

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of)
)
Public Knowledge;) RM No. 11771
Open Technology Institute at New America;)
Petition for Rulemaking and Request for)
Emergency Stay of Operation of Dedicated)
Short-Range Communications Service in the)
5.850-5.925 GHz Band (5.9 GHz Band))

To: The Commission

VIA ELECTRONIC DELIVERY

COMMENTS OF
THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Date: August 19, 2016

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THE STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

The State of California, Department of Transportation, pursuant to the Commission's Rules, including 47 C.F.R. §1.4, 1.405 and 1.415, hereby respectfully submits its comments in response to the recent Public Notice in the above-captioned petition.

I.
BACKGROUND

A. The State of California, Department of Transportation (Caltrans)

The State of California, Department of Transportation (Caltrans), is a State Government Agency. For more than 100 years, Caltrans and its predecessors have been responsible for planning, designing, building, operating and maintaining California's state highway system. Over time, that role has evolved to include rail and mass transit. However, as California's transportation needs have broadened over the last century, so has Caltrans' focus.

The Caltrans has more than 23,000 employees with an annual budget of about \$10 billion. Headquartered in Sacramento, the Department also has 12 district offices situated in Eureka, Redding, Marysville, Oakland, San Luis Obispo, Fresno, Los Angeles, Bishop, Stockton, San Bernardino, Orange County and San Diego.

In addition to a changing mix of transportation modes - such as highways, rail, mass transit and aeronautics - Caltrans professionals today must consider such complex issues as land use, environmental standards, and the formation of partnerships between private industry and local, State and Federal agencies. Caltrans today understands its purpose as promoting California's economic vitality and enhancing its quality of life by providing for the mobility of people, goods, services and information.

More specifically, Caltrans will continue to play its traditional role as owner and operator of the 15,000 mile State Highway System. Highways will continue as the backbone of the state's 'multimodal' transportation system. Caltrans is responsible for delivering the State's multibillion-dollar State Transportation Improvement Program.

However, the Caltrans of the 2000s and beyond will emphasize partnerships, new 'non-structural' solutions to problems, innovation and a commitment to the Intelligent Transportation Systems of tomorrow. The implementation of Dedicated Short-Range Communications Systems (DSRC) are an important part of our plans.

B. Caltrans Dedicated Short-Range Communications (DSRC) Activities

Caltrans has been actively engaged in connected and automated vehicle research and development since the early 1990's. Over that period, Caltrans has invested more than \$50 million to improve the safety and mobility of vehicles, with vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications serving as the foundation for these improvements.

Caltrans was granted Radio Station Authorization WQBH796 by the Commission on October 9, 2004 for operation in the Intelligent Transportation Service. Caltrans was among the first State Transportation Agencies to implement stations in this service. Caltrans currently has 176 locations licensed in California in the Intelligent Transportation Service, with additional locations planned in the near future. Caltrans current Radio Station Authorization Expires on October 9, 2024.

Caltrans, General Motors, and the University of California, Partners for Advanced Transportation Technology, (PATH) Program successfully demonstrated the technical feasibility of passenger car automation on Interstate Highway 15 in San Diego in 1997, giving members of the transportation industry the opportunity to experience the feeling of riding in a platoon of eight cars travelling under full automation at freeway speeds. Since then, Caltrans and PATH have continued to perform research on connected and automated cars, buses, and commercial trucks, and all of this work is dependent on reliable V2V and V2I technologies, such as DSRC, that supplement the sensor systems on those vehicles. This research has consistently shown that connected and automated vehicles cannot rely on sensors alone to operate safely on our roads; there are many circumstances (weather, darkness, occlusion by other nearby vehicles) where sensors have limitations, while wireless communications works effectively.

In 2004, Caltrans and the Metropolitan Transportation Commission of the San Francisco Bay Area, which is the federally-recognized Metropolitan Planning Organization for that region, formed a partnership to build the first public Connected Vehicle Test Bed on El Camino Real (State Route 82), a signalized arterial roadway that serves more than 60,000 vehicles travelling each day between

San Francisco and San Jose. This \$3 million investment equipped 11 locations with DSRC radios, and was used by local automakers, such as BMW, Mercedes, Toyota, and VW/Audi, to develop and test their connected vehicle safety and mobility applications in a real-world environment. Some examples of these applications include:

- Intersection crash avoidance
- Curve speed warning
- Highway-rail crossing warning
- Work zone warning

In 2013, Caltrans worked with the USDOT to invest an additional \$1 million to update the equipment in the test bed so that it now complies with the latest version of the standards for DSRC message sets and delivery mechanisms. These improvements were recently used to successfully demonstrate Multi-Modal Intelligent Traffic Signal Systems and Environmentally-Friendly Driving, two important suites of connected vehicle applications that were developed using USDOT funding. To operate properly, both suites depend on information exchanges between the vehicle and the infrastructure using DSRC.

Based on the success of the Connected Vehicle Test Bed, Caltrans is now planning to invest another \$10 million to expand its size from the current 11 consecutive signalized intersections to about 135 intersections, a corridor of about 30 miles in length. This expansion will include updated traffic signal controllers, DSRC radios and antennae, back-haul communications to a central location, and all the cables that interconnect them. With the experience gained from operating the existing test bed, the expanded corridor is expected to be operational within 18 months of funding

approval. It is also expected that this corridor will serve as a model deployment that can be duplicated on similar corridors in other urban regions of California.

In addition to this connected vehicle development, Caltrans and PATH continue working on aspects of partial vehicle automation that improve safety and mobility, while reducing the environmental impact of transportation. Specifically, there are two USDOT-funded projects involving Cooperative Adaptive Cruise Control (CACC): one for passenger cars and one for commercial trucks. The CACC project for cars uses DSRC to enable strings of up to four cars to safely travel at short-headways on freeways, harmonizing speeds to increase the throughput of an existing lane and thereby reducing traffic congestion on freeways. Real-world testing of this application is underway now on freeways in the San Francisco Bay Area. The truck project also uses DSRC to enable trucks to travel in “platoons,” which are strings of trucks travelling safely at short headways. For this application, in addition to the greater truck throughput, trucks receive the added benefit of reduced fuel consumption and associated greenhouse gas emissions due to the reduction in aerodynamic drag. Testing of the truck platooning technology will begin in August 2016, also in the Bay Area.

C. The Commission’s Public Notice

In the Public Notice, the Commission asks interested persons to file statements opposing or supporting the Petition for Rulemaking. Caltrans is extremely concerned that the implementation of DSRC should not be unnecessarily delayed.

II. **COMMENTS**

Caltrans is familiar with communication network security in general and with the standards and applications being developed for Dedicated Short Range Communications (DSRC). Caltrans, along with other governmental road operators, looks forward to using DSRC to improve safety and mobility on the nation's transportation system.

Every year there are thousands of fatalities due to collisions on the nation's highways. DSRC holds the promise to prevent many of these collisions and mitigate others. Every year, over 20,000 highway workers are killed and injured in the line of duty serving the public. DSRC will provide the means to help reduce the number of highway worker injuries. DSRC will also aid emergency personnel responding to incidents, including: fires, police and medical emergencies, and other events. Preventing and reducing vehicle collisions are but only a few of the DSRC safety applications developed and tested.

In addition to the safety applications, environmental protection and mobility applications have been developed that will enhance road operators' ability to serve the public. The standards are developed in a way to put safety of life first and these other critical concerns as second priority with the 5.9 GHz band.

Neither the use of the 5.9 GHz band, nor the use of the standards based protocols developed by the Institute of Electrical and Electronic Engineers (IEEE) and Society of Automotive Engineers (SAE), poses a unique vulnerability for vehicle safety or user privacy. Actually, the security and privacy measures implemented by following the standards

make the use of the 5.9 GHz band less vulnerable to hackers. The petition asking to delay this life-saving technology (DSRC) does not point out any specific vulnerabilities, but rather preys on fears of zombies to derail a well designed and tested system. The system is designed to use predetermined message structures to identify current highway and vehicle conditions. These messages do not include the ability for installing malware or software from one car to another. Any message asking to install malware will be discarded by vehicles using the standards. For these reasons and others, we believe the petition for emergency stay of operating DSRC service is without merit.

Caltrans is committed to the advancement and deployment of wireless communications and technologies to support Connected Vehicle applications and feels there is great potential to enhance the safety of our Highways through the use of this technology.

In the greater scheme of things, the life-saving potential of the vehicle-to-vehicle safety and other safety applications will enhance road user safety and security without introducing any unusual risk to privacy.

III.
CONCLUSIONS

Caltrans wishes to thank the Commission for its efforts to date in supporting the implementation of technology in the DSRC band. Caltrans reiterates its position that there is no unusual risk to security or privacy which would justify delaying the immediate implementation of DSRC technologies.

Caltrans stands ready to work with the FCC, and all interested parties to support safety and security when implementing technology in the DSRC band. However, developments to date do not indicate any unusual risk to security or privacy.

WHEREFORE, it is respectfully requested that the Commission reject the Petition of Public Knowledge and Open Technology Institute at New America because it lacks merit.

Respectfully submitted,

State of California,
Department of Transportation:



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