Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency	)	PS Docket No. 11-15

NOTICE OF INQUIRY

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Comment Date: [40 days from publication in the Federal Register]
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By the Commission: Chairman Genachowski and Commissioners McDowell, Clyburn, Rosenworcel, and Pai issuing separate statements.

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I. INTRODUCTION

1. This Notice of Inquiry (NOI) examines the role of deployable aerial communications architecture (DACA) in facilitating emergency response by rapidly restoring communications capabilities in the immediate aftermath of a catastrophic event. Following the events of September 11 and Hurricane Katrina, the 9/11 Commission and the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina, respectively, prepared and submitted reports that identified communications failure as a severe impediment to emergency response.[1] Disasters, regardless of size or the level of devastation, teach us about the importance of emergency communications for managing and coordinating a response, maintaining the rule of law, and keeping the public safe and fully informed. Terrestrial communications services are often disrupted during these emergencies,[2] complicating even the most prepared response effort. DACA technologies could enable emergency management officials, first responders, critical infrastructure industry (CII) personnel, and the public to use their day-to-day communications devices seamlessly[3] during and immediately after an emergency.

2. As a result of National Security Presidential Directive 51 (also known as Homeland Security Presidential Directive 20, or NSPD 51/HSPD 20), the Commission has been assigned the "Primary Mission Essential Function" to "ensure continuous operations and reconstitution of critical communications and services."[4] Our colleagues in other Federal agencies, as well as state, and local governments are also constantly working to improve their emergency communications capabilities, and the communications industry has invested billions of dollars in emergency preparedness and response capabilities. Yet there remains a gap during the first 72 hours after a catastrophic event when communications may be disrupted or completely disabled due to damaged facilities, widespread power outages, and lack of access by restoration crews into the affected area. The United States Armed Forces use DACA technologies successfully in theater to provide communications in the absence of available infrastructure.[5] These technologies could potentially fill this gap for civilian communications as well and thereby further strengthen and enhance the security and reliability of the nation's communications infrastructure. Most significantly, the use of DACA to ensure quick restoration of emergency communications could save lives.

3. In this NOI, we explore the use of DACA to provide emergency communications during those first critical hours after a major disaster. The NOI explores the technologies that are or will be available, including innovative DACA technologies that are still in development. It also examines technical and operational issues associated with the use of DACA technologies, including interference and coordination issues, that must be addressed to enable their use, in order to increase the capabilities of emergency responders and provide the public with connectivity when it is needed the most.

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[1] *See e.g.,* National Commission on Terrorist Attacks Upon the United States, Final Report of the National Commission on Terrorist Attacks Upon the Unites States (2004) (*9/11 Commission Report*); A Failure of Initiative, Final Report of the Select Bipartisan Committee to Investigate the Preparation for and Response to Hurricane Katrina (2006) (*Katrina Report*).

[2] *Id*.

[3] *See, e.g.*, Comments of Daniel Devasirvatham at 4; Comments of AT&T at 7; Comments of APCO at 1; Comments of NPSTC at 3; and Comments of Arkansas Interoperable Communications Executive Committee at 2.

[4] *See* Memorandum from John O. Brennan, Assistant to the President for Homeland Security and Counterterrorism, to Department and Agency Heads (June 1, 2009); *see also* National Security Presidential Directive 51/Homeland Security Presidential Directive 20 (May 4, 2007), para. 5.

[5] *See, e.g.*, Comments of AeroVironment at 1; Comments of Aurora Flight Sciences Corporation at 1; Comments of Space Data Corporation at 2; and Comments of ViaSat at 2.

II. BACKGROUND

4. On January 28, 2011, the Public Safety and Homeland Security Bureau (Bureau) issued a public notice on potential technological solutions that could provide communications during and after a catastrophic event, when terrestrial communications infrastructures may be severely damaged or unavailable.[6] The *DACA PN* sought comment on a host of issues, including: the potential for DACA technologies to provide accessible, reliable, resilient, cost-effective, and secure communications over a multitude of platforms; operational concerns such as interference coordination and spectrum management before and during DACA deployment; and any costs associated with implementing, deploying, and maintaining DACA solutions. Eighteen parties submitted comments in response to the *DACA PN*.[7]

5. The majority of comments were supportive of the goals of facilitating the restoration of communications after a catastrophic event by employing DACA technologies.[8] Many comments indicated that existing technologies used by the military and commercially, such as unmanned aircraft, balloon-borne systems, and near space platforms, are available today and could support the restoration of commercial and public safety communications.[9] Some comments raised concerns regarding how the deployment of DACA technologies could complicate the interference environment and suggested the possible need for a rulemaking to consider interference and related issues.[10] Others identified a need to coordinate use of DACA with other federal agencies, such as the Federal Aviation Administration (FAA) and the Federal Emergency Management Agency (FEMA), as well as with state and local public safety officials.[11]

6. Comments submitted in response to the *DACA PN* facilitated the Bureau's development of the *DACA White Paper*, which examines various DACA technologies and their capabilities, as well as issues related to the use and deployment of DACA solutions.[12] The *DACA White Paper* observes the current limited use of DACA solutions by the commercial communications industry and the public safety community but notes its ongoing use by the United States Armed Forces to provide enhanced localized communications coverage in various spaces.[13] The *DACA White Paper* also addresses a number of promising DACA technologies, such as small unmanned aerial vehicles (SUAV), weather balloons

[6] *See* Public Safety and Homeland Security Bureau Seeks Comment on Rapidly Deployable Aerial Communications Architecture Capable of Providing Immediate Communications to Disaster Areas, PS Docket 11-15, *Public Notice*, 26 FCC Rcd 666 (PSHSB 2011) (*DACA PN*).

[7] The parties filing comments included AeroVironment, Inc., Association of Public-Safety Communication Officials (APCO), Arkansas Interoperable Communications Executive Committee, AT&T, Aurora Flight Sciences Corporation, CTIA -The Wireless Association (CTIA), Cohen, Dippell and Everist, P.C., Comsite Hardware, Inc., Daniel Devasirvatham, Emilio Lopez, Layer2 Connections, LLC, National Public Safety Telecommunications Council (NPSTC), Rex Buddenberg, Satellite Industry Association (SIA), Space Data Corporation, Spring Nextel Corporation, ViaSat, Inc., and WildBlue Communications, Inc.

[8] Comments of APCO at 1; Comments of AT&T at 1; Comments of CTIA at 3; Comments of Space Data Corporation at 1; Comments of ViaSat at 1.

[9] Comments of Aurora Flight Sciences Corporation at 1; Comments of Space Data Corporation at 2; Comments of ViaSat at 2.

[10] *See* Comments of AT&T at 4-5; Comments of Sprint Nextel at 1-2; Comments of CTIA at 4-5.

[11] Comments of APCO.

[12] *See* Federal Communications Commission, Public Safety and Homeland Security Bureau, *White Paper: The Role of Deployable Aerial Communications Architecture in Emergency Communications and Recommended Next Steps* (2011) (DACA White Paper), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/DOC-309742A1.pdf (last visited May 22, 2012).

[13] *Id.* at 4.

(balloons), high altitude long distance unmanned vehicles (HALE), and deployable suitcase systems[14], that could be deployed during the first 72 hours after a disaster to help ensure communications capabilities without requiring deployment of special user devices.[15] The *DACA White Paper* also examines regulatory governance issues relevant to the deployment and use of DACA solutions, including spectrum use, interference mitigation and coordination, international considerations, and inter-agency coordination of DACA solutions. Finally, the *White Paper* includes a set of recommendations to the Commission aimed at further exploring the potential of DACA technologies and solutions, including the convening of a workshop to further build the record for a proceeding.[16]

7. On October 31, 2011, the Bureau convened a workshop to examine DACA technologies. The workshop consisted of three expert panels addressing: (1) uses of DACA and its benefits; (2) potential DACA technologies; and (3) technical issues associated with the deployment of various DACA technologies and solutions. The first panel explored the lessons learned from successful DACA deployments and identified the need to develop a better sense of situational awareness, the importance of taking into account the power requirements and weight limitations of various DACA technologies, and lessons learned from deployment and use of DACA technologies.[17] The second panel focused on successful DACA technologies that have been deployed and tested around the world, such as autonomous radio networks, lighter than air communications systems, off-the-shelf suitcase repeaters, and high altitude long endurance aircraft.[18] The third panel explored issues relating to the operational and system performance of DACA solutions.[19] Specifically, panelists discussed issues such as interference, coverage,

[14] The DACA White Paper describes these as "deployable suitcase transceivers that can be placed on low flying aircraft to be used as repeaters." *See DACA White Paper* at 7; *see also* Comments of Arkansas Interoperable Communications Executive Committee at 1-2.

[15] *See id.* at 5.

[16] *Id*. at 10. The *DACA White Paper* also recommended sharing and discussing findings as well as possible next steps for pilot programs, with federal partners such as the FAA, FEMA, and the Department of State. *See id*. at 9.

[17] *See* Remarks and presentation of Vincent (Tex) Boyer, Chief, Emergency Communications and Regional Emergency Communications Coordinator, Federal Emergency Management Agency Region IV, (October 31, 2011) (*Boyer Remarks and Presentation*); Remarks and presentation of Captain James Cash, Chief, C4IT and Sensor Capability, United States Coast Guard, (October 31, 2011) (*Cash Remarks and Presentation*); Remarks and presentation of Brian Steckler, Director, Hastily Formed Networks Center, Naval Postgraduate School, (October 31, 2011) (*Steckler Remarks and Presentation*); and Remarks and presentation of Dr. Edwin "Ted" David, Leader, Advanced System Concepts Group, MIT Lincoln Laboratory, (October 31, 2011) (*David Remarks and Presentation*). These presentations were made at the *DACA Workshop* and are available in PS Docket No. 11-15.

[18] *See* Remarks and presentation of Robert "Bob" Buckle, CEO, Intelcomm, Ltd., (October 31, 2011) (*Buckle Remarks and Presentation*); Remarks and presentation of Gerald Knoblach, Co-founder, Chairman and CEO, Space Data Corporation, (October 31, 2011) (*Knoblach Remarks and Presentation*); Remarks and presentation of Penny Rubow, Director, Arkansas Wireless Information Network, State of Arkansas, (October 31, 2011) (*Rubow Remarks and Presentation*); and Remarks and presentation of Ted Wierzbanowski, Director, UAS Airspace Integration, AeroVironment, (October 31, 2011) (*Wierzbanowski Remarks and Presentation*). These presentations were made at the *DACA Workshop* and are available in PS Docket No. 11-15.

[19] *See* Remarks and presentation of David Buchanan, Chair, National Public Safety Telecommunications Council Spectrum Committee, (October 31, 2011) (*Buchanan Remarks and Presentation*); Remarks and presentation of Jim Bugel, Assistant Vice President, Public Safety and Homeland Security, AT&T, (October 31, 2011) (*Bugel Remarks and Presentation*); Remarks and presentation of Dr. Daniel M. Devasirvatham, CTO, Applied Technology Division, Defense and Maritime Solutions, SAIC, (October 31, 2011) (*Devasirvatham Remarks and Presentation*); Remarks and presentation of Al Johnson, Director, Integrated Information and Communications Technology Support, Office of the Assistant Secretary of Defense Networks and Information Integration, CIO, United States Department of Defense, (October 31, 2011) (*Johnson Remarks and Presentation*); Remarks and presentation of Brian M. Josef, Assistant Vice President, Regulatory Affairs, CTIA - The Wireless Association, (October 31, 2011) (*Josef Remarks and Presentation*); and Remarks and presentation of Michael Roberts, Senior Systems Engineer, CoCo Communications Corp, (October 31, 2011) (*Roberts Remarks and Presentation*). These presentations were made at the *DACA Workshop* and are available in PS Docket No. 11-15.

capacity, and power, as well as licensing and standards development. These issues and recommendations from the workshop and the observations and analysis reflected in the *DACA White Paper* are further examined in this NOI to determine appropriate next steps to further the use of DACA technologies.

III. NOTICE OF INQUIRY

8. This NOI further examines the potential for DACA technologies to provide communications when terrestrial communications infrastructures are disrupted or disabled due to a catastrophic event. To that end we seek comment on the role of DACA, the technical network service and platform descriptions of various DACA technologies that are currently available or in development, and the scope of their use in the aftermath of a catastrophic event, as well as how to best coordinate operations and spectrum availability and authorization matters. We also seek comment on system performance of DACA technologies, as well as coverage, capacity, interference, power consumption, and the interoperability of DACA technologies with existing communications services and infrastructure, among other issues.

A. DACA Technologies

9. The *DACA White Paper* identified several promising DACA technology platforms that could be deployed shortly after a disaster to support communications without requiring deployment of any special user devices. These include small unmanned aerial vehicles, weather balloons, and suitcase based systems.[20] The *DACA Workshop* also recognized various DACA technologies that can provide critical communications as either a standalone aerial platform or an add-on payload.[21] We seek comment on the ability of each of the various DACA technologies, either as standalone aerial platforms or add-on payloads, to deliver critical communications immediately after a catastrophic event. We also seek comment on each DACA technology's ability to support existing communication services and devices. Based on past experience, we believe that it is critical that the devices consumers and first responders use on a day-to-day basis be able to work with DACA systems. Are there other technological solutions similar to DACA that are ground based, such as drop-in suitcase architectures, that would be equally adept at restoring commercial and public safety communications to an area?

10. The United States Armed Forces, particularly the National Guard, are recognized as emergency responders in the aftermath of major disasters across the United States. The record in response to the *DACA PN* showed that the U.S. Armed Forces have used DACA technologies successfully.[22] What DACA technologies are the United States military currently using and in what situations are they used? Are they used domestically, internationally, or both? What has been the experience of the U.S. Armed Forces with such use? What lessons can we learn from the military's use of these technologies? Are there relevant differences between military use and civilian use that should be taken into account? What are the costs and benefits associated with such use?

11. We seek comment on the availability and cost of DACA technology platforms. Are these technologies commercially available today? If they are not, what are the plans for development? What are the capital costs of DACA platforms, either as standalone aerial systems, add-on technologies,

[20] *See, e.g.,* Comments of AeroVironment at 1; Comments of Arkansas Interoperable Communications Executive Committee at 1-2; Comments of Space Data Corporation at 2-4.

[21] *See Buckle Remarks and Presentation*; *Knoblack Remarks and Presentation*; *Rubow Remarks and Presentation*; *Wierzbanowski Remarks and Presentation*.

[22] Comments of AeroVironment at 1; Comments of Aurora Flight Sciences Corporation at 1; Comments of Space Data Corporation at 2; and Comments of ViaSat at 2.

or alternative ground based solutions? What are the operational costs of these platforms? Could access to these platforms be leased or shared among multiple entities as a means of reducing costs? We also seek comment on the advantages and disadvantages of each solution as well as the cost.

12. We seek comment on the capabilities of each DACA technology to support commercial and public safety communications services. Vincent "Tex" Boyer, Chief, Emergency Communications and Regional Emergency Communications Coordinator, Federal Emergency Management Agency (FEMA) Region IV, suggested at the *DACA Workshop* that Civil Air Patrol (CAP)[23] personnel could deploy fixed-wing, single-engine aircrafts with existing repeater packages to "provide a low cost solution to this problem."[24] Is the use of CAP a viable approach? Are there other volunteer organizations that have similar capabilities? We note that other participants in the DACA workshop addressed the cost-effectiveness of unmanned aerial vehicles, weather balloons, and high altitude platforms.[25] How does the cost compare for each system? Is one approach more cost effective than the others? What are the benefits of each technology relative to its cost?

13. AT&T and AeroVironment have stated that weight may be a limiting factor in how many communications payloads DACA technology can support at a time. We seek comment on this observation. Are certain technologies or communications payloads not appropriate for use in DACA because of weight? If so, what if any solutions are possible to mitigate weight limitations? What impact, if any, does weight have on the cost effectiveness of DACA deployments?

14. We also seek comment on whether DACA technologies are being used in other countries. What has been the experience with these technologies abroad? Have they worked successfully? If there have been problems, what were they, and if they were solved, how? Have other countries found DACA technologies to be a cost effective solution to restore communications after major disasters? Have any countries discontinued the use of DACA technologies. If so, for what reasons?

B. Scope of DACA Usage and Coordination of Operations

15. The 9/11 Commission Report noted challenges related to establishing incident command structure and coordinating response efforts among many different agencies during the September 11 terrorist attacks.[26] The Katrina Report stated in its finding that "Command and Control was impaired at all levels of government."[27] We seek comment on the appropriate emergency response coordination necessary to successfully deploy DACA solutions in the aftermath of a catastrophic event to establish emergency communications. How are incident command structures established and do these structures in the commercial sector differ from those used by the military? If so, what lessons can we learn from each? How can an Incident Command System (ICS) make use of DACA solutions? What are the costs of establishing operational tools and capabilities that use DACA in support of ICS?

16. We also seek comment on real-time coordination during emergency response efforts when using DACA solutions. Panelists from the *DACA Workshop* agreed that prior coordination is vital to DACA deployment and use.[28] Should any agency of the federal government, or a combination of

[23] Civil Air Patrol is the civilian volunteer auxiliary of the U.S. Air Force.

[24] *See Boyer Remarks and Presentation* at 16.

[25] *See Josef Remarks and Presentation* at 3; *Knoblach Remarks and Presentation* at 9.

[26] *See 9/11 Commission Report*.

[27] *See Katrina Report*.

[28] *See Steckler Remarks and Presentation*; *Josef Remarks and Presentation*.

agencies, be responsible for coordinating the deployment and use of DACA technologies and solutions during emergencies? What about state or local agencies? Could they be responsible for coordinating the use of DACA solutions during disasters? How could a regime be structured to support an approach that encompasses representatives from various federal, state, and local agencies? Should DACA solutions be stationed across the United States, like the Civil Air Patrol, so that they are readily deployable?

17. We next seek comment on ensuring that DACA usage complies with the regulations and operational constraints of the U.S. national airspace system. How should DACA system usage be coordinated with other government agencies that have a role with regard to emergency response and air traffic control, in particular the Federal Aviation Administration (FAA)? What role should the Federal Emergency Management Administration (FEMA), the National Guard, and state and local emergency response agencies play with respect to coordination with the FAA? In seeking comment on FAA coordination, we observe that the FAA Modernization and Reform Act of 2012 directs the Secretary of Transportation to develop, in consultation with Federal government and industry stakeholders, a plan for integrating civil unmanned aircraft systems into the national airspace system by September 30, 2015.[29] Are there considerations that should be taken into account as this plan is developed to ensure that DACA systems in particular are properly integrated?

18. AT&T states that DACA technologies should only be utilized as a last resort, where other existing terrestrial options for restoring service are inadequate to address the circumstances, to avoid impeding the restoration efforts that carriers typically bring to bear in these types of emergency situations.[30] We seek comment on this approach. If we adopted a requirement that restricted DACA deployment to "last resort" scenarios, how should "last resort" be defined? Who should make this determination (*e.g.*, FEMA, the National Guard, or a state or local emergency response official)? Should we allow waivers of this requirement so that deployment of DACA-based solutions can be used at earlier points during emergencies? How should we define the general parameters for such a waiver? Should there be a plan to prepare and test the use of DACA solutions? Should training of personnel for the use of DACA technologies be required? Who should manage, fund, and coordinate training exercises and resources? Who should participate? What are the costs associated with these training exercises and what entity should bear these costs?

19. An important consideration in authorizing the use of DACA during emergencies is the coordinated introduction and operation of these technologies among various federal, state and local agencies responding to an event. In the wake of Hurricane Katrina, the Naval Postgraduate School produced an "after action and lessons learned report" that describes the use of hastily formed networks (HFN) to create "the first and only official and publicly accessible set of broadband wireless hotspot clouds in an area that suffered virtually 100% disruption of all communications capabilities."[31] The report states that the biggest challenge they faced was not deploying or maintaining HFNs but coordinating operations among the conflicting civilian and military command structures.[32] We seek comment on appropriate protocols or procedures to coordinate both civilian and military emergency

[29] FAA Modernization and Reform Act of 2012, Pub. L. 112-95, 126 Stat. 11, 61 § 332 (2012). *See also* Federal Aviation Administration, "FAA Makes Progress with UAS Integration," http://www.faa.gov/news/updates/?newsId=68004 (last visited May 22, 2012).

[30] Comments of AT&T at 6-7.

[31] *See* Brian Steckler, Bryan L. Bradford, and Steve Urrea, Hastily Formed Networks for Complex Humanitarian Disasters After Action Report and Lessons Learned from the Naval Postgraduate School's Response to Hurricane Katrina (2005), *available at* http://faculty.nps.edu/dl/HFN/documents/NPS_Katrina_AAR-LL_04-MAY-06.pdf (last visited May 22, 2012).

[32] *Id.*

response activities involving the use of DACA solutions. What role should (or could) the Commission play in deciding when and whether to implement DACA solutions? What procedures should be followed by military or civilian personnel, and how should the Commission exercise its authority to help further the creation of a process that would involve entities and functions that the Commission regulates and those that we do not? More specifically, we request comment on how to resolve critical issues that will straddle jurisdictional lines, such as determining priorities between military and commercial use of DACA systems, and deciding whether to establish guidelines for the use of DACA technologies to promote interoperability. If guidelines are warranted, what role should the Commission play in crafting them and determining what they should entail? Will different DACA technologies require different sets of guidelines? In assessing these questions, what approach would be most cost effective and efficient?

20. Next, we examine possible mechanisms for authorizing DACA systems' use of radio spectrum. As a threshold matter, we seek comment on how the control over and operation of DACA transmitters would fit into the current framework of the Communications Act and our rules, and how the regulatory authority of other agencies (*e.g.*, NTIA) will play into their operations. For DACA systems operating on spectrum of existing licensees, should the Commission pursue an approach that would authorize those licensees to own and operate DACA transmitters, or might third parties be authorized to serve as DACA operators? What types of entities (*e.g.* commercial carriers, federal agencies, state and local government jurisdictions) are likely to want to own and operate DACA transmitters? Could ownership or control of a DACA transmitter be shared among multiple entities? What effect on cost could one approach have over another?

21. We next seek more specific comment on the range of authorization mechanisms that may be appropriate for various circumstances in which DACA solutions may be deployed. Could existing station licenses already cover – or be modified to cover -- ownership and operation of DACA transmitters? Commenters have suggested that various rule changes may be necessary or desirable as well.[33] To the extent DACA operations are conducted by FCC licensees, what type of adjustments would need to be made in our rules? Would license modifications be necessary? To the extent that third parties own and operate DACA solutions that operate over spectrum allocated for Non-Federal use, we seek comment on how their operations should be authorized. Should third party operators of DACA transmitters pursue special licenses or Special Temporary Authorizations (STAs) from the Commission, or could the operator pursue a lease or other authorization from the existing licensee? If a third party operator pursues authorization directly from the Commission, should it first be required to notify or obtain the consent of the licensee? Are there other coordination requirements the Commission should consider imposing as a condition of any authorization to deploy DACA transmitters? Are there other authorization mechanisms the Commission should consider? Are there additional criteria that DACA operators should be required to satisfy in order obtain an authorization?

C. System Performance

1. Coverage

22. Adequate DACA coverage within the area affected by a disaster will be critical to the success of any DACA deployment. We seek comment on how to delineate the affected area for which a DACA solution is deployed. We seek comment on how to best achieve as much coverage of an affected

[33] *See, e.g.*, Comments of CTIA at 4-5 (stating that existing rules that address out-of-band emissions (OOBE) and intermodulation interference would require re-evaluation); Comments of AT&T at 4-5 (recommending that Commission should reexamine the extent to which its rules to abate interference to public safety networks would continue to apply if DACA technologies deploy public safety communications in the 800 MHz public safety spectrum).

area as possible. What are the factors that determine the extent of coverage by DACA platforms? How should coverage be measured? At the *DACA Workshop* Daniel Devasirvatham suggested deploying DACA platforms in stages, and at multiple altitudes, to quickly serve and restore communications.[34] We seek comment on this approach. Could deployment of DACA solutions in stages provide maximum coverage to both emergency first responders and the public? How should coverage be measured? Should a staged deployment include various DACA platforms at different heights for specific communication services? What are the advantages and disadvantages of this type of deployment? What are the costs associated with deploying DACA solutions in stages? We also seek comment on the ability of DACA technologies to provide geographic coverage over all geographies and terrains. With the varied topography of the United States, can DACA technologies provide adequate service in areas with mountainous regions or in tall buildings? Are there geographical limits on the types of DACA solutions that can be deployed, including in densely populated metropolitan areas? Can DACA technologies provide in-building coverage or service in geographically complex areas? Are there other technologies that can complement DACA technologies that might be better suited to providing coverage in more complex environments? What are the costs and benefits associated with deployment and operation of these complementary technologies?

2. Frequency Planning and Minimizing the Potential for Harmful Interference

23. The record demonstrates that frequency preplanning will be vital to successful deployment of DACA systems in order to avoid harmful interference and to enable terrestrial communications to be restored on an efficient and timely basis.[35] Accordingly, we seek comment on the frequency bands that are most suitable for DACA use. Vincent "Tex" Boyer stated at the *DACA Workshop* that FEMA, through the use of CAP aircraft, has mounted and used very high frequency (VHF) spectrum, ultra high frequency (UHF) spectrum, and spectrum in the 700 MHz band to successfully provide communications services in disaster areas.[36] Gerald Knoblach noted at the *DACA Workshop* that the forty narrowband VHF and UHF channels and forty 12.5 kHz channel pairs in the 900 MHz band that are licensed to Space Data could be used to support DACA solutions.[37] AT&T stated that 2G, 3G, 4G, GSM, UMTS, LTE, and cdma2000 network services and technologies will need to be incorporated as well.[38] On which frequency bands should DACA technologies be permitted to operate? Would use of DACA on certain bands interfere with public safety or other services? If so, in which bands and what solutions are available to minimize interference?

24. AT&T has expressed concern over the interference potential of DACA deployment in commercial bands used by services premised on cellular architecture, for which highly coordinated reuse of frequencies is essential.[39] AT&T suggests, however, that some of its interference concerns can be minimized if DACA technologies do not employ the commercial frequency bands and instead are limited to those bands used for unlicensed operations and other non-cellular-based technologies.[40] We seek comment on this observation. What effect would limitations on the use of commercial frequency bands have on emergency response? Are there cost implications to limiting the use of DACA in certain bands?

[34] *See Devasirvatham Remarks and Presentation*.

[35] *See Buchanan Remarks and Presentation*.

[36] *See Boyer Remarks and Presentation*.

[37] *See Knoblach Remarks and Presentation*.

[38] *See Bugel Remarks and Presentation*.

[39] *See* AT&T Comments at 3-4.

[40] *Id*.

If DACA technologies cannot be deployed supporting commercial bands, how would consumers be affected? Would limiting the use of DACA in commercial bands affect the ability of consumers to reach 911 during a wide-scale disaster where terrestrial infrastructure may not be available?

25. We seek comment on whether the Commission should authorize a third party to develop and maintain frequency assignments and or a database(s) to manage the use of DACA solutions to limit the interference potential among and between DACA and terrestrial uses. For example, Comsearch has indicated that it has successfully implemented frequency coordination plans as well as on-site spectrum monitoring and real-time frequency deconfliction.[41] If the Commission were to authorize a third party for spectrum coordination, how should it be selected? Should it be an existing entity, or should it be a newly formed entity representing industry, government, and other stakeholders? Should this entity be responsible for developing guidelines or requirements to better manage and coordinate the use of spectrum and interference mitigation as terrestrial networks are restored? Who, if anyone, should be responsible for developing a process or a standard operating procedure for deploying DACA systems? Comsearch suggests that "a centralized database approach offers several merits including: standardized data structures and format, efficiency in data provisioning, ease of maintenance, high accuracy and reliability, and streamlined interaction."[42] We seek comment on this "centralized database" approach. Could a "centralized database" be a viable option? Is so, what are the advantages and disadvantages of this approach and the associated costs? Are there existing frequency coordination models that could be adapted for DACA deployments? If a third party is used, what are the anticipated costs and who should bear them?

26. Several comments in response to the *DACA PN* raised the concern that use of certain DACA technologies may create harmful interference to commercial wireless services and other services.[43] To ensure that frequency reuse does not cause interference, wireless providers must ensure that they coordinate the transmitters in their network and coordinate with providers operating in adjacent markets on the same frequencies. We seek comment on whether similar procedures should be adopted for DACA technologies and, if so, what they should include. What are the costs of implementing various interference mitigation techniques for DACA technologies? Do the costs of each justify relying on them? If so, identify the specific costs and benefits.

27. Comments on the *DACA PN* also raised the concern that the mobile nature of DACA technologies increases the difficulty of frequency coordination.[44] Other than allocating dedicated spectrum for the use of DACA technologies, are there methods to ensure that frequency reuse does not cause interference or to minimize any such interference? Can DACA technologies use frequencies in areas where commercial base stations are out of service but have been coordinated with neighboring service markets? Once base stations that were out of service come back into service, can frequency reuse be coordinated with DACA technologies to limit interference? Could frequency reuse be managed by assigning unused base station frequencies that are not in service, within an existing system, essentially adding in a DACA system as if it were a planned base station? Are there other approaches to frequency coordination that the Commission should consider, such as existing cell selection mechanisms used in mobile handheld devices? What are the costs of allowing a DACA technology platform to serve as a base station? Do other frequency coordination approaches have costs? If so, what are they and will these

[41] Ex Parte Filing of Comsearch, PS Docket 06-229 at 2-3 (filed Nov. 8, 2011).

[42] *Id*.

[43] Comments of APCO at 1-2; Comments of AT&T at 2-3; Comments of CTIA at 1-2; Comments of NPSTC at 3-6; Comments of Rex Buddenberg at 4; Comments of SIA at 6; Comments of Sprint Nextel at 6.

[44] *See, e.g.,* Comments of AT&T at 3-5.

other approaches provide the same benefits of frequency reuse as coordinating with neighboring service markets?

28. Several commenters raised the concern that the use of DACA technologies during emergencies could overlap with the restoration of terrestrial services, potentially creating interference.[45] We seek comment on ways to avoid this problem. Are there procedures available that will enable DACA solutions to operate in an affected area and limit harmful interference to terrestrial network services as they are restored, and have these procedures been used? Does the military have such an approach in place? If so, has it been successful? Are there costs to avoiding the overlap and interference between DACA solutions and terrestrial network services, as services are restored? If so, what are these costs and do the benefits of implementing any procedures justify the costs?

29. We also seek comment on DACA signal propagation. The radio frequency transmission from these systems through free space (usually air) provides almost ideal conditions for signal transmission. Also, the radio frequency propagation distance can be extensive and cover a considerably larger footprint than terrestrial operations and deployable systems close to the ground. The larger coverage area increases the potential for harmful interference. At what altitudes could DACA systems potentially operate (*e.g.*, 250, 500, 1,000, 2,000, 10,000, 50,000 feet)? Is coverage dependent on which frequency is in use? What potential exists for interference with commercial network services that may remain operational during disasters or for cell sites and systems that are restored shortly after the disaster? What are the methods to mitigate or reduce the impact of these interference scenarios? What are the costs of implementing such methods and techniques? Do the benefits of interference mitigation justify the costs of implementation? What are the appropriate levels of interference for commercial and land mobile radio (LMR) systems to accept, if any, such that during the worst disasters DACA technologies could be deployed to provide the required communications? Are there frequencies that aerial systems could use and altitudes at which such systems could operate to minimize interference? Are there any limited, practical scenarios in which aerial transmissions could be used without creating interference? If the uplink (mobile user to DACA platform) radio communication path is assumed to be the weaker path because of lower transmit power levels than the downlink (DACA platform to mobile user), what is the desired and acceptable altitude for a DACA platform based on currently available LMR and commercial mobile radios? Does the threat of interference from an aerial platform increase or decrease as its altitude changes? Is there an optimum altitude that would limit interference? Do certain technologies have improved interference parameters? If so, which ones and why? Are the costs directly proportional to the increase or decrease in altitude?

30. Are there other methods available to mitigate the potential for harmful interference? For example, CTIA states that there needs to be advance coordination of the use of DACA technologies.[46] Is advance coordination sufficient, and what would be required to complete coordination? Are automatic interference coordination features feasible with existing and evolving technologies such as Long Term Evolution (LTE)? Should parties coordinate among themselves or should there be a third party frequency coordinator? If there is a third party frequency coordinator, how should it be selected? What role should the FCC play, if any? What would be the relevant costs and benefits?

31. We also seek comment on directional antennas and any other products that can help to mitigate or reduce interference. Can directional antennas be used to focus aerial transmissions on the desired service area in a way that would limit interference? Are there currently available off the shelf

[45] *See, e.g.,* Comments of APCO at 1-3; Comments of AT&T at 3-5; Comments of CTIA at 5-8; Comments of SIA at 6; Comments of Sprint Nextel at 6-8.

[46] Comments of CTIA at 1.

products that can be used today to help mitigate interference for use by DACA systems, or do products need to be developed? What types of aerial systems, if any, make use of currently available products that would limit interference? What are the costs of such systems and what are the benefits?

32. AT&T suggests that the use of tethered aerostats, *i.e.*, aerostats tethered to the ground, would minimize interference concerns and propagate a more predictable signal, especially if equipped with stabilizers to minimize movement of the aerostat that accompanies the use of DACA technology.[47] We seek comment on the suitability of tethered platforms. At what height could tethered systems operate to provide reliable service? Could tethered systems operate in the same frequency band as a commercial service provider? If tethered systems were deployed at only a few hundred feet, operating in the same frequency band as other base stations, could the height and service area of the platform be managed with proper frequency reuse? In such a scenario, could the system be considered an extension of the existing terrestrial network and coordinated in a proper manner to ensure that frequency reuse does not cause interference to existing base stations and adjacent systems? Should tethered systems be marked and illuminated, similar to fixed antenna structures, to avoid creating aviation hazards? What are the costs and benefits of such systems?

3. Interoperability

33. Interoperability is a central requirement of emergency response communications between multiple disciplines and agencies. If DACA technologies are used for emergency communications, it is critical to ensure that they preserve interoperability for emergency responders. How can existing public safety network services be accessed using DACA solutions while preserving interoperability? What are the technical and operational considerations for interoperability among existing communications network services and DACA technologies? What factors determine if DACA technologies can interoperate with existing communications network services? Are there or should there be any additional open technological standards that are considered to ensure interoperability? Could DACA solutions be interoperable with other base stations and systems operating in the same band and be considered an extension of the existing terrestrial network, coordinated in a proper manner for frequency reuse without any interference to existing base stations and adjacent systems? What are the costs of implementing interoperable DACA solutions, and do these outweigh the benefits?

C. Prioritization of Service and Access

34. DACA systems may have limitations in terms of the aggregate volume of traffic that can be supported by an aerial platform, due to factors such as the size, weight, and power of DACA technologies.[48] Such limitations may create a need to examine priorities among the various communications services that DACA systems might help restore. We seek comment on the issue of prioritizing certain communications services immediately following a catastrophic event. How would prioritization be implemented with these technologies? What are the highest priority communication capabilities and services for a DACA solution to support in times of emergency? Would public safety responder communications have the highest priority and thus have to be available first, before other commercial services could be available?

D. International Considerations

35. We recognize that radio transmissions, including from DACA transmitters, do not

[47] *See* Comments of AT&T at 4-5.

[48] *See, e.g.*, AT&T Comments at 5-6.

recognize political boundaries. For example, a DACA system operating in California may provide coverage to both California and Mexico, potentially impacting communications in Mexico. We note that U.S. agreements with Canada and Mexico covering commercial spectrum generally require licensees to abide by a maximum signal strength limit at (and beyond) the border.[49] Could DACA technologies operate in a way that would comply with the signal strength limits set forth in these agreements? If DACA technologies are unable to comply with technical criteria detailed in existing agreements with Canada and Mexico, we seek comment on what types of agreement would need to be reached with each country to permit DACA operations along the border.

36. Our agreements with Canada and Mexico covering public safety spectrum are generally based on the United States' dividing primary spectrum with the neighboring country.[50] Under this scenario, licensees are free to operate up to the border on channels designated as primary to their own country as long as they satisfy certain power and antenna height limits. Could DACA technologies be designed to comply with existing public safety agreements as long as they restrict their operation to spectrum designated as primary to the United States? If not, what changes to existing agreements would have to be made to permit deployment of DACA technologies in the public safety frequency bands?

E. CONCLUSION

37. Ensuring that communications are available immediately following a catastrophic event is critical to emergency response. DACA brings the promise of a new tool that can be rapidly deployed and utilized when terrestrial infrastructure is not available, potentially facilitating the use of day-to-day commercial and public safety devices. This capability could save lives. We intend for the record generated by this proceeding to provide the opportunity for a thorough discussion of DACA technologies and solutions that address system performance, service prioritization, and governance issues.

IV. PROCEDURAL MATTERS

A. Ex Parte Presentations

38. The proceeding this Notice initiates shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[51] Persons making *ex parte* presentations must file a

[49] *See, e.g.*, Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of The United States of America Concerning The Use of The Frequency Bands 698-758 MHz And 776-788 MHz For The Fixed And Land Mobile Services Along The Canada-United States Border (Arrangement O) attached to Letter from Julius Genachowski, Chairman, Federal Communications Commission to Ms. Helen McDonald, Assistant Deputy Minister, Spectrum, Information Technologies and Telecommunications, Industry Canada (July 13, 2011); Protocol Between the Department of State of the United States of America and the Secretariat of Communications and Transportation of the United Mexican States Concerning the Allotment and Use of the 698-806 MHz Band for Terrestrial Non-Broadcasting Radio communication Services Along the Common Border as amended on Feb. 3, 2011.

[50] *See, e.g.,*. Sharing Arrangement Between the Department of Industry of Canada and the Federal Communications Commission of the United States of America Concerning the Use of The Frequency Bands 806-824 MHz, and 851-869 MHz by the Land Mobile Service Along the Canada-United States Border (Arrangement F) attached to Letter from Ms. Helen McDonald, Assistant Deputy Minister, Spectrum, Information Technologies and Telecommunications, Industry Canada to Julius Genachowski, Chairman, Federal Communications Commission (July 18, 2011): Protocol Between the Department of State of The United States of America and The Secretariat of Communications and Transportation of the United Mexican States Concerning the Allotment and Use of the 806-824 MHz, 851-869 MHz, 896-901 MHz and 935-940 MHz Bands For Terrestrial Non-Broadcasting Radiocommunication Services Along the Common Border (June 1994).

[51] 47 C.F.R. §§ 1.1200 *et seq*. Although a Notice of Inquiry proceeding is generally exempt from the *ex parte* rules, we find that the public interest is best served by treating this matter of critical importance to the reliability of our Nation's communications networks as a "permit-but-disclose" proceeding. *See* 47 C.F.R. §§1.1200(a), 1.1204(b)(1).

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 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. 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. 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.

B. Comment Filing Procedures

39. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply 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.

C. Accessible Formats for People with Disabilities

40. 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 & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

V. ORDERING CLAUSE

41. Accordingly, IT IS ORDERED that, pursuant to sections 1, 4(i), 4(j), 4(o), 7(b), 301, 316, and 403 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i)-(j) & (o), 157(b), 301, 316 and 403, section 1.430 of the Commission's Rules, 47 C.F.R. § 1.430, this Notice of Inquiry IS ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI

Re: *Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency*, PS Docket No. 11-15.

This item is one of several we have considered at the Commission, including another later today, that seem like science fiction – but antennas in the sky are fact, not fiction.

When disaster strikes, our ground-based communications infrastructure can of course be damaged. And as reliant as we have become on communications for public safety and the business of life, this can severely complicate even the best-prepared emergency response efforts.

Deployable Aerial Communications Architecture has the ability to temporarily restore critical communications – including emergency response and 911 calling. And it can potentially restore communications quickly, in the first hours after a disaster strikes.

The idea, though technologically complex, is relatively straightforward: sending self-powered antennas into the sky, that can provide floating 3G, LTE, or Wi-Fi service. We know this technology can work. It is already being used by the U.S. military.

This technology would have been remarkably useful after Hurricane Katrina, for example, when thirty-eight 911 call centers became inoperable and more than 3 million customers lost telephone service.

We're launching this proceeding to accelerate the availability and use of this technology for domestic emergency services. Building on the work of our Public Safety and Homeland Security Bureau, we expect this Notice of Inquiry will help us answer a number of outstanding questions.

For example, how to protect terrestrial networks from harmful interference. And what is the most efficient way to activate this technology during an emergency.

Public safety remains a top agency priority, and there's been much progress on harnessing advanced communications technology to empower first responders and save lives – including the accelerated launch of the new system that allows authorities to send targeted alerts to peoples' mobile devices during an emergency, important steps toward next-generation 911, and the funding and legislative adoption of a framework to stand up a nationwide interoperable mobile broadband public safety network.

Of course, realizing the potential of this technology will be a joint effort. I want to acknowledge the work of our industry and government partners. Particularly, thank you to Brian Steckler of the HFN Center for joining us today. Brian Conner, who is part of the Unmanned Aircraft Group at the FAA, is also here, and thank you for your work.

Finally, thank you to my fellow Commissioners and the staff of the Public Safety Bureau for their work on this item.

STATEMENT OF
COMMISSIONER ROBERT M. McDOWELL

RE: *Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency*, PS Docket No. 11-15.

Thank you David Furth and your talented team in the Public Safety and Homeland Security Bureau for their thoughtful work in putting together today's Notice of Inquiry on deployable aerial communications architecture (DACA). I also thank the many commenters for your significant contributions in response to the Bureau's Public Notice and the subsequent DACA white paper. This has been a beneficial partnership.

I am pleased that we are exploring the use of aerial devices and systems to provide emergency communications immediately after a catastrophic event -- when communications are inaccessible due to damaged facilities, power outages or other setbacks. Over the years, the private sector has invested billions of dollars in emergency preparedness and response capabilities. We have every reason to ensure that our colleagues in other federal agencies, as well as those in state and local entities, are able to take advantage of these efficiencies, including the potential use of DACA systems. I look forward to engaging with both my colleagues here at the Commission and all interested parties to learn more – especially on the potential for DACA to cause harmful interference to other systems – as we analyze this important matter.

STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN

Re: *Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency,* PS Docket No. 11-15.

I wish to commend the Public Safety and Homeland Security Bureau for presenting us with an item, which reinforces our mission essential function to ensure continuous operations of critical communications and other services. Each year, particularly during Hurricane season, our Nation is faced with large scale disasters, which routinely result in terrestrial communications networks being compromised. Therefore, in addition to examining ways to improve the reliability of legacy and broadband networks, we also must prepare for the reality that, despite best efforts, networks will go out of service.

The experiences of federal agencies have shown that aerial platforms offer a rapid response solution to temporarily restore critical communications. Specifically, the U.S. Armed Forces have used these platforms successfully, to provide communications in the absence of available terrestrial infrastructure.

In response to the Public Notice that the Commission released last year, several parties raised technical and coordination concerns. This NOI seeks comment on these issues and additionally asks important questions about the costs of deploying these platforms, frequency planning, and minimizing potential interference. I was pleased to see that a number of commercial mobile wireless carriers offered recommendations for how aerial platforms could be deployed to prevent interference with their commercial networks. The continued collaboration of all relevant stakeholders will be important to ensure that we have a thorough and productive discussion on the best way to take advantage of these technologies.

STATEMENT OF
COMMISSIONER JESSICA ROSENWORCEL

Re: *Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency*, PS Docket No. 11-15.

This Notice of Inquiry is my first vote at a Commission meeting. I thank the Chairman for placing it on the agenda today, and for bringing these issues to our attention.

This item demonstrates what the Commission can do at its best: provide vision that brings together the communications industry and the government to find creative ways to serve the public.

With this inquiry, we are exploring how to use advanced technologies to improve communications and access to information during a disaster. While our terrestrial networks are built to withstand a lot of abuse, we must make sure that emergency management officials, first responders, and personnel from the critical infrastructure industry always have the tools they need to communicate. This is especially true in those early hours after a disaster, when every second counts.

Deployable Aerial Communications Architecture may be one solution. When the power has been knocked out, bridges have been washed away, or other unthinkable events have come to pass, this technology may help keep us connected.

The Commission already has taken its first steps on this subject with its white paper and workshop. But much more needs to be done to ready this technology for prime time. Coordination is key, in light of other government uses of the national airspace system, including, but not limited to, those addressed in the Federal Aviation Administration Modernization Act. Practical issues need attention. And addressing the potential for interference to existing networks is essential. After all, in our zeal to provide reliable communications in disaster, we cannot inadvertently impede restoration efforts of traditional networks.

I look forward to reviewing the record as it develops.

STATEMENT OF
COMMISSIONER AJIT V. PAI

Re: *Utilizing Rapidly Deployable Aerial Communications Architecture in Response to an Emergency*, PS Docket No. 11-15

The Communications Act begins by observing that the Federal Communications Commission was created in part "for the purpose of promoting safety of life and property through the use of wire and radio communications." 47 U.S.C. § 151. I am pleased that the first item I have the privilege of supporting at a Commission meeting fulfills this core purpose. The failure of terrestrial infrastructure following an emergency can leave a dangerous gap in communications capabilities. Deployable aerial communications architectures (DACA) have the potential to fill this gap. The action we take today is particularly timely considering recent experiences during emergencies and Americans' increasing reliance on communications services.

Following adoption of the Notice of Inquiry, the agency will benefit from robust participation by all stakeholders. Commission decisions are always better informed by a thorough record, of course, but this matter presents policy questions which call for an especially strong factual foundation. For instance, what are the advantages and disadvantages of various DACA technologies, and are particular solutions better suited for use in different parts of the country? What lessons does the military's experience with DACA suggest with respect to civilian use? What is the best approach to operational concerns such as the use of commercial bands, interference, and frequency coordination? To what extent could DACA be deployed along American borders consistent with existing agreements with Canada and Mexico? It is my hope that the record ultimately developed in this proceeding will reflect a full airing of views on these and other issues.

Once the record is complete, I will work with the Chairman, my fellow Commissioners, and the talented staff in the Public Safety and Homeland Security Bureau who worked on this item (as well as the White Paper which inspired this proceeding) to take appropriate action. We should do what we can to enable emergency management officials, first responders, industry personnel, and the public to communicate when existing networks are destroyed or damaged. We may not know when or where the next emergency will happen, but we can be sure that communications services will be vital to helping those in need.