

In the Matter of )  
 )  
Amendment of Part 90 of the Commission's ) WP Docket No. 07-100  
Rules )  
 ) PS Docket No. 06-229  
Implementing a Nationwide, Broadband, )  
Interoperable Public Safety Network in the 700 )  
MHz Band )  
 ) WT Docket No. 06-150  
Service Rules for the 698-746, 747-762 and )  
777-792 MHz Bands )

**COMMENTS  
OF THE  
AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION  
OFFICIALS**

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## Introduction

The American Association of State Highway and Transportation Officials (AASHTO) represents the Department, Agency or Bureau responsible for the construction, operation and maintenance of our nation's transportation system in each of the fifty states, the District of Columbia and the Commonwealth of Puerto Rico. These highways, waterways, rail lines air facilities and public transit systems form the lifeblood of our nation's economy. Within each of the five modes of transportation, surface, water, rail, air and public flow the goods and services that let this nation function. Without safe, efficient and secure transit pathways our nation would not function.

AASHTO's voting membership consists of each of the fifty states, the District of Columbia and the Commonwealth of Puerto Rico. AASHTO has members representing the United States Department of Transportation and the following administrations within this cabinet level agency:

- Federal Aviation Administration
- Federal Highway Administration
- Federal Motor Carrier Safety Administration
- Federal Railroad Administration
- Federal Transit Administration
- Maritime Administration
- National Highway Traffic Safety Administration
- Pipeline and Hazardous Materials Safety Administration
- Research and Innovative Technologies Administration
- Saint Lawrence Seaway Development Corporation

AASHTO's associate members include

- Bridge, Port and Toll Agencies, Commissions, Administrations and Authorities
- City and County Departments, Authorities and Administrations
- Other Federal Agencies, Commissions and Services including

- Department of Defense
- Department of Homeland Security
- National Park and Forest Services
- Appalachian Regional Commission

International associate members include:

- Canadian provincial ministries of Transportation and Infrastructure
- Highway Department Hong Kong
- Korea Expressway Corporation
- Republic of Turkey
- Abu Dhabi Department of Transportation

Regional associate members range from Alaskan native villages to metropolitan transportation commissions and transportation corridors.

Internally, AASHTO is comprised of 11 standing committees each overseeing a particular aspect of transportation. Within the AASHTO Standing Committee on Highways the Special Committee on Wireless Communications and Technology is tasked with keeping the Association's membership apprised of changes which could affect its use and access to radio spectrum. The AASHTO Special Committee on Wireless Communications Technology (SCOWCoT) is the underlying frequency advisory committee certified by the Commission to manage the spectrum assigned to Highway Maintenance and provide frequency coordination services to entities eligible for licensing under the provisions of Title 47, United States Code Section 90.20.

The AASHTO Special Committee on Wireless Communications Technology is pleased to have this opportunity to provide comments on improving the use of spectrum and efficiency in the 4.9 GHz band.

**Comments of the AASHTO Special Committee on  
Wireless Communications Technology**

**BACKGROUND**

AASHTO is recognized by the Commission as one of four Frequency Advisory Committees (FAC or Coordinator) certified to administer specifically the radio spectrum assigned to Highway Maintenance; and, to recommend frequencies for licensing by local government and other entities authorized under Section 90.20 of the Commission's rules and regulations.

AASHTO is a founding member of the National Public Safety Telecommunications Council (NPSTC), the Transit Wireless Communications Council and member of the Land Mobile Communications Council, Public Safety Communications Council, Public Safety Spectrum Trust Corporation and the Land Mobile Communications Council. AASHTO representatives serve on many additional boards, commissions, panels and committees dealing with wireless communications for emergency responders and critical infrastructure.

AASHTO helps fund and provides resources to the federally chartered National Academies of Science to conduct research and investigations into issues affecting transportation, emergency response and critical infrastructure.

AASHTO develops and published guides, recommendations and standards which range from material specifications to design, operation and use of systems. AASHTO publications are internationally recognized as the authoritative voice on the subject and

are incorporated into the mandated requirements of cities, counties, states, tribal nations, the U.S. Department of Transportation and foreign countries.

In accordance with Section 1.415 of the Federal Communication Commission (“FCC” or “Commission”) Rules and Regulations, 47 C.F.R. § 1.415, the American Association of State Highway and Transportation Officials Special Committee on Wireless Communications Technology (AASHTO, AASHTO SCOWCoT, or SCOWCoT) hereby respectfully submits its Comments in the above-captioned proceeding.

## **SUMMARY**

The AASHTO Special Committee on Wireless Communications Technology strongly supports expanded eligibility in use of the 4.9 GHz band. The domestic safety of our nation depends on access to this spectrum for all eligible users as defined by Presidential Directives<sup>1</sup>, the Homeland Security Act of 2002<sup>2</sup>, The Middle Class Tax Relief Act and Job Creation act of 2012<sup>3</sup>, The Commission’s Rules and Regulations<sup>4</sup> and other private entities supplying critical goods and services.

A majority of the AASHTO committee members believe this band can best be utilized by requiring the Commission’s certified Public Safety Frequency Advisory Committees<sup>5</sup> to provide coordination of applications and recommending spectrum assignments to authorized users in specific segments dependent on the intended use.

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<sup>1</sup> Homeland Security Presidential Directives One through Eight

<sup>2</sup> Public Law 107-296

<sup>3</sup> Public Law 112-96

<sup>4</sup> 47 CFR 90.20

<sup>5</sup> American Association of State Highway and Transportation Officials (AASHTO); Association of Public Safety Communications Officials, International (APCO); Forestry Conservation Communications

AASHTO advocates for restrictions to be implemented on incumbent users requiring conformation to a Commission formulated band plan setting aside specific ranges for each type of anticipated activity. AASHTO further advocates incumbent licenses should not be automatically renewed without proof of coordination which will populate the Uniform Licensing System (ULS) database with accurate information regarding each system in use.

## **AASHTO RESPONSES TO SELECTED REQUESTS FOR COMMENT:**

### **Current Uses of the Spectrum**

In April 2009, the Commission released a *Report and Order and Further Notice of Proposed Rulemaking*<sup>6</sup> permitting the licensing of permanent, fixed links supporting broadband communications on a primary basis. Following this order, many state departments of transportation constructed links within this frequency allocation providing for the flow of high-speed data to enhance the safety and protection of the people using our nation's roads and highways. In one particular example, the Washington State Department of Transportation (WSDOT) is using 4.9 GHz fixed links to mitigate congestion and reduce emissions along Interstate Highway 5 in Pierce, King and Snohomish Counties.

WSDOT has approximately 100 point-to-point locations licensed and another 80 locations in various stages of being planned, budgeted and installed. Others are pending licensing utilizing the 4.9 GHz spectrum for low cost point-to-point, point-to-multipoint

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Association (FCCA); and, International Association of Fire Chiefs/International Municipal Signal Association (IAFC/IMSA or IMSA)

<sup>6</sup> Amendment of Part 90 of the Commission's Rules, WP Docket No. 07-100, *Report and Order and Further Notice of Proposed Rulemaking*, 24 FCC Rcd 4298

and mesh applications. These low cost, medium capacity links are vital to the state's transportation system and provide data connectivity to Variable or Dynamic Message signs (DMS or VMS), Variable Speed Limit signs (VSL), Remote Weather Information Stations (RWIS), Traveler Information Stations (TIS) (also referred to as Highway Advisory Radio (HAR)) as well as full motion video to WSDOT Traffic Management Centers (TMC) and Emergency Operations Centers (EOC).

The video and data provided by these links and augmented with fiber optic connections allow the TMCs and EOCs to make real-time decisions on traffic and road conditions on the monitored state and federal highway systems. The Washington State Patrol assists in manning these centers to provide updates and instructions to officers in the field and on-scene incident commanders during emergencies and planned events.

The data collected provides input for messages posted on VMS informing drivers of anticipated travel times and conditions. Roadside weather monitors track visibility, precipitation and temperatures that affect the road conditions providing additional information for drivers and maintenance personnel on the need for road surface treatment. Video feeds from remote cameras are used to monitor traffic flow and provide visual images augmenting fixed sensor data used to determine if speed limits need to be adjusted because of congestion or other conditions. Video feeds are also used to inform and direct emergency responders as to the location and severity of incidents along the right-of-way.

Without the use of these 4.9 GHz links, travelers in the Seattle metro area would face increased risk and travel time while significantly increasing vehicular emissions due to the congestion. Emergency responders benefit from the increased situational awareness

allowing the response activity to be tailored to the severity of the incident. The WSDOT installation is used as a model for other states and municipalities which are monitoring the success and issues uncovered with this project for implementation in other localities. Lessons learned are shared with other transportation and emergency management specialists at AASHTO conferences and summits held both nationally and regionally throughout each year.

The New Hampshire DOT is currently using 4.9 GHz spectrum for point-to-multipoint hub communications with Intelligent Transportation System (ITS) devices such as dynamic message signs (DMS), roadway weather information systems, (RWIS) security CCTV, and Highway Camera CCTV monitoring and control along with variable speed limit signs (VSL). Long distance backhaul within the state is accomplished with microwave systems licensed under Part 101 of the Commission's rules. The 4.9 GHz links provide what can be termed as "last mile" Ethernet communications.

The New Hampshire DOT 4.9 GHz communications links are mainly along Interstate 93 and Interstate 95 where they provide essential service to both the NHDOT and NH State Police. New Hampshire plans further expansion of the 4.9 GHz network. Installations of 4.9 GHz equipment are planned for many mountain tops throughout New Hampshire. Cannon Mountain in Grafton County currently has a 4.9 point of presence for ITS devices and voice channel / radio controls for the radio over IP dispatch system. Other states are using the 4.9 GHz band primarily in short to medium range backhaul and to provide broadband access to areas not easily reached with conventional hardwired communications links.

The Florida DOT has 4.9 GHz links providing broadband connectivity for devices connected along the highway between the mainland and Key West. The Overseas Highway contains 42 bridges and 126 miles of roadway which would be difficult to connect using traditional hardwired connections.

## **Frequency Coordination**

The Commission requested comment regarding the need for frequency coordination procedures and if they should be applied to this band.<sup>7</sup> The members of AASHTO's Special Committee on Wireless Communications Technology are split on this issue with the majority of committee members stating the public will be better served by requiring certified coordination services within this band. However, requiring coordination also opens other areas of concern which include questions regarding which coordinators will be eligible to recommend frequencies and the processing of applications within the selected coordinators.

AASHTO has monitored the activity in this band for several years and has been a party to many discussions with other public safety coordinators and members of NPSTC regarding the use of this spectrum. The April 2009 Report and Order granting primary status to fixed links supporting broadband applications was a major step forward in AASHTO's estimation. Many state departments of transportation have taken advantage of this provision to install networks supporting the protection of life, health and property. We have noted the struggles of our members in obtaining data on existing systems that would both impact and be impacted by the installation of a new, permanent fixed link.

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<sup>7</sup>Amendment of Part 90 of the Commission's Rules, WP Docket No. 07-100, *Report and Order and Further Notice of Proposed Rulemaking*, FCC 12-61 ¶19-20

AASHTO believes the public will be better served by requiring the services of a frequency advisory committee's coordination services which will bring structure and guidelines to the assignment of spectrum. Frequency Coordinators will also provide licensees with an adjudication process capable of resolving many of the reports of interference without impacting the Commission's resources. AASHTO believes the Regional Planning Committees can be a useful resource in determining how the band is deployed in their area however, not all the designated RPCs are active in this area nor have all but a handful submitted regional plans.

AASHTO proposes the criteria for selecting frequencies for assignment and the resolution of possible areas of concern follow the Commission's published rules and regulations. The four public safety frequency advisory committees, AASHTO, APCO, FCCA and IMSA have developed additional guidelines and procedures which augment the Commission's regulations. The four coordinators meet regularly as the Public Safety Communications Council to discuss items and issues affecting the recommended frequency assignments we forward to the Commission for licensing. Among the procedures already in place are guidelines on resolving intercoordinator objections and concerns one coordinator may have with another coordinator's recommendation posted for comment prior to filing with the Commission.

AASHTO also supports the further subdivision of the band through designating specific frequency ranges for specific purposes. AASHTO supports where a portion of the band is set aside for point-to-point systems only with a channel aggregation of up to 20 MHz maximum. Applicants should be required to provide the information as

documented in §101.21(e) as found in the Commission Rules and Regulations, Title 47, Code of Federal Regulations.

As this band is currently set aside for the use of entities eligible under Section 90.20 of the Commission's rules, AASHTO suggests the pool of eligible coordinators be restricted to the four already certified to recommend frequencies under this section, AASHTO, APCO, FCCA and IAFC/IMSA. We four public safety coordinators have developed guidelines and procedures for the processing of applications quickly and efficiently. Currently, none of the four is actively coordinating point-to-point and point-to-multipoint microwave applications under Part 101 however, each of us has the tools and expertise to perform the functions<sup>8</sup>. We also anticipate using the same policies and guidelines developed for processing LMR applications as a basis and these will be modified to accommodate any additional licensing requirements.

The use of certified coordinators will help insure operations in adjacent jurisdictions are not hampered by unnecessary interference and it will provide a means of quickly identifying and resolving interference problems. Under the current licensing procedures an agency wouldn't know where to begin searching for the source of an interfering signal nor would they necessarily know which of several possible sources began interfering operations.

AASHTO also believes a further refinement of the band plan shown in §90.1213 restricting certain modes of operations to specific areas within the band will not only segregate, but reduce harmful interference to other critical operations occurring within the band. AASHTO further suggests incumbent licensees be required to submit to

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<sup>8</sup> Forestry Conservation Communications Association has been providing Part 101 coordination services however their primary person responsible for this activity recently left the organization.

frequency coordination either at the time their license is set for renewal or within one calendar year from the adoption of any ruling by the Commission requiring coordination. AASHTO also further believes incumbent licensees must modify their current operation to comply with any modifications to the band plan the Commission may impose at that time. We also further note the majority of equipment used within the 4.9 GHz band has sufficient bandwidth is sufficiently frequency agile to accommodate any required shifts in channel centers without incurring non-recoverable equipment costs.

The Commission also sought comment on the approach to be utilized in coordination<sup>9</sup>. AASHTO does not believe all the requirements found in Part 101 need be followed; certain provisions can and should be modified along with new procedures and guidelines being developed for coordinations within the 4.9 GHz band. AASHTO believes with a limited number of FACs allowed to certify frequency recommendations and a further refinement of the band plan by the Commission, a working draft of modified coordination procedures and guidelines can be submitted for Commission review and adoption within six months of any requirement to use frequency coordination.

AASHTO does not oppose participation of Regional Planning Committees (RPCs) in the registration and database administration<sup>10</sup> process. We believe the RPCs are a valuable asset in determining the shape and structure of any enhanced band plan and can greatly assist the Commission in populating a license database with the operational characteristics used by incumbent licensees. Capturing the elements detailed in §101.21(e) for point-to-point installations and for point-to-multipoint installations is crucial to the coordination process and the resolution of harmful interference reports.

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<sup>9</sup> *Ibid* ¶ 21ff

<sup>10</sup> *Ibid* ¶ 25ff

AASHTO believes all permanent installations including “hot-spots” must be documented similarly to the requirements found in §90.375 with the transmitter information captured. Hot Spots, both permanent and temporary should also be power limited to confine their operations within communications zones with a maximum radius of 1000 meters. The maximum EIRP for fixed hot spot locations will vary according to the height of the antenna above the surface to maintain the coverage area limitations.

### *Channel Assignment*

AASHTO also believes a segment of the available spectrum should be set aside for the operation of terrestrial fixed mesh networks with an additional, smaller allocation for temporary, ad-hoc networks which may be required for specific incidents. Within these allocations provision should be made for air-to-ground communications utilizing limited power from the aerial vehicle. Section 90.1205(c) specifically prohibits aeronautical operations however the ability of an on scene incident commander to evaluate the conditions over large areas as encountered during flooding, tornadoes or wildfires is severely hampered by this restriction. AASHTO believes this restriction should be lifted and the use of low power omnidirectional antennas or, with steerable directional antennas higher power permitted while minimizing the possible interference to existing installations. AASHTO believes fixed, terrestrial mesh networks should have primary status in regards to coordination procedures while temporary and ad-hoc networks set up for special events and incidents should be secondary to other users.

AASHTO supports the concept of jurisdictional licensing and proposes the public would be better served by creating a new designation for a licensing area, the District or Region. Currently, the Commission issues licenses by area generally bounded by either

an arbitrary area of operations defined by point and radius or political boundary.

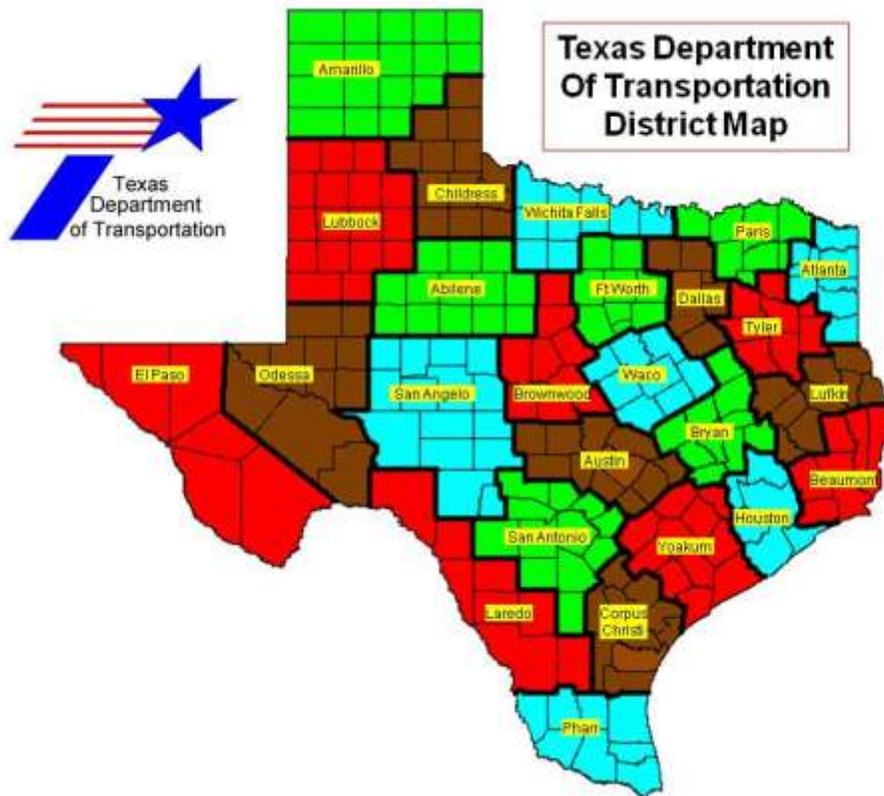
Generally these designations are sufficient with the exception of the statewide license or for eligible entities that span state boundaries or for eligible entities that may cross state boundaries. State DOTs, and most agencies operating over an entire state, divide their operations into districts or regions. A district may range from a few square miles within a heavily populated area to several counties which are similar to the area contained within an RPC. AASHTO would propose a statewide allocation in the 4.9 GHz band be classified as secondary operations while a district would receive primary status. While this proposal does increase the number of licenses and the administrative burden, it also simplifies a license by limiting the number of fixed sites enumerated on that license to a more manageable number. As examples, Rhode Island, the smallest state area wise has five counties, but there are 8 districts within the DOT structure covering the state.

Delaware is tied with Hawaii as having the fewest counties at 3 but Delaware is also divided into 4 districts by the state highway department. Texas, on the other end of the scale, has 254 counties served by 25 districts. Within the state of Texas, the DOT District boundaries follow county boundaries while in other states they may split similar geopolitical boundaries. Alaska, the largest state by land area is subdivided into 18 regions or Boroughs with 3 regional offices which do not include the state's marine highway system of ocean going ferries serving points within the states of Alaska and Washington as well as international service in the Canadian province, British Columbia.

In some areas an eligible transportation agency may conduct operations in neighboring states. As examples, the Washington Metropolitan Area Transit Agency (WMATA) conducts its operations in two states and the District of Columbia. The transit

agency has its own police force operating under the rules for each city, county and state served. WMATA is hampered by the inability to obtain coordinated spectrum to license as it has to obtain concurrence from two regional planning committees for migration to spectrum managed by the RPC. Additionally, the RPC process did not fully understand nor made allowances for eligible agencies required to operate in both areas during their allocation process. Similar situations exist in the New York/New Jersey, Philadelphia and Boston metropolitan areas.

Subdividing states and other large areas into districts or regions would promote spectrum efficiency as a licensee would not necessarily have a primary frequency allocation protected in areas where it is not used. Radio spectrum allocations can be more closely tailored to the unique requirements of each district or region rather than a blanket assignment covering the entire state which impacts the reuse of both co-channel and adjacent channels in neighboring jurisdictions. Applicants for regional or district wide licenses would be required to provide fixed geographic coordinates for the area served.



## Backhaul and Coordination/Licensing

AASHTO supports the ability of FirstNet to obtain licenses for backhaul of the 700 MHz broadband network but believes this authorization should be limited to areas where no other viable means of providing the connectivity required can be obtained. AASHTO also believes licenses for spectrum obtained by FirstNet should be returned to the Commission for reassignment upon the establishment of alternate backhaul paths and media. The amount of bandwidth which can be aggregated must also be limited as it may impact future operations in the area. As AASHTO sees the primary requests for 4.9 GHz bandwidth by FirstNet will be in primarily remote and rural areas. AASHTO is concerned

assigning all the available bandwidth to FirstNet for fixed backhaul operations would impact a wildfire or other response. Use of the band for backhaul should follow similar technical restrictions and limitations found in Part 101.

The Commission requested comment<sup>11</sup> regarding the availability of equipment using the 4.9 GHz band. AASHTO believes expanding access to the band by certain commercial critical infrastructure entities will expand the number of potential equipment users to elevate this band from a niche market to a more general use market reducing the costs to potential implementers.

### *Database Options*

The Commission also sought comment regarding the possible use of the Computer-Assisted Pre-Coordination Resource and Database or CAPRAD. CAPRAD is operated and maintained under a contract from the U. S. Department of Justice and therefore vulnerable to loss of funding. As funding priorities within the DOJ shift, it is entirely possible the database will be terminated due to a funding stream cutoff. Additionally, the CAPRAD database is not currently fully capable of exchanging coordination data between itself and either the Commission's Uniform Licensing System's (ULS) databases and those used by the certified coordinators. The database and its programmatic interfaces would have to be modified to capture the EBF data routinely exchanged between the Commission and certified coordinators. To accomplish this, the DOJ Support Contract would have to be modified to allow this development work and support any increased administrative costs associated with housing and supporting the data.

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<sup>11</sup> *Ibid* ¶43

Arguments can be waged for a third party database and for use of the Commission's ULS. Both have their advantages. A third-party database would more likely adapt quickly to changing rules and requirements as it would be market driven however, the Commission's ULS would ensure the data was freely available. Each of the four certified public safety coordinators use private databases which download and reformat data based on the FCC's Pending, Granted and other license databases. Should the Commission decide on supplying the database as an adjunct to ULS, a consistent stream of data mirroring the requirements will be assured. However, it is also certain private databases will provide value-added features expanding on the minimal elements found in the Commission provided data gleaned from work each coordinator does in performing any licensing work in the band. These value-added features would not be available to third parties such as RPCs without subscription.

## **Conclusion**

The uses of the 4.9 GHz band are many and vary within different areas of the country. AASHTO thanks the Commission for opening this discussion on both the current and possible future uses of the spectrum. AASHTO urges the Commission to begin development of a more robust national plan to increase the utilization. The addition of formal coordination procedures, refinement of the band plan and the inclusion of certain critical infrastructure entities in partnership with public safety agencies will greatly increase the use of the band and its importance in protecting the life, health and property of citizens.