

**Before the
Federal Communications Commission
Washington, DC 20554**

In the Matter of:)	
)	
Accelerating Wireline Broadband)	WC Docket No. 17-84
Deployment by Removing Barriers to)	
Broadband Infrastructure Investment)	

COMMENTS OF HARRIS CORPORATION

The Harris Corporation ("Harris") respectfully submits these Comments in response to the *Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment*¹ ("NPRM") in the above-captioned proceeding. Harris applauds and supports the Commission's efforts to accelerate and improve deployment of broadband infrastructure in all ways, including in the national wireline network. Harris is the primary telecommunications system provider to the Federal Aviation Administration ("FAA") and believes that these Comments are consistent with the views and service needs of the FAA. These Comments are provided so that the Commission may support wireline broadband deployment while protecting the essential air travel safety services of the FAA.

I. Background.

Harris is the Prime Systems Integrator for the FAA Telecommunications Infrastructure ("FTI") program. FTI is the primary means through which the FAA acquires the telecommunications services required for National Airspace System ("NAS"), which is

¹ *Notice of Proposed Rulemaking, Notice of Inquiry, and Request for Comment*, FCC 17-37 (Released April 21, 2017). Due to a misunderstanding, these Comments are filed a few days after the June 15, 2017 filing date. Harris respectfully requests that the Commission accept them *nunc pro tunc* because of the public interest value of a more complete record, including vital information about the FAA's telecommunications network operations, and because no party will be disadvantaged because the July 17, 2017 reply comments filing date remains weeks away in the future.

the foundation of air traffic safety in and around the United States. The NAS, consisting of thousands of people, procedures, facilities, and pieces of equipment, enables safe and expeditious air travel in the United States and over large portions of the world's oceans.

The FAA continually upgrades its infrastructure systems concurrent with its implementation of Next Generation ("NextGen") air traffic control operational capabilities which transforms the system over time from terrestrial based to a primarily space based system for navigation and surveillance. These NextGen systems such as Automatic Dependent Surveillance Broadcast ("ADS-B"), Data Comm and System Wide Information Management ("SWIM") are currently delivering increased safety as well as operational performance benefits such as reduced taxi time, more accurate surveillance and real time data for decision making. Another NextGen program, the NAS Voice System ("NVS"), will convert thousands of air-to-ground and ground-to-ground voice services to Voice Over IP ("VOIP") technology. Given the complexity and around-the-clock nature of air traffic services, the rollout of such upgrades to over 4,400 sites must be carefully coordinated with all key stakeholders. As a result, some FAA systems continue to rely on Time-Division Multiplexing ("TDM") technology for essential U.S. air traffic control system services. TDM is not compatible with Internet Protocol ("IP") standards, which comprise part of the fundamental system architecture of underlying commercial broadband service offerings. The FAA will require support for TDM-based technologies for the foreseeable future until compatible replacements are available and the delivery of IP-based and digital services to numerous remote sites is achieved.

Harris leads a team of telecommunications companies, consisting of AT&T, CenturyLink, Level 3, Sprint, Verizon Communications and others, to interconnect more

than 4,400 FAA sites and more than 26,000 services through a dedicated, secure Wide Area Network. FTI interoperates with hundreds of non-FAA facilities, including the Department of Defense, the National Weather Service, and all major U.S. telecommunications wireline service providers. Harris manages nearly 20,000 distributed network devices containing in excess of 100,000 manageable components. Through FTI, Harris also provides network engineering services and order fulfillment for evolving FAA communications needs.

Key components of FTI, the largest non-military network in the U.S. Government, include:

- 1) Support for hundreds of services classes that represent several availability levels, protocols, interface types and security levels. The services uses TDM and IP technologies and are delivered to urban and rural locations.
- 2) The Harris dedicated Optical Network Backbone is made up of more than 22,378 miles of fiber utilizing Dense Wavelength Division Multiplexing over SONET in 2.5 Gbps and 10 Gbps segments. It contains 42 Points of Presence connecting 22 dual SONET rings at the FAA's primary Air Route Traffic Control Center ("ARTCC") facilities.
- 3) A nationwide Dual-Core IP network to interconnect critical NextGen programs with protection from rare but potentially large scale network attacks.
- 4) The Harris Primary Network Operations and Control Center monitors more than 100,000 pieces of communications equipment, and enables the management of a field maintenance workforce of 250-plus people nationwide, 24/7/365. A Backup Network Operations Control Center is used for disaster recovery.
- 5) The FTI Mission Support Network transports administrative functions, such as payroll and e-mail to most of the FAA's 50,000 employees at more than 1,000 sites across the U.S.
- 6) The FTI satellite ("FTI-SAT") network provides transport for critical air-to-ground voice and radar sites in the Continental United States and Caribbean where terrestrial or microwave transport is not feasible or cost prohibitive. The FTI-SAT network is currently comprised of two geographically diverse hubs supporting 51 FAA remote sites.
- 7) The FTI Microwave network converted and migrated FAA Owned Microwave Systems operating within the 1.7 GHz frequency band to an FTI service-based solution.

II. The Commission Must Preserve FAA Operations.

Harris supports Commission efforts to pave the way to improvements to the national wireline network. Indeed, Harris has been undertaking upgrades to FTI to the extent that FAA's budget provides. However, as shown above, the FAA continues to rely upon TDM, and will continue to do so for years to come. Such TDM systems are not compatible with broadband interconnections and IP standards. It is essential to the continued integrity of FAA flight safety operations that the Commission take all steps necessary to preserve sufficient TDM services so that FTI may continue without interruption in a robust and orderly way. In response to specific inquiries in the NPRM, Harris offers the following:

Pole Attachments. The Commission has asked for comments on reforms to improve pole attachments. (NPRM, para. 6, *et seq.*). In response, Harris supports efforts to streamline the pole attachment process, accelerate the deployment of fiber optic cable infrastructure in replacement of copper and generally promote competition. Based upon its own extensive experience in rights management, Harris is confident that all relevant parties have the ability to cooperate in an effective way to mitigate or eliminate the risks of service disruptions based on pole attachment expansions.

Expedited Copper Retirement. The Commission requests comments on expediting retirement of copper-based infrastructure and the related network change notification process. (NPRM, para. 56, *et seq.*) Harris wants to emphasize that the FAA's FTI communications system interconnects thousands of locations in order to support air safety operations. Approximately 52% of those points of interconnection are rural in nature. It is highly unlikely that copper interconnections will be replaced by fiber optic cable quickly in rural areas, if at all.

While replacement of copper to improve national telecommunications infrastructure

clearly is good public policy, undoubtedly commercial deployments will outpace the ability of the FAA to upgrade air traffic control systems due to budgetary prioritization.

Replacement of copper and rapid transitions to broadband might risk stranding FAA remote facilities, resulting in disruptions to air traffic control operations.

In addition, as portions of FTI are transitioned to fiber optic facilities, FTI would continue to depend on existing node connections under its current architecture. Thus, Ethernet and legacy interfaces (such as DS-1 and DS-3) must be provided for interoperability with FAA systems. Forced deployment to Ethernet would disrupt FAA operations.

The carrier replacements for legacy technology sites are higher bandwidth, typically incurring greater recurring costs. Many of the FAA sites rely on 64Kbps to 1.544Mbps of bandwidth to support current NAS systems while the initial bandwidth for replacement Ethernet technology is 2Mbps, and more commonly, 10Mbps. The 2Mbps circuit is not a viable solution for the FAA due to network adaptation issues. Therefore, Harris is concerned that the FAA would be forced to convert 64Kbps DS-0 or 1.544Mbps DS-1 circuits to 10Mbps Ethernet circuits. 10M Ethernet provides far more bandwidth than legacy technologies, bandwidth that the FAA does not need, so Harris asks that the Commission ensure that network upgrades do not force cost increases on customers, such as the FAA, with lower bandwidth requirements.

Moreover, having studied the technologies, Harris has determined that wireless interconnections are not compatible with many FAA systems. For example, LTE wireless interconnections have failed under interoperability testing between FAA systems and existing wireless network capabilities offered by commercial carriers. FAA systems require the deterministic performance of wireline connections, which currently cannot be achieved by

wireless facilities.

Therefore, no matter the pace of copper replacements, the FAA's network's operations must be protected thoroughly. Such protections must, at a minimum, include thorough change notifications provided to Harris (and the public) at least 180 days prior to any change so that Harris and its partners may resolve service concerns without any risk of disruptions to FAA operations. In addition, due to its safety-critical mission, the FAA should be added to the list of entities requiring special notification.

Streamlining Section 214(a) Discontinuations. The Commission asks for comments on streamlining the processes under Section 214 of the Communications Act which are required before a provider may reduce, impair or discontinue existing telecommunications services. (NPRM, para. 71, *et seq.*) The primary proposal is to shorten the waiting period to ten days after issuance of public notice of a 214 application to permit the discontinuation or impairment to go into effect.

Similar to the concerns expressed in the preceding section, Harris and the FAA must be provided sufficient time to receive, analyze and react to any proposed network changes which might affect the NAS adversely. Ten days is insufficient. Harris urges that the Commission require network change notifications of at least 180 days in advance of any discontinuation or impairment, without regard to any Section 214 public notice period.

In addition, Harris requests that the Commission confirm that maintaining TDM functionalities is entirely consistent with the Commission's "Functional Test" Standard (*see* NPRM, para. 115),² and in addition, that maintaining functionality preserves the same cost structure. As noted above, the FAA depends upon TDM-based telecommunications services

² *See, Technology Transitions et al., GN Docket No. 13-5 et al., Notice of Proposed Rulemaking and Declaratory Ruling*, 29 FCC Rcd 14968, 15015-18, paras. 114-119 (2014).

for much of the U.S. air traffic control system and a Section 214 application to impair or discontinue service should not be the basis to undermine TDM functionality. But reliance on TDM is not unique to the FAA. TDM technologies are in use in many federal agencies. Fundamentally, the integrity of FAA and other federal government operations must be protected by a Commission determination that TDM functions and cost structures must be preserved as the wireline network is improved.

III. Conclusion and Relief Requested.

Harris is entirely supportive of Commission efforts to promote improvements to the national wireline network, including more rapid retirement of copper facilities in favor of fiber optic interconnections. Harris is assisting the FAA with ensuring that its telecommunications network keeps pace with changes in the commercial marketplace. Realistically, however, federal government budgetary constraints will not support improvements to NAS systems as rapidly as is likely to occur in parts of the commercial network.

Accordingly, Harris urges the Commission to take into account the fundamental needs of the FAA and other federal government telecommunications systems, which cannot operationally keep pace with rapid wireline network upgrades without protections.

Therefore, Harris respectfully requests that the Commission:

- (1) Ensure that the pole attachment process is competitive and efficient;
- (2) Promote expedited processes to replace copper but do so in a way that does not strand, or otherwise undermine, legacy technologies that federal government systems necessarily will continue to require, including the U.S. air traffic control system;
- (3) Provide that network change notifications, including under Section 214 of the

Communications Act, are thorough and provide at least 180 days advance notice; and

(4) Apply its Functional Test Standard by requiring that network upgrades continue to support legacy technologies, such as TDM, and at their current recurring costs.

These Commission actions would support the public interest in promotion of wireline network improvements and investments in broadband while striking a fair balance with protection of vital federal government telecommunications functions, including essential FAA air safety operations.

Respectfully submitted,

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