

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the Matter of )  
 )  
Rapidly Deployable Aerial ) PS Docket No. 11-15  
Telecommunications Architecture Capable of )  
Providing Immediate Communications to )  
Disaster Areas )

To: The Public Safety and Homeland Security Bureau

**COMMENTS OF CTIA – THE WIRELESS ASSOCIATION®**

CTIA – The Wireless Association® (“CTIA”) respectfully submits these comments in response to the above-captioned Public Notice regarding issues related to the deployment of aerial telecommunications technology to provide immediate communications to disaster areas.<sup>1</sup> Wireless providers share the Commission’s goal of quickly restoring communications to protect life and property when disaster strikes. While we understand these goals and believe strongly that they are aligned with carriers’ goals, CTIA takes this opportunity to share its thoughts and potential concerns about the use of overlay wireless architectures in the event of a disaster.

The following comments identify several key considerations in any assessment of whether to pursue an aerial communications solution. First, any aerial deployment must involve prior coordination to ensure that airborne infrastructure of terrestrial-based radio services does not unintentionally interfere with other important services in the disaster region or nearby areas – particularly including interference to dynamic commercial wireless systems that successfully

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<sup>1</sup> Public Notice, *Public Safety and Homeland Security Bureau Seeks Comment on Rapidly Deployable Aerial Telecommunications Architecture Capable of Providing Immediate Communications to Disaster Areas*, 26 FCC Rcd 666 (PSHSB rel. Jan. 28, 2011) (“Public Notice”).

maintain operations in the disaster area or are in the process of promptly restoring service. Second, any decision to incorporate commercial mobile radio service (“CMRS”) spectrum into an aerial deployment must be at the express authorization of the relevant licensee. Third, any assessment of whether to include CMRS spectrum must address feasibility – for example, whether aerial transmissions create interference to elements of the cellularized architecture that remain in service, whether an aerial approach would provide adequate capacity for users of CMRS service, and whether resources committed to coordinating and deploying an aerial technology following a disaster would be better dedicated to restoring the terrestrial wireless infrastructure and expanding capacity. Ultimately, the Commission should ensure that any such deployments avoid hampering the ability of consumers to make and receive calls and wireless providers to maintain or restore commercial service promptly in a disaster area.

## **I. INTRODUCTION**

At the outset, it is important to note that time and again, the Commission has recognized the value that commercial wireless services provide to residents, aid workers, and first responders in the aftermath of disasters. For example, the Commission has acknowledged the role that wireless services played on September 11, 2001, notifying first responders and medical personnel of the urgent need for their services and aiding the restoration and security efforts across all levels of government.<sup>2</sup> After Hurricane Katrina struck the Gulf Coast, the Commission noted the importance of having resilient and reliable wireless communications because “the

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<sup>2</sup> See *New Part 4 of the Commission’s Rules Concerning Disruptions to Communications*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 16830, 16836 ¶ 10 (2004); see also *Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Agency Communication Requirements Through the Year 2010; Establishment of Rules and Requirements for Priority Access Service*, Second Report and Order, 15 FCC Rcd 16720, 16725 ¶ 10 (2000) (“In general, Federal, State and local government public safety organizations are increasingly using CMRS systems.”).

public, public safety personnel, and hospitals, among others, rely heavily” on such services.<sup>3</sup> The Commission elsewhere has observed, “[t]he importance of wireless communications for public safety is critical, especially as consumers increasingly rely upon their personal wireless service devices as their primary method of communication.”<sup>4</sup> As the Commission considers aerial telecommunications architectures as a short-term solution to communications outages in disaster areas, it should ensure that any initiatives in this area avoid undermining commercial wireless networks and other important services.

CTIA commends the Public Safety and Homeland Security Bureau (“Bureau”) for issuing this Public Notice seeking input on whether aerial telecommunications architecture can serve as an effective solution in a post-disaster scenario. Wireless providers have significant experience maintaining, restoring, and expanding service in the immediate aftermath of disasters that will prove helpful in this assessment. As discussed below, deploying an aerial base station creates geographic- and frequency-adjacent interference concerns to CMRS services because of the density of low power sites used in cellularized architecture. These issues are even more pronounced where only a portion of the terrestrial wireless system is experiencing an outage in a disaster area.

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<sup>3</sup> *Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks*, Order on Reconsideration, 22 FCC Rcd 18013, 18022 ¶ 23 (2007).

<sup>4</sup> *Petition for Declaratory Ruling to Clarify Provisions of Section 332(c)(7)(B) to Ensure Timely Siting Review and to Preempt Under Section 253 State and Local Ordinances that Classify All Wireless Siting Proposals as Requiring a Variance*, Declaratory Ruling, 24 FCC Rcd 13994, 14008 ¶ 36 (2009) (subsequent history omitted).

## **II. AN AERIAL TELECOMMUNICATIONS DEPLOYMENT FOR IMMEDIATE COMMUNICATIONS IN DISASTER AREAS MUST BE COORDINATED WITH OTHER KEY SERVICES TO AVOID INTERFERENCE.**

The use of aerial telecommunications architecture as a temporary fill-in infrastructure for disrupted communications systems creates a new interference dynamic for terrestrial services that must be addressed prior to deployment – not while carriers are doing all within their power to maintain or restore service. Even the deployment of such systems by public safety entities using their own spectrum requires consideration of the consequences to other services. Prior coordination with other services is imperative.

The Public Notice seeks comment on the rapid deployment of aerial systems such as “unmanned aerial vehicles or balloon mounted or unmounted systems” within hours after disaster strikes.<sup>5</sup> It envisions an architecture that would restore existing communications services that otherwise operate via terrestrial wireless infrastructure. Importantly, the Bureau asks “how to best ensure spectrum coordination” between an aerial deployment and “terrestrial and satellite infrastructure in the affected or adjacent areas.”<sup>6</sup> It goes on to ask whether specific interference mitigation efforts should be adopted “to ensure that terrestrial and satellite infrastructure are not negatively impacted....”<sup>7</sup>

Transitioning a wide-area radio communications service from terrestrial infrastructure to an aerial architecture necessarily creates a new interference scenario that must be accounted for prior to deployment. Technical rules governing existing services set maximum power levels relevant to antenna heights, which do not take into account aerial transmissions. Rules crafted to

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<sup>5</sup> Public Notice at 1.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.*

protect licensed users from out-of-band emissions and intermodulation interference would require re-evaluation in the context of an aerial architecture, let alone any technical rule waivers that aerial deployment might require. Further complicating the task of managing deployment of an aerial architecture when disaster strikes is the flurry of *ad hoc* wireless rule waivers and requests for special temporary authority as existing providers alter their usual operating parameters to execute recovery and restoration plans while emergency personnel enter the region. Indeed, the Commission granted more than 90 STA requests and 100 temporary frequency authorizations for short-term emergency wireless and broadcast operations in the wake of Hurricanes Katrina and Rita.<sup>8</sup> The risk of inserting aerial transmissions includes interference to commercial wireless systems that successfully maintained operations in the disaster area or that will restore service promptly. For example, in the immediate wake of Hurricane Katrina, thousands of cell sites in the affected areas remained operational at the same time that the wireless industry was able to repair damaged cell sites and switches, put up new cell sites, and distribute over 25,000 wireless phones to individuals in the affected area.<sup>9</sup> Interference to public safety networks operating in areas adjacent to the affected area also risk interference from aerial transmissions.

If aerial communications architectures are deemed an effective short-term solution, deployments must be carefully coordinated with other providers and diligently managed to avoid

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<sup>8</sup> See Written Statement of Kevin J. Martin, Chairman, Federal Communications Commission at Hearing on Public Safety Communications from 9/11 to Katrina: Critical Public Policy Lessons, Before the Subcommittee on Telecommunications and the Internet, Committee on Energy and Commerce, U.S. House of Representatives (Sept. 29, 2005), 2005 FCC LEXIS 5321 \*21-31.

<sup>9</sup> Comments of CTIA-The Wireless Association®, Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks, EB Docket No. 06-119 (Aug. 7, 2006).

adversely impacting the capacity or coverage of wireless services during these critical times. The Commission should require that any aerial telecommunications architectures – regardless of spectrum deployed – engage in both prior and real-time, continuous coordination with public safety, commercial wireless, and broadcast licensees that could be adversely impacted by such deployment. Any deployment of aerial telecommunications architectures that fails to coordinate with these other licensees risks doing more harm than good to consumers and their post-disaster communications.

**III. A DECISION TO DEPLOY COMMERCIAL SPECTRUM IN AN AERIAL ARCHITECTURE MUST BE EXPRESSLY AUTHORIZED BY THE RELEVANT LICENSEE AND ANY SUCH USE SHOULD TAKE INTO ACCOUNT SEVERAL IMPORTANT CONSIDERATIONS.**

The Public Notice seeks comment on the use of aerial solutions capable of enhancing public safety and emergency response communications “over a multitude of platforms (e.g., HF, UHF, VHF, cellular, Internet, and satellite).”<sup>10</sup> As a threshold matter, the Bureau should clarify that the deployment of commercial spectrum in an aerial architecture is subject to the express approval of the relevant licensee, whether the intended use is for public safety-related operations or general use. Arrangements to dedicate use of certain commercial spectrum to first responders in the aftermath of disaster is not unprecedented – through spectrum leasing or other operational arrangements – but such operations should commence and continue only pursuant to the express authorization of the relevant licensee.<sup>11</sup>

Beyond this fundamental issue of the right to access licensed spectrum, any consideration of an aerial solution must assess feasibility issues – first and foremost, whether it makes sense to

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<sup>10</sup> Public Notice at 1.

<sup>11</sup> See *Recommendations of the Independent Panel Reviewing the Impact of Hurricane Katrina on Communications Networks*, Order, 22 FCC Rcd 10541, 10551 ¶ 26 n.45 (2007).

set up an entirely distinct, short-term communications infrastructure. The cellularized architecture of a CMRS network utilizes very low power levels from the handset – 0.6 watts maximum, a high density of cell sites, and much greater frequency reuse than a typical public safety network. Public safety radios may use up to five (5) watts of power and a small number of base stations. One cannot easily substitute a CMRS network and network capacity for an aerial network architecture, where a single base station in the sky replaces a higher density cellularized architecture without severely impacting base stations in range or the aerial system. The range of relatively weak cellular handsets also will limit the coverage area the aerial equipment offers.

In addition, the network architecture at times may change in the event of a natural or man-made disaster. Network operators may substitute coverage for capacity, or may coordinate restoration efforts with a compatible carrier, in essence creating a patchwork of coverage across more than one network. With decades of experience operating CMRS networks, wireless providers have a deep understanding of how disasters affect their networks and how to promptly operationalize recovery plans to restore and expand service in a disaster area. CTIA has identified three key areas in assessing the feasibility of aerial deployments with regard to the use of CMRS spectrum.

**A. Impacts on Wireless Service Providers' Recovery Efforts.**

One important consideration is the utility of launching a stop-gap solution for CMRS service if the terrestrial infrastructure is not completely rendered inoperable or can be restored in the short-term.

In many disasters, substantial numbers of cell sites remain operational, or carriers can stand them up relatively quickly. However, the coverage footprint of an unmanned aerial vehicle or balloon may be broader than the outage pockets and unable to distinguish between impacted

and non-impacted service areas. To operate the aerial architecture absent interference, the wireless provider may need to shut down those portions of its network within the footprint that are operational – reducing network capacity and further hindering restoration efforts.

Further, when disasters occur, carriers launch into detailed emergency response and operation procedures – many of which were developed through CTIA’s Business Continuity / Disaster Recovery Program.<sup>12</sup> An aerial solution, however, will require substantial coordination and management with respect to the terrestrial CMRS providers’ network – as noted above – to ensure that such deployments are interoperable and will not cause interference to adjacent spectrum licensees or network operations unaffected by the disaster. Such coordination also risks diverting carrier resources and personnel from its own disaster recovery efforts, thereby delaying carriers’ restoration of the overall network.

#### **B. Operational Efficiency.**

In disaster scenarios, restoring network capacity is often the primary challenge. A logical evaluation would need to assess the level of capacity that an aerial solution would furnish compared to deploying, or sharing with another carrier, resources that restore a high capacity, cellularized architecture and backhaul for terrestrial facilities. The potential benefits of an aerial solution, compared to a terrestrial network restoration plan, may not be worthwhile. In addition, the question arises whether an aerial architecture would be capable of supporting a full contingent of existing services and the broad range of devices and capabilities citizens expect

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<sup>12</sup> CTIA’s Business Continuity / Disaster Recovery program helps carriers evaluate and prepare contingency plans in emergency situations based on an individual risk assessment of a carrier’s network taking into account the specific environmental, topographical, geographical, population, and cultural circumstances that influence the network. Participating carriers meeting the necessary planning standards and objectives certify annually. *See* Comments of CTIA, *Effects on Broadband Communications Networks of Damage to or Failure of Network Equipment or Severe Overload*, PS Docket No. 10-92, at 5-6, Appendix A (filed June 25, 2010).



from their network providers. Specifically, a complete solution would need to support the numerous CMRS frequency bands and air interfaces currently in use. Many of the basic services customers use today, such as inbound call delivery or short message service (“SMS”), would require that the aerial platforms and their downlinks be integrated with wireless carriers’ switches, Home Location Registers (“HLRs”), data nodes, and/or the Local Exchange Routing Guide (“LERG”).

### **C. Compliance with Required Services.**

Finally, in the aftermath of a disaster, a significant portion of the traffic on wireless networks involves 9-1-1 calls and communications between key national security and emergency preparedness (“NS/EP”) personnel. The Commission should examine whether an aerial architecture would complete 9-1-1 calls to the appropriate PSAP and whether it would relay accurate location information. Further, many wireless providers participate in the Wireless Priority Service (“WPS”) program through contracts with the National Communications System. The Commission should seek to ensure that any aerial solution is capable of complying with WPS protocols to ensure NS/EP personnel communications. Finally, the Commission also must consider whether aerial solutions will be able to support Commercial Mobile Alert Service (“CMAS”).

## **IV. CONCLUSION**

Wireless providers share the Bureau’s goal of quickly restoring communications to protect life and property when disaster strikes. In assessing the appropriateness of aerial telecommunications technologies, the Commission should weigh the above-noted considerations as to the impact on other services and the feasibility for CMRS in particular. Ultimately, the

Commission must ensure that any short-term solution does not hinder the continued operation and restoration of commercial service, which plays a critical role in public safety and homeland security communications.

Respectfully submitted,

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