Impact of the June 2012 Derecho on Communications Networks and Services: Report and Recommendations

In January 2013, the FCC’s Public Safety and Homeland Security Bureau ("Bureau") released a report and recommendations entitled, *Impact of the June 2012 Derecho on Communications Networks and Services*. This report was in response to a directive from former FCC Chairman Julius Genachowski in an attempt to prevent future outages similar to the ones experienced in June 2012, as a rare derecho swept across the Midwest and East Coast, affecting communications from Illinois to New Jersey. The Bureau conducted an extensive review of confidential outage reports; public comments and related documents; interviews with service providers, equipment and backup power vendors, and public safety and community officials in drafting this report.

A derecho is a fast-moving, destructive windstorm which offers little to no warning compared to hurricanes or superstorms. The derecho began in Iowa on June 29th and reached the Mid-Atlantic states on June 30, 2012. The storm caused twenty-two deaths and left millions of people without power for spans of less than an hour to over two weeks. Over 3.6 million people across six states lost some degree of connectivity to the seventy-seven 911 call centers (also known as “Public Safety Answering Points” or “PSAPs”) in the affected areas. More than two million people had no means of reaching 911 when seventeen PSAPs across three states lost all connectivity.

Ohio, New Jersey, Maryland, and Indiana experienced isolated breakdowns, while Virginia and West Virginia suffered systemic failures. A PSAP in Fairfax, Virginia, estimated that it did not receive approximately 1,900 emergency calls because of the derecho. A majority of these outages were due to problems in providers’ networks.

Two tragedies in Washington, D.C., highlight the real consequences of this communications disaster. First, electrical wires brought down by the derecho struck and killed a man. Bystanders called 911 for more than thirty minutes with no success. Second, a woman was knocked off of her motorcycle by the storm and pinned under a tree outside of her apartment in D.C. Passersby could not reach 911, and instead flagged down an ambulance. She was left partially paralyzed by the incident.

The FCC, through the Communications Act, shoulders the responsibility of ensuring that communications networks “promote safety of life and property.” This responsibility includes promoting the reliability, resilience, and availability of communications networks at all times, including in times of emergency.
or a natural disaster. The FCC, through the Bureau, administers rules on communication outage reporting and analyzes the reports to identify outage trends nationwide. However, the severity of the 911 outages caused by the derecho necessitated a more intensive review.

The Bureau reviewed data from over 500 outage reports from twenty-two communications providers and released a Public Notice seeking comment on various topics, including the cause of the outages, their effect on public safety, and the resiliency and reliability of 911 networks generally. The Public Notice yielded forty-five filings—twelve comments and reply comments from communications providers and trade associations, thirteen from PSAPs and public safety groups, and twelve from individuals. Additionally, the Bureau conducted many interviews and participated in meetings and hearings on the effects of the derecho.

After the storm, the Bureau began meeting with cable, wireline, and wireless providers, mainly those in Virginia and West Virginia. Verizon Communications, Inc., ("Verizon") and Frontier Communications Corporation ("Frontier") were asked to provide a detailed timeline of events relating to each affected PSAP in their service areas, since these companies were the PSAP providers in the areas most affected by the derecho. In addition, the Bureau sent requests for information to the major wireless providers in the affected areas, namely Verizon Wireless, AT&T, Sprint, and T-Mobile. The requests sought information on the causes of cell site outages and on cell site battery life.

Northern Virginia experienced the most severe derecho impact, with the greatest number of people affected. Four PSAPs in Northern Virginia lost connectivity altogether: Fairfax County, Prince William County, Manassas, and Manassas Park. The Bureau discovered that these failures were caused in significant part by generator failures in Verizon’s Arlington and Fairfax central offices, leading to loss of commercial power.

In general, the Bureau recommends that the Commission take specific action to supplement current industry best practices, and that providers implement existing best practices as well as advise the Bureau on additional practices that could be promoted to address the shortfalls evident in the aftermath of the derecho. Specifically, the Bureau recommends that the Commission consider action to ensure improved 911 circuit auditing, central office backup power, and diversity of monitor and control links.

First, a 911 circuit audit could enhance reliability by leading to fewer 911 outages. Without regular audits of the physical routes of the 911 circuits and automatic location information ("ALI") links, a single failure can cause loss of all E911 circuits or all ALI links for a particular PSAP. The Bureau views this audit as a modest burden in that it would only apply to a limited number of high-priority circuits rather than to the entire commercial wireline network.
Second, providers should maintain robust, resilient backup power in central offices, supported by appropriate testing, maintenance, and records retention. Reliable central office backup power is essential during large-scale emergencies like the derecho. The significant public-safety concerns justify the cost of this recommendation, which the Bureau estimates will be affordable for many providers given that the necessary infrastructure is likely already in place.

Third, providers’ network operations centers should have diverse monitor and control links and capabilities throughout the network to ensure network reliability, resiliency, and rapid recovery. While the impact of a loss of monitor and control links can be serious, the small set of links involved should make this recommendation plausible for providers.

Fourth, the Commission should consider revising the PSAP Notification Rule. The current rule requires providers suffering a facilities outage that could affect a PSAP to notify that PSAP as soon as possible. The rule could be revised to provide more specific guidance to providers. For example, the rule could further describe methods of notification and a minimum level of detail in the information provided to PSAPs. Clarification of the Commission’s expectations could increase compliance and result in greater situational awareness for PSAPs.

The Bureau found that the 911 communication disruptions were avoidable, had providers followed industry best practices and available guidance. Had the Communications Security, Reliability, and Interoperability Council’s (“CSRIC”) best practices been properly implemented, many of the derecho’s effects on communications networks—including 911 service outages—could have been prevented. Many of the failures to implement best practices involved network operators, service providers, and property managers not properly maintaining their generator systems and other critical infrastructure. The Bureau recommends asking CSRIC to address this lack of adoption and effective implementation of its best practices at the earliest opportunity.

Although PSAPs themselves were not responsible for the communications breakdown during the derecho, the Bureau has recommended several proactive improvements for PSAPs to consider: Having different means of communication available in the event of an emergency; having multiple means of backup power and running periodic tests on them, and; in the event of loss of connectivity, deactivating and reactivating their reroutes until service is restored or the PSAPs receive notification from the provider of a working route.

The derecho exposed many flaws in the nation’s critical communications infrastructure. These flaws manifested themselves in system design, personnel management, polices, and procedures of the primary providers of the 911 networks in the central and Mid-Atlantic regions. The Bureau recommends that the Commission take this opportunity to ensure implementation of best prac-
tices and other measures to ensure the reliability of the communications infra-
structure, with particular emphasis on 911 service reliability.

*Summarized by Geraldine McIntyre*

**Legal and Regulatory Framework for Next Generation 911 Services: Report to Congress and Recommendations**

On February 22, 2013, the FCC submitted a report to Congress pursuant to the Next Generation 9-1-1 Advancement Act of 2012 designated: *Legal and Regulatory Framework for Next Generation 911 Services*. The report, composed by the FCC staff in the Public Safety and Homeland Security Bureau, includes recommendations to establish the necessary legal and regulatory foundation to support states, Public Safety Answering Points ("PSAPs"), and service providers as they convert from legacy 911 to Next Generation 911 ("NG911"). The 911 system used in the United States is a critical element of the public safety framework, with more than 240 million 911 calls made each year. The 911 system has proven to be beneficial, nonetheless it faces noteworthy challenges. As a result of its legacy circuit-switched infrastructure, it is unable to support the increasing number of Americans who are using newer technologies to send emergency communications to 911 PSAPs. Furthermore, some of the essential framework that the legacy 911 system relies on is aging and will eventually become a liability unless it is updated or replaced by current technology. For the aforementioned reasons, Congress has acknowledged the necessity of converting to a NG911 system, which uses Internet Protocol (IP)-based technology to handle all 911 communications.

After summarizing the technological changes that will occur upon the deployment of NG911 services, the FCC sought governmental action and collaboration between the federal agencies and state authorities. In its National Broadband Plan, the Commission noted that the existing federal and state regulations that manage the 911 system are outdated and have hindered the application of NG911. Therefore, the FCC suggested that Congress contemplate initiating a new "legal and regulatory framework for development of NG911 and the transition from legacy 911 to NG911 networks." Pursuant to the NG911 Act, in which Congress instructed the Commission to produce more detailed recommendations for constructing such a framework, this report responds.
I. INCENTIVIZE STATES TO BECOME “EARLY ADOPTERS” OF NG911

The FCC recognizes the importance of accelerating the transition throughout the states from legacy 911 to NG911. The state public safety authorities will play a major role in the management of NG911 and those who choose to become “early adopters” of the system will be able to contribute their experience in transitioning to other parts of the country. Yet, the early adopter states will be at risk to technological and programmatic issues. For this reason, the FCC recommends that “Congress establish incentive-based programs to encourage states to compete to be among the first to extensively implement NG911.” Incentives would include challenge grants and other competitive funding programs, which would likely motivate states to overcome challenges as a result of proceeding with the NG911 transition more quickly.

II. ENCOURAGE STATE-LEVEL GOVERNANCE OF NG911 DEPLOYMENT

The FCC believes that state-level governance of the NG911 conversion is beneficial, noting the success of states that have developed 911 boards to provide guidance and promote the transition to NG911, such as the Vermont Enhanced 911 Board. Not all states have 911 boards equipped with the necessary technical expertise, and the FCC recommends that “Congress recognize the importance of state 911 boards and state-level governance entities in the cost-effective and efficient implementation of emergency services.” The Commission suggests that Congress provide funding for those states that choose to create such boards, as well as requiring a board to be established before a state is eligible to receive NG911 grants or other federal benefits associated with public safety.

In addition to the state-level governance of NG911 deployment, the FCC also recommends that Congress deliberate on developing a federal regulatory “backstop” to eliminate the potential gap between federal and state authority regarding NG911. The Commission believes that the federal government’s role should be concentrated on “supporting and coordinating state and local transition efforts and targeting federal resources to components of NG911 architecture that are uniquely suited to development at the national level.” This would ensure the ability of coordinated funding, at the federal level between agencies, to increase the efficiency of incentive-based NG911 programs. Even so, there may be occasions where states either lack the jurisdiction under state law to control particular components of NG911 service—such as VoIP services—or in other respects make the decision to not use such authority. In these instances, Congress should establish a federal regulatory backstop as mentioned above.
III. PROMOTE A CONSISTENT NATIONWIDE APPROACH TO KEY ELEMENTS OF NG911

The FCC further recommends that Congress promotes standards that "support seamless communication among PSAPs and between PSAPs and emergency responders; reforms to the NG911 funding structure; appropriate liability protection to encourage technological innovation and rapid deployment of NG911; and provisions to make NG911 fully accessible to people with disabilities."

One of the crucial courses of action in the conversion to NG911 is the use of IP-based networks, commonly known as Emergency Services IP Networks ("ESInets"), which will allow for emergency communications through voice, text, and other media capabilities. The FCC recommends that Congress work towards an early establishment of state or regional ESInets in order to develop the necessary framework, as well as compel the performance of uniform standards in the conveyance of information between ESInets and other public safety networks.

As stated by the Commission’s latest annual report regarding 911 fees, states vary on how they handle NG911 in their respective funding statutes. Three states noted that their funding processes do not allow the distribution of 911 assets to NG911 programs. Also, the report reveals that some states have been using 911 fees for non-911 purposes. The FCC recommends that Congress motivate states to modify their funding statutes to contribute to NG911 and legacy 911 activities, as well as limit federal benefits to only those states that use fees collected for 911 and NG911 exclusively for such purposes.

In regards to liability protection standards for NG911, the FCC recommends Congress to concentrate on developing incentives for states to amend their liability regimes using standardized guidelines or model legislation as a template. This would also include liability protection to be extended to any entity that is supplying voluntary NG911 assistance to promote the conversion and support individuals who are using advanced communication applications.

Presently in the United States, about 34.5 million people have hearing disabilities and about 7.5 million have trouble using their voices. In the past, the advancement of communication technologies has surpassed the disability laws, hindering the disabled population from gaining access. For this reason, the Commission recommends Congress continue to update communication laws in order to ensure individuals with disabilities can use all technologies that support the retention of emergency services. Furthermore, the FCC believes that Congress should investigate ways that technology could strengthen communi-
cations between individuals with disabilities and public safety services by supporting the creation of an advisory body and furthering the coordination between the Commission and the U.S. Department of Justice.

IV. PROMOTE THE DEVELOPMENT OF LOCATION TECHNOLOGIES

Upon the implementation of NG911 services, IP-based technologies will eventually replace the legacy 911 network procedures for designating call location information and call signaling for emergencies. NG911 will use "geospatial location (the geographic coordinate-based location) of the caller to the initiating call router (or end unit customer device), which will then use an emergency call identifier and the location information, along with other information, to route the call to the nearest IP-enable PSAP." This process will enable the efficient conveyance of 911 caller information to emergency response agencies despite the network or instrument used by the caller. Thus, the FCC recommends Congress to supply incentives to states initiating the deployment of improved location technologies through its conversion to NG911, by providing grants exclusively to the states that have chosen to move forward. Also, neutral third-party testing will be required by states converting to NG911 to confirm that precise location information is being transmitted. Congress should encourage testing by limiting funds to only the states that have participated in such tests.

Additionally, NG911 will be using a Location-to-Service Transition ("LoST"), referred to as the "Forest Guide." The Forest Guide "is a lookup directory database that associates a NG911 emergency call or request with other NG-specific functions." The FCC seeks congressional authorization to create a national Forest Guide, which would include a national database of ESIInets and enhance NG911 routing and security. Accordingly, the FCC recommends Congress to fund the creation of the national NG911 Forest Guide, which will provide "economies of scale, reduce NG911 transition costs for states and localities, and promote consistent adoption of technical standards nationwide."

V. ELIMINATION OF LEGACY STATE REGULATIONS

As a final matter, the FCC recognizes areas where Congress could aid in the elimination of legacy state regulations that are hindering the NG911 conversion, such as obsolete selective router requirements. Additionally, a vital component of NG911 service is the IP-based routing of calls, which is distinct from the network elements that are used by legacy 911 systems. For this reason, the Commission recommends Congress also provide incentives for states to update
their regulations to further assist NG911 deployment. Such improvements will “enable both traditional and non-traditional service providers to support an expanded array of NG911 services and applications, and will facilitate the deployment of more flexible and resilient network architecture to support NG911 operations.”

Summarized by Koria Stanton

In re Applications of Deutsche Telekom AG, T-Mobile USA, Inc., and MetroPCS Communications, Inc.; For Consent to Transfer of Control of Licenses and Authorizations, Memorandum Opinion and Order and Declaration Ruling, 28 F.C.C.R. 2322 (Mar. 12, 2013).

On March 12, 2013, the Federal Communications Commission ("Commission" or "FCC") released a Memorandum Opinion and Order and Declaratory Ruling allowing the transfer of control of a number of Personal Communications Service ("PCS") and Advanced Wireless Services ("AWS-1") licenses and leases, and one lower 700 MHz license as part of T-Mobile USA and MetroPCS' merger. The Commission found that in permitting the two parties to consummate the transaction, the public is likely to benefit from the facilitation of Long Term Evolution ("LTE") deployment, the development of a more robust national network, improved quality of service, and the solidification of the fourth largest nationwide service provider's ability to compete in the mobile broadband services market.

T-Mobile USA, Inc. ("T-Mobile USA") is a wholly-owned, indirect subsidiary of Deutsche Telekom AG, a publicly-traded German corporation. T-Mobile USA is the fourth largest wireless service provider in the United States in terms of network coverage, number of subscribers and revenues. At the end of 2012, T-Mobile USA reported a total of 33.4 million U.S. subscribers, and service revenues totaling $4.1 billion.

Metro PCS Communications, Inc. ("MetroPCS") is a self-described facilities-based mobile broadband communications provider offering wireless services in certain major metropolitan areas in the United States, predominately on an unlimited, flat-rate, no-long-term-contract basis. It is the fifth largest wireless service provider in the United States, and at the end of 2012, MetroPCS recorded 8.9 million subscribers and revenues totaling $4.5 billion.
I. STANDARD OF REVIEW, PUBLIC INTEREST FRAMEWORK AND OVERVIEW

As per Sections 214(a) and 310(d) of the Communications Act, the Applicants must demonstrate that the “proposed transfer of control of licenses, authorizations, and spectrum leasing arrangements will serve the public interest, convenience, and necessity.” The Commission must determine whether the transaction complies with the specific legal requirements of the Communications Act, other applicable statutes, and the Commission’s rules. So long as there are no regulatory or statutory violations, the Commission then considers whether the transaction could harm the public interest by frustrating the objectives of the Communications Act or other relevant statutes. Lastly, the commission balances any potential public interest harms against any public interest benefits that the transaction would result in.

Inherent in the FCC’s evaluation is the need to preserve and enhance competition in wireless markets. The Commission may assess whether the proposed transaction will affect the quality of communications services or will produce new or additional services to consumers. The FCC’s competitive analysis is not limited to traditional antitrust principles though; it incorporates, for example, public interest factors and assesses the transaction’s broad impact on competition, such as whether the transaction will enhance future competition, and does not merely preserve the status quo.

II. POTENTIAL PUBLIC INTEREST HARMS

Transactions between competitors, such as this merger, raise potential competitive concerns when the merged entity has the incentive and the ability to raise prices, lower quality, or otherwise harm competition in a relevant market. First, the Commission examines how the proposed transaction would affect market concentration. Second, it assesses whether any substantial increase in market concentration would provide the combined entity with the ability to act anti-competitively, either unilaterally or in concert with other service providers, at the local or national levels. In addition, the FCC commences a case-by-case review of the competitive effects of an increase in spectrum holdings on the marketplace. For instance, the Commission wants to ensure there is sufficient spectrum available for incumbent licensees as well as potential new entrants.

The FCC made several findings. First, there is a low risk of competitive harm. More specifically, the merger is not likely to have the ability to increase the quality adjusted price by reducing the quality of its service offerings or pushing back the introduction of new advanced technologies in any of the local markets studied, with the exception of two markets in south Florida. Because
three other major carriers all have sufficient spectrum coverage in terms of population in these areas, the FCC found that the competitive harms are far outweighed by the public benefits. Second, although the combined companies will hold a substantial amount of certain frequency of spectrum, the FCC found that the transfer of the spectrum at issue is unlikely to raise rivals costs or to foreclose entry, expansion, or the deployment of advanced mobile broadband technology to any of the studied local markets. Lastly, the new T-Mobile USA – MetroPCS entity will be the smallest of the four nationwide carriers in the U.S., and thus, the Commission finds it unlikely that it will have the ability to unilaterally raise prices or harm competition on the national level.

III. POTENTIAL PUBLIC BENEFITS

After assessing the potential harms of the proposed transaction, the Commission must then determine whether the merged companies would be able to pursue business strategies resulting in demonstrable and verifiable benefits to consumers that would not be pursued but for the transaction. The FCC uses several criteria in deciding whether a claimed benefit should be weighed against potential harm. First, the benefit must be transaction specific. Second, it must be verifiable, and the proposed transaction is required to provide sufficient evidence supporting each claimed benefit. Third, the Commission would like to see reductions to marginal costs, because it is more likely to result in lower prices for customers. Finally, the FCC applies a "sliding scale approach" to evaluating benefit claims. For instance, under this approach, if harms appear to be substantial and certain, then a demonstration of claimed benefits must reveal a higher degree of magnitude and likelihood. On the other hand, if potential harms appear less likely and less substantial, then the Commission will require a lesser showing.

The FCC found that the proposed T-Mobile USA – MetroPCS entity would likely result in meaningful public interest benefits that support approval of the proposed transaction. Furthermore, the claimed benefits are feasible and likely to be put into effect soon after the transaction is concluded. For example, the new company would allow for the deployment of a substantial LTE network on a national scale that would enhance competition and service to existing customers. The combined company, by merging the assets of MetroPCS and T-Mobile USA, would provide a broader, deeper, and faster LTE deployment than either company could accomplish on its own. The existing customers of MetroPCS would have access to a robust, national network and a broader array of service, and customers outside of MetroPCS's current service area would have the benefit of their service plans. By permitting the transaction to proceed, the license transfer would enhance the competitiveness of T-Mobile USA
MetroPCS, as the fourth largest nationwide service provider. Weighing the possible harms discussed above, particularly in south Florida, the Commission did not believe it would result in competitive or other public interest harms in the obstruction of wireless service. Thus, under the sliding-scale approach, the FCC found the expected magnitude of the public interest benefits to be sufficiently large or imminent to outweigh any potential public interest harms in certain individual markets.

IV. FOREIGN OWNERSHIP AND DECLARATORY RULING

Section 310(b)(4) of the Communications Act establishes a twenty-five percent benchmark for investment by foreign individuals, governments, and corporations in U.S.-organized entities that directly or indirectly control U.S. common carrier wireless licenses. The Act gives the Commission discretion to permit higher levels of foreign ownership unless it finds that the public interest will be served by refusing to permit such foreign ownership. It is presumed that foreign ownership of the licenses will not pose a risk to competition in the U.S. market. Once the twenty-five percent benchmark of foreign ownership is achieved, then the Commission must determine whether the public interest will be served by the refusal of such license.

Based on the Commission's analysis of the information that Deutsche Telekom, the parent organization of T-Mobile USA, and MetroPCS have submitted for the record, it found that at least 75 percent of the equity and voting interest of the merged companies would be foreign-owned. The Commission found no evidence in the record that rebuts the presumption that foreign ownership will not harm U.S. market competition.

V. CONCLUSION

Although this transaction raises horizontal competition issues because it would result in the combination of overlapping mobile wireless coverage and services in various markets, the Commission found the proposed transaction is not likely to result in competitive or other public interest harms. The combination of T-Mobile USA and MetroPCS' spectrum assets will aid in the deployment of the latest generation mobile wireless service. Furthermore, it will enhance the ability of the newly merged companies to compete against the top three nationwide service providers. Thus, because potential public interest benefits outweigh any potential public harms, the Commission consented to the proposed transaction that would serve public interest.

Summarized by Matthew Stummer