

To: European Commission
President Juncker
Vice-Presidents Timmermans, Ansip, Katainen and Šefčovič,
Commissioners Bulc, Gabriel, Bieńkowska, Moedas, Vestager and Oettinger
Cc. Secretary-General of the European Commission

From: NGMN Board of Directors

Date: 22 November 2018

Title: NGMN Recommendations on Cooperative Intelligent Transport Systems (C-ITS)

1. About the NGMN Alliance

The NGMN Alliance is an industry organization of leading world-wide Telecom Operators, Vendors and Research Institutes (see www.ngmn.org) and was founded by international network operators in 2006. Its objective is to ensure that the functionality and performance of next generation mobile network infrastructure, service platforms and devices will meet the requirements of operators and, ultimately, will satisfy end user demand and expectations. The NGMN Alliance will drive and guide the development of all future mobile broadband technology enhancements with a focus on 5G. The targets of these activities are supported by the strong and well-established partnership of worldwide leading operators, vendors, universities, and successful co-operations with other industry organisations.

2. NGMN Work on C-ITS / V2X

In February 2015 the NGMN Alliance published its 5G White Paper¹ providing consolidated 5G operator requirements. In June 2016, NGMN created a V2X task force to study and evaluate V2X technologies and requirements and harmonise Mobile Network Operators (MNOs) views on LTE-based V2X and DSRC/IEEE-802.11p. The task force objectives were to reduce time to market of C-V2X technology, and trigger cooperation with the automotive industry.

The results of the work were published in a White Paper² in June 2018, which presents a summary of the findings of the NGMN V2X task force and concludes with the following key points:

- To date, NGMN members have provided cellular connectivity to more than 30 million vehicles worldwide, which is used for a variety of safety related use cases (e.g. distribution of end of traffic jam warning, black ice warnings, etc.). It is expected that in the near future every vehicle will be equipped with cellular connectivity. This is a good and market driven basis for the deployment of further C-V2X technology and services.

- With the finalization of 3GPP Rel. 14 specifications at the beginning of 2017, a 3GPP standardized solution exists, which supports both long range as well as short range communication, and which fulfils all the requirements of a Cooperative Intelligent Transport System (C-ITS) eco-system.
- NGMN believes that C-V2X is not only able to enhance safety features for vehicles, but also supports use cases for other traffic participants, like pedestrians and cyclists.
- NGMN has investigated and concluded that C-V2X technology is superior to IEEE 802.11p standards, technically, economically, and eco-system wise, and can well satisfy the basic safety applications. NGMN studies found the following technical advantages of C-V2X:
 - It has better performance than IEEE 802.11p, e.g. in communication range, latency and scalability;
 - It can be harmonized with cellular technology and easily utilize the benefits of cellular technology, such as improving the penetration of C-V2X based on high penetration of cellular vehicle terminals and mobile phones, disseminating information using cellular broadcast and decrease the investment in infrastructure by reusing already deployed cellular networks.
 - It has a natural evolution path to future advanced applications by updating current networks to 5G.
- NGMN supports the go to market statements from major industry stakeholders, such as car manufactures and chip-set suppliers, and collaborates with the relevant industry associations, like 3GPP, ETSI, and 5GAA.
- NGMN members are engaged with other partners of the eco-system in ongoing tests in various trials worldwide; NGMN fully supports the timeline of go to market for C-V2X technology using chipsets commercially available from major chipset vendors by Q3/2018 for deployment in vehicles at the beginning of 2020.

The White Paper recommends to the players in the C-V2X eco-system to take note of the NGMN V2X Task Force studies and findings. Liaison Statements have been provided to relevant organisations including 5GAA³, which is a co-operation partner of NGMN.

3. NGMN Submission to US Department of Transportation

In April 2017, NGMN provided feedback on the 'Notice of Proposed Rule Making of US Department of Transportation / NHTSA'⁴. This feedback provides information on elements of NHTSA's proposed rules that are supported by NGMN as well as improvements and changes to other elements of the proposed rules.

NGMN V2X Task Force recommended USDOT to be technology neutral in the rule making, as cellular technologies beginning with 3GPP Release 14 could offer a technical and market-driven solution with a clear evolution path. NGMN views this capability as a technology option that could be deployed well within the deployment horizon envisioned in

NHTSA's proposal and also be compatible with 5G as that deployment matures. C-V2X is a set of features currently supported by LTE, and is part of a clear and seamless evolution path into 5G. This solution appears preferable by many measures including better technical performance, improved cost-efficiencies, and its flexibility to adapt to a variety of business models. A USDOT mandate for specific V2V technology could prevent the US from benefitting from future auto safety and automated vehicle solutions.

4. NGMN Recommendation to the European Commission

In its recent Meeting on Nov. 7, 2018, the NGMN Board has discussed the situation on C-ITS in Europe. In light of the results of the NGMN work, the potential implications of the current EC Delegated Act and the concerns stated by our cooperation partners, the Board decided to communicate NGMN's position in this important matter to the European Commission:

NGMN supports the concerns and recommendations recently expressed in related submissions to the EC from other relevant organisations in this area, most notably the 5GAA⁵ and the GSMA⁶.

Despite the European Commission's stated commitment to technology neutrality, we are very concerned about the progressing Delegated Act. At the current time, it rules out the most recent technology, Cellular-V2X (C-V2X), favouring a specific and single-purpose Wi-Fi based technology path, ITS-G5, which has no relationship to 5G technology and no evolutionary path towards compatibility with future 5G based C-ITS systems generations, as being planned in 5GAA, 5GCAR and other groups, thus precluding the evolution to 5G for connected cars.

Limiting C-ITS deployment to ITS-G5 would imperil the EU automotive industry's ability to compete in today's global and evolving technological marketplace. This places Europe at a technical and economic disadvantage compared with other regions of the world including China and the United States, where C-V2X is emerging as a strong technology candidate for C-ITS.

- China's strategy for intelligent transportation systems (ITS) designates LTE-V2X as the system to link vehicle to vehicle, RSU and person over the air. The Chinese government has officially published spectrum plans in the 5.9 GHz band for LTE-V2X networks which have a natural evolution path to 5G.
- The US has backed away from an Obama-era mandate to deploy DSRC and says it will take a technology-neutral approach, which may open yet another door for C-V2X.

Rather than opting for a C-ITS in which the ageing 802.11p radio technology would become the de facto standard, Europe's future C-ITS ecosystem deserves to be built on an optimal technology foundation, in order to remain sustainable over time and maximise the benefits of future investment in 5G. This will make Europe's roads safer and smarter.

Next Generation Mobile Networks

NGMN Letter to EC regarding C-ITS



NGMN strongly recommends to adopt a forward-looking, technology-neutral approach in developing the EU's C-ITS strategy. It calls upon European legislators to reconsider the current EC Delegated Act by including C-V2X on the list of potential technologies that European stakeholders may pursue and allow the market to decide which technology prevails. Given its importance, the Delegated Act adoption should not be rushed but conducted in transparent consultation with all stakeholders.

Emmanuel Lugagne Delpon,
SVP, Orange Labs Networks
Chairman of the Board, NGMN e.V.

NGMN Board:

Igal Elbaz, SVP, Wireless Network Architecture & Design, AT&T Services

Wolfgang Fleischer, Head of Network Virtualization, A1 Group

Bruce Rodin, VP Wireless Networks, Bell Canada

Howard Watson, Group CTIO, BT

Huang Yuhong, Deputy General Manager China Mobile Research Institute, China Mobile

Hey-Chyi Young, VP of Chunghwa Telecom Labs, Chunghwa Telecom

Arash Ashouriha,

SVP Group Technology Architecture & Innovation & Deputy CTO, Deutsche Telekom

Paul Berriman, Group CTO, Hongkong Telecom

Tom Poelhekken, CTO, KPN

Seong-Mok Oh, President and Head of Network Group, KT

Maqbool Aliani, SVP Spectrum Standards & Technology, Ligado

Babak Fouladi, CTIO, MTN

Peter Meissner, CEO, NGMN Alliance

Seizo Onoe,

Chief Technology Architect, NTT DOCOMO and President DOCOMO Technology

Jorge Fernandes, CTO, Rogers

Mark Chin Kok Chong, Group CTO, Singtel

Sungho Jo, Senior Director, Head of Access Network Lab, SK Telecom

Czar Christopher Lopez, Head of Technology Strategy & Transformation Office, Smart

Ron Marquardt, VP of Technology Innovation & Architecture, Sprint

Andrea Calvi, Head of Technology Evolution & Innovation, TIM

Thomas Björklund, Group CTO, Tele2

Bernard Bureau, VP 5G Spectrum and Wireless Networks, TELUS

Neville Ray, EVP & CTO, T-Mobile US

Gediz Sezgin, Chief Network Technologies Officer, Turkcell

Michael Irizarry, EVP & CTO Engineering and Information Services, US Cellular

Yogesh Malik, Group CTO, Veon

Johan Wibergh, Group CTO, Vodafone

Next Generation Mobile Networks

NGMN Letter to EC regarding C-ITS



¹ 5G White Paper, NGMN, March 2015

https://www.ngmn.org/fileadmin/ngmn/content/downloads/Technical/2015/NGMN_5G_White_Paper_V1_0.pdf

² V2X White Paper, NGMN, June 2018

https://www.ngmn.org/fileadmin/ngmn/content/downloads/Technical/2018/V2X_white_paper_v1_0.pdf

³ NGMN Liaison Statement on Technology Evaluation of LTE-V2X and DSRC, October 2017

https://www.ngmn.org/fileadmin/user_upload/171011_NGMN_LS_on_Technology_Evaluation_of_LTE-V2X_and_DSRC_to_5GAA.pdf

⁴ NGMN Submission to US Department of Transportation during NPRM Process, April 2017

https://www.ngmn.org/fileadmin/user_upload/170412_NPRM_NGMN_Alliance_v1_0_web.pdf

⁵ 5GAA: Connected car legislation taking the wrong turn: Europe risks falling behind in 5G. Letter to the European Commission. 6th July

2018 http://5gaa.org/wp-content/uploads/2018/08/5GAA_CEO-Letter-V2X-27-July.pdf

⁶ Safer and smarter driving: the rollout of Cellular V2X services in Europe

GSMA position on C-V2X in Europe, September 2017.

<https://www.gsma.com/gsmaeurope/wp-content/uploads/2017/09/GSMA-position-on-C-V2X-in-Europe-September-2017.pdf>