Submission No 34

REVIEW OF ROAD SAFETY ISSUES FOR FUTURE INQUIRY

Organisation: Nokia

Date Received: 21 September 2018

Nokia Submission to the Staysafe Committee

Nokia solution for Highways and roads ensuring safe, on-time and connected highway journeys

Date 21/09/2018

Contents

1 Introduction

Increased congestion, pollution, road fatalities and changing connectivity demands of travelers are some of the challenges faced by the highway industry and local road authorities. By evolving into truly Intelligent Transportation Systems (ITS), highway agencies and departments of road transportation can ensure safe, on-time and connected journeys.

2 Nokia Highways and Roads Solutions

Nokia Communications networks interconnect roadside equipment, vehicles, travelers, roadside workers and all highway stakeholders with each other and with traffic control centers. They are the path to providing reliable, voice, video and data services to improve traffic flow, lower traffic pollution, increasing traffic safety and enhancing traveler experience.

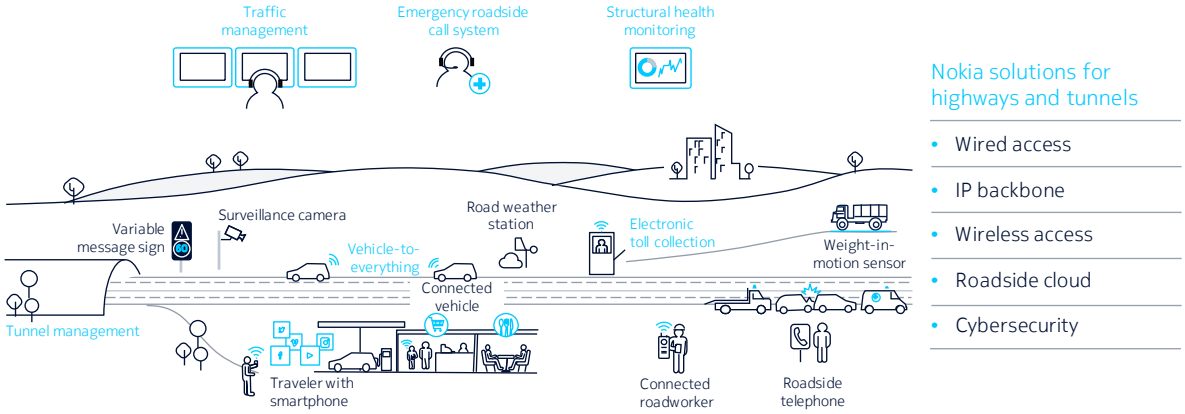

Figure 1. Enhancing road safety with vehicle-to-everything communications

2.1 Nokia supporting current ITS systems

Nokia provide mission-critical network communications solutions to support intelligent highways and roads. These highly available, resilient and reliable networks ensure that end devices such as Emergency Roadside telephones, Variable Messages Signs, Weather Stations, CCTV cameras etc. are always connected keeping the end user safe and fully informed during their journey.

Nokia Bell Labs has years of relevant highways industry experience, and with expertise in mission-critical networks and in ultra-broadband communications, we partner with highway agencies around the world.

2.2 Nokia supporting current V2X Trials

Nokia is a key stakeholder in a number V2X Trials in several countries, e.g. Germany, Greece, Turkey, Italy, Spain and Portugal. These Trials consist of several stakeholders which include government, communications solution providers (Nokia), vehicle manufacturers and mobile network operators.

2.2.1 Nokia V2X Trial Use Case Examples:

Detailed below are some Trial use cases being considered.

- Coordinated lane merge
- Cooperative perception of connected vehicles
- Protection of vulnerable road user through ultra-precise positioning
- Dynamic adaptation of vehicle automation levels based on infrastructure information
- Intersection crossing & lane merging – “virtual mirror”
- Truck platooning - linking of two or more trucks in convoy
- Using connectivity technology and automated driving support systems
- Reduce CO2 emission and vehicle emission control
- Vehicle manoeuvre negotiation
- Automated driving at high speeds (level 3)
- Real-time mapping updates and event notifications
- Road infrastructure to vehicle communication

2.3 Nokia developing standards for V2X

Nokia is a founding member of 5G Automotive Association which has been set up to develop, test and promote communications solutions which safely and effectively support V2X connectivity, initiate their standardization and accelerate their commercial availability and global market penetration.

Nokia is also a member of the 3rd Generation Partnership Project (3GPP) which is a collaboration between groups of key stakeholders in the telecommunications sphere. With input from Nokia

and others, 3GPP is developing functionality to provide enhancements specifically for vehicular communications - both in terms of direct communication (between vehicles, vehicle to pedestrian and vehicle to infrastructure) and for cellular communications with networks.

2.4 5G the Future of V2X Connectivity

Nokia's innovative 5G capability is also leading the drive towards the implementation of 5G at a global level.

5G networks will support the diverse and extreme requirements for latency, throughput, capacity and availability required for the implementation of V2X. With network slicing, operators and enterprises will be able to address precisely the specific needs of different customer segments, including transport.

5G enables the implementation of agile, cognitive, sensing, self-learning and programmable networks that push the boundaries of technology to revolutionize and transform the way people live, work and interact.

5G will be the communications enabler for future ITS and V2X connectivity.

2.5 Nokia IoT Use Case Examples

Nokia also deliver IoT solutions which contribute to the safe and efficient operation of the highways and road infrastructure, some examples are detailed below:

- Structural health monitoring - Highways Assets
- Road surface monitoring – temperature, water film height etc.
- Environmental monitoring – air quality
- Smart Lighting - remote monitoring and control
- Smart parking - monitoring and control of parking spaces at rest areas

3 Conclusion

Nokia would welcome the opportunity to provide further detail on the information provided in this submission in the form of a written submission or via a face to face engagement.

<End Document>