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2nd JUNE 2026

To,

Shri Akhilesh Kumar Trivedi
Advisor (Networks, Spectrum and Licensing)
TRAI

Sir,

Subject:- Consultation Paper on the Regulatory Framework for Vehicle-to-Everything (V2X) Communication

We are a registered CAG of TRAI.

We are pleased to forward our **comments** on some of the issues mentioned in the above consultation paper for your perusal and consideration.

Thanking you,
Yours Sincerely

GOPAL RATNAM V
Secretary
Consumer Care Society
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Comments on
Consultation Paper on
the Regulatory Framework for
Vehicle-to-Everything (V2X) Communication

Q1. Whether there is a need to introduce an authorisation for vehicle-to-infrastructure (V2I) communication service under Section 3(1)(a) of the Telecommunications Act, 2023? If yes, please provide input with respect to the following aspects:
(a) Eligibility conditions for the authorisation;
(b) Period of validity of the authorisation and conditions for its renewal;
(c) Service area of the authorisation;
(d) Scope of service of the authorisation;
(e) Technical, operating, security related conditions etc. of the authorisation;
(f) Any other related aspect.
Kindly provide a detailed response with justification.

Yes. A light-touch, safety-oriented and infrastructure-focused authorisation framework should be introduced for Vehicle-to-Infrastructure (V2I) communication services under Section 3(1)(a) of the Telecommunications Act, 2023.

The proposed framework should be such that it should facilitate rapid deployment of safety-critical ITS infrastructure and ensure coordinated spectrum usage and interference management. Further it should maintain interoperability and cybersecurity, avoid excessive financial or regulatory burdens, and preserve flexibility for future evolution from LTE-V2X to NR-V2X and beyond.

The authorisation should resemble a public-interest infrastructure authorisation rather than a commercial telecom service licence.

(a) Eligibility Conditions for the Authorisation

Based on the objective of a public interest infrastructure the entities that would be eligible would be Central Government agencies, State Government Agencies, Urban Local Bodies / Smart City SPVs, NHAI and other road-owning authorities and Metro rail and transport authorities. These can be categoried the primary eligibility entities.

The entities from Private would be Secondary eligibility entities and should be permitted only if they are authorised by a government transport authority or operating under PPP arrangements, like highway concessionaires, toll operators and smart mobility concessionaires.

This suggestion is broadly consistent with MoRTH recommendations, and global practice.

(b) Period of validity of the authorisation and conditions for its renewal

We suggest a period of validity of 10 years with a renewal option. The length of time is reasonable for infrastructure investment where there is a need for regulatory certainty**.**

Renewal should be subject to performance on various criteria like

- compliance history,
- spectrum usage compliance,
- cybersecurity compliance,
- interoperability compliance,
- adherence to technical standards,
- absence of harmful interference.

(c) Service Area of the Authorisation

The Service area should be Flexible to suit the local requirements and scalable to ensure fast implementation..

The possible ways that this can be determined in two, Site-based or Transport Corridor based. Site based can be Intersection Specific, City, District or State. Corridor based can be High Street Corridor, Frieght Corridor, State Highway Corridor or National Highway Corridor.

We suggest it should be a mix of both.

(d) Scope of Service of the Authorisation

The authorisation should permit deployment and operation of RSUs, V2I Communication Systems and Safety Messaging Systems. Authorisation should also cover V2N Integration Gateways where they are applicable. The Applications that the provide services like Traffic Safety, Cooperative ITS should be allowed.

Permitted services should include these

- safety applications,
- traffic management,
- congestion management,
- emergency response support,
- tolling support,
- road weather systems,
- cooperative driving support,
- vulnerable road-user protection.

The authorisation should **not** permit Public mobile telecom services or broadband retail services.

(e) Technical, Operating and Security Conditions

(i) Technology neutrality
India should adopt as suggested by the Task Force C-V2X as the harmonized framework initially while remaining evolution-friendly toward NR-V2X. The framework should avoid locking into a specific 3GPP release as practiced in USA.

(ii) Mandatory interoperability
RSUs and OBUs should comply with TEC standards, Interoperability standards and Standardized ITS stack. The ETSI ITS stack may be adopted initially, as recommended by the Task Force.

(iii) Mandatory testing and certification
All RSUs should undergo MTCTE certification along with EMI/EMC testing, cybersecurity testing and interoperability testing.

(iv) Cybersecurity framework
A dedicated V2X PKI framework should be established because:

- V2X systems are vulnerable to spoofing,
- false safety messages can create severe public harm.

(v) Spectrum usage conditions
The spectrum should be administratively assigned on a non-exclusive basis to be shared and coordinated. Auction-based assignment is not appropriate because V2X is a public-safety infrastructure and revenue maximization should not be the objective.

Q2. In case your reply to Q1 is no, what should be the mechanism for enabling, facilitating and regulating vehicle-to-infrastructure (V2I) communication service in India? Kindly provide a detailed response with justification.

Since our response to Q1 is yes, Q2 is not applicable.

Q3. Any other suggestions relevant to the authorisation for vehicle-to-infrastructure (V2I) communication service may be submitted with proper explanation and justification.

The following additional suggestions are submitted for consideration:

1. Adopt a "Safety-First" Regulatory Philosophy
V2X regulation as mentioned earlier should be framed primarily as a public safety initiative, rather than a commercial telecom licensing exercise. India has one of the highest number of deaths due to accidents on the road.

The regulatory design should therefore prioritize reliability, affordability and public interest.

2. Ensure Interoperability Across States and Agencies

We should avoid city-specific proprietary ecosystems and incompatible state-level ITS deployments. Hence, all V2X deployments should comply with common national standards.

Without harmonization nationwide interoperability may fail, vehicle manufacturers may face excessive complexity and deployment costs may rise substantially.

Q4. Whether a specific technology (such as LTE-based C-V2X, NR based C-V2X etc.) should be prescribed for the implementation of C-V2X in India? If yes, which technology should be adopted for the implementation of C-V2X? If no, in what manner, the issues related to inter-operability between different technologies should be addressed? Kindly provide a detailed response with justification.

The primary objective should be protection of consumer interests through interoperability, affordability, safety, cybersecurity and most importantly with technology, the future proofing of the consumers investments in devices.

Our suggestions is further elaborated with these justifications.

1. Consumers Benefit More from Interoperability than from Technology Mandates

From a consumer perspective, the most important requirement is not whether a vehicle uses LTE-V2X or NR-V2X, but whether all vehicles and road infrastructure communicate safely and reliably with each other

Therefore, interoperability should be the primary regulatory objective.

2. LTE-Based C-V2X should be the Initial Technology

With the adoption of LTE Based C-V2X by many countries, equipment availability is greater and deployment costs are lower. Further, LTE-V2X technology is more mature and has major advantages over other technologies as mentioned in the consultation paper

3. Regulatory Lock-In should be avoided

Past experiences demonstrates that telecommunications technologies evolve rapidly and as such a rigid mandate today increase future migration costs, create stranded investments, delay innovation and impose replacement costs on consumers.

The regulatory framework should prescribe performance, safetey and interoperability requirements rather mandating a single technological standard.

4. NR-Based C-V2X should be supported as an Evolution Path and backward compability is mandated

NR-V2X is expected to support advanced cooperative driving and automated mobility. It also provided for enhanced road safety services.

Consumers purchasing vehicles today should easily migrate to the newer technology whenever they become available. So TRAI should mandate that NR-based deployments be able to communicate with legacy LTE-V2X systems so that consumers do not have to incur costs to upgrade.

Q5. Whether there is a need to bring road-side units (RSUs) and on board units (OBUs) under the regime of Mandatory Testing Certification of Telecom Equipment (MTCTE)? If no, in what manner, Electromagnetic Interference (EMI), Electromagnetic Compatibility (EMC), safety, technical and security requirements prescribed by TEC/ DoT may be ensured? Kindly provide a detailed response with justification.

Yes. Both RSUs and OBUs should be brought under the MTCTE framework.

V2X systems are safety-critical technologies whose failures may directly affect human life, personal safety and consumer welfare. Therefore, mandatory certification in addition to electromagnetic compatibility and electromagnetic interference, should cover radio performance, interoperability, cybersecurity and functional safety.

The reasons according to us are;

1. V2X Failures Can Have Life-Threatening Consequences

V2X devices generate information that may influence driver decisions. Any Incorrect warnings may cause unsafe manoeuvres and collisions resulting in loss of human lives or physcial diabilities.

Consumer have the right to safe and reliable products/services.

2. Testing ensures a Uniform Safety Standard

Certification should ensure that all equipment satisfies minimum requirements regarding the various parameters and as a consequence consumer benefit by the assurances that come with certified products.

3. Cybersecurity Certification Should Be Mandatory

Cybersecurity is as important as radio certification as a compromised V2X device may disrupt transportation systems through false alerts leading to fatal consequences.

4. Interoperability Testing Should Be Part of Certification

Consumers should not suffer because different manufacturers implement standards differently. Interoperability ensures that safety warning works irrespective of the vehicle brand.

Q11. Any other issues/ suggestions relevant to the regulatory framework for V2X communication may be submitted with proper explanation and justification.

In addition to the most important and primary regulatory objective of Consumer Safety, we list some issues which have immense impact on consumers along with our recommendations for consideration.

1. Strong Consumer Privacy and Data Protection Framework

V2X systems are expected to generate unprecedented volumes of personal mobility data including vehicle location, travel routes, driving behaviour. Such information can reveal personal details of an individual's life and hence there is a need for strong privacy and data protection framework.

2. Establishment of a Consumer Grievance Redressal Mechanism

The consultation paper does not presently address grievance handling.

Consumers should have access to a dedicated mechanism for complaints concerning various problems and grievances. These could be inaccurate safety alerts, service failures, cybersecurity incidents.

The Regulator should establish a multi-tier mechanism, along with the establishment of service standards. We strongly suggest that TRAI make provisions for compensation to the consumer for various deficiencies of services and product failures.

3. Protection of Vulnerable Road Users

India has a large number of Vulnerable Road Users and the benefits of V2X should extend beyond vehicle owners. Special consideration should be given to these users like pedestrians, cyclists, two wheelers as they account for the largest number of fatalities on Indian roads.

The regulatory framework should encourage development of pedestrian warning systems, cyclist detection systems to maximise social welfare.

4. Consumer Awareness and Digital Literacy Requirements

With the introduction of these new technologies of which most consumers are unfamiliar, there will a need to educate consumer. V2X technologies are complex and consumer should have a clear understanding of the system capacbilities and its limiations.

The regulatory framework should include compulsory consumer education initiatives and awareness campaigns to be conducted the different stakeholders.

5. Creation of a Consumer Advisory Council

We also suggest that TRAI along with other Governmental agencies consider establishing a Consumer Advisory Council. The Council may have representatives from consumer organizations and civil society organizations along with experts in Road Safety and Cybersecurity.

The council could consumer impacts, advise on policy changes, monitor privacy concerns and assess safety outcomes.

Finally, the introduction of Vehicle-to-Everything (V2X) communications has the potential to significantly improve road safety, traffic efficiency and mobility outcomes. However, unlike conventional telecommunications networks, V2X systems will directly influence decisions affecting human life, physical safety, privacy, and mobility. Consequently, the regulatory framework should not be confined merely to spectrum management and technical standards, but should also incorporate consumer protection, accountability, transparency, and public interest safeguards of the highest level possible.