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

In the Matter of	)	
	)	
	)	ET Docket No. 11-90
Amendment of Sections 15.35 and 15.253 of	)	RM-11555
the Commission's Rules Regarding Operation	)	
of Radar Systems in the 76.0-77.0 GHz Band.	)	
	)	
Amendment of Section 15.253 of the	)	
Commission's Rules to Permit Fixed Use of	)	ET Docket No. 10-28
Radar in the 76-77 GHz Band.	)	

REPLY COMMENTS OF THE

TOYOTA MOTOR CORPORATION

TOYOTA MOTOR NORTH AMERICA, INC.
601 Thirteenth Street, NW
Suite 910 South
Washington, DC 20005
(202) 463-6831

Kevin Ro
National Manager
Technical and Regulatory Affairs

Submitted: August 1, 2011

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

In the Matter of	)	
	)	
	)	ET Docket No. 11-90
Amendment of Sections 15.35 and 15.253 of	)	RM-11555
the Commission's Rules Regarding Operation	)	
of Radar Systems in the 76.0-77.0 GHz Band.	)	
	)	
Amendment of Section 15.253 of the	)	
Commission's Rules to Permit Fixed Use of	)	ET Docket No. 10-28
Radar in the 76-77 GHz Band.	)	

REPLY COMMENTS OF THE

TOYOTA MOTOR CORPORATION

Toyota Motor North America, Inc. (TMA), on behalf of Toyota Motor Corporation (TMC), hereby submits reply comments in response to comments filed in the above-captioned proceeding.[1] In our original Petition for Rule Making, TMC maintained that the radiated emission limits specified in Section 15.253 of the FCC's Rules for the 76-77 GHz frequency band are based on overly conservative assumptions, and we requested that the Commission amend this rule section and Section 15.35 to establish limits for radiated emissions that are based solely on preventing unwanted electromagnetic interference.[2]

As discussed in our comments filed in this proceeding, TMC generally supports the Commission's proposals in the NPRM with respect to vehicular radar systems, which in most

[1] *See* Amendment of Sections 15.35 and 15.253 of the Commission's Rules Regarding Operation of Radar Systems in the 76-77 GHz Band, ET Docket No. 11-90, RM-11555, Amendment of Section 15.253 of the Commission's Rules to Permit Fixed Use of Radar in the 76-77 GHz Band, ET Docket No. 10-28, *Notice of Proposed Rule Making* (rel. May 25, 2011) ("NPRM").

[2] *See* Petition for Rulemaking of the Toyota Motor Corporation, RM-11555 (filed July 21, 2009).

instances are entirely consistent with the proposals made in our petition.[3] However, as also discussed in our comments, TMC opposes the Commission's proposal to generally authorize fixed radar installations regardless of location. TMC explained why we believe that a thorough analysis is necessary of the potential for electromagnetic interference to vehicular radar systems from fixed radar installations, and thus we urged the Commission to separate these proposals. TMC supports approving the changes for vehicular radar, but we urge the Commission to defer action on allowing unlicensed fixed systems in this frequency band.

The overwhelming majority of comments filed to date in this proceeding support the proposals set forth in the NPRM for changing the Commission's rules regarding radiated emissions from vehicular radar systems. Specifically, the Commission's proposals to eliminate the "not in motion" criteria for vehicular radar, to amend Sections 15.35 and 15.253 of its rules for these systems, and to adopt radiated emission limits recommended by ETSI and others are supported by Alliance of Automobile Manufacturers ("Alliance"), Autoliv Active Safety Systems ("Autoliv"), the BMW Group, ("BMW"), Robert Bosch GmbH ("Bosch"), Continental Automotive Systems ("Continental"), Delphi Corporation ("Delphi"), Denso Corporation ("Denso"), Fujitsu Ten Limited ("Fujitsu Ten"), Mercedes-Benz USA ("MBUSA"), and the Strategic Automotive Radar Frequency Allocation Group ("SARA").[4] As pointed out by SARA, eliminating the "unnecessary and outdated" distinction between "in motion" and "not in motion" will harmonize the Commission's rules with those adopted in other countries around the world.[5] Moreover, SARA observes (as TMC has noted in its previous filings) that harmonization with European and global standards for the 76-

[3] *See id.;* Comments of the Toyota Motor Corporation (July 18, 2011).
[4] *See* Comments of the Alliance of Automobile Manufacturers, Autoliv Active Safety Systems, the BMW Group, Robert Bosch GmbH, Continental Automotive Systems, Delphi Corporation, Denso Corporation, Fujitsu Ten Limited, Mercedes-Benz USA, the Strategic Automotive Radar Frequency Allocation Group (July 14-18, 2011).
[5] *Id.*, Comments of SARA, p. 3.

77 GHz band will help reduce costs for automotive technology and facilitate the development of new products for vehicular radar.

With respect to the issue of standards harmonization, TMC has continued to urge the Commission to use maximum peak power for specifying limits in Section 15.253, rather than power density at a distance of three meters, noting that this would make the Commission's rules comparable to those established in other countries and would also benefit the automotive industry with regard to the development of new technologies and cost reduction.[6] In concurrence with TMC's position on this matter, SARA urges the Commission to "specify the EIRP values expressly" in Section 15.253, and Denso supports specifying the Commission's limits in terms of "dBm."[7] Given the absence of any obvious reasons that would offset the benefits noted above, we continue to strongly urge the Commission to specify its newly adopted limits in terms of maximum peak power rather than in terms of power density.

In our previous comments, TMC responded to concerns expressed by the National Radio Astronomy Observatory ("NRAO") regarding potential interference to radio astronomy facilities.[8] We have noted that the limits proposed for maximum peak power (55 dBm) are actually *lower* than those currently specified in Section 15.253. Therefore, we believe that NRAO's claim that these proposed changes would increase the potential for adverse EMI to radio astronomy installations continues to be unrealistic. As stated in the NPRM, the Commission agrees with this assessment, and SARA concurs.[9]

However, in comments filed in this proceeding, NRAO continues to maintain that vehicular radar systems in the 76-77 GHz band will interfere with radio astronomy observations and that the

[6] Comments of TMC at 5.
[7] Comments of SARA at 3; Comments of Denso at 1.
[8] Comments of TMC at 4. *See also* TMC Reply Comments, RM-11555 (Oct. 8, 2009).
[9] NPRM at para.14; Comments of SARA at 4.

range over which this interference can occur is large.[10] NRAO claims that such interference is "inevitable," and "destruction" of radio astronomy receivers is a "serious possibility" if "high-powered" vehicular radars operate near radio astronomy sites.[11] NRAO provides an extensive technical discussion and analysis as evidence for its claims.

However, TMC has no information of any documented instances of such interference in areas where these vehicular radar systems have been used for over a decade in proximity to radio astronomy sites – and NRAO has provided none. Similarly, Delphi notes that 76-77 GHz automotive radar systems have been implemented in both the U.S. and Europe starting in 1999 without any reports of harmful interference to radio astronomy.[12] Since NRAO has failed to corroborate its claims with documented interference cases, TMC can only conclude that the claims made by NRAO are speculative and not supported by facts.

Until factual data are provided to support NRAO's position, TMC continues to believe that no significant potential exists from interference from vehicular radar to radio astronomy receivers. Furthermore, there is simply no evidentiary or well-founded policy basis to support NRAO's proposal to equip vehicles with an "on/off" switch to protect radio astronomy installations, which is both unnecessary and costly.

In addition, for reasons stated in its comments, SARA has serious concerns regarding NRAO's prior request for coordination zones based on "GPS–aware" vehicular radar systems. SARA believes that such systems would prevent the widest deployment of 76-77 GHz vehicular safety technology, particularly in mid- and low-level vehicles, and could hinder the mass-marketing of these devices. TMC supports SARA's position, and urges the Commission to confirm this assessment and to refrain from adopting unnecessary requirements in Section 15.253.

[10] Comments of NRAO at 2.
[11] *Id.* at 5.
[12] Comments of Delphi, p. 1.

Finally, TMC has already expressed its concern and opposition to the Commission's proposal to generally allow fixed radar applications on an unlicensed basis regardless of location.[13] The record in this proceeding now reflects overwhelming opposition to the Commission's proposal. The Alliance, Autoliv, BMW, Bosch, Continental, Delphi, MBUSA, SARA, and Volvo all join TMC in expressing outright opposition to, or at least serious concern over, the wisdom of expanding applications in this frequency band to unlicensed fixed radar.[14] Moreover, these commenters generally concur with TMC that the Commission's proposal for fixed radar should be deferred and considered separately from the proposed changes with regard to vehicular radar.[15]

In the NPRM the Commission expressed the view that vehicular radar systems and unlicensed fixed radar installations could coexist without concern for electromagnetic interference. However, in our prior comments TMC pointed out that the Commission has offered no data or research to support this conclusion. Furthermore, TMC and others have noted that we have information from results of the "MOSARIM" project that fixed 76-77 GHz installations can result in significant interference to automotive radar sensors.[16] Delphi also discussed implications of the MOSARIM project and provided other reasons why fixed radar installations may have a greater potential to interfere with vehicular radar, given their potential use of elevated antennas and antennas with higher gain and broader beamwidth.[17]

Given the critical importance of this issue for vehicular safety, TMC believes that the matter of potential interference from fixed systems to vehicular radar deserves thorough study and analysis before any decisions are made by the Commission to authorize such systems. As noted by Bosch, the Commission should not make such important conclusions that affect vehicular safety without

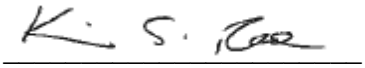
[13] Comments of TMC at 7.
[14] Comments of AAM, Autoliv, BMW, Bosch, Continental, Delphi, MBUSA, SARA, and Volvo.
[15] Comments of AAM, BMW, Bosch, Continental, Delphi, MBUSA, and SARA.
[16] Comments of TMC, Bosch, MBUSA and SARA.
[17] Comments of Delphi at 2.

supportive data on electromagnetic compatibility.[18] Similarly, MBUSA argues that further research is needed regarding the potential for interference from fixed radar installations, and that the Commission has "combined two distinct matters" that should be considered separately.[19] TMC fully supports these views. We continue to urge the Commission not to make any premature decisions with respect to allowing unlicensed fixed radar installations in the 76-77 GHz band that could have serious implications for vehicular safety.

In summary, TMC is pleased that the overwhelming majority of comments filed in the above-captioned proceeding support the proposals made in TMC's original petition for vehicular radar systems in the 76-77 GHz band, which have been largely incorporated into the Commission's NPRM. We continue, however, to urge the Commission to limit radiated emissions in the 76-77 GHz band by specifying maximum peak power rather than power density at a distance. We maintain our opposition to proposals made in this proceeding by NRAO to restrict vehicular radar systems based on what we consider to be utterly unsubstantiated claims for interference to radio astronomy installations. We also reaffirm our opposition to allowing unlicensed fixed radar systems in this frequency band, and strongly urge the Commission to defer action on its proposals in that regard.

[18] Comments of Bosch at 6.
[19] Comments of MBUSA.

Respectfully submitted,



Kevin Ro
National Manager

Toyota Motor North America, Inc.
601 Thirteenth Street, NW
Suite 910 South
Washington, DC 20005
(202) 463-6831

August 1, 2011