BROADBAND INDIA FORUM
"Think Tank for Digital Transformation"

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New Delhi – 110 029.

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

Dear Sir,

Please find enclosed Broadband India Forum's (BIF's) response to the Telecom Regulatory Authority of India's Consultation Paper on the "Regulatory Framework for Vehicle-to-Everything (V2X) Communication".

We trust that our submissions will receive your kind consideration and would be pleased to provide any further clarifications or participate in subsequent discussions, if required.

With warm regards,

Yours sincerely,

T.V. Ramachandran,
President,
Broadband India Forum

BIF RESPONSE TO TRAI CP on the Regulatory Framework for Vehicle-to-Everything (V2X) Communication

PREAMBLE/BACKGROUND

Broadband India Forum at the outset lauds the Authority to come out with this Consultation Paper which focuses on a matter of critical national importance concerning road safety and decreasing the fatalities on the roads thereby leading to increased safety of human lives and overall welfare of citizens. This paper only covers the Vehicle-to-Infrastructure (V2I) communication technologies component of V2X (Vehicle to Everything) with the presumption that V2V (Vehicle to Vehicle) is being already taken care of by the Department of Telecommunications suitably through delicensing of 30MHz from 5875-5905 MHz.

India continues to face a considerably concerning road safety situation, with a high number of accidents and fatalities annually, noticeably impacting the economically productive population. In such a context, the timely consultation, discussions & consequent recommendations that are likely to accelerate the adoption of proven, technology-driven safety interventions is not merely desirable but a critical national imperative.

Our detailed response to all the Questions of the Consultation Paper is as given below.

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.

BIF RESPONSE

At the outset, we wish to state upfront that this subject is of significant importance for Public Safety and for saving human lives. Hence the Policy should be light touch, and should not get mired in complex regulatory/licensing issues which delay the implementation of the Policy. With this as the fundamental principle, all the questions have been answered keeping this in mind.

A Background Note is given below that explains why only Road Authorities and Road Operators are eligible for seeking Authorisation for V2I/V2X and also what type of Authorisation should be provided and justification for the same. The explanation given herewith shall help justify answers to several questions on this aspect which are sought in the Consultation Paper.

BACKGROUND NOTE

Why only road operators or road authorities shall be eligible for authorisation for vehicle-to-infrastructure (V2I) communication service under Section 3(1)(a) of the Telecommunications Act, 2023?

Road operators and authorities (such as the Ministry of Road Transport and Highways or state entities) physically own and manage the roadways. Hence they are best positioned to deploy, maintain, and monitor the Road Side Units (RSUs) within their jurisdiction. V2I networks transmit critical, life-saving data (e.g., sudden braking warnings, speed limits, and accident

alerts) to vehicles. This communication relies on Roadside Units (RSUs) deployed along physical roadways. Restricting authorizations to road authorities avoids signal overlapping, manages radio frequency interference, and ensures highly coordinated deployment.

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The framework outlines the administrative assignment of spectrum for the safety and operation of transport systems. By limiting who can apply, the government can easily track and allocate these specific radio frequencies to verified public-service or government-authorized agencies.

What kind of license should be applicable for RSIs and OBUs.

While individual dedicated and hard licensing is usually meant for services where spectrum is provided to an entity who has exclusive rights for using the spectrum for the period it is given and requires exclusivity, coordination, and operator-specific accountability and compliances. On the other hand, General Authorization under a 'light touch 'framework enables shared, non-exclusive spectrum access through predefined technical and operational conditions. These frameworks deliberately replace individual spectrum assignments with equipment conformity and rule compliance, and are globally recognised as the appropriate regulatory treatment for standardized, low-interference, and safety-critical technologies deployed at scale.

TECHNICAL REASON:

RSUs operate at 2 W EIRP in a 10–20 MHz ITS/V2X channel and provides only localized, intersection-scale coverage (≈ 100–600 m), comparable to vehicle OBUs constrained by low transmit power, elevated but limited antenna height, and wideband safety-oriented waveforms. In contrast, this is several orders of magnitude smaller than licensed land-mobile or PMRTS systems. Such systems that may also have commercial usages, operate at significantly higher power with elevated antennas, providing coverage over several kilometres to tens of kilometres and therefore necessitating coordinated, individually licensed spectrum. ITS RSUs are fundamentally incapable of wide-area coverage and cannot be therefore equated with such large coverage higher power wireless networks for licensing purposes. This should be taken into account to technically preclude any need for individual spectrum licensing.

For **Road Side Units (RSUs)**, which are expected to have the same transmit power levels, we propose an approach, similar to a **general authorization.** A distributed model like VAHAN[1] including **RSU** as a **light-touch authorisation control** (traceability, security governance, accountability and interference resolution), **without** conferring any geographic exclusivity or exclusive spectrum rights, could be suitably considered.

ITS RSUs are meant for **lower EIRP** and **short-range, high spatial reuse** along roads/intersections, so their interference footprint and effective service range are drastically smaller than typical administratively licensed land mobile / maritime / broadcast systems designed for wide-area coverage with higher power and elevated antennas. This fundamental difference warrants a **non-exclusive, shared-spectrum** regulatory treatment for RSUs.

Therefore the upper part of the **5.9 GHz ITS band (5905-5925MHz) for V2I applications** should be administered on a **shared, non-exclusive basis** with clear **technical conditions** (EIRP/OOBE, channel access/congestion control, standards conformance) linked to the **authorisation**. This is consistent with global best practices followed by CEPT/ECC, ACMA, FCC and Ofcom.

[1] https://www.nic.gov.in/project/etransport/
https://parivahan.gov.in/sites/default/files/FAQDOCS/RTO/VAHAN4.0VehicleRegistrationsandTransactions.pdf

With this Background Note, we now proceed to provide specific responses to the Question.

Yes- there is a need for introducing an authorisation for vehicleto-infrastructure (V2I) communication service under Section 3(1)(a) of the Telecommunications Act, 2023?,

a) Eligibility Conditions : Road authorities/road operators and their authorised integrators may register RSUs, consistent with RSUs being **road infrastructure** (not a telecom service) **This registration is expressly without prejudice to shared access; it does not constitute assignment of spectrum conferring exclusivity or seeking interference protection under the Telecommunications Act, 2023.**

(b) Period of Validity and Renewal

- **Validity Period:** The authorization should be valid for a long term, preferably **20 years**,
- **Renewal:** Renewal should be available for 10 years at a time. There should be no **entry fees at the time of renewal so as** to reduce financial burdens.
- **Migration:** Voluntary migration of existing V2I testbed registrations to this new authorization regime should be permitted.

(c) Service Area

- The authorization should allow for **pan-India** or **area-specific** (e.g., specific highway corridors, smart cities) deployment.

(d) Scope of service of the Authorisation

Establishing a secure cost-efficient, anonymous, authenticated, verified, and privacy-preserving communication between the vehicle and the Road side Unit to manage safety and mobility.

e) **Technical, Operating, and Security Conditions**

- **Spectrum Assignment:** Spectrum should be administratively assigned according to the National Frequency Allocation Plan (NFAP) 2025 for safety purposes.
- **Security Measures:** Mandatory implementation of security credentials (PKI based) for V2I messages. The authorized entity must store all data within India.
- **Lawful Interception:** The system must be capable of supporting lawful interception, as required by the government in the interest of public safety.
- **Cybersecurity:** Compliance with cyber security guidelines for critical infrastructure.

Jutsification:

The authorisation for V2I should be granted under a **General Authorisation** framework and should not be awarded on individual station licensing with **published technical and security conditions** applicable to all compliant deployments. Accordingly, the authorisation should be light touch authorisation[Because the spectrum is shared and not granted on exclusive basis]. Require **RSU registration/notification** (operator + site details) in a registry for security governance, accountability, and interference issue resolution. **Registration must not be considered as a permission step** and must not confer exclusivity.

Any permissions should be limited strictly to **civil right-of-way / mounting / safety approvals by the road authority** (analogous to placing traffic signals/signage), and **must not be treated as telecom spectrum authorisation**.

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.

BIF RESPONSE

Not applicable as response to Q1 is Yes

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

BIF RESPONSE

We propose :

1. Establishment of a registry-based governance mechanism under the **General Authorisation** framework along with
    - RSU location (geo-coordinates/road segment), operator contact, device compliance attestation (EIRP/OOBE/standards), and security credential policy identifiers.
2. For future enablement of enhanced V2I traffic safety services (and applications from the cloud), having a unified framework and common standards maybe beneficial.
3. Establishment of a clear technical compliance test to ensure technical testing without requiring individual licensing.
4. In case of the registry, if established at local body level, it must be expressly **non-rights-conferring**. Registration shall **not** create any exclusive spectrum entitlement or protection claim; operation should remain on a **shared, non-exclusive** basis subject to technical conditions.

Q4. Whether a specific technology (such as LTE-based C-V2X, NRbased 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.

BIF RESPONSE

While the policy should be technology neutral and we are also not bound to any technology, the policy should be amenable to accept any new technology that comes in future.

Based on today's technology we could start with LTE-V2X and progressively move forward with this as the baseline technology. From an engineering maturity perspective also , **LTE-V2X (with 20 MHz channels)** is suggested as it is well-suited for initial nationwide safety deployments. **NR-V2X** may also be permitted for advanced use-cases, encouraging trials / pilots / and early implementation, with coexistence ensured via standards-based mechanisms. Interoperability between different vendors and implementations for **basic-safety** using **LTE-V2X** should be ensured by adopting **common message sets**, **security framework**, and **compliance test profiles**.

Q5. Whether there is a need to bring road-side units (RSUs) and onboard 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.

BIF RESPONSE

We are of the opinion that the Policy should be light touch and speedily putting in place so that there is no loss of lives. The framework should be light touch and there should be no delays in implementing the framework. Any provisions pertaining to detailed testing etc. should therefore be shunned as it is not in consonance with the core essence of the policy to implement the norms in an expeditious manner.

With this as the background, we wish to specifically respond to the Question as below:

No. We do not agree that RSUs and OBUs should be brought under the MTCTE regime.

The MTCTE framework generally applies to all telecommunication network equipment connected to the Indian network to ensure security and safety. V2X technologies are specialized equipment, blending automotive and telecom standards.

Other reasons for justification of non-inclusion of

- **Unique V2X Ecosystem:** V2X devices are highly specialized components of intelligent transportation systems rather than standard public network equipment.
- **Existing Automotive Regulation:** RSUs and OBUs are already subject to vehicular safety and environmental regulations (under AIS/MoRTH).
- **Avoidance of Over-regulation:** Applying general telecom MTCTE, which is optimized for base stations and switches, to small, fast-evolving road sensors may introduce delays in deployment.

Instead, we propose the alternate regime should focus on minimising certification overheads. The alternate proposal should consist of :

- Self certification Focus on minimizing certification overheads.
- Since it is expected that both OBUs and RSUs will be deployed in delicensed spectrum band, only Equipment Type Approval (ETA) by TEC should suffice.
- Focus on standards compliance and RF emission compliance.

Q6. To ensure inter-operability among different RSUs/ OBUs, whether there is a need to standardize the layered communication framework (stack) for higher layers (other than the access layer in which C-V2X will be used) of Intelligent Transportation System (ITS)? If yes, which standard for ITS stack and security should be adopted? Specifically, whether the ETSI standard for ITS stack and security, as recommended by the Task Force on Intelligent Transportation System for the use of 5.9 GHz (mentioned at para 3.5 of this consultation paper) should be adopted? If no, in what manner, inter-operability among different RSUs/ OBUs can be ensured? Kindly provide a detailed response with justification.

BIF RESPONSE

Yes, there is a clear need for standardisation of the layered communication framework (stack) for higher layers (other than the access layer in which C-V2X will be used viz. facilities, networking, transport , security) of ITS to facilitate interoperability. A common ITS stack avoids fragmented deployments and ensures that safety broadcasts are universally decodable by compliant receivers.

We recommend that the Government adopt the Recommendations of the Task Force as a baseline., maintain conformance profiles and plug tests to validate multi-vendor interoperability across RSUs and ecosystems.

As regards Security, it should follow an internationally recognised V2X security framework (IEEE 1609.2) with clear certificate policies and misbehavior reporting procedures, integrated with RSU registration for auditability.

We agree with the FINAL Report and Recommendation of Task Force on ITS, which proposes LTE-V2X for Radio Layer and ETSI TC ITS Rel.2 for support of 20 MHz for the message-set and IEEE 1609.2 based SCMS with support of multiple root CAs for implementation flexibility.

Q7. Whether there is a need for prescribing a security framework for ITS/ C-V2X in India? If yes, - (a) What should be the security framework for ITS/ C- V2X? (b) Which agency [such as Controller of Certifying Authorities (CCA), Ministry of Electronics & Information Technology (MeitY)] should implement the Public Key Infrastructure (PKI) framework for ITS/ C-V2X in India? (c) How to ensure coexistence of V2X PKI certificates with the legacy PKI mechanism in India i.e. based on X.509, operated by Root Certifying Authority of India (RCAI)? Please provide a detailed response with justifications.

BIF RESPONSE

Yes, there is a need to prescribe a security framework for Intelligent Transport Systems (ITS) and C-V2X in India. As C-V2X facilitates real-time communication between vehicles (V2V) and infrastructure (V2I) for critical safety, it is susceptible to cyberattacks (spoofing, data tampering, and location tracking).

Here is a detailed breakdown of the required framework, implementation agency, and integration with legacy systems:

(a) Security Framework for ITS/C-V2X

- A national PKI framework for V2X consistent with the recommendation of Task Force on ITS is required.
- The framework should include: **PKI governance** (root-of-trust), **certificate policy**, enrolment/authorization credentials, **revocation**, and **auditability via RSU registration**.
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The security framework should be a **PKI-based hierarchical structure** tailored for high-speed, low-latency vehicular environments (e.g., using 5.9 GHz).

- **Core Standards:** Implementation of standards compliant with **ETSI TS 103 097** and **IEEE 1609.2** for secure message signing and encryption.
- **Architecture Components:**
  - **Root Certification Authority (RCA):** The top-level trust anchor.
  - **Enrollment Authority (EA):** Responsible for registering devices (OBU/RSU) and issuing long-term certificates.
  - **Authorization Authority (AA):** Issues short-lived, frequently changing "Authorization Tickets" (pseudonym certificates) to prevent tracking of vehicles and ensure privacy.

(b) Agency to Implement PKI Framework

- The implementing agency should operate the national root of trust and policy controls, with operational delegation to accredited entities as required for scale and resiliency.
- The implementation of the PKI framework should be led by a collaborative effort, with the technical governance resting with the **Controller of Certifying Authorities (CCA)/RCAI** , under the **Ministry of Electronics & Information Technology (MeitY)**. The CCA should work in tandem with the **Department**

of Telecommunications (DoT) and **Ministry of Road Transport and Highways (MoRTH)** for domain-specific security policies.
- It would be desirable to have a national policy level recognition of IEEE 1609.2 based ITS Security Root CA.

(c) Coexistence with Legacy PKI (RCAI)
- Maintain a V2X-domain security architecture with defined interworking boundaries at policy/root level only, avoiding unnecessary coupling of end-device certificate processing; ensure governance is enforceable via certificate policy.
- Preferably have a national policy level recognition of IEEE 1609.2 based ITS Security Root CA
- Essential to have V2X Security certificates within the ITS-domain only based on V2X security. Interworking, if any, with X.509, to be limited only at Root CA level and not percolate to end-devices (OBUs and RSUs).

Q8. What should be the regulatory framework for the assignment of frequency spectrum to the entities holding the proposed V2I communication service authorisation? Specifically, - (a) Whether there is a need for partitioning the 30 MHz spectrum (5,875-5,905 MHz) for specific applications such as "safety applications" and "operational applications (non-safety applications)"? (b) In case more than one authorised entity has to operate in the same geographical area, what should be the mechanism for simultaneous use of the spectrum? Specifically, whether the spectrum should be divided amongst the authorised entities in an exclusive manner, or should the authorised entities utilize the spectrum in a shared manner? (c) If your response to part (b) is "in an exclusive manner", what should be the minimum quantity of spectrum to be assigned to each entity holding the proposed V2I communication service authorisation? If your response to part (b) is "in a shared manner", whether there is a need to prescribe a mechanism for interference management? (d) For interference management, whether there is a need to prescribe – (i) minimum directionality of road-side unit (RSU), or (ii) protection distance between the RSUs, or
(iii) maximum antenna height for RSUs? If yes, what should be such parameter(s)? (e) Whether there is need to mandate a mechanism for obtaining prior approval (analogous to SACFA clearance) for the establishment of RSUs by the entities holding the proposed V2I communication service authorisation? If no, in what manner, the establishment of RSUs should be regulated? (f) For avoiding (i) interference between RSUs, (ii) interference between RSUs and OBUs, and (iii) interference between OBUs, whether the radiated power limits for OBUs and RSUs and OOBE limits, recommended by the Task Force on Intelligent Transportation System for the use of 5.9 GHz (mentioned at para 3.4 of this consultation paper) should be adopted? If no, what should be the radiated power limits for OBUs and RSUs and OOBE limits? (g) What should be the maximum period of assignment of spectrum to the entities holding the proposed V2I communication service authorisation? (h) Whether there is a need to prescribe roll-out obligations associated with the assignment of spectrum to the entities holding the proposed V2I communication service authorisation? (i) Whether there is a need to introduce a provision for the surrender of frequency spectrum? Kindly provide a detailed response with justification.

BIF RESPONSE

Given below is a detailed response and justification for the proposed regulatory framework for the 5.875–5.905 GHz band (30 MHz) for V2I services:

(a) Partitioning the 30 MHz Spectrum (5,875-5,905 MHz).

We propose that there is no need to partition the band and the entire 30Mhz should be harmonized in India for safety and non-safety applications in a shared manner. Exclusivity by splitting the 30 MHz is inefficient and wasteful and therefore we recommend a shared, common-use approach which shall foster interoperability.

(b) Mechanism for Simultaneous Use in the Same Area

- Where more than one authorised entity operates in the same geography, spectrum use must be **shared and remain non-exclusive**. V2X is designed for coexistence; geographic exclusivity would impede interoperability and impose artificial scarcity.
- By design, technology supports shared use of spectrum. No geographical exclusivity is required. However, for implementation and operational reasons, a competent authority may be appointed who will decide as to who is permitted within a segment of road governed by them.

(c) Mechanism for Interference Management (for "Shared Manner")

(i) Interference management should be **registry-enabled**, non exclusive assignment-based.
(ii) Mandate conformance to technical limits (EIRP/OOBE), congestion control and security as **conditions of authorisation/registration**;
(iii) use the RSU registry for traceability and remedial action.

(d) Specific Parameters for Interference Management

There is no need to specify any specific parameters for Interference Management. Only EIRP limit is sufficient. It may not be necessary to prescribe rigid directionality/protection distance/antenna height as hard authorisation conditions. These are deployment-engineering choices that vary based on intersection geometry and work-zones. A clear EIRP/OOBE envelope and standards compliance are sufficient; the registry may capture antenna height/type for audit where needed.

(e) Prior Approval (SACFA) for RSU Establishment

No a simplified, accelerated mechanism is required instead of the traditional SACFA.

- RSUs should only operate under **General Authorisation** as specified earlier in response to Q1
- Any approvals should be limited to **civil/ROW/structural safety permissions** by the road owner (traffic signal/signage analogy), and must not be treated as spectrum authorisation or site licensing. This may be by a competent authority (e.g., entity governing the road and traffic).

(f) Radiated Power Limits and OOBE Limits

(i) 2W (33dBm) EIRP for both OBU and RSU.
(ii) Adopt the OOBE limits agreed by Part 1 Recommendation of Task Force on ITS.

(g) Maximum Period of Spectrum Assignment

(i) Classical “exclusive assignment period” is not applicable under shared/non-exclusive access. As mentioned in Response to Q1, the **Validity Period of** The authorization should be for a period of **20 years** with an option for Renewal for a further period of 10 years at a time. There should be no **entry fees at the time of renewal**

(ii) RSU registration should be continuous (subject to compliance with conditions of authorisation), with periodic update obligations (e.g., every 5 years or upon change).

(h) Roll-out Obligations

(i) An approach similar to US DOT V2X Implementation Roadmap strategy would be ideal to prioritize and incentivize early implementation of RSU on accident prone intersections and segments of roads.
(ii) Instead of Roll-out obligations, it should be renamed as Rollout Incentivisation
(iii) Roll-out obligations should not be spectrum-assignment based.
(iv) We suggest national/State road-safety programmes to prioritise high-risk corridors/intersections and incentivise early RSU deployments.

(i) Provision for Surrender of Spectrum

Surrender of spectrum is not applicable as no exclusivity is conferred. Decommissioning is handled via registry updates and cessation of operation.

Q9. Whether there is a need for prescribing timelines for processing the applications for the assignment of spectrum to the entities holding the proposed V2I communication service authorisation? Kindly provide a detailed response with justification.

BIF RESPONSE

There is no need to prescribe any timelines for processing the applications for assignment of spectrum to the entities holding the V2I Service Authorisation. This is because under the proposed General Authorisation, there is no individual spectrum assignment for RSUs**.** Under the proposed registration model, per-site spectrum assignment processing isnot required. RSU establishment should be enabled via online registration with automated acknowledgement and defined exception-handling timelines only for flagged cases.

If any approvals are needed, short timelines should be prescribed (e.g., 15–30 working days) to prevent safety deployments from being delayed by administrative processes.

Q10. Whether there are any other suggestions related to assignment of spectrum to the entities holding the proposed V2I communication service authorisation? Please provide a detailed response with justification.

BIF RESPONSE

We propose that:

(i) ITS spectrum access for RSUs be **shared** and given in a **non-exclusive manner**. The RSU registry is for governance and accountability and does not create exclusive rights. Creation of a single national conformance and test regime (RF + protocol + security) to ensure interoperability across all deployments and States/ULBs.

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

BIF RESPONSE

India should adopt global best practices for ITS safety spectrum. This must include harmonised technical conditions, shared access, and proportionate authorisation for RSUs via a registry. This enables scale, interoperability, and rapid safety impact.

Some important and relevant international parallels are given below (non-exhaustive):

- (i) CEPT/ECC Decision (08)01 (ITS in 5.9 GHz, general authorisation approach),
- (ii) ACMA Radiocommunications (Intelligent Transport Systems) Class Licence 2017 (no application/fees; compliance-based),

- (iii) FCC ITS framework in 5.9 GHz with differentiated governance for OBUs/RSUs,
- (iv) Ofcom SRD licensing principles supporting licence exemption for low interference risk devices.

Q12. In view of the public welfare-oriented nature of V2X applications and the need to encourage the deployment of such infrastructure and services, should there be spectrum charges levied on spectrum assigned to the V2I communication service authorised entities under the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

We propose that:

- No spectrum usage charges should be levied.
- ITS/V2X safety applications are public-welfare oriented and delivered via shared, non-exclusive spectrum access.
- Imposing SUC will slow deployment and reduce safety benefits.
- International ITS frameworks typically rely on general authorisation/class licensing approaches that minimise cost/administrative barriers (CEPT/ECC, ACMA, Ofcom).

Q13. If answer to Q12 is affirmative, whether the spectrum charges for the V2I communication service authorised entities under the proposed V2I communication service authorisation should be determined based on the spectrum charging methodology prescribed by the Department of Telecommunications (DoT) vide its order dated 11.12.2023? If yes, then which of the radiocommunication services specified in the said order, should be taken as basis for calculation of spectrum Charges? Please provide detailed justification in support of your response.

BIF RESPONSE

In view of our response to the previous question, please find our answers to the two parts of the question as below:

1. Not applicable. In a shared, non-exclusive safety band, spectrum charge methodologies based on exclusive licensed services are not appropriate for an application which is primarily for safety of life.
2. At most, nominal cost-recovery fees may be considered solely for RSU registry administration and compliance monitoring.

Q14. If answer to Q12 is affirmative, whether the spectrum charges for the V2I communication service authorised entities under the proposed V2I communication service authorisation should be levied as a percentage of Adjusted Gross Revenue (AGR)? If yes are there any specific operational/ non-operational revenue items that should be included in/ excluded from AGR for the purpose of determination of spectrum charges? Please provide your response with detailed justification.

BIF RESPONSE

In view of our response to the question no. 12, please find our answers to the parts of the question as below:

1. Application of this spectrum band is for public good and safety of life. Charging, service providers for deploying V2I systems, will demotivate and discourage them

from providing such services and the overall objective of reducing fatalities on roads gets defeated.
2. RSU deployments are public infrastructure. The implementation agency in most of the cases would be a city / state / central government agency.
3. AGR-linked charging may be conceptually misaligned and administratively burdensome.
4. If any fee is levied, it should be a flat, nominal cost-recovery fee unrelated to revenues so as to ensure that implementation agencies are not demotivated and discouraged from such deployments towards providing safety of life on roads.

Q15. If response to questions 13 and 14 is negative, then what should be the appropriate methodology for determination of spectrum charges for the V2I communication service authorised entities under the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

In view of our response to the question no. 14 , please find our response to the question as below:

This spectrum is for public safety and public good and hence should be exempted from spectrum usage charges. The radio devices are low-power and use spectrum in shared manner. If any, only nominal cost-recovery for registry operation and compliance enforcement may be levied so as not to demotivate and discourage implementation agencies.

Q16. For spectrum assigned to the V2I communication service authorised entities under the proposed V2I communication service authorisation, what should be the appropriate payment terms for spectrum charges, if any? Please provide your response with detailed justification.

BIF RESPONSE

As mentioned above we do not recommend any spectrum usage charges.

Q17. What are the potential sources of revenue, if any, for an V2I communication service authorised entity under the proposed V2I communication service authorisation? Please provide your response with detailed justification.

BIF RESPONSE

1. V2I safety services are predominantly non-commercial public-good functions (road safety, traffic efficiency, emergency response). There is no potential for revenue generation.
2. Where indirect monetisation exists (e.g., value-added analytics), it should not be the basis for charging spectrum fees in a shared safety band.

Q18. What should be the definitions of Gross Revenue (GR), Applicable Gross Revenue (ApGR), and Adjusted Gross Revenue (AGR) for V2I communication service authorised entity under the proposed V2I communication service authorisation? Further, what should be the relevant items of revenue, exclusions and deductions and consequent definitions of GR, AGR and ApGR? Please provide your response with detailed justification.

Not Applicable. Safety broadcasts are public interest functions and should not be burdened by revenue-based levies.

Q19. What revenue components should be included in, or excluded from, the computation of Gross Revenue (GR), Applicable Gross Revenue (ApGR) and Adjusted Gross Revenue (AGR) for the purpose of determining authorisation fees or spectrum charges for the proposed V2I communication service authorisation? Please provide your response with detailed justification.

BIF RESPONSE

Not Applicable. Safety broadcasts are public interest functions and should not be burdened by revenue-based levies.

Q20. Whether revenue derived from safety-related V2X services under the proposed V2I communication service authorisation should be excluded from the computation of AGR, in view of their public interest and non-commercial nature? Please provide your response with detailed justification.

BIF RESPONSE

Not Applicable. Safety broadcasts are public interest functions and should not be burdened by revenue-based levies.

Q21. What should be the appropriate entry fee for V2I communication service authorised entities under the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

No entry fees are required to be charged. If essential, then only nominal entry fees could be considered for administrative overhead of keeping track of RSUs.

Q22. What should be the appropriate terms and conditions for bank guarantees for the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

No bank guarantees should be proposed, since this is a predominantly based on shared safety spectrum. RSU operation is shared and non-exclusive; the registry model focuses on compliance and enforcement rather than financial risk management.

Q23. What should be the applicable minimum equity and minimum net worth requirements for authorised entities under the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

No such prohibitive criteria is proposed, since this is predominantly based on shared safety spectrum. Such criteria would exclude legitimate public road authorities and smaller contractors implementing safety infrastructure. Eligibility for authorisation should be based on competence and accountability, not balance-sheet thresholds.

Q24. What should be the applicable application processing fee for the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

No fees are required to be charged.

Q25. What should be the applicable rate of authorisation fee for proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

No fees are required to be charged.

Q26. Apart from the financial provisions discussed earlier, are there any other financial terms and conditions that should be made applicable for the proposed V2I communication service authorisation? Please provide detailed justification in support of your response.

BIF RESPONSE

Additional financial terms should be avoided. If required, adopt fee waivers for government road-safety programmes and pilots, and ensure any cost-recovery fees are transparent, minimal, and strictly tied to registry/compliance operations.