Subject: Response to TRAI Consultation Paper on C-V2X – Role of V2N-Based Services in Early Deployment

Overview

Harman International appreciates the opportunity to provide inputs on the TRAI Consultation Paper on Cellular Vehicle-to-Everything (C-V2X).

As a global provider of connected vehicle solutions, Harman supports the advancement of cooperative safety technologies in India and globally. We believe that C-V2X represents a critical enabler for improving road safety, traffic efficiency, and future mobility services.

In this context, we provide our perspective on the role of Vehicle-to-Network (V2N)-based services within the broader C-V2X ecosystem, particularly with respect to early deployment ("Day-0") use cases in India.

Harman Position

Harman supports a phased, technology-neutral, and complementary deployment approach to cooperative safety, where network-based communication (V2N) and direct communication (C-V2X PC5) are developed and deployed in parallel, consistent with global industry direction, including the 5G Automotive Association (5GAA).

We do not view V2N and PC5 as competing alternatives, but as complementary technologies addressing different safety and mobility use cases.

For early-stage deployment in India, V2N-based services provide a practical and scalable foundation to enable immediate safety benefits, while allowing direct C-V2X capabilities to evolve.

Key Considerations Supporting V2N-Based Deployment

Some of the key considerations for including V2N-based use-cases as part of Day-0 and Day-1 scope are as follows:

1. Immediate Deployability: V2N services can be deployed using existing cellular networks without requiring dedicated spectrum, RSUs, or new hardware.

2. Cost Efficiency: No additional BOM cost, enabling scalability in price-sensitive markets.

3. Rapid Fleet Penetration: OTA deployment enables faster ecosystem scaling.

4. Complementary Role: PC5 enables low-latency proximity interactions, while V2N enables wide-area awareness and backend intelligence.

5. Alignment with ADAS: ADAS, PC5, and V2N together form a holistic safety framework, where ADAS addresses immediate local sensing and control, PC5 supports short-range cooperative awareness, and V2N enables broader contextual and upstream hazard awareness.

6. Global Alignment: Euro NCAP and 5GAA recognize both V2N and PC5 as complementary technologies within the broader cooperative safety ecosystem.

7. Ecosystem Momentum: Enables early deployment, validation, and adoption while direct C-V2X capabilities continue to mature.

Harman can also provide detailed technical comments and implementation perspectives related to the various topics covered in the final report of the task force on ITS (i.e., "Recommendations for Automotive Industry Standards and regulations related to Intelligent Transportation Systems, and rollout of communication between vehicle to anything (V2X)"), such as Day-0 deployment strategy, scalability, awareness-oriented use cases, and the complementary roles of ADAS, PC5, and V2N. We would welcome the opportunity to discuss these aspects further, if helpful.

Recommendations to TRAI

1. Adopt a technology-neutral framework supporting both V2N and PC5. Any inclusion of V2X in new car assessment programs (e.g. Bharat NCAP) or V2X related regulations should consider both V2N and PC5.
2. Enable immediate deployment of V2N services.
3. Support phased implementation for Day-0 use cases.
4. Allow ecosystem-driven scaling of PC5.

Conclusion

A balanced deployment approach ensures immediate safety benefits, rapid adoption, and long-term scalability aligned with global standards.

Harman remains committed to supporting TRAI and ecosystem partners in advancing connected mobility solutions.