This document responds to the "Opinion for public consultation on Spectrum Aspects of Intelligent Transport Systems" (RSPG 16-044) the secretariat of the Radio Spectrum Policy Group (RSPG) has published on 9 November 2016.

This document represents the opinion of Kapsch TrafficCom and Kapsch CarrierCom.

Kapsch TrafficCom is a leading provider of electronic road charging and ITS solutions world-wide. Kapsch TrafficCom is a member of the ITS Advisory Group, the C-ITS Deployment Platform and the Roundtable on automated and connected driving.

Kapsch CarrierCom is a leading global producer, supplier and systems integrator of end-to-end telecommunications solutions. The company offers innovative, business and mission-critical products, technologies and services for rail and urban public transport operators, carrier networks and energy supply companies. Kapsch CarrierCom is a trusted partner to organisations, who benefit from a comprehensive array of professional services and round-the-clock customer service.

Comments on the section "Recommendations on ITS for roads"

Kapsch TrafficCom shares the opinion of there is a risk of potentially competing ITS technologies that threatens the robust and safe operation of road safety ITS applications on the 5875-5905 MHz frequency band.

Currently there is only one mature technology that is capable of delivering safety critical road safety applications, which is ETSI ITS-G5. The European Commission explicitly recognises this in the staff working paper accompanying „5G an Action Plan for Europe"[1]. The European Commission's "A European strategy on Cooperative Intelligent Transport Systems, a milestone towards cooperative, connected and automated mobility" COM (2016) 766 reiterates that point and underlines the importance that safety-related ITS applications must be protected from harmful interference.

Cellular V2X communication (LTE-V2X) has not matured to a degree that it can be considered for an analysis from a spectrum point of view, as the ECC's Working Group FM has noted[2]. It is expected to mature and then fit with ETSI ITS-G5 to form the "hybrid communication" that the

[1] European Commission SWD (2016) 306 "5G Global Developments" accompanying the 5G Action Plan COM (2016) 588, p 9

[2] ECC WG FM "Final Minutes of the 86th WG FM Meeting" http://www.cept.org/Documents/wg-fm/33262/fm-16-225_final-minutes-of-the-86-wgfm-meeting-bordeaux-october-2016

European Commission, as well as EU Member States[3], are calling for. 3GPP is currently working on LTE-V2X standards and has concluded that LTE-V2X and ETSI ITS-G5 best use different radio channels, as they can not co-exist[4].

In practice this would mean dividing the 5875-5905 MHz frequency band, which would cause both technologies to fail at delivering improved road safety. Hence from a road safety point of view it makes little sense to run both technologies on the same frequency band, two equivalent technologies on the same frequency band would result in wasting valuable frequency band.

Road safety would improve though with LTE-V2X using the 3.4-3.8 GHz frequency band, since it would offer an alternative to 5.9 GHz based service should the frequency band experience problems. It would make road safety related V2X applications more robust, since there are not only two different communication technologies involved, but also two different frequency bands.

We believe that running ETSI ITS-G5 on the 5.9 GHz frequency band and LTE-V2X on the 3.4-3.8 GHz frequency band serves the policy goals formulated by the European Commission and the EU Member States best, since this model offers improved road safety and robustness and it allows 5G to develop, without obstructing the deployment of V2X connectivity.

We agree to keep 20 MHz on the top and low end for optional non safety-related ITS applications. The ECC has already discussed using the top end of the 5.9 GHz frequency band for urban rail networks, the lower band could be used for efficiency applications such as platooning[5].

[3] "Amsterdam Declaration – cooperation in the field of connected and automated driving", 14-15 April 2016
[4] 3GPP Liaison Statement on LTE based solution for ITS services http://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_72/Docs/RP-161322.zip
[5] ECC WG FM "Final Minutes of the 86th WG FM Meeting" http://www.cept.org/Documents/wg-fm/33262/fm-16-225_final-minutes-of-the-86-wgfm-meeting-bordeaux-october-2016

Comments on the section "Recommendations on spectrum for next-generation of railway communication systems

Over the last month Kapsch CarrierCom has been actively involved in several consultations within the UIC Frequency Management Group (FMG), the CEPT FM 54 working group as well as the preparation of the ETSI TR 103 333 System Reference Document to assess and define the spectrum requirements for the next generation communication system for railways.

Overall Kapsch CarrierCom agrees with the recommendations on spectrum for next-generation of railway communications systems. In addition we see the need to present a few considerations and highlight potential issues.

1) Today GSM-R communication services utilizes 2x4 MHz (876-880/921-925 MHz) and some railway undertakings experience today shortage of radio resources in busy areas (shunting areas, large train stations) and thus are in the process of evaluating technology options to optimize the utilization (e.g. GPRS/EDGE introduction)

2) During a transition period which is expected to last several years a coexistence of GSM-R with one or more future radio technology is foreseen. To avoid interference and support the expected capacity requirement during the migration phase it can be expected that the 2x4MHz is not sufficient to host partially GSM-R and a future radio access technology[6].

3) Radio interference represents a significant risk and lead to degradation of mission critical services relying on a cellular access network. From our perspective the usage of SRD radio technologies as direct neighbour to GSM-R services or a future radio access technology for railway communication services is not fully analysed and future studies are required to define detailed guidelines for guard bands, safe separation and signal emission profiles.

To summarize, Kapsch CarrierCom sees the demand for more spectrum dedicated to railway operational communication needs to ensure safe and secure mission critical communication over the transistion period to a next generation communication solution as well as to support new emerging future applications around automated train operation, remote supervision and smart traffic management.

[6]The study "Coexistence of GSM-R with other communication systems" from the European Union Agency for Railway (ERA 2015 04 2 SC) highlights that supporting railway communication services would likely not be possible using only 1.4MHz channel bandwidth for the future communication system while leaving the remaining spectrum for GSM-R services while considering a guard band.