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Abstract — This paper introduces the particularities of the regulatory framework in Russian Federation compared to other countries, the world's leading car exporters. It focuses on the frequency spectrum allocation for safety improvement and communication systems as a part of Intelligent Transport Systems (ITS) that are built in the cars. Overlooking these regulatory differences could cause rejection of legal export to the Russian Federation of the new models of vehicles or a need for structural changes that lead to the weakening of the security requirements. A solution to this problem is to harmonize established in the Russian Federation requirements for Radio Electronic Equipment that is built in the ITS with the technical requirements that are set by other countries.

Keywords — Intelligent Transportation System (ITS), Vehicle-to-Vehicle (V2V), Vehicle-to-Infrastructure (V2I), Commission on Radio Frequencies (SCRF), Regulatory Framework, Radio Spectrum, Automotive Radar

I. INTRODUCTION

The problem of high number of accidents associated with vehicles in recent years is becoming especially acute due to a mismatch between the needs of society in safety on the roads and the existing infrastructure as well as due to a poor efficiency of existing security systems and poor discipline of traffic participants. According to the World Health Organization [1], every 30 seconds somewhere in the world a person dies on a road. Thus, every year victims of these accidents are 1.2 million people and another 20-50 million are seriously injured.

One of the most promising ways to solve this problem is to equip the modern cars with various types of Radio Electronic Equipment (REE) for security, and to develop and implement various Intelligent Transport Systems (ITS).

The first category of REE includes radars of various purposes and range. These systems are used in most modern cars manufactured in the USA, Japan, South Korea and countries of the EU. The second category is the technology Vehicle-to-Vehicle (V2V, wireless communication between two vehicles) and Vehicle-to-Infrastructure (V2I, communication between the vehicle and an external infrastructure). Linking vehicles and road infrastructure in a single network enables an increase in traffic management efficiency and safety.

In the export case of cars with various electronic safety devices to other countries, manufacturers and dealers should pay attention to the intricacies of local legislation regulating the radio spectrum and adapt the characteristics of the built-in REE to these requirements. Otherwise, it may cause serious problems with the legal use of this equipment. Given that Russia is a major importer of cars (in 2013 there were imported 818,100 cars for 16,432 billion dollars, and for the first two months of 2014 - 95 900 cars for 1,843 billion [2]) a loss from legislative framework ignorance by car manufacturers can be significant to them.

This paper presents the particularities of the Russian legislation regarding radio spectrum regulation in terms of opportunities for legal use of electronic safety features and elements built in an imported car for ITS implementation. In accordance with the current legislation on technical regulation, standards of the Russian Federation are harmonized with the European regulations.

II. REGULATORY FRAMEWORK PARTICULARITIES OF RADIO FREQUENCY SPECTRUM USE

A. Particularities of frequency resource use in the Russian Federation

Regulating the use of frequency spectrum is an exclusive right of the state. Russian Government has entrusted development and implementation of the state policies in the field of radio spectrum allocation to the State Commission on Radio Frequencies (SCRF) under Ministry of Posts and Telecommunications of the Russian Federation (Russian acronym MINSVIAZ). Radio frequency bands are allocated in accordance with the National Table of radio frequency distribution and SCRF decisions, which tend to be generic in
nature, i.e., radio frequency bands allocated "to unspecified persons". SCRF decisions define the conditions and general rules for the use of a radio frequency band for a REE technology, when complying with a number of technical and organizational requirements, which are stated in technical data tables. Most often in the generalized SCRF decisions a bandwidth is allocated for development, production and use of REE.

If a SCRF decision states that there is a need in obtaining a permission to use radio frequencies or radio frequency channels, an expertise is required to verify that electronic equipment can be used and to declare its electromagnetic compatibility with existing and planned REE. This expertise is held by the General Radio Frequency Centre (GRFC).

With a positive expertise result, the Federal Service for Supervision of Communications and Mass Media (Russian acronym ROSCOMNADZOR) provides the applicant with a permission to use radio frequencies.

The final stage, after which the REE can be operated legally, is to register the equipment in the territorial bodies of the ROSSVIAZCOMNADZOR.

B. REE Import Procedure in the Russian Federation

Any REE, including built-in or a part of other products (e.g., cars), has to be imported into the territory of the Russian Federation according to licenses, issued by the Ministry of Industry and Trade of the Russian Federation (Russian acronym Minpromtorg) in the importing company’s registration region. Obtaining a license is mandatory, if the equipment is indicated in the List of REE that is restricted for import. This List is an annex to the Regulations on the import procedure of electronic equipment and (or) high-frequency civilian devices, including embedded or as a part of other goods into the customs territory of the Customs Union.

In addition, imported equipment shall be specified in the List of REE that is permitted for import. This List is managed by SCRF. The List specifies either REE type directly or a number of a SCRF’s Generalized Solution that establishes requirements to the same REE type. In the latter case, there has to be a certificate of compliance obtained that states that the technical characteristics of the imported REE or peripheral equipment (components) comply with the specifications and conditions of use, issued by the radio frequency service organizations, in the cases determined by these generalized solutions of SCRF.

In the case of the presence in the REE of encryption (cryptographic) means, import based on the information on registered in the consent of the state that is a member of the Customs Union (Federal Security Service of the Russian Federation (FSB)) Notification without issuing any other permits.

C. Compliance Confirmation Procedure

Since the legitimate use of REE in a Public Switched Telephone Network (PSTN) in Russian Federation without the appropriate certificates and declarations is not possible, every car manufacturer has to fulfill the requirements of conformity assessment procedures for the REE that is a part of the car.

Procedure of compulsory certification is determined by the “Rules of organization and work on mandatory conformation of communication equipment compliance” approved by the Government of the Russian Federation, dated June 25, 2009, N 532.

If REE is not included in the List of REE that is subject to mandatory certification, then it is simply declared. In particular, all user devices used as a part of the public network must be declared, e.g., GSM/UMTS/LTE/Wi-Fi/DSRC and other modems, wireless headsets of technology BlueTooth; Wi-Fi access points are a certification subject.

These procedures are carried out in a test laboratory that is accredited in the established order in the certification system "Sviaz" or "GOST R". This laboratory prepares a corresponding test (measurements) report and identifies an REE. As a result a laboratory compliance certificate (or a declaration) can be issued, which states as well a code of the common Foreign Economic Activity Commodity Nomenclature of the Customs Union.

The compliance verification procedure is based on the Rules of the corresponding REE use, which are approved by an order of MINSVIAZ. If the equipment is new and there is no rule, it is necessary to develop relevant draft document, quadrate it and register it in the established order.

III. FEATURES OF THE RUSSIAN LEGAL FRAMEWORK FOR CAR-MOUNTED RADARS

Short, middle and long range radars (SRR, MSR, and LSR respectively) are used in a number of active safety systems:
- Automatic emergency braking system,
- Assistance while changing a lane,
- Assistance while moving within a lane,
- Automatic parking system,
- Adaptive Cruise Control.

For such devices in different countries the allocated frequency bands are 24-29 GHz ("24 GHz") and 76-81 GHz ("79 GHz").

77-81 GHz band is defined as a preferred for automotive radar one [3, 4]. However, for economic reasons as a temporary band a 24 GHz band was allocated for Short Range Radars (SRR). Research [5] has shown that there are electromagnetic compatibility problems of SRR with Fixed Service, Radio Astronomy Service and Earth Exploration-Satellite Service. Therefore, from 1st July, 2013 the new SRR shall be transferred to 79 GHz frequency band or 24.25-26.65 GHz (up to January 1, 2018) [6].

Frequency band of 76-77 GHz is dedicated for these purposes by Federal Communications Commission (FCC) in the United States of America and the Ministry of Internal affairs and Communications (MIC) Japan (ARIB STD T48). In the United States functioning of automotive radars, operating in the band 76-77 GHz, is regulated in accordance...
with § 15.253 Volume 47 of the FCC rules, and as a subject to Part 15, these devices can not cause harmful interference, and shall not complain about the interference, which can be caused by an authorized radio communication system, another source of intentional or unintentional radiation, Industrial, Scientific and Medical (ISM) equipment or random source. In addition, in accordance with the European requirements for spectrum for Road Transport and Traffic Telematics (RTTT) in European Telecommunications Standards Institute (ETSI), European standards have been adopted for automotive radars operating in the band 76-77 GHz [7], and the Electronic Communications Committee (ECC) decided ECC/DEC/ (02)01 on which bands are dedicated for the coordinated introduction of RTTT, including the band 76-77 GHz.

Existing automotive radar technology, operating at 24 GHz, has either limited resolution or limited range. Therefore, European Conference of Postal and Telecommunications Administrations (CEPT) concluded that 77-81 GHz band should be considered as a single globally harmonized frequency band for automotive radars. For SRR, operating in the band 77-81 GHz, ETSI has adopted harmonized standard EN 302 264 [8, 9]. Recommendation ITU-R M.2057 [10] divides into two categories the automotive radars in the band 77-81 GHz in terms of functional and security requirements:

- Category 1: Adaptive Cruise Control (ACC) and Collision Avoidance (CA) radar, for measurement ranges up to 250 meters (Radar A). For these applications, a maximum continuous bandwidth of 1 GHz is required;
- Category 2: Sensors for high resolution applications such as Blind Spot Detection (BSD), Lane-Change Assist (LCA) and Rear-Traffic-Crossing-Alert (RTCA), detection of pedestrians and bicycles in close proximity to a vehicle, for measurement ranges up to 100 meters (Radar B, C and D). For these high resolution applications, a necessary bandwidth of 4 GHz is required. Such radars directly add to the passive safety of a vehicle and are therefore an essential benefit towards improved traffic safety. Radar E operates with a higher field of view to enable high-resolution applications such as pedestrian detection, parking-aid, and emergency braking at low speed (< 30 km / h).

In March 2010, MIC of Japan established the at the Council on information and communications a group for introduction in the country the radar use with high resolution in the frequency band of 77-81 GHz, and the standard ARIB STD T111 [APT Report] was Current. Currently, in the United States there are being consultations held on whether to allow the application of automotive radars operating in the band of 77-81 GHz.

Frequency bands of 76 - 77.5 GHz, 78 - 79 GHz and 79 - 81 GHz are allocated to the radiolocation service on a primary basis. Frequency band of 77.5-78 GHz has to be allocated to the radiolocation service on a primary basis to ensure a common distribution of the band 77-81 GHz for high resolution automotive radars on a worldwide basis. Based on the stated above needs, the Committee 6 on WCR-12 proposed ITU-R to conduct studies to determine the feasibility of allocation of 77.5-78 GHz radio frequency band to the radiolocation service on a primary basis. The Conference adopted Resolution 654 [SOM6/23] (WCR -12), which articulates the need for research under paragraph 1.18 of the agenda WCR- 15 and the main directions of research.

Given that the road radars are a class of Short Range Devices (SRD), the main frequency ranges and specifications defined in Annex 5 of ERC Recommendation (70-03) [11], see Table I.

### TABLE I

<table>
<thead>
<tr>
<th>Frequency Band, GHz</th>
<th>Power / Magnetic Field</th>
<th>Spectrum access and mitigation requirements</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>76-77</td>
<td>55 dBm peak e.i.r.p.</td>
<td>No requirement</td>
<td>50 dBm average power or 23.5 dBm average power for pulse radar only. For ground based vehicle and infrastructure systems only.</td>
</tr>
<tr>
<td>77-81</td>
<td>See detailed requirements in related ECC Decision</td>
<td>For automotive SRR*</td>
<td></td>
</tr>
<tr>
<td>21.65-26.65</td>
<td>See detailed requirements in related ECC Decision</td>
<td>For automotive SRR**</td>
<td></td>
</tr>
<tr>
<td>24.25 - 26.65</td>
<td>See detailed requirements in related ECC Decision</td>
<td>For automotive SRR***</td>
<td></td>
</tr>
<tr>
<td>24.050 - 24.075</td>
<td>100 mW e.i.r.p.</td>
<td>No requirement</td>
<td>For vehicle radars</td>
</tr>
<tr>
<td>24.075 - 24.150</td>
<td>0.1 mW e.i.r.p.</td>
<td>No requirement</td>
<td>3µs/40 kHz dwell time every 3ms. For automotive radars</td>
</tr>
<tr>
<td>24.150 - 24.250</td>
<td>100 mW e.i.r.p.</td>
<td>No requirement</td>
<td>1ms/40 kHz dwell time every 40ms. For automotive radars</td>
</tr>
<tr>
<td>24.250 - 24.495</td>
<td>-11 dBm e.i.r.p.</td>
<td>No requirement</td>
<td>0.25/4/25 MHz duty cycle. For automotive radars</td>
</tr>
</tbody>
</table>

Notes:
* New SRR equipment shall not be placed onto the market as of 1 July 2013.
** SRR equipment may only be placed on the market until 1 January 2018. This date is extended by 4 years for SRR equipment mounted on motor vehicles for which vehicle conformity compliance has been granted before 1 January 2018.
*** The spectrum access and mitigation requirement is given for devices mounted behind a bumper. If mounted without a bumper, the requirement should be 3µs/40kHz maximum dwell time every 3ms. A requirement for minimum frequency modulation range (applicable to FMCW or step frequency signals) or minimum instantaneous bandwidth (applicable to pulsed signal) of 250 kHz applies in addition to the requirement on maximum dwell time.
**** The spectrum access and mitigation requirement is given for devices mounted either behind a bumper or mounted without a bumper. A requirement for minimum frequency modulation range (applicable to FMCW or step frequency signals) or minimum instantaneous bandwidth (applicable to pulsed signal) of 250 kHz applies in addition to the requirement on maximum dwell time.
In Russia, the first serious attention to the automotive SRD was shown on May 7, 2007, with a decision of SCRF № 07-20-03-001 "On frequency band allocation for short-range devices." [12] Annex 15 of this decision identifies the main technical characteristics of SRR in the band of 22-26.65 GHz, see Table II.

### Table II
**Main Technical Specifications and Requirements of Automotive Short-Range Radars Use in the Band 22-26.65 GHz**

<table>
<thead>
<tr>
<th>Frequency range</th>
<th>Spectral density of e.i.r.p., dBm/MHz</th>
<th>Additional use requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>22,000 &lt; f &lt; 22.65</td>
<td>-61.3+20*ln(f)-21.65 GHz/1 GHz</td>
<td>Equipment shall automatically turn off within a radius of 35 km near the following towns: Dmitrov (56°26’00” N, 37°27’00” E), Paschino (54°49’00” N, 37°40’00” E), Kalyazin (57°13’22” N, 37°54’01” E), Zelenchukskaya (43°49’53” N, 41°35’32” E)</td>
</tr>
<tr>
<td>22.65 &lt; f &lt; 25.65</td>
<td>-41.3</td>
<td></td>
</tr>
<tr>
<td>25.65 &lt; f &lt; 26.65</td>
<td>-41.3-3.20*ln(f)-25.65 GHz/1 GHz</td>
<td></td>
</tr>
</tbody>
</table>

As it is stated in Table II, the radars should be automatically switched off in the vicinity of radio astronomy facilities.

Later the SCRF decision № 07-20-03-001 was completed and in the category "Devices for detection of movement and radio signaling" (Appendix 7). There were defined specifications and rules of automotive radars in the range of 24 and 76-81 GHz (Table III).

### Table III
**Main Technical Specifications and Requirements of Automotive Radars Use**

<table>
<thead>
<tr>
<th>Frequency bands</th>
<th>Technical characteristics</th>
<th>Additional use requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>24.05-24.25 GHz</td>
<td>Maximum e.i.r.p. 100 mW</td>
<td>Automotive radars: Radiation bandwidth not less than 9 MHz: without restrictions; Radiation time bandwidth less than 9 MHz: Radiation time shall not exceed 0.14 ms every 3 ms in the 60 kHz band</td>
</tr>
<tr>
<td>76-77 GHz</td>
<td>Maximum e.i.r.p. 1000 mW</td>
<td>Automotive radars: Modulation to be used: frequency modulated continuous wave/impulse with linear chirp</td>
</tr>
<tr>
<td>77-81 GHz</td>
<td>Maximum spectral density of e.i.r.p. -33 dBm/MHz</td>
<td>Automotive ultra wideband radars Channel width not less than 500 MHz</td>
</tr>
</tbody>
</table>

Comparative analysis of Tables I and III shows that, even though the permitted frequency bands in Europe and Russia are basically the same, there are differences in requirements to technical specifications (particularly the values of the radiated power and bandwidth). These very differences do not allow legally use such REE in Russia. According to [15], in the case when technical characteristics are the same, registration is not required for all types of automotive radars.

For legitimate use manufacturers need either to align their REE characteristics with established requirements, or to achieve the proposed changes acceptance in the applicable regulations to change the existing requirements.

### IV. Frequency Allocation Particularities of ITS Implementation

Currently, the world’s prevailing trend is not to create a transport management system, but transportation systems, in which the means of communication, management and control are initially embedded into vehicles and infrastructure. The management and decision-making functions are based on the resulting real-time information available not only to transport operators, but also to all the users of these transport services. The problem is solved by constructing an integrated system of "people - transport infrastructure - vehicles" with the maximum use of the newest information and control technologies. It is assumed that in the future technology of interaction with vehicles will be built-in in smartphones, bicycle constructions, travel bags, which will better inform drivers about road hazards and improve safety for cyclists and pedestrians. Such systems of transport security are known under various names (e.g., V2V, V2I, DSRC, C-ITS, ITS, C2C, C2H, etc.), but, as a rule, they are referred collectively as Intelligent Transportation System (ITS).

ITS, as a direction of automotive industry development and improvement, is a relatively new area of research and engineering [16]. So, the first International Organization for Standardization (ISO) standards, dedicated to ITS, appeared in 1992. It was then, when under the ISO framework the Technical Committee number 204 “Intelligent Transport Systems” was established (ISO / TC 204 Intelligent Transport Systems).

In October 1999, the Federal Communication Commission (FCC) allocated a frequency spectrum for V2V and V2I wireless communications. The Commission then established Dedicated Short Range Communications (DSRC) Service in 2003. DSRC is a communication service that uses the 5.850-5.925 GHz band for public safety and private applications [17].

V2V/V2I family includes several types of technologies: radio communications, mobile communications, satellite communications and DSRC (a kind of communication standard 802.11p [18]), which is sometimes called "roadside Wi-Fi". They allow the car, while driving, transmitting information (e.g., speed or direction of motion) and road services to other cars that are a part of the road traffic.

Currently, the National Highway and Traffic Safety Administration of the U.S. (NHTSA) is preparing to appoint the date on which car manufacturers will be required to implement technologies V2V/V2I. As analysts of the U.S. company Strategy Analytics have estimated, if the United
States will impose a standard for mandatory introduction of V2V/V2I, the demand for embedded systems, able to work with those in demand could reach 18.8 million unique instances per year [19].

Unlike the U.S., in Europe continuous spectrum in the 75 MHz band for DSRC is not available; therefore, 30 MHz are allocated in the 5875-5905 MHz band. The use of 20 MHz in frequency band 5855-5875 MHz is reserved for the Industrial, Scientific and Medical (ISM) use. Additionally, there are reserved for the further another 20 MHz in the range of 20 MHz 5905-5925 MHz (Table IV). Harmonized standardized ETSI EN 302 571 [20] ETSI adopted in 2008 in accordance with the results obtained by CEPT on ITS compatibility with other equipment. Thus, a common frequency band for the implementation of ITS in Europe 5855 -5925 MHz practically coincides with the American.

### TABLE IV

<table>
<thead>
<tr>
<th>Region</th>
<th>Frequency range, MHz</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA</td>
<td>5850-5925</td>
<td>FCC 47 CFR</td>
</tr>
<tr>
<td>Japan</td>
<td>5770-5850</td>
<td>AKB STD-T75</td>
</tr>
<tr>
<td>Korea</td>
<td>5,795-5,815</td>
<td>TTAS06-00625</td>
</tr>
</tbody>
</table>

EU finalized the standards for Connected Car, spending on research projects 180 million euros. Cars that can “talk” to each other through these protocols will appear on the public roads already in 2015. The global market volume for Connected Car I is expected to increase threefold by 2018, and will exceed 40 billion euros. The share of the related services segment (e.g., information on road traffic, support call centers, entertainment, web services, etc.) will reach 24.5 billion euros. [21, 22].

For the ITS implementation in Europe there was also allocated a 63-64 GHz range [23] with the maximum e.i.r.p. of 40 dBm. Similar parameters are defined in Recommendation ITU-R M.1452-2.

Another way of V2V and V2I interaction realization involves the use of SRD as elements of transport and traffic telematics in the range of 5795-5815 MHz in accordance with Annex 5 ERC Recommendation (70-03) (Table V). In this very frequency range DSRC systems operate in Japan and Korea (Table IV)

### TABLE V

<table>
<thead>
<tr>
<th>Frequency Band</th>
<th>Power / Magnetic Field</th>
<th>Spectrum access and mitigation requirements</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>5795-5805 MHz</td>
<td>2 W e.i.r.p 8 W e.i.r.p</td>
<td>Individual license may be required for the higher power of 8 W systems</td>
<td>Individual license may be required</td>
</tr>
<tr>
<td>5805-5815 MHz</td>
<td>2 W e.i.r.p 8 W e.i.r.p</td>
<td>Individual license may be required for the higher power of 8 W systems</td>
<td>Individual license may be required</td>
</tr>
</tbody>
</table>

As it is shown in Table V, the possibility of REE in the range 5795-5815 MHz involves obtaining an individual license.

Let us consider the legal framework for ITS elements implementation in Russian Federation.

Frequency band for ITS operation is allocated by two SCRF decisions. The first SCRF decision from 19.02.2010 № 10-06-03-2 [24] allocates the band of 63-64 GHz. REE specifications and conditions of use conform to European documents, where separately noted the possibility of Russia's accession to the CEPT ECC (09) 01 decision on certain conditions therein.

The second SCRF decision № 11-11-01-2 from 10.03.2011 [25] allocates for the ITS implementation radio frequency band of 5855-5925 MHz. The decision determined that the maximum e.i.r.p. for Road Side Units (RSU) is 2 Wt, and for On-Board Units (OBU) - 100 mWt. For RSU permission for the use of frequencies has to be obtained, which roughly corresponds to the procedure of individual licensing. Unfortunately, in large cities, where the deployment of ITS is expected, the 5.8 GHz range is already loaded, thus electromagnetic compatibility examination can give a negative result. Moreover, in this class of REE are subject to conformity assessment procedures in the certification system "Sviaz". However, there are no necessary regulations that establish rules for application of such REE, in particular REE of 802.11p standard. Therefore, certification of the 802.11p equipment is impossible before the necessary regulation is established.

5795-5815 MHz frequency band allocation for SRD conforms to the European distribution (Table V). However, in accordance with Annex 13 to the SCRF decision № 07-20-03-001 from 07.05.2007 (as amended SCRF solutions from 28.04.2008 № 08-24-01-001) maximum transmitter power is of 200 mWt and a permit is required to use frequencies for each installed REE. Under such use conditions, the development of roadside segment seems to be very problematic.

Regarding the registration procedure, according to [15] transport telematics REE in the band 5795-5815 MHz and ITS equipment in the 63-64 GHz band does not have to be registered. However, REE for ITS implementation in the frequency band of 5855-5925 MHz is subject to registration.

### V. CONCLUSION

In the world practice Intelligent Transportation System (ITS) is recognized as a general transport ideology that integrates telematics achievements in all transport activities to address economic and social problems. Implementation mechanisms for these principles, however, are different in every country, but the key components are identical. In the presence of the world's proven general concept of ITS, each State has its own national vision and priority programs for ITS deployment that are fixed in the regulations.

ITS standardization is considered not only as a mean of technical solutions harmonization, but also as an opportunity to support a competitive environment, so that a consumer will
not be “tied up” to a particular vendor of standardized hardware or software and will be able to choose on the market the most advanced solutions. On the other hand the manufacturer should take into account the particularities of the regulatory framework in different countries to ITS equipment could legally apply to them.

In Russia, the first steps are taken to develop a regulatory framework for the use of REE in the ITS. However, the regulations, that are set, are limiting both technical and organizational measures, impeding the full development and implementation of ITS. Moreover, they do not allow using the available technical solutions fully.

Therefore, further development of the regulatory framework of the Russian Federation on the use of REE in the ITS is highly demanded, as it provides the opportunity of REE operation with a sufficient quality for implementing the functions assigned to the ITS.

In particular, for vehicles imported in Russian Federation should be clear: what types of REE can be mounted on the vehicle in a lawful manner and in what modes they need to work on the territory of the Russian Federation (e.g., the radars of some technologies, embedded mobile communication systems, REE of DSRC technology). Otherwise, if the REE is not permitted for use in Russian Federation, it would have to be disabled and dismounted.

The research was carried out with the financial support of the Ministry of Education and Science of the Russian Federation under grant agreement #14.575.21.0058.

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[9] ETSI EN 302 264-2 V1.1.1 (2009-06) Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short Range Radar equipment operating in the 77 GHz to 81 GHz band; Part 2: Harmonized EN covering the essential requirements of article 3.2 of the R&TTE Directive.


[20] ETSI EN 302 571 (V1.1.1) Intelligent Transport Systems (ITS); Radiocommunications equipment operating in the 5855 MHz to 5925 MHz frequency band; Part 1: Technical requirements and methods of measurement.


[23] CEPT ECC(09)01 Use of the 57 - 64 GHz frequency band for point-to-point fixed wireless systems.
