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December 14, 2015

EX PARTE NOTICE VIA ECFS

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Room TW-A325
Washington, D.C. 20554

Re: ET Docket No. 15-26, *Amendments of Parts 1, 2, 15, 90, and 95 of the Commission's Rules to Permit Radar Services in the 76-81 GHz Band*
ET Docket No. 11-90, *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. 10-28, *Amendment of Section 15.253 of the Commission's Rules to Permit Fixed Use of Radar in the 76-77 GHz Band*
WT Docket No. 11-202, *Amendment of the Commission's Rules to Permit Radiolocation Operations in the 78-81 GHz Band*

Dear Dortch:

On December 10 and 11, 2015, Daniel Selke of Mercedes-Benz USA, LLC ("MBUSA"),[1] Thomas Weiss of Daimler Aktiengesellschaft, and Ari Fitzgerald, Counsel to MBUSA, met with various Federal Communications Commission ("Commission" or "FCC") staff[2] to discuss the Commission's Notice of Proposed Rulemaking ("NPRM") in the above captioned dockets[3] and make the presentation attached to this letter.

[1] Mercedes-Benz USA, LLC is a subsidiary and the registered agent of Daimler Aktiengesellschaft.

[2] On December 10, 2015, the MBUSA representatives met with Julius Knapp, Aspasia Paroutsas, Karen Rackley, Mark Settle, Bahman Badipour, and Matthew Hussey of the Office of Engineering and Technology, and separately with Chanelle Hardy, Chief of Staff and Legal Advisor to Commissioner Clyburn, and Brendan Carr, Legal Advisor to Commissioner Pai. On December 11, 2015, the MBUSA representatives met separately with Erin McGrath, Legal Advisor to Commissioner O'Rielly; Johanna Thomas, Legal Advisor to Commissioner Rosenworcel; and Edward Smith, Legal Advisor to Chairman Wheeler.

[3] Amendment of Parts 1, 2, 15, 90 and 95 of the Commission's Rules to Permit Radar Service in the 76-81 GHz Band, *Notice of Proposed Rulemaking and Reconsideration Order*, 30 FCC Rcd 1625 (2015) ("*NPRM*").

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Consistent with its comments in the above-referenced proceedings, MBUSA expressed its enthusiastic support for the Commission's proposal to expand vehicular radar use throughout the 76-81 GHz band.[4] By adopting that proposal, the Commission will advance international efforts to harmonize the spectrum allocation for vehicular radar, promote the development of innovative new automotive safety technologies, including next generation driver assistance, and provide an essential foundation for the development of autonomous vehicles.[5]

MBUSA also expressed its support for the Commission's proposal to license vehicular radar under Part 95 of the Commission's rules.[6] Vehicular radar technologies enable critical safety of life applications, including collision prevention, lane keeping assistance, and blind spot detection, among other safety features. Part 95 licensing will provide vehicular radar with primary status and protect it from harmful interference. This will ensure that vehicular radar-enabled safety technologies function in the critical moments when drivers need them the most. Indeed, drivers and vehicles will increasingly rely on vehicular radar to perform autonomous driving functions. Eventually, radar-based systems will take primary control of driving. Thus, as vehicular radar becomes more critical and important, so will the unhampered performance of such systems.

Considering the importance of unimpeded operation of vehicular radar, MBUSA discussed in the meetings its concerns with the FCC allowing fixed radar to also operate in the 76-81 GHz band.[7] There are continuing concerns that fixed radar operations will cause harmful interference to vehicular radar equipment in the 76-81 GHz band. The Commission should, at the very least, wait for the results of the European Conference of Postal and Telecommunications Administrations ("CEPT") Electronic Communications Committee's ("ECC") pending study of the compatibility of vehicular radar and fixed infrastructure radar in the 76-77 GHz band before allowing fixed radar equipment in the 76-81 GHz band.[8] The study is attempting to find a technical framework that would allow both types of systems to coexist. However, should the ECC study find that fixed infrastructure radars cause harmful interference to vehicular radar systems and that such interference cannot be mitigated, the FCC should consider allowing fixed radar to operate in the 70, 80, or 90 GHz bands as a part of its "5G" proceeding, instead of the 76-81 GHz band.[9] In any event, should the FCC decide to authorize fixed infrastructure radar in the 76-81 GHz band, it should limit such operation to the 76-77 GHz portion of that band. Similarly, the Commission should only authorize fixed radar systems on a subordinate basis to vehicular radar systems (*i.e.*, on an unlicensed basis under Part 15 of its rules). Furthermore, the FCC should consider subjecting fixed radars to a site-based registration

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[4] *NPRM*, ¶ 2; Comments of Mercedes-Benz USA, LLC, ET Docket No. 15-26 at 3 (Apr. 6, 2015) ("MBUSA Comments").

[5] Comments of The Former Strategic Automotive Radar Frequency Allocation Group, *et al.*, ET Docket No. 15-26, at 6 (Apr. 6, 2015) ("Former SARA Group Comments").

[6] *NPRM*, ¶ 2; MBUSA Comments at 3.

[7] *See* Former SARA Group Comments at 12-14.

[8] *Id.* at 13-14.

[9] Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, *Notice of Proposed Rulemaking*, FCC 15-138, GN Docket No. 14-177 ¶ 81-93 (rel. Oct. 23, 2015).

regime to prevent installations where they could cause harmful interference to vehicular radar systems (*e.g.* in tunnels and other areas where vehicles would be expected to congregate).

MBUSA also expressed concerns with some of the Commission's sunset proposals for vehicular radar operations in the 24 GHz band. *First*, MBUSA urged the FCC to clarify that it will not phase out the ability to secure new 24 GHz narrowband vehicular radar equipment certifications under sections 15.245 and 15.249 of the Commission's rules.[10] The certification of new 24 GHz narrowband vehicular radar equipment has not been phased out in Europe or anywhere else in the world.[11] Manufacturers of narrowband 24 GHz vehicular radars continue to rely on sections 15.245 and 15.249 of the Commission's rules.[12] Every major U.S. automobile manufacturer has installed narrowband 24 GHz vehicular radar in their automobiles based on those rules and they all hope to continue to have the flexibility to do so in future vehicle models.[13]

The Commission has proposed to add language to section 15.37, however, that could be interpreted to prohibit the certification of narrowband vehicular radar in the 24 GHz band.[14] The Commission has also broadly stated that it proposes "to prohibit the certification of new vehicular radars that do not operate in the 76-81 GHz range, effective 30 days from the date of publication of our final rules in the Federal Register."[15] This language could also be interpreted to propose prohibiting narrowband 24 GHz vehicular radar certifications. Yet the Commission did not propose to amend sections 15.245 or 15.249, which authorize the certification of 24 GHz band narrowband vehicular radar.[16]

In order to clarify that the certification of new narrowband 24 GHz vehicular radar will be allowed to continue in perpetuity, the Commission should in its Order in this proceeding expressly exempt field disturbance sensors and narrowband 24 GHz vehicular radar equipment authorized under sections 15.245 and 15.249 from any sunset provision, including in any changes it makes to section 15.37 of its rules.[17] Moreover, the Commission should expressly affirm that nothing in its new rules should be construed to prohibit new certifications for narrowband vehicular radar equipment in the 24 GHz band authorized under sections 15.245 and 15.249.

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[10] MBUSA Comments at 4.

[11] Former SARA Group Comments at 11-12.

[12] *Id.*

[13] *Id.*

[14] *See NPRM*, Appendix B, ¶ 8 (amending section 15.37 to state "the certification of field disturbance sensors that operate in the 16.2-17.7 GHz, 23.12-29.0 GHz, 46.7-46.9 GHz and 76.0-77.0 GHz bands will no longer be permitted. Existing equipment may continue to operate in accordance with their previous certification").

[15] *NPRM*, ¶ 44.

[16] *Id.* (the Commission proposes only to modify sections 15.37, 15.252, 15.253, and 15.515).

[17] *See Id.*, Appendix B, ¶ 8.

Second, MBUSA continues to believe that the Commission should not phase out new wideband or ultra wideband ("UWB") vehicular radar equipment certifications in the 24 GHz band that are currently authorized under sections 15.252 and 15.515 of the Commission's rules.[18] However, should the Commission decide to phase-out new wideband or UWB 24 GHz vehicular radar equipment certifications, it should not cease granting of such new certifications before January 1, 2018. This sunset date would harmonize any U.S. transition away from 24 GHz wideband and UWB vehicular radar equipment with the European transition plan.[19] Further, the Commission should expressly adopt its proposal to "grandfather, for the life of the equipment, vehicular radars that are already installed or in use in the 22-29 GHz band range."[20] The Commission should confirm in its Order in this proceeding that it does not intend to prohibit the sale of previously certified wideband and UWB 24 GHz vehicular radar equipment and will permit the sale of such equipment in perpetuity.

Pursuant to Section 1.1206(b)(1) of the Commission's rules, I am submitting a copy of this letter and the accompanying presentation into the proceeding record.

Sincerely,

/s/ Ari Q. Fitzgerald

Ari Q. Fitzgerald
Counsel to Mercedes-Benz USA, LLC

cc: Julius Knapp
Aspasia Paroutsas
Karen Rackley
Mark Settle
Bahman Badipour
Matthew Hussey
Chanelle Hardy
Erin McGrath
Brendan Carr
Johanna Thomas
Edward Smith

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[18] MBUSA Comments at 3-4; 47 CFR §§ 15.252, 15.515.

[19] *See* European Commission, Decision 2005/50/EC (Jan. 17, 2005), *available at* http://eurlex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32005D0050&from=EN; Press Release, European Commission, Anti-Crash Radars: Commission Enables Cars to Be Equipped with Road Safety Technology (Jan. 18, 2005), http://europa.eu/rapid/press-release_IP-05-54_en.htm?locale=en ("Beyond 2013 . . . new automotive radar applications will be required to use another frequency band."); European Commission, Decision 2011/485/EU (July 29, 2011), http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:198:0071:0072:EN:PDF (extending the sunset of new 24 GHz wideband and ultra-wideband vehicular radar equipment by 5 years).

[20] *NPRM*, ¶ 44.

Mercedes-Benz

Radar Applications in the 76 - 81 GHz Band

Ex Parte Presentation ET Docket No. 15-26

Thomas Weiß, RD/FZS
December 10 - 11, 2015

Mercedes-Benz
The best or nothing.

Ex Parte Presentation of Mercedes-Benz

Overview

Vehicular Radar Applications

- Current and future radar-based driver assistance functions
- Transition periods in the automotive industry

Sunset Regulation for 24 GHz Applications

- European sunset for vehicular 24 GHz ultra-wideband (“UWB”) radar
- Regulatory framework for 24 GHz radar in Europe and the US
- Mercedes-Benz comments in the FCC’s 76 – 81 GHz proceeding

Status of Vehicular Radar in the 76 – 81 GHz Band

- Regulatory Situation in Europe and the USA
- Aim, Design and Setup of the ECC-coexistence study on vehicular and fixed infrastructure radar applications
- Status of the coexistence study on vehicular and fixed infrastructure radars
- Mercedes-Benz comments to the 76 – 81 GHz NPRM

Radar-Based Driver Assistance Functions

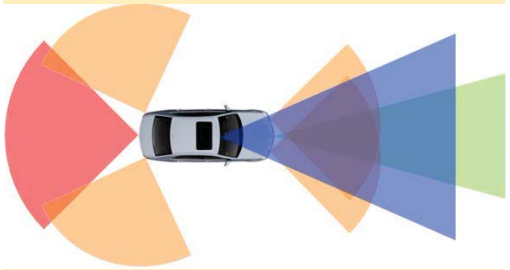
Radar Functions and Applied Frequency Use

Assistance System 3rd Generation
Current System

24 GHz and 76 GHz Radar
(24–29 GHz and 76–77 GHz)

State of the art driver assistance systems that offer comfort and safety applications.

Assistance System 4th Generation
Coming Up



76 GHz Radar
(76–77 GHz)

Significant expansion of functions that support and relieve the driver in particular situations, and a significant improvement of safety-related functions.

The transition from 24 GHz to 76 GHz radar sensors will be implemented with the roll-out of the 4th Generation of driver assistance functions.

Autonomous Vehicles
Future Applications

79 GHz Radar
(76–81 GHz)

Autonomously driving vehicles as well as future driver assistance functions will need radar sensors with a wide bandwidth to detect their environment with a high spatial resolution.

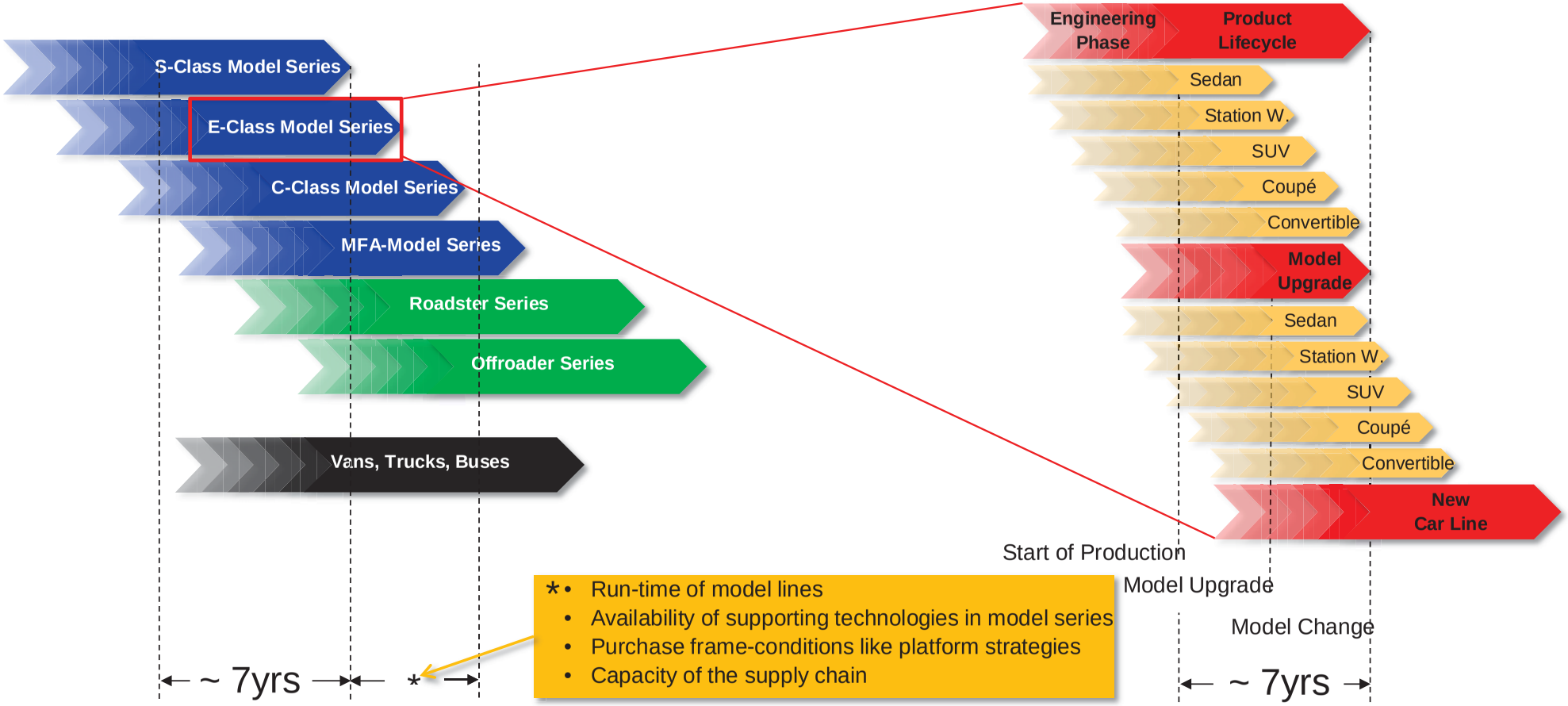
1. These safety-related automotive radar systems need protection from interference from other radar applications in the 76 – 77 GHz band (see current European coexistence study)

2. For this purpose a globally harmonized and continuous frequency range from 76 - 81 GHz is an essential prerequisite.

3. Autonomous vehicles will be steered by radar based functions. Protection from harmful interference will be even more important.

Radar-Based Driver Assistance Functions

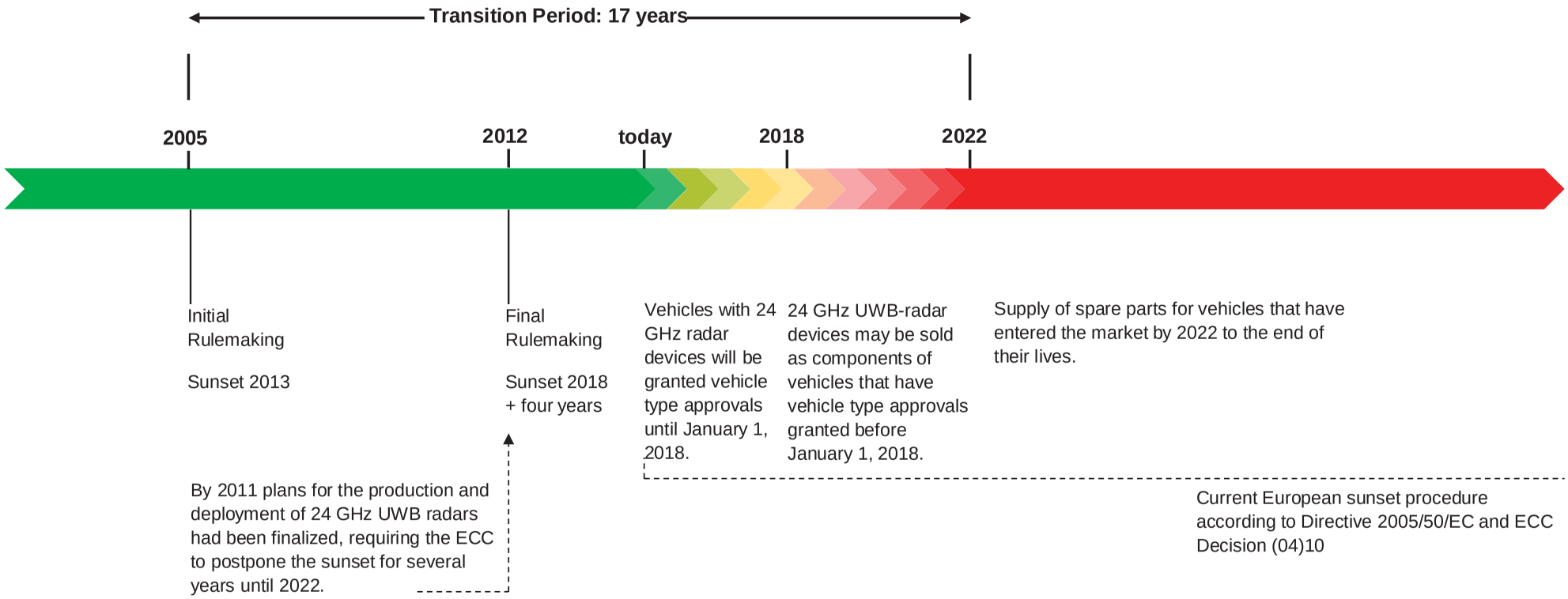
Transition Periods in the Automotive Industry



24 GHz Ultra Wide Band Radar Applications

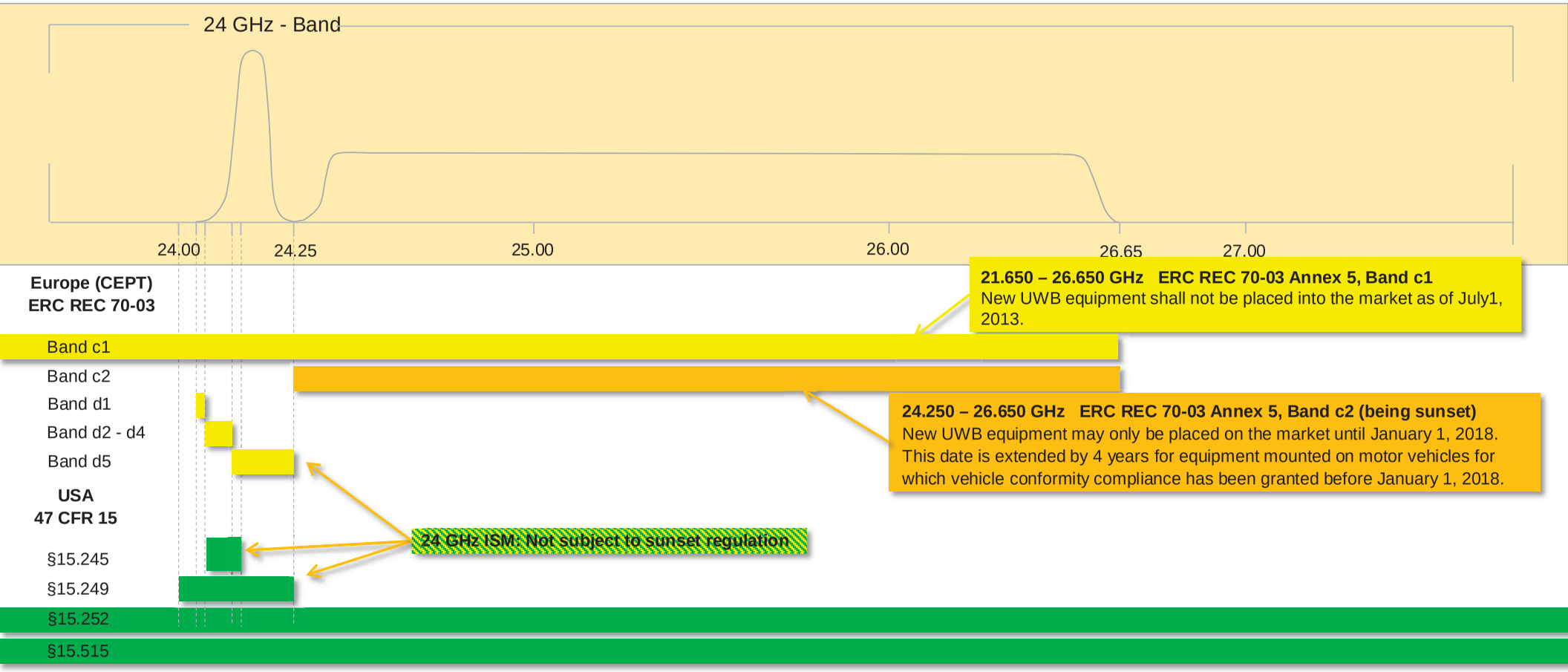
European Sunset Timeline According to Directive 2005/50/EC and ECC Decision (04)10

Sunset Timeline for the Band c2 (24.250 – 26.650 GHz)



24 GHz Radar Applications

Regulatory Framework in Europe and the USA



Mercedes-Benz

24 GHz Radar Applications

Comments on the FCC's Notice of Proposed Rulemaking

24 GHz wideband and ultra-wideband devices

- **The Commission should leave undisturbed the ability to obtain new equipment certifications for wideband (§15.252) and ultra-wideband (§15.515) radars.**

On Transition Periods

- The proposal to prohibit new wideband and ultra-wideband 24 GHz vehicular radar equipment within 30 days will not leave stakeholders with sufficient time to adapt.
- Product cycles in the automotive industry require longer lead times than in other industries regulated by the FCC.
- Automobile manufacturers have made plans and contracts beyond 2022.
- Automobile manufacturers and their suppliers need reasonable transition periods.
- The proposed period of 30 days is a far shorter phase out period than in other parts of the world.

- **The FCC should not implement any phase out period shorter or narrower than the current regulation within the CEPT- and European countries.**

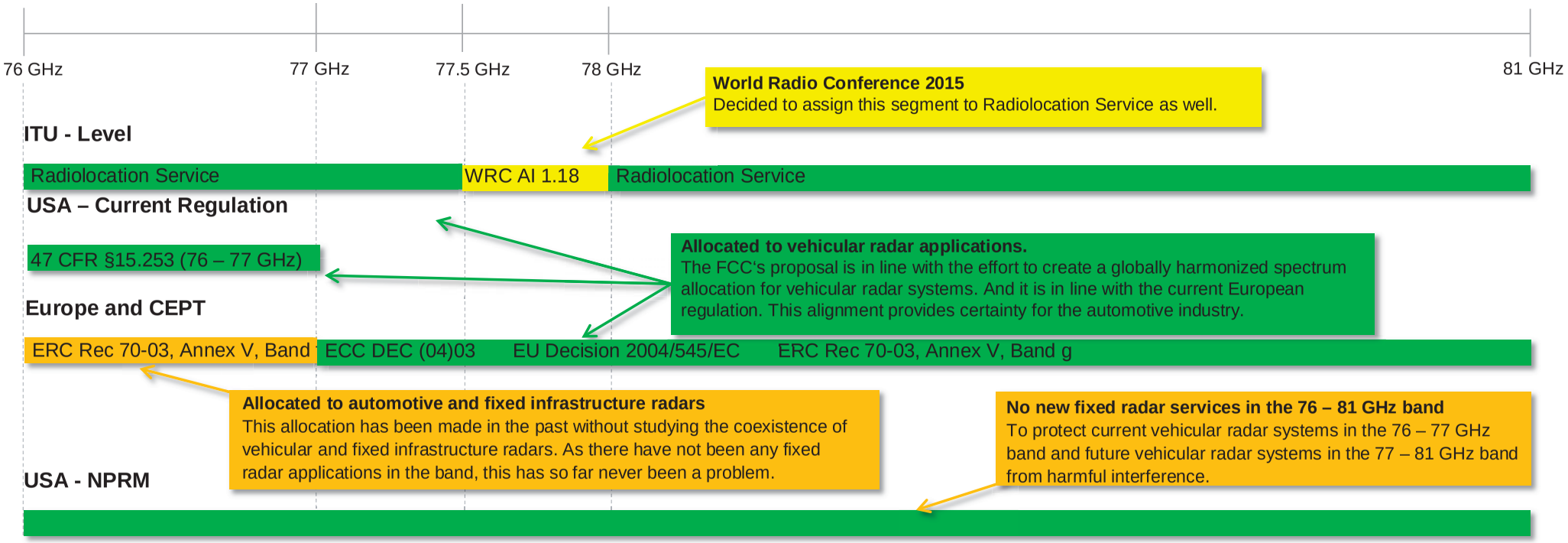
24 GHz narrowband equipment

- Devices under Section 15.245 and 15.249 belong to the most common radar devices and are being used by almost any automobile manufacturer.
- These sensors are also used outside of the automotive industry.
- We assume that the Commission does not propose to phase out the ability to certify new narrowband 24 GHz vehicular radar equipment under Section 15.245 and 15.249.
- The certification of new 24 GHz narrowband vehicular radar equipment has not been phased out in Europe nor anywhere else in the world.

- **The Commission should clarify its intent not to prohibit new 24 GHz vehicular radar equipment under §15.245 and §15.249**.

76 – 81 GHz Frequency Band

Regulatory Situation in Europe, the USA and the ITU



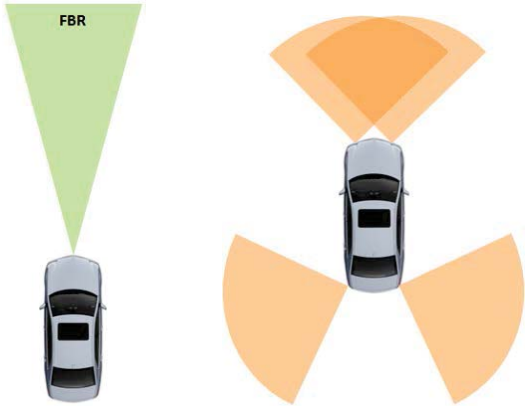
Coexistence Study on Vehicular and Fixed Infrastructure Radars

General facts on the European Coexistence Study

- Coexistence study by the European Communication Commission (ECC) in behalf of the Conference of European Postal and Telecommunication Administrations (CEPT)
  - Started in December 2014;
  - Focused on fixed-to-vehicle interference.
  - Investigation to identify harmful interference

Participants

- Daimler, BMW, Volkswagen
- Bosch, Continental, Autoliv
- NAVTEC Radar Ltd
- Bundesnetzagentur
- OffComUK



Test Program:

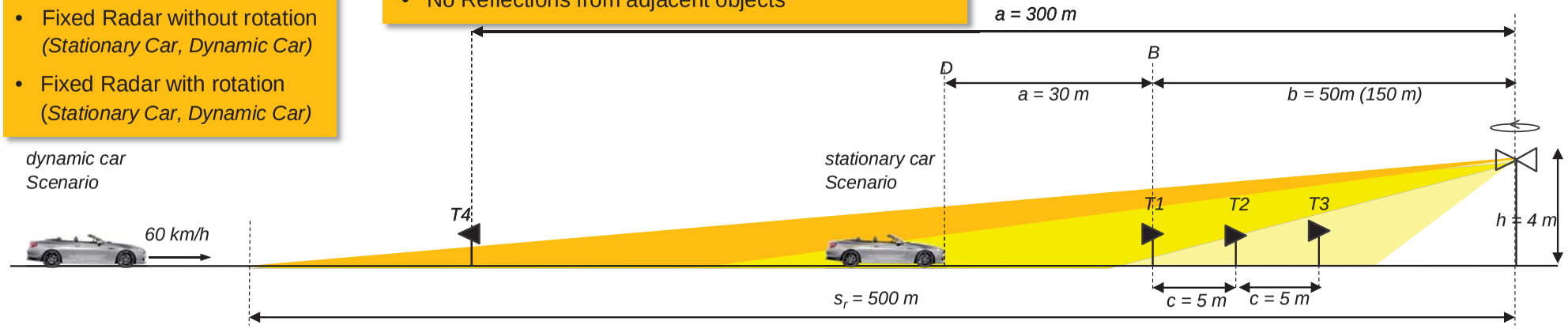
- Car vs. Car (Reference Case)

Vehicle vs. Fixed

- Fixed Radar without rotation *(Stationary Car, Dynamic Car)*
- Fixed Radar with rotation (*Stationary Car, Dynamic Car)*

Environmental Conditions

- Perfect Weather (dry sunny days)
- Open field
- No other Radars Sources
- No Reflections from adjacent objects



Coexistence Study on Vehicular and Fixed Infrastructure Radars

Current status

- Results will be published in early 2016.
- Work is currently in progress.

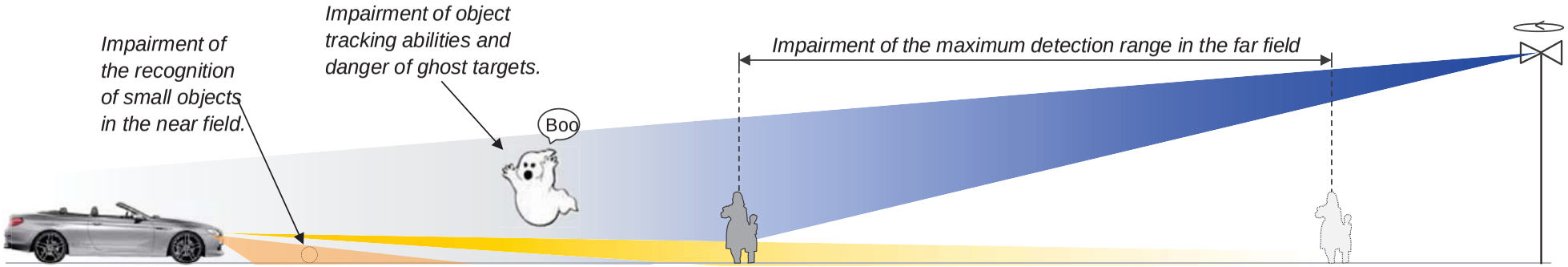
- The hypothesis of this investigation is that – like the earlier MOSARIM study indicates - an impairment of vehicular radar functions can occur under the influence of fixed radar sites.
- This view is objected by the manufacturer of the fixed radar system.

➢ It is currently unclear whether a mutually accepted technical or regulatory concept for the coexistence of both systems can be developed.

What's at stake ?

- Millions of Vehicles with safety relevant radar-based driver assistance functions are on the roads today.
- Several generations of vehicular radar devices have been deployed. *(Mercedes is currently preparing its 4th Generation of radar systems)*
- Only one fixed radar application has been studied thus far.
- New concepts and applications with a wide range of technical characteristics may develop in the future.
- Even if – through laborious studies - mitigation techniques could be found, they could not be retroactively implemented into prior vehicles.
- In future vehicle models, radar-based systems will not only control emergency operations, but will take control of a vehicle through autonomous navigation.

Concerns of the Automotive Industry



76 – 81 GHz Radar Applications

Comments on the FCC's Notice of Proposed Rulemaking

Expanding the available spectrum for Vehicular Radars in the 76 – 81 GHz band

- We enthusiastically support the Commission's proposal to expand vehicular radar use in the 76 – 81 GHz band.
- The FCC's proposal is consistent with current efforts to create a globally harmonized spectrum allocation for vehicular radars in the 76-81 GHz band, including the positive WRC-Decision on Agenda Item 1.18, which closes the gap for a globally harmonized primary allocation of the Radiolocation service in the 76 – 81 GHz band.

Licensing vehicular radars by rule under part 95

- We support authorizing vehicular radar services under Part 95 of the FCC's rules, which will avoid overly burdensome individual licensing requirements but provide vehicular radar with priority status and protection from harmful interference from other users.

The FCC should not allow any new fixed services in the 76 – 81 GHz band

- The automotive industry has repeatedly warned that fixed infrastructure radars create serious safety concerns due to harmful interference.
- The Commission should not allow any new fixed radar applications in the 76 – 81 GHz band before first confirming that they will not cause harmful interference.
- In view of the European coexistence study, the FCC should not issue any decision allowing new fixed radar applications in the 76 – 81 GHz band until the final report has been released and the FCC has had an opportunity to review and evaluate it.

If, however, the FCC declines to wait for the outcome of this European study, the FCC should harmonize its rulemaking with the European regulations. Accordingly fixed radar applications:

- Should be allocated only in the 76 – 77 GHz band, and
- Should be restricted to a bandwidth of no more than 1 gigahertz.

To protect vehicular system from interference by fixed radar applications these

- Should be subordinate to vehicular radar systems by allowing them on an unlicensed basis under part 15.
- Should be subject to a site-based licensing requirement to avoid installations in critical environments, like for example. tunnels.