its training and testing compliance so that procedures are followed to ensure the rapid correction of issues that can compromise the individual offices.
- Verizon will conduct testing that involves the termination of commercial power into each central office. This process, known as blackout testing, assesses the emergency power's ability to automatically engage to keep the central office operating. This will be done on a continual basis starting in 2013.

- Verizon has committed to the Board to review the network design for 9-1-1 trunks and ALI links to ensure that where physically possible and with PSAP concurrence, there are no choke points or single points of failure in a central office that can inhibit a PSAP from receiving 9-1-1 calls or location information.
- This is a three step process.
    - High-level network drawings have been developed to determine if the 9-1-1 trunk groups or ALI links intersect in a common piece of equipment within a Verizon central office, such as a router or switch.
        - The 9-1-1 trunks are traced from the PSAP to each of the tandems, and the ALI links are traced from the PSAP to the Freehold and Fairland data centers.
        - Drawings have been completed for each PSAP (Primary and Back-Up), and will be reviewed with each county PSAP Director.
    - Verizon engineers will do a detailed review of each 9-1-1 and ALI circuit to make certain that there are no single points of failure, and if diversity violations are discovered, to design solutions to create diversity within the network, where physically possible.
        - It is anticipated that the detailed reviews will be completed in the first quarter of 2013.
        - Verizon is also developing an algorithm to expedite the process, and possibly complete the reviews by December 31, 2012.
    - Verizon will follow-up with each county to review the findings and recommendations made by the engineering group.
        - Verizon will then schedule the remediation with each county at a time that minimizes the impact to the county PSAP operations.
        - This entire process is being done concurrently with Virginia.
        - The remainder of the Verizon footprint will be done sometime after Maryland, Virginia, and the District of Columbia are completed.
- Verizon has implemented a new alerting system to provide voice, text message and e-mail communication to the PSAP community in the event of a major outage that affects multiple jurisdictions. This will provide each county with updated information as quickly as possible. This is not a substitute for any other notification processes agreed to by Verizon, the counties and the Board. The process augments previously established procedures, by adding text messaging.

Next Steps

The Board anticipates the following actions to be completed on the dates indicated.

- Continue to meet with Verizon and the counties to discuss new information regarding the impact of the Derecho storm on 9-1-1. **Ongoing**

- Receive updates from Verizon and the counties regarding the network diversity reviews as they are completed. **Estimated Completion Time: First Quarter 2013**
- Assist each county with making certain that they have Verizon network diversity from PSAP to tandem for 9-1-1 calls, and PSAP to data center for ALI data. **Estimated Completion Time: First Quarter 2013**
- Review with Verizon the results of the power audits at the mission critical Verizon facilities. **Estimated Completion Time of Audits: November 30, 2012**
- Follow up with Verizon to ensure all power remediation is completed at the mission critical Verizon facilities. **Estimated Completion Time: First Quarter 2013**
- The Board has requested from Verizon the revised diversity guidelines for network telemetry published on August 15, 2012. **Received October 22, 2012 to be reviewed at next Board meeting.**
- Continue to participate in the Metropolitan COG process. **Ongoing**

The Board's process is an iterative process. The Board continues to meet with Verizon and counties to enhance Maryland's 9-1-1 system to ensure its reliability and resiliency, and to provide the best service to Maryland's citizens.

Verizon, 911 Service and the Derecho

Moving Forward

Corrective Actions Update

COG 911 Directors Meeting
September 24, 2012

MaureenDavis
Vice President Network Operations
MidAtlantic

Power

The specific cause of the Northern Virginia 911 disruptions was the failure of one of two back-up generators to start in Arlington and Fairfax following the loss of commercial power. These problems are fixed.

Issue	Action Plan	Status
Arlington Back-up Power	• Install new start batteries on Generator 1 • Complete Generator 2 repairs • Complete full load transfer test (pending battery tests and run down testing) • Complete fuel system repairs • Update manual generator-starting procedure	Complete
Fairfax (Lee Hwy) Back-up Power	• Install a new UPS on the Generator 2 Auto Transfer Switch (this solves the Generator 2 start failure) • Install a permanent Auto Transfer Switch power source.	Complete

Power (cont'd)

Verizon's investigation revealed significant opportunities for improvement to ensure that best practices are followed and lessons learned are applied throughout Verizon's service territory.

Issue	Action Plan	Status
Generator system failures were different in each location. While the specific failures have been repaired, we have extended our review across the footprint to identify and address potential vulnerabilities.	• Conduct back-up power system audits in the mission-critical Verizon facilities supporting 911 in Virginia, Maryland and Washington, D.C. • These audits include ensuring the proper categorization of power alarms, as the investigation revealed that an alarm from Fairfax before the loss of network monitoring was mis-categorized and thus placed lower on the priority list. • Institute any corrective measures identified in those power audits. • Where multiple generators are present, we will institute automated controls to prioritize system loads so that critical elements (e.g., network monitoring) stay up or are restored first in case one of the two generators fails.	Estimated completion for all locations identified: 10/31/12 Estimated completion across the Verizon landline service area: 2013

Power (cont'd)

Issue	Action Plan	Status
<u>Emergency Power Practices and Procedures</u> Verizon will improve its speed of restoration of power, moving to manual starts where necessary without delay, prioritizing power to key network equipment (e.g., 911, monitoring systems) in multi-generator configurations, and improving its deployment of mobile generators.	• Implement site-specific back-up power system procedures at critical facilities to ensure real-time on-site accurate identification of power loss anywhere in the facility. • Create site-specific manual generator start and transfer procedures, including prioritized system loads, to ensure a rapid start in the case of failure of automated starting systems. • Enhance critical facility "Black Out" testing. We test our back-up power systems regularly, but will now include "failed automated controls" and "prioritized system load transfer" scenarios. • Improve training and testing compliance. Our investigation revealed that the generator in Arlington had been tested just prior to the Derecho, failed to start, and required service, but that procedures weren't followed that would have ensured speedy correction of those service issues and/or faster restoration of the office.	Potomac-Complete Footprint-1Q 2013 Potomac- Est. 9/30/12 Footprint- 2013 Field Blackout Tests 1Q13 Est. 9/30/12

Emergency Management Processes

More robust visibility into our network and crisis management processes will improve coordination and communication with PSAPs and other government/local officials.

Issue	Action Plan
Verizon has a standard practice of internal mobilization based on actual or potential service impacts. These are triggered by alarms. The loss of visibility into our network prevented us from receiving these alarms and delayed our response.	• We have enhanced our event criteria and procedures for notification and mobilization to trigger activity more quickly when batteries are activated or when network monitoring is lost in multiple offices in a geographic area. Complete
Rapid identification of emergencies and transition to Emergency Management. The Derecho was initially treated more like an internal network problem than like a hurricane-type problem, and this affected incident management.	• Emergency Management has been centralized and enhanced so that all emergencies, including network emergencies, are managed by Verizon's National Emergency Coordination Center (NECC), which utilizes the National Incident Management System (NIMS) principles as published by the U.S. Department of Homeland Security. Complete

Verizon Network

Telemetry systems allow Verizon to receive alarms, monitor its network, identify the cause and location of problems, and repair them rapidly.

Issue	Action Plan
Creating diverse connectivity and alternative telemetry sites will provide greater resiliency in crises. It will also improve the effectiveness of real-time communications with PSAPs. • This initiative will enhance visibility into the 911 network. For example, our investigation revealed that the Eastern portion of Loudoun County could not reach the County's PSAP for several hours on June 30, but the loss of telemetry impeded effective communication with the PSAP on the issue.	• We are redesigning the telemetry network to include more diverse connections and failover (alternative) locations. • Diversity guidelines for telemetry network published 8/15/12; implementation plan approved.

911/PSAPs

Verizon's analysis of the network impacts following the Derecho has identified areas for improvement with specific PSAP configurations, especially involving ALI and trunk diversity. Verizon will work directly with the specific PSAP partners to make those improvements.

Issue	Action Plan	Status
Opportunities for improved diversity on PSAP trunking and ALI links. Conduct network design review for all Maryland and Virginia PSAPs.	• Review PSAP trunking and ALI links for diversity • Work with local Engineering and Operations team to remediate issues identified.	Review completed for affected PSAPs in Northern Virginia 7/31/12 Virginia redesign recommendations ready for review; to be scheduled with PSAPs Maryland reviews to be complete by 9/30/12
A centrally inventoried 911 Infrastructure will facilitate trouble-shooting and improve restoration times.	• Develop a means to implement and maintain an inventory for E911 Infrastructure .	Technical service managers to retain all currently developed network routing maps. Network routing maps will be integrated into new ticketing systems to allow for faster response and facilitate trouble-shooting and restoration.

Communications

- The 911 Directors of the City of Alexandria, and the Counties of Arlington, Fairfax, Loudoun, Prince William and Stafford have recommended that Verizon adopt five steps to improve communications and crisis response. Verizon has adopted those concepts.

Recommendation	Action Plan
Verizon adopt, embrace, instruct, train and utilize the National Incident Management System (NIMS) model, to address and mitigate any and all significant events/incidents impacting providing 911 service to the aforementioned jurisdictions. Complete	• Verizon employs an "all hazards approach" to its Business Continuity, Disaster Recovery, Facility Preparedness and Emergency Management programs. These are essential to the protection of its employees, critical business processes and structural facilities located around the globe. • Verizon's National Emergency Coordination Center (NECC) process utilizes the National Incident Management System (NIMS) principles as published by the U.S. Department of Homeland Security. Verizon offers internal training and orientation courses on its NECC processes, and an Introduction to the National Incident Management System.

Communications (cont'd)

Recommendation	Action Plan
Verizon obtain and utilize a Reverse 911® type system to notify, via voice and text, those persons identified by the above jurisdictions, as soon it is known or suspected by Verizon that there is or may be an interruption of 9-1-1 service to any or all of the above jurisdictions. The immediately transmitted voice and text message should contain, in plain language, the nature of the problem, current or potential impact of the problem, what Verizon is doing to address the problem, recommend actions the impacted 9-1-1 center(s) should take and other appropriate information and include the name of the sender and the telephone number (business and mobile) at which the sender can be reached, and their email address.	• Since March 2011, Verizon has employed a broadcast email process to provide specific ticket information to individual PSAPs, and also to provide general information and updates on issues that affect multiple PSAPs. Verizon has selected a tool for broadcast voice, text and email, and is working with 911 Directors to establish the correct contact lists and process details. Expected completion 9/30/2012. • Based on experience with the email process, it is evident that there is no one common standard vehicle that is universally desired by all PSAPs. Verizon will work with the 911 Directors to accommodate specific needs within a standard process. • Verizon will make every effort to share actionable information with PSAPs as soon as we are aware of service interruptions. For events that may impact multiple PSAPs, we will recommend that voice conference bridges be established to enable Verizon to brief PSAPs on the situation and allow for questions and discussion. Recommended actions would be specific to each PSAP (based on their back-up configuration and event impact) and need to be developed jointly between Verizon and the PSAP.

Communications (cont'd)

Recommendation	Action Plan
Verizon work with the jurisdictions to develop, by no later than December 31, 2012, a method to semi-annually conduct a drill/exercise with each jurisdiction on actions to be taken by Verizon and the impacted jurisdiction(s) in the event of a potential or actual 9-1-1 outage.	• Verizon will engage the assistance of its Business Continuity Emergency Management (BCEM) team to work with Verizon's 911 Customer Care Center organization to develop and exercise procedures for drills that model potential or actual 911 outages with any of the jurisdictions that request such a joint exercise.
Verizon provide the above jurisdictions, during the first week of each month, a current contact list; beginning with the name and contact information (email, business telephone number, business mobile telephone number and any other appropriate information) for the Verizon account manager assigned to the jurisdiction and four immediately escalating Verizon personnel up to a Vice President level.	Complete

Communications (cont'd)

Recommendation	Action Plan
Verizon, if/when requested by any of the above jurisdictions, have a Verizon representative with authority to act/react; respond to and to be present at the jurisdictions' Emergency Operations Center (EOC), to provide current accurate information concerning 9-1-1 service and outages, other telephone service, etc. and liaison with other parties staffing the EOC, when the EOC is activated. Complete	• Verizon has committed to partnering with the Virginia Department of Emergency Management and staffing the state EOC in Richmond with a Verizon representative upon request in the event of an emergency. • Verizon has discussed options for virtual participation in any EOC via an "instant messaging - like" application with Virginia emergency management leaders. • Verizon has discussed joint training with Fairfax Emergency Management personnel and would welcome the opportunity to participate in that activity. • If PSAP discussions regarding a joint regional 911 EOC become the strategy, that would present an excellent vehicle for Verizon to be on site in one location serving multiple jurisdictions in an emergency situation.

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