ISO 9001:2015 Company

Comments on TRAI Consultation Paper No. 08/2026 Regulatory Framework for Vehicle-to-Everything (V2X) Communication

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Version History

Version 1 [18th May 2026]: Initial Submission

Version 2 [3rd June 2026]: Updates based on feedback from other Stakeholders

Cover Letter

Danlaw Technologies India Ltd respectfully submits these comments in response to TRAI Consultation Paper No. 08/2026 on the Regulatory Framework for Vehicle-to-Everything (V2X) Communication. These comments are informed by practical V2X deployment, interoperability, standards, and certification experience accumulated through global and Indian ecosystem engagements.

Danlaw and its V2X ecosystem collaborations have participated in connected vehicle deployments, interoperability efforts, and ecosystem engagement activities relevant to C-V2X technologies, including exposure to international deployments, standards, interoperability, and certification discussions.

We appreciate the progressive direction already reflected in the consultation paper and submit these comments in a constructive spirit to support rapid, safe, interoperable, and scalable deployment of V2X in India.

Executive Summary

- Support adoption of C-V2X as India's harmonized V2X technology.
- ~~Avoid freezing regulations to a single 3GPP release; adopt a release-flexible approach.~~
- Establish a harmonized baseline C-V2X deployment profile to ensure nationwide interoperability while providing a clearly defined migration path toward future 3GPP releases.
- Maintain license-exempt treatment for OBUs under defined technical conditions.
- Adopt a light-touch authorization framework for RSUs rather than telecom-style licensing.
- Assign spectrum administratively, not through auction, due to public safety objectives.
- Keep spectrum charges nil or nominal for safety-related ITS deployments.
- Support harmonized higher-layer ITS stack, preferably ETSI ITS-based.
- Establish a national V2X PKI / SCMS framework prior to mass deployment.
- Support MTCTE/TEC certification with pilot flexibility during ecosystem ramp-up.
- Use a shared, non-exclusive spectrum coordination model.

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Organizational Perspective and Relevant Experience

Danlaw Technologies India Ltd and its associated V2X ecosystem engagements have practical experience in connected vehicle technologies, interoperability testing, standards participation, pilot deployments, and ITS stakeholder engagement. These comments are informed by exposure to real-world V2X deployment considerations, including interoperability, certification, roadside infrastructure, and multi-vendor ecosystem integration.

High-Level Principles for India's V2X Framework

A. **Safety-first regulation**: V2X should primarily be treated as safety-critical infrastructure.
B. **Deployment-friendly regulation**: Regulation should enable rapid pilots and ecosystem growth.
C. **Interoperability by design**: Multi-vendor interoperability should be mandatory.
D. **Technology evolution**: Frameworks should support LTE-V2X to NR-V2X migration.
E. **Security-by-design**: National PKI/SCMS should precede large-scale rollout.

Detailed Recommendations

Adoption of C-V2X

India should adopt C-V2X as the harmonized national ITS technology. Given the absence of large legacy DSRC deployments in India, the country has a unique opportunity to directly adopt a scalable 3GPP-based ecosystem aligned with global trends.

~~Release-Flexible Regulatory Framework~~

~~India should avoid locking regulations to a single 3GPP release. TRAI should prescribe performance, interoperability, latency, and reliability expectations rather than freezing the ecosystem to LTE-V2X or NR-V2X alone.~~

Harmonized Deployment Profile and Standards Evolution Framework

India should establish a harmonized baseline C-V2X deployment profile to ensure interoperability during the initial deployment phase. A common deployment profile will accelerate ecosystem growth, certification, interoperability testing, and safety application deployment. The regulatory framework should simultaneously provide a clearly defined migration path toward future 3GPP releases, including NR-V2X, while avoiding unnecessary long-term technology lock-in.

OBU Licensing

OBUs should remain license-exempt under defined technical conditions and equipment certification. This is essential to enable OEM adoption and rapid ecosystem growth.

RSU Authorization

RSUs should require authorization because they are fixed transmitting infrastructure; however, the authorization or license framework should remain light-touch, digitally administered, and non-exclusive rather than telecom-style licensing.

Spectrum Assignment

Spectrum for safety-related V2X should be administratively assigned and not auctioned, consistent with the public safety intent of transport systems under the Telecommunications Act, 2023.

Spectrum Charges

Spectrum fees for safety-oriented V2X should be nil or nominal. High fees may delay deployment and undermine national road safety objectives.

Higher Layer ITS Stack

India should standardize a harmonized ITS stack to ensure interoperability. ETSI ITS stack is recommended, with India-specific profiles where needed.

Security Credential Management System (SCMS)

India should establish a national V2X PKI / SCMS model supporting pseudonym certificates, certificate revocation, authentication, privacy, and interoperability with internationally recognized frameworks.

Certification and Compliance

OBUs and RSUs should be certified under TEC/MTCTE. However, early-stage pilots should be allowed through pragmatic mechanisms, including controlled exemptions or temporary recognition of international certifications.

Spectrum Sharing

TRAI should prefer a shared and non-exclusive spectrum model with interference coordination rather than fragmented exclusive allocations.

Spectrum Partitioning by Application

Danlaw recommends that the allocated V2X spectrum should not be statically partitioned by application category (for example, safety vs. non-safety services or V2V vs. V2I services). Existing 3GPP, ETSI, and SAE standards already define prioritization and congestion management mechanisms, including PPPP (Per Packet Priority Profile) and related quality-of-service controls, which ensure that safety-critical applications receive priority access to communication resources when required. Maintaining a common shared spectrum pool maximizes spectrum efficiency, simplifies deployment, preserves international interoperability, and avoids unnecessary regulatory complexity.

Responses to Major Consultation Areas

A. **Authorization framework**: Introduce a V2I-specific authorization category with simplified eligibility and digital workflows.
B. **Technology standard**: Adopt C-V2X with release flexibility.
C. **PKI/security**: Create a national SCMS/PKI framework before scale deployment.
D. **Certification**: Adopt MTCTE while enabling pilots.
E. **Spectrum**: Administrative assignment, shared usage, nominal fees.
F. **RSU deployment**: Simplified GIS-based registration rather than heavy SACFA-style approvals.
G. **Spectrum partitioning**: Avoid static partitioning of spectrum by application type; rely on established 3GPP/ETSI/SAE prioritization mechanisms to manage safety-critical traffic.

Closing Remarks

Danlaw Technologies India Ltd welcomes the progressive direction reflected in the consultation paper. India has a unique opportunity to leapfrog directly into a globally interoperable, secure, and scalable C-V2X ecosystem. A balanced regulatory approach emphasizing safety, interoperability, security, and deployment practicality can accelerate India's leadership in connected mobility.

The comments contained in this Version 2 submission have been further refined based on constructive discussions and feedback received from industry stakeholders, technical experts, and members of the broader V2X ecosystem. Danlaw Technologies India Ltd appreciates the collaborative nature of the consultation process and believes that continued engagement between regulators, industry participants, standards bodies, and deployment stakeholders will be essential to the successful rollout of V2X technologies in India.

We would be pleased to engage further with TRAI, DoT, MoRTH, or related stakeholders if additional technical inputs, interoperability perspectives, or deployment experience are considered useful.