

Before the
Department of Transportation
Federal Aviation Administration
Washington, D.C. 20590

In the Matter of

Safe Efficient Use and Preservation
of the Navigable Air Space

FAA-2006-25002

Notice of Proposed Rulemaking

COMMENTS OF TROPOS NETWORKS

Tropos Networks (Tropos) submits these comments in response to the *Notice of Proposed Rulemaking* (NPRM) of the Federal Aviation Administration (FAA) to amend its rules addressing the Safe, Efficient Use and Preservation of the Navigable Airspace. The NPRM proposes to modify and expand the scope of the FAA's rules in Part 77 of Title 14 of the Code of Federal Regulations. The proposed rules are directed to facilities using the radio spectrum and expand enormously the current FAA review and approval process relating to physical infrastructures.

Tropos technology uses the radio spectrum to deliver broadband to individuals, businesses and government agencies. Tropos opposes these amendments. The NPRM does not show how it will promote airspace safety yet the rules will have a severe detrimental affect on the rollout of broadband and other services using the radio spectrum.

Tropos Networks

Tropos Networks, headquartered in Sunnyvale, California, provides wireless Wi-Fi technology that delivers broadband access using unlicensed spectrum. In more than 350 deployments, Tropos technology is providing wireless broadband (>1Mbps) over large geographic areas. Its MetroMesh architecture allows a network to be installed at substantial savings over legacy systems by eliminating costly backhaul and proprietary client devices. No large towers are constructed nor are streets excavated. The system's capacity is designed for advanced applications delivering voice and video. Portable wireless devices, now mass produced to operate in a Wi-Fi environment, also reduce cost and expand consumer choice. Tropos technology allows one physical network to be separated into multiple secure virtual segments for use by different users.

With its partners, Tropos has emerged as a facilities-based broadband provider in a market that desperately needs competition. Tropos is the technology provider to EarthLink in its Philadelphia and Anaheim projects, and in the Google/EarthLink San Francisco project. Tropos equipment in New Orleans, in place prior to Hurricane Katrina to support video surveillance, is being expanded in coverage and use.

Tropos technology is a form of wireless mesh networking that can transmit voice, data, video, photographs and the range of other broadband applications. Any laptop or other device with Wi-Fi capability can connect to the network of antennas, even while the owner carries the device from place to place. The network consists of routers with antennas, the size of a breadbox, mounted on structures no higher than a street lamp or and telephone pole. A typical metro scale mesh network encompasses a large geographic area with approximately 25 routers/antennas per square mile. The innovation pervading

Wi-Fi technology, the growing investment committed and the expanding number of deployments is demonstrating how technology can lower cost and bring broadband to all Americans.

The FAA's Notice of Proposed Rulemaking

The NPRM proposes to require that structures supporting wireless communications in particular radio frequency bands notify the FAA of any initial construction and any modifications to one of the several components that comprise a communications facility's ability to transmit and receive information. These components include frequencies, power levels, the geographic operating parameters of the system and antenna configurations. In particular, the review includes communications systems where power levels will be increased at or in excess of 3 decibels (db). The FAA's current review is confined to potential physical obstructions of structures that are more than 200 feet tall or are located within five miles of an airport at any height.

Entities operating on licensed or unlicensed spectrum, even though operating within the confines of the FCC's or NTIA rules, would have to notify the FAA on a transmitter by transmitter basis at least 60 days prior to construction or alteration of an existing facility. Users would then await a determination of the potential hazard to air navigation prior to commencing construction or operations and then delay construction or

implementation for at least an additional forty days until the FAA's determination becomes effective. The frequency bands subject to review are:

54-108 MHz, 150-216 MHz, 406-420 MHz, 932-935/941 MHz, 952-960 MHz, 1390-1400 MHz, 2500-270 MHz, 3700-4200 MHz, 5000-5650 MHz, 5925-6525 MHz, 7450-8550 MHz, 14.2-14.4 GHz, and 21.2-23.6 GHz.

The FAA states it is required under the law to consider the effects of Electromagnetic Interference (EMI) on the safe and efficient use of airspace and that it must expand the current notice requirements to include changes that may produce EMI.

The Proposed Rules Are Not Supported By Reason or Need

Since the enactment of the Communications Act of 1934 creating the Federal Communications Commission (FCC), the establishment of the Federal Aviation Administration or enactment of the Airport and Airway Safety and Capacity Act of 1987, which the NPRM invokes, neither the FAA nor its predecessors have sought to manage the radio spectrum and determine the operating parameters of the various users of the spectrum. This responsibility is committed by law to the FCC and the National Telecommunications and Information Administration of the Department of Commerce (NTIA), which manages the federal government's use of the radio spectrum.

In carrying out these responsibilities, the FCC and NTIA have set rules to ensure the coexistence of various users of the radio spectrum while promoting national security, military defense, public safety, the safe use of navigable airspace and commercial services. The rules are detailed in nature and are particularly directed to the character of electromagnetic interference. The NPRM does not state how the FCC and NTIA have failed to protect the FAA's interest.

The FAA now proposes to review not only operations that comport with the rules and policies of the FCC and NTIA, but to substitute its judgment for that of the expert agencies. It proposes to do so with no articulated standards other than protecting against EMI, which is at the center of the FCC and NTIA administration of the radio spectrum.

The FAA is free to change course as its expertise and experience may suggest or require. Yet to do so it must articulate a reasoned analysis indicating why its prior policies are now being reversed. Failing to do so is an improper departure from the standard of reasoned decision making. Where an agency departs from established precedent without a reasoned explanation, its decision is arbitrary and capricious and violates the Administrative Procedure Act, 5 USC 706(2)(A). *Ramaprakash v. Federal Aviation Administration and the National Transportation Safety Board*, 346 F3rd 1121 (D.C. Circuit 2003) (J. Roberts).

The proposed rules provide no reference to any information or evidence that wireless communications facilities or equipment using unlicensed or licensed spectrum have caused or can potentially cause interference to aircraft or FAA communications facilities. The FAA ignores that the rules and policies of the FCC and NTIA are promulgated only after extensive technical analysis, with public participation of the very concerns FAA now purports to address. It ignores that it has opportunity to participate in these proceedings and in the FCC/NTIA coordination efforts to promote fair and effective use of all of the radio spectrum.¹ Tropos suggests that the FAA has no authority to

¹ Under a Memorandum of Understanding, dated January 31, 2003, between the FCC and the NTIA, the FCC provides an opportunity for federal agency review of its proposed rules. These rules are examined by members of the Interdepartmental Radio Advisory Committee (IRAC), a committee comprised of federal agency representatives that assist the NTIA in its spectrum management responsibilities. The FAA is a member of the IRAC. <http://www.ntia.doc.gov/oshome/IRAC>.

supersede these decisions of the expert agencies much less do so without detailing the standards by which it will conduct its review.

The proposed rules, in requiring review of virtually any change in a facility, ignores the character of Wi-Fi mesh networks and the burdens that it will impose on the technology. Wi-Fi mesh systems operate discretely within set geographic areas. The technology's efficiencies eliminate the need for per node wiring and the large infrastructure historically required. It provides for a self-organizing system allowing nodes to be added or subtracted as needed thereby remedying virtually immediately any faults in wireline backhaul that arise or interference that is encountered, all with the precise parameters of a geographic area. Tropos technology is designed to shift dynamically and change frequencies when necessary,

The small breadbox like devices, containing the antenna and router, approximately 25 per square mile, are mounted on infrastructure no higher than a street lamp or telephone pole. There are thousands already deployed with no claims that any present a danger to air navigation, yet the NPRM apparently encompasses them all. And with the technology capable of shifting frequencies when necessary, the proposed rules seemingly would require daily notifications to the FAA.

The efficiency, symmetry and integrity of Wi-Fi broadband networks, which translates to large cost savings, is the system of antennas and routers throughout the coverage area. An element of this cost saving is that these facilities do not require site-by-site licensing or review. Deploying Wi-Fi mesh in unlicensed spectrum bands requires no licensing or permits; no federal, state or local authorizations are needed to use

the spectrum. An operating Wi-Fi network delivering broadband can be deployed within days. The proposed rules will annul these important efficiencies.

The unlicensed sectors of the radio spectrum are intended to promote innovation and investment without government direction. Wi-Fi technology was designed to coexist with co-channel and adjacent spectrum users and interoperate with other facilities, wireless and wireline. Yet the proposed rules, in seeking to reserve judgment on a transmitter by transmitter basis, effectively overrule the entire unlicensed regime, by requiring the review and approval of thousands of facilities. The effect of the FAA's proposed rules on wireless broadband will be significant and severe.

The result will not be safer airspace but indeterminable delays in deploying communications systems – delays that will choke much needed competition. It will add significant costs to the network that will be absorbed by the consumer. The processing and transaction costs associated with thousands of transmitters, where there are now none, will be massive. More significantly, design and deployment of a network will be thrown into havoc because there will be no standard to design and construct to, each transmitter placement must await FAA approval. Infinite delays will also accrue in that what are now normal adjustments to a network or when the network is expanded will require FAA review. The innovative character of the technology, its ability to deliver affordable broadband services will be stifled by rules that will impose delay and costs yet provide no enhanced safety to the airspace.

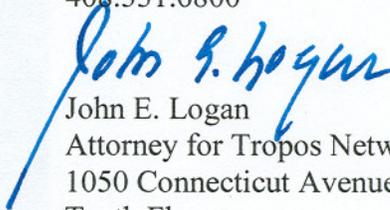
Conclusion

The important responsibilities of the Federal Aviation Administration will not be furthered by the proposed rules. There is no supporting analysis justifying the enormous

expansion of FAA review of facilities using the radio spectrum and showing how such will improve aviation safety. Nor is there any indication that the rules and polices of the Federal Communications Commission and National Telecommunications and Information Administration do not adequately protect the FAA's interest. The burdens the rules will impose will strangle broadband deployment. Tropos urges that the proposed rules be withdrawn from consideration.

Respectfully submitted,

Bert Williams
Acting Vice President, Marketing
Tropos Networks
555 Del Rey Avenue
Sunnyvale, California 94585
408.331.6800


John E. Logan
Attorney for Tropos Networks
1050 Connecticut Avenue, NW
Tenth Floor
Washington, D.C. 20036
202.772.1981

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